Naval Facilities Engineering Systems Command Hawaii
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Final

Third Quarter 2023 - Quarterly Groundwater Monitoring Report Red Hill Bulk Fuel Storage Facility

JOINT BASE PEARL HARBOR-HICKAM, O‘AHU, HI

DOH FACILITY ID NO.: 9-102271

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December 11, 2023

Prepared for NAVFAC Hawaii by
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EXECUTIVE SUMMARY

This report presents the results of the Third Quarter 2023 groundwater long-term monitoring (GW LTM) event conducted from July 3 through September 6, 2023, at the Red Hill Bulk Fuel Storage Facility (Facility), Joint Base Pearl Harbor-Hickam, Hawaiʻi. The Facility is located in the south-central portion of the island of Oʻahu, Hawaiʻi and currently contains 20 underground fuel storage tanks undergoing defueling. The State of Hawaiʻi Department of Health (DOH) Facility identification (ID) number is 9-102271. The DOH Release ID nos. are 990051, 010011, 020028, 140010, and 210012. The DOH Release Case ID nos. 20210507-0852 and 20211120-2330.

The GW LTM event was conducted pursuant to the *Groundwater Protection Plan* (DON 2014) and performed under the Comprehensive Long-Term Environmental Action Navy VI, contract task order N6274223F0142. Data collected for this GW LTM event also support Sections 6 and 7 of the *Administrative Order on Consent* [AOC] *in the Matter of Red Hill Bulk Fuel Storage Facility, EPA Docket No: RCRA 7003-R9-2015-01 and DOH Docket No: 15-UST-EA-01*, Attachment A, Statement of Work (EPA Region 9 and DOH 2015).

The purpose of the monitoring is to assess the condition of groundwater beneath the Facility and to ensure that the United States Department of the Navy remains in compliance with DOH Underground Storage Tank release response requirements as described in Hawaiʻi Administrative Rules Chapter 11-280.1, Subchapter 6, Release Response Action. The sampling was conducted in accordance with the May 2023 memorandum *Consolidation and Optimization of the Groundwater Sampling Programs, Red Hill Bulk Fuel Storage Facility* (DON 2023a), which unified multiple groundwater monitoring efforts at Red Hill under a single Groundwater Sampling Program beginning in June 2023.

During the Third Quarter 2023 GW LTM event, AECOM Technical Services, Inc. collected groundwater samples from 33 monitoring locations within the Red Hill groundwater monitoring network in accordance with the Groundwater Sampling Program (DON 2023a). Groundwater samples were also analyzed for natural attenuation parameters (NAPs), general chemistry, fuel additives, and at select locations, lead scavengers. Depth to groundwater measurements were collected, and locations were gauged for the presence of light nonaqueous-phase liquid.

Analytical results for project chemicals of potential concern (COPCs) were compared to the current Groundwater Sampling Program screening criteria (DOH 2017). The analytical results for groundwater samples collected from RHMW01R, RHMW02, and RHMW03 were also compared to Site-Specific Risk-Based Levels (SSRBLs) for total petroleum hydrocarbons (TPH)-diesel range organics (TPH-d) and benzene. Analytical results for the Third Quarter 2023 GW LTM even are summarized in Table ES-1.

During the Third Quarter 2023 GW LTM event, no detectable amounts of light nonaqueous-phase liquid were present at any of the monitoring locations. The significantly lower or non-detect analytical results for TPH with SGC analysis suggest that the majority of TPH-d and TPH-o consists of polar compounds, which may be indicative of ongoing biodegradation and weathering of fuel. TPH-d and TPH-o concentrations at RHMW01R, RHMW02, and RHMW03 did not exceed their respective SSRBLs, and NAP concentrations at these wells suggest that anaerobic biodegradation may be occurring there. The TPH-d/o detects at RHMW08, RHMW20, RHP04B, RHP04C and NMW24 are not indicative of fuel since the chromatography do not resemble fuel, soluble fuel components, or fuel metabolites.

Based on the groundwater monitoring results and pursuant to the Red Hill *Groundwater Protection Plan* (DON 2014) and AOC Statement of Work Sections 6 and 7 (EPA Region 9 and DOH 2015), groundwater monitoring at locations within the Red Hill groundwater monitoring network will continue based on the COPC list identified in the February 4, 2016, scoping completion letter (EPA Region 9 and DOH 2016a), the COPCs from the fuel additives, and the additional NAP and groundwater chemistry parameters presented in the September 15, 2016, Regulatory Agency disapproval letter (EPA Region 9 and DOH 2016b).

Table ES-1: Summary of Analytical Results, Third Quarter 2023 GW LTM Event

Monitoring Location	COPC, Fuel Additive, or Lead Scavenger Detected	Analyte Concentration Exceeding Screening Criterion
RHMW2254-01	None	None
RHMW01R	TPH-d (significantly lower after SGC) TPH-o (ND after SGC) 1-methylnaphthalene	None
RHMW02	TPH-g **TPH-d** (significantly lower after SGC) TPH-o (ND after SGC) Ethylbenzene Xylenes 1-methylnaphthalene Naphthalene	TPH-d: 2,170 µg/L (screening criterion: 400 µg/L)
RHMW03	TPH-d (ND after SGC) TPH-o (ND after SGC)	None
RHMW04	None	None
RHMW05	None	None
RHMW06	None	None
RHMW08	TPH-d [a] (ND after SGC)	None
RHMW09	None	None
RHMW10	None	None
RHMW11-05	None	None
RHMW12A	None	None
RHMW13-05	None	None
RHMW14-03	None	None
RHMW15-05	None	None
RHMW16	None	None
RHMW17	None	None
RHMW19	None	None
RHMW20	TPH-o (ND after SGC)	None
HDMW2253-03	None	None
RHP01	None	None
RHP02	None	None
RHP03	None	None
RHP04A	None	None
RHP04B	TPH-d (ND after SGC) TPH-o (ND after SGC)	None
RHP04C	TPH-d (ND after SGC)	None
RHP05	None	None
RHP06	None	None
RHP07	None	None
RHP08	Toluene	None
NMW24	TPH-d (ND after SGC)	None
NMW25	None	None
NMW32	Naphthalene [a]	None

Bold Indicates screening criterion exceedance.
µg/L micrograms per liter
ND non-detect
SGC silica gel cleanup
TPH-d total petroleum hydrocarbons – diesel range organics
TPH-o total petroleum hydrocarbons – residual oil range organics
[a] Detected in primary (normal) sample only.

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APPENDIXES

FIGURES

TABLES

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ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
µg/L	micrograms per liter
2-2-MEE	2-(2-methoxyethoxy)-ethanol
AOC	Administrative Order on Consent
APPL	Agriculture & Priority Pollutants Laboratories, Inc.
ARI	Analytical Resources, Inc.
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCV	continuous calibration verification
COPC	chemical of potential concern
CSM	conceptual site model
DL	detection limit
DO	dissolved oxygen
DOC	dissolved organic carbon
DoD	Department of Defense, United States
DOH	Department of Health, State of Hawaiʻi
EAL	environmental action level
EDMS	Environmental Data Management System
EPA	Environmental Protection Agency, United States
F-76	Marine Diesel Fuel
Facility	Red Hill Bulk Fuel Storage Facility
GW LTM	groundwater long-term monitoring
ICV	initial calibration verification
ID	identification
IDW	investigation-derived waste
IRR	Investigation and Remediation of Releases
J	estimated value
JBPHH	Joint Base Pearl Harbor-Hickam
JP	jet fuel propellant
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LNAPL	light nonaqueous-phase liquid
LOD	limit of detection
LOQ	limit of quantitation
mg/L	milligrams per liter
mL	milliliter
MS	matrix spike
MSD	matrix spike duplicate
msl	mean sea level
NAP	natural attenuation parameter
NAVFAC	Naval Facilities Engineering Systems Command
Navy	Department of the Navy, United States
ND	non-detect
no.	number
ORP	oxidation-reduction potential

PAH	polynuclear aromatic hydrocarbon
PID	photoionization detector
ppm	parts per million
ppmv	parts per million by volume
QC	quality control
Qtr	quarter
RPD	relative percent difference
SAP	sampling and analysis plan
SGC	silica gel cleanup
SIM	selected ion monitoring
SOW	scope of work
SSRBL	Site-Specific Risk-Based Level
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons – diesel range organics
TPH-g	total petroleum hydrocarbons – gasoline range organics
TPH-o	total petroleum hydrocarbons – oil range organics
U.S.	United States
VOC	volatile organic compound
WP	work plan

1. Introduction

This report presents results of the Third Quarter 2023 groundwater long-term monitoring (GW LTM) event conducted between July 3 and September 6, 2023 at the Red Hill Bulk Fuel Storage Facility (Facility), Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Figure 1). In accordance with the *Groundwater Protection Plan* (DON 2014), the purpose of the monitoring is to (1) assess the condition of groundwater beneath and around the Facility with respect to chemical constituents associated with Jet Fuel Propellant and Marine Diesel Fuel (F-76), and (2) ensure that the United States (U.S.) Department of the Navy (Navy) remains in compliance with the State of Hawai'i Department of Health (DOH) Underground Storage Tank release response requirements codified in Hawai'i Administrative Rules Chapter 11-280.1, Subchapter 6, Release Response Action. The DOH Facility identification (ID) number (no.) for the Facility is 9-102271. The DOH Release ID nos. are 990051, 010011, 020028, 140010, and 210012; the DOH Release Case ID nos. 20210507-0852 and 20211120-2330.

The groundwater monitoring was conducted under Naval Facilities Engineering Systems Command (NAVFAC) Pacific Contract No. N62742-23-D-1802 as part of the long-term groundwater and soil vapor monitoring program at the Facility for Naval Supply Systems Command Fleet Logistics Center Pearl Harbor. Soil vapor monitoring at Red Hill is conducted under another contract and reported separately. The groundwater sampling was conducted in accordance with the Navy's May 2023 memorandum *Consolidation and Optimization of the Groundwater Sampling Programs, Red Hill Bulk Fuel Storage Facility* (DON 2023a) and associated procedures and guidance[1].

This report presents the results for sampling activities conducted at groundwater monitoring locations both within and outside the Facility boundaries. Cumulative monitoring results for the Red Hill consolidated well network (formerly, the GW LTM network) are presented in tables and charts in Appendix A. Field activity and analytical documentation for the Third Quarter 2023 GW LTM event are presented in Appendix B and Appendix C, respectively.

1.1 SITE DESCRIPTION

The Facility is located on Federal Government land (on land zoned by the City and County of Honolulu as a mix of F-1 Federal and Military and P-1 Restricted Preservation districts) in south-central O'ahu, approximately 2.5 miles northeast of Pearl Harbor (Figure 1). It is located on a low ridge on the western edge of the Ko'olau Mountain Range that divides Hālawa Valley and Moanalua Valley. The Facility occupies 144 acres of land, and the majority of the ground surface of the site lies at an elevation of approximately 200–500 feet above mean sea level (msl). Proximate to the Facility lie Hālawa Industrial Park and Hālawa Correctional Facility to the north, preservation land to the northeast, residential neighborhoods in Moanalua Valley to the southeast, and additional residential neighborhoods and the U.S. Coast Guard reservation to the southwest. A quarry is located less than one-quarter mile to the northwest.

The Facility currently contains 20 underground fuel storage tanks that are operated by Naval Supply Systems Command Fleet Logistics Center Pearl Harbor. Each tank has a capacity of approximately 12 or 12.7 million gallons. The bottoms of the Facility's tanks are located a minimum of approximately 100 feet above the basal aquifer. The fuel storage tanks most recently contained Jet Fuel Propellant (JP) No. 5, North

[1] Naval Facilities Engineering Systems Command, Pacific Environmental Restoration Program *Project Procedures Manual* (DON 2015);

DOH *Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan* (DOH 2021);

AOC Statement of Work Sections 6 and 7 *Work Plan/Scope of Work* (DON 2017a);

Navy *Sampling and Analysis Plan* (SAP) and addenda (DON 2017b; 2017c; 2017d; 2021b).

Atlantic Treaty Organization-grade F-24 jet fuel, and F-76 diesel and are scheduled to undergo defueling starting in October 2023.

Groundwater monitoring locations in the current Consolidated Well Network are listed in Table 1-1, and monitoring zones for each of the four multilevel wells are described in Table 1-2.

Table 1-1: Groundwater Monitoring Locations in the Current Red Hill Groundwater Well Network

Location ID	Type	Location	Year Installed	Approximate Closest Distance to South Hālawa Stream (meters) [c]
RHMW2254-01 [a]	Sampling Point	Inside Facility boundary	2005	85
RHMW01R	Single Screen	Inside Facility boundary	2021	232
RHMW02	Single Screen	Inside Facility boundary	2005	299
RHMW03	Single Screen	Inside Facility boundary	2005	271
RHMW04	Single Screen	Inside Facility boundary	2005	81
RHMW05	Single Screen	Inside Facility boundary	2009	225
RHMW06	Single Screen	Inside Facility boundary	2014	104
RHMW08	Single Screen	Inside Facility boundary	2016	64
RHMW09	Single Screen	Inside Facility boundary	2016	376
RHMW10	Single Screen	Inside Facility boundary	2017	452
RHMW11	Multilevel	Hālawa Correctional Facility	2017	3 [d]
RHMW12A	Single Screen	Hālawa Correctional Facility	2021	166
RHMW13	Multilevel	Inside Facility boundary	2019	47
RHMW14	Multilevel	Hālawa Correctional Facility	2019	10 [d]
RHMW15	Multilevel	Inside Facility boundary	2019	153
RHMW16	Single Screen	Inside Facility boundary	2020	32
RHMW17	Single Screen	Inside Facility boundary	2022	54
RHMW19	Single Screen	Inside Facility boundary	2020	441
RHMW20	Single Screen	Inside Facility boundary	2023	50
HDMW2253-03 [b]	Deep Monitoring Well	Hālawa Correctional Facility	2000	20
RHP01	Single Screen	Inside Facility boundary	2022	26
RHP02	Single Screen	Inside Facility boundary	2022	35
RHP03	Single Screen	Inside Facility boundary	2022	53
RHP04A	Single Screen	Inside Facility boundary	2022	124
RHP04B	Deep Monitoring Well	Inside Facility boundary	2022	124
RHP04C	Deep Monitoring Well	Inside Facility boundary	2023	124
RHP05	Single Screen	South of Facility boundary	2022	192
RHP06	Single Screen	South of Facility boundary	2023	157
RHP07	Single Screen	Inside Facility boundary	2023	78
RHP08	Single Screen	South of Facility boundary	2023	104
NMW24	Single Screen	Northwest of Facility boundary	2022	289
NMW25	Single Screen	South of Facility boundary	2023	366
NMW32	Single Screen	West of Facility boundary	2023	462

Notes:
Single screen: Conventional monitoring well with single screen typically installed across or near the water table.
Multilevel: Well that is screened near the piezometric surface of the regional basal aquifer and at lower depths (zone identifiers decrease with depth).
[a] Sampling point located inside the shaft of Navy Supply Well 2254-01.
[b] Installed by State of Hawai‘i Department of Land and Natural Resources with a solid casing to approximately 50 feet below the water table.
[c] See Section 1.2.
[d] RHMW11 and RHMW14 are located adjacent to the concrete-lined portion of South Hālawa Stream.

(b) (3) (A)

[redacted]

Figure 1
Site Location Map
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Table 1-2: Description of Multilevel Monitoring Zones

Well	Number of Zones	Description	Zone(s) Currently Monitored	Zones Not Currently Monitored
RHMW11	8	• Zone 8 is completed at an elevation near the regional basal aquifer potentiometric surface, with the zone's sampling port located in saprolite. • Zones 6 and 7 are completed at elevations below the regional basal aquifer potentiometric surface, with sampling ports located in saprolite. • Zones 1 through 5 are completed deeper, with sampling ports within the basalt in the basal aquifer.	Zone 5	Zones 1 to 4 [a] Zones 6 to 8 [b]
RHMW13	5	All zones are located within high-hydraulic-conductivity portions of unweathered basalt: • Zone 5 is completed at an elevation near the regional basal aquifer potentiometric surface. • Zones 1 through 4 are completed deeper.	Zone 5	Zones 1 to 4 [a]
RHMW14	8	• Zone 8 is completed above the elevation of the piezometric surface of the regional basal aquifer with the zone's sampling port located in saprolite. • Zone 7 is completed across the regional basal aquifer potentiometric surface, with the sampling port in basalt with lower hydraulic conductivity. • Zones 4 to 6 are below the elevation of the piezometric surface of the regional basal aquifer, with sampling ports within basalt with relatively lower hydraulic conductivity. • Zones 1 to 3 are located deeper, with sampling ports within the relatively higher-hydraulic-conductivity portions of the unweathered basalt in the basal aquifer.	Zone 3	Zones 1 to 2 [a] Zones 4 to 8 [b]
RHMW15	5	All zones are located within high-hydraulic-conductivity portions of unweathered basalt: • Zone 5 is completed at an elevation near the regional basal aquifer potentiometric surface. • Zones 1 through 4 are completed deeper.	Zone 5	Zones 1 to 4 [a]

[a] Not monitored due to lack of detections of COPCs in previous GW LTM events.
[b] Not monitored due to low hydraulic conductivity.

1.2 PHYSICAL SETTING

The Facility is situated on the southwest flank of the Ko‘olau shield volcano and is primarily underlain by Ko‘olau volcanic series basalts. Climatological conditions in the vicinity of the Facility consist of warm to moderate temperatures and low to moderate rainfall. The average annual precipitation is approximately 40 inches, which occurs mainly between November and April (Giambelluca, Nullet, and Schroeder 1986). Average temperatures range from the low 60s to high 80s (degrees Fahrenheit) (Juvik and Juvik 1998).

The Facility is located at the administrative boundary between the Waimalu Aquifer System of the Pearl Harbor Aquifer Sector and the Moanalua Aquifer System of the Honolulu Aquifer Sector. The underlying aquifer is classified as a basal, unconfined, flank-type and is currently used as a drinking water source. The aquifer is considered fresh, with less than 250 milligrams per liter (mg/L) of chloride, and is considered an irreplaceable resource with a high vulnerability to contamination (Mink and Lau 1990).

The nearest drinking water supply well is Navy Supply Well 2254-01 (also known as Red Hill Shaft), located within the Facility's lower access tunnel. Navy Supply Well 2254-01 is located approximately 2,600 feet topographically downgradient of the fuel storage tanks (Figure 1) and is one of three supply wells that have provided potable water to the Joint Base Pearl Harbor-Hickam Water System, which serves approximately 65,000 military customers. NAVFAC Hawaii Utilities Energy Management Division operates Navy Supply Well 2254-01 and its associated water development tunnel.

The nearest surface water body is South Hālawa Stream, which is an ephemeral stream present along the north side of the Facility. The approximate distance from each monitoring location to South Hālawa Stream is listed in Table 1-1. Despite some wells being located within 150 meters of surface water (South Hālawa Stream), there are no indications of any complete pathways from the basal aquifer to nearby surface water bodies. Both South Hālawa Stream and Moanalua Stream (located in Moanalua Valley east of the Facility) are located approximately 100 feet or more above the water table of the basal aquifer. Moreover, the bottoms of the fuel tanks are located at least 50 feet below the bottom of the streams, and the segment of South Hālawa Stream between Red Hill and Hālawa Correctional Facility is concrete-lined. Thus, basal groundwater conditions do not affect the nearby stream, and analytical results for the Red Hill Groundwater Sampling Program are therefore compared to the screening criteria based on DOH Environmental Action Levels (EALs), Table D-1b (i.e., groundwater EALs for sites where "groundwater is a current or potential drinking water resource" and the nearest "surface water body is not located within 150 meters of release site") (DOH 2017).

1.3 BACKGROUND

The U.S. Government constructed the Facility in the early 1940s. Twenty tanks were constructed of reinforced concrete lined with steel. The fueling system is a self-contained underground unit that was installed into native rock composed primarily of basalt with some interbedded tuffs and breccias (DON 2010). Each tank measures approximately 250 feet in height and 100 feet in diameter. The upper domes of the tanks lie at depths varying between 100 and 200 feet below ground surface. The tanks currently contain Jet Fuel Propellant No. 5, North Atlantic Treaty Organization-grade F-24 jet fuel, and F-76 diesel. In the past, the tanks also stored Navy special fuel oil, Navy distillate, aviation gasoline, and motor gasoline (DON 2010).

1.3.1 Previous Groundwater Monitoring Results

Groundwater samples for GW LTM events have been analyzed by the various offsite laboratories listed in Table 1-3. The GW LTM results spanning from 2005 onward are summarized in Table 1-4.

Table 1-3: Red Hill GW LTM Analytical Laboratories

GW LTM Event	Analytical Laboratory
2nd Qtr 2023	• APPL (2-(2-methoxyethoxy)ethanol) • Energy (BTEX, TPH-g/d/o, TPH-d/o SGC, lead scavengers, and TOC) • Eurofins (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, phenol, methane, and NAPs)
1st Qtr 2023	• APPL (2-(2-methoxyethoxy)ethanol) • Energy (BTEX, TPH-g/d/o, TPH-d/o SGC, lead scavengers, and TOC) • Eurofins (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, phenol, methane, and NAPs)
4th Qtr 2022	• APPL (2-(2-methoxyethoxy)ethanol) • Energy (BTEX, TPH-g/d/o, TPH-d/o SGC, lead scavengers, and TOC) • Eurofins (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, phenol, methane, NAPs, and DOC)
3rd Qtr 2022	• APPL (2-(2-methoxyethoxy)ethanol) • Energy (BTEX, TPH-g/d/o, TPH-d/o SGC, lead scavengers, and TOC) • Eurofins (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, phenol, methane, general chemistry parameters, and NAPs)
2nd Qtr 2022	• APPL (2-(2-methoxyethoxy)ethanol, general chemistry parameters, and NAPs) • Energy (BTEX, TPH-g/d/o, TPH-d/o SGC, methane, lead scavengers, and TOC) • Eurofins (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and phenol)
1st Qtr 2022	• APPL (2-(2-methoxyethoxy)ethanol, general chemistry parameters, NAPs) • Energy (BTEX, TPH-g/d/o, TPH-d/o SGC, methane, lead scavengers, and TOC) • Eurofins (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and phenol)

GW LTM Event	Analytical Laboratory
4th Qtr 2021	• APPL (naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, 2-(2-methoxyethoxy)ethanol, TOC, general chemistry parameters, NAPs) • Energy (BTEX, TPH-g/d/o, TPH-d/o SGC, methane, lead scavengers, phenol)
1st Qtr 2020 – 3rd Qtr 2021	• APPL
4th Qtr 2019	• APPL (all COPCs and NAPs) • ARI (TOC and DOC)
2nd Qtr 2019 – 3rd Qtr 2019	• APPL
1st Qtr 2019	• APPL (all COPCs and NAPs) • ARI (TOC)
3rd Qtr 2018 – 4th Qtr 2018	• APPL (all COPCs and NAPs) • ALS Environmental – Houston (TOC and DOC)
4th Qtr 2016 – 2nd Qtr 2018	• APPL (all COPCs and all NAPs) • Eurofins Lancaster Laboratories (TOC)
1st Qtr 2017 – 3rd Qtr 2017, 1st Qtr 2018, 3rd Qtr 2018 (split samples only)	• EPA Region 9 Laboratory
2nd Qtr 2015 – 3rd Qtr 2016	• ALS Environmental – Kelso
4th Qtr 2012 – 1st Qtr 2015	• Calscience Environmental Laboratories, Inc. (currently Eurofins Calscience)
4th Qtr 2010 – 3rd Qtr 2012	• APPL
1st Qtr 2008 – 3rd Qtr 2010	• SGS Environmental Services, Inc. – Alaska Division
3rd Qtr 2006 [a] – 3rd Qtr 2007 [b]	• Accutest Laboratories – Florida (currently SGS Accutest Laboratories Southeast)
1st Qtr 2005 – 4th Qtr 2005	• Columbia Analytical Services, Inc. (currently ALS Environmental – Kelso)

APPL Agriculture & Priority Pollutants Laboratories, Inc.
ARI Analytical Resources, Inc.
BTEX benzene, toluene, ethylbenzene, and xylenes
COPC chemical of potential concern
DOC dissolved organic carbon
EPA Environmental Protection Agency, United States
NAP natural attenuation parameter
Qtr quarter
SGC silica gel cleanup
TOC total organic carbon
TPH-d total petroleum hydrocarbons – diesel range organics
TPH-g total petroleum hydrocarbons – gasoline range organics
TPH-o total petroleum hydrocarbons – oil range organics
[a] GW LTM samples were not collected during the First and Second Quarters 2006 due to Phase I and Phase II site investigation activities (DON 2007) occurring at that time.
[b] GW LTM samples were not collected during the Fourth Quarter 2007.

Groundwater sampling locations are depicted on Figure 1. Detailed results of cumulative groundwater monitoring are tabulated in Appendix A.1, and concentration graphs of chemicals of potential concern (COPCs) over time are presented in Appendix A.2. All current and historical data are compared to the most recently updated (Fall 2017) DOH EALs (DOH 2017). Total petroleum hydrocarbons (TPH)-diesel range organics (TPH-d) and benzene are also compared to the Site-Specific Risk-Based Levels (SSRBLs), as presented in the Red Hill *Groundwater Protection Plan* (DON 2014) and as supplemented by the February 4, 2016, Administrative Order on Consent (AOC) Statement of Work Sections 6 and 7 scoping completion letter (EPA Region 9 and DOH 2016a). Historical results indicate that most, and generally the highest, detected concentrations of COPCs occur at monitoring well RHMW02.

Prior to the Fourth Quarter 2021 GW LTM event, no measurable amount of light nonaqueous-phase liquid (LNAPL) had been detected at any Red Hill monitoring location. On November 20, 2021, a release of JP-5 impacted the Red Hill Shaft water development tunnel, which exhibited LNAPL on the water table in the weeks after the release. No LNAPL has been detected in any other Red Hill groundwater monitoring location.

Of the 52 monitoring locations (including multilevel well monitoring zones) that have been sampled during the Red Hill GW LTM program from 2005 to 2023, 10 locations have had COPC detections. Only RHMW02 has exceeded the SSRBL (not since 2016, however). A detailed discussion of historical (2005–2022) COPC detections at each well was presented in the *Second Quarter 2023 Groundwater Monitoring Report* (DON 2023b), and an in-depth evaluation of the historical data is discussed in the AOC Statement of Work Sections 6 and 7 *Conceptual Site Model* (CSM) report (DON 2019b) and *Investigation and Remediation of Releases* [IRR] *Report* (DON 2020).

1.3.2 TPH Analysis Concerns

As discussed in previous quarterly monitoring reports, TPH and polynuclear aromatic hydrocarbon (PAH) concentrations for the Second Quarter 2018 through Fourth Quarter 2018 GW LTM events were higher than the reported results from the Fourth Quarter 2016 through First Quarter 2018 GW LTM events. The increase in concentrations starting from the Fourth Quarter 2017 through Third Quarter 2018 is attributable to changes made to the Navy-contracted laboratory’s extraction and analysis protocols to optimize the laboratory’s EPA Method 8015 and EPA Method 8270 selected ion monitoring (SIM) standard operating procedures. The changes were prompted by the January–March 2017 split sampling and October 2017 TPH-d performance testing results conducted by the EPA Region 9 laboratory in Richmond, California, and the Navy-contracted laboratory (EPA Region 9 and DOH 2018; DON 2017e).

The split sampling and performance testing results showed that although both laboratories’ processes and protocols were in accordance with EPA Method 8015, the EPA Region 9 laboratory had higher TPH-d and PAH recoveries than the Navy-contracted laboratory for analytes present in groundwater samples at high concentrations (EPA Region 9 and DOH 2017a, 2018; DON 2018b). The differences in recoveries were due to the EPA Region 9 laboratory protocols being more effective at recovering higher TPH-d and PAH concentrations, especially for samples with higher concentrations of polar hydrocarbons and metabolites. Changes made to the Navy-contracted laboratory’s protocols included: using calibration standards identical to those used by the EPA Region 9 laboratory; sample acidification to pH less than 5 prior to extraction; switching extraction methodologies from EPA Method 3510C (separatory funnel liquid-liquid extraction) to EPA Method 3520C (continuous liquid-liquid extraction); using a rotary evaporator for extract condensation; and reducing the field-collected sample volume for optimal extraction within the liquid-liquid extractor vessel. After the method optimizations, there were no apparent differences in the TPH and PAH concentration trends between EPA Region 9 laboratory and Navy-contracted laboratory results. Evaluation of the split sampling data was presented in detail in the *Third Quarter 2018 Groundwater Monitoring Report* (DON 2018a).

Starting from the First Quarter 2020 through the Fourth Quarter 2020 GW LTM events, increasing concentrations of non-petroleum-related impurities were observed in batches of reagent-grade solvent used in the extraction of groundwater samples for EPA Method 8015 analysis. Extraction of samples for EPA Method 8015 uses a relatively large amount of solvent (300 milliliters [mL]) that is concentrated (5 mL or less) prior to analysis. Thus, the trace impurities are magnified in the final extract for TPH analysis. The solvent contamination is evident in samples from the Second, Third, and Fourth Quarter 2020 GW LTM events. Additional EPA Method 8270 analysis of the RHMW13-05 March 2020 sample tentatively identified three compounds (i.e., 2-ethyl-1-hexanol, cis-1-butyl-2-methylcyclopropane, and octadecanoic acid) used in polymeric materials and plasticizers. No other compounds associated with the solvent contamination could be positively identified using the method documented in the *Fourth Quarter 2020 Groundwater Monitoring Report* (DON 2021a).

EPA Method 8015 TPH detections due to laboratory contamination were previously flagged with an asterisk (*), but starting with the Third Quarter 2020 report, have been flagged by the letter “A” to facilitate recognition among other qualifiers. Additionally, the cumulative groundwater COPC graphs (Appendix A.2) and COPC detections figure (presented in Section 3.2) differentiate TPH detections due to laboratory contamination. In an effort to reduce chromatographic noise, the laboratory changed the chromatographic column prior to the Second Quarter 2021 GW LTM event, resulting in baseline noise below the detection limit (DL) and TPH detections not flagged for laboratory contamination.

Table 1-4: Summary Statistics of Cumulative Groundwater COPC Data
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		RHMW2254-01						Inside-Tunnel Wells							Outside-Tunnel Wells						
Analyte	DOH EAL (µg/L)	No. of Detects	No. of Non-detects	Percent Detected	Have Concentrations Ever Exceeded EALs?	Maximum Detected Concentration (µg/L)	Date Sampled of Max Concentration	No. of Detects	No. of Non-detects	Percent Detected	Have Concentrations Ever Exceeded EALs?	Location of Max Concentration	Maximum Detected Concentration (µg/L)	Date Sampled of Max Concentration	No. of Detects	No. of Non-detects	Percent Detected	Have Concentrations Ever Exceeded EALs?	Location of Max Concentration	Maximum Detected Concentration (µg/L)	Date Sampled of Max Concentration
TPH-d	400	18	121	13%	No	280	23-Apr-20	325	89	79%	**Yes**	RHMW02	6500	20-Jan-16	116	466	20%	**Yes**	OWDFMW01	3100	22-Jul-15
TPH-g	300	2	130	1.5%	No	14	4-Feb-09	119	255	32%	**Yes**	RHMW02	660	28-Jan-13	9	572	1.5%	No	RHMW11 Zone 5	34	3-Aug-20
TPH-o	500	5	88	5.4%	No	360	14-Apr-22	99	126	44%	**Yes**	RHMW01	890	17-Feb-05	63	451	12%	**Yes**	RHMW13 Zone 5	595	7-Dec-22
Benzene	5	0	140	0%	—	—	—	20	381	5.0%	No	RHMW02	0.26	4-Feb-09	24	560	4%	No	OWDFMW01	1.3	19-Jul-12
Ethylbenzene	30	2	138	1%	No	1.0	14-Apr-22	58	343	14%	No	RHMW02	1.3	10-Jul-06	0	584	0%	—	—	—	—
Toluene	40	3	137	2.1%	No	0.71	22-Oct-12	11	390	2.7%	No	RHMW01	2.5	15-Jan-14	7	577	1.2%	No	RHMW12A	7.1	25-Oct-21
Xylenes, Total (p/m-, o-xylene)	20	2	138	1%	No	0.81	22-Oct-18	77	324	19%	No	RHMW02	1.4	6-Jul-17	2	582	0.3%	No	OWDFMW01	0.39	21-Apr-11
1-Methylnaphthalene	10	1	124	0.8%	No	0.0276	22-Oct-08	175	231	43%	**Yes**	RHMW02	142	10-Jul-06	11	571	1.9%	No	OWDFMW01	0.030	19-Jan-16
2-Methylnaphthalene	10	4	139	2.8%	No	0.038	6-Dec-05	178	245	42%	**Yes**	RHMW02	88.5	20-Sep-05	16	591	2.6%	No	OWDFMW01	0.020	19-Jan-16
Naphthalene	17	13	155	8%	No	0.099	23-Jul-13	259	251	51%	**Yes**	RHMW02	343	10-Jul-06	34	614	5%	No	RHMW09	1.0	8-Feb-17

Notes:
Bold and shaded text indicates analyte detected above DOH EAL.
RHMW2254-01 is the sampling point located inside the shaft of the Navy Supply Well 2254-01.
Inside Wells: RHMW01, RHMW01R, RHMW02, RHMW03, RHMW05.
Outside Wells: RHMW04, RHMW06, RHMW07, RHMW08, RHMW09, RHMW10, RHMW11, RHMW12A, RHMW13, RHMW14, RHMW15, RHMW16, RHMW16A, RHMW17, RHMW19, HDMW2253-03, OWDFMW01.
As of the Third Quarter 2018 Groundwater Monitoring Report, the "No. of Detects" and "No. of Non-detects" includes all primary and replicate results; versions of this table previous to the Third Quarter 2018 report included only the maximum detected concentration between primary and replicate samples.
As of the Second Quarter 2019 Groundwater Monitoring Report, the "No. of Detects" and "No. of Non-detects" includes EPA Region 9 Laboratory split sampling data; versions of this table previous to the Second Quarter 2019 report included only data from Navy-contracted laboratories.
TPH-d and TPH-o results at wells other than RHMW01, RHMW02, and RHMW03 from Second Quarter 2020 through Fourth Quarter 2020 are partially or wholly due to laboratory solvent contamination. See Fourth Quarter 2020 report narrative for additional discussion.
Beginning in the Third Quarter 2023, under the Consolidated Groundwater Sampling Program RHMW01, RHMW07, RHMW16A, and OWDFMW01 were removed from the Red Hill monitoring well network. The following new wells were added: delineation wells (RHP01–RHP08) and sentinel wells (currently, NMW24, and NMW25, and NMW32
— = no data
% = percent
µg/L = microgram per liter
DOH = Department of Health, State of Hawai'i
EAL = Environmental Action Level
EPA = Environmental Protection Agency, United States
no. = number
TPH-d = total petroleum hydrocarbons-diesel range organics
TPH-g = total petroleum hydrocarbons-gasoline range organics
TPH-o = total petroleum hydrocarbons-residual range organics (i.e., TPH-oil)

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Due to the EPA Method 8015 TPH detections attributed to laboratory contamination that was identified during the Third Quarter 2021 GW LTM event, and to improve time required for sample analyses, Energy Laboratories Inc. (Energy) was subcontracted to support the Fourth Quarter 2021 and future GW LTM events. Table 1-3 provides a summary of Energy's analytical suite.

1.3.3 Previous Reports

Red Hill GW LTM quarterly reporting commenced in the First Quarter 2005, initially with separate reports for in-tunnel and outside-tunnel wells. Beginning with the Fourth Quarter 2016 GW LTM event, information for both the inside-tunnel and outside-tunnel monitoring locations has been combined into one report. A comprehensive list of previous Red Hill GW LTM reports is presented in the Second Quarter 2023 GW LTM report (DON 2023b).

1.3.4 Consolidated Groundwater Sampling Program

The monitoring wells and analytes reported in this Third Quarter 2023 GW LTM Report are in accordance with the *Consolidation and Optimization of the Groundwater Sampling Programs, Red Hill Bulk Fuel Storage Facility* (DON 2023a) published in May 2023, and therefore differ slightly from those included in previous GW LTM Reports. The memorandum integrated all Red Hill groundwater sampling programs into a single program, revised the NOI analyte list, optimized the sampling frequency, identified free product gauging and photoionization detector (PID) headspace measurement procedures, and standardized sample collection methodology to low-flow purging. Sampling under the consolidated program began in June 2023.

Changes to previous GW LTM reporting due to implementation of the Consolidated Groundwater Sampling Program include:

- Removed RHMW01, RHMW07, RHMW16A, and OWDFMW01 from the Red Hill sampling program.
- Added delineation wells (RHP01–RHP08) and sentinel wells (currently, NMW24, NMW25, and NMW32) to the Red Hill monitoring well network.
- Revised the groundwater analytical program to that listed in Table 1 of the Consolidation and Optimization memorandum (DON 2023a, Table 1).

2. Groundwater Monitoring Activities

During the Third Quarter 2023 GW LTM event, AECOM Technical Services, Inc. collected groundwater samples from the monitoring locations listed in Table 1-1. Additionally, field duplicate samples were collected from NMW32, RHMW08, RHMW10, RHMW16, and RHP06.

All samples were collected in accordance with the Consolidated Groundwater Sampling Program (DON 2023a), AOC Statement of Work Sections 6 and 7 Work Plan (WP)/Scope of Work (SOW) (DON 2017a), the Sampling and Analysis Plan (SAP) (DON 2017b; 2017c), SAP Addendum 01 (DON 2017d), and SAP Addendum 03 (DON 2021b). The WP/SOW and SAP are consistent with DOH underground storage tank release response requirements (Hawaiʻi Administrative Rules, Chapter 11-280.1), NAVFAC Pacific Environmental Restoration Program Project Procedure I-C-3, *Monitoring Well Sampling* (DON 2015), and the Red Hill *Groundwater Protection Plan* (DON 2014).

Prior to purging and sampling, ambient and headspace vapor readings (VOCs, oxygen, hydrogen sulfide, carbon monoxide, and lower explosive limit of vapors) were measured using a MultiRAE multi-gas monitor at all inside-tunnel sampling locations. VOCs were measured using a MiniRAE 3000 or MultiRAE PID at all other outside-tunnel sampling locations. The depth to groundwater was measured using Solinst oil/water interface probes and calibrated Solinst water level measuring tapes for inside tunnel wells (see Appendix B.2 for tape correction factors). The depth to groundwater was measured using Heron oil/water interface probes and calibrated Solinst water level measuring tapes for outside wells (see Appendix B.2 for tape correction factors). No LNAPL was observed in any well. PID detections in the monitoring well headspace were recorded at only RHMW06 and RHMW08, with PID measurements between 0.1 and 0.3 part per million by volume (ppmv) (Section 3.1). Field measurements and observations are presented in the groundwater sampling logs in Appendix B.1.

2.1 GROUNDWATER SAMPLING

The analytical program for the Third Quarter 2023 GW LTM event is summarized in Table 2-1.

2.1.1 Single-Screen Monitoring Well Sampling

Prior to collecting groundwater samples, the single-screen monitoring wells were purged of standing water in the well casings. These monitoring locations each contain a dedicated bladder pump, which was used to purge the well and collect samples. The groundwater wells were purged using low-flow sampling methodology at flow rates of approximately 0.10–0.30 liter per minute or less to minimize VOC loss and drawdown.

To operate the pump, a portable air compressor with an in-line filter was connected to a QED Environmental Systems MicroPurge MP10 Controller, which was then connected to the pump. The compressor was turned on to power the pump, and the controller was adjusted to achieve a flow rate of approximately 0.10–0.30 liter per minute or less. Compressed nitrogen gas was used to purge and sample these single-screen monitoring wells.

Water quality parameters were monitored on a periodic basis during well purging using an In-Situ Inc. smarTROLL multiparameter handheld water quality meter to automate data entry of the parameters into a digitized format. Parameters measured included total dissolved solids, pH, temperature, specific conductivity, dissolved oxygen (DO), turbidity, oxidation-reduction potential (ORP), and salinity. The water quality parameters were used to evaluate whether the natural characteristics of the aquifer formation water were present within the monitoring wells before the samples were collected. A minimum of six readings were collected at each well during the purging process. When feasible depending on the well's inside diameter allowing space for both the bladder pump tubing and calibrated tape, water level measurements were collected and recorded during purging to detect indications of drawdown; if drawdown approaching 0.2 foot was detected, the rate of low-flow purging was reduced. Purging was considered complete when at least three consecutive water quality measurements stabilized within the specified range for each parameter noted in groundwater sampling logs (Appendix B.1) and in accordance with NAVFAC Pacific Environmental Restoration Program Project Procedure I-C-3, *Monitoring Well Sampling* (DON 2015). The readings were recorded in the groundwater sampling logs (Appendix B.1).

Once water quality parameters stabilized, groundwater samples were immediately collected from the wells using the bladder pumps. Groundwater samples for all single-screen monitoring wells were collected no more than 2.5 hours after purging was completed. Groundwater samples were collected in sample containers that were pre-preserved (as necessary) and provided by the analytical laboratory. Samples collected for ferrous iron analysis were filtered in the field using new, individual 0.45-micron filters attached at the end of the pump/probe discharge tubing.

Table 2-1: Analytical Program for the Third Quarter 2023 GW LTM Event

Parameter	Analytical Method	Analyte(s) [a]	Screening Criterion (µg/L) [a]	RHMW2254-01	RHMW01R	RHMW02	RHMW03	RHMW04	RHMW05	RHMW06	RHMW08	RHMW09	RHMW10	RHMW12A	RHMW16	RHMW17	RHMW19	RHMW20	RHMW11-05	RHMW13-05	RHMW14-03	RHMW15-05	HDMW2253-03	RHP01	RHP02	RHP03	RHP04A	RHP04B	RHP04C	RHP05	RHP06	RHP07	RHP08	NMW24	NMW25	NMW32
TPH	EPA 8260	TPH-g	300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 8015	TPH-d	400	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		TPH-o	500	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TPH with SGC [c]	EPA 3630/8015	TPH-d	—	—	✓	✓	✓	✓	✓	—	✓	—	—	—	—	✓	—	✓	—	—	—	—	—	—	—	—	—	✓	✓	—	—	—	—	✓	—	✓
		TPH-o	—	—	✓	✓	✓	✓	✓	—	✓	—	—	—	—	✓	—	✓	—	—	—	—	—	—	—	—	—	✓	✓	—	—	—	—	✓	—	✓
VOCs	EPA 8260	Benzene	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Ethyl Benzene	30	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Toluene	40	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Total Xylenes	20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PAHs	EPA 8270 SIM	1-Methylnaphthalene	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		2-Methylnaphthalene	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Naphthalene	17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
		Acenaphthene	20	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Acenaphthylene	240	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Anthracene	0.18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Benzo(a)anthracene	0.029	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Benzo(a)pyrene	0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Benzo(b)fluoranthene	0.22	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Benzo(g,h,i)perylene	0.13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Benzo(k)fluoranthene	0.4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Chrysene	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Dibenzo(a,h)anthracene	0.022	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Fluoranthene	13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Fluorene	240	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Indeno(1,2,3-cd)pyrene	0.095	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Phenanthrene	210	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Pyrene	68	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fuel Additives	EPA 8270	Phenol	300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		2-(2-Methoxyethoxy)Ethanol	800 [b]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead Scavengers [d]	EPA 8011	1,2-Dibromoethane	0.04	—	—	—	✓	—	—	—	—	—	—	✓	—	—	✓	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 8260	1,2-Dichloroethane	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NAPs	Field Parameter	DO, ORP	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SM 3500-Fe	Ferrous Iron	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RSK 175M	Methane	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 300.0	Nitrate, Sulfate, Chloride	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 353.2	Nitrate-Nitrite as Nitrogen	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	SM 2320	Carbonate, Bicarbonate, and Total Alkalinity	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 9060A	TOC	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 9060A	Dissolved Organic Carbon	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Parameter	Analytical Method	Analyte(s) [a]	Screening Criterion (µg/L) [a]	RHMW2254-01	RHMW01R	RHMW02	RHMW03	RHMW04	RHMW05	RHMW06	RHMW08	RHMW09	RHMW10	RHMW12A	RHMW16	RHMW17	RHMW19	RHMW20	RHMW11-05	RHMW13-05	RHMW14-03	RHMW15-05	HDMW2253-03	RHP01	RHP02	RHP03	RHP04A	RHP04B	RHP04C	RHP05	RHP06	RHP07	RHP08	NMW24	NMW25	NMW32
General Chemistry [e]	EPA 300.0	Bromide	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 300.0	Fluoride	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 4500-SI-D	Dissolved Silica	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 4500-SI-D	Total Silica	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 6010D	Total Calcium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 6010D	Total Magnesium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 6010D	Total Manganese	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 6010D	Total Potassium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EPA 6010D	Total Sodium	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

µg/L micrograms per liter
✓ analyzed
— not analyzed

[a] COPCs and associated GW LTM screening criteria were provided in the February 4, 2016, AOC Statement of Work Sections 6 and 7 scoping completion letter from the Regulatory Agencies (EPA Region 9 and DOH 2016a) and updated with the most current DOH Tier 1 EALs in Table D-1b (DOH 2017) with the exception of 2-(2-methoxyethoxy)-ethanol (2-2-MEE), which is the EPA Tap Water Regional Screening Level.
[b] Screening criterion is from EPA Tap Water Regional Screening Levels, target hazard quotient = 1.0, May 2021 (EPA 2021).
[c] TPH-d and TPH-o with SGC were analyzed only in samples with detections of TPH-d and TPH-o.
[d] Lead scavengers are collected only from newly installed monitoring wells for at least 1 year of sampling, and may be discontinued if sample results are below the Groundwater Action Levels established in the February 4, 2016, scoping completion letter (EPA Region 9 and DOH 2016a). Lead scavenger analysis was performed during the Third Quarter 2023 GW LTM event for RHMW12A and RHMW17, which have not yet completed the minimum 1 year of sampling prior to this GW LTM event. The lead scavenger requirement has been completed for all other monitoring locations.
[e] General chemistry parameters and dissolved organic carbon are analyzed only during the first round of sampling for new wells added to the GW LTM program.

2.1.2 Multilevel Monitoring Well Sampling

Due to the multilevel design of monitoring wells RHMW11, RHMW13, RHMW14, and RHMW15, purging was not required immediately prior to collecting groundwater from the sampled monitoring zone, because the sampling ports extend into the surrounding formation and there is no filter pack. Groundwater was collected using sampling probes from the following multilevel monitoring zones: RHMW11 Zone 5, RHMW13 Zone 5, RHMW14 Zone 3, and RHMW15 Zone 5.

A string of four sealed 250-mL sample containers was connected to the sampling probe, which was lowered to each monitoring zone, and the containers filled with groundwater from the formation through a sampling port in the central casing of the well. Once sampling containers were filled, the sampling port was closed, and the probe and container string were brought to the surface. The groundwater was then transferred to the appropriate laboratory-supplied containers. For collection of groundwater quality parameters, the sample containers were flushed with nitrogen to remove air from within the containers prior to collection of groundwater. The nitrogen flush was performed to minimize DO enrichment due to high water pressure in the formation, which would otherwise have forced air in the sample containers to mix into the groundwater collected. Groundwater quality parameters were collected at least three times during the sampling of each multilevel monitoring well zone and recorded in the groundwater sampling logs (Appendix B.1).

Groundwater samples were collected in sample containers that were pre-preserved (as necessary) and provided by the analytical laboratory. Samples collected for ferrous iron were filtered in the field using new, single-use 0.45-micron filters attached at the end of the pump/probe discharge tubing.

Groundwater sampling at multilevel monitoring well zones requires a few hours for each zone due to the limited volume (1 liter) collected from each deployment of the sample container string. During the Second Quarter 2019 GW LTM event, a one-time evaluation was conducted to determine whether the groundwater geochemistry changes during the sampling duration. Three additional aliquots of groundwater (from run #2, run #7, and run #13) were collected from RHMW11-05 and analyzed for anions and alkalinity. The results indicated that the groundwater geochemistry is consistent during the 4-hour sampling duration at RHMW11-05. Data related to these samples were presented in the *Second Quarter 2019 Groundwater Monitoring Report* (DON 2019c).

2.1.3 Sample Control Procedures

Field instruments were calibrated each morning prior to starting field activities. The PID was calibrated with 100 parts per million (ppm) isobutylene calibration gas. The multi-gas monitor was calibrated with 100 ppm isobutylene calibration gas and a multi-gas monitor calibration gas composed of 50 ppm carbon monoxide, 25 ppm dihydrogen sulfide, 19 percent oxygen, and 50 percent of the lower explosive limit of methane. The water quality meter was calibrated with an auto-calibration solution prior to recording measurements.

To assess the effectiveness of the equipment decontamination process, one equipment blank sample was collected from the reusable sample container used during the multilevel monitoring well zone sampling. The equipment blank sample was collected on site by pouring distilled water onto the decontaminated multilevel monitoring well sample container string and then into the sample containers. A field blank sample was also collected to assess the quality of the locally sourced Menehune Water Company distilled water used to collect the equipment blank. The field blank was collected by pouring distilled water directly into sample containers. The field blank and equipment blank samples were analyzed for the same COPCs as the groundwater samples.

Because all single-screen monitoring locations have dedicated bladder pumps installed, no field or equipment blanks were collected from single-screen monitoring locations.

To help assess the precision of the data collection activity, including sampling and analysis, field duplicates were collected at the same approximate time as their respective primary samples. During the Third Quarter 2023 GW LTM event, one field duplicate was collected from NMW32, RHMW08, RHMW10, RHMW16, and RHP06.

One trip blank was used for each sampling location for VOCs (TPH-g, BTEX, methane, and lead scavengers) to evaluate the condition of the samples in each shipment. The hermetically sealed trip blank samples were prepared by the field team using laboratory-provided VOC-free water immediately prior to the GW LTM event and kept chilled until the sampling day. Trip blanks remained with the associated groundwater samples in the cooler during the field event and during sample shipment to the laboratory.

2.2 Sample Handling and Analysis

The samples were labeled and logged in accordance with NAVFAC Pacific Environmental Restoration Program Project Procedure III-E, *Record Keeping, Sample Labeling, and Chain-of-Custody Procedures* (DON 2015). Immediately after collection, all samples were labeled, logged in the field logbooks, custody-sealed, sealed with tape, and placed in a resealable plastic bag. To meet the recommended holding time for nitrate analysis, efforts were made to ship samples to the laboratory on the day of collection. Samples not shipped on the day of collection were stored in secure and controlled cold storage overnight and shipped the following day.

Prior to shipping, the samples were logged in a chain-of-custody form and loaded into a cooler with double-bagged wet ice. Packed coolers were sent by field personnel via express-courier overnight shipping in custody-sealed coolers to Eurofins (located in Seattle, Washington and Denver, Colorado), EMAX (Torrance, California), Agriculture & Priority Pollutants Laboratories, Inc. (Clovis, California), and Energy Laboratories, Inc. (Billings, Montana). Sample transport and custody details are provided in the chain-of-custody records in the laboratory reports in Appendix C.2.

2.3 Decontamination

Decontamination activities were performed in accordance with NAVFAC Pacific Environmental Restoration Program Project Procedure I-F, *Equipment Decontamination* (DON 2015). A staging and decontamination area was established near each well location. Non-disposable sampling equipment (e.g., water level meter, oil/water interface probe, and multilevel monitoring well sample container string) was decontaminated at the beginning of each day and after purging and sampling each well. The decontamination process included washing and scrubbing the equipment with stiff-bristled nylon brushes and a non-phosphate detergent (e.g., Alconox) solution, followed by rinsing once with isopropyl alcohol and twice with distilled water. Liquid wastes generated during decontamination activities were captured and containerized in properly labeled, U.S. Department of Transportation-approved 55-gallon drums or other suitable temporary containers and managed as investigation-derived waste (IDW).

2.4 Investigation-Derived Waste Management

IDW generated during the GW LTM event consisted of purged groundwater from the monitoring wells and decontamination water. The IDW was handled, stored, and labeled in accordance with NAVFAC Pacific Environmental Restoration Program Project Procedure I-A-6, *Investigation-Derived Waste Management* (DON 2015). Approximately 55 gallons of fluid from all wells were containerized in one clearly labeled, 55-gallon-capacity drum, covered with a tarp, and stored on site in an area designated by the Navy pending disposal. Disposable personal protective equipment and sampling equipment and supplies were collected in plastic trash bags and disposed of as municipal waste.

3. Data Evaluation and Quality Assessment

Field observations and measurements and laboratory groundwater analytical results collected during the Third Quarter 2023 GW LTM event were evaluated along with available correction factors and historical groundwater concentrations. A data quality assessment consisting of a review of the overall groundwater sample collection and analysis process was performed to determine whether the analytical data generated met the quality objectives for the project. The data quality assessment was performed in accordance with the AOC Statement of Work Sections 6 and 7 WP/SOW (DON 2017a) and the SAP and addenda (DON 2017b; 2017c; 2017d; 2021b). The field quality control (QC) program consisted of standardized sample collection and management procedures and the collection of field duplicate samples, matrix spike (MS) samples, and trip blank samples. The laboratory quality assurance program consisted of the use of standard analytical methods and the preparation and analyses of MS/MS duplicate (MSD) samples, surrogate spikes, blanks, and laboratory control samples (LCSs)/LCS duplicates (LCSDs).

3.1 GROUNDWATER LEVEL MEASUREMENTS

Depths to groundwater were gauged from the notched and surveyed top of casing using calibrated water level measuring tapes at single-screen monitoring well locations prior to sampling. The measuring tape correction factors were updated as described in a December 14, 2022 letter from the U.S. Geological Survey and have been provided for the Third Quarter 2023 GW LTM event (Appendix B.2). Additionally, a Heron or Solinst oil/water interface probe was used to detect LNAPL, which was measured if present.

The oil/water interface probe and water level measuring tapes were decontaminated between well measurements by washing with a non-phosphate detergent solution and rinsing with isopropyl alcohol and distilled water to prevent cross-contamination. Measuring points for all single-screen monitoring wells are detailed in three well elevation survey reports. The measuring point elevations have been updated to reflect the well elevation survey report revised on January 7, 2022 (DON 2018c; 2018e; 2019a) and to include recent elevations surveyed from July 2022 to present, all presented in Table 3-1. Two wells, RHP08 and NMW32, do not have surveyed TOC elevations yet, and appropriate estimations were used to compute GW elevations.

During the Third Quarter 2023 GW LTM event, groundwater elevations beneath and near the site ranged from 11.87 to 18.79 feet above msl, as presented in Table 3-1. Basal groundwater elevations ranged from 16.39 to 18.79 feet above msl except for RHMW2254-01. RHMW2254-01 is sampling point in the Red Hill Shaft water supply well and monitors groundwater at Red Hill Shaft. Groundwater elevations from single-screen wells have decreased in comparison to Third Quarter 2022 groundwater elevations. Groundwater graphs of cumulative depth to groundwater readings are presented in Appendix A.4.

During the Third Quarter 2023 GW LTM event, PID readings at the wellheads ranged from 0.0 to 2.6 ppmv. PID readings of ambient conditions ranged from 0.0 to 0.1 ppmv. Consistent with previous GW LTM events, no LNAPL or visible sheen was observed in any monitoring location during the Third Quarter 2023 GW LTM events. All groundwater samples appeared clear except for HDMW2253-03, which had a slight yellow tint. No odors were noted in any groundwater samples except for RHMW02, which had a strong sulfur odor, and RHMW11, which had a slight hydrocarbon odor.

Additionally, due to the design of the multilevel monitoring wells, depths to groundwater cannot be measured in the monitoring zones of RHMW11, RHMW13, RHMW14, and RHMW15. Instead, transducers are used in these wells to measure potentiometric elevations. Cumulative results of water pressure, temperature, and elevation for multilevel monitoring wells were last presented in Appendix D of the *Fourth Quarter 2020 Groundwater Monitoring Report* (DON 2021a).

Table 3-1: Third Quarter 2023 Groundwater Elevations

Monitoring Well No.	Sampling Date	PID Reading at Wellhead (ppm)	Ambient PID Reading (ppm)	Depth to Water (ft btoc) [a]	Measuring Tape Correction Factor [Tape ID] (ft) [b]	Well Horizontal Displacement Correction Factor (ft) [c]	Corrected Depth to Water (ft btoc)	Measuring Point Elevation (ft msl) [d]	Groundwater Elevation (ft msl)
RHMW2254-01 [g]	7/3/2023	0	0	88.66	-0.08[N-4]	—	88.58	100.45	11.87
RHMW01R	7/7/2023	0	0	83.5	-0.05 [N-3]	-0.06	83.39	101.99	18.60
RHMW02	7/5/2023	0	0	86.68	-0.05 [N-3]	-0.06	86.57	104.60	18.03
RHMW03	7/5/2023	0	0	103.03	-0.06 [N-3]	-0.04	102.93	120.90	17.97
RHMW04	7/5/2023	0	0	294.42	-0.14 [N-4]	-0.02	294.26	312.11	17.85
RHMW05	7/7/2023	0.1	0.1	83.53	-0.05 [N-3]	-0.01	83.47	101.31	17.84
RHMW06	7/5/2023	0	0	241.37	-0.14[N-4]	-0.01	241.22	259.09	17.87
RHMW08	7/6/2023	0	0	292.91	-0.14[N-4]	-0.03	292.74	310.43	17.69
RHMW09	7/6/2023	0	0	377.97	-0.10 [N-6]	-0.24	377.63	395.37	17.74
RHMW10	7/5/2023	0	0	477.99	-0.10 [N-6]	-0.09	477.80	495.59	17.79
RHMW12A	7/7/2023	0	0	220.86	-0.09 [N-6]	-0.06	220.71	238.43	17.72
RHMW16	7/7/2023	0	0	202.06	-0.08 [N-6]	-0.90	201.08	218.94	17.86
RHMW17	7/7/2023	0	0	234.69	-0.14 [N-4]	-0.01	234.54	252.34	17.80
RHMW19	7/6/2023	0	0	426.9	-0.10[N-6]	-0.21	426.59	444.82	18.23
RHMW20	7/6/2023	0	0	237.9	-0.09 [N-6]	—[h]	237.81	255.87	18.06
RHMW11-05 [f]	7/6/2023	0	0	192.13	—	-0.09	192.13	210.38	18.25
RHMW13-05 [f]	7/5/2023	0	0	230.02	—	—[h]	230.02	248.41	18.39
RHMW14-03 [f]	7/7/2023	0	0	162.24	—	—[h]	162.24	179.78	17.54
RHMW15-05 [f]	7/3/2023	0	0	291.21	—	—[h]	291.21	310.00	18.79
HDMW2253-03	7/11/2023	0	0	208.12	-0.08 [N-6]	-0.01	208.03	226.68	18.65
RHP01	7/6/2023	0	0	139.56	-0.08 [N-3]	-0.04	139.52	156.79	17.27
RHP02	7/6/2023	0	0	122.41	-0.07 [N-3]	-0.02	122.36	140.38	18.02
RHP03	7/3/2023	0	0	119.12	-0.07 [N-3]	-0.02	119.07	136.78	17.71
RHP04A	7/3/2023	0	0	140.1	-0.07 [N-6]	-0.04	140.07	157.70	17.64
RHP04B	7/3/2023	0	0	139.23	-0.07 [N-6]	—[h]	139.16	156.81	17.65
RHP04C	7/3/2023	2.6	0	138.5	-0.07 [N-6]	-0.02	138.43	156.08	17.65
RHP05	7/6/2023	0	0	212.92	-0.14 [N-4]	—[h]	212.78	230.28	17.50
RHP06	7/24/2023	0	0	253.33	-0.03 [N-5]	—[h]	253.30	270.84	17.54
RHP07	7/3/2023	0	0	83.08	-0.08[N-4]	-0.0026	83.00	100.83	17.83
RHP08	9/11/2023	0.4	0	285.7	-0.14 [N-4]	—[h]	285.56	302.96	17.40
NMW24	7/5/2023	0	0	90.85	-0.06 [N-6]	-0.06	90.79	107.18	16.39
NMW25	7/26/2023	0.1	0	190.64	-0.02 [N-5]	—[h]	190.62	208.43	17.81
NMW32	8/29/2023	0	0	170.85	-0.12 [N-4]	—[h]	170.73	188.27	17.54

—	not applicable
btoc	below top of casing
ft	foot or feet
N-1	500-foot calibrated water level tape
N-2	1,000-foot calibrated water level tape
N-3	500-foot calibrated oil/water interface probe
N-4	500-foot calibrated oil/water interface probe
N-5	500-foot calibrated oil/water interface probe
N-6	750-foot calibrated oil/water interface probe

[a] Depth to water readings were collected using the calibrated water level measuring tapes.

[b] Water level measuring tape calibration information and correction factors are presented in Appendix B.2.

[c] Well horizontal displacement correction factor based on gyroscopic survey of the monitoring well's vertical plumbness. Correction factors are presented in the *Technical Memorandum, Gyroscopic Survey Results and Calculated Correction Factors for Groundwater Monitoring Network Wells at the Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i* (DON 2018d). Correction factors for newly installed wells will be provided in an upcoming deliverable.

[d] Well Elevation Survey Reports: (DON 2018c; 2018e; 2019a), July 2022 to present surveyed wells are not yet included in a report.

[e] Depth to water is measured from the top of the gray plate at monitoring wells RHMW06, RHMW08, RHMW09, RHMW10, and RHMW19.

[f] Depth to water measurements derived from pressure readings in multilevel monitoring wells RHMW11, RHMW13, RHMW14, and RHMW15. Well horizontal displacement correction factor does not apply since a water level meter was not used to measure depth to water.

[g] Depth to water at the Red Hill Shaft sampling point resumed measurement for the first time since 2019.

[h] The horizontal displacement correction factor for RHMW20, NMW25, NMW32, RHP04B, RHP05, RHP06, RHP08, and the multilevel wells RHMW13, RHMW14, and RHMW15 are currently developed will be published in a forthcoming deliverable.

3.2 Analytical Results

The following analytes were analyzed using the listed test methods:

- TPH-d and TPH-o by EPA SW846 Method 8015B
- TPH-g, benzene, toluene, ethylbenzene, xylenes, and 1,2-dichloroethane by EPA Method 8260B
- 1,2-dibromoethane by EPA Method 8011
- Full suite PAHs by EPA Method 8270D SIM
- Phenol by EPA Method 8270D
- 2-(2-methoxyethoxy)-ethanol (2-2-MEE) by a proprietary laboratory procedure
- Nitrate, chloride, and sulfate by EPA Method 300.0
- Nitrate-nitrite as nitrogen, methane, ferrous iron, and alkalinity by EPA 353.2, RSK175, SM 3500-Fe-B, and SM2320B, respectively
- Total organic carbon (TOC) by EPA Method 9060A
- Dissolved organic carbon (DOC) by EPA Method 9060A

Figure 2 presents the Third Quarter 2023 GW LTM Event COPC detections for all monitoring wells in the Red Hill monitoring well network established by the Consolidated Groundwater Sampling Program (DON 2023a). Analytical results for the Third Quarter 2023 GW LTM event are summarized in Table 3-2; detailed field and QC sample results are presented in Appendix A.6. An index to the laboratory reports and third-party data validation reports is presented in Appendix C.1. Copies of the laboratory reports and third-party data validation reports are available in the Joint Base Pearl Harbor-Hickam (JBPHH) Environmental Data Management System (EDMS). A description of laboratory data qualifiers and definitions with basic concepts of the terms DL, limit of detection (LOD), and limit of quantitation (LOQ) are presented in the Department of Defense (DoD) Environmental Data Quality Workgroup Fact Sheet included as Appendix C.4.

(b) (3) (A)

[redacted]

Figure 2
Third Quarter 2023 COPC Detections
Third Quarter 2023 -
Quarterly Groundwater Monitoring Report
Red Hill Bulk Fuel Storage Facility
JBPHH, O'ahu, Hawai'i

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Table 3-2: Summary of Analytical Results, Third Quarter 2023 GW LTM Event

Monitoring Location	COPC, Fuel Additive, or Lead Scavenger Detected	Analyte Concentration Exceeding Screening Criterion
RHMW2254-01	None	None
RHMW01R	TPH-d (significantly lower after SGC) TPH-o (ND after SGC) 1-methylnaphthalene	None
RHMW02	TPH-g **TPH-d** (significantly lower after SGC) TPH-o (ND after SGC) Ethylbenzene Xylenes 1-Methylnaphthalene Naphthalene	TPH-d: 2,170 µg/L (screening criterion: 400 µg/L)
RHMW03	TPH-d (ND after SGC) TPH-o (ND after SGC)	None
RHMW04	None	None
RHMW05	None	None
RHMW06	None	None
RHMW08	TPH-d [a] (ND after SGC)	None
RHMW09	None	None
RHMW10	None	None
RHMW11-05	None	None
RHMW12A	None	None
RHMW13-05	None	None
RHMW14-03	None	None
RHMW15-05	None	None
RHMW16	None	None
RHMW17	None	None
RHMW19	None	None
RHMW20	TPH-o (ND after SGC)	None
HDMW2253-03	None	None
RHP01	None	None
RHP02	None	None
RHP03	None	None
RHP04A	None	None
RHP04B	TPH-d (ND after SGC) TPH-o (ND after SGC)	None
RHP04C	TPH-d (ND after SGC)	None
RHP05	None	None
RHP06	None	None
RHP07	None	None
RHP08	Toluene	None
NMW24	TPH-d (ND after SGC)	None
NMW25	None	None
NMW32	Naphthalene [a]	None

Notes:
Bold Indicates screening criterion exceedance.
µg/L micrograms per liter
ND non-detect
[a] Detected in primary (normal) sample only.

3.3 GROUNDWATER COPC CONCENTRATIONS

A table of cumulative groundwater analytical results is included as Appendix A.1. The cumulative groundwater COPC concentrations for TPH-g, TPH-d, TPH-o, BTEX, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene are illustrated in Appendix A.2; beginning with March 2020 data, these graphs differentiate TPH-d and TPH-o detections due to laboratory contamination. Historical measurements of natural attenuation parameters (NAPs) starting from the Fourth Quarter 2016 GW LTM event are illustrated in Appendix A.3.1, and Third Quarter 2023 NAP measurements are illustrated in Appendix A.3.2. No graphs are presented for lead scavengers, fuel additives, analytes recently added (i.e., full suite PAHs) or analytes that are no longer included as COPCs for the Red Hill Groundwater Sampling Program (DON 2023a). The only detections of lead scavengers and other fuel additives in groundwater samples were two detections of phenol, in RHMW09 during the December 2016 GW LTM event and in RHMW15-05 during the Second Quarter 2022 GW LTM event.

Although TPH-d concentrations for RHMW02 exceeded the EALs, the concentration did not exceed the SSRBL. The TPH-d exceedance for RHMW02 exhibited chromatographic profiles, with peaks spanning the carbon range (C10–C24) characteristic of some dissolved components of jet fuel, and a "hump" in the TPH-d range consistent with metabolites from JP-5/JP-8 and degraded jet fuels in general. TPH-d/o concentrations for RHMW01R and RHMW03 did not exceed either their respective EALs or SSRBLs.

The TPH-d/o detects at RHMW08, RHMW20, RHP04B, RHP04C, and NMW24 did not exceed the EALs, and the chromatography indicates that the constituents do not resemble fuel, soluble fuel components, or fuel metabolites.

3.4 GROUNDWATER CHEMISTRY PARAMETERS

Groundwater chemistry parameters for all monitoring locations are presented in Appendix A.5. Evaluation of groundwater chemistry parameters (including but not limited to groundwater conditions, flow paths, preferential pathways, effect of subsurface geology on groundwater general chemistry, and intra-well comparisons) in the monitoring wells within the GW LTM program is discussed in the AOC Statement of Work Sections 6 and 7 CSM report (DON 2019b) and IRR Report (DON 2020), with further discussion planned for forthcoming AOC deliverables.

3.5 DATA VALIDATION AND ASSESSMENT

The objective of data validation is to provide data of known quality for project decisions. Data quality is judged in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity. The analytical laboratory data for the Third Quarter 2023 GW LTM event were submitted to a third-party data validator (Environmental Data Services, Inc.) for data validation and assessment. Analytical data from GW LTM events from 2005 to Third Quarter 2016 underwent a limited data verification for all GW LTM events in which a third-party data validation was not performed (DON 2018a). Analytical data from Fourth Quarter 2016 onward were validated by a third-party data validator.

Validation of analytical data from Fourth Quarter 2016 to First Quarter 2021 was performed in accordance with the NAVFAC Pacific Environmental Restoration Program *Project Procedures Manual* (DON 2015). Data validation from the Second Quarter 2021 onward has been performed in accordance with the data validation procedures in the U.S. Department of Defense (DoD) General Data Validation Guidelines, Revision 1 and most current versions of the DoD Data Validation Guidelines Module 1, Module 2, and Module 4 (DoD 2019; 2020a; 2020b; 2021a; 2021b) along with the Data Validation Guidelines Modules 1, 2, 3, and 4-Revised Table for Sample Qualification in the Presence of Blank Contamination (DoD 2022). The data validation performed was also consistent with the protocol in the DoD *Quality Systems Manual Version 5.4* (DoD and DOE 2021), as presented in the SAP and addenda (DON 2017b; 2017c; 2017d; 2021b).

A number of factors may affect the quality of data, including sample collection methods; sample analysis methods; and adherence to established procedures for sample collection, preservation, management, shipment, and analysis. Data validation reports are presented in the Data Validation Reports Library of the JBPHH EDMS.

3.5.1 Precision

Precision is defined as the reproducibility of replicate measurements. Precision is evaluated by the relative percent difference (RPD) of field duplicate, LCS/LCSD, MS/MSD, and laboratory duplicate results. Field duplicate and MS/MSD samples were collected at a rate of approximately 10 percent of primary samples. Field duplicates were sent to the laboratory along with the primary samples. Primary and field duplicate RPDs are presented in Table 3-3. When COPCs were not detected in the primary or field duplicate samples, no RPDs could be calculated (which was the case for RHMW10, RHMW16, and RHP06 this quarter).

Table 3-3: Field Duplicate Analyte RPDs

Sampling Location	Analyte	Screening Criterion (µg/L)	Sample ID	Concentration (µg/L)	RPD [a,b]
NMW32	Naphthalene	17	NMW32-WGN01LF-23Q3	0.43 J	—
			NMW32-WGFD01LF-23Q3	0.4 U	
RHMW08	TPH-d	400	RHMW08-WGN01LF-23Q3	58.3 J	—
			RHMW08-WGFD01LF-23Q3	143 U	

— not calculable
% percent
J estimated value
J- estimated low
N/A not applicable
U non-detect value
UJ non-detect estimate value
[a] Field duplicate RPD measurement performance criterion for groundwater is 50 percent in accordance with the criteria presented in Table 5-1 of the SAP (DON 2017b, 2018c) and Table 3-2 of the SAP addenda (DON 2017d, 2018g).
[b] RPD = $\frac{|(x2 - x1)|}{((X2+X1)/2)}$

No RPD from primary and field duplicate samples violated the 50 percent measurement performance criterion (Table 3-3). No other precision concerns were identified during validation of sample results.

Data usability of the samples is discussed in Section 3.6.

3.5.2 Accuracy

Accuracy is defined as the degree of conformity of a measurement to a standard or true value. Accuracy is evaluated through measurement of the percent recovery (%R) of an analyte in a reference standard or spiked sample. Accuracy also encompasses the percent difference (%D) between the initial calibration verification and the continuing calibration verification. Accuracy limits for surrogates, LCS, MS, and MSD samples are either prescribed by the DoD or established by the individual laboratory. The acceptance criteria for accuracy are dependent on the analytical method and based on historical laboratory or DoD data.

Headspace was not present in the sample vials, and ensured that results for benzene, ethylbenzene, toluene, total xylenes, 1,2-dichloroethane, ethylene dibromide, methane and TPH-g were not subject to VOC loss.

The following results were flagged due to %Rs of the specified analyte exceeding QC limits:

- 2-2-MEE not-detected results for NMW32, NMW32 field duplicate, and RHP08 were flagged as estimated (J) due to low LCS/LCSD or MS/MSD %Rs.
- DOC detected results for RHP04C and RHP06 were flagged as estimated low (J-) due to low MS/MSD %Rs.

- Ferrous iron not-detected results for RHMW08, RHMW14-03, RHMW16, RHMW20, RHP01, and RHP05 were flagged as estimated (J), and the detected result for HDMW2253-03 was flagged as estimated low (J-) due to low CCV %Rs.
- Fluoride detected result for NMW24 was flagged as estimated high (J+) due to high initial calibration verification (ICV) and continuous calibration verification (CCV) %Rs.
- Chloride detected result for RHP08 was flagged as estimated low (J-) due to low MS/MSD %Rs.
- Sodium detected result for NMW32 was flagged as estimated high (J+) due to high CCV %Rs. In addition, the sodium detected result for NMW25 was flagged as estimated low (J-) due to low LCS %Rs.

No other accuracy concerns identified during validation affected sample results. Data usability is discussed in Section 3.6.

3.5.3 Representativeness

Representativeness is the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness was achieved by conducting sampling in accordance with the sample collection procedures described in the AOC Statement of Work Sections 6 and 7 WP/SOW (DON 2017a) and the SAP (DON 2017b; 2017c; 2017d), including standardized sample collection methods identified in NAVFAC Pacific Environmental Restoration Program Project Procedure I-C-3, *Monitoring Well Sampling* (DON 2015).

Representativeness is also evaluated through compliance with the method-recommended sample holding time and sample preservation methods and through the analysis of blank samples, including method blank, equipment blank, field blank, and trip blank samples. All sample holding times and sample preservation were evaluated in accordance with EPA SW-846 method recommendations and DoD *Quality Systems Manual Version 5.4* (DoD and DOE 2021).

All samples were associated with a trip blank and laboratory calibration, preparation, and/or extraction blanks. Groundwater sample results were flagged per Data Validation Guidelines Modules 1, 2, 3, and 4 Revised Table for Sample Qualification in the Presence of Blank Contamination (DoD 2022). If blank contamination was present, the impacted sample result is flagged as (J+) if sample result was greater than the LOD and less than or equal to 5× the blank concentration. Sample results were flagged as not detected if the results are less than or equal to the LOD. The following samples were impacted by laboratory or field blank contamination:

- Toluene was positively identified in multiple trip blanks; however, sample results for the associated wells were not detected except for RHMW09. The toluene detected result for RHMW09 was qualified as not detected.
- TPH-g detected result for RHMW02 was qualified as estimated high (J+) due to a positive identification in the trip blank.
- Ferrous iron detected results for RHP03 and RHP04B were qualified as not detected due to positive identifications in the continuing calibration blanks.

The following results were flagged as estimated for the specified methods due to samples being extracted or analyzed beyond the method recommended holding times:

- Chloride detected results for RHMW2254-01, RHMW15-05, RHP03, RHP04A–C, and RHP07 were flagged as estimated low (J-) as the samples were re-analyzed outside the 28-day method-recommended holding time.

- Sulfate detected results for RHP04A–C were flagged as estimated low (J-) as the samples were re-analyzed outside the 28-day method-recommended holding time.
- Total and dissolved silica detected results for RHP08 were flagged as estimated low (J-) as the samples were re-analyzed outside of the 28-day method-recommended holding time.
- 2-2-MEE not-detected results for HDMW2253-03, NMW24, NMW25, NMW32, NMW32 field duplicate, RHMW2254-01, RHMW01R, RHMW02, RHMW03, RHMW04, RHMW05, RHMW06, RHMW08, RHMW08 field duplicate, RHMW09, RHMW10, RHMW10 field duplicate, RHMW11-05, RHMW12A, RHMW13-05, RHMW14-03, RHMW15-05, RHMW16, RHMW16 field duplicate, RHMW17, RHMW19, RHMW20, RHP01, RHP02, RHP03, RHP04A–C, RHP05, RHP06, RHP06 field duplicate, RHP07, and RHP08 were flagged as estimated (J) as samples were extracted outside the 7-day method-recommended holding time.
- Nitrate-nitrite samples for RHP04B and RHMW02 were qualified as estimated (J) because the continuing calibration blank results were lower than the method detection limit concentration.

All groundwater samples were analyzed for nitrate-nitrite as nitrogen, which can be used to confirm and determine %R of the nitrate as nitrogen results that were analyzed outside the 48-hour holding time. The calculated equivalent nitrate as nitrogen concentration based on nitrate-nitrite as nitrogen results are presented in Table 3-4. Samples were not extracted out of hold time. All nitrate results recovered above 90 percent of the calculated equivalent nitrate as nitrogen concentration except for RHMW12A, RHMW14-03, RHMW20, HDMW2253-03, and RHP02, which can either be due to a possible low or high bias for the nitrate or nitrate-nitrite as nitrogen result.

Discussion of data usability is presented in Section 3.6.

Table 3-4: Nitrate Result Confirmation

Location	Sample ID	Nitrate Result (mg/L)	Nitrate-Nitrite as Nitrogen Result [a] (mg/L)	Calculated Equivalent Nitrate Concentration (mg/L) [a]	%R
RHMW2254-01	RHMW2254-01-WGN01LF-23Q3	2.8	0.48	2.13	131
RHMW01R	RHMW01R-WGN01LF-23Q3	<0.18 U	0.33 J	—	—
RHMW02	RHMW02-WGN01LF-23Q3	0.084 J	<0.09 UJ	—	—
RHMW03	RHMW03-WGN01LF-23Q3	9.1	1.9	8.417	108
RHMW04	RHMW04-WGN01LF-23Q3	2.5	0.48 J	2.13	117
RHMW05	RHMW05-WGN01LF-23Q3	1.9	0.11 J	0.49	388
RHMW06	RHMW06-WGN01LF-23Q3	2.6	0.58	2.57	101
RHMW08	RHMW08-WGN01LF-23Q3	0.61	0.44 J	—[d]	139
RHMW09	RHMW09-WGN01LF-23Q3	0.46	0.46 J	—[d]	100
RHMW10	RHMW10-WGN01LF-23Q3	1.9	0.38 J	1.68	113
RHMW11-05	RHMW11-05-WGN01G-23Q3	<0.12 U	0.3 J	—	—
RHMW12A	RHMW12A-WGN01LF-23Q3	1.7	0.68	3.01	56
RHMW13-05	RHMW13-05-WGN01G-23Q3	0.29 J	0.056 J	0.25	116
RHMW14-03	RHMW14-03-WGN01G-23Q3	2.0	0.94	4.16	48
RHMW15-05	RHMW15-05-WGN01G-23Q3	1.8	0.3 J	1.33	135
RHMW16	RHMW16-WGN01LF-23Q3	1.6	0.2 J	0.89	180
RHMW17	RHMW17-WGN01LF-23Q3	0.75	<0.09 U	—	—
RHMW19	RHMW19-WGN03LF-23Q3	0.39	<0.09 U	—	—
RHMW20	RHMW20-WGN01LF-23Q3	0.37	1.8	—[d]	21
HDMW2253-03	HDMW2253-03-WGN01LF-23Q3	1.0	0.39 J	1.73	58
RHP01	RHP01-WGN01LF-23Q3	0.97	0.18 J	—[d]	539

Location	Sample ID	Nitrate Result (mg/L)	Nitrate-Nitrite as Nitrogen Result [a] (mg/L)	Calculated Equivalent Nitrate Concentration (mg/L) [a]	%R
RHP02	RHP02-WGN01LF-23Q3	0.79	3.0	—[d]	26
RHP03	RHP03-WGN01LF-23Q3	4.2	0.92	4.08	103
RHP04A	RHP04A-WGN01LF-23Q3	4.0	0.89	3.94	102
RHP04B	RHP04B-WGN01LF-23Q3	<0.18 U	<0.09 UJ	—	—
RHP04C	RHP04C-WGN01LF-23Q3	0.54	0.068 J	0.30	180
RHP05	RHP05-WGN01LF-23Q3	9.3	0.36 J	1.59	608
RHP06	RHP06-WGN01LF-23Q3	9.6	1.8	7.97	120
RHP07	RHP07-WGN01LF-23Q3	5.6	1.2	5.32	105
RHP08	RHP08-WGN01LF-23Q3	0.56	0.57	—[d]	98
NMW24	NMW24-WGN01LF-23Q3	5.1	1.1	4.87	105
NMW25	NMW25-WGN01LF-23Q3	20	4.1	18.16	110
NMW32	NMW32-WGN01LF-23Q3	2.9	2.5	—[d]	116

— not calculable
%R percent recovery
mg/L milligrams per liter
J estimated value
J- estimated low
J+ estimated high
U non-detect value
R exclusion of data recommended

[a] Concentration based on nitrate-nitrite as nitrogen result. Nitrate-nitrite as nitrogen result converted to nitrate by multiplying nitrate-nitrite as nitrogen result by a factor of 4.43 (CalEPA 2011).
[b] Groundwater samples from these locations were analyzed outside the holding time for nitrate.
[c] No equivalent nitrate concentration or %R was calculated due to the nitrate or nitrate-nitrite results reported as rejected or non-detect(s).
[d] Nitrate-nitrite as nitrogen results were not converted to a nitrate equivalent concentration because results are reported as nitrate as nitrogen.

The representativeness of the Third Quarter 2023 GW LTM data is considered acceptable after qualification for laboratory or field blank contamination and recommended holding time. Data usability is discussed in Section 3.6.

3.5.4 Completeness

Completeness is defined as the overall percentage of valid analytical results (including estimated results) compared to the total number of analytical results reported by the analytical laboratory. There were no rejected results of the 2,006 results reported from the Third Quarter 2023 GW LTM event. The completeness of the data (100 percent) met the 90 percent completeness goal.

3.5.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. Comparability can be related to accuracy and precision because these quantities are measures of data reliability. Data with acceptable precision and accuracy are considered comparable if collection techniques, analytical procedures, methods, and reporting are equivalent.

Samples collected from 2005 through the current GW LTM event have been analyzed by multiple laboratories (Table 1-3). Data comparability is complicated by differences in analytical methods and extraction and analysis protocols used. For example, TPH-g and naphthalene have been reported using different EPA methods (either or both EPA 8260 and EPA 8270 SIM), and TPH-d and TPH-o have been reported using the same method (EPA 8015) but with differing carbon ranges over time (e.g., C10–C28, C10–C24 for reporting TPH-d) and different extraction methods (i.e., separatory funnel liquid-liquid extraction [EPA 3510] versus continuous liquid-liquid extraction [EPA 3520]), yielding different TPH concentrations.

Current analytical methods are aimed to achieve laboratory limits lower than the current GW LTM screening criteria. Starting from the Fourth Quarter 2016 GW LTM event, analytical method DLs, LODs, and LOQs have been lower for most analytes than they had been during previous GW LTM events except for the EPA Method 8015 TPH-d and TPH-o DLs, LODs, and LOQs starting from March 2020. The method used to analyze TPH-g was also changed from EPA Method 8015 to EPA Method 8260 to improve sensitivity. The changed reporting limits should be considered when results are compared to data from earlier GW LTM events. An evaluation of data reported between laboratories is presented in the AOC Statement of Work Sections 6 and 7 *Conceptual Site Model* (CSM) report (DON 2019b) as part of the AOC investigation.

The laboratory used standard analytical methods for all analyses. In all cases, the DLs and LODs attained were below the specified LOQs. Target analytes detected below the LOQs flagged (J) by the laboratory should be considered estimated.

3.5.6 Sensitivity

The LOQs are established by the laboratory based on the LODs or instrument DLs, historical data, and limits established for the various methods. The LOQs and LODs for samples may require adjustment by the laboratory due to matrix interference or when high levels of target analytes necessitate dilution before analysis. Matrix interference and sample dilutions decrease sensitivity and increase the LOQs/LODs. The following samples were affected by sensitivity issues:

- Total and dissolved silica detected results for NMW32 were flagged as estimated (J) because the instrument signal was out of the calibration range.

No results in this data set had increased LOQs or LODs that impacted sensitivity and data usability.

3.6 Data Assessment and Usability Conclusions

The precision, accuracy, representativeness, comparability, completeness, and sensitivity criteria were evaluated, and with some limited exceptions, the criteria were met. Results associated with QC data that failed acceptance criteria are discussed in Section 3.2. Data quality issues that need to be considered for project decisions are summarized below.

3.6.1 Precision

No primary and field duplicate samples RPD violated the 50 percent measurement performance criterion (Table 3-3). No other precision concerns were identified during validation of sample results.

3.6.2 Accuracy

The 2-2-MEE results for NMW32, NMW32 field duplicate, and RHP08 may be impacted by the low LCS/LCSD or MS/MSD %Rs since the LOD is estimated because of low LCS/LCSD or MS/MSD %Rs; however, the data quality should not impact the data usability.

The DOC results for RHP04C and RHP06 were biased low due to MS/MSD %Rs. The RHP04C DOC result is higher than the TOC result, which may indicate a high bias instead. The RHP06 DOC result is similar to the NVDOC results collected during monthly monitoring. The data quality should not impact the data usability.

The ferrous iron results for RHMW08, RHMW14-03, RHMW16, RHMW20, RHP01, and RHP05 were estimated due to low CCV %Rs; however, they were not detected and are consistent with historical data.

The ferrous iron detected result for HDMW2253-03 was also biased low due to low CCV %Rs, however, it is consistent with historical data. The data quality should not impact the data usability.

The fluoride result for NMW24 was biased high due to high ICV and CCV %Rs. Since this is the first time monitoring for this parameter, it is unknown how the data quality is impacted; however, since data are compliant with *Quality Systems Manual* 5.4 criteria and the results were not rejected, data can be used for decision-making purposes.

The chloride result for RHP08 was biased low due to low MS/MSD % Rs. Since this is the first time monitoring for this parameter, it is unknown how the data quality is impacted; however, since data are compliant with *Quality Systems Manual* 5.4 criteria and the result was not rejected, data can be used for decision-making purposes.

Sodium results for NMW32 and NMW25 were biased high and low respectively due to high CCV %Rs and low LCS %Rs. Since this is the first time monitoring for this parameter, it is unknown how the data quality is impacted; however, since data are compliant with *Quality Systems Manual* 5.4 criteria and the results were not rejected, data can be used for decision-making purposes.

3.6.3 Representativeness

Laboratory or trip blank contamination that qualified the TPH-g result for RHMW02 and toluene result for RHMW09 not detected were consistent with historical data. Therefore, the data quality should not impact the data usability. Qualified results from wells with samples impacted by laboratory or trip blank contamination for TPH-g and toluene were consistent with historical data or results were not detected. The ferrous iron results for RHP03 and RHP04B has been previously detected at low levels, and therefore the not detected result may be biased low.

Chloride detected results for RHMW2254-01, RHMW15-05, RHP03, RHP04A–C, and RHP07, sulfate detected results for RHP04A-C, and total and dissolved silica detected results for RHP08 were analyzed beyond the 28-day method-recommended holding time. All results were qualified as estimated low (J-). The data for all samples were consistent with the historical detected trends for chloride and sulfate. Since this is the first time monitoring for total and dissolved silica for RHP04A–C, it is unknown how the data quality is impacted; however, since data are compliant with *Quality Systems Manual* 5.4 criteria and the results were not rejected,. the data quality should not impact data usability.

2-2-MEE results for HDMW2253-03, NMW24, NMW25, NMW32, NMW32 field duplicate, RHMW2254-01, RHMW01R, RHMW02, RHMW03, RHMW04, RHMW05, RHMW06, RHMW08, RHMW08 field duplicate, RHMW09, RHMW10, RHMW10 field duplicate, RHMW11-05, RHMW12A, RHMW13-05, RHMW14-03, RHMW15-05, RHMW16, RHMW16 field duplicate, RHMW17, RHMW19, RHMW20, RHP01, RHP02, RHP03, RHP04A–C, RHP05, RHP06, RHP06 field duplicate, RHP07, and RHP08 were extracted beyond the 7-day method-recommended holding time; however, results were not detected, which is consistent with historical data. The data quality should not impact the data usability.

The third-party data assessment (Appendix C.3) concluded that data generated during the GW LTM events reported herein are usable for the intended purpose with the limitations described above.

4. Natural Attenuation Evaluation

As described in the Red Hill CSM report (DON 2019b, Section 7.3), the natural attenuation evaluation uses the following lines of evidence:

- Use of current and historical groundwater primary indicators (COPC data) to demonstrate contaminant concentration over time.

- Use of secondary lines of evidence (general groundwater chemistry parameters and NAPs) to evaluate whether natural attenuation processes are active at the site and the rate at which such processes can reduce contaminant concentrations to below screening levels.
- Comparison of TPH-d and TPH-o with and without SGC to evaluate the degree of weathering of dissolved fuel hydrocarbons based on the fraction of polar-weathered hydrocarbons and total recoverable hydrocarbons.

NAP measurements collected during the groundwater monitoring field activities included DO and ORP, nitrate, ferrous iron, methane, sulfate, and chloride. These parameters indicate the conditions under which natural attenuation is likely occurring.

4.1 DISSOLVED OXYGEN AND OXIDATION-REDUCTION POTENTIAL

DO and ORP concentrations for the Third Quarter 2023 GW LTM event were generally consistent with previous measurements, unless stated otherwise in the following. The background (RHMW04) DO measurement for the Third Quarter 2023 GW LTM event was 8.45 mg/L, which is consistent with literature values for O‘ahu groundwater (Hunt Jr. 2004); the background ORP measurement was 209.89 millivolts.

Similar to previous GW LTM events, during the Third Quarter 2023 GW LTM event the monitoring locations with consistent COPC detections had depressed DO measurements (0.13–0.62 mg/L at RHMW01R, RHMW02, and RHMW03) and low ORP values -219.54 to 0.56 millivolts at RHMW01R, RHMW02, and RHMW03). In RHMW01R, RHMW02, and RHMW03, the depleted DO results in conjunction with the historical presence of dissolved-phase COPCs and other NAP results such as dissolved methane concentrations (946 and 5,270 µg/L at RHMW01R and RHMW02, respectively) indicated that anaerobic conditions are present. While the presence of methane is lower in concentration at RHMW03 (0.23 J µg/L) than at RHMW01R and RHMW02, DO depletion and historical presence of methane at RHMW03 suggest that anaerobic biodegradation may be occurring.

RHP04B also had a depressed DO measurement (0.65 mg/L) and a low ORP value (-279.03 millivolts). In conjunction with the presence of dissolved-phase TPH detections, the reduced DO and ORP values are indicative of an anerobic aquifer.

RHMW13-05, RHMW14-03, RHMW15-05, and RHP04C also had low DO measurements (ranging from 0.41 to 1.92 mg/L), similar to previous groundwater monitoring events. The consistently low DO, high ORP, and lack of COPC detections indicate that the low DO values are characteristic of those monitoring locations.

4.2 NITRATE

For the Third Quarter 2023 GW LTM event, RHMW01R, RHMW11-05, and RHP04B had non-detected nitrate concentrations.

The non-detect nitrate result in RHMW01R and RHP04B in conjunction with the low DO and ORP measurements may suggest that anaerobic respiration is occurring at these wells. Historically, RHMW02 has also had non-detectable nitrate concentrations.

Remaining wells had nitrate at concentrations similar to or greater than historical background nitrate levels for the site. Additionally, evaluation of the nitrate results at these locations in conjunction with DO and ORP results suggest that biodegradation of petroleum contaminants may not be occurring. Wells with no TPH detections or where aerobic conditions are evident, such as at RHMW03, had lower DO but higher nitrate than background.

4.3 FERROUS IRON

Ferrous iron was detected in wells RHMW01R, RHMW02, RHMW11-05, RHMW13-05, and HDMW2253-01 at concentrations ranging from 0.19 J mg/L (RHMW13-05) to 1.9 mg/L (RHMW02). When compared to results from other monitoring locations, COPC detections, and evaluation with other NAPs discussed above, the ferrous iron results for RHMW01R and RHMW02 suggest that anaerobic biodegradation may be occurring at these wells. The ferrous iron concentration at the other locations were within the historical concentration range, and COPC detections were either not detected or low-level detects attributed to baseline noise below the LOD.

4.4 METHANE

Methane was detected in the samples from NMW25 (0.19 J µg/L), RHMW01R (946 µg/L), RHMW02 (5,270 µg/L), RHMW03 (0.23 J µg/L), RHMW08 (1.2 µg/L), RHMW09 (0.34 J µg/L), RHMW11-05 (0.62 µg/L), RHMW17 (0.18 J µg/L), RHP04B (1.5 µg/L), RHP04C (0.63 µg/L), and HDMW2253-03 (1.9 µg/L). Elevated methane concentrations and consistent TPH detections at RHMW01R, RHMW02, RHMW03, and RHP04B may suggest that methanogenic biodegradation is occurring in these wells. Detections of relatively low concentrations of methane at the other wells are not entirely consistent with the other measured biodegradation indicators or COPC concentrations, such that no conclusions can be drawn at this time, but further monitoring is warranted.

4.5 SULFATE

Sulfate results for many monitoring locations fell below the historical data range during the Fourth Quarter 2020 and First Quarter 2021 GW LTM events. The low sulfate results rebounded to historical sulfate concentrations during the Second and Third Quarter 2021 GW LTM events (see Appendix A.3.1 for cumulative NAP graphs).

The concentration of sulfate in groundwater at RHMW01R, RHMW02, RHMW05, RHMW09, RHMW10, RHMW12A, RHMW13-05, RHMW14-03, RHMW15-05, RHMW16, and RHMW19 were equal to or lower than the background sulfate concentration in RHMW04 (11 mg/L). The sulfate results at RHMW01R and RHMW02, in conjunction with COPC detections, suggest that anaerobic activity may be occurring at those locations. Lower-than-background sulfate concentrations are the baseline for monitoring locations RHMW05, RHMW09, RHMW10, RHMW11-05, RHMW12A, RHMW13-05, RHMW14-03, RHMW15-05, RHMW16 and RHMW19, based on the consistently low historical sulfate concentrations, lack of TPH detections, and lack of other NAP results that may be indicative of biodegradation.

4.6 CHLORIDE

Evaluation of NAP data from the Fourth Quarter 2016 GW LTM event onward and groundwater geochemistry parameters indicates that chloride concentrations at the site are due to the aquifer geochemistry and not to anaerobic dechlorination.

Chloride results for several monitoring locations fell below the historical data range during the Fourth Quarter 2020 and First Quarter 2021 GW LTM events. Monitoring wells affected during the Fourth Quarter 2020 GW LTM event included RHMW2254-01, RHMW02, RHMW03, RHMW04, RHMW05, RHMW08, and HDMW2253-03, along with the following monitoring wells during the First Quarter 2021 GW LTM event, RHMW02, RHMW03, RHMW08, RHMW09, RHMW10, and RHMW14-03. The low chloride results rebounded to historical chloride concentrations from the Second Quarter 2021 GW LTM event onward (see Appendix A.3.1 for cumulative NAP graphs).

Chloride concentrations at RHMW01R, RHMW02, RHMW03, RHMW05, RHMW09, RHMW10, RHMW11-05, RHMW12A, RHMW13-05, RHMW14-03, RHMW15-05, RHMW16, RHMW17, RHMW19, and RHP01 were below the apparent background (RHMW04) concentration of 81 mg/L. All other locations analyzed had chloride concentrations higher than background.

4.7 ALKALINITY

The alkalinity concentrations in NMW24, NMW25, NMW32, RHMW01R, RHMW02, RHMW03, RHMW06, RHMW08, RHMW11-05, RHMW13-05, RHMW17, RHMW20, RHP01, RHP02, RHP03, RHP04A–C, RHP05, RHP07, and RHP08 were greater than the background concentration (RHMW04) of 78 mg/L. Elevated alkalinity at RHMW01R, RHMW02, RHMW03, and RHP04B may be attributable to the presence of carbon dioxide produced by biodegradation processes occurring at these locations, which is underscored by historical detections of TPH. Elevated alkalinity at the other monitoring locations may be attributable to aquifer geochemistry or to a possible laboratory bias as detailed in Section 3.5, based on the lack of both COPC detections and other NAP results that may be indicative of biodegradation.

4.8 TPH WITH SILICA GEL CLEANUP

TPH-d and TPH-o with SGC results for RHMW01R, RHMW02, and RHMW03 were either non-detected or significantly less than respective detected TPH-d and TPH-o results during the Third Quarter 2023 GW LTM event (Table 4-1). The TPH-d and TPH-o with SGC results suggest that petroleum weathering is occurring in the vicinity of these three wells, especially when evaluated in conjunction with other NAPs.

For RHMW02 Third Quarter 2023 results, the TPH-d with SGC concentration was 149 J µg/L (with a non-SGC TPH-d concentration of 2,170 µg/L), suggesting that biodegradation has been occurring. The historical recoveries of TPH-d with SGC to TPH-d (without SGC) for RHMW02 have ranged from 7 to 57 percent, thus indicating that 43–93 percent of the reported results for TPH-d are biodegradation by-products.

Chromatograms for the RHMW02 sample show evidence of soluble components of degraded jet fuel, with a large portion of the mass showing a signature indicative of polar metabolites from petroleum degradation. The corresponding SGC chromatogram for RHMW02 is characteristic of dissolved aromatic hydrocarbons expected from jet fuel. Further evaluation of the SGC TPH results and natural attenuation, along with the potential role of other site-specific factors (e.g., complex geology, surface water recharge, infiltration rates), are included in the AOC Statement of Work Sections 6 and 7 CSM report (DON 2019b) and IRR Report (DON 2020).

Table 4-1 presents a comparison of TPH-d and TPH-o concentrations without and with SGC for RHMW02 and RHMW03 from the Fourth Quarter 2016 GW LTM event onward.

4.9 TOTAL AND DISSOLVED ORGANIC CARBON

For the Third Quarter 2023 GW LTM event, TOC was analyzed for all groundwater samples; DOC was analyzed for newly installed monitoring wells NMW24, NMW25, NMW33, RHMW20, RHP01, RHP02, RHP03, RHP04A–C, RHP05, RHP06, RHP07, and RHP08. TOC results for RHMW02 and RHMW03 were consistent with historical TPH, SGC TPH, and NAP data, indicating that petroleum constituents and petroleum biodegradation by-products were present at these wells, contributing to TOC concentrations. Additionally, the TOC concentrations were higher than corresponding TPH concentrations (e.g., for RHMW02, TOC was 6.5 mg/L [6,500 µg/L] and TPH-d was 2.17 mg/L [2,170 µg/L]), suggesting that the TPH method may not capture all polar compounds and metabolites present in the groundwater and supporting evidence of natural attenuation occurring at these locations. Additionally, the TOC concentrations at other locations may also indicate the presence of polar compounds and metabolites not captured in the TPH extraction or not related to petroleum.

Table 4-1: Comparison of TPH Concentrations Without and With Silica Gel Cleanup, Third Quarter 2023 Quarterly Groundwater Monitoring Event
Red Hill Bulk Fuel Storage Facility, JBPHH, O‘ahu, Hawai‘i

Monitoring Well	Monitoring Event [a]	TPH-d (non-SGC) (µg/L)	TPH-d w/ SGC (µg/L)	Percent of Polar Compounds (SGC Result) in Non-SGC TPH-d Result	TPH-o (non-SGC) (µg/L)	TPH-o w/ SGC (µg/L)	Percent of Polar Compounds (SGC Result) in Non-SGC TPH-o Result
RHMW01R	3rd Qtr 2023	248 J	65.6 J	74%	75.7 J	< 141 U	100%
	2nd Qtr 2023	96.2 J	< 143 U	100%	< 143 U	< 143 U	—
	1st Qtr 2023	135 J	38.9 J	71%	< 143 U	< 143 U	—
	4th Qtr 2022	142 J	45.9 J	68%	173 J	< 150 U	100%
	3rd Qtr 2022	181 J	41 J	77%	282 J	< 150 U	100%
	2nd Qtr 2022	250 J	48 J	81%	150 J	< 150 U	100%
	1st Qtr 2022[b]	270 J	40 J	85%	190 J	< 150 U	100%
	1st Qtr 2022[b]	270 J	39 J	86%	200 J	< 140 U	100%
	4th Qtr 2021	220 J	55 J	75%	55 J	< 150 U	100%
	3rd Qtr 2021	200 J	< 300 U	100%	150 J	< 300 U	100%
	2nd Qtr 2021	190 J	< 300 U	100%	< 300 U	< 300 U	—
RHMW02	3rd Qtr 2023	**2,170**	149 J	93%	218 J	< 142 U	100%
	2nd Qtr 2023	**1,900**	193 J	90%	132 J	< 143 U	100%
	1st Qtr 2023	**1,860**	243 J	87%	357	< 143 U	100%
	4th Qtr 2022	**3,450**	365	89%	327	< 149 U	100%
	3rd Qtr 2022	**3,570**	371	90%	350	< 150 U	100%
	2nd Qtr 2022	**4,100**	390	90%	360	< 150 U	100%
	1st Qtr 2022[d]	—	—	—	—	—	—
	4th Qtr 2021 [b]	**2,500**	540	78%	210 J	< 140 U	100%
	4th Qtr 2021 [b]	**2,800**	620	78%	240 J	< 140 U	100%
	3rd Qtr 2021 [b]	**2,300**	480	79%	280 J	210 J	25%
	3rd Qtr 2021 [b]	**2,500**	650	74%	230 J	210 J	9%
	2nd Qtr 2021 [b]	**1,300**	320	75%	< 300.0 U	< 300.0 U	—
	2nd Qtr 2021 [b]	**1,400**	390	72%	160 J	< 300.0 U	100%
	1st Qtr 2021 [b]	**1,500**	390	74%	180 J	< 300.0 U	100%
	1st Qtr 2021 [b]	**1,600**	380	76%	330	< 300.0 U	100%
	4th Qtr 2020 [b]	**2,000**	560	72%	290 J	< 300.0 U	100%
	4th Qtr 2020 [b]	**2,000**	360	82%	270 J	< 300.0 U	100%
	3rd Qtr 2020 [b]	**1,800**	450	75%	190 J	< 300.0 U	100%
	3rd Qtr 2020 [b]	**1,900**	470	75%	180 J	< 300.0 U	100%
	2nd Qtr 2020 [b]	**1,700 J**	350	79%	260 J	< 300.0 U	100%
	2nd Qtr 2020 [b]	**1,500 J**	310 J	79%	290 J	< 300.0 U	100%
	1st Qtr 2020 [b]	**1,500 J**	280	81%	< 40 U	< 40 U	—
	1st Qtr 2020 [b]	**1,700**	360	79%	< 40 U	< 40 U	—
	4th Qtr 2019 [b]	**1,700**	520	69%	200	< 40 U	100%
	4th Qtr 2019 [b]	**1,800**	430	76%	190	< 40 U	100%
	3rd Qtr 2019 [b]	**2,400**	690	71%	190	< 40 U	100%
	3rd Qtr 2019 [b]	**2,600**	480	82%	200	< 40 U	100%
	2nd Qtr 2019 [b]	**2,300**	430	81%	< 40 U	< 40 U	—
	2nd Qtr 2019 [b]	**2,200**	440	80%	< 40 U	< 40 U	—
	1st Qtr 2019 [b]	**2,400**	420	83%	< 40 U	< 40 U	—
	1st Qtr 2019 [b]	**2,700**	430	84%	< 40 U	< 40 U	—
	4th Qtr 2018 [b]	**2,000 J**	370 J	82%	< 40 UJ	< 40 UJ	—
	4th Qtr 2018 [b]	**2,100 J**	430 J	80%	< 40 UJ	< 40 UJ	—
	3rd Qtr 2018 [b]	**2,100**	580	72%	< 40 U	< 40 U	—
	3rd Qtr 2018 [b]	**1,500**	260	83%	< 40 U	< 40 U	—
	2nd Qtr 2018 [b]	**2,700**	510	81%	< 40 U	< 40 U	—
	2nd Qtr 2018 [b]	**2,800**	420	85%	< 40 U	< 40 U	—
	1st Qtr 2018 [b]	**1,900**	640	66%	< 40 U	< 40 U	—
	1st Qtr 2018 [b]	**1,800**	460	74%	< 40 U	< 40 U	—
	4th Qtr 2017 [b]	**1,300 J**	230	82%	< 40 U	< 40 U	—
	4th Qtr 2017 [b]	**1,600**	230	86%	< 40 U	< 40 U	—
	3rd Qtr 2017	**1,000**	250	75%	< 40 U	< 40 U	—
	Jun 2017	**1,000**	570	43%	< 40 U	< 40 U	—
	May 2017	**1,000**	< 480 U [c]	100%	< 40 U	< 40 U	—
	4th Qtr 2016	**1,300 J**	300	77%	< 40 U	< 40 U	—
RHMW03	3rd Qtr 2023	63.4 J	< 141 U	100%	138 J	< 141 U	100%
	2nd Qtr 2023	73.5 J	< 113 U	100%	150 J	< 141 U	100%

Table 4-1: Comparison of TPH Concentrations Without and With Silica Gel Cleanup, Third Quarter 2023 Quarterly Groundwater Monitoring Event (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O‘ahu, Hawai‘i

Monitoring Well	Monitoring Event [a]	TPH-d (non-SGC) (µg/L)	TPH-d w/ SGC (µg/L)	Percent of Polar Compounds (SGC Result) in Non-SGC TPH-d Result	TPH-o (non-SGC) (µg/L)	TPH-o w/ SGC (µg/L)	Percent of Polar Compounds (SGC Result) in Non-SGC TPH-o Result
	1st Qtr 2023	110 J	< 114 U	100%	220 J	< 143 U	100%
	4th Qtr 2022	88.9 J	< 149 U	100%	183 J	< 149 U	100%
	3rd Qtr 2022	124 J	< 119 U	100%	255 J	< 148 U	100%
	2nd Qtr 2022	87 J	< 120 U	100%	220 J	< 150 U	100%
	1st Qtr 2022[d]	—	—	—	—	—	—
	4th Qtr 2021	130 J	< 120 U	100%	230 J	< 140 U	100%
	3rd Qtr 2021	180 J	< 300.0 U	100%	250 J	< 300.0 U	100%
	2nd Qtr 2021	< 300.0 U	< 300.0 U	—	< 300.0 U	< 300.0 U	—
	1st Qtr 2021	180 J	< 300.0 U	100%	220 J	< 300.0 U	100%
	4th Qtr 2020	220 J	< 300.0 U	100%	260 J	< 300.0 U	100%
	3rd Qtr 2020	200 J	< 300.0 U	100%	210 J	< 300.0 U	100%
	2nd Qtr 2020	220 J	< 300.0 U	100%	240 J	< 300.0 U	100%
	1st Qtr 2020	260	< 25 U	100%	250	< 40 U	100%
	4th Qtr 2019	150	< 25 U	100%	230	< 40 U	100%
	3rd Qtr 2019	300	< 25 U	100%	270	< 40 U	100%
	2nd Qtr 2019	300	< 25 U	100%	190	< 40 U	100%
	1st Qtr 2019	380	< 25 U	100%	310	< 40 U	100%
	4th Qtr 2018	220 J	< 25 UJ	100%	190 J	< 40 UJ	100%
	3rd Qtr 2018	300	< 25 U	100%	140	< 40 U	100%
	2nd Qtr 2018	160	< 25 U	100%	110	< 40 U	100%
	1st Qtr 2018	190	< 25 U	100%	180	< 40 U	100%
	4th Qtr 2017 [b]	160	< 25 U	100%	160	< 40 U	100%
	4th Qtr 2017 [b]	210	< 25 U	100%	200	< 40 U	100%
	3rd Qtr 2017	49	< 25 U	100%	46	< 40 U	100%
	Jun 2017	46	50	0%	36 J	34	6%
	May 2017	50	< 25 U	100%	46	< 40 U	100%
	4th Qtr 2016	65	< 25 U	100%	59	< 40 U	100%

Note: **Bold text** indicates concentrations exceeding the TPH-d screening criterion of 400 µg/L.
— = no data
% = percent
µg/L = microgram per liter
A = result is due to laboratory solvent contamination
J = estimated value
Qtr = quarter
SGC = silica gel cleanup
U = non-detect value
[a] Table presents only quarterly and monthly monitoring events during which TPH with SGC is analyzed.
[b] Primary and field duplicate samples.
[c] Result was flagged as non-detect during data validation due to laboratory method blank contamination.
[d] Well was not sampled during the First Quarter 2022 monitoring event due to the presence of transducers installed within the well.
RHMW01 was removed from the Red Hill monitoring well network beginning with the Third Quarter 2023 monitoring event. RHMW01R is sampled instead.

4.10 NAP CONCENTRATIONS

Graphs of historical groundwater NAP results are presented in Appendix A.3.1, and graphs of NAP results for the Third Quarter 2023 GW LTM event are presented in Appendix A.3.2. Evaluation of NAP data from the Fourth Quarter 2016 GW LTM event onward indicates that there is no evidence that seasonal variations (i.e., wet- and dry-season effects) influence NAP concentrations (and thus biodegradation) in groundwater at the Red Hill GW LTM network.

NAP concentrations at RHMW01R, RHMW02, and RHMW03 indicate that anaerobic biodegradation may be occurring at these locations. This is confirmed for RHMW01R and RHMW02 because TPH with SGC results suggest petroleum biodegradation (43–93 percent of the reported results for TPH-d are biodegradation by-products). However, evaluating NAPs along with TPH trends (based on TPH concentrations) must be conducted with caution, because there may be increased variability of the TPH-d procedures when a different laboratory is used. Continuous anaerobic biodegradation is likely occurring at RHMW01R, RHMW02, and RHMW03 based on the depleted electron acceptors and presence of dissolved methane.

Additional evaluation of the 2014 fuel release, natural source-zone depletion, and natural attenuation at the Facility is discussed in the AOC Statement of Work Sections 6 and 7 CSM report (DON 2019b) and IRR Report (DON 2020).

5. Summary, Conclusions, and Recommendations

During the Third Quarter 2023 GW LTM event, groundwater samples were collected from 33 monitoring locations within the Red Hill Groundwater Sampling Network in accordance with the SAP and addenda (DON 2017b; 2017c; 2017d; 2021b):

- No detectable amount of LNAPL was present at any monitoring location.
- The COPCs TPH-g, TPH-d, TPH-o, 1-methylnaphthalene, naphthalene, ethylbenzene, toluene, and xylene were detected in one or more monitoring wells. TPH-d exceeded the GW LTM screening criterion at RHMW02. No lead scavengers or fuel additives were detected at the monitoring locations where they were analyzed for.
- The significantly lower or non-detect analytical results for TPH with SGC analysis suggest that the majority of TPH-d and TPH-o results consist of polar compounds, which may be indicative of ongoing biodegradation and weathering of fuel.
- NAP concentrations at RHMW01R, RHMW02, and RHMW03 indicate that anaerobic biodegradation may be occurring at these locations.
- The TPH-d/o detects at RHMW08, RHMW20, RHP04B, RHP04C, and NMW24 are not indicative of fuel since the chromatograms do not resemble fuel, soluble fuel components, or fuel metabolites.

Based on the groundwater monitoring results, pursuant to the Red Hill *Groundwater Protection Plan* (DON 2014), and in accordance with AOC Statement of Work Sections 6 and 7 (EPA Region 9 and DOH 2015), groundwater monitoring at locations within the Red Hill GW LTM network will continue. It is recommended that the Red Hill Groundwater Sampling Program continue testing for NAPs at each GW LTM event and continue TPH-d and TPH-o with SGC analysis for all locations with TPH-d or TPH-o detections.

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Appendix A:
Cumulative Monitoring Results

Table A.1: Cumulative Groundwater COPC Results
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC				COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Method	8015				8260				8015				8015				8015				8015				8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup				Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC				71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	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			
		DOH EAL	300				300				400				—				500				—				5				5				30				30				40				40				20			
		SSRBL	—				—				4500				—				—				—				750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	RH-B-001	2/16/2005[be]	< 50	U			—				< 50	U			—				< 100	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	UJ	t		—				< 0.50	U		
RHMW2254-01	RH-B-002	2/16/2005[bf]	< 50	U			—				< 53	U			—				< 110	U			—				< 0.50	U			—				< 0.50	U			—				< 1.2	UJ	t		—				< 0.50	U		
RHMW2254-01	RH-B-003	2/16/2005*[bf]	< 50	U			—				< 50	U			—				< 100	U			—				< 0.50	U			—				< 0.50	U			—				< 0.81	UJ	t		—				< 0.50	U		
RHMW2254-01	RH-B-004	6/28/2005[ae]	< 13	U			—				**43**	**J**			—				—				—				< 0.50	U		b	—				< 0.50	U		b	—				< 0.50	U		b	—				< 0.50	U		b
RHMW2254-01	RH-B-005	6/28/2005*[ae]	< 13	U			—				**67**			Z	—				—				—				< 0.50	U		b	—				< 0.50	U		b	—				< 0.50	U		b	—				< 0.50	U		b
RHMW2254-01	RH-B-006	6/28/2005*[af]	< 13	U			—				**58**			Z	—				—				—				< 0.50	U		b	—				< 0.50	U		b	—				< 0.50	U		b	—				< 0.50	U		b
RHMW2254-01	RH-B-007	9/8/2005[ae]	< 13	U			—				**45**	**J**			—				**59**	**J**			—				< 0.14	U			—				< 0.13	U			—				< 0.11	U			—				< 0.22	U		
RHMW2254-01	RH-B-008	9/8/2005[af]	< 13	U			—				< 19	U			—				< 28	U			—				< 0.14	U			—				< 0.13	U			—				< 0.11	U			—				< 0.22	U		
RHMW2254-01	RH-B-009	9/8/2005*[af]	< 13	U			—				< 50	U		d	—				< 100	U		d	—				< 0.14	U			—				< 0.13	U			—				< 0.11	U			—				< 0.22	U		
RHMW2254-01	RHMW2254W01	9/20/2005[bd]	—				—				—				—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW2254-01	RH-B-010	12/6/2005[ae]	< 13	U			—				**38**	**J**			—				—				—				< 0.14	U			—				< 0.13	U			—				< 0.11	U			—				< 0.22	U		
RHMW2254-01	RH-B-011	12/6/2005*[ae]	< 13	U			—				**24**	**J**			—				—				—				< 0.14	U			—				< 0.13	U			—				< 0.11	U			—				< 0.22	U		
RHMW2254-01	RH-B-012	12/7/2005[af]	< 13	U			—				< 20	U			—				—				—				< 0.14	U			—				< 0.13	U			—				< 0.11	U			—				< 0.22	U		
RHMW2254-01	RHMW2254-01-GW02	7/10/2006[a]	< 50	U			—				< 110	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW2254-01	RHMW2254-01-GW06	12/5/2006[a]	< 50	U			—				< 100	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW2254-01	RHMW2254-01-WG07	3/27/2007[a]	< 50	U			—				< 98	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW2254-01	RHMW2254-01-WG08	6/12/2007[a]	< 50	U			—				< 98	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW2254-01	RHMW2254-01-WG0	9/10/2007[a]	< 50	U			—				< 97	U			—				—				—				< 0.20	U			—				< 0.20	U			—				< 0.27	U			—				< 0.36	U		
RHMW2254-01	RHMW2254-01-WG10 (RHMW2254-WG10)	1/15/2008[a]	< 10.0	U			—				< 102	UJ	b		—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW2254-01	RHMW2254-01-WG10.1	2/6/2008[a]	—				—				< 100	U			—				—				—				—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WG10.1	2/6/2008[a]	—				—				< 10.3	U			—				—				—				—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WG11 (RHMW2254-WG11)	4/15/2008[a]	< 10.0	U			—				< 86.0	U			—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW2254-01	RHMW2254-01-WG12	7/29/2008[ad]	< 10.0	U			—				< 83.3	U			—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW2254-01	RHMW2254-01-WG13	10/22/2008[ad]	< 10.0	U			—				< 84.2	U			—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW2254-01	RHMW2254-WG13B	12/16/2008[c]	—				—				—				—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.93	U		
RHMW2254-01	RHMWA01-WG13B	12/16/2008*[c]	—				—				—				—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.93	U		
RHMW2254-01	RHMW2254-01-WG14	2/4/2009[a]	**14.0**	**J**			—				< 92.0	U			—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW2254-01	RHMW2254-01-WG15	5/13/2009[a]	< 19.1	UJ	b t		—				< 169	U			—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW2254-01	RHMW2254-01-WG16	7/15/2009[a]	< 30.0	U			—				< 163	U			—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW2254-01	RHMW2254-WG17	10/14/2009[a]	< 30	U			—				< 158	U			—				—				—				< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 1	U		
RHMW2254-01	RHMW2254-01-WG18	1/27/2010	< 60.0	U			—				< 320	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW2254-01	RHMW2254-01-WG19 (RHMW225-WG19)	4/13/2010	< 60.0	U			—				< 320	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW2254-01	RHMW2254-01-WG20 (RHMW2254-WG20)	7/13/2010	< 60.0	U			—				< 320	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW2254-01	ES004	10/19/2010	—				< 12.12	U			< 80.0	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES014	1/20/2011[d]	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES019	4/19/2011[d]	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES040	7/20/2011	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES050	10/25/2011	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES062	2/1/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES074	4/17/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES077	7/17/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW2254-01	ES006	10/22/2012	—				< 18	UJ	b		< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				**0.71**	**J**			—				< 1.0	U		
RHMW2254-01	ES014	1/29/2013	—				< 30	U			**22**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES023	4/23/2013	—				< 30	U			< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES032	7/23/2013	—				< 30	U			< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES041	10/22/2013	—				< 21	UJ	b t		< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES050	1/16/2014[d]	—				—				< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES060	1/29/2014[d]	—				< 16	UJ	b		< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES067	3/6/2014[d]	—				—				< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES075	3/26/2014[d]	—				—				< 10	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES085	4/22/2014[d]	—				< 30	U			< 10	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES094	5/28/2014[d]	—				—				< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES102	6/24/2014[d]	—				—				< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES107	7/22/2014	—				< 30	U			< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES117	10/28/2014	—				< 30	U			**22**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES125	1/27/2015	—				< 30	U			< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW2254-01	ES134	4/21/2015	< 25	U			—				< 14	UJ	b		—				< 37	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW2254-01	ES149	7/21/2015	< 25	U			—				**17**	**J**			—				**42**	**J**			—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW2254-01	ERH009	10/20/2015	< 25	U			—				< 16	UJ	b		—				< 53	UJ	b		—				< 0.10	UJ	h		—				< 0.10	UJ	h		—				< 0.99	UJ	t		—				< 0.20	UJ	h	
RHMW2254-01	ERH021	1/20/2016	< 25	U			—				< 21	UJ	b		—				< 54	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.16	UJ	t		—				< 0.20	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	RH-B-001	2/16/2005[be]	—				—				—				< 0.020	U			—				< 0.020	U			—				—				—				—				—				< 0.0083	U		b	—			
RHMW2254-01	RH-B-002	2/16/2005[bf]	—				—				—				< 0.022	U			—				< 0.022	U			—				—				—				—				—				< 0.0081	U		b	—			
RHMW2254-01	RH-B-003	2/16/2005*[bf]	—				—				—				< 0.021	U			—				< 0.021	U			—				—				—				—				—				< 0.0082	U		b	—			
RHMW2254-01	RH-B-004	6/28/2005[ae]	—				—				—				< 0.020	U		b	—				< 0.020	U		b	—				—				—				—				—				< 0.0095	U		b	—			
RHMW2254-01	RH-B-005	6/28/2005*[ae]	—				—				—				< 0.020	U		b	—				< 0.020	U		b	—				—				—				—				—				< 0.0097	U		b	—			
RHMW2254-01	RH-B-006	6/28/2005*[af]	—				—				—				< 0.021	U		b	—				< 0.021	U		b	—				—				—				—				—				< 0.0095	U		b	—			
RHMW2254-01	RH-B-007	9/8/2005[ae]	—				—				—				< 0.020	U		b	—				**0.085**				—				—				—				—				—				< 0.0095	U		b	—			
RHMW2254-01	RH-B-008	9/8/2005[af]	—				—				—				< 0.020	U		b	—				< 0.020	U		b	—				—				—				—				—				< 0.0095	U		b	—			
RHMW2254-01	RH-B-009	9/8/2005*[af]	—				—				—				< 0.020	U		b	—				**0.045**				—				—				—				—				—				< 0.0095	U		b	—			
RHMW2254-01	RHMW2254W01	9/20/2005[bd]	—				—				—				—				—				—				< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW2254-01	RH-B-010	12/6/2005[ae]	—				—				—				**0.038**				—				**0.036**				—				—				—				—				—				< 0.0096	U		b	—			
RHMW2254-01	RH-B-011	12/6/2005*[ae]	—				—				—				**0.022**				—				< 0.024	UJ	b		—				—				—				—				—				< 0.0094	U		b	—			
RHMW2254-01	RH-B-012	12/7/2005[af]	—				—				—				**0.0071**	**J**			—				**0.011**	**J**			—				—				—				—				—				< 0.0095	U		b	—			
RHMW2254-01	RHMW2254-01-GW02	7/10/2006[a]	—				—				< 0.26	U			< 0.26	U			—				< 0.26	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW2254-01	RHMW2254-01-GW06	12/5/2006[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW2254-01	RHMW2254-01-WG07	3/27/2007[a]	—				—				< 0.24	U			< 0.24	U			—				< 0.24	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW2254-01	RHMW2254-01-WG08	6/12/2007[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW2254-01	RHMW2254-01-WG0	9/10/2007[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 0.44	U			—				—				—				< 0.20	U			—				—			
RHMW2254-01	RHMW2254-01-WG10 (RHMW2254-WG10)	1/15/2008[a]	—				—				< 0.0150	U			< 0.0150	U			—				< 0.0310	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-01-WG10.1	2/6/2008[a]	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WG10.1	2/6/2008[a]	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WG11 (RHMW2254-WG11)	4/15/2008[a]	—				—				< 0.0435	UJ	b		< 0.0561	UJ	b		—				< 0.0332	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-01-WG12	7/29/2008[ad]	—				—				< 0.0156	U			< 0.0156	U			—				< 0.0323	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-01-WG13	10/22/2008[ad]	—				—				**0.0276**	**J**			< 0.0150	U			—				**0.0466**	**J**			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-WG13B	12/16/2008[c]	—				—				—				—				—				—				< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMWA01-WG13B	12/16/2008*[c]	—				—				—				—				—				—				< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-01-WG14	2/4/2009[a]	—				—				< 0.0161	U			< 0.0161	U			—				< 0.0333	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-01-WG15	5/13/2009[a]	—				—				< 0.0156	U			**0.0180**	**J**			—				< 0.0323	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-01-WG16	7/15/2009[a]	—				—				< 0.0165	U			< 0.0165	U			—				< 0.0341	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW2254-01	RHMW2254-WG17	10/14/2009[a]	—				—				< 0.017	U			< 0.017	U			—				< 0.0352	U			< 0.62	U			—				—				—				< 0.31	U			—				—			
RHMW2254-01	RHMW2254-01-WG18	1/27/2010	—				—				< 0.0316	U			< 0.0316	U			—				**0.0375**	**J**			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW2254-01	RHMW2254-01-WG19 (RHMW225-WG19)	4/13/2010	—				—				< 0.0330	U			< 0.0330	U			—				< 0.0682	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW2254-01	RHMW2254-01-WG20 (RHMW2254-WG20)	7/13/2010	—				—				< 0.0320	U			< 0.0320	U			—				< 0.0664	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW2254-01	ES004	10/19/2010	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES014	1/20/2011[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES019	4/19/2011[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES040	7/20/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES050	10/25/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES062	2/1/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES074	4/17/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES077	7/17/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW2254-01	ES006	10/22/2012	—				—				< 0.050	U			< 0.050	U			—				**0.037**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES014	1/29/2013	—				—				< 0.050	U			< 0.050	U			—				**0.052**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES023	4/23/2013	—				—				< 0.051	U			< 0.051	U			—				< 0.051	U			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES032	7/23/2013	—				—				< 0.050	U			< 0.050	U			—				**0.099**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES041	10/22/2013	—				—				< 0.050	U			< 0.050	U			—				**0.036**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES050	1/16/2014[d]	—				—				< 0.049	U			< 0.049	U			—				**0.046**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES060	1/29/2014[d]	—				—				< 0.050	U			< 0.050	U			—				**0.049**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES067	3/6/2014[d]	—				—				< 0.050	U			< 0.050	U			—				**0.081**	**J**			—				—				—				—				—				—				—			
RHMW2254-01	ES075	3/26/2014[d]	—				—				< 0.050	U			< 0.050	U			—				< 0.050	U			—				—				—				—				—				—				—			
RHMW2254-01	ES085	4/22/2014[d]	—				—				< 0.049	U			< 0.049	U			—				< 0.049	U			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES094	5/28/2014[d]	—				—				< 0.050	U			< 0.050	U			—				< 0.050	U			—				—				—				—				—				—				—			
RHMW2254-01	ES102	6/24/2014[d]	—				—				< 0.049	U			< 0.049	U			—				< 0.049	U			—				—				—				—				—				—				—			
RHMW2254-01	ES107	7/22/2014	—				—				< 0.048	U			< 0.048	U			—				< 0.048	U			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES117	10/28/2014	—				—				< 0.097	U			< 0.049	U			—				< 0.049	U			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES125	1/27/2015	—				—				< 0.10	U			< 0.050	U			—				< 0.050	U			—				—				—				—				< 0.50	U			—				—			
RHMW2254-01	ES134	4/21/2015	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW2254-01	ES149	7/21/2015	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW2254-01	ERH009	10/20/2015	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	UJ	h		—				—			
RHMW2254-01	ERH021	1/20/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	RH-B-001	2/16/2005[be]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RH-B-002	2/16/2005[bf]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RH-B-003	2/16/2005*[bf]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RH-B-004	6/28/2005[ae]	—				—				< 0.50	U		b	—				—				—			
RHMW2254-01	RH-B-005	6/28/2005*[ae]	—				—				< 0.50	U		b	—				—				—			
RHMW2254-01	RH-B-006	6/28/2005*[af]	—				—				< 0.50	U		b	—				—				—			
RHMW2254-01	RH-B-007	9/8/2005[ae]	—				—				< 0.12	U			—				—				—			
RHMW2254-01	RH-B-008	9/8/2005[af]	—				—				< 0.12	U			—				—				—			
RHMW2254-01	RH-B-009	9/8/2005*[af]	—				—				< 0.12	U			—				—				—			
RHMW2254-01	RHMW2254W01	9/20/2005[bd]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RH-B-010	12/6/2005[ae]	—				—				< 0.12	U			—				—				—			
RHMW2254-01	RH-B-011	12/6/2005*[ae]	—				—				< 0.12	U			—				—				—			
RHMW2254-01	RH-B-012	12/7/2005[af]	—				—				< 0.12	U			—				—				—			
RHMW2254-01	RHMW2254-01-GW02	7/10/2006[a]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RHMW2254-01-GW06	12/5/2006[a]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG07	3/27/2007[a]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG08	6/12/2007[a]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG0	9/10/2007[a]	—				—				< 0.20	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG10 (RHMW2254-WG10)	1/15/2008[a]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG10.1	2/6/2008[a]	—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WG10.1	2/6/2008[a]	—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WG11 (RHMW2254-WG11)	4/15/2008[a]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG12	7/29/2008[ad]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG13	10/22/2008[ad]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-WG13B	12/16/2008[c]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMWA01-WG13B	12/16/2008*[c]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG14	2/4/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG15	5/13/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG16	7/15/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW2254-01	RHMW2254-WG17	10/14/2009[a]	—				—				< 0.15	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG18	1/27/2010	—				—				< 0.300	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG19 (RHMW225-WG19)	4/13/2010	—				—				< 0.300	U			—				—				—			
RHMW2254-01	RHMW2254-01-WG20 (RHMW2254-WG20)	7/13/2010	—				—				< 0.300	U			—				—				—			
RHMW2254-01	ES004	10/19/2010	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES014	1/20/2011[d]	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES019	4/19/2011[d]	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES040	7/20/2011	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES050	10/25/2011	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES062	2/1/2012	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES074	4/17/2012	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES077	7/17/2012	—				—				< 0.28	U			—				—				—			
RHMW2254-01	ES006	10/22/2012	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES014	1/29/2013	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES023	4/23/2013	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES032	7/23/2013	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES041	10/22/2013	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES050	1/16/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES060	1/29/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES067	3/6/2014[d]	—				—				—				—				—				—			
RHMW2254-01	ES075	3/26/2014[d]	—				—				—				—				—				—			
RHMW2254-01	ES085	4/22/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES094	5/28/2014[d]	—				—				—				—				—				—			
RHMW2254-01	ES102	6/24/2014[d]	—				—				—				—				—				—			
RHMW2254-01	ES107	7/22/2014	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES117	10/28/2014	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES125	1/27/2015	—				—				< 0.50	U			—				—				—			
RHMW2254-01	ES134	4/21/2015	< 0.010	U			< 0.015	U			—				—				—				—			
RHMW2254-01	ES149	7/21/2015	—				< 0.015	U			—				—				—				—			
RHMW2254-01	ERH009	10/20/2015	—				< 0.015	U			—				—				—				—			
RHMW2254-01	ERH021	1/20/2016	—				< 0.015	U			—				—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	300				300				400				—				500				—			
		SSRBL	—				—				4500				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	ERH037	4/20/2016	< 25	U			—				< 21	U	b f		—				< 61	U	b f		—			
RHMW2254-01	ERH051	7/20/2016	< 25	U			—				< 21	U			—				< 27	U	b f		—			
RHMW2254-01	ERH088	10/18/2016	—				< 18	UJ	q		< 25	U			—				< 40	U			—			
RHMW2254-01	ERH092	10/18/2016*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH115	11/14/2016	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH116	11/14/2016*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH135	12/12/2016	—				< 18	U			**14**	**J**		Y	—				**16**	**J**			—			
RHMW2254-01	ERH137	12/12/2016*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH161	1/9/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH162	1/9/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH161 (EPA split)	1/9/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
RHMW2254-01	ERH162 (EPA split)	1/9/2017*	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
RHMW2254-01	ERH205	2/6/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH206	2/6/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH205 (EPA split)	2/6/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
RHMW2254-01	ERH206 (EPA split)	2/6/2017*	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
RHMW2254-01	ERH257	3/6/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH258	3/6/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH257 (EPA split)	3/6/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
RHMW2254-01	ERH258 (EPA split)	3/6/2017*	< 25	UJ	c		—				**100**	**J**			—				< 300	U			—			
RHMW2254-01	ERH292	4/3/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH293	4/3/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH329	5/2/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH330	5/2/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH349	6/6/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH350	6/6/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH378	7/5/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH379	7/5/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH409	10/24/2017	—				< 18	U			**65**	**J**	e q	Z	—				< 40	UJ	q		—			
RHMW2254-01	ERH410	10/24/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH542	3/14/2018	—				< 18	U			< 25	UJ	h		—				< 40	U			—			
RHMW2254-01	ERH543	3/14/2018*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH588	4/23/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH589	4/23/2018*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH634	7/23/2018	—				< 18	U			< 25	U			—				< 40	UJ	l		—			
RHMW2254-01	ERH635	7/23/2018*	—				< 18	U			< 25	UJ	s		—				< 40	UJ	l s		—			
RHMW2254-01	ERH678	10/22/2018	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—			
RHMW2254-01	ERH679	10/22/2018*	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—			
RHMW2254-01	ERH712	11/13/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH713	11/13/2018*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH715	11/14/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH716	11/14/2018*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH719	12/12/2018	—				< 18	U			< 25	UJ	s		< 25	U			< 40	UJ	s		< 40	U		
RHMW2254-01	ERH720	12/12/2018*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH722	12/13/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH723	12/13/2018*	—				< 18	U			< 25	U			< 25	U			< 40	U			< 40	U		
RHMW2254-01	ERH730	1/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH731	1/23/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH733	1/24/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH734	1/24/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH782	4/22/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH783	4/22/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH785	4/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH786	4/23/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH838	7/22/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH838	7/22/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH907	10/21/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH908	10/21/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW2254-01	ERH971	1/21/2020	—				< 18	U			**100**			Z	< 25	U			< 40	U			< 40	U		
RHMW2254-01	ERH972	1/21/2020*	—				< 18	U			**< 25**	U			—				< 40	U			—			
RHMW2254-01	ERH1039	4/23/2020	—				< 18	U			**180**	**J**	q,l	Z	—				< 300.0	U			—			
RHMW2254-01	ERH1040	4/23/2020*	—				< 18	U			**280**	**J**	l	Z	—				< 300.0	U			—			
RHMW2254-01	ERH1105	7/21/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW2254-01	ERH1106	7/21/2020*	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW2254-01	ERH1157	10/13/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW2254-01	ERH1158	10/13/2020*	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW2254-01	ERH1214	1/26/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW2254-01	ERH1215	1/26/2021*	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW2254-01	ERH1304	4/21/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW2254-01	ERH1305	4/21/2021*	—				< 18	U			< 300.0	U			—				< 300.0	U			—			

		Analyte Class	Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Methoc	8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	5				5				30				30				40				40				20			
		SSRBL	750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	ERH037	4/20/2016	< 0.10	U			—				< 0.10	U	f		—				< 0.10	U			—				< 0.20	U		
RHMW2254-01	ERH051	7/20/2016	< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW2254-01	ERH088	10/18/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH092	10/18/2016*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH115	11/14/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH116	11/14/2016*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH135	12/12/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH137	12/12/2016*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH161	1/9/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH162	1/9/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH161 (EPA split)	1/9/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW2254-01	ERH162 (EPA split)	1/9/2017*	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW2254-01	ERH205	2/6/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH206	2/6/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH205 (EPA split)	2/6/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW2254-01	ERH206 (EPA split)	2/6/2017*	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW2254-01	ERH257	3/6/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH258	3/6/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH257 (EPA split)	3/6/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW2254-01	ERH258 (EPA split)	3/6/2017*	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW2254-01	ERH292	4/3/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH293	4/3/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH329	5/2/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH330	5/2/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH349	6/6/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH350	6/6/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH378	7/5/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH379	7/5/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH409	10/24/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH410	10/24/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH542	3/14/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH543	3/14/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH588	4/23/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH589	4/23/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH634	7/23/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH635	7/23/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH678	10/22/2018	< 0.30	U			—				**1**				—				**0.24**	**J**			—				**0.81**	**J**		
RHMW2254-01	ERH679	10/22/2018*	< 0.30	U			—				**0.99**	**J**			—				**0.21**	**J**			—				**0.73**	**J**		
RHMW2254-01	ERH712	11/13/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	UJ	q	
RHMW2254-01	ERH713	11/13/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH715	11/14/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH716	11/14/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH719	12/12/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH720	12/12/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH722	12/13/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH723	12/13/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH730	1/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	UJ	q l		—				< 0.30	U		
RHMW2254-01	ERH731	1/23/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	UJ	l		—				< 0.30	U		
RHMW2254-01	ERH733	1/24/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH734	1/24/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH782	4/22/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH783	4/22/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH785	4/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH786	4/23/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH838	7/22/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH838	7/22/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH907	10/21/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH908	10/21/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH971	1/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH972	1/21/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1039	4/23/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1040	4/23/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1105	7/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1106	7/21/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1157	10/13/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1158	10/13/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1214	1/26/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1215	1/26/2021*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1304	4/21/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1305	4/21/2021*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	ERH037	4/20/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH051	7/20/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0051	U	b f		—				—				—				—				—				—				—			
RHMW2254-01	ERH088	10/18/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH092	10/18/2016*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH115	11/14/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH116	11/14/2016*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH135	12/12/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH137	12/12/2016*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH161	1/9/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH162	1/9/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH161 (EPA split)	1/9/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW2254-01	ERH162 (EPA split)	1/9/2017*	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW2254-01	ERH205	2/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH206	2/6/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH205 (EPA split)	2/6/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c s		< 0.025	UJ	c s		< 0.5	U			< 0.025	UJ	s		—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW2254-01	ERH206 (EPA split)	2/6/2017*	< 0.5	U			< 0.2	U			< 0.025	UJ	c s		< 0.025	UJ	c s		< 0.5	U			< 0.025	UJ	s		—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW2254-01	ERH257	3/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH258	3/6/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH257 (EPA split)	3/6/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW2254-01	ERH258 (EPA split)	3/6/2017*	< 0.5	U			< 0.2	U			< 0.026	UJ	c		< 0.026	UJ	c		< 0.5	U			< 0.026	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW2254-01	ERH292	4/3/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH293	4/3/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH329	5/2/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH330	5/2/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH349	6/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH350	6/6/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH378	7/5/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH379	7/5/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH409	10/24/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH410	10/24/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH542	3/14/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH543	3/14/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH588	4/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH589	4/23/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH634	7/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH635	7/23/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH678	10/22/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH679	10/22/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH712	11/13/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH713	11/13/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH715	11/14/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH716	11/14/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH719	12/12/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH720	12/12/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH722	12/13/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH723	12/13/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH730	1/23/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH731	1/23/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH733	1/24/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH734	1/24/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH782	4/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH783	4/22/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH785	4/23/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH786	4/23/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH838	7/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH838	7/22/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH907	10/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH908	10/21/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH971	1/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH972	1/21/2020*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1039	4/23/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1040	4/23/2020*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1105	7/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1106	7/21/2020*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1157	10/13/2020	—				—				< 0.10	UJ	l		< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1158	10/13/2020*	—				—				< 0.10	UJ	l		< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1214	1/26/2021	—				—				< 0.10	U			< 0.10	UJ	c		—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1215	1/26/2021*	—				—				< 0.10	U			< 0.10	UJ	c		—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1304	4/21/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1305	4/21/2021*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	ERH037	4/20/2016	—				—				—				—				—				—			
RHMW2254-01	ERH051	7/20/2016	—				—				—				—				—				—			
RHMW2254-01	ERH088	10/18/2016	—				—				—				—				< 4.00	U			< 80.0	UJ	h	
RHMW2254-01	ERH092	10/18/2016*	—				—				—				—				< 4.00	U			< 80.0	UJ	h	
RHMW2254-01	ERH115	11/14/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH116	11/14/2016*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH135	12/12/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH137	12/12/2016*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH161	1/9/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH162	1/9/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH161 (EPA split)	1/9/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW2254-01	ERH162 (EPA split)	1/9/2017*	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW2254-01	ERH205	2/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH206	2/6/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH205 (EPA split)	2/6/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW2254-01	ERH206 (EPA split)	2/6/2017*	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW2254-01	ERH257	3/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH258	3/6/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH257 (EPA split)	3/6/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW2254-01	ERH258 (EPA split)	3/6/2017*	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW2254-01	ERH292	4/3/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH293	4/3/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH329	5/2/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH330	5/2/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH349	6/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH350	6/6/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH378	7/5/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH379	7/5/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH409	10/24/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH410	10/24/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH542	3/14/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH543	3/14/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH588	4/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH589	4/23/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH634	7/23/2018	—				—				—				—				< 4.00	UJ	h		< 80.0	U		
RHMW2254-01	ERH635	7/23/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH678	10/22/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH679	10/22/2018*	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH712	11/13/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH713	11/13/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH715	11/14/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH716	11/14/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH719	12/12/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH720	12/12/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH722	12/13/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH723	12/13/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH730	1/23/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH731	1/23/2019*	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH733	1/24/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH734	1/24/2019*	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH782	4/22/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH783	4/22/2019*	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH785	4/23/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH786	4/23/2019*	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH838	7/22/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH838	7/22/2019*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH907	10/21/2019	—				—				—				—				< 4.00	UJ	l		< 80.0	U		
RHMW2254-01	ERH908	10/21/2019*	—				—				—				—				< 4.00	UJ	l		< 80.0	U		
RHMW2254-01	ERH971	1/21/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH972	1/21/2020*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1039	4/23/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1040	4/23/2020*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1105	7/21/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	e	
RHMW2254-01	ERH1106	7/21/2020*	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW2254-01	ERH1157	10/13/2020	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW2254-01	ERH1158	10/13/2020*	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW2254-01	ERH1214	1/26/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1215	1/26/2021*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1304	4/21/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1305	4/21/2021*	—				—				—				—				< 4.00	U			< 80.0	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC				COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015				8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup				Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC				71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	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			
		DOH EAL	300				300				400				—				500				—				5				5				30				30				40				40				20			
		SSRBL	—				—				4500				—				—				—				750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	ERH1482	7/29/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1483	7/29/2021*	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW2254-01	ERH1680	10/26/2021	—				< 8.7	U			< 150	U			< 120	U			< 150	U			< 150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	ERH1681	10/26/2021*	—				< 8.7	U			< 150	U			—				< 150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	ERH2635	3/3/2022	<8.7	U			—				<140	U			—				<140	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	ERH3202	4/14/2022	<8.7	U			—				**140**	**J**			150	U			**280**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	ERH3203	4/14/2022*	<8.7	U			—				**130**	**J**			150	U			**360**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGN01LF-22Q3	07/21/2022	<8.7	U			—				<148	U			—				<148	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGFD01LF-22Q3	07/21/2022*	<8.7	U			—				<150	U			—				<150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGN01LF-22Q4	12/7/2022	**2.25**	**J**			—				<150	U			—				<150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGFD01LF-22Q4	12/7/2022*	<8.5	U			—				<150	U			—				<150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGN01LF-23Q1	2/2/2023	<8.5	U			—				<141	U			—				<141	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGFD01LF-23Q1	2/2/2023*	<8.5	U			—				**66.2**	**J**			<141	U			<141	U			<141	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGN01LF-23Q2	4/13/2023	<8.5	U			—				<143	U			—				<143	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.2	U		
RHMW2254-01	RHMW2254-01-WGFD01LF-23Q2	4/13/2023*	<8.5	U			—				<141	U			—				<141	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW2254-01	RHMW2254-01-WGN01LF-23Q3	7/3/2023	<8.5	U			—				<141	U			—				<141	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW01R	ERH1350	4/19/2021	—				< 18	U			**190**	**J**			< 300.0	U			< 300.0	U			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW01R	ERH1487	7/26/2021	—				< 18	U			**200**	**J**			< 300.0	U			**150**	**J**			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW01R	ERH1685	10/25/2021	—				**6.6**	**J**			**220**	**J**			**55**	**J**			**55**	**J**			< 150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW01R	ERH2636	3/2/2022	**3.3**	**J**			—				**270**	**J**			**39**	**J**			**200**	**J**			<140	U			< 0.2	U			—				< 0.2	U			—				< 0.2	UT			—				< 0.2	U		
RHMW01R	ERH2603	03/02/2022*	**2.8**	**J**			—				**270**	**J**			**40**	**J**			**190**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	UT			—				< 0.2	U		
RHMW01R	ERH3157	4/12/2022	**2.5**	**J**			—				**250**	**J**			**48**	**J**			**150**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW01R	RHMW01R-WGN01LF-22Q3	07/19/2022	<8.7	U			—				**181**	**J**			**41**	**J**			**282**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW01R	RHMW01R-WGN01LF-22Q4	12/6/2022	**3.29**	**J**			—				**142**	**J**			**45.9**	**J**			**173**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW01R	RHMW01R-WGN01LF-23Q1	1/31/2023	<8.5	U			—				**135**	**J**			**38.9**	**J**			< 143	U			< 143	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW01R	RHMW01R-WGN01LF-23Q2	4/10/2023	<8.5	U			—				**96.2**	**J**			< 143	U			< 143	U			< 143	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW01R	RHMW01R-WGN01LF-23Q3	7/7/2023	<8.5	U			—				**248**	**J**			**65.5**	**J**			**75.7**	**J**			< 141	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW02	RHMW02W01	9/20/2005[a]	< 50	U			—				**2,660**				—				—				—				< 2.5	U			—				< 2.5	U			—				< 2.5	U			—				< 2.5	U		
RHMW02	RHMW02Q01	9/20/2005*[a]	< 50	U			—				**2,500**				—				—				—				< 2.5	U			—				< 2.5	U			—				< 2.5	U			—				< 2.5	U		
RHMW02	RHMW02-GW02	7/10/2006[a]	**124**	**J**	s		—				**2,800**				—				—				—				< 0.50	U			—				**1.3**				—				< 0.50	U			—				< 0.50	U		
RHMW02	RHMW05-GW02	7/10/2006*[a]	**119**	**J**	s		—				**2,790**				—				—				—				< 2.5	U			—				< 2.5	U			—				< 2.5	U			—				< 2.5	U		
RHMW02	RHMW02-GW06	12/5/2006[a]	**110**	**J**	s		—				**2,600**				—				—				—				< 0.50	U			—				**1.2**				—				< 0.50	U			—				< 0.50	U		
RHMW02	RHMWA01-GW06	12/5/2006*[a]	**138**	**J**	s		—				**2,690**				—				—				—				< 0.50	U			—				**1.1**				—				< 0.50	U			—				< 0.50	U		
RHMW02	RHMW02-WG07	3/27/2007[a]	**122**	**J**	s		—				**2,750**				—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW02	RHMWA01-WG07	3/27/2007*[a]	**148**	**J**	s		—				**2,250**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW02	RHMW02-WG08	6/12/2007[a]	**52.5**	**J**			—				**2,750**				—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.5	U		
RHMW02	RHMWA01-WG08	6/12/2007*[a]	**56.5**	**J**			—				**2,900**				—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW02	RHMW02-WG09	9/10/2007[a]	**76**	**J**	s		—				**2,810**				—				—				—				< 0.20	U			—				< 0.20	U			—				< 0.27	U			—				< 0.36	U		
RHMW02	RHMWA01-WG09	9/10/2007*[a]	**78.2**	**J**	s		—				**3,180**				—				—				—				< 0.2	U			—				< 0.20	U			—				< 0.27	U			—				< 0.38	U		
RHMW02	RHMW02-WG10	1/15/2008[a]	**64.3**	**J**			—				**2,310**			Y	—				—				—				**0.170**	**J**			—				< 0.310	U			—				< 0.310	U			—				**1.06**			
RHMW02	RHMWA01-WG10	1/15/2008*[a]	**66.2**	**J**			—				**3,230**			Y	—				—				—				**0.170**	**J**			—				**0.350**	**J**			—				< 0.310	U			—				**1.10**			
RHMW02	RHMW02-WG11	4/15/2008[a]	**58.9**	**J**			—				**3,120**			Y	—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				**0.740**	**J**		
RHMW02	RHMWA01-WG11	4/15/2008*[a]	**58.9**	**J**			—				**3,020**			Y	—				—				—				**0.150**	**J**			—				< 0.310	U			—				< 0.310	U			—				**0.750**	**J**		
RHMW02	RHMW02-WG12	7/29/2008[ad]	**61.7**	**J**			—				**4,470**				—				—				—				< 0.120	U			—				**0.580**	**J**			—				< 0.310	U			—				< 0.620	U		
RHMW02	RHMWA01-WG12	7/29/2008*[ad]	**61.2**	**J**			—				**3,640**				—				—				—				**0.120**	**J**			—				**0.560**	**J**			—				< 0.310	U			—				< 0.620	U		
RHMW02	RHMW02-WG13	10/22/2008[ad]	**52.8**	**J**			—				**4,540**				—				—				—				**0.140**	**J**			—				**0.450**	**J**			—				< 0.310	U			—				**0.450**	**J**		
RHMW02	RHMWA01-WG13	10/22/2008*[ad]	**52.9**	**J**			—				**6,300**				—				—				—				**0.150**	**J**			—				**0.420**	**J**			—				< 0.310	U			—				**0.490**	**J**		
RHMW02	RHMW02-WG14	2/4/2009[a]	**52.3**	**J**			—				**2,840**				—				—				—				**0.260**	**J**			—				**0.490**	**J**			—				< 0.310	U			—				**0.400**	**J**		
RHMW02	RHMWA01-WG14	2/4/2009*[a]	**54.3**	**J**			—				**2,840**				—				—				—				**0.240**	**J**			—				**0.520**	**J**			—				< 0.310	U			—				**0.470**	**J**		
RHMW02	RHMW02-WG15	5/13/2009[a]	< 39.1	U	b t		—				**1,620**				—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				**0.310**	**J**		
RHMW02	RHMWA01-WG15	5/13/2009*[a]	< 36.7	U	b t		—				**2,000**				—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW02	RHMW02-WG16	7/15/2009[a]	< 30.0	U			—				**1,450**				—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW02	RHMWA01-WG16	7/15/2009*[a]	< 30.0	U			—				**1,300**				—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW02	RHMW02-WG17	10/13/2009[a]	**36.9**	**J**			—				**2,570**				—				—				—				< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 1	U		
RHMW02	RHMWA01-WG17	10/13/2009*[a]	< 30	U			—				**2,570**				—				—				—				< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 1	U		
RHMW02	RHMW02-WG18	1/26/2010	**42.3**	**J**			—				**2,130**			Y	—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW02	RHMWA01-WG18	1/26/2010*	**38.1**	**J**			—				**3,410**			Y	—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW02	RHMW02-WG19	4/13/2010	**39.3**	**J**			—				**2,350**				—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW02	RHMWA01-WG19	4/13/2010*	**39.0**	**J**			—				**2,080**				—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW02	RHMW02-WG20	7/13/2010	**46.5**	**J**			—				**3,060**				—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				**0.690**	**J**		
RHMW02	RHMWA01-WG20	7/13/2010*	**45.4**	**J**			—				**3,110**				—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				**0.660**	**J**		
RHMW02	ES002	10/18/2010	—				**150**			O	**1,700**			O	—				—				—				< 0.32	U			—				**0.25**	**J**			—				< 0.34	U			—				**0.60**	**J**		
RHMW02	ES003	10/18/2010*	—				**160**			O	**1,700**			O	—				—				—				< 0.32	U			—				**0.32**	**J**			—				< 0.34	U			—				**0.51**	**J**		
RHMW02	ES010	1/18/2011[d]	—				**17**	**J**		O	**1,100**			O	—				—				—				< 0.32	U			—				**0.29**	**J**			—				< 0.34	U			—				**0.48**	**J**		
RHMW02	ES011	1/18/2011*[d]	—				**20**			O	**980**			O	—				—				—				< 0.32	U			—				**0.25**	**J**			—				< 0.34	U			—				**0.58**	**J**		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	ERH1482	7/29/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1483	7/29/2021*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1680	10/26/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH1681	10/26/2021*	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW2254-01	ERH2635	3/3/2022	—				—				<0.032	UMQ			<0.081	UMQ			—				<0.081	UMQ			—				—				—				<0.0049	U			—				—				—			
RHMW2254-01	ERH3202	4/14/2022	—				—				<0.031	UQ			<0.078	UQ			—				<0.078	UMQ			—				—				—				—				—				—				—			
RHMW2254-01	ERH3203	4/14/2022*	—				—				<0.031	UQ			<0.076	UQ			—				<0.076	UMQ			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGN01LF-22Q3	07/21/2022	—				—				<0.031	U			<0.078	U			—				<0.078	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGFD01LF-22Q3	07/21/2022*	—				—				<0.031	U			<0.079	U			—				<0.079	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGN01LF-22Q4	12/7/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGFD01LF-22Q4	12/7/2022*	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGN01LF-23Q1	2/2/2023	—				—				<0.03	U			<0.075	U			—				<0.075	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGFD01LF-23Q1	2/2/2023*	—				—				<0.03	U			<0.075	U			—				<0.075	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGN01LF-23Q2	4/13/2023	—				—				<0.03	U			<0.075	U			—				<0.075	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGFD01LF-23Q2	4/13/2023*	—				—				<0.032	U			<0.079	U			—				<0.079	U			—				—				—				—				—				—				—			
RHMW2254-01	RHMW2254-01-WGN01LF-23Q3	7/3/2023	—				—				<0.42	U			<0.42	U			—				<0.42	U			—				—				—				—				—				—				—			
RHMW01R	ERH1350	4/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			< 0.30	U			—				—			
RHMW01R	ERH1487	7/26/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			< 0.30	U			—				—			
RHMW01R	ERH1685	10/25/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW01R	ERH2636	3/2/2022	—				—				<0.031	UMQ			<0.077	UMQ			—				0.11	MQ			—				—				—				<0.0049	U			—				—				—			
RHMW01R	ERH2603	03/02/2022*	—				—				<0.032	UQ			<0.081	UMQ			—				0.093	JMQ			—				—				—				—				—				—				—			
RHMW01R	ERH3157	4/12/2022	—				—				<0.031	UM			<0.077	UM			—				0.13	J			—				—				—				<0.0049	U			—				—				—			
RHMW01R	RHMW01R-WGN01LF-22Q3	07/19/2022	—				—				0.054	J			<0.076	U			—				0.13				—				—				—				—				—				—				—			
RHMW01R	RHMW01R-WGN01LF-22Q4	12/6/2022	—				—				<0.03	U			<0.076	U			—				0.15				—				—				—				—				—				—				—			
RHMW01R	RHMW01R-WGN01LF-23Q1	1/31/2023	—				—				0.036	J			<0.076	U			—				0.066	J			—				—				—				—				—				—				—			
RHMW01R	RHMW01R-WGN01LF-23Q2	4/10/2023	—				—				<0.031	U			<0.077	U			—				0.1				—				—				—				—				—				—				—			
RHMW01R	RHMW01R-WGN01LF-23Q3	7/7/2023	—				—				1.1				<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW02	RHMW02W01	9/20/2005[a]	—				—				104				88.5				—				120				283	J	c		—				—				—				< 2.5	U			—				—			
RHMW02	RHMW02Q01	9/20/2005*[a]	—				—				102				87.2				—				123				319				—				—				—				< 2.5	U			—				—			
RHMW02	RHMW02-GW02	7/10/2006[a]	—				—				142				65.8				—				171				343				—				—				—				< 0.50	U			—				—			
RHMW02	RHMW05-GW02	7/10/2006*[a]	—				—				133				67.1				—				180				335				—				—				—				< 2.5	U			—				—			
RHMW02	RHMW02-GW06	12/5/2006[a]	—				—				124				45.1				—				160				257				—				—				—				< 0.50	U			—				—			
RHMW02	RHMWA01-GW06	12/5/2006*[a]	—				—				114				51.1				—				147				269				—				—				—				< 0.50	U			—				—			
RHMW02	RHMW02-WG07	3/27/2007[a]	—				—				72.1				30.3				—				105				196				—				—				—				< 0.50	U			—				—			
RHMW02	RHMWA01-WG07	3/27/2007*[a]	—				—				59.4				26.2				—				90.1				207				—				—				—				< 0.50	U			—				—			
RHMW02	RHMW02-WG08	6/12/2007[a]	—				—				67.3				26.5				—				87.2				209				—				—				—				< 0.50	U			—				—			
RHMW02	RHMWA01-WG08	6/12/2007*[a]	—				—				88.3				33				—				128				207				—				—				—				< 0.50	U			—				—			
RHMW02	RHMW02-WG09	9/10/2007[a]	—				—				109				21.5				—				144				206				—				—				—				< 0.20	U			—				—			
RHMW02	RHMWA01-WG09	9/10/2007*[a]	—				—				102				19.7				—				136				264				—				—				—				< 0.20	U			—				—			
RHMW02	RHMW02-WG10	1/15/2008[a]	—				—				67.0				23.8				—				93.6				195				—				—				—				< 0.310	U			—				—			
RHMW02	RHMWA01-WG10	1/15/2008*[a]	—				—				73.2				27.6				—				102				194				—				—				—				< 0.310	U			—				—			
RHMW02	RHMW02-WG11	4/15/2008[a]	—				—				75.8				34.5				—				73.0				290				—				—				—				< 0.310	U			—				—			
RHMW02	RHMWA01-WG11	4/15/2008*[a]	—				—				71.9				40.8				—				105				293				—				—				—				< 0.310	U			—				—			
RHMW02	RHMW02-WG12	7/29/2008[ad]	—				—				102				31.5				—				140				320				—				—				—				< 0.310	U			—				—			
RHMW02	RHMWA01-WG12	7/29/2008*[ad]	—				—				96.0				42.2				—				132				309				—				—				—				< 0.310	U			—				—			
RHMW02	RHMW02-WG13	10/22/2008[ad]	—				—				72.1				13.7				—				97.4				239				—				—				—				< 0.310	U			—				—			
RHMW02	RHMWA01-WG13	10/22/2008*[ad]	—				—				62.4				12.7				—				82.3				245				—				—				—				< 0.310	U			—				—			
RHMW02	RHMW02-WG14	2/4/2009[a]	—				—				21.2	J	s		10.5				—				15.2				42.8				—				—				—				< 0.310	U			—				—			
RHMW02	RHMWA01-WG14	2/4/2009*[a]	—				—				22.8				11.1				—				16.6				43				—				—				—				< 0.310	U			—				—			
RHMW02	RHMW02-WG15	5/13/2009[a]	—				—				17.9				0.136				—				1.17				< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW02	RHMWA01-WG15	5/13/2009*[a]	—				—				24.6				0.107				—				1.08				< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW02	RHMW02-WG16	7/15/2009[a]	—				—				13.2				3.66				—				8.37				10.1				—				—				—				< 0.310	U			—				—			
RHMW02	RHMWA01-WG16	7/15/2009*[a]	—				—				10.6				2.58				—				6.71				11.2				—				—				—				< 0.310	U			—				—			
RHMW02	RHMW02-WG17	10/13/2009[a]	—				—				2.46				0.486				—				6.77				23.3				—				—				—				< 0.31	U			—				—			
RHMW02	RHMWA01-WG17	10/13/2009*[a]	—				—				4.03				0.783				—				7.82				20				—				—				—				< 0.31	U			—				—			
RHMW02	RHMW02-WG18	1/26/2010	—				—				9.03				3.85				—				17.3				31.5				—				—				—				< 0.620	U			—				—			
RHMW02	RHMWA01-WG18	1/26/2010*	—				—				8.26				2.65				—				15.7				9.30				—				—				—				< 0.620	U			—				—			
RHMW02	RHMW02-WG19	4/13/2010	—				—				6.61				1.69				—				14.3				20.6				—				—				—				< 0.620	U			—				—			
RHMW02	RHMWA01-WG19	4/13/2010*	—				—				5.90				1.90				—				12.7				21.4				—				—				—				< 0.620	U			—				—			
RHMW02	RHMW02-WG20	7/13/2010	—				—				7.43				1.06				—				59.9				107				—				—				—				< 0.620	U			—				—			
RHMW02	RHMWA01-WG20	7/13/2010*	—				—				7.05				0.937				—				61.1				102				—				—				—				< 0.620	U			—				—			
RHMW02	ES002	10/18/2010	—				—				15				5.0				—				59				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES003	10/18/2010*	—				—				15				6.3				—				54				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES010	1/18/2011[d]	—				—				19				3.6				—				57				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES011	1/18/2011*[d]	—				—				23				5.6				—				63				—				—				—				—				< 0.40	U			—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW2254-01	ERH1482	7/29/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1483	7/29/2021*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW2254-01	ERH1680	10/26/2021	—				—				—				—				< 5.6	U			< 80	U		
RHMW2254-01	ERH1681	10/26/2021*	—				—				—				—				< 5.5	U			< 80	U		
RHMW2254-01	ERH2635	3/3/2022	—				—				<0.25	U			—				<0.61	UMQ			—			
RHMW2254-01	ERH3202	4/14/2022	—				—				—				—				<0.58	U			<80	U		
RHMW2254-01	ERH3203	4/14/2022*	—				—				—				—				<0.57	UMQ			<80	U		
RHMW2254-01	RHMW2254-01-WGN01LF-22Q3	07/21/2022	—				—				—				—				<0.58	U			<80	U		
RHMW2254-01	RHMW2254-01-WGFD01LF-22Q3	07/21/2022*	—				—				—				—				<0.59	U			<80	U		
RHMW2254-01	RHMW2254-01-WGN01LF-22Q4	12/7/2022	—				—				—				—				<0.57	U			<80	UJ		
RHMW2254-01	RHMW2254-01-WGFD01LF-22Q4	12/7/2022*	—				—				—				—				<0.57	U			<80	UJ		
RHMW2254-01	RHMW2254-01-WGN01LF-23Q1	2/2/2023	—				—				—				—				<0.56	U			<80	U		
RHMW2254-01	RHMW2254-01-WGFD01LF-23Q1	2/2/2023*	—				—				—				—				<0.57	U			<80	U		
RHMW2254-01	RHMW2254-01-WGN01LF-23Q2	4/13/2023	—				—				—				—				<0.56	U			<80	U		
RHMW2254-01	RHMW2254-01-WGFD01LF-23Q2	4/13/2023*	—				—				—				—				<0.59	U			<80	U		
RHMW2254-01	RHMW2254-01-WGN01LF-23Q3	7/3/2023	—				—				—				—				<2	U			<80	UJ		
RHMW01R	ERH1350	4/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW01R	ERH1487	7/26/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW01R	ERH1685	10/25/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW01R	ERH2636	3/2/2022	—				—				<0.25	U			—				<0.57	UQ			—			
RHMW01R	ERH2603	03/02/2022*	—				—				—				—				<0.61	UMQ			—			
RHMW01R	ERH3157	4/12/2022	—				—				<0.2	U			—				<0.57	UM			<80	U		
RHMW01R	RHMW01R-WGN01LF-22Q3	07/19/2022	—				—				—				—				<0.57	U			<80	U		
RHMW01R	RHMW01R-WGN01LF-22Q4	12/6/2022	—				—				—				—				<0.57	U			<80	UJ		
RHMW01R	RHMW01R-WGN01LF-23Q1	1/31/2023	—				—				—				—				<0.57	U			<80	U		
RHMW01R	RHMW01R-WGN01LF-23Q2	4/10/2023	—				—				—				—				<0.58	U			<80	U		
RHMW01R	RHMW01R-WGN01LF-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW02	RHMW02W01	9/20/2005[a]	—				—				< 2.5	U			—				—				—			
RHMW02	RHMW02Q01	9/20/2005*[a]	—				—				< 2.5	U			—				—				—			
RHMW02	RHMW02-GW02	7/10/2006[a]	—				—				< 0.50	U			—				—				—			
RHMW02	RHMW05-GW02	7/10/2006*[a]	—				—				< 2.5	U			—				—				—			
RHMW02	RHMW02-GW06	12/5/2006[a]	—				—				< 0.50	U			—				—				—			
RHMW02	RHMWA01-GW06	12/5/2006*[a]	—				—				< 0.50	U			—				—				—			
RHMW02	RHMW02-WG07	3/27/2007[a]	—				—				< 0.50	U			—				—				—			
RHMW02	RHMWA01-WG07	3/27/2007*[a]	—				—				< 0.50	U			—				—				—			
RHMW02	RHMW02-WG08	6/12/2007[a]	—				—				< 0.50	U			—				—				—			
RHMW02	RHMWA01-WG08	6/12/2007*[a]	—				—				< 0.50	U			—				—				—			
RHMW02	RHMW02-WG09	9/10/2007[a]	—				—				< 0.20	U			—				—				—			
RHMW02	RHMWA01-WG09	9/10/2007*[a]	—				—				< 0.20	U			—				—				—			
RHMW02	RHMW02-WG10	1/15/2008[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMWA01-WG10	1/15/2008*[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMW02-WG11	4/15/2008[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMWA01-WG11	4/15/2008*[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMW02-WG12	7/29/2008[ad]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMWA01-WG12	7/29/2008*[ad]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMW02-WG13	10/22/2008[ad]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMWA01-WG13	10/22/2008*[ad]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMW02-WG14	2/4/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMWA01-WG14	2/4/2009*[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMW02-WG15	5/13/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMWA01-WG15	5/13/2009*[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMW02-WG16	7/15/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMWA01-WG16	7/15/2009*[a]	—				—				< 0.150	U			—				—				—			
RHMW02	RHMW02-WG17	10/13/2009[a]	—				—				< 0.15	U			—				—				—			
RHMW02	RHMWA01-WG17	10/13/2009*[a]	—				—				< 0.15	U			—				—				—			
RHMW02	RHMW02-WG18	1/26/2010	—				—				< 0.300	U			—				—				—			
RHMW02	RHMWA01-WG18	1/26/2010*	—				—				< 0.300	U			—				—				—			
RHMW02	RHMW02-WG19	4/13/2010	—				—				< 0.300	U			—				—				—			
RHMW02	RHMWA01-WG19	4/13/2010*	—				—				< 0.300	U			—				—				—			
RHMW02	RHMW02-WG20	7/13/2010	—				—				< 0.300	U			—				—				—			
RHMW02	RHMWA01-WG20	7/13/2010*	—				—				< 0.300	U			—				—				—			
RHMW02	ES002	10/18/2010	—				—				< 0.28	U			—				—				—			
RHMW02	ES003	10/18/2010*	—				—				< 0.28	U			—				—				—			
RHMW02	ES010	1/18/2011[d]	—				—				< 0.28	U			—				—				—			
RHMW02	ES011	1/18/2011*[d]	—				—				< 0.28	U			—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	300				300				400				—				500				—			
		SSRBL	—				—				4500				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW02	ES020	4/19/2011[d]	—				**24**			O	**1,100**			O	—				—				—			
RHMW02	ES021	4/19/2011*[d]	—				**29**			O	**1,100**			O	—				—				—			
RHMW02	ES037	7/19/2011	—				< 12.12	U			**1,100**			O	—				< 212.0	U			—			
RHMW02	ES038	7/19/2011*	—				< 12.12	U			**1,800**	J	s	O	—				< 212.0	U			—			
RHMW02	ES046	10/24/2011	—				< 12.12	U			**750**			O	—				—				—			
RHMW02	ES047	10/24/2011*	—				< 12.12	U			**730**			O	—				—				—			
RHMW02	ES061	1/26/2012	—				< 12.12	U			**1,700**			O	—				—				—			
RHMW02	ES071	4/16/2012	—				< 12.12	U			**1,200**			O	—				—				—			
RHMW02	ES072	4/16/2012*	—				< 12.12	U			**1,100**			O	—				—				—			
RHMW02	ES082	7/18/2012	—				< 12.12	U			**1,700**			Y	—				—				—			
RHMW02	ES002	10/22/2012	—				**320**				**2,200**			Y	—				—				—			
RHMW02	ES003	10/22/2012*	—				**360**				**1,800**			Y	—				—				—			
RHMW02	ES011	1/28/2013	—				**660**				**1,700**			Y	—				—				—			
RHMW02	ES012	1/28/2013*	—				**650**				**1,500**			Y	—				—				—			
RHMW02	ES020	4/22/2013	—				< 54	UJ	t		**2,600**			Y	—				—				—			
RHMW02	ES021	4/22/2013*	—				< 56	UJ	t		**3,300**			Y	—				—				—			
RHMW02	ES029	7/22/2013	—				**55**	J	h		**2,500**			Y	—				—				—			
RHMW02	ES030	7/22/2013*	—				**61**	J	h		**2,600**			Y	—				—				—			
RHMW02	ES038	10/21/2013	—				< 48	UJ	b		**2,400**			Y	—				—				—			
RHMW02	ES039	10/21/2013*	—				< 63	UJ	b		**2,400**			Y	—				—				—			
RHMW02	ES046	1/15/2014[d]	—				—				**5,000**				—				—				—			
RHMW02	ES047	1/15/2014*[d]	—				—				**5,200**				—				—				—			
RHMW02	ES057	1/28/2014[d]	—				< 50	U	b		**2,300**			Y	—				—				—			
RHMW02	ES058	1/28/2014*[d]	—				< 52	U	b		**2,100**			Y	—				—				—			
RHMW02	ES063	2/24/2014[d]	—				**40**	J			**2,200**			Y	—				—				—			
RHMW02	ES065	3/5/2014[d]	—				—				**2,100**				—				—				—			
RHMW02	ES066	3/5/2014*[d]	—				—				**2,200**				—				—				—			
RHMW02	ES070	3/10/2014[d]	—				—				**930**				—				—				—			
RHMW02	ES071	3/10/2014*[d]	—				—				**890**				—				—				—			
RHMW02	ES073	3/25/2014[d]	—				—				**1,700**			Y	—				—				—			
RHMW02	ES074	3/25/2014*[d]	—				—				**1,700**			Y	—				—				—			
RHMW02	ES078	4/7/2014[d]	—				—				**3,500**			Y	—				—				—			
RHMW02	ES079	4/7/2014*[d]	—				—				**3,300**			Y	—				—				—			
RHMW02	ES081	4/21/2014[d]	—				**53**				**1,900**				—				—				—			
RHMW02	ES082	4/21/2014*[d]	—				**50**				**1,500**				—				—				—			
RHMW02	ES092	5/27/2014[d]	—				—				**1,500**			Y	—				—				—			
RHMW02	ES093	5/27/2014*[d]	—				—				**1,300**			Y	—				—				—			
RHMW02	ES099	6/23/2014[d]	—				—				**1,800**				—				—				—			
RHMW02	ES100	6/23/2014*[d]	—				—				**1,600**				—				—				—			
RHMW02	ES104	7/21/2014	—				**48**	J			**1,200**			Y	—				—				—			
RHMW02	ES105	7/21/2014*	—				**49**	J			**1,300**			Y	—				—				—			
RHMW02	ES114	10/27/2014	—				**57**				**2,000**			Y	—				—				—			
RHMW02	ES115	10/27/2014	—				**53**				**2,000**			Y	—				—				—			
RHMW02	ES126	1/28/2015	—				**54**				**1,100**			Y	—				—				—			
RHMW02	ES127	1/28/2015*	—				**59**				**1,700**			Y	—				—				—			
RHMW02	ES131	4/20/2015	**46**	J			—				**5,200**			Y	—				**360**			Y	—			
RHMW02	ES132	4/20/2015*	**47**	J			—				**5,400**			Y	—				**360**			Y	—			
RHMW02	ES144	6/25/2015	—				—				**3,800**			Y	—				**250**			Y	—			
RHMW02	ES146	7/20/2015	**40**	J			—				**3,900**	J	s	Y	—				**240**	J	s	Y	—			
RHMW02	ES147	7/20/2015*	**41**	J			—				**3,200**			Y	—				**260**			Y	—			
RHMW02	ERH012	10/20/2015	**47**	J			—				**6,100**			Y	—				**310**			Y	—			
RHMW02	ERH013	10/20/2015*	**47**	J			—				**6,200**			Y	—				**320**			Y	—			
RHMW02	ERH025	1/20/2016	**36**	J			—				**6,500**			Y	—				**340**			Y	—			
RHMW02	ERH040	4/20/2016	< 35	U	f		—				**4,400**			Y	—				**390**			Y	—			
RHMW02	ERH041	4/20/2016*	< 35	U	f		—				**3,700**			Y	—				**400**			Y	—			
RHMW02	ERH054	7/20/2016	**31**	J	s		—				**3,600**			Y	—				**280**			Y	—			
RHMW02	ERH055	7/20/2016*	**30**	J	s		—				**3,200**			Y	—				**270**			Y	—			
RHMW02	ERH091	10/19/2016	—				**35**				**1,300**				**300**			Y	< 40	U			< 40	U		
RHMW02	ERH124	11/15/2016	—				**26**			Y	**1,300**			O	—				**100**				—			
RHMW02	ERH144	12/13/2016	—				< 18	U			**1,300**			O	—				< 40	U			—			
RHMW02	ERH174	1/10/2017	—				**63**			Y	**1,400**			O	—				**42**				—			
RHMW02	ERH174 (EPA split)	1/10/2017	**41**	J	c		—				**4,000**				—				< 300	U			—			
RHMW02	ERH216	2/7/2017	—				**65**			Y	**1,000**			O	—				< 40	U			—			
RHMW02	ERH216 (EPA split)	2/7/2017	**32**	J	c		—				**2,700**				—				< 300	U			—			
RHMW02	ERH265	3/7/2017	—				**73**			W	**1,200**			O	—				< 40	U			—			
RHMW02	ERH265 (EPA split)	3/7/2017	**37**	J	c		—				**2,500**				—				< 300	U			—			

	Analyte Class	Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
	Analyte Type	COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
	Analytical Methoc	8260				524.2				8260				524.2				8260				524.2				8260			
	Analyte	Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
	CAS No.	71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
	Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
	DOH EAL	5				5				30				30				40				40				20			
	SSRBL	750				750				—				—				—				—				—			
Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
ES020	4/19/2011[d]	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				**0.41**	J		
ES021	4/19/2011*[d]	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				**0.41**	J		
ES037	7/19/2011	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
ES038	7/19/2011*	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
ES046	10/24/2011	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
ES047	10/24/2011*	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
ES061	1/26/2012	< 0.32	U			—				**0.30**	J			—				< 0.34	U			—				< 0.38	U		
ES071	4/16/2012	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
ES072	4/16/2012*	< 0.32	U			—				**0.23**	J			—				< 0.34	U			—				< 0.38	U		
ES082	7/18/2012	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				**0.43**	J		
ES002	10/22/2012	< 0.50	U			—				**0.18**	J			—				**0.59**	J			—				**0.51**	J		
ES003	10/22/2012*	< 0.50	U			—				**0.18**	J			—				**0.60**	J			—				**0.47**	J		
ES011	1/28/2013	< 0.50	U			—				**0.21**	J			—				< 0.50	U			—				**0.65**	J		
ES012	1/28/2013*	< 0.50	U			—				**0.24**	J			—				< 0.50	U			—				**0.69**	J		
ES020	4/22/2013	< 0.50	U			—				**0.21**	J			—				< 0.50	U			—				**0.58**	J		
ES021	4/22/2013*	< 0.50	U			—				**0.21**	J			—				< 0.50	U			—				**0.58**	J		
ES029	7/22/2013	< 0.50	UJ	h		—				**0.17**	J	h		—				< 0.50	UJ	h		—				**0.45**	J	h	
ES030	7/22/2013*	< 0.50	UJ	h		—				**0.19**	J	h		—				< 0.50	UJ	h		—				**0.50**	J	h	
ES038	10/21/2013	< 0.50	U			—				**0.14**	J			—				< 0.50	U			—				**0.37**	J		
ES039	10/21/2013*	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.37**	J		
ES046	1/15/2014[d]	< 0.50	U			—				**0.17**	J			—				< 0.50	U			—				**0.48**	J		
ES047	1/15/2014*[d]	< 0.50	U			—				**0.17**	J			—				< 0.50	U			—				**0.45**	J		
ES057	1/28/2014[d]	**0.14**	J			—				**0.20**	J			—				< 0.50	U			—				**0.38**	J		
ES058	1/28/2014*[d]	**0.15**	J			—				**0.20**	J			—				< 0.50	U			—				**0.34**	J		
ES063	2/24/2014[d]	< 0.50	U			—				**0.15**	J			—				< 0.50	U			—				**0.29**	J		
ES065	3/5/2014[d]	< 0.50	U			—				**0.15**	J			—				< 0.50	U			—				**0.29**	J		
ES066	3/5/2014*[d]	< 0.50	U			—				**0.15**	J			—				< 0.50	U			—				**0.32**	J		
ES070	3/10/2014[d]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.30**	J		
ES071	3/10/2014*[d]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.31**	J		
ES073	3/25/2014[d]	< 0.50	U			—				**0.15**	J			—				< 0.50	U			—				**0.38**	J		
ES074	3/25/2014*[d]	< 0.50	U			—				**0.16**	J			—				< 0.50	U			—				**0.41**	J		
ES078	4/7/2014[d]	< 0.50	U			—				**0.18**	J			—				< 0.50	U			—				**0.40**	J		
ES079	4/7/2014*[d]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.33**	J		
ES081	4/21/2014[d]	< 0.50	U			—				**0.17**	J			—				< 0.50	U			—				**0.43**	J		
ES082	4/21/2014*[d]	< 0.50	U			—				**0.16**	J			—				< 0.50	U			—				**0.42**	J		
ES092	5/27/2014[d]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.31**	J		
ES093	5/27/2014*[d]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.32**	J		
ES099	6/23/2014[d]	< 0.50	U			—				**0.16**	J			—				< 0.50	U			—				**0.40**	J		
ES100	6/23/2014*[d]	< 0.50	U			—				**0.18**	J			—				< 0.50	U			—				**0.37**	J		
ES104	7/21/2014	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.36**	J		
ES105	7/21/2014*	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				**0.33**	J		
ES114	10/27/2014	< 0.50	U			—				**0.15**	J			—				< 0.50	U			—				**0.32**	J		
ES115	10/27/2014	< 0.50	U			—				**0.14**	J			—				< 0.50	U			—				**0.29**	J		
ES126	1/28/2015	< 0.50	U			—				**0.16**	J			—				< 0.50	U			—				**0.35**	J		
ES127	1/28/2015*	< 0.50	U			—				**0.17**	J			—				< 0.50	U			—				**0.35**	J		
ES131	4/20/2015	**0.090**	J			—				**0.18**	J			—				< 0.10	U			—				**0.26**	J		
ES132	4/20/2015*	**0.080**	J			—				**0.19**	J			—				< 0.10	U			—				**0.30**	J		
ES144	6/25/2015	—				—				—				—				—				—				—			
ES146	7/20/2015	< 0.10	U			—				**0.16**	J			—				**0.060**	J			—				**0.26**	J		
ES147	7/20/2015*	**0.10**	J			—				**0.17**	J			—				< 0.10	U			—				**0.27**	J		
ERH012	10/20/2015	**0.090**	J	h		—				**0.29**	J	h		—				< 0.3	UJ	b h t		—				**0.32**	J	h	
ERH013	10/20/2015*	**0.090**	J	h		—				**0.26**	J	h		—				< 0.49	UJ	b h t		—				**0.30**	J	h	
ERH025	1/20/2016	**0.080**	J			—				**0.014**	J			—				< 0.07	UJ	t		—				**0.21**	J		
ERH040	4/20/2016	< 0.10	U			—				< 0.17	U	f		—				< 0.10	U			—				< 0.16	U	f	
ERH041	4/20/2016*	**0.070**	J			—				< 0.17	U	f		—				< 0.10	U			—				< 0.18	U	f	
ERH054	7/20/2016	**0.070**	J			—				< 0.13	U	f		—				< 0.10	U			—				< 0.21	U	f	
ERH055	7/20/2016*	**0.080**	J			—				< 0.14	U	f		—				< 0.10	U			—				< 0.23	U	f	
ERH091	10/19/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
ERH124	11/15/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
ERH144	12/13/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.19**	J		
ERH174	1/10/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.26**	J		
ERH174 (EPA split)	1/10/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
ERH216	2/7/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.23**	J		
ERH216 (EPA split)	2/7/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
ERH265	3/7/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
ERH265 (EPA split)	3/7/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW02	ES020	4/19/2011[d]	—				—				5.1				0.43				—				3.5				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES021	4/19/2011*[d]	—				—				5.2				0.53				—				4.2				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES037	7/19/2011	—				—				0.85				0.16	J			—				2.2				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES038	7/19/2011*	—				—				0.90				0.12	J			—				2.7				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES046	10/24/2011	—				—				0.53				0.15	J			—				0.80				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES047	10/24/2011*	—				—				0.62				0.20				—				1.0				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES061	1/26/2012	—				—				0.57				0.17	J			—				1.7				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES071	4/16/2012	—				—				0.30				< 0.12	U			—				0.86				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES072	4/16/2012*	—				—				1.2				0.61				—				2.9				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES082	7/18/2012	—				—				4.7				0.88				—				17				—				—				—				—				< 0.40	U			—				—			
RHMW02	ES002	10/22/2012	—				—				24				14				—				63				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES003	10/22/2012*	—				—				21				12				—				61				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES011	1/28/2013	—				—				47				35				—				110				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES012	1/28/2013*	—				—				41				31				—				100				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES020	4/22/2013	—				—				16				13				—				53				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES021	4/22/2013*	—				—				20				16				—				61				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES029	7/22/2013	—				—				21				9.1				—				73				—				—				—				—				< 0.50	UJ	h		—				—			
RHMW02	ES030	7/22/2013*	—				—				18				6.6				—				67				—				—				—				—				< 0.50	UJ	h		—				—			
RHMW02	ES038	10/21/2013	—				—				9.0				9.0				—				30				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES039	10/21/2013*	—				—				7.5				7.5				—				25				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES046	1/15/2014[d]	—				—				6.0				4.9				—				18				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES047	1/15/2014*[d]	—				—				5.3				4.3				—				17				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES057	1/28/2014[d]	—				—				8.8				5.4				—				18				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES058	1/28/2014*[d]	—				—				9.0				5.9				—				18				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES063	2/24/2014[d]	—				—				5.2				2.5				—				15				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES065	3/5/2014[d]	—				—				2.6				1.5				—				10				—				—				—				—				—				—				—			
RHMW02	ES066	3/5/2014*[d]	—				—				3.9				2.9				—				13				—				—				—				—				—				—				—			
RHMW02	ES070	3/10/2014[d]	—				—				3.7				2.5				—				11				—				—				—				—				—				—				—			
RHMW02	ES071	3/10/2014*[d]	—				—				4.2				3.0				—				12				—				—				—				—				—				—				—			
RHMW02	ES073	3/25/2014[d]	—				—				9.0				4.9				—				33				—				—				—				—				—				—				—			
RHMW02	ES074	3/25/2014*[d]	—				—				8.1				4.0				—				33				—				—				—				—				—				—				—			
RHMW02	ES078	4/7/2014[d]	—				—				6.2				4.4				—				25				—				—				—				—				—				—				—			
RHMW02	ES079	4/7/2014*[d]	—				—				9.0				7.6				—				31				—				—				—				—				—				—				—			
RHMW02	ES081	4/21/2014[d]	—				—				8.7				8.1				—				31				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES082	4/21/2014*[d]	—				—				8.3				7.7				—				32				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES092	5/27/2014[d]	—				—				9.3				2.7				—				34				—				—				—				—				—				—				—			
RHMW02	ES093	5/27/2014*[d]	—				—				7.8				1.5				—				28				—				—				—				—				—				—				—			
RHMW02	ES099	6/23/2014[d]	—				—				11				3.4				—				38				—				—				—				—				—				—				—			
RHMW02	ES100	6/23/2014*[d]	—				—				12				4.5				—				41				—				—				—				—				—				—				—			
RHMW02	ES104	7/21/2014	—				—				25				20				—				71				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES105	7/21/2014*	—				—				26				22				—				76				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES114	10/27/2014	—				—				59				43				—				140				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES115	10/27/2014	—				—				54				36				—				130				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES126	1/28/2015	—				—				34				7.6				—				90				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES127	1/28/2015*	—				—				25				2.7				—				63				—				—				—				—				< 0.50	U			—				—			
RHMW02	ES131	4/20/2015	—				—				31				15				—				39				—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW02	ES132	4/20/2015*	—				—				68				37				—				140				—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW02	ES144	6/25/2015	—				—				71				48				—				150				—				—				—				—				—				—				—			
RHMW02	ES146	7/20/2015	—				—				65				43				—				150				—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW02	ES147	7/20/2015*	—				—				66				43				—				160				—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW02	ERH012	10/20/2015	—				—				60				27				—				120				—				—				—				< 0.0040	U			< 0.20	UJ	h		—				—			
RHMW02	ERH013	10/20/2015*	—				—				57				24				—				88				—				—				—				< 0.0040	U			< 0.20	UJ	h		—				—			
RHMW02	ERH025	1/20/2016	—				—				48				7.9				—				120				—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW02	ERH040	4/20/2016	—				—				59				38				—				100				—				—				—				—				—				—				—			
RHMW02	ERH041	4/20/2016*	—				—				61				39				—				110				—				—				—				—				—				—				—			
RHMW02	ERH054	7/20/2016	—				—				36				13				—				67				—				—				—				—				—				—				—			
RHMW02	ERH055	7/20/2016*	—				—				33				12				—				62				—				—				—				—				—				—				—			
RHMW02	ERH091	10/19/2016	—				—				25				9.2				—				49				—				—				—				—				—				—				—			
RHMW02	ERH124	11/15/2016	—				—				29				12				—				58				—				—				—				—				—				—				—			
RHMW02	ERH144	12/13/2016	—				—				17				11				—				40				—				—				—				—				—				—				—			
RHMW02	ERH174	1/10/2017	—				—				25				11				—				69				—				—				—				—				—				—				—			
RHMW02	ERH174 (EPA split)	1/10/2017	< 0.5	U			0.2	J	s		33	J	c		11	J	c		12				77	J	v		—				110				72				—				—				—				< 0.2	U		
RHMW02	ERH216	2/7/2017	—				—				22				16				—				57				—				—				—				—				—				—				—			
RHMW02	ERH216 (EPA split)	2/7/2017	< 0.5	U			< 0.2	U			28	J	c v		—				18				—				—				100	J	s		64				—				—				—				< 0.2	U		
RHMW02	ERH265	3/7/2017	—				—				22				17				—				49				—				—				—				—				—				—				—			
RHMW02	ERH265 (EPA split)	3/7/2017	< 0.5	U			0.2	J			21	J	c s v		—				18				—				—				73				67				—				—				—				< 0.2	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW02	ES020	4/19/2011[d]	—				—				< 0.28	U			—				—				—			
RHMW02	ES021	4/19/2011*[d]	—				—				< 0.28	U			—				—				—			
RHMW02	ES037	7/19/2011	—				—				< 0.28	U			—				—				—			
RHMW02	ES038	7/19/2011*	—				—				< 0.28	U			—				—				—			
RHMW02	ES046	10/24/2011	—				—				< 0.28	U			—				—				—			
RHMW02	ES047	10/24/2011*	—				—				< 0.28	U			—				—				—			
RHMW02	ES061	1/26/2012	—				—				< 0.28	U			—				—				—			
RHMW02	ES071	4/16/2012	—				—				< 0.28	U			—				—				—			
RHMW02	ES072	4/16/2012*	—				—				< 0.28	U			—				—				—			
RHMW02	ES082	7/18/2012	—				—				< 0.28	U			—				—				—			
RHMW02	ES002	10/22/2012	—				—				< 0.50	U			—				—				—			
RHMW02	ES003	10/22/2012*	—				—				< 0.50	U			—				—				—			
RHMW02	ES011	1/28/2013	—				—				< 0.50	U			—				—				—			
RHMW02	ES012	1/28/2013*	—				—				< 0.50	U			—				—				—			
RHMW02	ES020	4/22/2013	—				—				< 0.50	U			—				—				—			
RHMW02	ES021	4/22/2013*	—				—				< 0.50	U			—				—				—			
RHMW02	ES029	7/22/2013	—				—				< 0.50	UJ	h		—				—				—			
RHMW02	ES030	7/22/2013*	—				—				< 0.50	UJ	h		—				—				—			
RHMW02	ES038	10/21/2013	—				—				< 0.50	U			—				—				—			
RHMW02	ES039	10/21/2013*	—				—				< 0.50	U			—				—				—			
RHMW02	ES046	1/15/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW02	ES047	1/15/2014*[d]	—				—				< 0.50	U			—				—				—			
RHMW02	ES057	1/28/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW02	ES058	1/28/2014*[d]	—				—				< 0.50	U			—				—				—			
RHMW02	ES063	2/24/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW02	ES065	3/5/2014[d]	—				—				—				—				—				—			
RHMW02	ES066	3/5/2014*[d]	—				—				—				—				—				—			
RHMW02	ES070	3/10/2014[d]	—				—				—				—				—				—			
RHMW02	ES071	3/10/2014*[d]	—				—				—				—				—				—			
RHMW02	ES073	3/25/2014[d]	—				—				—				—				—				—			
RHMW02	ES074	3/25/2014*[d]	—				—				—				—				—				—			
RHMW02	ES078	4/7/2014[d]	—				—				—				—				—				—			
RHMW02	ES079	4/7/2014*[d]	—				—				—				—				—				—			
RHMW02	ES081	4/21/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW02	ES082	4/21/2014*[d]	—				—				< 0.50	U			—				—				—			
RHMW02	ES092	5/27/2014[d]	—				—				—				—				—				—			
RHMW02	ES093	5/27/2014*[d]	—				—				—				—				—				—			
RHMW02	ES099	6/23/2014[d]	—				—				—				—				—				—			
RHMW02	ES100	6/23/2014*[d]	—				—				—				—				—				—			
RHMW02	ES104	7/21/2014	—				—				< 0.50	U			—				—				—			
RHMW02	ES105	7/21/2014*	—				—				< 0.50	U			—				—				—			
RHMW02	ES114	10/27/2014	—				—				< 0.50	UJ	c		—				—				—			
RHMW02	ES115	10/27/2014	—				—				< 0.50	UJ	c		—				—				—			
RHMW02	ES126	1/28/2015	—				—				< 0.50	U			—				—				—			
RHMW02	ES127	1/28/2015*	—				—				< 0.50	U			—				—				—			
RHMW02	ES131	4/20/2015	< 0.010	U			< 0.015	U			—				—				—				—			
RHMW02	ES132	4/20/2015*	< 0.010	U			< 0.015	U			—				—				—				—			
RHMW02	ES144	6/25/2015	—				—				—				—				—				—			
RHMW02	ES146	7/20/2015	—				< 0.015	U			—				—				—				—			
RHMW02	ES147	7/20/2015*	—				< 0.015	U			—				—				—				—			
RHMW02	ERH012	10/20/2015	—				< 0.015	U			—				—				—				—			
RHMW02	ERH013	10/20/2015*	—				< 0.015	U			—				—				—				—			
RHMW02	ERH025	1/20/2016	—				< 0.015	U			—				—				—				—			
RHMW02	ERH040	4/20/2016	—				—				—				—				—				—			
RHMW02	ERH041	4/20/2016*	—				—				—				—				—				—			
RHMW02	ERH054	7/20/2016	—				—				—				—				—				—			
RHMW02	ERH055	7/20/2016*	—				—				—				—				—				—			
RHMW02	ERH091	10/19/2016	—				—				—				—				< 4.00	U			< 80.0	UJ	h	
RHMW02	ERH124	11/15/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH144	12/13/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH174	1/10/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH174 (EPA split)	1/10/2017	—				—				—				< 0.2	U			< 2.5	U			—			
RHMW02	ERH216	2/7/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH216 (EPA split)	2/7/2017	—				—				—				< 0.2	U			< 2.5	U			—			
RHMW02	ERH265	3/7/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH265 (EPA split)	3/7/2017	—				—				—				< 0.2	U			< 2.5	U			—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC			
		Analytical Method	8015				8260				8015				8015				8015				8015			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	300				300				400				—				500				—			
		SSRBL	—				—				4500				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW02	ERH300	4/4/2017	—				**57**			W	**940**			O	—				**84**				—			
RHMW02	ERH334	5/1/2017	—				**94**			Y	**1,000**			Y	< 480	U	b	Y	< 40	U			< 40	U		
RHMW02	ERH354	6/5/2017	—				**65**			Y	**1,000**			O	**570**			O	< 40	U			< 40	U		
RHMW02	ERH391	7/6/2017	—				**33**			Y	**1,000**			O	**250**			O	< 40	U			< 40	U		
RHMW02	ERH415	10/23/2017	—				**43**			Y	**1300**	J	q	O	**230**	J	q e	Y	< 40	U			< 40	U		
RHMW02	ERH416	10/23/2017*	—				**76**			Y	**1,600**			O	**230**			Y	< 40	U			< 40	U		
RHMW02	ERH415 (EPA split)	10/23/2017	—				—				**3300**			F13	**550**			F3	< 320	U			< 320	U		
RHMW02	ERH547	3/13/2018	—				**47**			Y	**1,900**			O	**640**			O	< 40	U			< 40	U		
RHMW02	ERH548	3/13/2018*	—				**42**			Y	**1,800**			O	**460**			O	< 40	U			< 40	U		
RHMW02	ERH547 (EPA split)	3/13/2018	—				—				**2,900**			F13	**430**			F13	< 300	U			< 300	U		
RHMW02	ERH593	4/24/2018	—				**51**				**2,700**			O	**510**			O	< 40	U			< 40	U		
RHMW02	ERH594	4/24/2018*	—				**44**				**2,800**			O	**420**			O	< 40	U			< 40	U		
RHMW02	ERH639	7/24/2018	—				**78**				**2,100**			O	**580**			O	< 40	U			< 40	U		
RHMW02	ERH640	7/24/2018*	—				**78**				**1500**			O	**260**			O	< 40	U			< 40	U		
RHMW02	ERH639 (EPA split)	7/24/2018	—				—				**2,400**			F13	**570**			F13	< 300	U			< 300	U		
RHMW02	ERH683	10/23/2018	—				**81**			Y	**2,000**	J	h	O	**370**	J	h	O	< 40	UJ	h		< 40	UJ	h	
RHMW02	ERH684	10/23/2018*	—				**92**			Y	**2,100**	J	h	O	**430**	J	h	O	< 40	UJ	h		< 40	UJ	h	
RHMW02	ERH738	1/21/2019	—				**48**			W	**2,400**			O	**420**			O	< 40	U			< 40	U		
RHMW02	ERH739	1/21/2019*	—				**22**			W	**2,700**			O	**430**			O	< 40	U			< 40	U		
RHMW02	ERH790	4/24/2019	—				**48**				**2,300**			O	**430**			O	< 40	U			< 40	U		
RHMW02	ERH791	4/24/2019*	—				**57**				**2,200**			O	**440**			O	< 40	U			< 40	U		
RHMW02	ERH846	7/23/2019	—				**79**				**2,400**			O	**690**			O	**190**				< 40	U		
RHMW02	ERH847	7/23/2019*	—				< 18	U			**2,600**			O	**480**			O	**200**				< 40	U		
RHMW02	ERH912	10/22/2019	—				**81**				**1,700**			O	**520**			O	**200**				< 40	U		
RHMW02	ERH913	10/22/2019*	—				**74**				**1,800**			O	**430**			O	**190**				< 40	U		
RHMW02	ERH976	1/20/2020	—				**58**				**1500**	J	s	O	**280**			O	< 40	U			< 40	U		
RHMW02	ERH977	1/20/2020*	—				**49**				**1,700**			O	**360**			O	< 40	U			< 40	U		
RHMW02	ERH1044	4/22/2020	—				**49**				**1,700**	J	l	O	**350**			O	**260**	J	l		< 300.0	U		
RHMW02	ERH1045	4/22/2020*	—				**63**				**1500**	J	l	O	**310**	J		O	**290**	J	l		< 300.0	U		
RHMW02	ERH1110	7/20/2020	—				**46**				**1900**			O	**470**			O	**180**	J			< 300.0	U		
RHMW02	ERH1111	7/20/2020*	—				**95**				**1800**			O	**450**			O	**190**	J			< 300.0	U		
RHMW02	ERH1162	10/12/2020	—				**66**				**2000**			O	**360**			O	**270**	J			< 300.0	U		
RHMW02	ERH1163	10/12/2020*	—				**53**				**2000**			O	**560**			O	**290**	J			< 300.0	U		
RHMW02	ERH1219	1/25/2021	—				< 18	U			**1500**			O	**390**			O	**180**	J			< 300.0	U		
RHMW02	ERH1220	1/25/2021*	—				< 18	U			**1600**			O	**380**			O	**330**				< 300.0	U		
RHMW02	ERH1309	4/20/2021	—				**41**				**1400**			O	**390**			O	**160**	J			< 300.0	U		
RHMW02	ERH1310	4/20/2021*	—				**47**				**1300**			O	**320**			O	< 300.0	U			< 300.0	U		
RHMW02	ERH1489	7/27/2021	—				**46**				**2300**			O	**480**			O	**280**	J			**210**	J		
RHMW02	ERH1490	7/27/2021*	—				**54**				**2500**			O	**650**			O	**230**	J			**210**	J		
RHMW02	ERH1687	10/28/2021	—				**34**				**2500**				**540**				**210**	J			< 140	U		
RHMW02	ERH1688	10/28/2021*	—				**32**				**2800**				**620**				**240**	J			< 140	U		
RHMW02	ERH3169	4/13/2022	**0.14**	J			—				**4100**				**390**				**360**				<150	U		
RHMW02	RHMW02-WGN01LF-22Q3	07/20/2022	**25**				—				**3570**				**371**				**350**				<150	U		
RHMW02	RHMW02-WGN01LF-22Q4	12/8/2022	**27.2**				—				**3450**				**365**				**327**				<149	U		
RHMW02	RHMW02-WGN01LF-23Q1	1/30/2023	**17.6**	J			—				**1860**				**243**	J			**357**				<143	U		
RHMW02	RHMW02-WGN01LF-23Q2	4/12/2023	**12.5**	J			—				**1900**				**193**	J			**132**	J			<143	U		
RHMW02	RHMW02-WGN01LF-23Q3	7/7/2023	**14.4**	J+			—				**2170**				**149**	J			**218**	J			< 142	U		
RHMW03	RHMW03W01	9/20/2005[a]	< 0.50	U			—				**162**	J		Y	—				—				—			
RHMW03	RHMW03-GW02	7/10/2006[a]	< 50	U			—				**142**			Y	—				—				—			
RHMW03	RHMW03-GW06	12/5/2006[a]	< 50	U			—				< 100	U			—				—				—			
RHMW03	RHMW03-WG07	3/27/2007[a]	< 50	U			—				**95.7**	J			—				—				—			
RHMW03	RHMW03-WG08	6/12/2007[a]	< 50	U			—				**123**	J			—				—				—			
RHMW03	RHMW03-WG09	9/10/2007[a]	< 50	U			—				< 96	U			—				—				—			
RHMW03	RHMW03-WG10	1/15/2008[a]	< 10.0	U			—				**242**	J			—				—				—			
RHMW03	RHMW03-WG11	4/15/2008[a]	< 10.0	U			—				**190**	J			—				—				—			
RHMW03	RHMW03-WG12	7/29/2008[ad]	< 10.0	U			—				**199**	J			—				—				—			
RHMW03	RHMW03-WG13	10/22/2008[ad]	< 10.0	U			—				**244**	J			—				—				—			
RHMW03	RHMW03-WG14	2/4/2009[a]	**16.1**	J			—				**207**	J			—				—				—			
RHMW03	RHMW03-WG15	5/13/2009[a]	< 14.8	UJ	b t		—				< 161	U			—				—				—			
RHMW03	RHMW03-WG16	7/15/2009[a]	< 30.0	U			—				< 150	U			—				—				—			
RHMW03	RHMW03-WG17	10/14/2009[a]	< 30	U			—				< 163	U			—				—				—			
RHMW03	RHMW03-WG18	1/27/2010	< 60.0	U			—				< 330	U			—				—				—			
RHMW03	RHMW03-WG19	4/13/2010	< 60.0	U			—				< 320	U			—				—				—			
RHMW03	RHMW03-WG20	7/13/2010	< 60.0	U			—				< 324	U			—				—				—			
RHMW03	ES001	10/18/2010[d]	—				< 12.12	U			**330**			Y	—				—				—			
RHMW03	ES012	1/19/2011	—				< 12.12	U			< 80.8	U			—				—				—			
RHMW03	ES025	4/20/2011[d]	—				< 12.12	U			< 80.8	U			—				—				—			

		Analyte Class	Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Method	8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	5				5				30				30				40				40				20			
		SSRBL	750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW02	ERH300	4/4/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH334	5/1/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH354	6/5/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH391	7/6/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**1.4**	J		
RHMW02	ERH415	10/23/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.25**	J		
RHMW02	ERH416	10/23/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.26**	J		
RHMW02	ERH415 (EPA split)	10/23/2017	—				—				—				—				—				—				—			
RHMW02	ERH547	3/13/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.28**	J		
RHMW02	ERH548	3/13/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.37**	J		
RHMW02	ERH547 (EPA split)	3/13/2018	—				—				—				—				—				—				—			
RHMW02	ERH593	4/24/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH594	4/24/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH639	7/24/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH640	7/24/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH639 (EPA split)	7/24/2018	—				—				—				—				—				—				—			
RHMW02	ERH683	10/23/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH684	10/23/2018*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH738	1/21/2019	< 0.30	UJ	s		—				< 0.50	UJ	s		—				< 0.30	UJ	s		—				< 0.30	UJ	s	
RHMW02	ERH739	1/21/2019*	< 0.30	UJ	s		—				< 0.50	UJ	s		—				< 0.30	UJ	s		—				< 0.30	UJ	s	
RHMW02	ERH790	4/24/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH791	4/24/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH846	7/23/2019	< 0.30	UJ	s		—				< 0.50	UJ	s		—				< 0.30	UJ	s		—				< 0.30	UJ	s	
RHMW02	ERH847	7/23/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH912	10/22/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH913	10/22/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH976	1/20/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH977	1/20/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1044	4/22/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1045	4/22/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1110	7/20/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1111	7/20/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1162	10/12/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1163	10/12/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1219	1/25/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1220	1/25/2021*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1309	4/20/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1310	4/20/2021*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1489	7/27/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1490	7/27/2021*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW02	ERH1687	10/28/2021	< 0.2	U			—				**0.17**	J			—				< 0.2	U			—				**0.19**	J		
RHMW02	ERH1688	10/28/2021*	< 0.2	U			—				**0.16**	J			—				< 0.2	U			—				**0.19**	J		
RHMW02	ERH3169	4/13/2022	<0.2	U			—				**0.14**	J			—				<0.2	UT			—				**0.14**	J		
RHMW02	RHMW02-WGN01LF-22Q3	07/20/2022	<0.2	U			—				**0.11**	J			—				< 0.2	U			—				**0.21**	J		
RHMW02	RHMW02-WGN01LF-22Q4	12/8/2022	<0.2	U			—				**0.124**	J			—				< 0.2	U			—				**0.123**	J		
RHMW02	RHMW02-WGN01LF-23Q1	1/30/2023	<0.2	U			—				<0.2	U			—				< 0.2	U			—				<0.4	U		
RHMW02	RHMW02-WGN01LF-23Q2	4/12/2023	<0.1	U			—				<0.1	U			—				< 0.2	U			—				**0.0787**	J		
RHMW02	RHMW02-WGN01LF-23Q3	7/7/2023	< 0.1	U			—				**0.0862**	J			—				< 0.2	U			—				**0.051**	J		
RHMW03	RHMW03W01	9/20/2005[a]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW03	RHMW03-GW02	7/10/2006[a]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW03	RHMW03-GW06	12/5/2006[a]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW03	RHMW03-WG07	3/27/2007[a]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW03	RHMW03-WG08	6/12/2007[a]	< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW03	RHMW03-WG09	9/10/2007[a]	< 0.20	U			—				< 0.20	U			—				< 0.27	U			—				< 0.36	U		
RHMW03	RHMW03-WG10	1/15/2008[a]	< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW03	RHMW03-WG11	4/15/2008[a]	< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW03	RHMW03-WG12	7/29/2008[ad]	< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW03	RHMW03-WG13	10/22/2008[ad]	< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW03	RHMW03-WG14	2/4/2009[a]	< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW03	RHMW03-WG15	5/13/2009[a]	< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW03	RHMW03-WG16	7/15/2009[a]	< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW03	RHMW03-WG17	10/14/2009[a]	< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 1	U		
RHMW03	RHMW03-WG18	1/27/2010	< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW03	RHMW03-WG19	4/13/2010	< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW03	RHMW03-WG20	7/13/2010	< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW03	ES001	10/18/2010[d]	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW03	ES012	1/19/2011	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW03	ES025	4/20/2011[d]	< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW02	ERH300	4/4/2017	—				—				**20**				**17**				—				**52**				—				—				—				—				—				—				—			
RHMW02	ERH334	5/1/2017	—				—				**28**				**24**				—				**65**				—				—				—				—				—				—				—			
RHMW02	ERH354	6/5/2017	—				—				**25**				**16**				—				**62**				—				—				—				—				—				—				—			
RHMW02	ERH391	7/6/2017	—				—				**14**				**1.5**				—				**56**				—				—				—				—				—				—				—			
RHMW02	ERH415	10/23/2017	—				—				**14**	**J**	q		**7.4**	**J**	e q		—				**38**	**J**	q		—				—				—				—				< 0.50	U			—				—			
RHMW02	ERH416	10/23/2017*	—				—				**15**				**8.6**				—				**37**				—				—				—				—				< 0.50	U			—				—			
RHMW02	ERH415 (EPA split)	10/23/2017	—				—				**19**				**13**				—				**50**				—				—				—				—				—				—				—			
RHMW02	ERH547	3/13/2018	—				—				**20**				**13**				—				**53**				—				—				—				—				—				—				—			
RHMW02	ERH548	3/13/2018*	—				—				**25**				**18**				—				**65**				—				—				—				—				—				—				—			
RHMW02	ERH547 (EPA split)	3/13/2018	—				—				**23**				**15**				—				**50**				—				—				—				—				—				—				—			
RHMW02	ERH593	4/24/2018	—				—				**26**				**25**				—				**70**				—				—				—				—				—				—				—			
RHMW02	ERH594	4/24/2018*	—				—				**27**				**27**				—				**73**				—				—				—				—				—				—				—			
RHMW02	ERH639	7/24/2018	—				—				**16**				**10**				—				**38**				—				—				—				—				—				—				—			
RHMW02	ERH640	7/24/2018*	—				—				**19**				**14**				—				**48**				—				—				—				—				—				—				—			
RHMW02	ERH639 (EPA split)	7/24/2018	—				—				**19**				**12**				—				**47**				—				—				—				—				—				—				—			
RHMW02	ERH683	10/23/2018	—				—				**21**				**20**				—				**51**				—				—				—				—				—				—				—			
RHMW02	ERH684	10/23/2018*	—				—				**20**				**18**				—				**49**				—				—				—				—				—				—				—			
RHMW02	ERH738	1/21/2019	—				—				**11**				**8.8**				—				**32**				—				—				—				—				—				—				—			
RHMW02	ERH739	1/21/2019*	—				—				**9.6**				**7.2**				—				**26**				—				—				—				—				—				—				—			
RHMW02	ERH790	4/24/2019	—				—				**9.0**				**7.9**				—				**28**				—				—				—				—				—				—				—			
RHMW02	ERH791	4/24/2019*	—				—				**8.7**				**7.4**				—				**26**				—				—				—				—				—				—				—			
RHMW02	ERH846	7/23/2019	—				—				**12**				**11**				—				**33**				—				—				—				—				—				—				—			
RHMW02	ERH847	7/23/2019*	—				—				**12**				**11**				—				**34**				—				—				—				—				—				—				—			
RHMW02	ERH912	10/22/2019	—				—				**30**				**26**				—				**66**				—				—				—				—				—				—				—			
RHMW02	ERH913	10/22/2019*	—				—				**31**				**27**				—				**68**				—				—				—				—				—				—				—			
RHMW02	ERH976	1/20/2020	—				—				**23**				**23**				—				**52**				—				—				—				—				—				—				—			
RHMW02	ERH977	1/20/2020*	—				—				**24**				**23**				—				**57**				—				—				—				—				—				—				—			
RHMW02	ERH1044	4/22/2020	—				—				**13**				**12**				—				**33**				—				—				—				—				—				—				—			
RHMW02	ERH1045	4/22/2020*	—				—				**13**				**11**				—				**32**				—				—				—				—				—				—				—			
RHMW02	ERH1110	7/20/2020	—				—				**31**				**26**				—				**64**				—				—				—				—				—				—				—			
RHMW02	ERH1111	7/20/2020*	—				—				**29**				**30**				—				**73**				—				—				—				—				—				—				—			
RHMW02	ERH1162	10/12/2020	—				—				**45**	**J**	l		**45**				—				**98**				—				—				—				—				—				—				—			
RHMW02	ERH1163	10/12/2020*	—				—				**52**	**J**	l		**51**				—				**97**				—				—				—				—				—				—				—			
RHMW02	ERH1219	1/25/2021	—				—				**25**				**17**				—				**44**				—				—				—				—				—				—				—			
RHMW02	ERH1220	1/25/2021*	—				—				**23**				**16**				—				**41**				—				—				—				—				—				—				—			
RHMW02	ERH1309	4/20/2021	—				—				**25**				**18**				—				**69**				—				—				—				—				—				—				—			
RHMW02	ERH1310	4/20/2021*	—				—				**33**				**26**				—				**62**				—				—				—				—				—				—				—			
RHMW02	ERH1489	7/27/2021	—				—				**17**				**14**				—				**40**				—				—				—				—				—				—				—			
RHMW02	ERH1490	7/27/2021*	—				—				**17**				**14**				—				**42**				—				—				—				—				—				—				—			
RHMW02	ERH1687	10/28/2021	—				—				**32**				**35**				—				**67**				—				—				—				—				—				—				—			
RHMW02	ERH1688	10/28/2021*	—				—				**27**				**31**				—				**57**				—				—				—				—				—				—				—			
RHMW02	ERH3169	4/13/2022	—				—				**6.9**	**QJ1**			<0.076	UMQ			—				**0.38**	**MQ**			—				—				—				—				—				—				—			
RHMW02	RHMW02-WGN01LF-22Q3	07/20/2022	—				—				**9**				**0.42**	**J**			—				**0.61**				—				—				—				—				—				—				—			
RHMW02	RHMW02-WGN01LF-22Q4	12/8/2022	—				—				**7.2**				**4.8**								**14**				—				—				—				—				—				—				—			
RHMW02	RHMW02-WGN01LF-23Q1	1/30/2023	—				—				**4.7**				**3.5**	**J**							**11**	**J**			—				—				—				—				—				—				—			
RHMW02	RHMW02-WGN01LF-23Q2	4/12/2023	—				—				**2.5**				**1.5**								**5.7**				—				—				—				—				—				—				—			
RHMW02	RHMW02-WGN01LF-23Q3	7/7/2023	—				—				**0.65**	**J**			<0.4	U			—				**1.2**				—				—				—				—				—				—				—			
RHMW03	RHMW03W01	9/20/2005[a]	—				—				< 0.24	U			< 0.24	U			—				< 0.24	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW03	RHMW03-GW02	7/10/2006[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW03	RHMW03-GW06	12/5/2006[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW03	RHMW03-WG07	3/27/2007[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW03	RHMW03-WG08	6/12/2007[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW03	RHMW03-WG09	9/10/2007[a]	—				—				< 0.25	U			< 0.25	U			—				< 0.25	U			< 0.44	U			—				—				—				< 0.20	U			—				—			
RHMW03	RHMW03-WG10	1/15/2008[a]	—				—				< 0.0156	U			< 0.0156	U			—				< 0.0323	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW03	RHMW03-WG11	4/15/2008[a]	—				—				< 0.0268	UJ	b		< 0.0279	UJ	b		—				< 0.0341	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW03	RHMW03-WG12	7/29/2008[ad]	—				—				**0.0294**	**J**			< 0.0156	U			—				**0.0689**	**J**			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW03	RHMW03-WG13	10/22/2008[ad]	—				—				**0.0658**				**0.0937**				—				**0.219**				< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW03	RHMW03-WG14	2/4/2009[a]	—				—				< 0.0161	U			< 0.0161	U			—				< 0.0333	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW03	RHMW03-WG15	5/13/2009[a]	—				—				< 0.0152	U			< 0.0152	U			—				< 0.0313	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW03	RHMW03-WG16	7/15/2009[a]	—				—				< 0.0158	U			< 0.0158	U			—				< 0.0326	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW03	RHMW03-WG17	10/14/2009[a]	—				—				< 0.0169	U			< 0.0169	U			—				< 0.0348	U			< 0.62	U			—				—				—				< 0.31	U			—				—			
RHMW03	RHMW03-WG18	1/27/2010	—				—				< 0.0322	U			< 0.0322	U			—				< 0.0666	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW03	RHMW03-WG19	4/13/2010	—				—				< 0.0322	U			< 0.0322	U			—				< 0.0666	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW03	RHMW03-WG20	7/13/2010	—				—				< 0.0322	U			< 0.0322	U			—				< 0.0666	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW03	ES001	10/18/2010[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW03	ES012	1/19/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW03	ES025	4/20/2011[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW02	ERH300	4/4/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH334	5/1/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH354	6/5/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH391	7/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH415	10/23/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW02	ERH416	10/23/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW02	ERH415 (EPA split)	10/23/2017	—				—				—				—				—				—			
RHMW02	ERH547	3/13/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH548	3/13/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH547 (EPA split)	3/13/2018	—				—				—				—				—				—			
RHMW02	ERH593	4/24/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH594	4/24/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH639	7/24/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH640	7/24/2018*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH639 (EPA split)	7/24/2018	—				—				—				—				—				—			
RHMW02	ERH683	10/23/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH684	10/23/2018*	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH738	1/21/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH739	1/21/2019*	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH790	4/24/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH791	4/24/2019*	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH846	7/23/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH847	7/23/2019*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH912	10/22/2019	—				—				—				—				< 4.00	UJ	I		< 80.0	U		
RHMW02	ERH913	10/22/2019*	—				—				—				—				< 4.00	UJ	I		< 80.0	U		
RHMW02	ERH976	1/20/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH977	1/20/2020*	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH1044	4/22/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1045	4/22/2020*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1110	7/20/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH1111	7/20/2020*	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW02	ERH1162	10/12/2020	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW02	ERH1163	10/12/2020*	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW02	ERH1219	1/25/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1220	1/25/2021*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1309	4/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1310	4/20/2021*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1489	7/27/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1490	7/27/2021*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW02	ERH1687	10/28/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW02	ERH1688	10/28/2021*	—				—				—				—				< 4.8	U			< 80	U		
RHMW02	ERH3169	4/13/2022	—				—				—				—				<0.57	UM			<80	U		
RHMW02	RHMW02-WGN01LF-22Q3	07/20/2022	—				—				—				—				<0.57	U			<80	U		
RHMW02	RHMW02-WGN01LF-22Q4	12/8/2022	—				—				—				—				<0.57	U			<80	U		
RHMW02	RHMW02-WGN01LF-23Q1	1/30/2023	—				—				—				—				<0.57	U			<80	U		
RHMW02	RHMW02-WGN01LF-23Q2	4/12/2023	—				—				—				—				**0.21**	**J**			<80	U		
RHMW02	RHMW02-WGN01LF-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW03	RHMW03W01	9/20/2005[a]	—				—				< 0.50	U			—				—				—			
RHMW03	RHMW03-GW02	7/10/2006[a]	—				—				< 0.50	U			—				—				—			
RHMW03	RHMW03-GW06	12/5/2006[a]	—				—				< 0.50	U			—				—				—			
RHMW03	RHMW03-WG07	3/27/2007[a]	—				—				< 0.50	U			—				—				—			
RHMW03	RHMW03-WG08	6/12/2007[a]	—				—				< 0.50	U			—				—				—			
RHMW03	RHMW03-WG09	9/10/2007[a]	—				—				< 0.20	U			—				—				—			
RHMW03	RHMW03-WG10	1/15/2008[a]	—				—				< 0.150	U			—				—				—			
RHMW03	RHMW03-WG11	4/15/2008[a]	—				—				< 0.150	U			—				—				—			
RHMW03	RHMW03-WG12	7/29/2008[ad]	—				—				< 0.150	U			—				—				—			
RHMW03	RHMW03-WG13	10/22/2008[ad]	—				—				< 0.150	U			—				—				—			
RHMW03	RHMW03-WG14	2/4/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW03	RHMW03-WG15	5/13/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW03	RHMW03-WG16	7/15/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW03	RHMW03-WG17	10/14/2009[a]	—				—				< 0.15	U			—				—				—			
RHMW03	RHMW03-WG18	1/27/2010	—				—				< 0.300	U			—				—				—			
RHMW03	RHMW03-WG19	4/13/2010	—				—				< 0.300	U			—				—				—			
RHMW03	RHMW03-WG20	7/13/2010	—				—				< 0.300	U			—				—				—			
RHMW03	ES001	10/18/2010[d]	—				—				< 0.28	U			—				—				—			
RHMW03	ES012	1/19/2011	—				—				< 0.28	U			—				—				—			
RHMW03	ES025	4/20/2011[d]	—				—				< 0.28	U			—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC				COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015				8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup				Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC				71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	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			
		DOH EAL	300				300				400				—				500				—				5				5				30				30				40				40				20			
		SSRBL	—				—				4500				—				—				—				750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW03	ES035	7/19/2011	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW03	ES049	10/24/2011	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW03	ES060	1/26/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW03	ES073	4/16/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW03	ES081	7/18/2012	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW03	ES004	10/22/2012	—				< 30	U			**45**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				**0.54**	**J**			—				< 1.0	U		
RHMW03	ES013	1/28/2013	—				< 30	U			**59**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES022	4/22/2013	—				< 30	U			**69**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES031	7/22/2013	—				< 30	UJ	h		**48**	**J**		Y	—				—				—				< 0.50	UJ	h		—				< 0.50	UJ	h		—				< 0.50	UJ	h		—				< 1.0	UJ	h	
RHMW03	ES040	10/21/2013	—				< 23	UJ	b		**54**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES059	1/28/2014[d]	—				< 20	UJ	b		**74**				—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES083	4/21/2014[d]	—				< 30	U			**39**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES106	7/22/2014	—				< 30	U			**37**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES116	10/27/2014	—				< 30	U			**80**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES123	1/28/2015	—				< 30	U			**39**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW03	ES133	4/20/2015	< 25	U			—				**100**			Y	—				**110**			Y	—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW03	ES148	7/20/2015	< 25	U			—				**130**			Y	—				**150**			Y	—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW03	ERH014	10/20/2015	< 25	U			—				**130**			Y	—				< 160	UJ	b	Y	—				< 0.10	UJ	h		—				< 0.10	UJ	h		—				< 0.4	UJ	h t		—				< 0.20	UJ	h	
RHMW03	ERH026	1/20/2016	< 25	U			—				**150**			Y	—				< 160	UJ	b	Y	—				< 0.10	U			—				< 0.10	U			—				< 0.14	UJ	t		—				< 0.20	U		
RHMW03	ERH042	4/20/2016	< 25	U			—				< 95	U	f	Y	—				< 170	U	b f	Y	—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW03	ERH056	7/20/2016	< 25	U			—				< 70	U	f	Y	—				< 110	U	b f		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW03	ERH093	10/19/2016	—				< 18	U			**65**			Y	< 25	U			**59**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH125	11/15/2016	—				< 18	U			**51**			Y	—				**42**				—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH152	12/14/2016	—				< 18	U			**56**			Y	—				**49**				—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH181	1/12/2017	—				< 18	U			**51**			Y	—				**46**				—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH181 (EPA split)	1/12/2017	< 25	UJ	c		—				**190**				—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW03	ERH231	2/8/2017	—				< 18	U			**67**			Y	—				**71**				—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH231 (EPA split)	2/8/2017	< 25	UJ	c		—				**170**				—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW03	ERH268	3/7/2017	—				< 18	U			**55**			Y	—				**41**				—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH268 (EPA split)	3/7/2017	< 25	UJ	c		—				**170**				—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW03	ERH303	4/4/2017	—				< 18	U			**47**			Y	—				**47**				—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH336	5/1/2017	—				< 18	U			**50**			Y	< 25	U			**46**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH356	6/6/2017	—				< 18	U			**46**			Y	**50**			Y	**36**	**J**			**34**	**J**			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH393	7/6/2017	—				< 18	U			**49**			Y	< 25	U			**46**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH418	10/23/2017	—				< 18	U			**160**			Y	< 25	U			**160**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH419	10/23/2017*	—				—				**210**			O	< 25	U			**200**				< 40	U			—				—				—				—				—				—				—			
RHMW03	ERH418 (EPA split)	10/23/2017	—				—				< 180	U	b	F6	< 75	U			< 300	U			< 300	U			—				—				—				—				—				—				—			
RHMW03	ERH550	3/12/2018	—				< 18	U			**190**				< 25	U			**180**			Y	< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH550 (EPA split)	3/12/2018	—				—				**150**			F13	< 75	U			< 300	U			< 300	U			—				—				—				—				—				—				—			
RHMW03	ERH596	4/25/2018	—				< 18	U			**160**			Y	< 25	U			**110**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH642	7/25/2018	—				< 18	U			**300**			Y	< 25	U			**140**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH642 (EPA split)	7/25/2018	—				—				**180**			F13	< 75	U			< 300	U			< 300	U			—				—				—				—				—				—				—			
RHMW03	ERH686	10/23/2018	—				< 18	U			**220**	**J**	h	Y	< 25	UJ	h		**190**	**J**	h		< 40	UJ	h		< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH741	1/22/2019	—				< 18	U			**380**			Y	< 25	U			**310**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH793	4/24/2019	—				< 18	U			**300**			Y	< 25	U			**190**			Y	< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH849	7/22/2019	—				< 18	U			**300**			Y	< 25	U			**270**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH915	10/21/2019	—				< 18	U			**150**			Y	< 25	U			**230**				< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH979	1/20/2020	—				< 18	U			**260**			Y	< 25	U			**250**			Y	< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH1047	4/20/2020	—				< 18	U			**220**	**J**		O	< 300.0	U			**240**	**J**	l		< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH1113	7/22/2020	—				< 18	U			**200**	**J**		O	< 300.0	U			**210**	**J**			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH1165	10/12/2020	—				< 18	U			**220**	**J**			< 300.0	U			**260**	**J**			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH1222	1/25/2021	—				< 18	U			**180**	**J**			< 300.0	U			**220**	**J**			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH1312	4/20/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW03	ERH1492	7/26/2021	—				< 18	U			**180**	**J**			< 300.0	U			**250**	**J**			< 300.0	U			< 0.30	UJ			—				< 0.50	UJ			—				< 0.30	UJ			—				< 0.30	UJ		
RHMW03	ERH1690	10/28/2021	—				< 8.7	U			**130**	**J**			< 120	U			**230**	**J**			< 140	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW03	ERH3175	4/14/2022	<8.7	U			—				**87**	**J**			<120	U			**220**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	UT			—				< 0.2	U		
RHMW03	RHMW03-WGN01LF-22Q3	07/20/2022	<8.7	U			—				**124**	**J**			<119	U			**255**	**J**			<148	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW03	RHMW03-WGN01LF-22Q4	12/16/2022	**2.54**	**J**			—				**89**	**J**			<149	U			**183**	**J**			<149	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW03	RHMW03-WGN01LF-23Q1	1/30/2023	<8.5	U			—				**110**	**J**			<114	U			**220**	**J**			<143	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW03	RHMW03-WGN01LF-23Q2	4/12/2023	<8.5	U			—				**74**	**J**			<113	U			**150**	**J**			<141	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW03	RHMW03-WGN01LF-23Q3	7/5/2023	<8.5	U			—				**63**	**J**			<141	U			**138**	**J**			<141	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW04	RHMW04W01	9/19/2005[a]	< 50.0	U			—				**338**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW04	RHMW04-GW02	7/10/2006[a]	< 50.0	U			—				< 100	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 0.50	U		
RHMW04	RHMW04-WG-01	8/4/2009[ad]	< 30.0	U			—				< 157	U			—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW04	RHMWA01-WG-01	8/4/2009*[ad]	< 30.0	U			—				< 161	U			—				—				—				**0.250**	**J**			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW04	RHMW04-WG-02	10/13/2009[abd]	< 30.0	U			—				< 169	U			—				—				—				< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 0.62	U		
RHMW04	RHMWA01-WG-02	10/13/2009*[abd]	< 30.0	U			—				< 174	U			—				—				—				< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 0.62	U		
RHMW04	RHMW04-WG-03	1/26/2010[d]	< 60.0	U			—				< 334	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW03	ES035	7/19/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW03	ES049	10/24/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW03	ES060	1/26/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW03	ES073	4/16/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW03	ES081	7/18/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW03	ES004	10/22/2012	—				—				< 0.050	U			< 0.050	U			—				**0.029**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES013	1/28/2013	—				—				**0.10**	**J**			**0.069**	**J**			—				**0.32**				—				—				—				—				< 0.50	U			—				—			
RHMW03	ES022	4/22/2013	—				—				< 0.053	U			< 0.053	U			—				< 0.053	U			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES031	7/22/2013	—				—				< 0.050	U			< 0.050	U			—				**0.064**	**J**			—				—				—				—				< 0.50	UJ	h		—				—			
RHMW03	ES040	10/21/2013	—				—				< 0.050	U			< 0.050	U			—				< 0.050	U			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES059	1/28/2014[d]	—				—				< 0.050	U			< 0.050	U			—				**0.15**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES083	4/21/2014[d]	—				—				< 0.049	U			< 0.049	U			—				**0.11**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES106	7/22/2014	—				—				< 0.047	U			< 0.047	U			—				< 0.047	U			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES116	10/27/2014	—				—				< 0.11	U			< 0.054	U			—				< 0.054	U			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES123	1/28/2015	—				—				< 0.097	U			< 0.048	U			—				< 0.048	U			—				—				—				—				< 0.50	U			—				—			
RHMW03	ES133	4/20/2015	—				—				**0.015**	**J**			**0.0083**	**J**			—				**0.035**				—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW03	ES148	7/20/2015	—				—				< 0.0052	U			< 0.0052	U			—				< 0.0052	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW03	ERH014	10/20/2015	—				—				**0.0039**	**J**			< 0.0034	UJ	b		—				< 0.0094	UJ	b		—				—				—				< 0.0040	U			< 0.20	UJ	h		—				—			
RHMW03	ERH026	1/20/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW03	ERH042	4/20/2016	—				—				< 0.0084	U	f		< 0.0075	U	f		—				< 0.0050	U			—				—				—				—				—				—				—			
RHMW03	ERH056	7/20/2016	—				—				**0.0073**	**J**			**0.0040**	**J**			—				< 0.025	U	f		—				—				—				—				—				—				—			
RHMW03	ERH093	10/19/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH125	11/15/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH152	12/14/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH181	1/12/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH181 (EPA split)	1/12/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW03	ERH231	2/8/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH231 (EPA split)	2/8/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW03	ERH268	3/7/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH268 (EPA split)	3/7/2017	< 0.5	U			< 0.2	U			< 0.027	UJ	c		< 0.027	UJ	c		< 0.5	U			< 0.027	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW03	ERH303	4/4/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH336	5/1/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH356	6/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH393	7/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH418	10/23/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				< 0.50	U			—				—			
RHMW03	ERH419	10/23/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH418 (EPA split)	10/23/2017	—				—				< 0.025	U			< 0.025	U			—				< 0.025	U			—				—				—				—				—				—				—			
RHMW03	ERH550	3/12/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH550 (EPA split)	3/12/2018	—				—				< 0.025	U			< 0.025	U			—				< 0.025	U			—				—				—				—				—				—				—			
RHMW03	ERH596	4/25/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH642	7/25/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH642 (EPA split)	7/25/2018	—				—				< 0.027	U			< 0.027	U			—				< 0.027	U			—				—				—				—				—				—				—			
RHMW03	ERH686	10/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH741	1/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH793	4/24/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH849	7/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH915	10/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH979	1/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH1047	4/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH1113	7/22/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH1165	10/12/2020	—				—				< 0.10	UJ	l		< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH1222	1/25/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH1312	4/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH1492	7/26/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW03	ERH1690	10/28/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW03	ERH3175	4/14/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW03	RHMW03-WGN01LF-22Q3	07/20/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW03	RHMW03-WGN01LF-22Q4	12/16/2022	—				—				<0.031	U			<0.078	U			—				<0.078	U			—				—				—				—				—				—				—			
RHMW03	RHMW03-WGN01LF-23Q1	1/30/2023	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW03	RHMW03-WGN01LF-23Q2	4/12/2023	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW03	RHMW03-WGN01LF-23Q3	7/5/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.0098	U			—				—				—			
RHMW04	RHMW04W01	9/19/2005[a]	—				—				< 0.28	U			< 0.28	U			—				< 0.28	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW04	RHMW04-GW02	7/10/2006[a]	—				—				< 0.26	U			< 0.26	U			—				< 0.26	U			< 1.0	U			—				—				—				< 0.50	U			—				—			
RHMW04	RHMW04-WG-01	8/4/2009[ad]	—				—				< 0.0162	U			< 0.0162	U			—				< 0.0335	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW04	RHMWA01-WG-01	8/4/2009[*ad]	—				—				< 0.0167	U			< 0.0167	U			—				< 0.0344	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW04	RHMW04-WG-02	10/13/2009[abd]	—				—				< 0.0172	U			< 0.0172	U			—				< 0.0356	U			< 0.62	U			—				—				—				< 0.31	U			—				—			
RHMW04	RHMWA01-WG-02	10/13/2009[*abd]	—				—				< 0.0169	U			< 0.0169	U			—				< 0.0348	U			< 0.62	U			—				—				—				< 0.31	U			—				—			
RHMW04	RHMW04-WG-03	1/26/2010[d]	—				—				< 0.0326	U			< 0.0326	U			—				< 0.0674	U			< 1.24	U			—				—				—				< 0.620	U			—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW03	ES035	7/19/2011	—				—				< 0.28	U			—				—				—			
RHMW03	ES049	10/24/2011	—				—				< 0.28	U			—				—				—			
RHMW03	ES060	1/26/2012	—				—				< 0.28	U			—				—				—			
RHMW03	ES073	4/16/2012	—				—				< 0.28	U			—				—				—			
RHMW03	ES081	7/18/2012	—				—				< 0.28	U			—				—				—			
RHMW03	ES004	10/22/2012	—				—				< 0.50	U			—				—				—			
RHMW03	ES013	1/28/2013	—				—				< 0.50	U			—				—				—			
RHMW03	ES022	4/22/2013	—				—				< 0.50	U			—				—				—			
RHMW03	ES031	7/22/2013	—				—				< 0.50	UJ	h		—				—				—			
RHMW03	ES040	10/21/2013	—				—				< 0.50	U			—				—				—			
RHMW03	ES059	1/28/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW03	ES083	4/21/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW03	ES106	7/22/2014	—				—				< 0.50	U			—				—				—			
RHMW03	ES116	10/27/2014	—				—				< 0.50	UJ	c		—				—				—			
RHMW03	ES123	1/28/2015	—				—				< 0.50	U			—				—				—			
RHMW03	ES133	4/20/2015	< 0.010	U			< 0.015	U			—				—				—				—			
RHMW03	ES148	7/20/2015	—				< 0.015	U			—				—				—				—			
RHMW03	ERH014	10/20/2015	—				< 0.015	U			—				—				—				—			
RHMW03	ERH026	1/20/2016	—				< 0.015	U			—				—				—				—			
RHMW03	ERH042	4/20/2016	—				—				—				—				—				—			
RHMW03	ERH056	7/20/2016	—				—				—				—				—				—			
RHMW03	ERH093	10/19/2016	—				—				—				—				< 4.00	U			< 80.0	UJ	h	
RHMW03	ERH125	11/15/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH152	12/14/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH181	1/12/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH181 (EPA split)	1/12/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW03	ERH231	2/8/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH231 (EPA split)	2/8/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW03	ERH268	3/7/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH268 (EPA split)	3/7/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW03	ERH303	4/4/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH336	5/1/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH356	6/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH393	7/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH418	10/23/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW03	ERH419	10/23/2017*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH418 (EPA split)	10/23/2017	—				—				—				—				—				—			
RHMW03	ERH550	3/12/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH550 (EPA split)	3/12/2018	—				—				—				—				—				—			
RHMW03	ERH596	4/25/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH642	7/25/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH642 (EPA split)	7/25/2018	—				—				—				—				—				—			
RHMW03	ERH686	10/23/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW03	ERH741	1/22/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW03	ERH793	4/24/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW03	ERH849	7/22/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH915	10/21/2019	—				—				—				—				< 4.00	UJ	l		< 80.0	U		
RHMW03	ERH979	1/20/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW03	ERH1047	4/20/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH1113	7/22/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW03	ERH1165	10/12/2020	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW03	ERH1222	1/25/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH1312	4/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH1492	7/26/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW03	ERH1690	10/28/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW03	ERH3175	4/14/2022	—				—				—				—				<0.57	UM			<80	U		
RHMW03	RHMW03-WGN01LF-22Q3	07/20/2022	—				—				—				—				<0.57	U			<80	U		
RHMW03	RHMW03-WGN01LF-22Q4	12/16/2022	—				—				—				—				<0.58	U			<80	U		
RHMW03	RHMW03-WGN01LF-23Q1	1/30/2023	—				—				—				—				<0.57	U			<80	U		
RHMW03	RHMW03-WGN01LF-23Q2	4/12/2023	—				—				—				—				<0.57	U			<80	U		
RHMW03	RHMW03-WGN01LF-23Q3	7/5/2023	—				—				—				—				<2	U			<80	UJ		
RHMW04	RHMW04W01	9/19/2005[a]	—				—				< 0.50	U			—				—				—			
RHMW04	RHMW04-GW02	7/10/2006[a]	—				—				< 0.50	U			—				—				—			
RHMW04	RHMW04-WG-01	8/4/2009[ad]	—				—				< 0.150	U			—				—				—			
RHMW04	RHMWA01-WG-01	8/4/2009*[ad]	—				—				< 0.150	U			—				—				—			
RHMW04	RHMW04-WG-02	10/13/2009[abd]	—				—				< 0.15	U			—				—				—			
RHMW04	RHMWA01-WG-02	10/13/2009*[abd]	—				—				< 0.15	U			—				—				—			
RHMW04	RHMW04-WG-03	1/26/2010[d]	—				—				< 0.300	U			—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC				COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Method	8015				8260				8015				8015				8015				8015				8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup				Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC				71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	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			
		DOH EAL	300				300				400				—				500				—				5				5				30				30				40				40				20			
		SSRBL	—				—				4500				—				—				—				750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW04	RHMWA01-WG-03	1/26/2010*[d]	< 60.0	U			—				< 330	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW04	RHMW04-WG-04	4/26/2010[d]	< 60.0	U			—				< 348	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW04	RHMWA01-WG-04	4/26/2010*[d]	< 60.0	U			—				< 352	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW04	ES112	7/23/2014	—				< 30	U			**17**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW04	ES119	10/29/2014	—				< 30	U			< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW04	ES129	1/29/2015	—				< 30	U			**10**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW04	ES139	4/22/2015	< 25	UJ	s		—				< 21	U			—				< 28	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW04	ES156	8/20/2015	< 25	U			—				< 24	UJ	b		—				< 40	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW04	ERH006	10/19/2015	< 25	U			—				< 22	UJ	b		—				< 53	UJ	b		—				**0.08**	**J**	h		—				< 0.10	UJ	h		—				< 0.42	UJ	h t		—				< 0.20	UJ	h	
RHMW04	ERH019	1/19/2016	< 25	U			—				< 36	UJ	b		—				< 52	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW04	ERH020	1/19/2016	< 25	U			—				< 29	UJ	b		—				< 53	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.11	UJ	t		—				< 0.20	U		
RHMW04	ERH034	4/19/2016	< 25	U			—				< 20	U	b f		—				< 33	U	b f		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW04	ERH048	7/19/2016	< 25	U			—				< 23	U	f		—				< 54	U	b f		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW04	ERH096	10/25/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH128	11/14/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH138	12/13/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH166	1/9/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH166 (EPA split)	1/9/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW04	ERH208	2/6/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH208 (EPA split)	2/6/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW04	ERH260	3/6/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH260 (EPA split)	3/6/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW04	ERH295	4/3/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH381	7/5/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH421	10/24/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH552	3/14/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH598	4/25/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH644	7/26/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH688	10/24/2018	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH743	1/21/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				**0.18**	**J**		
RHMW04	ERH795	4/22/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH851	7/23/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH917	10/21/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH981	1/21/2020	—				< 18	U			**120**			Z	< 25	U			< 40	U			< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH1049	4/22/2020	—				< 18	U			**240**	**J**	l	Z	—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH1115	7/22/2020	—				< 18	U			< 300.0	U			—				**160**	**J**		Z	< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH1167	10/12/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH1224	1/25/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH1314	4/20/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH1494	7/21/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW04	ERH1692	10/20/2021	—				< 8.7	U			**840**				< 110	U			**570**				< 140	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW04	ERH1740	4/11/2022	<8.7	U			—				<150	U			—				<150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW04	RHMW04-WGN01LF-22Q3	07/28/2022	<8.7	U			—				<152	U			—				<152	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW04	RHMW04-WGN01LF-22Q4	12/14/2022	<8.7	U			—				<149	U			<149	U			**91.2**	**J**			<149	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW04	RHMW04-WGN01LF-23Q1	2/2/2023	<8.5	U			—				<143	U			—				<143	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW04	RHMW04-WGN01LF-23Q2	4/19/2023	<8.5	U			—				<143	U			—				<143	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW04	RHMW04-WGN01LF-23Q3	7/5/2023	<8.5	U			—				<143	U			—				<143	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW05	RHMW05-WG15	5/13/2009[a]	< 13.2	UJ	b t		—				**200**	**J**		Z	—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW05	RHMW05-WG16	7/15/2009[a]	< 30.0	U			—				**491**			Z	—				—				—				< 0.120	U			—				< 0.310	U			—				< 0.310	U			—				< 0.620	U		
RHMW05	RHMW05-WG17	10/13/2009[a]	< 30.0	U			—				**673**			Z	—				—				—				< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 1	U		
RHMW05	RHMW05-WG18	1/26/2010	< 60.0	U			—				**2,060**			Z	—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW05	RHMW05-WG19	4/13/2010	< 60.0	U			—				< 300	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW05	RHMW05-WG20	7/13/2010	< 60.0	U			—				< 320	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
RHMW05	ES005	10/20/2010	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES013	1/19/2011	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES024	4/20/2011[d]	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES039	7/19/2011	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES051	10/25/2011	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES063	2/1/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES070	4/16/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES079	7/17/2012	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES080	7/17/2012*	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
RHMW05	ES005	10/22/2012	—				< 15	UJ	b		**17**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				**0.31**	**J**			—				< 1.0	U		
RHMW05	ES015	1/29/2013	—				< 30	U			**62**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES024	4/23/2013	—				< 21	UJ	t		**27**	**J**			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES033	7/23/2013	—				< 30	U			< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES042	10/22/2013	—				< 17	UJ	b		< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES049	1/16/2014[d]	—				—				< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES061	1/29/2014[d]	—				< 23	UJ	b		**16**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW04	RHMWA01-WG-03	1/26/2010*[d]	—				—				< 0.0338	U			< 0.0338	U			—				< 0.0696	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW04	RHMW04-WG-04	4/26/2010[d]	—				—				< 0.0352	U			< 0.0352	U			—				< 0.0730	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW04	RHMWA01-WG-04	4/26/2010*[d]	—				—				< 0.0352	U			< 0.0352	U			—				< 0.0730	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW04	ES112	7/23/2014	—				—				< 0.052	U			< 0.052	U			—				< 0.052	U			—				—				—				—				< 0.50	U			—				—			
RHMW04	ES119	10/29/2014	—				—				< 0.099	U			< 0.050	U			—				< 0.050	U			—				—				—				—				< 0.50	U			—				—			
RHMW04	ES129	1/29/2015	—				—				< 0.10	U			< 0.052	U			—				< 0.052	U			—				—				—				—				< 0.50	U			—				—			
RHMW04	ES139	4/22/2015	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	UJ	h		< 0.20	U			—				—			
RHMW04	ES156	8/20/2015	—				—				< 0.0050	U			**0.0059**	**J**			—				**0.0075**	**J**			—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW04	ERH006	10/19/2015	—				—				**0.0043**	**J**			< 0.0047	UJ	b		—				< 0.0051	UJ	b		—				—				—				< 0.0040	U			< 0.20	UJ	h		—				—			
RHMW04	ERH019	1/19/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW04	ERH020	1/19/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			
RHMW04	ERH034	4/19/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				—				—				—				—			
RHMW04	ERH048	7/19/2016	—				—				**0.0070**	**J**			**0.0068**	**J**			—				**0.18**				—				—				—				—				—				—				—			
RHMW04	ERH096	10/25/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH128	11/14/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH138	12/13/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH166	1/9/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH166 (EPA split)	1/9/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW04	ERH208	2/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH208 (EPA split)	2/6/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW04	ERH260	3/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH260 (EPA split)	3/6/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW04	ERH295	4/3/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH381	7/5/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH421	10/24/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH552	3/14/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH598	4/25/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH644	7/26/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH688	10/24/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH743	1/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH795	4/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH851	7/23/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH917	10/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH981	1/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH1049	4/22/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH1115	7/22/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH1167	10/12/2020	—				—				< 0.10	UJ	l		< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH1224	1/25/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH1314	4/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH1494	7/21/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW04	ERH1692	10/20/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW04	ERH1740	4/11/2022	—				—				<0.030	U			<0.076	UM			—				<0.076	U			—				—				—				—				—				—				—			
RHMW04	RHMW04-WGN01LF-22Q3	07/28/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW04	RHMW04-WGN01LF-22Q4	12/14/2022	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW04	RHMW04-WGN01LF-23Q1	2/2/2023	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW04	RHMW04-WGN01LF-23Q2	4/19/2023	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW04	RHMW04-WGN01LF-23Q3	7/5/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW05	RHMW05-WG15	5/13/2009[a]	—				—				< 0.0158	U			< 0.0158	U			—				< 0.0326	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW05	RHMW05-WG16	7/15/2009[a]	—				—				< 0.0165	U			< 0.0165	U			—				< 0.0341	U			< 0.620	U			—				—				—				< 0.310	U			—				—			
RHMW05	RHMW05-WG17	10/13/2009[a]	—				—				< 0.017	U			< 0.017	U			—				< 0.0352	U			< 0.62	U			—				—				—				< 0.31	U			—				—			
RHMW05	RHMW05-WG18	1/26/2010	—				—				**0.0207**	**J**			**0.0246**	**J**			—				< 0.0712	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW05	RHMW05-WG19	4/13/2010	—				—				**0.0335**	**J**			< 0.0326	U			—				**0.0752**	**J**			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW05	RHMW05-WG20	7/13/2010	—				—				< 0.0316	U			< 0.0316	U			—				**0.0643**	**J**			< 1.24	U			—				—				—				< 0.620	U			—				—			
RHMW05	ES005	10/20/2010	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES013	1/19/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES024	4/20/2011[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES039	7/19/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES051	10/25/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES063	2/1/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES070	4/16/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES079	7/17/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES080	7/17/2012*	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
RHMW05	ES005	10/22/2012	—				—				< 0.050	U			< 0.050	U			—				**0.038**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW05	ES015	1/29/2013	—				—				< 0.050	U			< 0.050	U			—				**0.075**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW05	ES024	4/23/2013	—				—				< 0.048	U			< 0.048	U			—				**0.033**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW05	ES033	7/23/2013	—				—				< 0.051	U			< 0.051	U			—				**0.033**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW05	ES042	10/22/2013	—				—				< 0.051	U			< 0.051	U			—				**0.17**	**J**			—				—				—				—				< 0.50	U			—				—			
RHMW05	ES049	1/16/2014[d]	—				—				< 0.050	U			< 0.050	U			—				< 0.050	U			—				—				—				—				< 0.50	U			—				—			
RHMW05	ES061	1/29/2014[d]	—				—				< 0.050	U			< 0.050	U			—				**0.064**	**J**			—				—				—				—				< 0.50	U			—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW04	RHMWA01-WG-03	1/26/2010*[d]	—				—				< 0.300	U			—				—				—			
RHMW04	RHMW04-WG-04	4/26/2010[d]	—				—				< 0.300	U			—				—				—			
RHMW04	RHMWA01-WG-04	4/26/2010*[d]	—				—				< 0.300	U			—				—				—			
RHMW04	ES112	7/23/2014	—				—				< 0.50	U			—				—				—			
RHMW04	ES119	10/29/2014	—				—				< 0.50	U			—				—				—			
RHMW04	ES129	1/29/2015	—				—				< 0.50	U			—				—				—			
RHMW04	ES139	4/22/2015	< 0.010	U			< 0.015	U			—				—				—				—			
RHMW04	ES156	8/20/2015	—				< 0.015	U			—				—				—				—			
RHMW04	ERH006	10/19/2015	—				< 0.015	U			—				—				—				—			
RHMW04	ERH019	1/19/2016	—				< 0.015	U			—				—				—				—			
RHMW04	ERH020	1/19/2016	—				< 0.015	U			—				—				—				—			
RHMW04	ERH034	4/19/2016	—				—				—				—				—				—			
RHMW04	ERH048	7/19/2016	—				—				—				—				—				—			
RHMW04	ERH096	10/25/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH128	11/14/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH138	12/13/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH166	1/9/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH166 (EPA split)	1/9/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW04	ERH208	2/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH208 (EPA split)	2/6/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW04	ERH260	3/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH260 (EPA split)	3/6/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW04	ERH295	4/3/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH381	7/5/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH421	10/24/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH552	3/14/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH598	4/25/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH644	7/26/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH688	10/24/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW04	ERH743	1/21/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW04	ERH795	4/22/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW04	ERH851	7/23/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH917	10/21/2019	—				—				—				—				< 4.00	UJ	l		< 80.0	U		
RHMW04	ERH981	1/21/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH1049	4/22/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH1115	7/22/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW04	ERH1167	10/12/2020	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW04	ERH1224	1/25/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH1314	4/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH1494	7/21/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW04	ERH1692	10/20/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW04	ERH1740	4/11/2022	—				—				—				—				<0.57	U			<80	U		
RHMW04	RHMW04-WGN01LF-22Q3	07/28/2022	—				—				—				—				<0.58	U			<80	U		
RHMW04	RHMW04-WGN01LF-22Q4	12/14/2022	—				—				—				—				<0.57	U			<80	U		
RHMW04	RHMW04-WGN01LF-23Q1	2/2/2023	—				—				—				—				<0.58	U			<80	U		
RHMW04	RHMW04-WGN01LF-23Q2	4/19/2023	—				—				—				—				<0.57	U			<80	U		
RHMW04	RHMW04-WGN01LF-23Q3	7/5/2023	—				—				—				—				<2	U			<80	UJ		
RHMW05	RHMW05-WG15	5/13/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW05	RHMW05-WG16	7/15/2009[a]	—				—				< 0.150	U			—				—				—			
RHMW05	RHMW05-WG17	10/13/2009[a]	—				—				< 0.15	U			—				—				—			
RHMW05	RHMW05-WG18	1/26/2010	—				—				< 0.300	U			—				—				—			
RHMW05	RHMW05-WG19	4/13/2010	—				—				< 0.300	U			—				—				—			
RHMW05	RHMW05-WG20	7/13/2010	—				—				< 0.300	U			—				—				—			
RHMW05	ES005	10/20/2010	—				—				< 0.28	U			—				—				—			
RHMW05	ES013	1/19/2011	—				—				< 0.28	U			—				—				—			
RHMW05	ES024	4/20/2011[d]	—				—				< 0.28	U			—				—				—			
RHMW05	ES039	7/19/2011	—				—				< 0.28	U			—				—				—			
RHMW05	ES051	10/25/2011	—				—				< 0.28	U			—				—				—			
RHMW05	ES063	2/1/2012	—				—				< 0.28	U			—				—				—			
RHMW05	ES070	4/16/2012	—				—				< 0.28	U			—				—				—			
RHMW05	ES079	7/17/2012	—				—				< 0.28	U			—				—				—			
RHMW05	ES080	7/17/2012*	—				—				< 0.28	U			—				—				—			
RHMW05	ES005	10/22/2012	—				—				< 0.50	U			—				—				—			
RHMW05	ES015	1/29/2013	—				—				< 0.50	U			—				—				—			
RHMW05	ES024	4/23/2013	—				—				< 0.50	U			—				—				—			
RHMW05	ES033	7/23/2013	—				—				< 0.50	U			—				—				—			
RHMW05	ES042	10/22/2013	—				—				< 0.50	U			—				—				—			
RHMW05	ES049	1/16/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW05	ES061	1/29/2014[d]	—				—				< 0.50	U			—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC				COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Method	8015				8260				8015				8015				8015				8015				8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup				Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC				71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	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			
		DOH EAL	300				300				400				—				500				—				5				5				30				30				40				40				20			
		SSRBL	—				—				4500				—				—				—				750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW05	ES068	3/6/2014[d]	—				—				< 21	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES076	3/26/2014[d]	—				—				**17**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES084	4/22/2014[d]	—				< 30	U			< 10	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES095	5/28/2014[d]	—				—				< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES101	6/24/2014[d]	—				—				< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES108	7/22/2014	—				< 30	U			< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES118	10/28/2014	—				< 30	U			**16**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES124	1/27/2015	—				< 30	U			< 13	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
RHMW05	ES135	4/21/2015	< 25	U			—				< 17	UJ	b		—				< 34	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW05	ES142	6/25/2015	—				—				**15**	**J**			—				**41**	**J**			—				—				—				—				—				—				—				—			
RHMW05	ES150	7/21/2015	< 25	U			—				**18**	**J**	s		—				**44**	**J**	s		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW05	ERH010	10/20/2015	< 25	U			—				< 20	UJ	b		—				< 54	UJ	b		—				< 0.10	UJ	h		—				< 0.10	UJ	h		—				< 0.59	UJ	t		—				< 0.20	UJ	h	
RHMW05	ERH022	1/20/2016	< 25	U			—				< 27	UJ	b		—				< 45	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.18	UJ	t		—				< 0.20	U		
RHMW05	ERH023	1/20/2016*	< 25	U			—				< 26	UJ	b		—				< 44	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.12	UJ	t		—				< 0.20	U		
RHMW05	ERH038	4/20/2016	< 25	U			—				< 22	U	b f		—				< 65	U	b f		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW05	ERH052	7/20/2016	< 25	U			—				< 21	U			—				< 29	U	b f		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW05	ERH089	10/19/2016	—				< 18	U			< 25	U			< 25	U			< 40	U			< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH126	11/15/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH136	12/12/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH164	1/10/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH164 (EPA split)	1/10/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW05	ERH212	2/7/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH212 (EPA split)	2/7/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW05	ERH278	3/8/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH278 (EPA split)	3/8/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW05	ERH313	4/3/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH338	5/1/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH358	6/6/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH387	7/5/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH423	10/24/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH554	3/13/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH600	4/23/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH646	7/23/2018	—				< 18	U			< 25	UJ	s		—				< 40	UJ	l s		—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH690	10/22/2018	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH745	1/21/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH797	4/22/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH853	7/22/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH919	10/21/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH983	1/21/2020	—				< 18	U			**93**			Z	< 25	UJ	s		**92**			Z	< 40	UJ	s		< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH1051	4/21/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH1117	7/21/2020	—				< 18	U			< 300.0	U			—				**150**	**J**		Z	< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH1169	10/13/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH1226	1/25/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH1316	4/20/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH1496	7/27/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW05	ERH1694	10/26/2021	—				< 8.7	U			< 150	U			—				< 150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	ERH3131	4/11/2022	<8.7	U			—				<140	U			<110				**170**	**J**			<140	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	ERH3132	4/11/2022*	**2.4**	**J**			—				**75**	**J**			<120	U			**250**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	RHMW05-WGN01LF-22Q3	07/18/2022	<8.7	U			—				**125**	**J**			<148	U			**333**				<148	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	RHMW05-WGFD01LF-22Q3	07/18/2022*	<8.7	U			—				<148	U			—				<148	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	RHMW05-WGN01LF-22Q4	12/5/2022	<8.7	U			—				**178**	**J+**			<150	U			<150	U			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	RHMW05-WGFD01LF-22Q4	12/5/2022*	<8.7	U			—				<150	U			<150	U			**297**	**J**			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	RHMW05-WGN01LF-23Q1	2/2/2023	<8.5	U			—				<146	U			—				<146	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	RHMW05-WGFD01LF-23Q1	2/2/2023*	<8.5	U			—				**90.2**	**J**			<144	U			<144	U			<144	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW05	RHMW05-WGN01LF-23Q2	4/14/2023	<8.5	U			—				<143	U			<143	U			<143	U			<143	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW05	RHMW05-WGFD01LF-23Q2	4/14/2023*	<8.5	U			—				**54.3**	**J**			<144	U			**136**	**J**			<144	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW05	RHMW05-WGN01LF-23Q3	7/7/2023	<8.5	U			—				<141	U			—				<141	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW06	RHMW06-GW-01	10/21/2014[d]	< 20	U			—				< 86	U			—				< 86	U			—				< 0.200	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	RHMW06-GW-02	1/23/2015[d]	< 20	U			—				< 76	U			—				< 76	U			—				< 0.200	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ES140	4/23/2015	< 25	U			—				**20**	**J**			—				< 47	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW06	ES155	7/28/2015	< 25	U			—				< 20	U			—				< 50	U			—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW06	ERH004	10/19/2015	< 25	U			—				< 17	UJ	b		—				< 53	UJ	b		—				< 0.10	UJ	h		—				< 0.10	UJ	h		—				< 1.1	UJ	b h t		—				< 0.20	UJ	h	
RHMW06	ERH005	10/19/2015	< 25	U			—				< 21	UJ	b		—				< 53	UJ	b		—				< 0.10	UJ	h		—				< 0.10	UJ	h		—				< 0.5	UJ	b h t		—				< 0.20	UJ	h	
RHMW06	ERH018	1/19/2016	< 25	U			—				< 21	UJ	b		—				< 54	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.1	UJ	t		—				< 0.20	U		
RHMW06	ERH033	4/19/2016	< 25	U			—				< 28	U	b f		—				< 48	U	b f		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW06	ERH047	7/19/2016	< 25	U			—				< 23	U			—				< 27	U	b f		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
RHMW06	ERH097	10/19/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH120	11/14/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH139	12/12/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles	Volatiles	Semivolatiles (PAHs)	Semivolatiles (PAHs)	Semivolatiles (PAHs)	Semivolatiles (PAHs)	Semivolatiles (PAHs)	Semivolatiles (PAHs)	Semivolatiles (PAHs)	Lead Scavenger	Lead Scavenger	Lead Scavenger	Lead Scavenger
		Analyte Type	non-COPC	non-COPC	COPC	COPC	non-COPC	COPC	COPC	non-COPC	non-COPC	Lead Scavenger	Lead Scavenger	Lead Scavenger	Lead Scavenger
		Analytical Methoc	524.2	524.2	8270 SIM	8270 SIM	8270	8270 SIM	8260	524.2	8270	8011	8260	504.1	524.2
		Analyte	Xylenes, p/m-	Xylenes, o-	1-Methylnaphthalene	2-Methylnaphthalene	2-Methylnaphthalene	Naphthalene *****	Naphthalene *****	Naphthalene *****	Naphthalene *****	1,2-Dibromoethane *****	1,2-Dibromoethane *****	1,2-Dibromoethane *****	1,2-Dibromoethane *****
		CAS No.	179601-23-1	95-47-6	90-12-0	91-57-6	91-57-6	91-20-3	91-20-3	91-20-3	91-20-3	106-93-4	106-93-4	106-93-4	106-93-4
		Unit	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
		DOH EAL	20	20	10	10	10	17	17	17	17	0.04	0.04	0.04	0.04
		SSRBL	—	—	—	—	—	—	—	—	—	—	—	—	—
Well Name	Sample ID	Date Sampled	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note
RHMW05	ES068	3/6/2014[d]	—	—	< 0.050 U	< 0.050 U	—	**0.038 J**	—	—	—	—	—	—	—
RHMW05	ES076	3/26/2014[d]	—	—	< 0.050 U	< 0.050 U	—	**0.092 J**	—	—	—	—	—	—	—
RHMW05	ES084	4/22/2014[d]	—	—	< 0.051 U	< 0.051 U	—	**0.066 J**	—	—	—	—	< 0.50 U	—	—
RHMW05	ES095	5/28/2014[d]	—	—	< 0.049 U	< 0.049 U	—	< 0.049 U	—	—	—	—	—	—	—
RHMW05	ES101	6/24/2014[d]	—	—	< 0.051 U	< 0.051 U	—	< 0.051 U	—	—	—	—	—	—	—
RHMW05	ES108	7/22/2014	—	—	< 0.049 U	< 0.049 U	—	< 0.049 U	—	—	—	—	< 0.50 U	—	—
RHMW05	ES118	10/28/2014	—	—	< 0.096 U	< 0.048 U	—	< 0.048 U	—	—	—	—	< 0.50 U	—	—
RHMW05	ES124	1/27/2015	—	—	< 0.096 U	< 0.048 U	—	< 0.048 U	—	—	—	—	< 0.50 U	—	—
RHMW05	ES135	4/21/2015	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0050 U	—	—	—	< 0.0040 U	< 0.20 U	—	—
RHMW05	ES142	6/25/2015	—	—	**0.0046 J**	**0.0029 J**	—	< 0.0050 U	—	—	—	—	—	—	—
RHMW05	ES150	7/21/2015	—	—	**0.0041 J**	**0.0036 J**	—	**0.0058 J**	—	—	—	< 0.0040 U	< 0.20 U	—	—
RHMW05	ERH010	10/20/2015	—	—	**0.0050 J**	< 0.0066 UJ b	—	< 0.0074 UJ b	—	—	—	< 0.0040 U	< 0.20 UJ h	—	—
RHMW05	ERH022	1/20/2016	—	—	< 0.0050 U	**0.0031 J**	—	< 0.0050 U	—	—	—	< 0.0040 U	< 0.20 U	—	—
RHMW05	ERH023	1/20/2016*	—	—	< 0.0050 U	**0.0039 J**	—	**0.0046 J**	—	—	—	< 0.0040 U	< 0.20 U	—	—
RHMW05	ERH038	4/20/2016	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0050 U	—	—	—	—	—	—	—
RHMW05	ERH052	7/20/2016	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0060 U b f	—	—	—	—	—	—	—
RHMW05	ERH089	10/19/2016	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH126	11/15/2016	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH136	12/12/2016	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH164	1/10/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH164 (EPA split)	1/10/2017	< 0.5 U	< 0.2 U	< 0.025 UJ c	< 0.025 UJ c	< 0.5 U	< 0.025 U	—	< 0.2 U	< 0.5 U	—	—	—	< 0.0025 U
RHMW05	ERH212	2/7/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH212 (EPA split)	2/7/2017	< 0.5 U	< 0.2 U	< 0.025 UJ c	< 0.025 UJ c	< 0.5 U	< 0.025 U	—	< 0.2 U	< 0.5 U	—	—	—	< 0.0025 U
RHMW05	ERH278	3/8/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH278 (EPA split)	3/8/2017	< 0.5 U	< 0.2 U	< 0.027 UJ c	< 0.027 UJ c	< 0.6 U	< 0.027 U	—	< 0.2 U	< 0.6 U	—	—	—	< 0.0025 U
RHMW05	ERH313	4/3/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH338	5/1/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH358	6/6/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH387	7/5/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH423	10/24/2017	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH554	3/13/2018	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH600	4/23/2018	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH646	7/23/2018	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH690	10/22/2018	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH745	1/21/2019	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH797	4/22/2019	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH853	7/22/2019	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH919	10/21/2019	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH983	1/21/2020	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH1051	4/21/2020	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH1117	7/21/2020	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH1169	10/13/2020	—	—	< 0.10 UJ l	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH1226	1/25/2021	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH1316	4/20/2021	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH1496	7/27/2021	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW05	ERH1694	10/26/2021	—	—	< 0.1 U	< 0.1 U	—	< 0.1 U	—	—	—	—	—	—	—
RHMW05	ERH3131	4/11/2022	—	—	<0.030 U	<0.076 U	—	<0.076 U	—	—	—	—	—	—	—
RHMW05	ERH3132	4/11/2022*	—	—	<0.031 U	<0.076 U	—	<0.076 UM	—	—	—	—	—	—	—
RHMW05	RHMW05-WGN01LF-22Q3	07/18/2022	—	—	<0.030 U	<0.076 U	—	<0.076 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGFD01LF-22Q3	07/18/2022*	—	—	<0.031 U	<0.077 U	—	<0.077 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGN01LF-22Q4	12/5/2022	—	—	<0.03 U	<0.076 U	—	<0.076 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGFD01LF-22Q4	12/5/2022*	—	—	<0.03 U	<0.076 U	—	<0.076 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGN01LF-23Q1	2/2/2023	—	—	<0.031 U	<0.078 U	—	<0.078 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGFD01LF-23Q1	2/2/2023*	—	—	<0.031 U	<0.076 U	—	<0.076 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGN01LF-23Q2	4/14/2023	—	—	<0.031 U	<0.076 U	—	<0.076 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGFD01LF-23Q2	4/14/2023*	—	—	<0.031 U	<0.078 U	—	<0.078 U	—	—	—	—	—	—	—
RHMW05	RHMW05-WGN01LF-23Q3	7/7/2023	—	—	<0.4 U	<0.4 U	—	<0.4 U	—	—	—	—	—	—	—
RHMW06	RHMW06-GW-01	10/21/2014[d]	—	—	< 0.011 U	**0.0064 J**	—	< 0.053 U	—	—	—	< 0.020 U	< 0.50 U	—	—
RHMW06	RHMW06-GW-02	1/23/2015[d]	—	—	< 0.010 U	< 0.010 U	—	< 0.052 U	—	—	—	< 0.020 U	< 0.50 U	—	—
RHMW06	ES140	4/23/2015	—	—	< 0.0052 U	< 0.0052 U	—	< 0.0052 U	—	—	—	< 0.0040 UJ h	< 0.20 U	—	—
RHMW06	ES155	7/28/2015	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0050 U	—	—	—	< 0.0040 U	< 0.20 U	—	—
RHMW06	ERH004	10/19/2015	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0050 UJ b	—	—	—	< 0.0040 U	< 0.20 UJ h	—	—
RHMW06	ERH005	10/19/2015	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0050 U	—	—	—	< 0.0040 U	< 0.20 UJ h	—	—
RHMW06	ERH018	1/19/2016	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0050 U	—	—	—	< 0.0040 U	< 0.20 U	—	—
RHMW06	ERH033	4/19/2016	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0050 U	—	—	—	—	—	—	—
RHMW06	ERH047	7/19/2016	—	—	< 0.0050 U	< 0.0050 U	—	< 0.0047 U b f	—	—	—	—	—	—	—
RHMW06	ERH097	10/19/2016	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW06	ERH120	11/14/2016	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—
RHMW06	ERH139	12/12/2016	—	—	< 0.10 U	< 0.10 U	—	< 0.10 U	—	—	—	—	—	—	—

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW05	ES068	3/6/2014[d]	—				—				—				—				—				—			
RHMW05	ES076	3/26/2014[d]	—				—				—				—				—				—			
RHMW05	ES084	4/22/2014[d]	—				—				< 0.50	U			—				—				—			
RHMW05	ES095	5/28/2014[d]	—				—				—				—				—				—			
RHMW05	ES101	6/24/2014[d]	—				—				—				—				—				—			
RHMW05	ES108	7/22/2014	—				—				< 0.50	U			—				—				—			
RHMW05	ES118	10/28/2014	—				—				< 0.50	U			—				—				—			
RHMW05	ES124	1/27/2015	—				—				< 0.50	U			—				—				—			
RHMW05	ES135	4/21/2015	< 0.010	U			< 0.015	U			—				—				—				—			
RHMW05	ES142	6/25/2015	—				—				—				—				—				—			
RHMW05	ES150	7/21/2015	—				< 0.015	U			—				—				—				—			
RHMW05	ERH010	10/20/2015	—				< 0.015	U			—				—				—				—			
RHMW05	ERH022	1/20/2016	—				< 0.015	U			—				—				—				—			
RHMW05	ERH023	1/20/2016*	—				< 0.015	U			—				—				—				—			
RHMW05	ERH038	4/20/2016	—				—				—				—				—				—			
RHMW05	ERH052	7/20/2016	—				—				—				—				—				—			
RHMW05	ERH089	10/19/2016	—				—				—				—				< 4.00	U			< 80.0	UJ	h	
RHMW05	ERH126	11/15/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH136	12/12/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH164	1/10/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH164 (EPA split)	1/10/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW05	ERH212	2/7/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH212 (EPA split)	2/7/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW05	ERH278	3/8/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH278 (EPA split)	3/8/2017	—				—				—				< 0.0025	U			< 2.8	U			—			
RHMW05	ERH313	4/3/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH338	5/1/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH358	6/6/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH387	7/5/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH423	10/24/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH554	3/13/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH600	4/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH646	7/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH690	10/22/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW05	ERH745	1/21/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH797	4/22/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW05	ERH853	7/22/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH919	10/21/2019	—				—				—				—				< 4.00	UJ	l		< 80.0	U		
RHMW05	ERH983	1/21/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH1051	4/21/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH1117	7/21/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW05	ERH1169	10/13/2020	—				—				—				—				< 4.00	UJ	l		< 80.0	U		
RHMW05	ERH1226	1/25/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH1316	4/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH1496	7/27/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW05	ERH1694	10/26/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW05	ERH3131	4/11/2022	—				—				—				—				<0.57	U			<80	U		
RHMW05	ERH3132	4/11/2022*	—				—				—				—				<0.57	U			<80	U		
RHMW05	RHMW05-WGN01LF-22Q3	07/18/2022	—				—				—				—				<0.57	U			<80	U		
RHMW05	RHMW05-WGFD01LF-22Q3	07/18/2022*	—				—				—				—				<0.57	U			<80	U		
RHMW05	RHMW05-WGN01LF-22Q4	12/5/2022	—				—				—				—				<0.57	U			<80	UJ		
RHMW05	RHMW05-WGFD01LF-22Q4	12/5/2022*	—				—				—				—				<0.57	U			<80	UJ		
RHMW05	RHMW05-WGN01LF-23Q1	2/2/2023	—				—				—				—				<0.58	U			<80	U		
RHMW05	RHMW05-WGFD01LF-23Q1	2/2/2023*	—				—				—				—				<0.57	U			<80	U		
RHMW05	RHMW05-WGN01LF-23Q2	4/14/2023	—				—				—				—				<0.57	U			<80	U		
RHMW05	RHMW05-WGFD01LF-23Q2	4/14/2023*	—				—				—				—				<0.58	U			<80	U		
RHMW05	RHMW05-WGN01LF-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW06	RHMW06-GW-01	10/21/2014[d]	—				—				< 0.100	U			—				—				—			
RHMW06	RHMW06-GW-02	1/23/2015[d]	—				—				< 0.100	U			—				—				—			
RHMW06	ES140	4/23/2015	< 0.010	U			< 0.015	U			—				—				—				—			
RHMW06	ES155	7/28/2015	—				< 0.015	U			—				—				—				—			
RHMW06	ERH004	10/19/2015	—				< 0.015	U			—				—				—				—			
RHMW06	ERH005	10/19/2015	—				< 0.015	U			—				—				—				—			
RHMW06	ERH018	1/19/2016	—				< 0.015	U			—				—				—				—			
RHMW06	ERH033	4/19/2016	—				—				—				—				—				—			
RHMW06	ERH047	7/19/2016	—				—				—				—				—				—			
RHMW06	ERH097	10/19/2016	—				—				—				—				< 4.00	U			< 80.0	UJ	h	
RHMW06	ERH120	11/14/2016	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH139	12/12/2016	—				—				—				—				< 4.00	U			< 80.0	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC				COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015				8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup				Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC				71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	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			
		DOH EAL	300				300				400				—				500				—				5				5				30				30				40				40				20			
		SSRBL	—				—				4500				—				—				—				750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW06	ERH168	1/9/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH168 (EPA split)	1/9/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW06	ERH210	2/7/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH210 (EPA split)	2/7/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW06	ERH284	3/7/2017	—				< 18	U			< 25	U			—				**47**			Y	—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH284 (EPA split)	3/7/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW06	ERH319	4/3/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH369	7/4/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH425	10/24/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH556	3/12/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH602	4/23/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH648	7/23/2018	—				< 18	U			< 25	U			—				< 40	UJ	l		—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH692	10/23/2018	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH747	1/21/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH799	4/22/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH855	7/22/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH921	10/21/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH985	1/20/2020	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH1053	4/20/2020	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH1119	7/20/2020	—				< 18	U			< 300.0	U			< 300.0	U			**150**	**J**		Z	< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH1171	10/12/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH1228	1/19/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH1318	4/28/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH1498	7/20/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW06	ERH1696	10/20/2021	—				< 8.7	U			< 140	U			—				< 140	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW06	ERH2637	2/28/2022	<8.7	U			—				< 140	U			<110	U			<140	U			<140	U			< 0.2	U			—				< 0.2	U			—				< 0.2	UT			—				< 0.2	U		
RHMW06	ERH3124	4/15/2022	<8.7	U			—				<150	U			—				<150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW06	RHMW06-WGN01LF-22Q3	07/18/2022	<8.7	U			—				<148	U			—				<148	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW06	RHMW06-WGN01LF-22Q4	12/14/2022	**2.11**	**J**			—				<149	U			—				<149	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW06	RHMW06-WGN01LF-23Q1	2/2/2023	<8.5	U			—				**127**	**J**			<143	U			<143	U			<143	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW06	RHMW06-WGN01LF-23Q2	4/19/2023	<8.5	U			—				<143	U			—				<143	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW06	RHMW06-WGN01LF-23Q3	7/5/2023	<8.5	U			—				<141	U			—				<141	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW08	ERH102	10/19/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH122	11/15/2016	—				< 18	U			**33**			Y	< 25	U			**32**	**J**			< 40	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH141	12/12/2016	—				< 18	U			**27**	**J**		Y	—				**29**	**J**			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH157	12/21/2016	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH158	12/21/2016*	—				< 18	U			**63**			O	—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH169	1/11/2017	—				< 18	U			**28**	**J**		Y	—				**29**	**J**			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH170	1/11/2017*	—				< 18	U			**23**	**J**		Y	—				**27**	**J**			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH169 (EPA split)	1/11/2017	< 25	UJ	c		—				**160**				—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW08	ERH170 (EPA split)	1/11/2017*	< 25	UJ	c		—				**150**				—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW08	ERH220	2/6/2017	—				< 18	U			**26**	**J**		Y	—				**31**	**J**			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH221	2/6/2017*	—				< 18	U			**25**	**J**		Y	—				**28**	**J**			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH220 (EPA split)	2/6/2017	< 25	UJ	c		—				**130**	**J**			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW08	ERH221 (EPA split)	2/6/2017*	< 25	UJ	c		—				**120**	**J**			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW08	ERH262	3/6/2017	—				< 18	U			**27**	**J**		Y	—				**23**	**J**			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH263	3/6/2017*	—				< 18	U			**25**	**J**		Y	—				**25**	**J**			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH262 (EPA split)	3/6/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW08	ERH263 (EPA split)	3/6/2017*	< 25	UJ	c		—				**98**	**J**			—				< 300	U			—				—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW08	ERH297	4/4/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH298	4/4/2017*	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH340	5/2/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH360	6/5/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH376	7/4/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH429	10/23/2017	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH560	3/12/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH606	4/23/2018	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH652	7/24/2018	—				< 18	UJ	s		< 25	U			—				< 40	U			—				< 0.30	UJ	s		—				< 0.50	UJ	s		—				< 0.30	UJ	s		—				< 0.30	UJ	s	
RHMW08	ERH696	10/24/2018	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH751	1/21/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH803	4/23/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH859	8/7/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH925	10/30/2019	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH989	1/20/2020	—				< 18	U			< 25	U			—				< 40	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH1057	4/20/2020	—				< 18	U			**150**	**J**	s	Z	< 300.0	U			**170**	**J**	s,l	Z	< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH1123	7/22/2020	—				< 18	U			< 300.0	U			< 300.0	U			**150**	**J**		Z	< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH1175	10/13/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH1230	1/19/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH1322	4/19/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW08	ERH1502	7/20/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW06	ERH168	1/9/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH168 (EPA split)	1/9/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW06	ERH210	2/7/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH210 (EPA split)	2/7/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c s		< 0.025	UJ	c s		< 0.5	U			< 0.025	UJ	s		—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW06	ERH284	3/7/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH284 (EPA split)	3/7/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW06	ERH319	4/3/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH369	7/4/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH425	10/24/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH556	3/12/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH602	4/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH648	7/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH692	10/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH747	1/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH799	4/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH855	7/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH921	10/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH985	1/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH1053	4/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH1119	7/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH1171	10/12/2020	—				—				< 0.10	U	l		< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH1228	1/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH1318	4/28/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH1498	7/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW06	ERH1696	10/20/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW06	ERH2637	2/28/2022	—				—				<0.033	UM			<0.081	UMQ			—				<0.081	UM			—				—				—				—				—				—				—			
RHMW06	ERH3124	4/15/2022	—				—				<0.031	UQ			<0.076	UQ			—				<0.076	UQ			—				—				—				—				—				—				—			
RHMW06	RHMW06-WGN01LF-22Q3	07/18/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW06	RHMW06-WGN01LF-22Q4	12/14/2022	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW06	RHMW06-WGN01LF-23Q1	2/2/2023	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW06	RHMW06-WGN01LF-23Q2	4/19/2023	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW06	RHMW06-WGN01LF-23Q3	7/5/2023	—				—				<0.42	U			<0.42	U			—				<0.42	U			—				—				—				—				—				—				—			
RHMW08	ERH102	10/19/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH122	11/15/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	UJ	c		—				—				—			
RHMW08	ERH141	12/12/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH157	12/21/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH158	12/21/2016*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH169	1/11/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH170	1/11/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH169 (EPA split)	1/11/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW08	ERH170 (EPA split)	1/11/2017*	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW08	ERH220	2/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH221	2/6/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH220 (EPA split)	2/6/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW08	ERH221 (EPA split)	2/6/2017*	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW08	ERH262	3/6/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH263	3/6/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH262 (EPA split)	3/6/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW08	ERH263 (EPA split)	3/6/2017*	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW08	ERH297	4/4/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH298	4/4/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH340	5/2/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH360	6/5/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH376	7/4/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW08	ERH429	10/23/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH560	3/12/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH606	4/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH652	7/24/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH696	10/24/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH751	1/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH803	4/23/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH859	8/7/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH925	10/30/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH989	1/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH1057	4/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH1123	7/22/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH1175	10/13/2020	—				—				< 0.10	UJ	l		< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH1230	1/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH1322	4/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW08	ERH1502	7/20/2021	—				—				< 0.10	U			< 0.10	U			—				**0.15**	**J**			—				—				—				—				—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW06	ERH168	1/9/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH168 (EPA split)	1/9/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW06	ERH210	2/7/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH210 (EPA split)	2/7/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW06	ERH284	3/7/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH284 (EPA split)	3/7/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW06	ERH319	4/3/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH369	7/4/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH425	10/24/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH556	3/12/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH602	4/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH648	7/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH692	10/23/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW06	ERH747	1/21/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH799	4/22/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW06	ERH855	7/22/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH921	10/21/2019	—				—				—				—				< 4.00	UJ	l		< 80.0	U		
RHMW06	ERH985	1/20/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW06	ERH1053	4/20/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH1119	7/20/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW06	ERH1171	10/12/2020	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW06	ERH1228	1/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH1318	4/28/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH1498	7/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW06	ERH1696	10/20/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW06	ERH2637	2/28/2022	—				—				—				—				<0.61	U			—			
RHMW06	ERH3124	4/15/2022	—				—				—				—				<0.57	UMQ			<80	U		
RHMW06	RHMW06-WGN01LF-22Q3	07/18/2022	—				—				—				—				<0.57	U			<80	U		
RHMW06	RHMW06-WGN01LF-22Q4	12/14/2022	—				—				—				—				<0.57	U			<80	U		
RHMW06	RHMW06-WGN01LF-23Q1	2/2/2023	—				—				—				—				<0.57	U			<80	U		
RHMW06	RHMW06-WGN01LF-23Q2	4/19/2023	—				—				—				—				<0.58	U			<80	U		
RHMW06	RHMW06-WGN01LF-23Q3	7/5/2023	—				—				—				—				<2	U			<80	UJ		
RHMW08	ERH102	10/19/2016	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	h	
RHMW08	ERH122	11/15/2016	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH141	12/12/2016	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH157	12/21/2016	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH158	12/21/2016*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH169	1/11/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH170	1/11/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH169 (EPA split)	1/11/2017	—				—				—				**3.1**	**J**			< 2.5	U			—			
RHMW08	ERH170 (EPA split)	1/11/2017*	—				—				—				**3.1**	**J**			< 2.5	U			—			
RHMW08	ERH220	2/6/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH221	2/6/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH220 (EPA split)	2/6/2017	—				—				—				**3.9**	**J**			< 2.5	U			—			
RHMW08	ERH221 (EPA split)	2/6/2017*	—				—				—				**3.8**	**J**			< 2.5	U			—			
RHMW08	ERH262	3/6/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH263	3/6/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH262 (EPA split)	3/6/2017	—				—				—				**2.7**	**J**			< 2.5	U			—			
RHMW08	ERH263 (EPA split)	3/6/2017*	—				—				—				**2.8**	**J**			< 2.5	U			—			
RHMW08	ERH297	4/4/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH298	4/4/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH340	5/2/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH360	6/5/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH376	7/4/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW08	ERH429	10/23/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH560	3/12/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH606	4/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH652	7/24/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH696	10/24/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW08	ERH751	1/21/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW08	ERH803	4/23/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW08	ERH859	8/7/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH925	10/30/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW08	ERH989	1/20/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW08	ERH1057	4/20/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH1123	7/22/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
RHMW08	ERH1175	10/13/2020	—				—				—				—				< 4.00	UJ	s,l		< 80.0	U		
RHMW08	ERH1230	1/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH1322	4/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW08	ERH1502	7/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC			
		Analytical Method	8015				8260				8015				8015				8015				8015			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	300				300				400				—				500				—			
		SSRBL	—				—				4500				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW08	ERH1700	10/19/2021	—				< 8.7	U			—				—				—				—			
RHMW08	ERH1868	11/2/2021	—				—				—				—				—				—			
RHMW08	ERH1870	11/2/2021	—				—				**65**	**J**			—				**190**	**J**			<140	U		
RHMW08	ERH2638	3/2/2022	<8.7	U			—				<140	U			—				<140	U			—			
RHMW08	ERH3244	4/19/2022	<8.7	U			—				<150	U			<120	U			<150	U			<150	U		
RHMW08	ERH3245	4/19/2022	<8.7	U			—				<150	U			<120	U			<150	U			<150	U		
RHMW08	RHMW08-WGN01LF-22Q3	07/28/2022	<8.7	U			—				<150	U			—				<150	U			—			
RHMW08	RHMW08-WGFD01LF-22Q3	07/28/2022*	<8.7	U			—				<150	U			—				<150	U			—			
RHMW08	RHMW08-WGN01LF-22Q4	12/15/2022	<8.7	U			—				<150	U			<150	U			<150	U			<150	U		
RHMW08	RHMW08-WGFD01LF-22Q4	12/15/2022*	**2.07**	**J**			—				**37.9**	**J**			<149	U			<149	U			<149	U		
RHMW08	RHMW08-WGN01LF-23Q1	2/7/2023	<8.5	U			—				**289**	**J**			<113	U			**136**	**J**			<141	U		
RHMW08	RHMW08-WGFD01LF-23Q1	2/7/2023*	<8.5	U			—				**265**	**J-**			<114	UJ			**127**	**J**			<143	U		
RHMW08	RHMW08-WGN01LF-23Q2	4/20/2023	<8.5	U			—				<144	U			—				<144	U			—			
RHMW08	RHMW08-WGFD01LF-23Q2	4/20/2023*	<8.5	U			—				<143	U			—				<143	U			—			
RHMW08	RHMW08-WGN01LF-23Q3	7/6/2023	<8.5	U			—				**58.3**	**J**			<143	U			<143	U			<143	U		
RHMW08	RHMW08-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-23Q3	7/6/2023	<8.5	U			—				<143	U			—				<143	U			—			
RHMW09	ERH103	10/25/2016	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH129	11/15/2016	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH146	12/12/2016	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH178	1/11/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH178 (EPA split)	1/11/2017	< 25	UJ	c		—				< 71	U			—				< 290	U			—			
RHMW09	ERH225	2/8/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH247	2/8/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH225 (EPA split)	2/8/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
RHMW09	ERH247 (EPA split)	2/8/2017*	< 25	UJ	c		—				< 71	U			—				< 280	U			—			
RHMW09	ERH272	3/7/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH272 (EPA split)	3/7/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
RHMW09	ERH307	4/4/2017	—				< 18	UJ	q		< 25	U			—				< 40	U			—			
RHMW09	ERH314	4/4/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH385	7/5/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH431	10/24/2017	—				< 18	U			< 25	UJ	s		—				< 40	UJ	s		—			
RHMW09	ERH562	3/13/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH608	4/25/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH654	7/25/2018	—				< 18	UJ	s		< 25	U			—				< 40	U			—			
RHMW09	ERH698	10/23/2018	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—			
RHMW09	ERH753	1/22/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH805	4/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH861	7/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH927	10/22/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW09	ERH991	1/21/2020	—				< 18	U			**100**			Z	< 25	U			**98**			Z	< 40	U		
RHMW09	ERH1059	4/21/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW09	ERH1127	7/21/2020	—				< 18	U			**150**	**J**		Z	< 300.0	U			< 300.0	U			< 300.0	U		
RHMW09	ERH1177	10/19/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW09	ERH1240	1/26/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW09	ERH1324	5/3/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW09	ERH1504	7/19/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U		
RHMW09	ERH1702	10/18/2021	—				< 8.7	U			< 150	U			—				< 150	U			—			
RHMW09	ERH2639	3/3/2022	<8.7	U			—				**430**	**J**			<140				**480**				<140	U		
RHMW09	ERH3252	4/18/2022	<8.7	U			—				<150	U			—				<150	U			—			
RHMW09	RHMW09-WGN01LF-22Q3	07/26/2022	<8.7	U			—				<150	U			<120	U			<150	U			<150	U		
RHMW09	RHMW09-WGN01LF-22Q4	12/12/2022	<8.7	U			—				**38.8**	**J**			<150	U			**107**	**J**			<150	U		
RHMW09	RHMW09-WGN01LF-23Q1	2/6/2023	<8.5	U			—				<141	U			<113	U			<141	U			<141	U		
RHMW09	RHMW09-WGN01LF-23Q2	4/17/2023	<8.5	U			—				**197**	**J**			<144	U			**407**				<144	U		
RHMW09	RHMW09-WGN01LF-23Q3	7/6/2023	<8.5	U			—				<148	U			—				<148	U			—			
RHMW09	RHMW09-WGN03LF-23Q3	9/5/2023	—				—				—				—				—				—			
RHMW10	ERH345	5/4/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW10	ERH346	5/4/2017*	—				< 18	U			**89**			Z	**56**			Z	**190**				**140**			
RHMW10	ERH365	6/5/2017	—				< 18	U			< 25	UJ	h		< 25	UJ	h		< 40	U			< 40	UJ	h	
RHMW10	ERH366	6/5/2017*	—				< 18	U			< 25	UJ	h		< 25	UJ	h		< 40	U			< 40	UJ	h	
RHMW10	ERH373	7/4/2017	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW10	ERH374	7/4/2017*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW10	ERH433	10/25/2017	—				< 18	U			< 25	U			—				**61**				—			
RHMW10	ERH564	3/13/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW10	ERH610	4/24/2018	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW10	ERH656	7/24/2018	—				< 18	UJ	s		< 25	U			—				< 40	U			—			
RHMW10	ERH700	10/31/2018	—				< 18	U			**120**	**J**	s	W	< 25	U			**62**	**J**	s		< 40	U		
RHMW10	ERH755	1/24/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW10	ERH807	4/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW10	ERH863	7/24/2019	—				< 18	U			< 25	U			—				< 40	U			—			

		Analyte Class	Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Method	8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	5				5				30				30				40				40				20			
		SSRBL	750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW08	ERH1700	10/19/2021	< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW08	ERH1868	11/2/2021	—				—				—				—				—				—				—			
RHMW08	ERH1870	11/2/2021	—				—				—				—				—				—				—			
RHMW08	ERH2638	3/2/2022	<0.2	U			—				<0.2	U			—				<0.2	UT			—				<0.2	U		
RHMW08	ERH3244	4/19/2022	<0.2	U			—				<0.2	U			—				<0.2	UT			—				<0.2	U		
RHMW08	ERH3245	4/19/2022	<0.2	U			—				<0.2	U			—				<0.2	UT			—				<0.2	U		
RHMW08	RHMW08-WGN01LF-22Q3	07/28/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW08	RHMW08-WGFD01LF-22Q3	07/28/2022*	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW08	RHMW08-WGN01LF-22Q4	12/15/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW08	RHMW08-WGFD01LF-22Q4	12/15/2022*	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW08	RHMW08-WGN01LF-23Q1	2/7/2023	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW08	RHMW08-WGFD01LF-23Q1	2/7/2023*	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW08	RHMW08-WGN01LF-23Q2	4/20/2023	<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW08	RHMW08-WGFD01LF-23Q2	4/20/2023*	<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW08	RHMW08-WGN01LF-23Q3	7/6/2023	< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW08	RHMW08-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-23Q3	7/6/2023	< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW09	ERH103	10/25/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH129	11/15/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH146	12/12/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH178	1/11/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH178 (EPA split)	1/11/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW09	ERH225	2/8/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH247	2/8/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH225 (EPA split)	2/8/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW09	ERH247 (EPA split)	2/8/2017*	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW09	ERH272	3/7/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH272 (EPA split)	3/7/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
RHMW09	ERH307	4/4/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH314	4/4/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH385	7/5/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH431	10/24/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH562	3/13/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH608	4/25/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH654	7/25/2018	< 0.30	UJ	s		—				< 0.50	UJ	s		—				< 0.30	UJ	s		—				< 0.30	UJ	s	
RHMW09	ERH698	10/23/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH753	1/22/2019	< 0.30	UJ	s		—				< 0.50	UJ	s		—				< 0.30	UJ	s		—				< 0.30	UJ	s	
RHMW09	ERH805	4/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH861	7/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH927	10/22/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH991	1/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH1059	4/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH1127	7/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH1177	10/19/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH1240	1/26/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH1324	5/3/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH1504	7/19/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW09	ERH1702	10/18/2021	< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW09	ERH2639	3/3/2022	<0.2	U			—				<0.2	U			—				<0.2	UT			—				<0.2	U		
RHMW09	ERH3252	4/18/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW09	RHMW09-WGN01LF-22Q3	07/26/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW09	RHMW09-WGN01LF-22Q4	12/12/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW09	RHMW09-WGN01LF-23Q1	2/6/2023	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW09	RHMW09-WGN01LF-23Q2	4/17/2023	<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW09	RHMW09-WGN01LF-23Q3	7/6/2023	< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW09	RHMW09-WGN03LF-23Q3	9/5/2023	—				—				—				—				—				—				—			
RHMW10	ERH345	5/4/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH346	5/4/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH365	6/5/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH366	6/5/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH373	7/4/2017	< 0.30	UJ	q		—				< 0.50	UJ	q		—				< 0.30	UJ	q		—				< 0.30	UJ	q	
RHMW10	ERH374	7/4/2017*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH433	10/25/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH564	3/13/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH610	4/24/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH656	7/24/2018	< 0.30	UJ	s		—				< 0.50	UJ	s		—				< 0.30	UJ	s		—				< 0.30	UJ	s	
RHMW10	ERH700	10/31/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH755	1/24/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH807	4/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW10	ERH863	7/24/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW08	ERH1700	10/19/2021	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW08	ERH1868	11/2/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW08	ERH1870	11/2/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW08	ERH2638	3/2/2022	—				—				<0.032	UM			<0.081	UMQ			—				<0.081	UM			—				—				—				—				—				—				—			
RHMW08	ERH3244	4/19/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW08	ERH3245	4/19/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGN01LF-22Q3	07/28/2022	—				—				<0.031	U			<0.076	U			—				**0.059**	J			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-22Q3	07/28/2022*	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGN01LF-22Q4	12/15/2022	—				—				<0.030	U			<0.075	U			—				<0.075	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-22Q4	12/15/2022*	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGN01LF-23Q1	2/7/2023	—				—				<0.032	U			<0.08	U			—				<0.08	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-23Q1	2/7/2023*	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGN01LF-23Q2	4/20/2023	—				—				<0.032	U			<0.079	U			—				<0.079	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-23Q2	4/20/2023*	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGN01LF-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW08	RHMW08-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW09	ERH103	10/25/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW09	ERH129	11/15/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	UJ	c		—				—				—			
RHMW09	ERH146	12/12/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW09	ERH178	1/11/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW09	ERH178 (EPA split)	1/11/2017	< 0.5	U			< 0.2	U			< 0.024	UJ	c		< 0.024	UJ	c		< 0.5	U			< 0.024	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW09	ERH225	2/8/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			< 0.50	U			—				—			
RHMW09	ERH247	2/8/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			< 0.50	U			—				—			
RHMW09	ERH225 (EPA split)	2/8/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				**1.0**				< 0.5	U			—				—				—				< 0.0025	U		
RHMW09	ERH247 (EPA split)	2/8/2017*	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW09	ERH272	3/7/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW09	ERH272 (EPA split)	3/7/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
RHMW09	ERH307	4/4/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			< 0.50	U			—				—			
RHMW09	ERH314	4/4/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			< 0.50	U			—				—			
RHMW09	ERH385	7/5/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW09	ERH431	10/24/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH562	3/13/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH608	4/25/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH654	7/25/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH698	10/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH753	1/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH805	4/23/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH861	7/23/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH927	10/22/2019	—				—				< 0.10	UJ	l		< 0.10	UJ	l		—				< 0.10	UJ	l		—				—				—				—				—				—				—			
RHMW09	ERH991	1/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH1059	4/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH1127	7/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH1177	10/19/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH1240	1/26/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH1324	5/3/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH1504	7/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW09	ERH1702	10/18/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW09	ERH2639	3/3/2022	—				—				<0.032	UQ			<0.08	UQ			—				<0.08	UMQ			—				—				—				—				—				—				—			
RHMW09	ERH3252	4/18/2022	—				—				<0.030	UQ			<0.076	UQ			—				<0.076	UQ			—				—				—				—				—				—				—			
RHMW09	RHMW09-WGN01LF-22Q3	07/26/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW09	RHMW09-WGN01LF-22Q4	12/12/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW09	RHMW09-WGN01LF-23Q1	2/6/2023	—				—				<0.030	U			<0.075	U			—				<0.075	U			—				—				—				—				—				—				—			
RHMW09	RHMW09-WGN01LF-23Q2	4/17/2023	—				—				<0.032	U			<0.079	U			—				<0.079	U			—				—				—				—				—				—				—			
RHMW09	RHMW09-WGN01LF-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW09	RHMW09-WGN03LF-23Q3	9/5/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW10	ERH345	5/4/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH346	5/4/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH365	6/5/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH366	6/5/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH373	7/4/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH374	7/4/2017*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH433	10/25/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH564	3/13/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH610	4/24/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW10	ERH656	7/24/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH700	10/31/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH755	1/24/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH807	4/23/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH863	7/24/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW08	ERH1700	10/19/2021	—				—				—				—				—				—			
RHMW08	ERH1868	11/2/2021	—				—				—				—				—				< 80	U		
RHMW08	ERH1870	11/2/2021	—				—				—				—				< 4.8	U			—			
RHMW08	ERH2638	3/2/2022	—				—				—				—				<0.6	UM			—			
RHMW08	ERH3244	4/19/2022	—				—				—				—				<0.57	UM			<80	U		
RHMW08	ERH3245	4/19/2022	—				—				—				—				<0.57	UM			<80	U		
RHMW08	RHMW08-WGN01LF-22Q3	07/28/2022	—				—				—				—				<0.57	U			<80	U		
RHMW08	RHMW08-WGFD01LF-22Q3	07/28/2022*	—				—				—				—				<0.57	U			<80	U		
RHMW08	RHMW08-WGN01LF-22Q4	12/15/2022	—				—				—				—				<0.57	U			<80	U		
RHMW08	RHMW08-WGFD01LF-22Q4	12/15/2022*	—				—				—				—				<0.57	U			<80	U		
RHMW08	RHMW08-WGN01LF-23Q1	2/7/2023	—				—				—				—				**0.29**	**J**			<80	U		
RHMW08	RHMW08-WGFD01LF-23Q1	2/7/2023*	—				—				—				—				**0.19**	**J-**			<80	U		
RHMW08	RHMW08-WGN01LF-23Q2	4/20/2023	—				—				—				—				<0.6	U			<80	U		
RHMW08	RHMW08-WGFD01LF-23Q2	4/20/2023*	—				—				—				—				<0.57	U			<80	U		
RHMW08	RHMW08-WGN01LF-23Q3	7/6/2023	—				—				—				—				<2	U			<80	UJ		
RHMW08	RHMW08-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—			
RHMW08	RHMW08-WGFD01LF-23Q3	7/6/2023	—				—				—				—				<2	U			<80	UJ		
RHMW09	ERH103	10/25/2016	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH129	11/15/2016	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH146	12/12/2016	—				—				< 0.30	U			—				**1.1**	**J**			< 80.0	U		
RHMW09	ERH178	1/11/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH178 (EPA split)	1/11/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW09	ERH225	2/8/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH247	2/8/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH225 (EPA split)	2/8/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW09	ERH247 (EPA split)	2/8/2017*	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW09	ERH272	3/7/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH272 (EPA split)	3/7/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
RHMW09	ERH307	4/4/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH314	4/4/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH385	7/5/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW09	ERH431	10/24/2017	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH562	3/13/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH608	4/25/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH654	7/25/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH698	10/23/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW09	ERH753	1/22/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW09	ERH805	4/23/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW09	ERH861	7/23/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH927	10/22/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH991	1/21/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH1059	4/21/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH1127	7/21/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW09	ERH1177	10/19/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH1240	1/26/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH1324	5/3/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH1504	7/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW09	ERH1702	10/18/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW09	ERH2639	3/3/2022	—				—				—				—				<0.6	UQ			—			
RHMW09	ERH3252	4/18/2022	—				—				—				—				<0.57	UM			<80	U		
RHMW09	RHMW09-WGN01LF-22Q3	07/26/2022	—				—				—				—				<0.57	U			<80	U		
RHMW09	RHMW09-WGN01LF-22Q4	12/12/2022	—				—				—				—				<0.57	U			<80	U		
RHMW09	RHMW09-WGN01LF-23Q1	2/6/2023	—				—				—				—				<0.57	U			<80	U		
RHMW09	RHMW09-WGN01LF-23Q2	4/17/2023	—				—				—				—				<0.59	U			<80	U		
RHMW09	RHMW09-WGN01LF-23Q3	7/6/2023	—				—				—				—				<2	U			<80	UJ		
RHMW09	RHMW09-WGN03LF-23Q3	9/5/2023	—				—				—				—				—				—			
RHMW10	ERH345	5/4/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH346	5/4/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH365	6/5/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH366	6/5/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH373	7/4/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH374	7/4/2017*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH433	10/25/2017	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH564	3/13/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH610	4/24/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW10	ERH656	7/24/2018	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW10	ERH700	10/31/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW10	ERH755	1/24/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW10	ERH807	4/23/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW10	ERH863	7/24/2019	—				—				—				—				< 4.00	U			< 80.0	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH	TPH	TPH	TPH	TPH	TPH	Volatiles	Volatiles	Volatiles	Volatiles	Volatiles	Volatiles	Volatiles
		Analyte Type	COPC	COPC	COPC	COPC	COPC	COPC	COPC	non-COPC	COPC	non-COPC	COPC	non-COPC	COPC
		Analytical Method	8015	8260	8015	8015	8015	8015	8260	524.2	8260	524.2	8260	524.2	8260
		Analyte	TPH-g ****	TPH-g ****	TPH-d	TPH-d with Silica Gel Cleanup	TPH-o	TPH-o with Silica Gel Cleanup	Benzene	Benzene	Ethylbenzene	Ethylbenzene	Toluene	Toluene	Xylenes, Total (p/m-, o-xylene)
		CAS No.	Gas	Gas	Diesel	Diesel SGC	Oil	Oil SGC	71-43-2	71-43-2	100-41-4	100-41-4	108-88-3	108-88-3	1330-20-7
		Unit	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
		DOH EAL	300	300	400	—	500	—	5	5	30	30	40	40	20
		SSRBL	—	—	4500	—	—	—	750	750	—	—	—	—	—
Well Name	Sample ID	Date Sampled	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note	Result Q rc note
RHMW10	ERH929	11/13/2019	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH993	1/28/2020	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH1061	4/21/2020	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH1125	7/21/2020	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH1179	10/13/2020	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH1236	1/20/2021	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH1326	4/22/2021	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH1506	7/26/2021	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW10	ERH1704	10/26/2021	—	< 8.7 U	< 140 U	—	< 140 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW10	ERH2628	3/4/2022	**2.7 J**	—	**400 J**	<140 U	**590**	**72 J**	< 0.2 U	—	< 0.2 U	—	< 0.2 UT	—	< 0.2 U
RHMW10	ERH3258	4/20/2022	<8.7 U	—	<150 U	—	<150 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 UT	—	< 0.2 U
RHMW10	RHMW10-WGN01LF-22Q3	7/25/2022	<8.7 U	—	<149 U	—	<149 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW10	RHMW10-WGN01LF-22Q4	12/16/2022	<8.7 U	—	<149 U	<149 U	<149 U	<149 U	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW10	RHMW10-WGN01LF-23Q1	2/1/2023	<8.5 U	—	<150 U	—	<150 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW10	RHMW10-WGN01LF-23Q2	4/11/2023	<8.5 U	—	<141 U	—	<141 U	—	< 0.1 U	—	< 0.1 U	—	< 0.2 U	—	< 0.1 U
RHMW10	RHMW10-WGN01LF-23Q3	7/5/2023	<8.5 U	—	<144 U	—	<144 U	—	< 0.1 U	—	< 0.1 U	—	< 0.2 U	—	< 0.1 U
RHMW10	RHMW10-WGFD01LF-23Q3	7/5/2023	<8.5 U	—	<141 U	—	<141 U	—	< 0.1 U	—	< 0.1 U	—	< 0.2 U	—	< 0.1 U
RHMW11-01	ERH573	3/21/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-01	ERH619	5/2/2018	—	< 18 U	< 340 U b	< 25 U	< 450 U b	< 40 U	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-01	ERH674	7/30/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-02	ERH575	3/22/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-02	ERH621	4/30/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-02	ERH672	8/1/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-03	ERH579	3/27/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-03	ERH623	4/30/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-03	ERH670	8/1/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-04	ERH577	3/27/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-04	ERH625	4/26/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-04	ERH668	8/2/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH581	3/28/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.26 U t	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH582	3/28/2018*	—	< 18 U	< 25 U	—	< 40 U	—	< 0.24 U t	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH627	5/1/2018	—	< 18 U	< 380 U b	< 25 U	< 530 U b	< 40 U	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH628	5/1/2018*	—	< 18 U	< 300 U b	< 25 U	< 400 U b	< 40 U	< 0.30 UJ s	—	< 0.50 UJ s	—	< 0.30 UJ s	—	< 0.30 UJ s
RHMW11-05	ERH665	7/31/2018	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH666	7/31/2018*	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 UJ s	—	< 0.50 UJ s	—	< 0.30 UJ s	—	< 0.30 UJ s
RHMW11-05	ERH709	10/29/2018	—	< 18 U	< 110 U f Y	< 25 U	< 120 U f	< 40 U	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH710	10/29/2018*	—	< 18 U	—	—	—	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH764	1/28/2019	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH816	4/29/2019	—	< 18 U	< 25 UJ l	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH878	8/1/2019	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 UJ c	—	< 0.30 U
RHMW11-05	ERH938	10/29/2019	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1002	1/30/2020	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1070	4/20/2020	—	< 18 U	< 260 U f Z	< 300.0 U	**240 J** l Z	< 300.0 U	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1133	8/3/2020	—	**34**	**160 J** Z	< 300.0 U	< 300.0 U	<300.0 U	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1185	10/22/2020	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1242	1/21/2021	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1338	4/29/2021	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1518	7/22/2021	—	< 18 U	**170 J**	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-05	ERH1718	11/11/2021	—	**4.4 J**	< 140 U	—	< 140 U	—	< 0.2 U	—	< 0.2 U	—	**0.064 J**	—	< 0.2 U
RHMW11-05	ERH3186	4/14/2022	<8.7 U	—	<150 U	—	<150 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW11-05	RHMW11-05-WGN01G-22Q3	07/21/2022	<8.7 U	—	<148 U	—	<148 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW11-05	RHMW11-05-WGN01G-22Q4R1	12/8/2022	**2.52 J**	—	150 U	—	150 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW11-05	RHMW11-05-WGN01G-23Q1	2/2/2023	<8.5 U	—	**74.7 J**	<143 U	**143 J**	<143 U	< 0.2 U	—	< 0.2 U	—	< 0.2 U	—	< 0.2 U
RHMW11-05	RHMW11-05-WGN01G-23Q2	4/13/2023	<8.5 U	—	<144 U	—	<144 U	—	< 0.1 U	—	< 0.1 U	—	< 0.2 U	—	< 0.1 U
RHMW11-05	RHMW11-05-WGN01G-23Q3	7/6/2023	<8.5 U	—	<141 U	—	<141 U	—	< 0.1 U	—	< 0.1 U	—	< 0.2 U	—	< 0.1 U
RHMW11-05	RHMW11-05-WGN03G-23Q3	9/6/2023	—	—	—	—	—	—	—	—	—	—	—	—	—
RHMW11-07	ERH874	8/5/2019	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW11-07	ERH940	10/30/2019	—	< 18 U	< 25 U	—	< 40 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW12A	ERH1572	8/4/2021	—	< 18 UJ	< 300.0 U	< 300.0 U	< 300.0 U	< 300.0 U	< 0.30 UJ	—	< 0.50 UJ	—	< 0.30 UJ	—	< 0.30 UJ
RHMW12A	ERH1706	10/25/2021	—	**12 J**	**40 J**	< 110 U	< 140 U	< 140 U	< 0.2 U	—	< 0.2 U	—	**7.1**	—	< 0.2 U
RHMW12A	ERH3270	4/18/2022	<8.7 U	—	**670 J**	<150 U	**580**	<150 U	<0.2 U	—	<0.2 U	—	<0.2 UT	—	<0.2 U
RHMW12A	RHMW12A-WGN01LF-22Q3	07/21/2022	<8.7 U	—	<150 U	—	<150 U	—	<0.2 U	—	<0.2 U	—	<0.2 U	—	<0.2 U
RHMW12A	RHMW12A-WGFD01LF-22Q3	07/21/2022*	**2.1 J**	—	<150 U	—	<150 U	—	<0.2 U	—	<0.2 U	—	<0.2 U	—	<0.2 U
RHMW12A	RHMW12A-WGFD01LF-22Q4R1	12/8/2022	<8.7 U	—	<149 U	—	<149 U	—	<0.2 U	—	<0.2 U	—	<0.2 U	—	<0.2 U
RHMW12A	RHMW12A-WGN01LF-23Q1	1/30/2023	<8.5 U	—	<143 U	—	<143 U	—	<0.2 U	—	<0.2 U	—	<0.2 U	—	<0.1 U
RHMW12A	RHMW12A-WGN01LF-23Q2	4/13/2023	<8.5 U	—	<147 U	—	<147 U	—	<0.1 U	—	<0.1 U	—	<0.2 U	—	<0.1 U
RHMW12A	RHMW12A-WGN01LF-23Q3	7/7/2023	<8.5 U	—	<141 U	—	<141 U	—	< 0.1 U	—	< 0.1 U	—	< 0.2 U	—	< 0.1 U
RHMW13-01	ERH1023	3/3/2020	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW13-02	ERH1025	3/4/2020	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 U	—	< 0.50 U	—	< 0.30 U	—	< 0.30 U
RHMW13-03	ERH1027	3/5/2020	—	< 18 U	< 300.0 U	—	< 300.0 U	—	< 0.30 UJ s	—	< 0.50 UJ s	—	< 0.30 UJ s	—	< 0.30 UJ s

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW10	ERH929	11/13/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH993	1/28/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH1061	4/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH1125	7/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH1179	10/13/2020	—				—				< 0.10	UJ	I		< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH1236	1/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH1326	4/22/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH1506	7/26/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW10	ERH1704	10/26/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW10	ERH2628	3/4/2022	—				—				<0.032	UM			<0.081	U			—				<0.081	UM			—				—				—				—				—				—				—			
RHMW10	ERH3258	4/20/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW10	RHMW10-WGN01LF-22Q3	7/25/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW10	RHMW10-WGN01LF-22Q4	12/16/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW10	RHMW10-WGN01LF-23Q1	2/1/2023	—				—				<0.031	U			<0.078	U			—				<0.078	U			—				—				—				—				—				—				—			
RHMW10	RHMW10-WGN01LF-23Q2	4/11/2023	—				—				<0.03	U			<0.075	U			—				<0.075	U			—				—				—				—				—				—				—			
RHMW10	RHMW10-WGN01LF-23Q3	7/5/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW10	RHMW10-WGFD01LF-23Q3	7/5/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW11-01	ERH573	3/21/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-01	ERH619	5/2/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-01	ERH674	7/30/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-02	ERH575	3/22/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-02	ERH621	4/30/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-02	ERH672	8/1/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-03	ERH579	3/27/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-03	ERH623	4/30/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-03	ERH670	8/1/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-04	ERH577	3/27/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-04	ERH625	4/26/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-04	ERH668	8/2/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-05	ERH581	3/28/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-05	ERH582	3/28/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.02	U			—				—				—			
RHMW11-05	ERH627	5/1/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-05	ERH628	5/1/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-05	ERH665	7/31/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-05	ERH666	7/31/2018*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-05	ERH709	10/29/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-05	ERH710	10/29/2018*	—				—				—				—				—				—				—				—				—				< 0.019	U			—				—				—			
RHMW11-05	ERH764	1/28/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH816	4/29/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH878	8/1/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH938	10/29/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1002	1/30/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1070	4/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1133	8/3/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1185	10/22/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1242	1/21/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1338	4/29/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1518	7/22/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW11-05	ERH1718	11/11/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW11-05	ERH3186	4/14/2022	—				—				<0.031	U			<0.078	U			—				<0.078	U			—				—				—				—				—				—				—			
RHMW11-05	RHMW11-05-WGN01G-22Q3	07/21/2022	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW11-05	RHMW11-05-WGN01G-22Q4R1	12/8/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW11-05	RHMW11-05-WGN01G-23Q1	2/2/2023	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW11-05	RHMW11-05-WGN01G-23Q2	4/13/2023	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW11-05	RHMW11-05-WGN01G-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW11-05	RHMW11-05-WGN03G-23Q3	9/6/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW11-07	ERH874	8/5/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW11-07	ERH940	10/30/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW12A	ERH1572	8/4/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW12A	ERH1706	10/25/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				< 0.0049	U			—				—				—			
RHMW12A	ERH3270	4/18/2022	—				—				<0.030	UQ			<0.076	UMQ			—				<0.076	UMQ			—				—				—				—		C		—				—				—			
RHMW12A	RHMW12A-WGN01LF-22Q3	07/21/2022	—				—				<0.031	U			<0.078	U			—				<0.078	U			—				—				—				<0.005	U			—				—				—			
RHMW12A	RHMW12A-WGFD01LF-22Q3	07/21/2022*	—				—				<0.031	U			<0.078	U			—				<0.078	U			—				—				—				<0.0048	U			—				—				—			
RHMW12A	RHMW12A-WGFD01LF-22Q4R1	12/8/2022	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				<0.0049	U			—				—				—			
RHMW12A	RHMW12A-WGN01LF-23Q1	1/30/2023	—				—				<0.032	U			<0.079	U			—				<0.079	U			—				—				—				—				—				—				—			
RHMW12A	RHMW12A-WGN01LF-23Q2	4/13/2023	—				—				<0.032	U			<0.079	U			—				<0.079	U			—				—				—				—				—				—				—			
RHMW12A	RHMW12A-WGN01LF-23Q3	7/7/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.005	U			—				—				—			
RHMW13-01	ERH1023	3/3/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-02	ERH1025	3/4/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-03	ERH1027	3/5/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW10	ERH929	11/13/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW10	ERH993	1/28/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW10	ERH1061	4/21/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW10	ERH1125	7/21/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW10	ERH1179	10/13/2020	—				—				—				—				< 4.00	UJ	I		< 80.0	U		
RHMW10	ERH1236	1/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW10	ERH1326	4/22/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW10	ERH1506	7/26/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW10	ERH1704	10/26/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW10	ERH2628	3/4/2022	—				—				—				—				<0.61	U			—			
RHMW10	ERH3258	4/20/2022	—				—				—				—				<0.57	UM			<80	U		
RHMW10	RHMW10-WGN01LF-22Q3	7/25/2022	—				—				—				—				<0.58	U			<80	U		
RHMW10	RHMW10-WGN01LF-22Q4	12/16/2022	—				—				—				—				<0.58	U			<80	U		
RHMW10	RHMW10-WGN01LF-23Q1	2/1/2023	—				—				—				—				<0.59	U			<80	U		
RHMW10	RHMW10-WGN01LF-23Q2	4/11/2023	—				—				—				—				<0.56	U			<80	U		
RHMW10	RHMW10-WGN01LF-23Q3	7/5/2023	—				—				—				—				<2	U			<80	UJ		
RHMW10	RHMW10-WGFD01LF-23Q3	7/5/2023	—				—				—				—				<2	U			<80	UJ		
RHMW11-01	ERH573	3/21/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-01	ERH619	5/2/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-01	ERH674	7/30/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-02	ERH575	3/22/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-02	ERH621	4/30/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-02	ERH672	8/1/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-03	ERH579	3/27/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-03	ERH623	4/30/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-03	ERH670	8/1/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-04	ERH577	3/27/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-04	ERH625	4/26/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-04	ERH668	8/2/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH581	3/28/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH582	3/28/2018*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH627	5/1/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH628	5/1/2018*	—				—				< 0.30	UJ	s		—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH665	7/31/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH666	7/31/2018*	—				—				< 0.30	UJ	s		—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH709	10/29/2018	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW11-05	ERH710	10/29/2018*	—				—				< 0.30	U			—				—				—			
RHMW11-05	ERH764	1/28/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH816	4/29/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH878	8/1/2019	—				—				—				—				< 4.00	U			< 80.0	UJ	I	
RHMW11-05	ERH938	10/29/2019	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1002	1/30/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1070	4/20/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1133	8/3/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1185	10/22/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1242	1/21/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1338	4/29/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1518	7/22/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW11-05	ERH1718	11/11/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW11-05	ERH3186	4/14/2022	—				—				—				—				<0.58	U			< 80	U		
RHMW11-05	RHMW11-05-WGN01G-22Q3	07/21/2022	—				—				—				—				<0.57	U			< 80	U		
RHMW11-05	RHMW11-05-WGN01G-22Q4R1	12/8/2022	—				—				—				—				<0.58	U			< 80	U		
RHMW11-05	RHMW11-05-WGN01G-23Q1	2/2/2023	—				—				—				—				<0.58	U			< 80	U		
RHMW11-05	RHMW11-05-WGN01G-23Q2	4/13/2023	—				—				—				—				<0.57	U			< 80	U		
RHMW11-05	RHMW11-05-WGN01G-23Q3	7/6/2023	—				—				—				—				<2	U			<80	UJ		
RHMW11-05	RHMW11-05-WGN03G-23Q3	9/6/2023	—				—				—				—				—				—			
RHMW11-07	ERH874	8/5/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW11-07	ERH940	10/30/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW12A	ERH1572	8/4/2021	—				—				< 0.30	UJ			—				< 4.00	U			< 80.0	U		
RHMW12A	ERH1706	10/25/2021	—				—				< 0.2	U			—				< 4.8	U			< 80	U		
RHMW12A	ERH3270	4/18/2022	—				—				—C				—				<0.57	UM			<80	U		
RHMW12A	RHMW12A-WGN01LF-22Q3	07/21/2022	—				—				< 0.2	U			—				<0.59	U			<80	U		
RHMW12A	RHMW12A-WGFD01LF-22Q3	07/21/2022*	—				—				< 0.2	U			—				<0.59	U			<80	U		
RHMW12A	RHMW12A-WGFD01LF-22Q4R1	12/8/2022	—				—				< 0.2	U			—				<0.57	U			<80	U		
RHMW12A	RHMW12A-WGN01LF-23Q1	1/30/2023	—				—				—				—				<0.59	U			<80	U		
RHMW12A	RHMW12A-WGN01LF-23Q2	4/13/2023	—				—				—				—				<0.59	U			<80	U		
RHMW12A	RHMW12A-WGN01LF-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW13-01	ERH1023	3/3/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW13-02	ERH1025	3/4/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW13-03	ERH1027	3/5/2020	—				—				< 0.30	UJ	c,s		—				< 4.00	U			< 80.0	UJ	I	

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	300				300				400				—				500				—			
		SSRBL	—				—				4500				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW13-03	ERH1076	4/23/2020	—				< 18	U			< 200	UJ	f,l	Z	—				< 300.0	U			—			
RHMW13-04	ERH1029	3/9/2020	—				< 18	U			**220**	**J**		Z	< 300.0	U			**240**	**J**		Z	< 300.0	U		
RHMW13-04	ERH1078	4/27/2020	—				< 18	U			< 160	U	b,f	Z	< 300.0	U			< 300.0	U			< 300.0	U		
RHMW13-04	ERH1720	11/22/2021	—				< 8.7	U			**58**	**J**			< 150	U			**180**	**J**			< 160	U		
RHMW13-04	ERH1721	11/22/2021*	—				< 8.7	U			< 120	U			—				< 150	U			—			
RHMW13-05	ERH1031	3/10/2020	—				< 18	U			**240**	**J**		Z	< 300.0	U			**240**	**J**		Z	< 300.0	U		
RHMW13-05	ERH1032	3/10/2020	—				< 18	U			**200**	**J**		Z	< 300.0	U			**170**	**J**		Z	< 300.0	U		
RHMW13-05	ERH1080	4/28/2020	—				< 18	U			< 210	U	b,f	Z	< 300.0	U			< 300.0	U			< 300.0	U		
RHMW13-05	ERH1081	4/28/2020	—				< 18	U			< 180	U	b,f	Z	< 300.0	U			< 300.0	U			< 300.0	U		
RHMW13-05	ERH1135	7/29/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1136	7/29/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1187	10/21/2020	—				< 18	U			< 180	U	b		< 300.0	U			< 300.0	U			< 300.0	U		
RHMW13-05	ERH1188	10/21/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1244	1/20/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1245	1/20/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1340	4/27/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1341	4/27/2021*	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1520	7/21/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH1521	7/21/2021*	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW13-05	ERH2640	3/2/2022	<8.7	U			—				<140	U			—				<140	U			—			
RHMW13-05	ERH3163	4/13/2022	<8.7	U			—				<150	U			—				<150	U			—			
RHMW13-05	RHMW13-05-WGN01G-22Q3	07/20/2022	<8.7	U			—				<154	U			—				<154	U			—			
RHMW13-05	RHMW13-05-WGN01G-22Q4	12/7/2022	<8.7	U			—				**475**				<150	U			**595**				<150	U		
RHMW13-05	RHMW13-05-WGN01G-23Q1	2/9/2023	<8.5	U			—				<143	U			<114	U			<143	U			<143	U		
RHMW13-05	RHMW13-05-WGN01G-23Q2	4/12/2023	<8.5	U			—				<143	U			—				<143	U			—			
RHMW13-05	RHMW13-05-WGN01G-23Q3	7/5/2023	<8.5	U			—				<141	U			—				<141	U			—			
RHMW14-01	ERH942	10/21/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-01	ERH1004	1/20/2020	—				< 18	U			< 160	U	f	Z	< 25	U			< 95	U	f	Z	< 40	U		
RHMW14-02	ERH944	10/22/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-02	ERH1006	1/21/2020	—				< 18	U			< 130	U	f	Z	< 25	U			< 110	U	f	Z	< 40	U		
RHMW14-03	ERH882	7/30/2019	—				< 18	UJ	q		< 25	U			—				< 40	U			—			
RHMW14-03	ERH883	7/30/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-03	ERH946	10/28/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-03	ERH947	10/28/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-03	ERH1008	1/22/2020	—				< 18	U			< 25	UJ	l		—				< 40	UJ	l		—			
RHMW14-03	ERH1009	1/22/2020*	—				< 18	U			< 25	UJ	l		< 25	U			< 220	UJ	f l	W	< 74	U	f	W
RHMW14-03	ERH1072	4/21/2020	—				< 18	U			< 300.0	U			< 300.0	U			**150**	**J**	l	Z	< 300.0	U		
RHMW14-03	ERH1138	7/30/2020	—				< 18	U			**150**	**J**		Z	< 300.0	U			< 300.0	U			< 300.0	U		
RHMW14-03	ERH1190	10/20/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW14-03	ERH1247	1/19/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW14-03	ERH1343	4/26/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW14-03	ERH1523	7/19/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U		
RHMW14-03	ERH1723	10/12/2022	—				< 8.7	U			**42**	**J**			< 120	U			< 150	U			< 150	U		
RHMW14-03	ERH1822	11/17/2021	—				—				—				—				—				—			
RHMW14-03	ERH1869	11/17/2021	—				—				—				—				—				—			
RHMW14-03	ERH3145	4/12/2022	<8.7	U			—				<150	U			—				<150	U			—			
RHMW14-03	RHMW14-03-WGN01G-22Q3	07/19/2022	<8.7	U			—				<149	U			—				<149	U			—			
RHMW14-03	RHMW14-03-WGN01G-22Q4	12/6/2022	<8.7	U			—				<150	U			<150	U			<150	U			<150	U		
RHMW14-03	RHMW14-03-WGN01G-23Q1R1	2/2/2023	<8.5	U			—				**37.1**	**J**			<143	U			<143	U			<143	U		
RHMW14-03	RHMW14-03-WGN01G-23Q2	4/11/2023	<8.5	U			—				<146	U			—				<146	U			—			
RHMW14-03	RHMW14-03-WGN01G-23Q3	7/7/2023	<8.5	U			—				<141	U			—				<141	U			—			
RHMW14-04	ERH880	7/29/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-04	ERH949	10/24/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-05	ERH872	7/31/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-05	ERH951	10/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-07	ERH876	8/6/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW14-07	ERH953	10/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-01	ERH955	11/4/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-02	ERH957	11/5/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-03	ERH959	11/7/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-03	ERH1011	1/27/2020	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-04	ERH961	10/31/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-04	ERH1013	1/28/2020	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-05	ERH963	11/6/2019	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-05	ERH964	11/6/2019*	—				< 18	U			< 25	U			—				< 40	U			—			
RHMW15-05	ERH1015	1/29/2020	—				< 18	U			< 220	U	f	Z	< 25	U			< 40	U			< 40	U		
RHMW15-05	ERH1074	4/22/2020	—				< 18	U			< 160	UJ	f,l	Z	—				< 300.0	U			—			
RHMW15-05	ERH1140	7/28/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW15-05	ERH1192	10/19/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
RHMW15-05	ERH1249	1/18/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			

		Analyte Class	Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Methoc	8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	5				5				30				30				40				40				20			
		SSRBL	750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW13-03	ERH1076	4/23/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-04	ERH1029	3/9/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-04	ERH1078	4/27/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-04	ERH1720	11/22/2021	< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW13-04	ERH1721	11/22/2021*	< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW13-05	ERH1031	3/10/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1032	3/10/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1080	4/28/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1081	4/28/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1135	7/29/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1136	7/29/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1187	10/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1188	10/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1244	1/20/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1245	1/20/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1340	4/27/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1341	4/27/2021*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1520	7/21/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH1521	7/21/2021*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW13-05	ERH2640	3/2/2022	<0.2	U			—				<0.2	U			—				<0.2	UT			—				<0.2	U		
RHMW13-05	ERH3163	4/13/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW13-05	RHMW13-05-WGN01G-22Q3	07/20/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW13-05	RHMW13-05-WGN01G-22Q4	12/7/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW13-05	RHMW13-05-WGN01G-23Q1	2/9/2023	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW13-05	RHMW13-05-WGN01G-23Q2	4/12/2023	<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW13-05	RHMW13-05-WGN01G-23Q3	7/5/2023	< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW14-01	ERH942	10/21/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-01	ERH1004	1/20/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-02	ERH944	10/22/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-02	ERH1006	1/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH882	7/30/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	UJ	q	
RHMW14-03	ERH883	7/30/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH946	10/28/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH947	10/28/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1008	1/22/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1009	1/22/2020*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1072	4/21/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1138	7/30/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1190	10/20/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1247	1/19/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1343	4/26/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1523	7/19/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-03	ERH1723	10/12/2022	< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW14-03	ERH1822	11/17/2021	—				—				—				—				—				—				—			
RHMW14-03	ERH1869	11/17/2021	—				—				—				—				—				—				—			
RHMW14-03	ERH3145	4/12/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW14-03	RHMW14-03-WGN01G-22Q3	07/19/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW14-03	RHMW14-03-WGN01G-22Q4	12/6/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW14-03	RHMW14-03-WGN01G-23Q1R1	2/2/2023	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW14-03	RHMW14-03-WGN01G-23Q2	4/11/2023	<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW14-03	RHMW14-03-WGN01G-23Q3	7/7/2023	< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW14-04	ERH880	7/29/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-04	ERH949	10/24/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-05	ERH872	7/31/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-05	ERH951	10/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-07	ERH876	8/6/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW14-07	ERH953	10/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-01	ERH955	11/4/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-02	ERH957	11/5/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-03	ERH959	11/7/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-03	ERH1011	1/27/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-04	ERH961	10/31/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-04	ERH1013	1/28/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH963	11/6/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH964	11/6/2019*	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH1015	1/29/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH1074	4/22/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH1140	7/28/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH1192	10/19/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH1249	1/18/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW13-03	ERH1076	4/23/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-04	ERH1029	3/9/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-04	ERH1078	4/27/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-04	ERH1720	11/22/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW13-04	ERH1721	11/22/2021*	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW13-05	ERH1031	3/10/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1032	3/10/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1080	4/28/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1081	4/28/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1135	7/29/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1136	7/29/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1187	10/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1188	10/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1244	1/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1245	1/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1340	4/27/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1341	4/27/2021*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW13-05	ERH1520	7/21/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW13-05	ERH1521	7/21/2021*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW13-05	ERH2640	3/2/2022	—				—				<0.032	UMQ			<0.08	UMQ			—				<0.08	UMQ			—				—				—				—				—				—				—			
RHMW13-05	ERH3163	4/13/2022	—				—				<0.033	U			<0.083	U			—				<0.083	UM			—				—				—				—				—				—				—			
RHMW13-05	RHMW13-05-WGN01G-22Q3	07/20/2022	—				—				<0.031	U			<0.079	U			—				<0.079	U			—				—				—				—				—				—				—			
RHMW13-05	RHMW13-05-WGN01G-22Q4	12/7/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW13-05	RHMW13-05-WGN01G-23Q1	2/9/2023	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW13-05	RHMW13-05-WGN01G-23Q2	4/12/2023	—				—				<0.03	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW13-05	RHMW13-05-WGN01G-23Q3	7/5/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW14-01	ERH942	10/21/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-01	ERH1004	1/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-02	ERH944	10/22/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-02	ERH1006	1/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH882	7/30/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH883	7/30/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH946	10/28/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH947	10/28/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH1008	1/22/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH1009	1/22/2020*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH1072	4/21/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-03	ERH1138	7/30/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW14-03	ERH1190	10/20/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW14-03	ERH1247	1/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW14-03	ERH1343	4/26/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW14-03	ERH1523	7/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW14-03	ERH1723	10/12/2022	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW14-03	ERH1822	11/17/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW14-03	ERH1869	11/17/2021	—				—				—				—				—				—				—				—				—				—				—				—							
RHMW14-03	ERH3145	4/12/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW14-03	RHMW14-03-WGN01G-22Q3	07/19/2022	—				—				<0.032	U			<0.08	U			—				<0.08	U			—				—				—				—				—				—				—			
RHMW14-03	RHMW14-03-WGN01G-22Q4	12/6/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW14-03	RHMW14-03-WGN01G-23Q1R1	2/2/2023	—				—				<0.032	U			<0.08	U			—				<0.08	U			—				—				—				—				—				—				—			
RHMW14-03	RHMW14-03-WGN01G-23Q2	4/11/2023	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW14-03	RHMW14-03-WGN01G-23Q3	7/7/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW14-04	ERH880	7/29/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-04	ERH949	10/24/2019	—				—				< 0.10	UJ	I		< 0.10	UJ	I		—				< 0.10	UJ	I		—				—				—				< 0.019	U			—				—				—			
RHMW14-05	ERH872	7/31/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-05	ERH951	10/23/2019	—				—				< 0.10	UJ	I		< 0.10	UJ	I		—				< 0.10	UJ	I		—				—				—				< 0.019	U			—				—				—			
RHMW14-07	ERH876	8/6/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW14-07	ERH953	10/23/2019	—				—				< 0.10	UJ	I		< 0.10	UJ	I		—				< 0.10	UJ	I		—				—				—				< 0.019	U			—				—				—			
RHMW15-01	ERH955	11/4/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-02	ERH957	11/5/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-03	ERH959	11/7/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-03	ERH1011	1/27/2020	—				—				< 0.10	UJ	s		< 0.10	UJ	s		—				< 0.10	UJ	s		—				—				—				< 0.019	U			—				—				—			
RHMW15-04	ERH961	10/31/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-04	ERH1013	1/28/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-05	ERH963	11/6/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-05	ERH964	11/6/2019*	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-05	ERH1015	1/29/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-05	ERH1074	4/22/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-05	ERH1140	7/28/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW15-05	ERH1192	10/19/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW15-05	ERH1249	1/18/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW13-03	ERH1076	4/23/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-04	ERH1029	3/9/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-04	ERH1078	4/27/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW13-04	ERH1720	11/22/2021	—				—				—				—				< 5.0	U			< 80	U		
RHMW13-04	ERH1721	11/22/2021*	—				—				—				—				< 5.6	U			< 80	U		
RHMW13-05	ERH1031	3/10/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1032	3/10/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1080	4/28/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW13-05	ERH1081	4/28/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW13-05	ERH1135	7/29/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1136	7/29/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1187	10/21/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1188	10/21/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1244	1/20/2021	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1245	1/20/2021	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1340	4/27/2021	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1341	4/27/2021*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1520	7/21/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH1521	7/21/2021*	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW13-05	ERH2640	3/2/2022	—				—				—				—				<0.6	UQ			—			
RHMW13-05	ERH3163	4/13/2022	—				—				—				—				<0.62	UM			<80	U		
RHMW13-05	RHMW13-05-WGN01G-22Q3	07/20/2022	—				—				—				—				<0.59	U			<80	U		
RHMW13-05	RHMW13-05-WGN01G-22Q4	12/7/2022	—				—				—				—				<0.58	U			<80	U		
RHMW13-05	RHMW13-05-WGN01G-23Q1	2/9/2023	—				—				—				—				<0.57	U			<80	U		
RHMW13-05	RHMW13-05-WGN01G-23Q2	4/12/2023	—				—				—				—				<0.57	U			<80	U		
RHMW13-05	RHMW13-05-WGN01G-23Q3	7/5/2023	—				—				—				—				<2	U			<80	UJ		
RHMW14-01	ERH942	10/21/2019	—				—				< 0.30	U			—				< 4.00	UJ	I		< 80.0	U		
RHMW14-01	ERH1004	1/20/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-02	ERH944	10/22/2019	—				—				< 0.30	U			—				< 4.00	UJ	I		< 80.0	U		
RHMW14-02	ERH1006	1/21/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH882	7/30/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW14-03	ERH883	7/30/2019*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW14-03	ERH946	10/28/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH947	10/28/2019*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH1008	1/22/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW14-03	ERH1009	1/22/2020*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW14-03	ERH1072	4/21/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH1138	7/30/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH1190	10/20/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH1247	1/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH1343	4/26/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH1523	7/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW14-03	ERH1723	10/12/2022	—				—				—				—				—				—			
RHMW14-03	ERH1822	11/17/2021					—				—				—				—				< 80	U		
RHMW14-03	ERH1869	11/17/2021	—				—				—				—				< 4.8	U			—			
RHMW14-03	ERH3145	4/12/2022	—				—				—				—				<0.57	UM			<80	U		
RHMW14-03	RHMW14-03-WGN01G-22Q3	07/19/2022	—				—				—				—				<0.6	U			<80	U		
RHMW14-03	RHMW14-03-WGN01G-22Q4	12/6/2022	—				—				—				—				<0.58	U			<80	UJ		
RHMW14-03	RHMW14-03-WGN01G-23Q1R1	2/2/2023	—				—				—				—				<0.6	U			<80	U		
RHMW14-03	RHMW14-03-WGN01G-23Q2	4/11/2023	—				—				—				—				<0.58	U			<80	U		
RHMW14-03	RHMW14-03-WGN01G-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW14-04	ERH880	7/29/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW14-04	ERH949	10/24/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-05	ERH872	7/31/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW14-05	ERH951	10/23/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-07	ERH876	8/6/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW14-07	ERH953	10/23/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-01	ERH955	11/4/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-02	ERH957	11/5/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-03	ERH959	11/7/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-03	ERH1011	1/27/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW15-04	ERH961	10/31/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW15-04	ERH1013	1/28/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH963	11/6/2019	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH964	11/6/2019*	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH1015	1/29/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH1074	4/22/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH1140	7/28/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH1192	10/19/2020	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH1249	1/18/2021	—				—				—				—				< 4.00	U			< 80.0	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC				COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015				8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup				Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC				71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	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			
		DOH EAL	300				300				400				—				500				—				5				5				30				30				40				40				20			
		SSRBL	—				—				4500				—				—				—				750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW15-05	ERH1345	4/26/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH1525	7/20/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			< 300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW15-05	ERH1725	11/16/2021	—				< 8.7	U			**56**	**J**			< 120	U			**240**	**J**			< 150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW15-05	ERH2671	3/4/2022	<8.7	U			—				**41**	**J**			<140	U			**210**	**J**			<140	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW15-05	ERH1733	4/11/2022	<8.7	U			—				<150	UJ			—				<150	UJ			—				< 0.2	UJ			—				< 0.2	UJ			—				< 0.2	UJ			—				< 0.2	UJ		
RHMW15-05	RHMW15-05-WGN01G-22Q3	07/18/2022	<8.7	U			—				**89**	**J**			<148	U			**316**				<148	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW15-05	RHMW15-05-WGN01G-22Q4	12/5/2022	**2.15**	**J**			—				<150	U			<150	U			<150	U			<150	U			< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW15-05	RHMW15-05-WGN01G-23Q1	1/30/2023	< 8.5	U			—				<150	U			—				<150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW15-05	RHMW15-05-WGN01G-23Q2	4/10/2023	< 8.5	U			—				<150	U			—				<150	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW15-05	RHMW15-05-WGN01G-23Q3	7/3/2023	<8.5	U			—				<141	U			—				<141	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW16	ERH1328	4/14/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW16	ERH1508	7/14/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW16	ERH1708	10/13/2021	—				<8.7	U			< 140	U			—				< 140	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW16	ERH3139	4/14/2022	<8.7	U			—				<150	U			—				<150	U			—				<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW16	RHMW16-WGN01LF-22Q3	07/20/2022	<8.7	U			—				**84**	**J**			**42**	**J**			**212**	**J**			<150	U			<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW16	RHMW16-WGN01LF-22Q4	12/8/2022	<8.7	U			—				**212**	**J**			<149	U			**368**				<149	U			<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW16	RHMW16-WGN01LF-23Q1	2/2/2023	<8.5	U			—				<143	U			<143	U			<143	U			<143	U			<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW16	RHMW16-WGN01LF-23Q2	4/12/2023	<8.5	U			—				<143	U			—				<143	U			—				<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW16	RHMW16-WGN01LF-23Q3	7/7/2023	<8.5	U			—				<141	U			—				<141	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW16	RHMW16-WGFD01LF-23Q3	7/7/2023	<8.5	U			—				<141	U			—				<141	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW17	RHMW17-WGN01LF-22Q3	07/29/2022	<8.7	U			—				<148	U			—				<148	U			—				<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW17	RHMW17-WGN01LF-22Q4	12/16/2022	<8.7	U			—				<149	U			—				<149	U			—				<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW17	RHMW17-WGN01LF-23Q1	2/1/2023	<8.5	U			—				<143	U			—				<143	U			—				<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW17	RHMW17-WGN01LF-23Q2	4/20/2023	<8.5	U			—				<143	U			—				<143	U			—				<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW17	RHMW17-WGN01LF-23Q3	7/7/2023	<8.5	U			—				<143	U			<143	U			<143	U			<143	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW19	ERH1103	7/15/2020	—				< 18	U			< 150	U	b	Z	< 300.0	U			**150**	**J**		Z	<300.0	U			< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW19	ERH1155	10/7/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW19	ERH1212	1/20/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW19	ERH1332	4/27/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW19	ERH1512	7/22/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—				< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
RHMW19	ERH1712	10/26/2021	—				< 8.7	U			< 140	U			—				< 140	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
RHMW19	ERH3213	4/15/2022	<8.7	U			—				<150	U			<150	U			<150	U			<150	U			<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW19	RHMW19-WGN01LF-22Q3	07/26/2022	<8.7	U			—				<149	U			—				<149	U			—				<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW19	RHMW19-WGN01LF-22Q4	12/13/2022	<8.7	U			—				<149	U			—				<149	U			—				<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW19	RHMW19-WGN01LF-23Q1	2/1/2023	<8.5	U			—				<146	U			—				<146	U			—				<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
RHMW19	RHMW19-WGN01LF-23Q2	4/20/2023	<8.5	U			—				<143	U			—				<143	U			—				<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
RHMW19	RHMW19-WGN01LF-23Q3	7/6/2023	<8.5	U			—				<145	U			—				<145	U			—				< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
RHMW19	RHMW19-WGN03LF-23Q3	9/5/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW20	RHMW20-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW20	RHMW20-WGN01LF-23Q3	7/6/2023	<8.5	U			—				<143	U			<143	U			**114**	**J**			<143	U			< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
HDMW2253-03	HDMW2253-03-WG-02	10/13/2009[abd]	< 30	U			—				< 185	U			—				—				—				< 0.12	U			—				< 0.31	U			—				< 0.31	U			—				< 0.62	U		
HDMW2253-03	HDMW2253-03-WG-03	1/26/2010[d]	< 60.0	U			—				**322**	**J**			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
HDMW2253-03	HDMW2253-03-WG-04	4/26/2010[d]	< 60.0	U			—				< 352	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
HDMW2253-03	HDMW2253-03-WG-05	7/8/2010[d]	< 60.0	U			—				< 320	U			—				—				—				< 0.240	U			—				< 0.620	U			—				< 0.620	U			—				< 1.24	U		
HDMW2253-03	ES006	10/21/2010[d]	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES016	1/21/2011[d]	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES028	4/21/2011[d]	—				< 12.12	U			< 80.8	U			—				—				—				**0.42**	**J**			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES043	7/21/2011[d]	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES053	10/26/2011	—				< 12.12	U			< 80.8	U			—				—				—				**0.92**	**J**			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES057	1/24/2012	—				< 12.12	U			< 80.8	U			—				< 212.0	U			—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES076	4/26/2012	—				< 12.12	U			**160**			Y	—				—				—				**0.20**	**J**			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES083	7/19/2012	—				< 12.12	U			< 80.8	U			—				—				—				< 0.32	U			—				< 0.46	U			—				< 0.34	U			—				< 0.38	U		
HDMW2253-03	ES009	11/7/2012	—				< 15	UJ	b h		**25**	**J**		Y	—				—				—				< 0.50	UJ	h		—				< 0.50	UJ	h		—				< 0.50	UJ	h		—				< 1.0	UJ	h	
HDMW2253-03	ES018	1/30/2013	—				< 30	U			**600**				—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES027	4/24/2013	—				< 30	U			**45**	**J**			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES036	7/24/2013	—				< 30	U			< 21	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES045	10/23/2013	—				< 15	UJ	b		< 20	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES051	1/22/2014[d]	—				—				**18**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES052	1/22/2014*[d]	—				—				**18**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES055	1/27/2014[d]	—				< 27	UJ	b		**35**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES088***	4/23/2014[d]	—				< 27	UJ	b		**220**			Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES111	7/23/2014	—				< 30	U			< 12	U			—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES120	10/22/2014	—				< 30	U			**14**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				**3.8**				—				< 1.0	U		
HDMW2253-03	ES128	1/29/2015	—				< 30	U			**16**	**J**		Y	—				—				—				< 0.50	U			—				< 0.50	U			—				< 0.50	U			—				< 1.0	U		
HDMW2253-03	ES136	4/22/2015	< 25	U			—				**13**	**J**			—				< 55	UJ	b		—				< 0.10	U			—				< 0.10	U			—				**0.070**	**J**			—				< 0.20	U		
HDMW2253-03	ES151	7/22/2015	< 25	U			—				< 18	UJ	b		—				< 77	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
HDMW2253-03	ERH001	10/19/2015	**16**	**J**			—				< 21	UJ	b		—				< 56	UJ	b		—				< 0.10	UJ	h		—				< 0.10	UJ	h		—				< 0.37	UJ	h t		—				< 0.20	UJ	h	
HDMW2253-03	ERH015	1/19/2016	< 25	U			—				< 43	UJ	b		—				< 63	UJ	b		—				< 0.10	U			—				< 0.10	U			—				< 0.24	UJ	t		—				< 0.20	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW15-05	ERH1345	4/26/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW15-05	ERH1525	7/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW15-05	ERH1725	11/16/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW15-05	ERH2671	3/4/2022	—				—				<0.032	U			<0.8	U			—				<0.8	U			—				—				—				—				—				—				—			
RHMW15-05	ERH1733	4/11/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW15-05	RHMW15-05-WGN01G-22Q3	07/18/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW15-05	RHMW15-05-WGN01G-22Q4	12/5/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW15-05	RHMW15-05-WGN01G-23Q1	1/30/2023	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW15-05	RHMW15-05-WGN01G-23Q2	4/10/2023	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW15-05	RHMW15-05-WGN01G-23Q3	7/3/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW16	ERH1328	4/14/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW16	ERH1508	7/14/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW16	ERH1708	10/13/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				< 0.0049	U			—				—				—			
RHMW16	ERH3139	4/14/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				<0.0049	U			—				—				—			
RHMW16	RHMW16-WGN01LF-22Q3	07/20/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW16	RHMW16-WGN01LF-22Q4	12/8/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW16	RHMW16-WGN01LF-23Q1	2/2/2023	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW16	RHMW16-WGN01LF-23Q2	4/12/2023	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW16	RHMW16-WGN01LF-23Q3	7/7/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW16	RHMW16-WGFD01LF-23Q3	7/7/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW17	RHMW17-WGN01LF-22Q3	07/29/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				<0.0049	U			—				—				—			
RHMW17	RHMW17-WGN01LF-22Q4	12/16/2022	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				<0.0098	U			—				—				—			
RHMW17	RHMW17-WGN01LF-23Q1	2/1/2023	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				<0.00499	U			—				—				—			
RHMW17	RHMW17-WGN01LF-23Q2	4/20/2023	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				<0.00499	U			—				—				—			
RHMW17	RHMW17-WGN01LF-23Q3	7/7/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHMW19	ERH1103	7/15/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW19	ERH1155	10/7/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW19	ERH1212	1/20/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW19	ERH1332	4/27/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				< 0.019	U			—				—				—			
RHMW19	ERH1512	7/22/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
RHMW19	ERH1712	10/26/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
RHMW19	ERH3213	4/15/2022	—				—				<0.030	UQ			<0.076	UQ			—				<0.076	UQ			—				—				—				—				—				—				—			
RHMW19	RHMW19-WGN01LF-22Q3	07/26/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW19	RHMW19-WGN01LF-22Q4	12/13/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW19	RHMW19-WGN01LF-23Q1	2/1/2023	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
RHMW19	RHMW19-WGN01LF-23Q2	4/20/2023	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
RHMW19	RHMW19-WGN01LF-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.01	U			—				—				—			
RHMW19	RHMW19-WGN03LF-23Q3	9/5/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW20	RHMW20-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHMW20	RHMW20-WGN01LF-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.0049	U			—				—				—			
HDMW2253-03	HDMW2253-03-WG-02	10/13/2009[abd]	—				—				< 0.0169	U			< 0.0169	U			—				< 0.035	U			< 0.62	U			—				—				—				< 0.31	U			—				—			
HDMW2253-03	HDMW2253-03-WG-03	1/26/2010[d]	—				—				< 0.0500	U			< 0.0500	U			—				< 0.103	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
HDMW2253-03	HDMW2253-03-WG-04	4/26/2010[d]	—				—				< 0.0348	U			< 0.0348	U			—				< 0.0720	U			< 1.24	U			—				—				—				< 0.620	U			—				—			
HDMW2253-03	HDMW2253-03-WG-05	7/8/2010[d]	—				—				< 0.0348	U			< 0.0348	U			—				**0.0596**	**J**			< 1.24	U			—				—				—				< 0.620	U			—				—			
HDMW2253-03	ES006	10/21/2010[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES016	1/21/2011[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES028	4/21/2011[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES043	7/21/2011[d]	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES053	10/26/2011	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES057	1/24/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES076	4/26/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES083	7/19/2012	—				—				< 0.12	U			< 0.12	U			—				< 0.10	U			—				—				—				—				< 0.40	U			—				—			
HDMW2253-03	ES009	11/7/2012	—				—				< 0.050	U			< 0.050	U			—				< 0.050	U			—				—				—				—				< 0.50	UJ	h		—				—			
HDMW2253-03	ES018	1/30/2013	—				—				< 0.050	U			< 0.050	U			—				**0.037**	**J**			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES027	4/24/2013	—				—				< 0.052	U			< 0.052	U			—				**0.16**	**J**			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES036	7/24/2013	—				—				< 0.047	U			< 0.047	U			—				**0.030**	**J**			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES045	10/23/2013	—				—				< 0.050	U			< 0.050	U			—				**0.041**	**J**			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES051	1/22/2014[d]	—				—				< 0.051	U			< 0.051	U			—				< 0.051	U			—				—				—				—				—				—				—			
HDMW2253-03	ES052	1/22/2014[*d]	—				—				< 0.051	U			< 0.051	U			—				< 0.051	U			—				—				—				—				—				—				—			
HDMW2253-03	ES055	1/27/2014[d]	—				—				< 0.051	U			< 0.051	U			—				**0.064**	**J**			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES088***	4/23/2014[d]	—				—				< 0.051	U			< 0.051	U			—				< 0.051	U			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES111	7/23/2014	—				—				< 0.053	U			< 0.053	U			—				< 0.053	U			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES120	10/22/2014	—				—				< 0.10	U			< 0.051	U			—				< 0.051	U			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES128	1/29/2015	—				—				< 0.11	U			< 0.053	U			—				< 0.053	U			—				—				—				—				< 0.50	U			—				—			
HDMW2253-03	ES136	4/22/2015	—				—				< 0.0052	U			< 0.0052	U			—				< 0.0052	U			—				—				—				< 0.0040	UJ	h		< 0.20	U			—				—			
HDMW2253-03	ES151	7/22/2015	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			
HDMW2253-03	ERH001	10/19/2015	—				—				< 0.0050	U			< 0.0050	UJ	b		—				< 0.0042	UJ	b		—				—				—				< 0.0040	U			< 0.20	UJ	h		—				—			
HDMW2253-03	ERH015	1/19/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				< 0.0040	U			< 0.20	U			—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
RHMW15-05	ERH1345	4/26/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH1525	7/20/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW15-05	ERH1725	11/16/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW15-05	ERH2671	3/4/2022	—				—				—				—				<0.6	U			—			
RHMW15-05	ERH1733	4/11/2022	—				—				—				—				**0.57**	**J**			<80	U		
RHMW15-05	RHMW15-05-WGN01G-22Q3	07/18/2022	—				—				—				—				<0.57	U			<80	U		
RHMW15-05	RHMW15-05-WGN01G-22Q4	12/5/2022	—				—				—				—				<0.57	U			<80	UJ		
RHMW15-05	RHMW15-05-WGN01G-23Q1	1/30/2023	—				—				—				—				<0.57	U			<80	U		
RHMW15-05	RHMW15-05-WGN01G-23Q2	4/10/2023	—				—				—				—				<0.58	U			<80	U		
RHMW15-05	RHMW15-05-WGN01G-23Q3	7/3/2023	—				—				—				—				<2	U			<80	UJ		
RHMW16	ERH1328	4/14/2021	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW16	ERH1508	7/14/2021	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW16	ERH1708	10/13/2021	—				—				< 0.2	U			—				< 4.9	U			< 80	U		
RHMW16	ERH3139	4/14/2022	—				—				<0.2	U			—				<0.57	UM			<80	U		
RHMW16	RHMW16-WGN01LF-22Q3	07/20/2022	—				—				—				—				<0.57	U			<80	U		
RHMW16	RHMW16-WGN01LF-22Q4	12/8/2022	—				—				—				—				<0.57	U			<80	U		
RHMW16	RHMW16-WGN01LF-23Q1	2/2/2023	—				—				—				—				<0.57	U			<80	U		
RHMW16	RHMW16-WGN01LF-23Q2	4/12/2023	—				—				—				—				<0.57	U			<80	U		
RHMW16	RHMW16-WGN01LF-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW16	RHMW16-WGFD01LF-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW17	RHMW17-WGN01LF-22Q3	07/29/2022	—				—				<0.2	U			—				<0.57	U			<80	U		
RHMW17	RHMW17-WGN01LF-22Q4	12/16/2022	—				—				<0.2	U			—				<0.57	U			<80	U		
RHMW17	RHMW17-WGN01LF-23Q1	2/1/2023	—				—				<0.2	U			—				<0.57	U			<80	U		
RHMW17	RHMW17-WGN01LF-23Q2	4/20/2023	—				—				<0.1	U			—				<0.57	U			<80	U		
RHMW17	RHMW17-WGN01LF-23Q3	7/7/2023	—				—				—				—				<2	U			<80	UJ		
RHMW19	ERH1103	7/15/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW19	ERH1155	10/7/2020	—				—				< 0.30	U			—				< 4.00	U			< 80.0	UJ	I	
RHMW19	ERH1212	1/20/2021	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW19	ERH1332	4/27/2021	—				—				< 0.30	U			—				< 4.00	U			< 80.0	U		
RHMW19	ERH1512	7/22/2021	—				—				—				—				< 4.00	U			< 80.0	U		
RHMW19	ERH1712	10/26/2021	—				—				—				—				< 4.8	U			< 80	U		
RHMW19	ERH3213	4/15/2022	—				—				—				—				<0.57	UQ			<80	U		
RHMW19	RHMW19-WGN01LF-22Q3	07/26/2022	—				—				—				—				<0.57	U			<80	U		
RHMW19	RHMW19-WGN01LF-22Q4	12/13/2022	—				—				—				—				<0.57	U			<80	U		
RHMW19	RHMW19-WGN01LF-23Q1	2/1/2023	—				—				—				—				<0.57	U			<80	U		
RHMW19	RHMW19-WGN01LF-23Q2	4/20/2023	—				—				—				—				<0.58	U			<80	U		
RHMW19	RHMW19-WGN01LF-23Q3	7/6/2023	—				—				—				—				<2	U			<80	UJ		
RHMW19	RHMW19-WGN03LF-23Q3	9/5/2023	—				—				—				—				—				—			
RHMW20	RHMW20-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—			
RHMW20	RHMW20-WGN01LF-23Q3	7/6/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
HDMW2253-03	HDMW2253-03-WG-02	10/13/2009[abd]	—				—				< 0.15	U			—				—				—			
HDMW2253-03	HDMW2253-03-WG-03	1/26/2010[d]	—				—				< 0.300	U			—				—				—			
HDMW2253-03	HDMW2253-03-WG-04	4/26/2010[d]	—				—				< 0.300	U			—				—				—			
HDMW2253-03	HDMW2253-03-WG-05	7/8/2010[d]	—				—				< 0.300	U			—				—				—			
HDMW2253-03	ES006	10/21/2010[d]	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES016	1/21/2011[d]	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES028	4/21/2011[d]	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES043	7/21/2011[d]	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES053	10/26/2011	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES057	1/24/2012	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES076	4/26/2012	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES083	7/19/2012	—				—				< 0.28	U			—				—				—			
HDMW2253-03	ES009	11/7/2012	—				—				< 0.50	UJ	h		—				—				—			
HDMW2253-03	ES018	1/30/2013	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES027	4/24/2013	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES036	7/24/2013	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES045	10/23/2013	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES051	1/22/2014[d]	—				—				—				—				—				—			
HDMW2253-03	ES052	1/22/2014[*d]	—				—				—				—				—				—			
HDMW2253-03	ES055	1/27/2014[d]	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES088***	4/23/2014[d]	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES111	7/23/2014	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES120	10/22/2014	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES128	1/29/2015	—				—				< 0.50	U			—				—				—			
HDMW2253-03	ES136	4/22/2015	< 0.010	U			< 0.015	U			—				—				—				—			
HDMW2253-03	ES151	7/22/2015	—				< 0.015	U			—				—				—				—			
HDMW2253-03	ERH001	10/19/2015	—				< 0.015	U			—				—				—				—			
HDMW2253-03	ERH015	1/19/2016	—				< 0.015	U			—				—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	TPH				TPH				TPH				TPH				TPH				TPH			
		Analyte Type	COPC				COPC				COPC				COPC				COPC				COPC			
		Analytical Methoc	8015				8260				8015				8015				8015				8015			
		Analyte	TPH-g ****				TPH-g ****				TPH-d				TPH-d with Silica Gel Cleanup				TPH-o				TPH-o with Silica Gel Cleanup			
		CAS No.	Gas				Gas				Diesel				Diesel SGC				Oil				Oil SGC			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	300				300				400				—				500				—			
		SSRBL	—				—				4500				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
HDMW2253-03	ERH029	4/19/2016	< 21	U	f		—				< 25	U	b f		—				< 48	U	b f		—			
HDMW2253-03	ERH043	7/19/2016	< 25	U			—				< 13	U	f		—				< 32	U	b f		—			
HDMW2253-03	ERH095	10/18/2016	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH127	11/16/2016	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH145	12/13/2016	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH176	1/10/2017	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH176 (EPA split)	1/10/2017	< 25	UJ	c		—				< 71	U			—				< 290	U			—			
HDMW2253-03	ERH214	2/7/2017	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH214 (EPA split)	2/7/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
HDMW2253-03	ERH280	3/8/2017	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH280 (EPA split)	3/8/2017	< 25	UJ	c		—				< 75	U			—				< 300	U			—			
HDMW2253-03	ERH437	10/31/2017	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH568	3/12/2018	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH614	4/23/2018	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH660	7/23/2018	—				< 18	UJ	s		< 25	UJ	s		—				< 40	UJ	l s		—			
HDMW2253-03	ERH704	10/22/2018	—				< 18	U			< 25	UJ	h		—				< 40	UJ	h		—			
HDMW2253-03	ERH759	2/7/2019	—				< 18	UJ	c l		< 25	U			—				< 40	U			—			
HDMW2253-03	ERH811	4/25/2019	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH867	7/25/2019	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH931	10/23/2019	—				< 18	U			< 25	U			—				< 40	U			—			
HDMW2253-03	ERH997	1/23/2020	—				< 18	U			< 25	UJ	l		—				< 40	UJ	l		—			
HDMW2253-03	ERH1065	4/23/2020	—				< 18	U			**190**	**J**	l	Z	—				< 300.0	U			—			
HDMW2253-03	ERH1131	7/23/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
HDMW2253-03	ERH1183	10/15/2020	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
HDMW2253-03	ERH1234	1/21/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
HDMW2253-03	ERH1336	4/19/2021	—				< 18	U			< 300.0	U			—				< 300.0	U			—			
HDMW2253-03	ERH1516	7/21/2021	—				< 18	U			< 300.0	U			< 300.0	U			< 300.0	U			—			
HDMW2253-03	ERH1716	10/21/2021	—				< 8.7	U			< 140	U			—				< 140	U			—			
HDMW2253-03	ERH2631	3/4/2022	<8.7	U			—				<140	U			<140				**140**	**J**			<140	U		
HDMW2253-03	ERH3210	4/22/2022	<8.7	U			—				<150	U			—				<150	U			—			
HDMW2253-03	HDMW2253-03-WGN01LF-22Q3	07/22/2022	<8.7	U			—				<150	U			—				<150	U			—			
HDMW2253-03	HDMW2253-03-WGN01LF-22Q4	12/12/2022	<8.7	U			—				**57.2**	**J**			<150	U			**145**	**J**			<150	U		
HDMW2253-03	HDMW2253-03-WGN01LF-23Q1	1/31/2023	<8.5	U			—				<143	U			—				<143	U			—			
HDMW2253-03	HDMW2253-03-WGN01LF-23Q2	4/11/2023	<8.5	U			—				<150	U			—				<150	U			—			
HDMW2253-03	HDMW2253-03-WGN01LF-23Q3	7/11/2023	<8.5				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN02LF-23Q3	8/11/2023	<8.5	U			—				<141	U			—				<141	U			—			
NMW24	NMW24-WGN01LF-23Q3	7/5/2023	<8.5	U			—				**46.3**	J			<141	U			<141	U			<141	U		
NMW25	NMW25-WGN01LF-23Q3	7/26/2023	<8.5	U			—				<143	U			—				<143	U			—			
NMW32	NMW32-WGN01LF-23Q3	8/29/2023	<8.5	U			—				<141	U			<141	U			<141	U			<141	U		
NMW32	NMW32-WGFD01LF-23Q3	8/29/2023	<8.5	U			—				<141	U			<141	U			<141	U			<141	U		
RHP01	RHP01-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—			
RHP01	RHP01-WGN01LF-23Q3	7/6/2023	<8.5	U			—				<143	U			—				<143	U			—			
RHP02	RHP02-WGN01LF-23Q3	7/6/2023	<8.5	U			—				<141	U			—				<141	U			—			
RHP02	RHP02-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—			
RHP03	RHP03-WGN01LF-23Q3	7/3/2023	<8.5	U			—				<141	U			—				<141	U			—			
RHP04A	RHP04A-WGN01LF-23Q3	7/3/2023	<8.5	U			—				<141	U			—				<141	U			—			
RHP04B	RHP04B-WGN01LF-23Q3	7/3/2023	<8.5	U			—				**122**	**J**			<141	U			**251**	**J**			<141	U		
RHP04C	RHP04C-WGN01LF-23Q3	7/3/2023	<8.5	U			—				**47.2**	**J**			<141	U			<141	U			<141	U		
RHP05	RHP05-WGN01LF-23Q3	7/3/2023	<8.5	U			—				<145	U			—				<145	U			—			
RHP06	RHP06-WGN01LF-23Q3	7/24/2023	<8.5	U			—				<141	U			—				<141	U			—			
RHP06	RHP06-WGFD01LF-23Q3	7/24/2023	<8.5	U			—				<141	U			—				<141	U			—			
RHP07	RHP07-WGN01LF-23Q3	7/3/2023	<8.5	U			—				<144	U			—				<144	U			—			
RHP08	RHP08-WGN01LF-23Q3	9/11//2023	<8.5	U			—				<141	U			—				<141	U			—			

		Analyte Class	Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles				Volatiles			
		Analyte Type	COPC				non-COPC				COPC				non-COPC				COPC				non-COPC				COPC			
		Analytical Methoc	8260				524.2				8260				524.2				8260				524.2				8260			
		Analyte	Benzene				Benzene				Ethylbenzene				Ethylbenzene				Toluene				Toluene				Xylenes, Total (p/m-, o-xylene)			
		CAS No.	71-43-2				71-43-2				100-41-4				100-41-4				108-88-3				108-88-3				1330-20-7			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	5				5				30				30				40				40				20			
		SSRBL	750				750				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
HDMW2253-03	ERH029	4/19/2016	< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
HDMW2253-03	ERH043	7/19/2016	< 0.10	U			—				< 0.10	U			—				< 0.10	U			—				< 0.20	U		
HDMW2253-03	ERH095	10/18/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH127	11/16/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH145	12/13/2016	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH176	1/10/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH176 (EPA split)	1/10/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
HDMW2253-03	ERH214	2/7/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH214 (EPA split)	2/7/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
HDMW2253-03	ERH280	3/8/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH280 (EPA split)	3/8/2017	—				< 0.2	U			—				< 0.2	U			—				< 0.2	U			—			
HDMW2253-03	ERH437	10/31/2017	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH568	3/12/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH614	4/23/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH660	7/23/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH704	10/22/2018	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH759	2/7/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH811	4/25/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH867	7/25/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH931	10/23/2019	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH997	1/23/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH1065	4/23/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH1131	7/23/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH1183	10/15/2020	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH1234	1/21/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH1336	4/19/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH1516	7/21/2021	< 0.30	U			—				< 0.50	U			—				< 0.30	U			—				< 0.30	U		
HDMW2253-03	ERH1716	10/21/2021	< 0.2	U			—				< 0.2	U			—				< 0.2	U			—				< 0.2	U		
HDMW2253-03	ERH2631	3/4/2022	<0.2	U			—				<0.2	U			—				<0.2	UT			—				<0.2	U		
HDMW2253-03	ERH3210	4/22/2022	<0.2	U			—				<0.2	U			—				<0.2	UT			—				<0.2	U		
HDMW2253-03	HDMW2253-03-WGN01LF-22Q3	07/22/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
HDMW2253-03	HDMW2253-03-WGN01LF-22Q4	12/12/2022	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
HDMW2253-03	HDMW2253-03-WGN01LF-23Q1	1/31/2023	<0.2	U			—				<0.2	U			—				<0.2	U			—				<0.2	U		
HDMW2253-03	HDMW2253-03-WGN01LF-23Q2	4/11/2023	<0.1	U			—				<0.1	U			—				<0.2	U			—				<0.1	U		
HDMW2253-03	HDMW2253-03-WGN01LF-23Q3	7/11/2023	—				—				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN02LF-23Q3	8/11/2023	< 0.1	U			—				< 0.1	U			—				< 0.2	U			—				< 0.1	U		
NMW24	NMW24-WGN01LF-23Q3	7/5/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
NMW25	NMW25-WGN01LF-23Q3	7/26/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
NMW32	NMW32-WGN01LF-23Q3	8/29/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
NMW32	NMW32-WGFD01LF-23Q3	8/29/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP01	RHP01-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—			
RHP01	RHP01-WGN01LF-23Q3	7/6/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP02	RHP02-WGN01LF-23Q3	7/6/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP02	RHP02-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—			
RHP03	RHP03-WGN01LF-23Q3	7/3/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP04A	RHP04A-WGN01LF-23Q3	7/3/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP04B	RHP04B-WGN01LF-23Q3	7/3/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP04C	RHP04C-WGN01LF-23Q3	7/3/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP05	RHP05-WGN01LF-23Q3	7/3/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP06	RHP06-WGN01LF-23Q3	7/24/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP06	RHP06-WGFD01LF-23Q3	7/24/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP07	RHP07-WGN01LF-23Q3	7/3/2023	< 0.1	U			—				<0.1	U			—				< 0.2	U			—				< 0.1	U		
RHP08	RHP08-WGN01LF-23Q3	9/11//2023	< 0.1	U			—				<0.1	U			—				**< 0.0855**	**J**			—				< 0.1	U		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Volatiles				Volatiles				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Semivolatiles (PAHs)				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analyte Type	non-COPC				non-COPC				COPC				COPC				non-COPC				COPC				COPC				non-COPC				non-COPC				Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger			
		Analytical Methoc	524.2				524.2				8270 SIM				8270 SIM				8270				8270 SIM				8260				524.2				8270				8011				8260				504.1				524.2			
		Analyte	Xylenes, p/m-				Xylenes, o-				1-Methylnaphthalene				2-Methylnaphthalene				2-Methylnaphthalene				Naphthalene *****				Naphthalene *****				Naphthalene *****				Naphthalene *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****				1,2-Dibromoethane *****			
		CAS No.	179601-23-1				95-47-6				90-12-0				91-57-6				91-57-6				91-20-3				91-20-3				91-20-3				91-20-3				106-93-4				106-93-4				106-93-4				106-93-4			
		Unit	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			
		DOH EAL	20				20				10				10				10				17				17				17				17				0.04				0.04				0.04				0.04			
		SSRBL	—				—				—				—				—				—				—				—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
HDMW2253-03	ERH029	4/19/2016	—				—				< 0.0050	U			< 0.0050	U			—				< 0.0050	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH043	7/19/2016	—				—				< 0.0050	U			**0.0027**	**J**			—				< 0.015	U	b f		—				—				—				—				—				—				—			
HDMW2253-03	ERH095	10/18/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH127	11/16/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH145	12/13/2016	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH176	1/10/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH176 (EPA split)	1/10/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
HDMW2253-03	ERH214	2/7/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH214 (EPA split)	2/7/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c s		< 0.025	UJ	c s		< 0.5	U			< 0.025	UJ	s		—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
HDMW2253-03	ERH280	3/8/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH280 (EPA split)	3/8/2017	< 0.5	U			< 0.2	U			< 0.025	UJ	c		< 0.025	UJ	c		< 0.5	U			< 0.025	U			—				< 0.2	U			< 0.5	U			—				—				—				< 0.0025	U		
HDMW2253-03	ERH437	10/31/2017	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH568	3/12/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH614	4/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH660	7/23/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH704	10/22/2018	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH759	2/7/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH811	4/25/2019	—				—				< 0.10	UJ	s		< 0.10	UJ	s		—				< 0.10	UJ	s		—				—				—				—				—				—				—			
HDMW2253-03	ERH867	7/25/2019	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH931	10/23/2019	—				—				< 0.10	UJ	l		< 0.10	UJ	l		—				< 0.10	UJ	l		—				—				—				—				—				—				—			
HDMW2253-03	ERH997	1/23/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH1065	4/23/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH1131	7/23/2020	—				—				< 0.10	UJ	s		< 0.10	UJ	s		—				< 0.10	UJ	s		—				—				—				—				—				—				—			
HDMW2253-03	ERH1183	10/15/2020	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH1234	1/21/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH1336	4/19/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH1516	7/21/2021	—				—				< 0.10	U			< 0.10	U			—				< 0.10	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH1716	10/21/2021	—				—				< 0.1	U			< 0.1	U			—				< 0.1	U			—				—				—				—				—				—				—			
HDMW2253-03	ERH2631	3/4/2022	—				—				<0.032	UMQ			<0.08	UMQ			—				<0.08	UMQ			—				—				—				<0.0049	U			—				—				—			
HDMW2253-03	ERH3210	4/22/2022	—				—				<0.031	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN01LF-22Q3	07/22/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN01LF-22Q4	12/12/2022	—				—				<0.031	U			<0.077	U			—				<0.077	U			—				—				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN01LF-23Q1	1/31/2023	—				—				<0.030	U			<0.076	U			—				<0.076	U			—				—				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN01LF-23Q2	4/11/2023	—				—				<0.032	U			<0.08	U			—				<0.08	U			—				—				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN01LF-23Q3	7/11/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
HDMW2253-03	HDMW2253-03-WGN02LF-23Q3	8/11/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
NMW24	NMW24-WGN01LF-23Q3	7/5/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.0049	U			—				—				—			
NMW25	NMW25-WGN01LF-23Q3	7/26/2023	—				—				<0.4	U			<0.4	U			—				<0.076	U			—				—				—				<0.0049	U			—				—				—			
NMW32	NMW32-WGN01LF-23Q3	8/29/2023	—				—				<0.4	U			<0.4	U			—				**0.43**	**J**			—				—				—				<0.0051	U			—				—				—			
NMW32	NMW32-WGFD01LF-23Q3	8/29/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—				—				—				—			
RHP01	RHP01-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHP01	RHP01-WGN01LF-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.0098	U			—				—				—			
RHP02	RHP02-WGN01LF-23Q3	7/6/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.005	U			—				—				—			
RHP02	RHP02-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—				—				—				—				—				—				—				—			
RHP03	RHP03-WGN01LF-23Q3	7/3/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.01	U			—				—				—			
RHP04A	RHP04A-WGN01LF-23Q3	7/3/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.01	U			—				—				—			
RHP04B	RHP04B-WGN01LF-23Q3	7/3/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.01	U			—				—				—			
RHP04C	RHP04C-WGN01LF-23Q3	7/3/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.01	U			—				—				—			
RHP05	RHP05-WGN01LF-23Q3	7/3/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.005	U			—				—				—			
RHP06	RHP06-WGN01LF-23Q3	7/24/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.0049	U			—				—				—			
RHP06	RHP06-WGFD01LF-23Q3	7/24/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				—	U			—				—				—			
RHP07	RHP07-WGN01LF-23Q3	7/3/2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.01	U			—				—				—			
RHP08	RHP08-WGN01LF-23Q3	9/11//2023	—				—				<0.4	U			<0.4	U			—				<0.4	U			—				—				—				<0.0049	U			—				—				—			

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte Class	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Semivolatiles				Semivolatiles			
		Analyte Type	Lead Scavenger				Lead Scavenger				Lead Scavenger				Lead Scavenger				Fuel Additive				Fuel Additive			
		Analytical Methoc	8260SIM				8260SIM				8260				524.2				8270				8270/8270 Mod.			
		Analyte	1,2-Dibromoethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				1,2-Dichloroethane *****				Phenol				2-(2-Methoxyethoxy)-ethanol			
		CAS No.	106-93-4				107-06-2				107-06-2				107-06-2				108-95-2				111-77-3			
		Unit	µg/L				µg/L				µg/L				µg/L				µg/L				µg/L			
		DOH EAL	0.04				5				5				5				300				800			
		SSRBL	—				—				—				—				—				—			
Well Name	Sample ID	Date Sampled	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note	Result	Q	rc	note
HDMW2253-03	ERH029	4/19/2016	—				—				—				—				—				—			
HDMW2253-03	ERH043	7/19/2016	—				—				—				—				—				—			
HDMW2253-03	ERH095	10/18/2016	—				—				—				—				< 4.00	U			< 80.0	UJ	h	
HDMW2253-03	ERH127	11/16/2016	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH145	12/13/2016	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH176	1/10/2017	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH176 (EPA split)	1/10/2017	—				—				—				< 0.0025	U			< 2.4	U			—			
HDMW2253-03	ERH214	2/7/2017	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH214 (EPA split)	2/7/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
HDMW2253-03	ERH280	3/8/2017	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH280 (EPA split)	3/8/2017	—				—				—				< 0.0025	U			< 2.5	U			—			
HDMW2253-03	ERH437	10/31/2017	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH568	3/12/2018	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH614	4/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH660	7/23/2018	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH704	10/22/2018	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
HDMW2253-03	ERH759	2/7/2019	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH811	4/25/2019	—				—				—				—				< 4.00	UJ	h		< 80.0	UJ	l	
HDMW2253-03	ERH867	7/25/2019	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH931	10/23/2019	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH997	1/23/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
HDMW2253-03	ERH1065	4/23/2020	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH1131	7/23/2020	—				—				—				—				< 4.00	U			< 80.0	UJ	l	
HDMW2253-03	ERH1183	10/15/2020	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH1234	1/21/2021	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH1336	4/19/2021	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH1516	7/21/2021	—				—				—				—				< 4.00	U			< 80.0	U		
HDMW2253-03	ERH1716	10/21/2021	—				—				—				—				< 4.8	U			< 80	U		
HDMW2253-03	ERH2631	3/4/2022	—				—				<0.25	U			—				<0.6	UMQ			—			
HDMW2253-03	ERH3210	4/22/2022	—				—				—				—				<0.57	UM			<80	U		
HDMW2253-03	HDMW2253-03-WGN01LF-22Q3	07/22/2022	—				—				—				—				<0.58	U			<80	U		
HDMW2253-03	HDMW2253-03-WGN01LF-22Q4	12/12/2022	—				—				—				—				<0.58	U			<80	U		
HDMW2253-03	HDMW2253-03-WGN01LF-23Q1	1/31/2023	—				—				—				—				<0.57	U			<80	U		
HDMW2253-03	HDMW2253-03-WGN01LF-23Q2	4/11/2023	—				—				—				—				<0.6	U			<80	U		
HDMW2253-03	HDMW2253-03-WGN01LF-23Q3	7/11/2023	—				—				—				—				<2	U			<80	UJ		
HDMW2253-03	HDMW2253-03-WGN02LF-23Q3	8/11/2023	—				—				—				—				—				—			
NMW24	NMW24-WGN01LF-23Q3	7/5/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
NMW25	NMW25-WGN01LF-23Q3	7/26/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
NMW32	NMW32-WGN01LF-23Q3	8/29/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
NMW32	NMW32-WGFD01LF-23Q3	8/29/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP01	RHP01-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—			
RHP01	RHP01-WGN01LF-23Q3	7/6/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP02	RHP02-WGN01LF-23Q3	7/6/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP02	RHP02-WGN03LF-23Q3	9/6/2023	—				—				—				—				—				—			
RHP03	RHP03-WGN01LF-23Q3	7/3/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP04A	RHP04A-WGN01LF-23Q3	7/3/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP04B	RHP04B-WGN01LF-23Q3	7/3/2023	—				—				<0.1	U			—				<1.9	U			<80	UJ		
RHP04C	RHP04C-WGN01LF-23Q3	7/3/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP05	RHP05-WGN01LF-23Q3	7/3/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP06	RHP06-WGN01LF-23Q3	7/24/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP06	RHP06-WGFD01LF-23Q3	7/24/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP07	RHP07-WGN01LF-23Q3	7/3/2023	—				—				<0.1	U			—				<2	U			<80	UJ		
RHP08	RHP08-WGN01LF-23Q3	9/11//2023	—				—				<0.1	U			—				<2	U			<80	UJ		

Table A.1: Cumulative Groundwater COPC Results (cont'd)
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

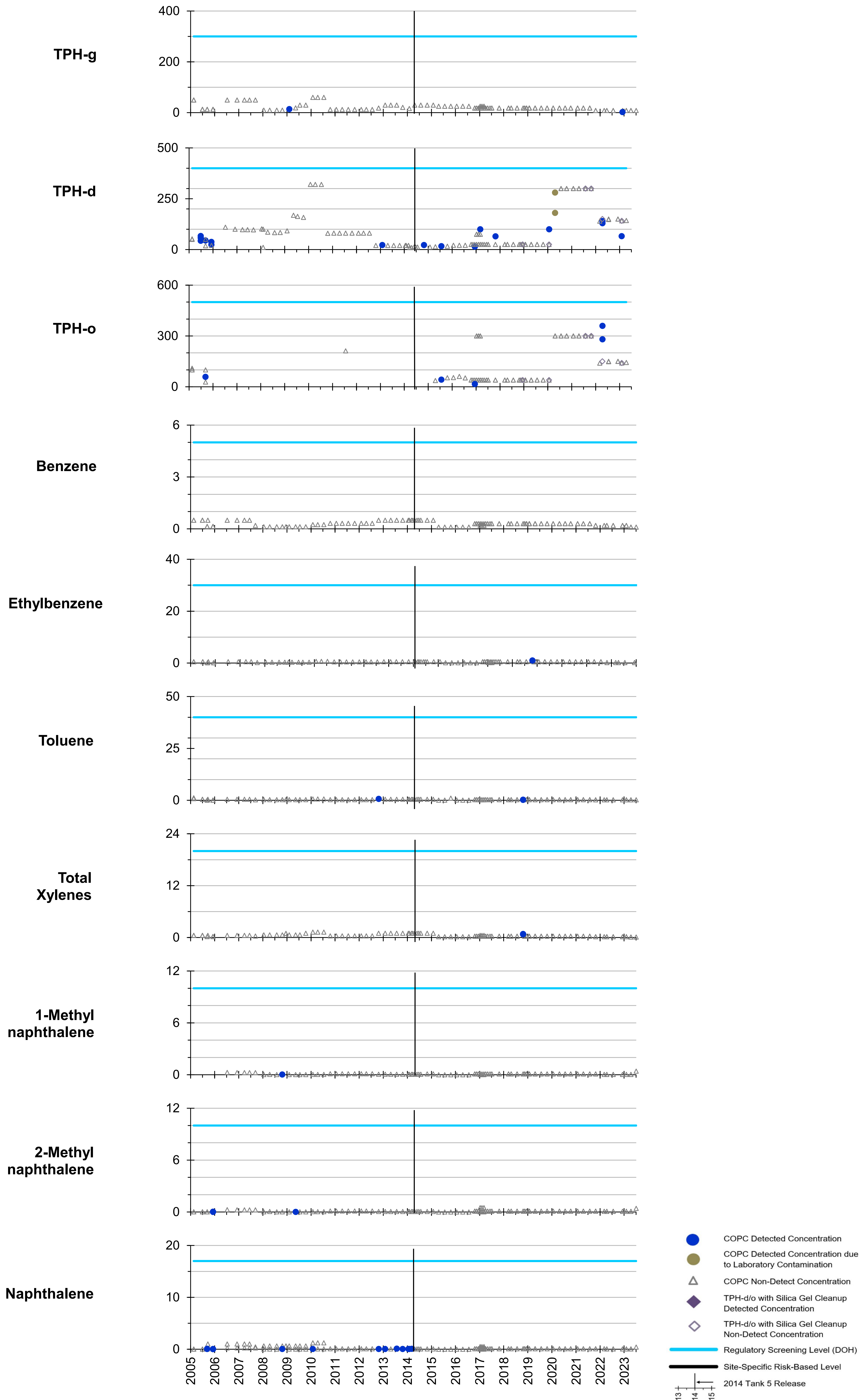
Notes:
A data verification effort was conducted after the Second Quarter 2018 groundwater monitoring event to verify reported values and make data qualification consistent with the current data validation procedures. As such, data presented in the Third Quarter 2018 groundwater monitoring event (and succeeding) cumulative data tables may differ from data presented in cumulative data tables in previous reports.
Table A.1-6 presents a comparison of values, qualifiers, and notes between pre- and post-data verification.
DOH Tier 1 Environmental Action Levels, Table D-1b. Groundwater Action Levels (Groundwater IS a current or potential drinking water resource, surface water body IS NOT located within 150 meters of release site).

Grey highlight	Exceeds EAL
Bold	Detected value
*	Duplicate sample
***	Samples ES087 and ES088 possibly switched prior to analysis.
****	TPH-g analyzed by either 8015 or 8260.
*****	Analyzed by either 8260, 8260 SIM, 8011, 504.1, and/or 524.2.
%D	RH-B-003
%R	percent recovery
%RSD	percent relative standard deviation
µg/L	micrograms per liter
COPC	chemical of potential concern
DL	detection limit
DOH	Department of Health, State of Hawaiʻi
EAL	environmental action level
ID	identification
MDL	method detection limit
MRL	method reporting limit
QC	quality control
r	correlation coefficient
r^2	coefficient of determination
RL	reporting limit
RPD	relative percent difference
RRF	relative response factor
TPH	total petroleum hydrocarbons
TPH-g	total petroleum hydrocarbons-gasoline range organics
[a]	MDL values were used for non-detects.
[b]	MRL values were used for non-detects.
[c]	No analytical lab reports found, could not verify results.
[d]	No analytical lab reports available, used data table from groundwater monitoring report.
[e]	Results from stilling basin, pumps offline.
[f]	Results from stilling basin, pumps online.
[g]	Analyzed by Method 6010B.
[h]	Analyzed by Method 6020.
[k]	Analyzed by Method 200.8.
Result Qualifiers (Q)	
J	Estimated value.
U	The compound was analyzed for but not detected above the stated limit.
R	Rejected
Reason Codes (rc)	
b	Presumed contamination from preparation (method blank).
c	Calibration %RSD, r, r^2, or %D were noncompliant.
e	Matrix Spike/Matrix Spike Duplicate or Duplicate RPD was high.
f	Presumed contamination from field blank or equipment rinsate.
h	Holding times were exceeded.
i	Internal standard performance was unsatisfactory.
l	Laboratory Control Sample/Laboratory Control Sample Duplicate %R or RPD was not within control limits.
m	Instrument performance check was noncompliant.
q	Matrix Spike/Matrix Spike Duplicate recovery was poor.
r	Calibration RRF was <0.05.
s	Surrogate recovery was outside QC limits.
t	Presumed contamination from trip blank.
v	Unusual problems found with the data. Description of the problem can be found in the associated laboratory or groundwater monitoring report.
Data Notes (note)	
I	RL/DL elevated due to chromatographic interference.
W	Chromatographic signature was mostly non-petroleum hydrocarbon peaks.
X	Possible high bias due to matrix interference.
Y, F13	Chromatographic pattern was inconsistent with the profile of the reference fuel standard; or, fuel or product type: mixed or unknown
Z	Chromatographic signature does not resemble a petroleum product.
O, F4	Chromatogram is main match to hydrocarbons in diesel fuel range; or, fuel type: diesel fuel
F3	Fuel type: kerosene or jet fuel
F6	Product type: hydraulic fluid

Appendix A.1:
Cumulative Groundwater COPC Results

Appendix A.2:
Groundwater COPC Graphs

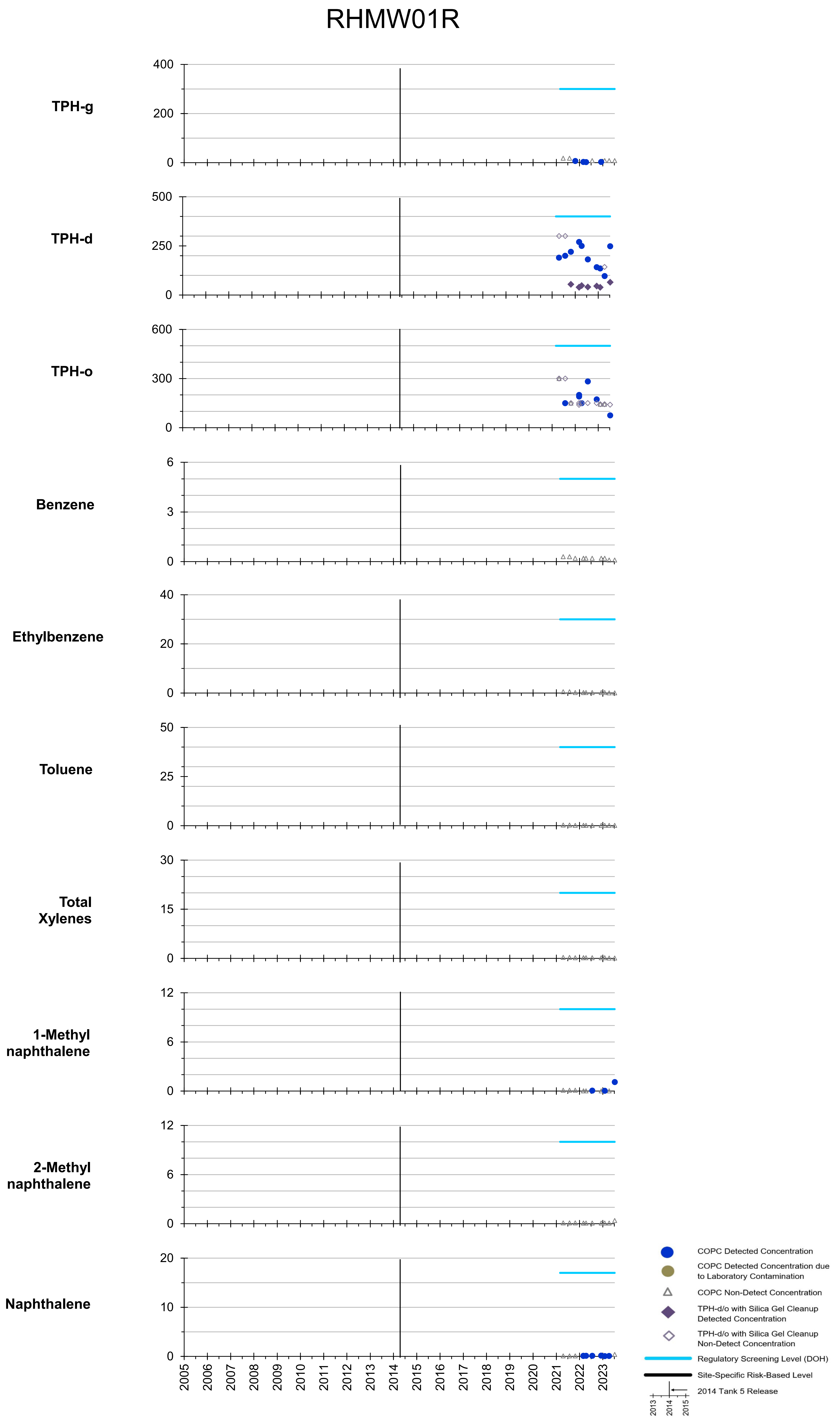
RHMW2254-01



All results in micrograms per liter (µg/L or parts per billion).

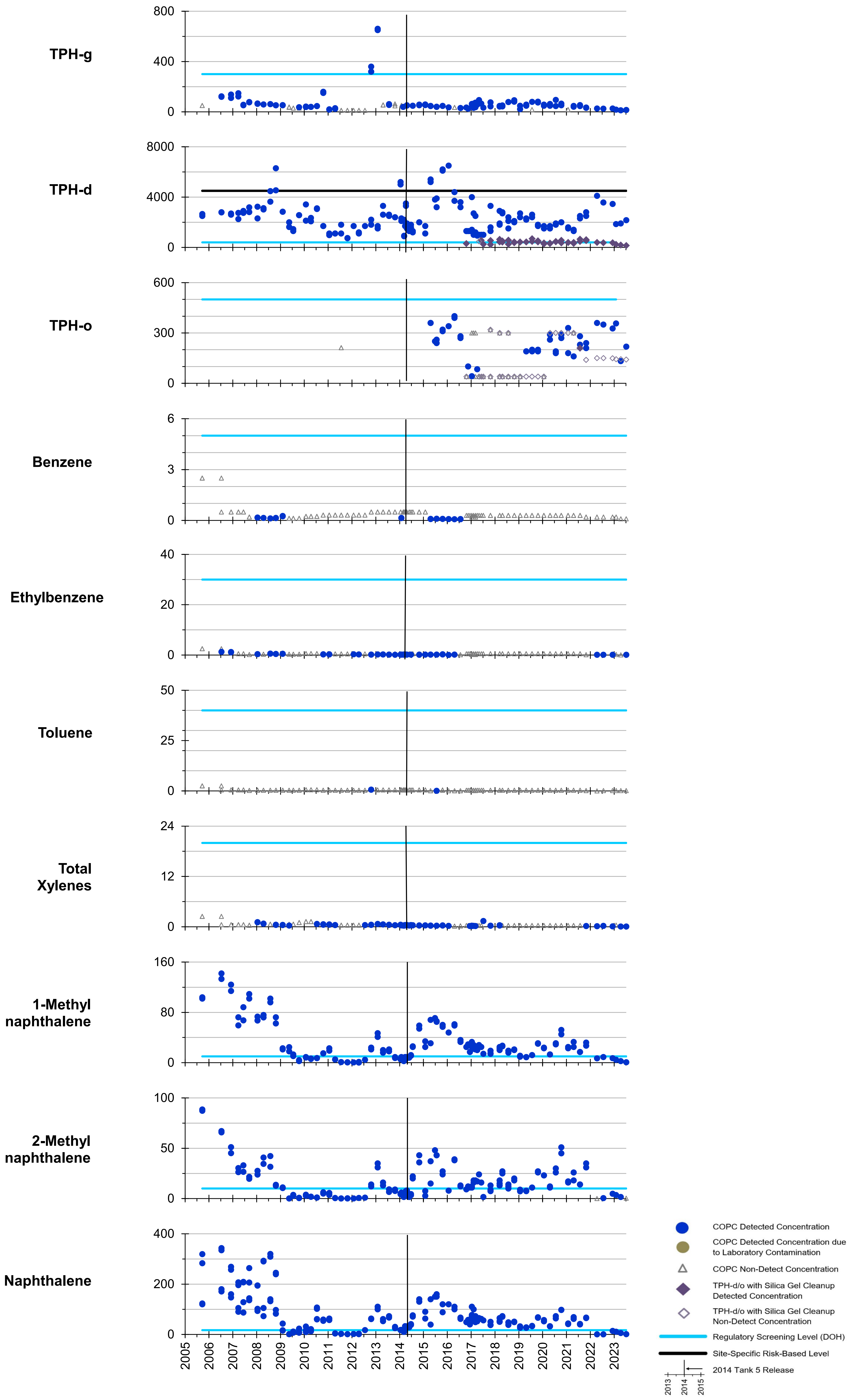
EPA Region 9 Laboratory split sampling data from First to Third Quarters 2017 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).



All results in micrograms per liter (µg/L or parts per billion).

RHMW02

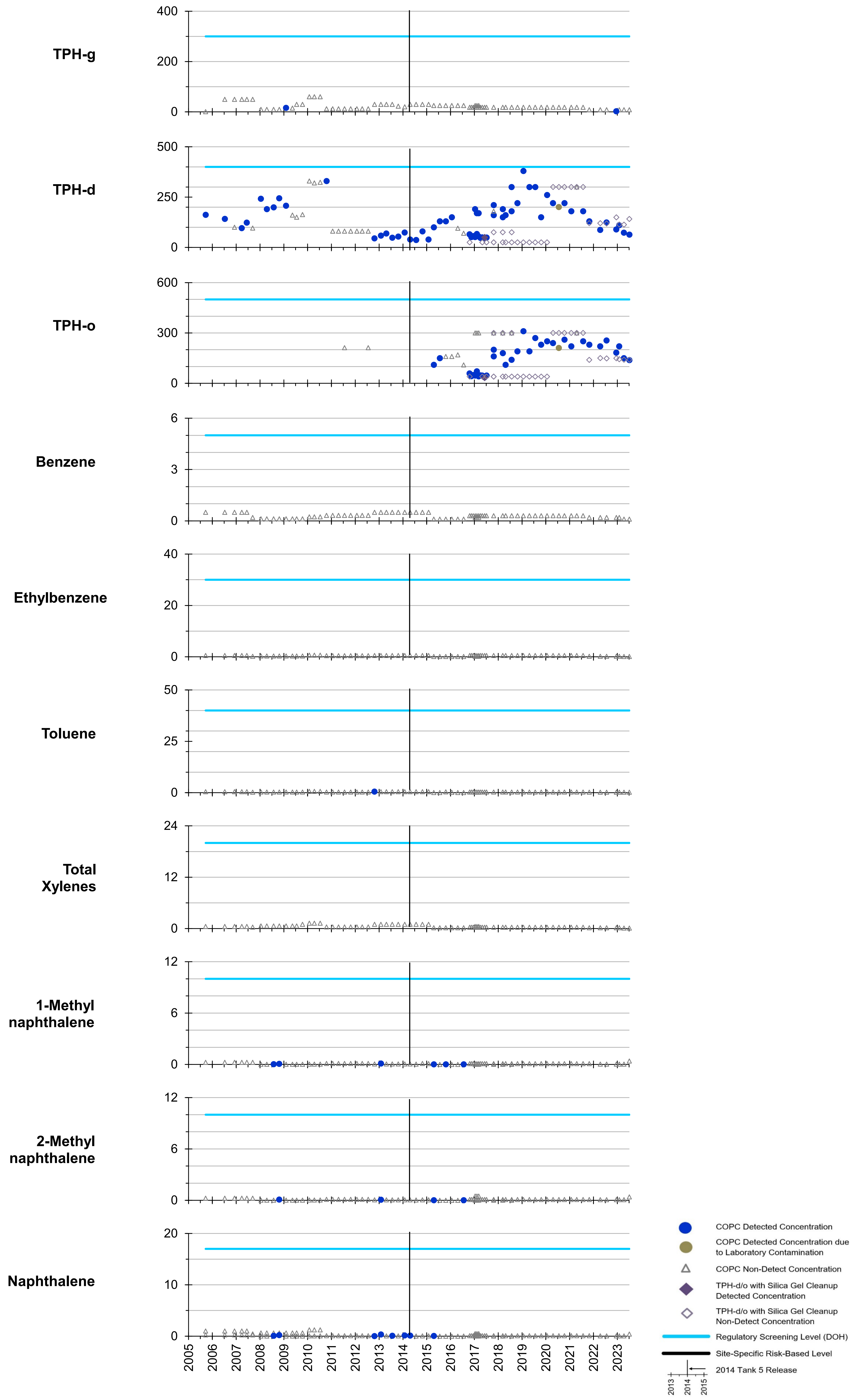


All results in micrograms per liter (μg/L or parts per billion).

EPA Region 9 Laboratory split sampling data from First to Fourth Quarters 2017, First Quarter 2018, and Third Quarter 2018 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW03

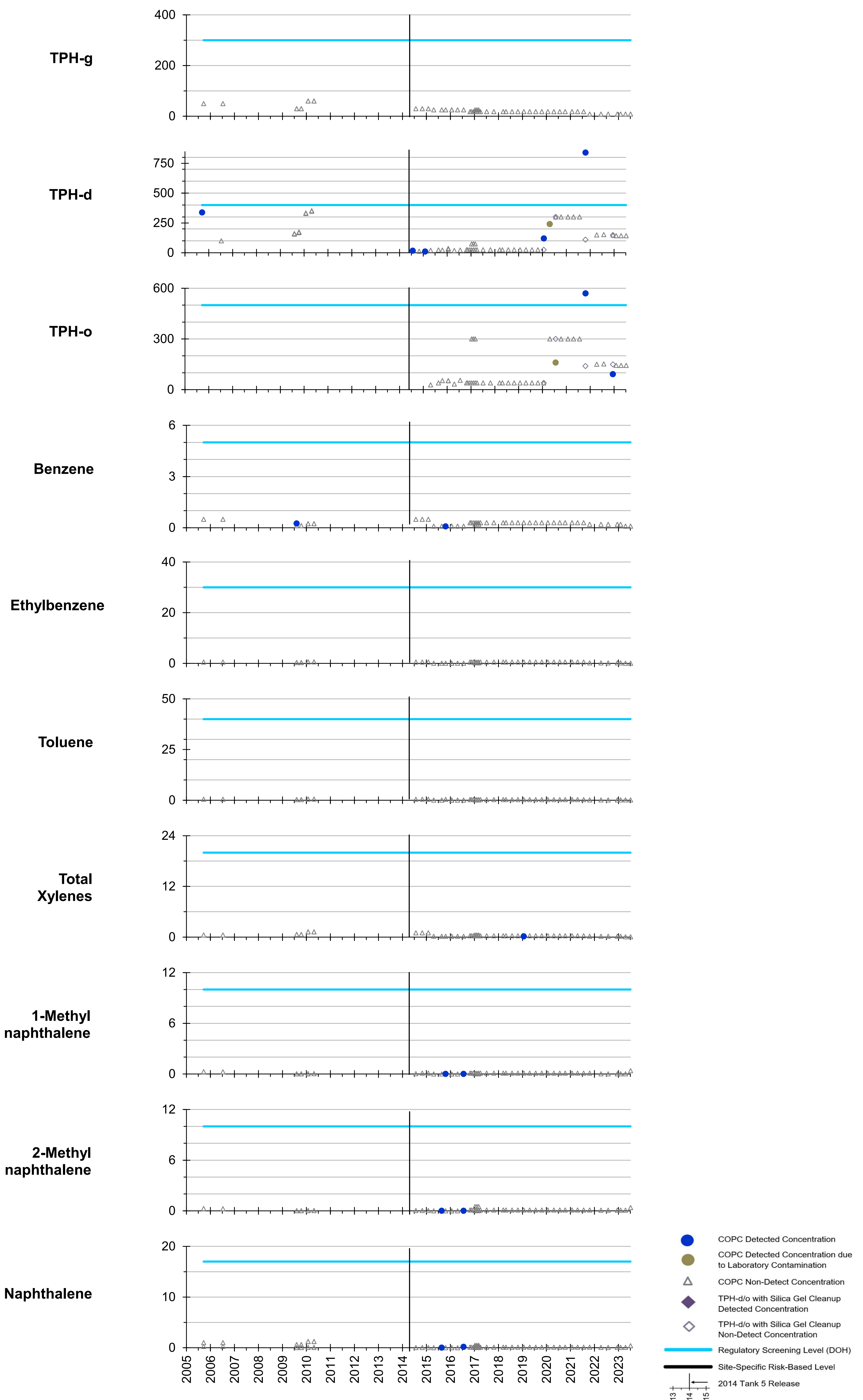


All results in micrograms per liter (µg/L or parts per billion).

EPA Region 9 Laboratory split sampling data from First to Fourth Quarters 2017, First Quarter 2018, and Third Quarter 2018 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW04

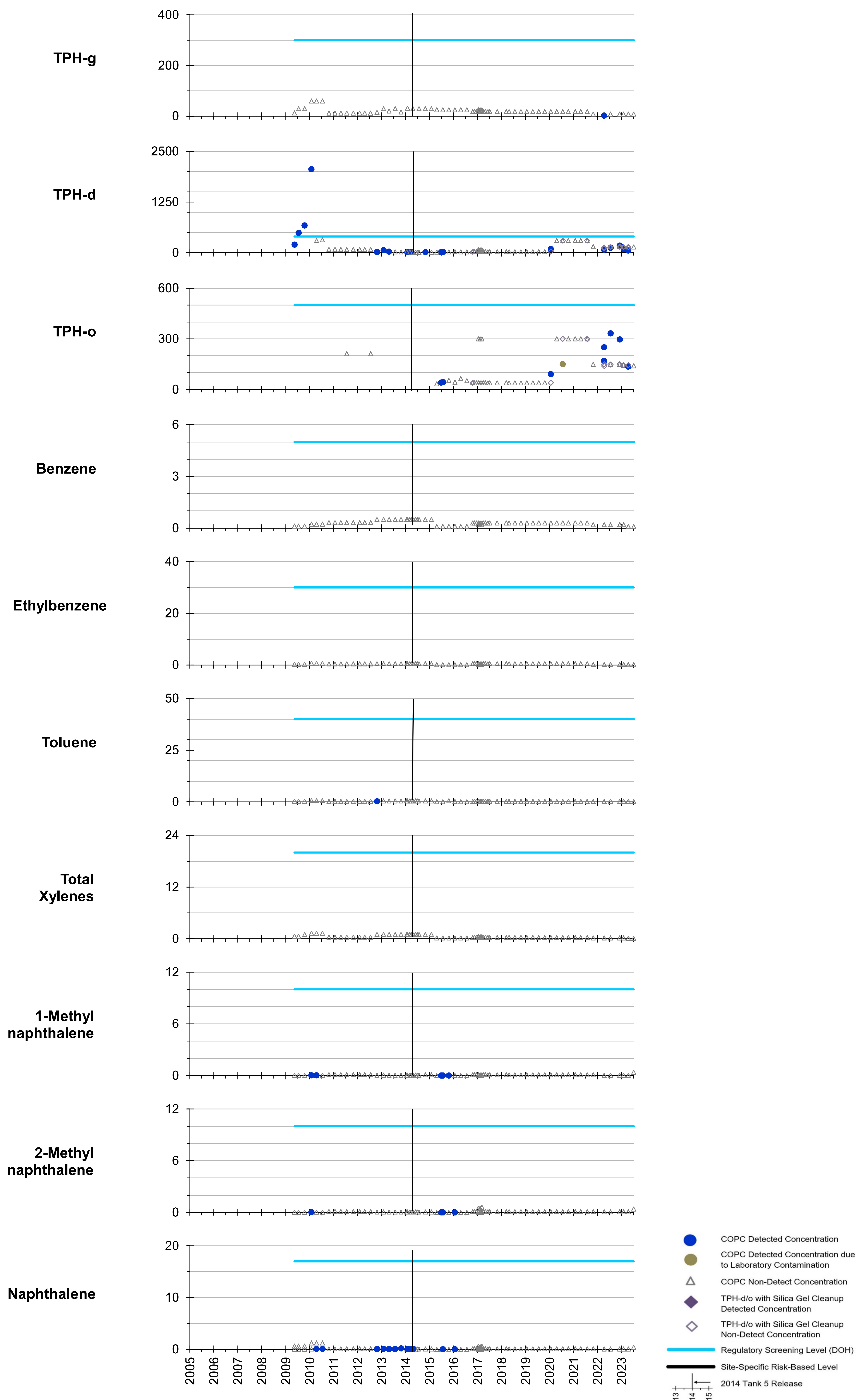


All results in micrograms per liter (µg/L or parts per billion).

EPA Region 9 Laboratory split sampling data from First to Third Quarters 2017 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW05

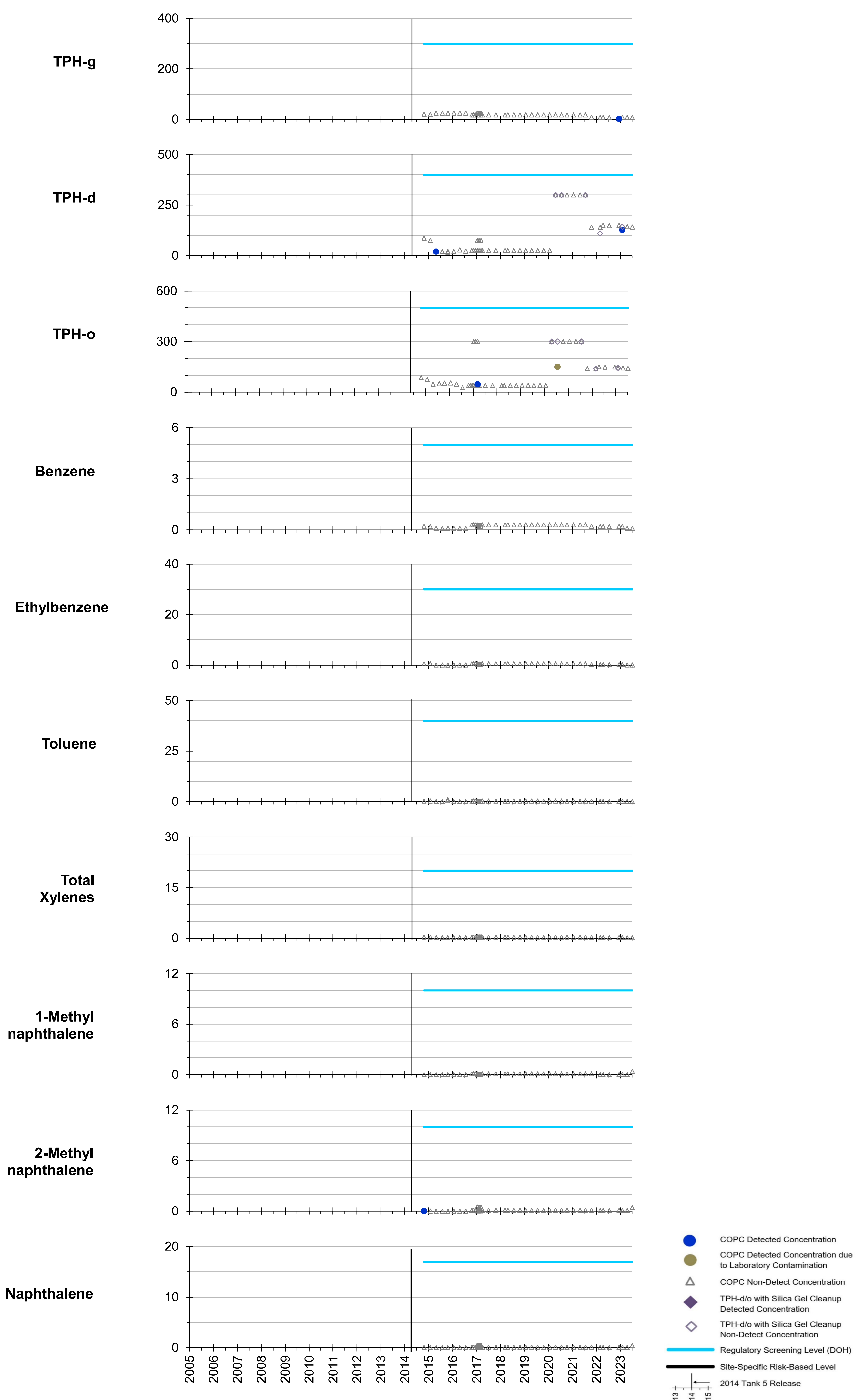


All results in micrograms per liter (µg/L or parts per billion).

EPA Region 9 Laboratory split sampling data from First to Third Quarters 2017 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW06



All results in micrograms per liter (µg/L or parts per billion).

EPA Region 9 Laboratory split sampling data from First to Third Quarters 2017 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

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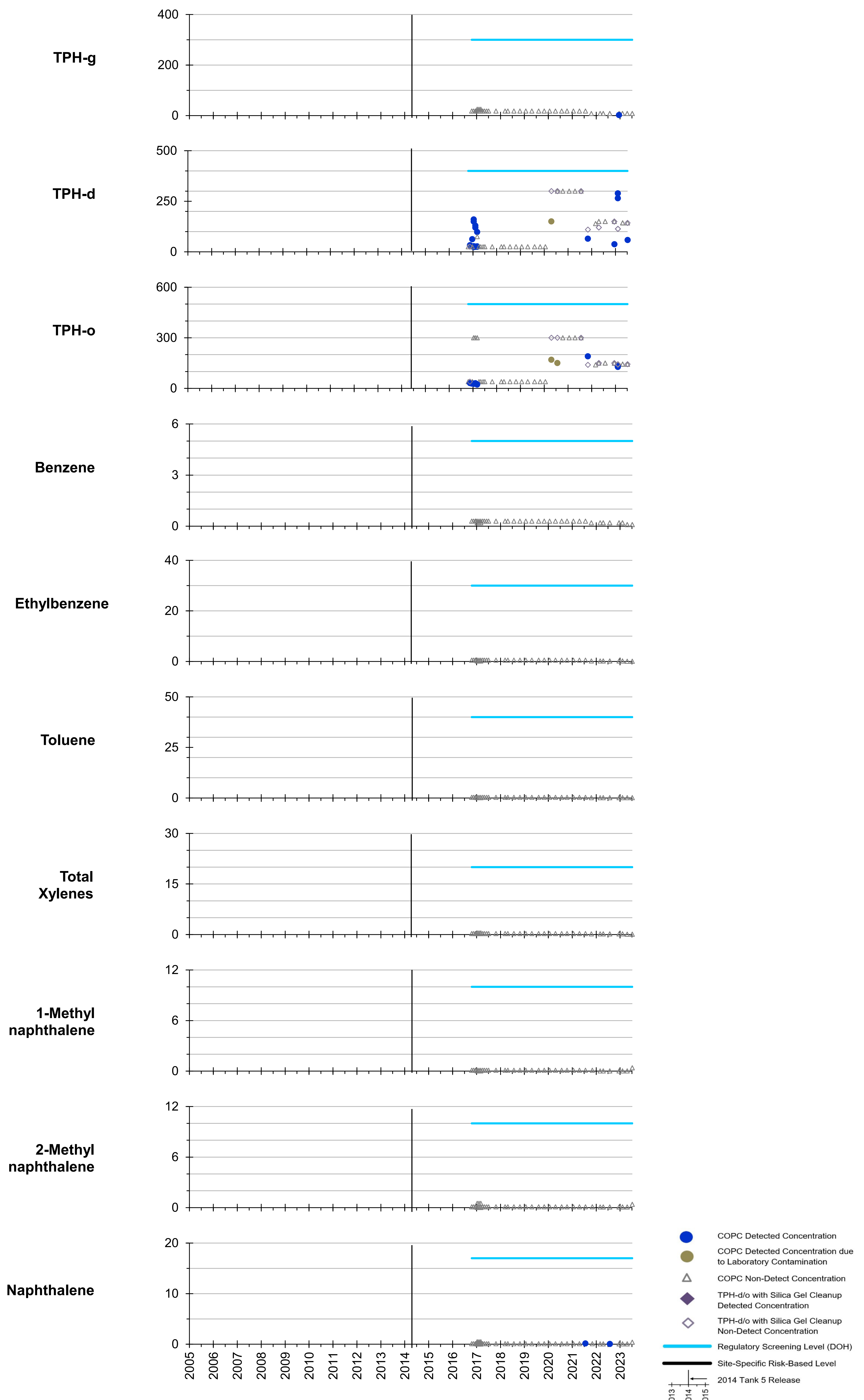
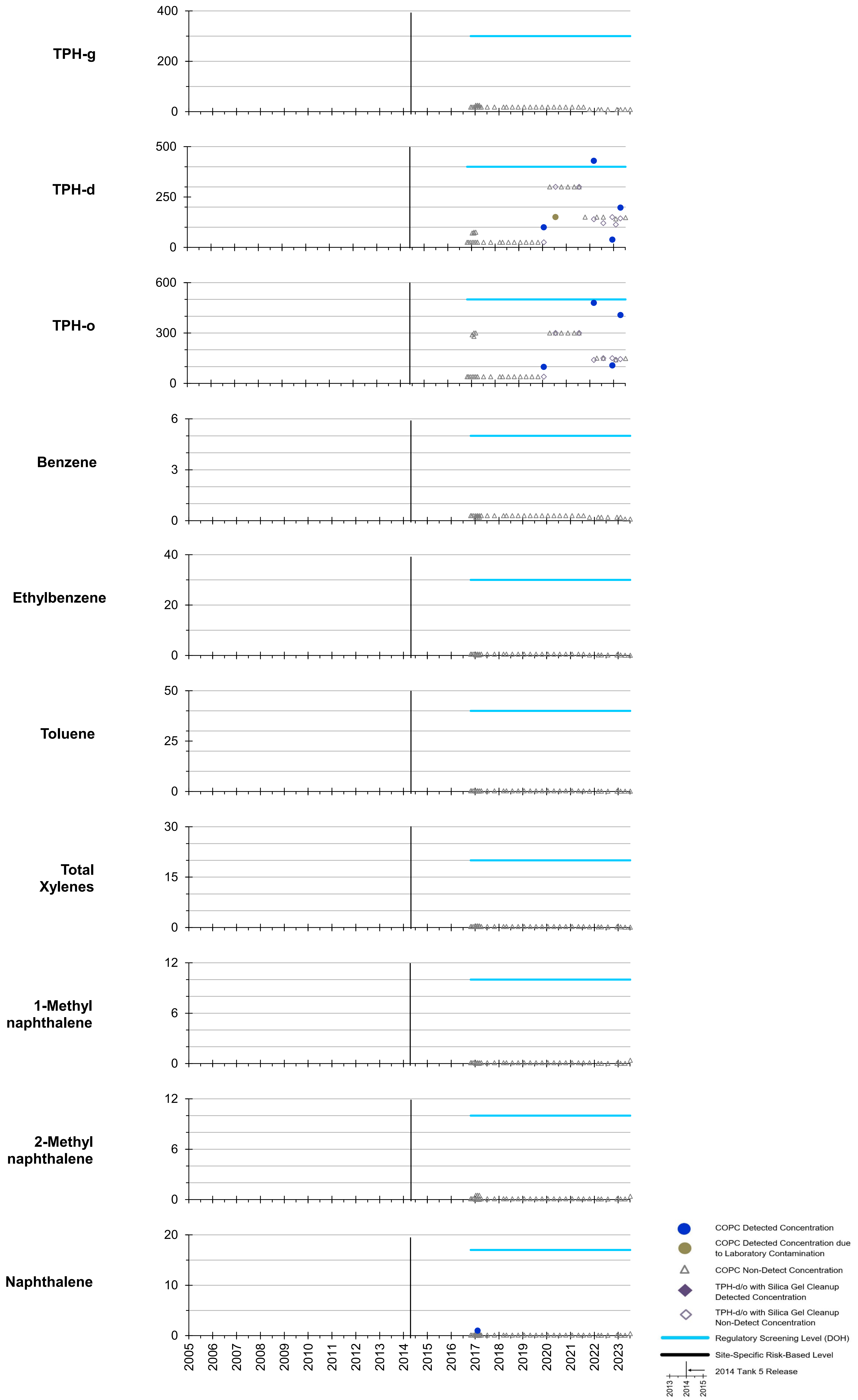


All results in micrograms per liter (μg/L or parts per billion).

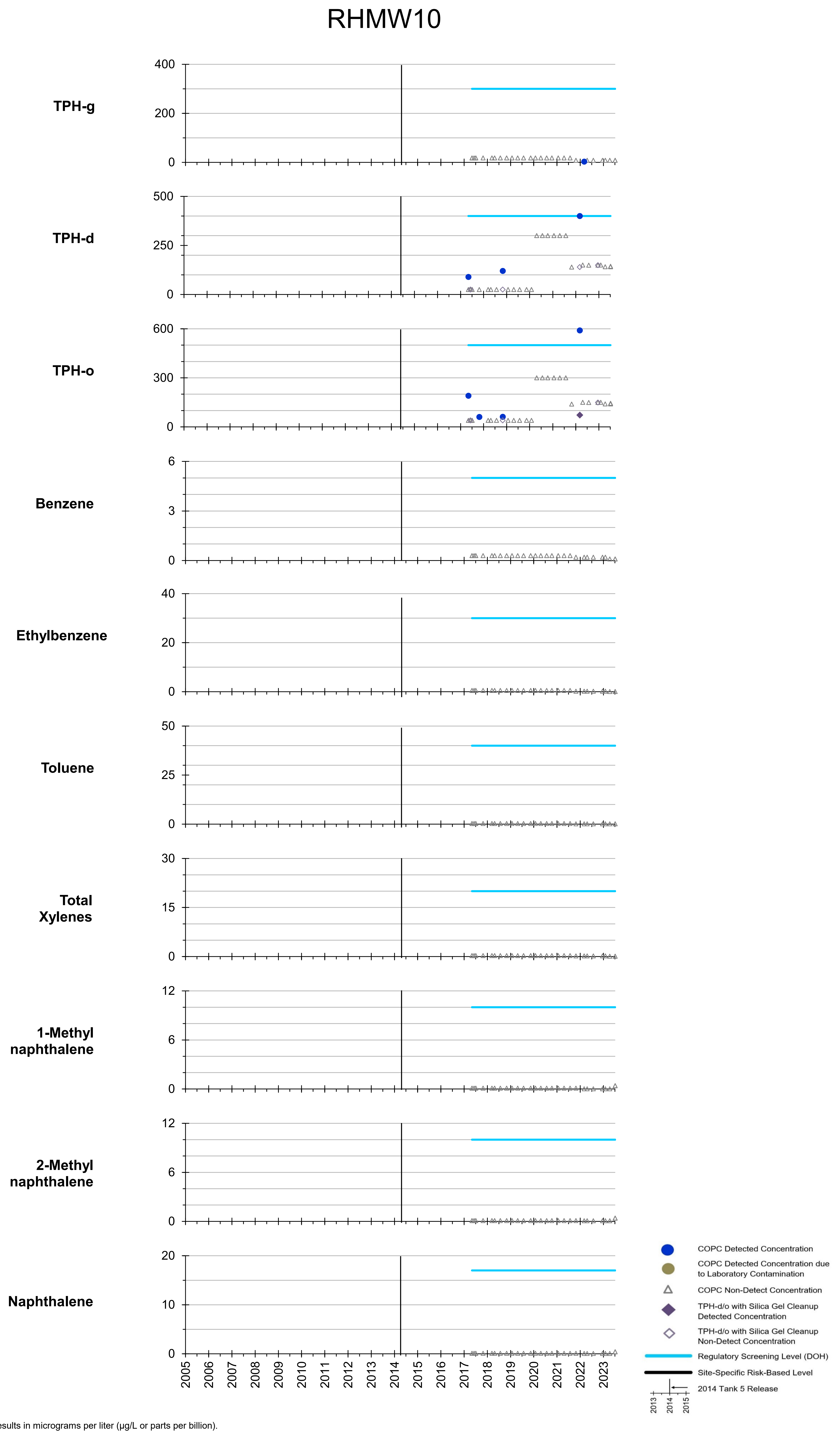
EPA Region 9 Laboratory split sampling data from First to Third Quarters 2017 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW09



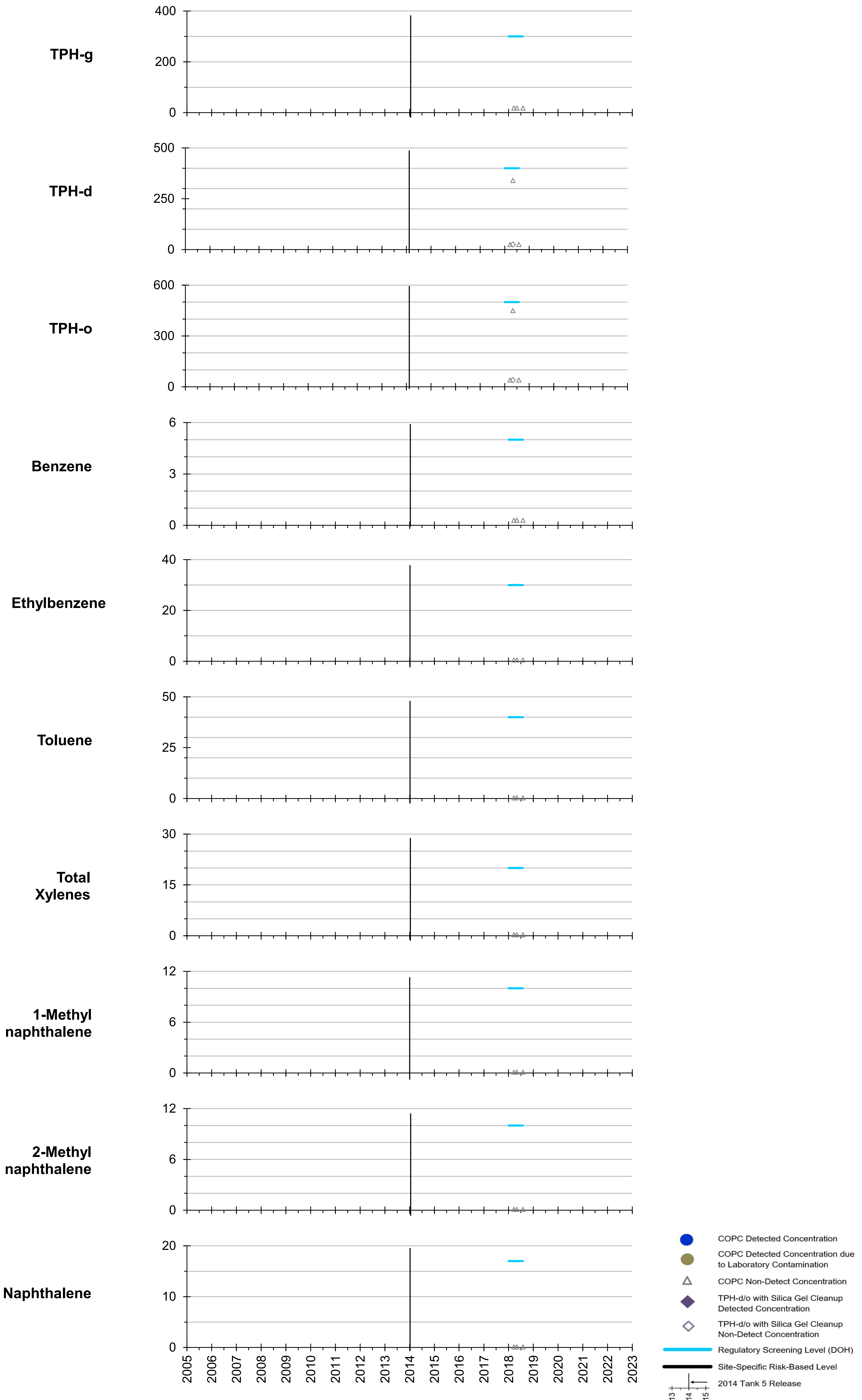
All results in micrograms per liter (µg/L or parts per billion).
EPA Region 9 Laboratory split sampling data from First to Third Quarters 2017 included in the graphs.
Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).



All results in micrograms per liter (µg/L or parts per billion).

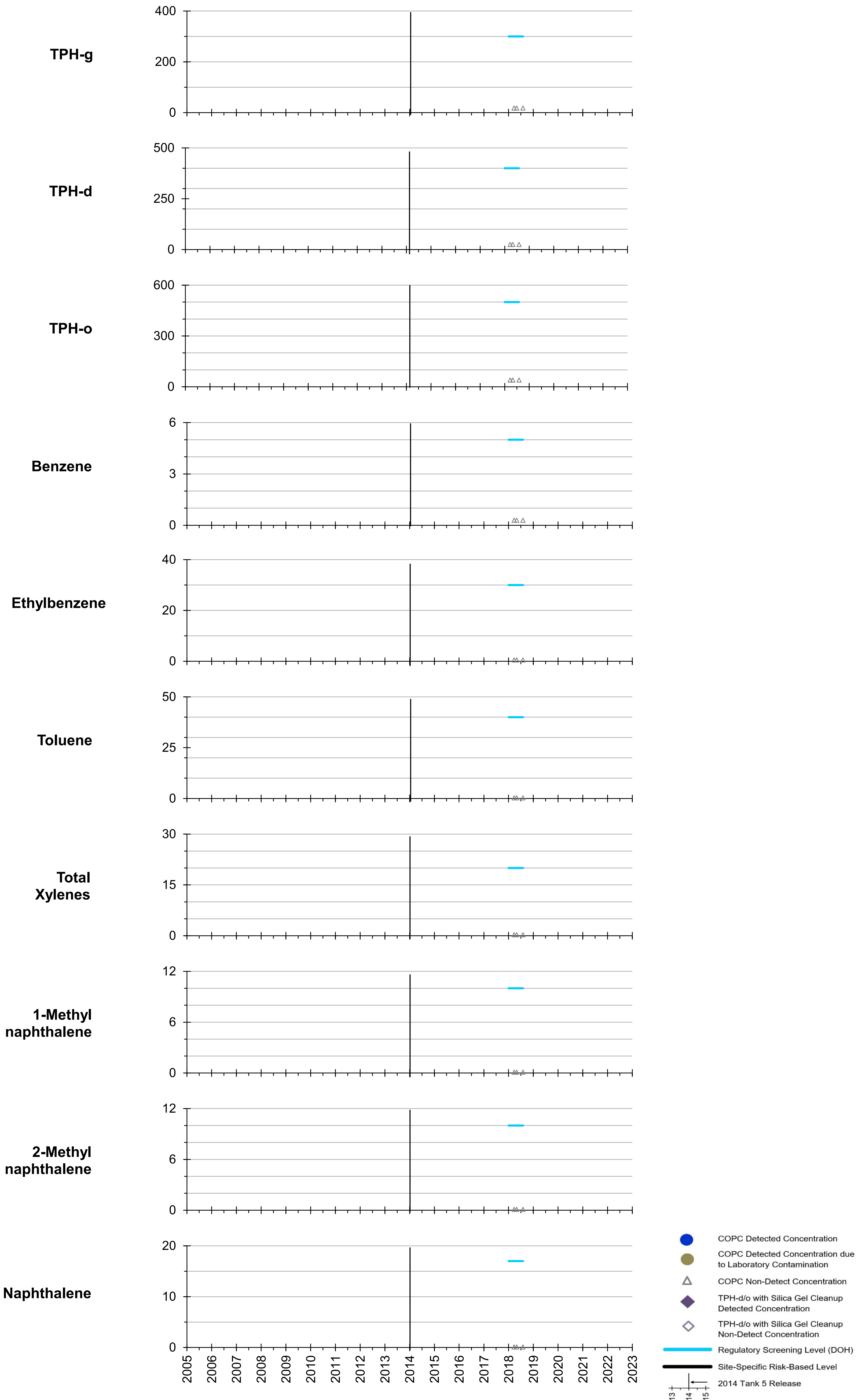
Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW11 Zone 1



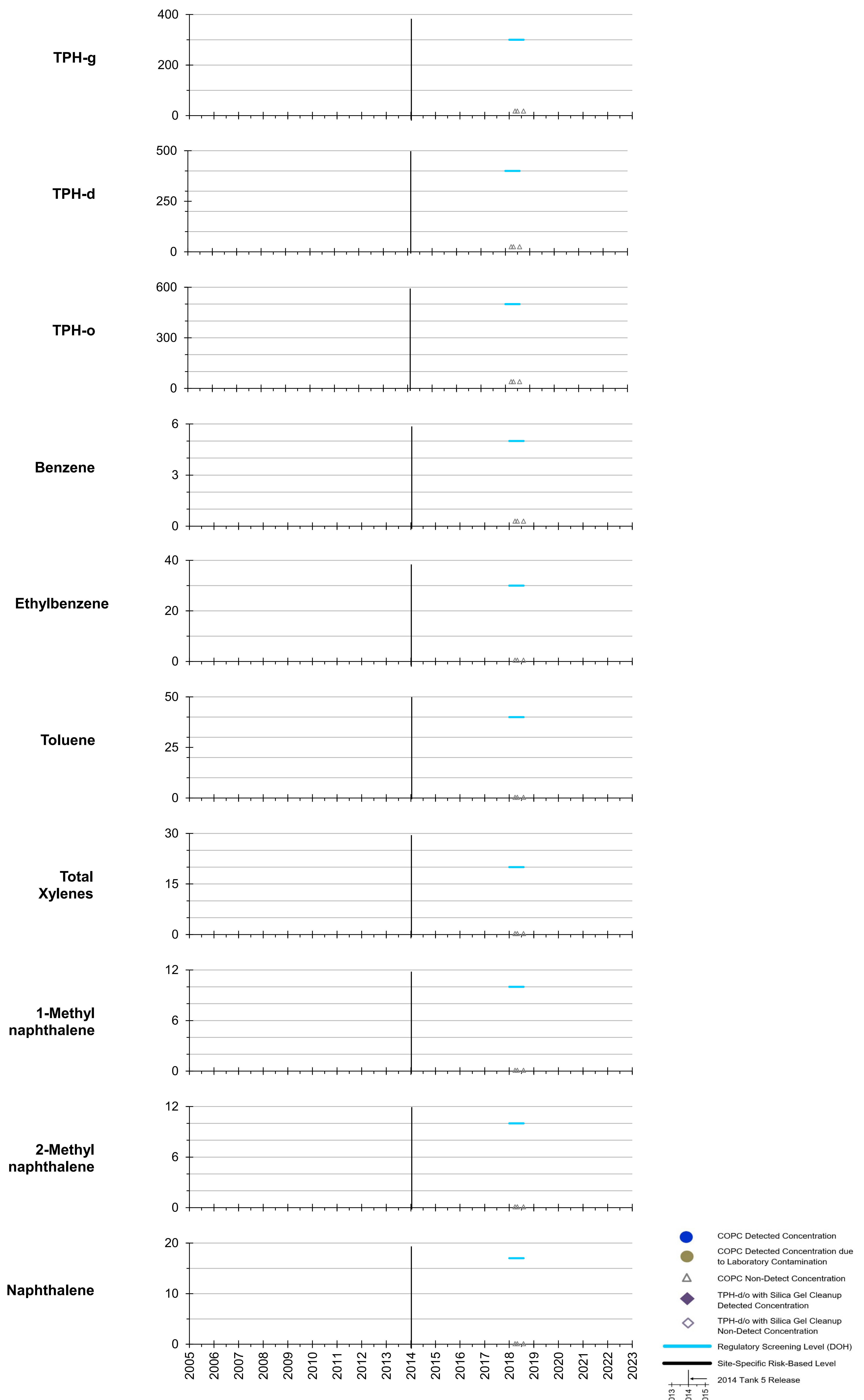
All results in micrograms per liter (µg/L or parts per billion).

RHMW11 Zone 2



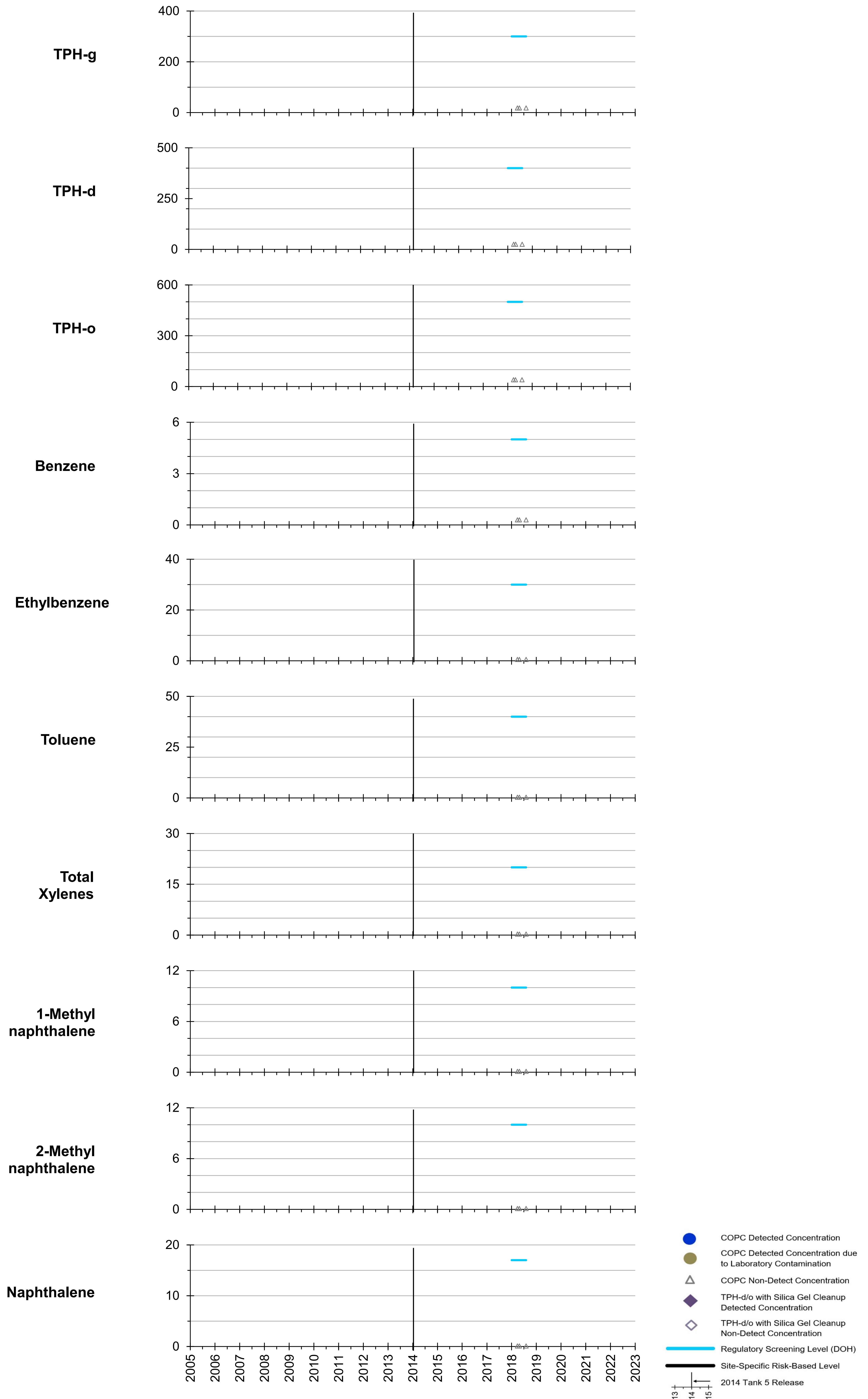
All results in micrograms per liter (µg/L or parts per billion).

RHMW11 Zone 3

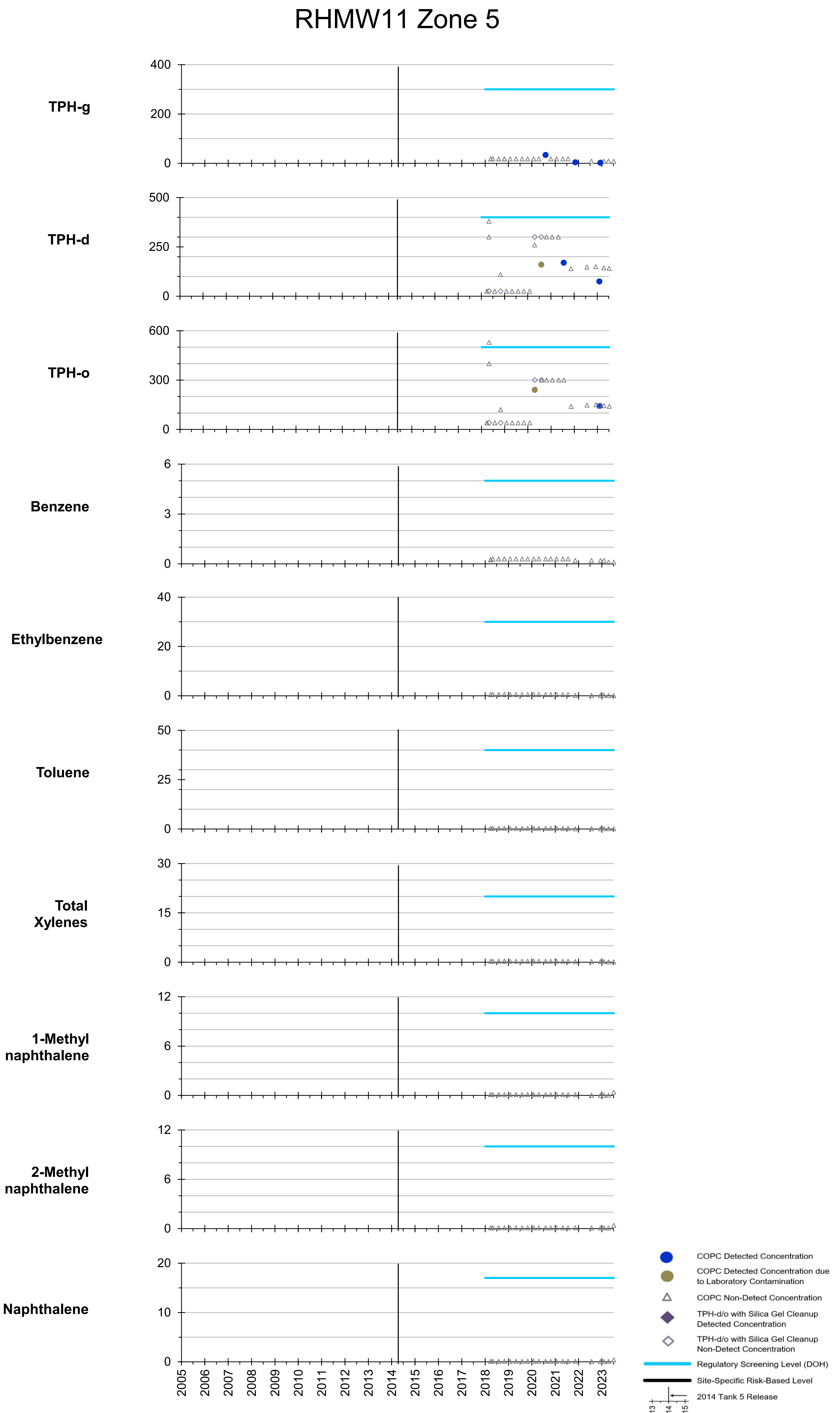


All results in micrograms per liter (µg/L or parts per billion).

RHMW11 Zone 4



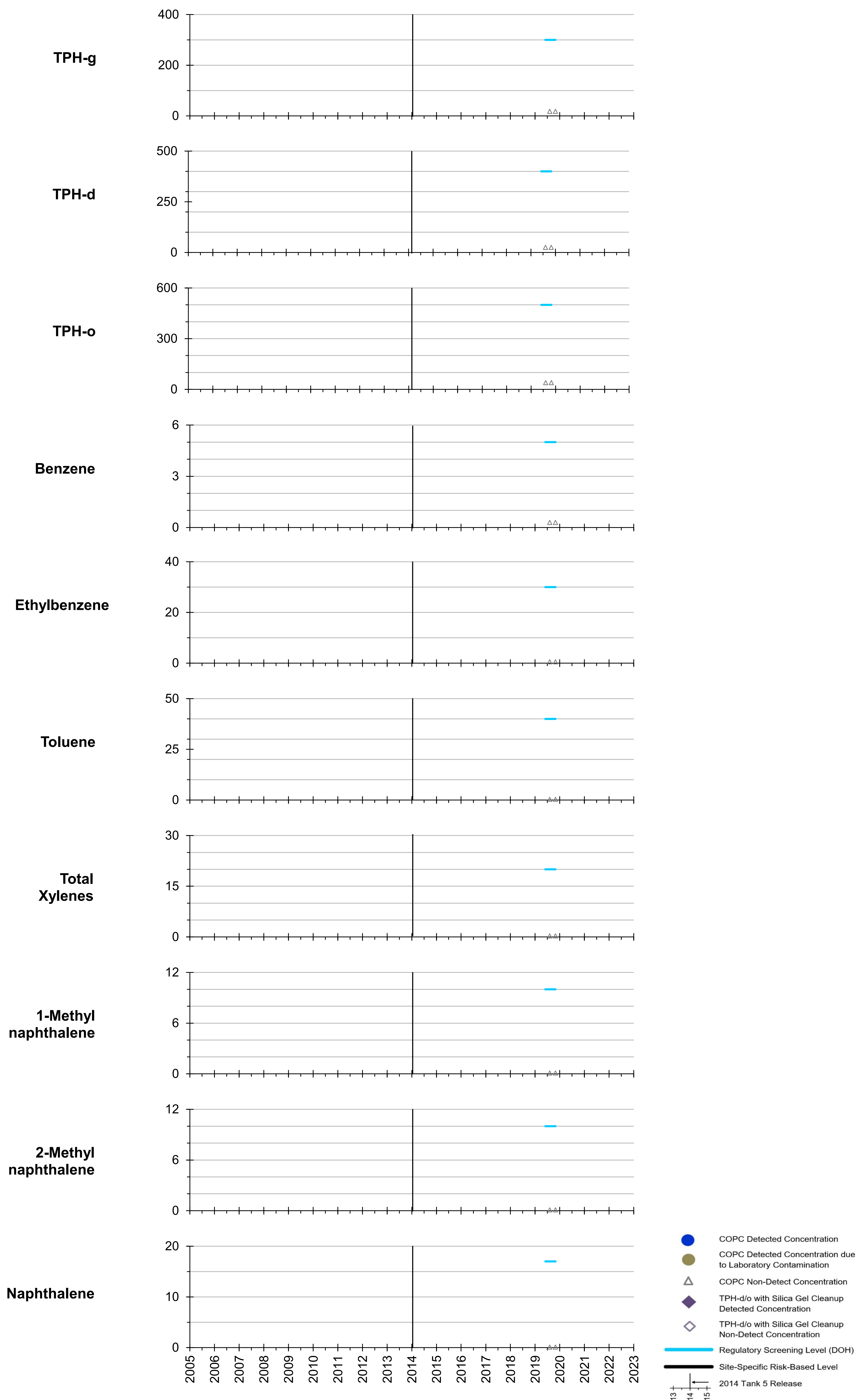
All results in micrograms per liter (µg/L or parts per billion).



All results in micrograms per liter (µg/L or parts per billion).

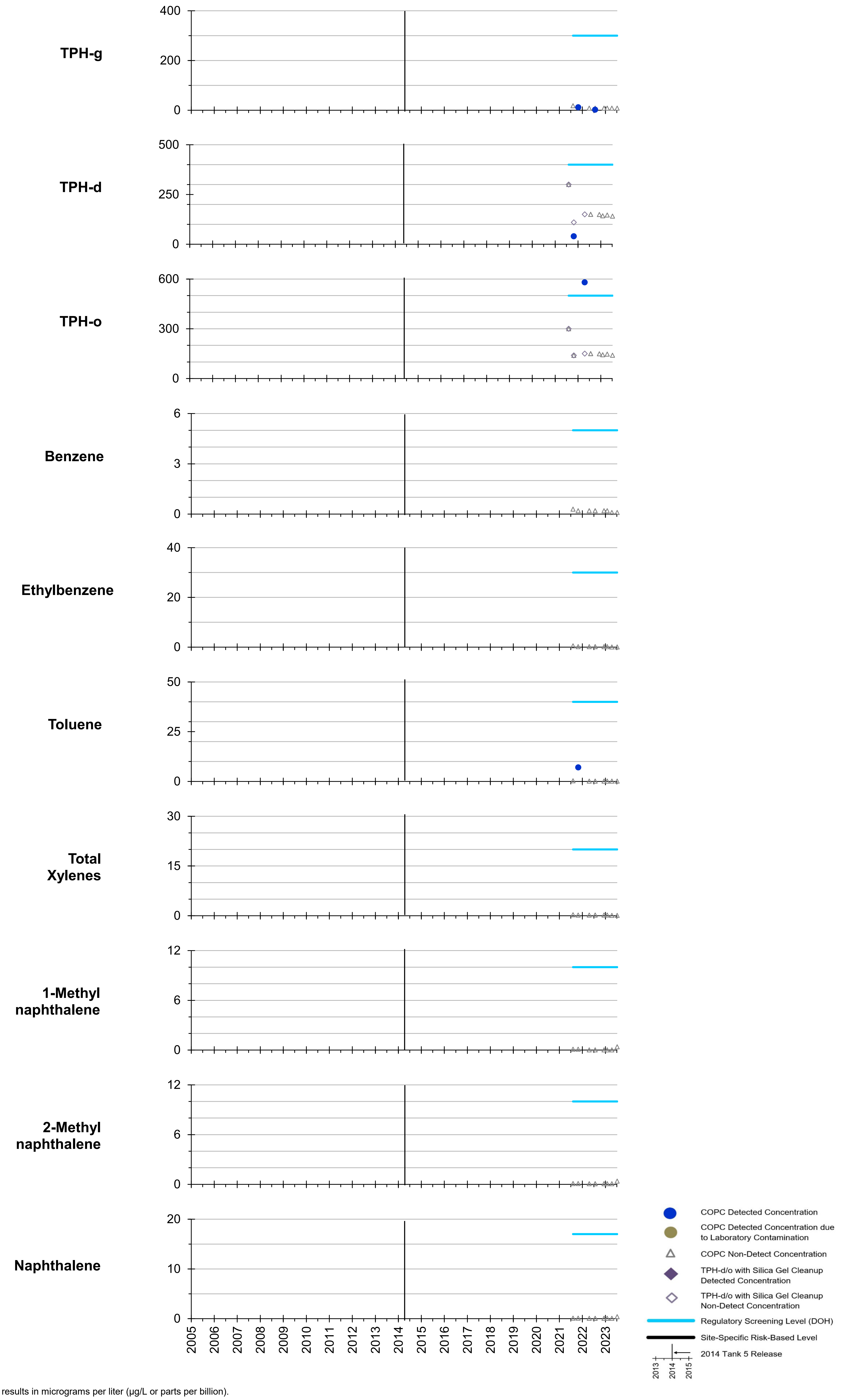
Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW11 Zone 7



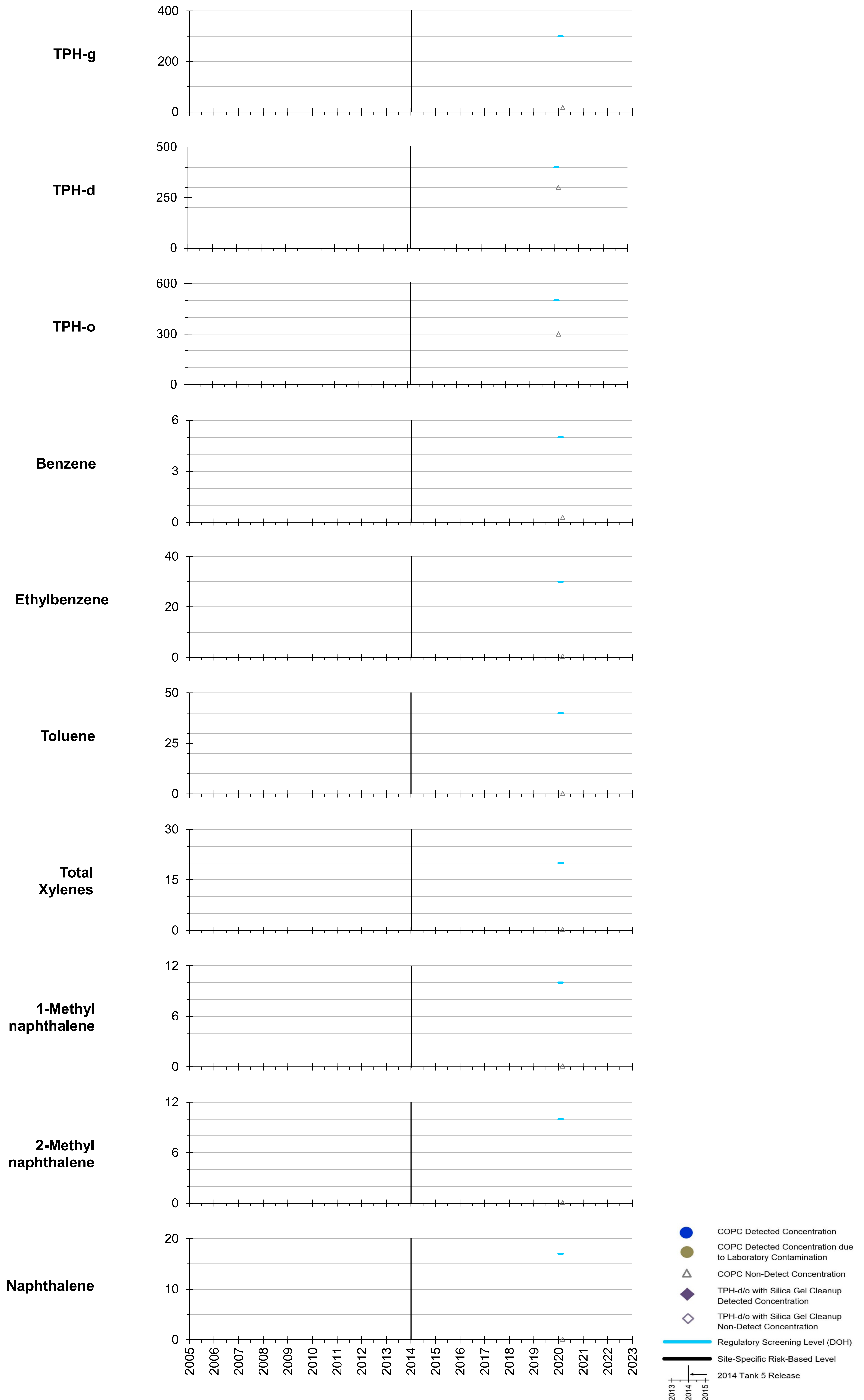
All results in micrograms per liter (µg/L or parts per billion).

RHMW12A



All results in micrograms per liter (µg/L or parts per billion).

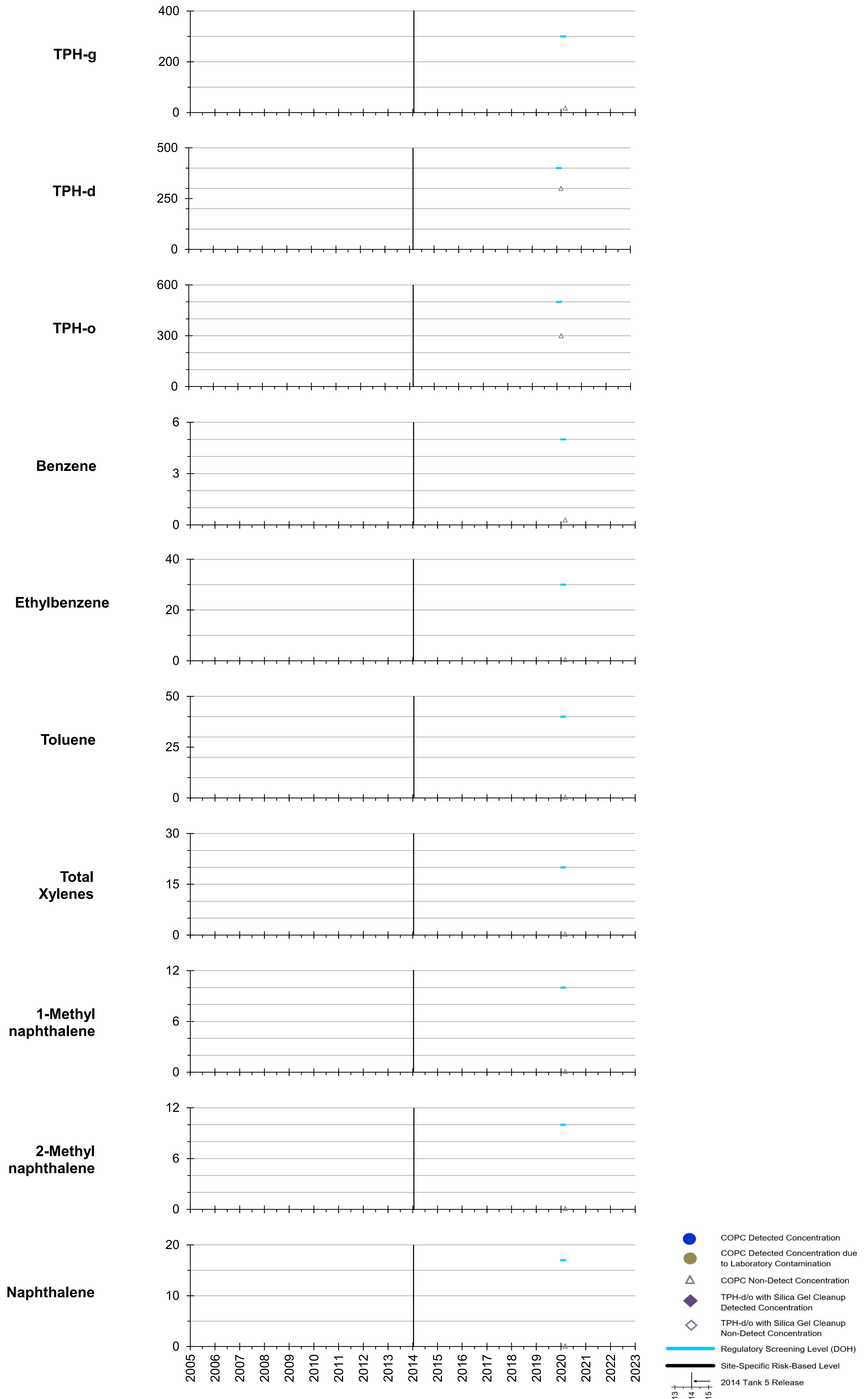
RHMW13 Zone 1



All results in micrograms per liter (µg/L or parts per billion).

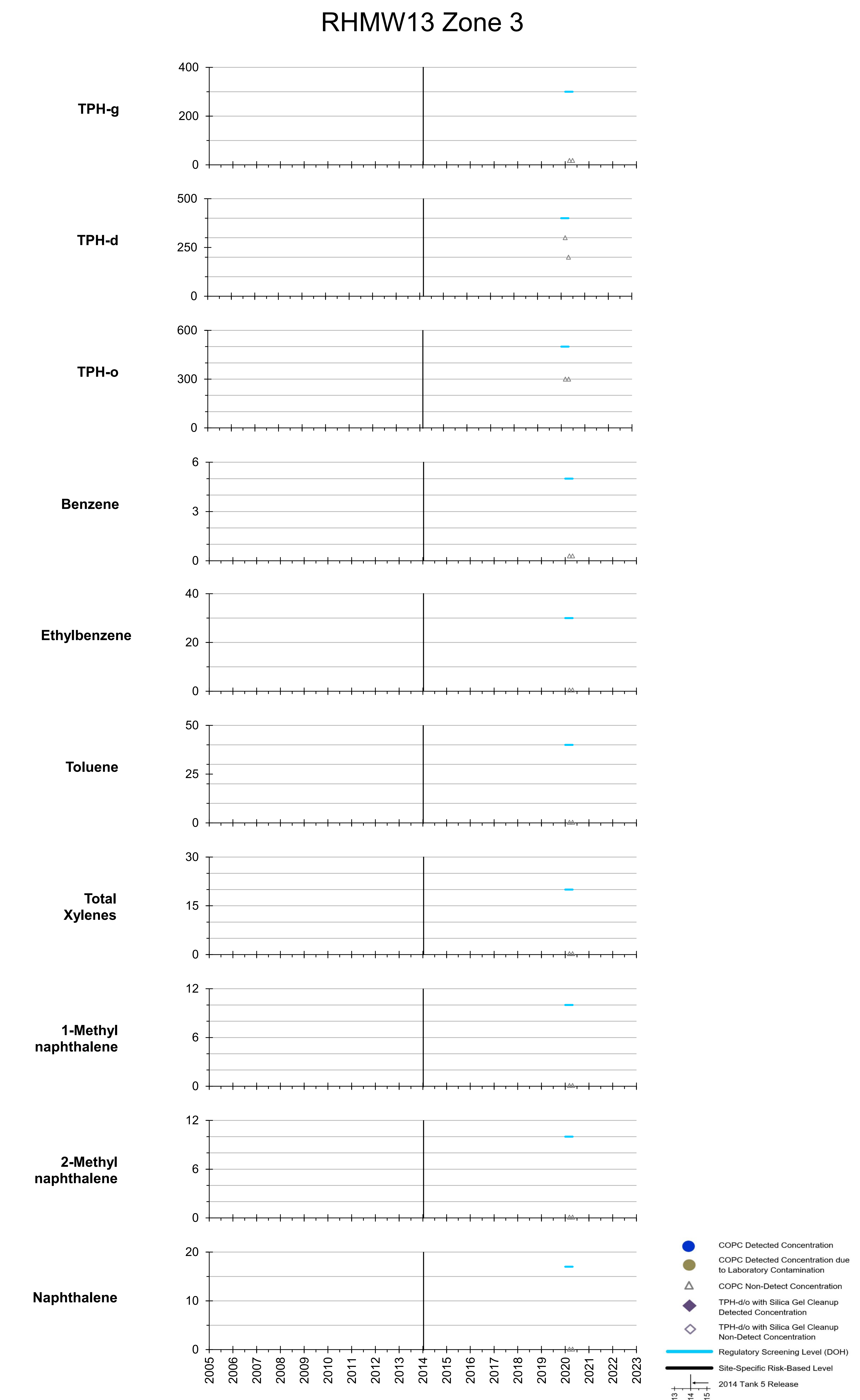
Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW13 Zone 2



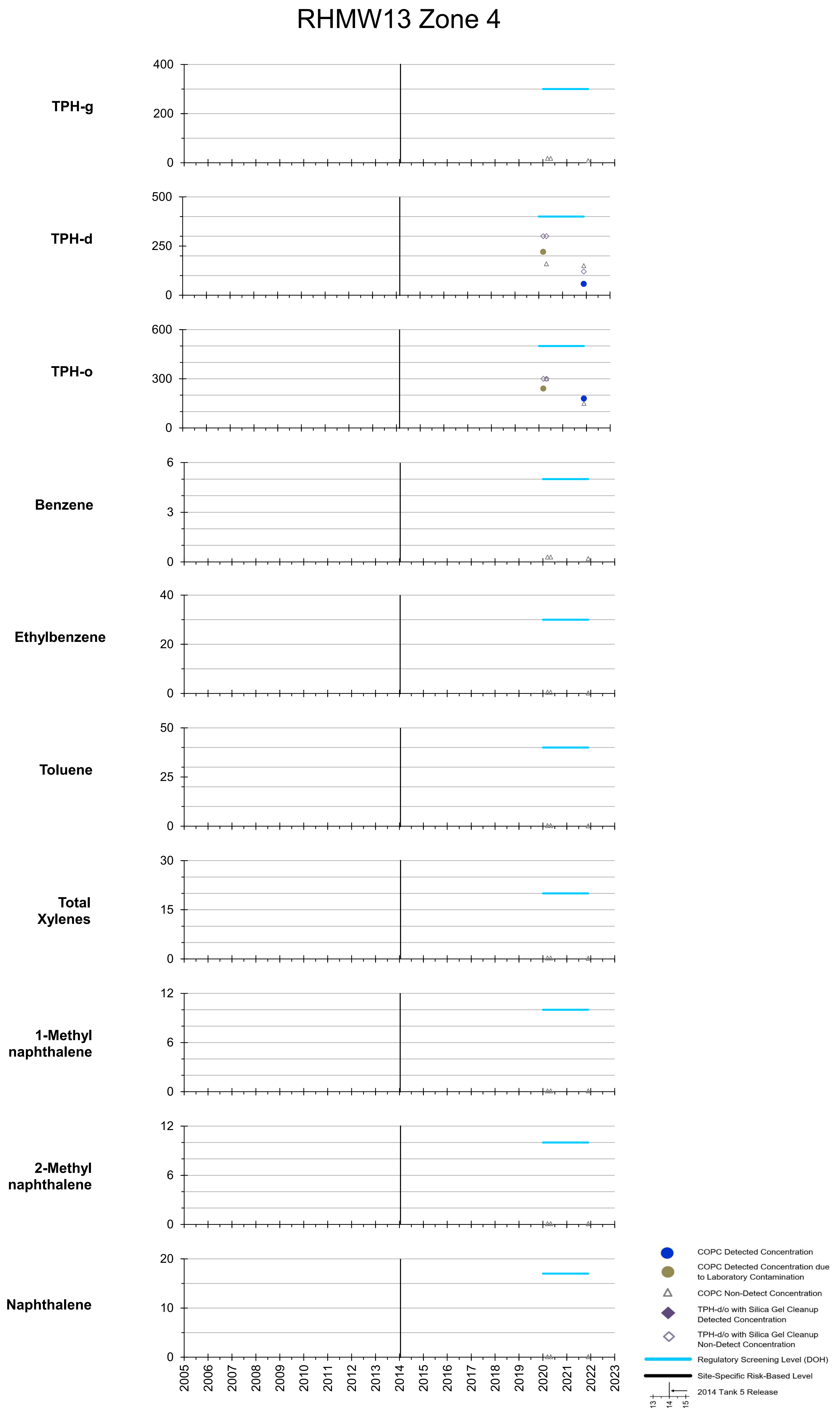
All results in micrograms per liter (µg/L or parts per billion).

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).



All results in micrograms per liter (µg/L or parts per billion).

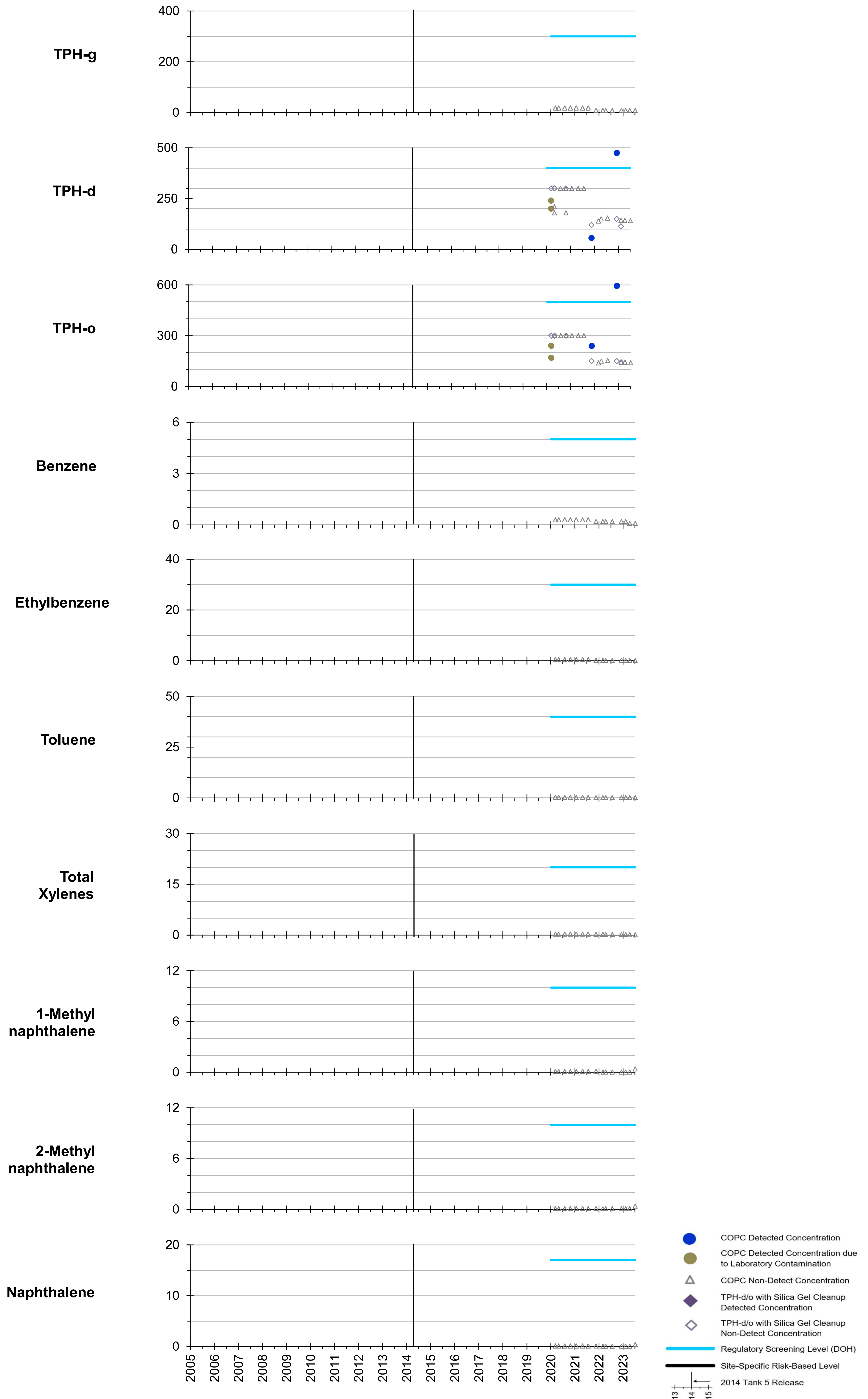
Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).



All results in micrograms per liter (µg/L or parts per billion).

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW13 Zone 5



All results in micrograms per liter (µg/L or parts per billion).

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

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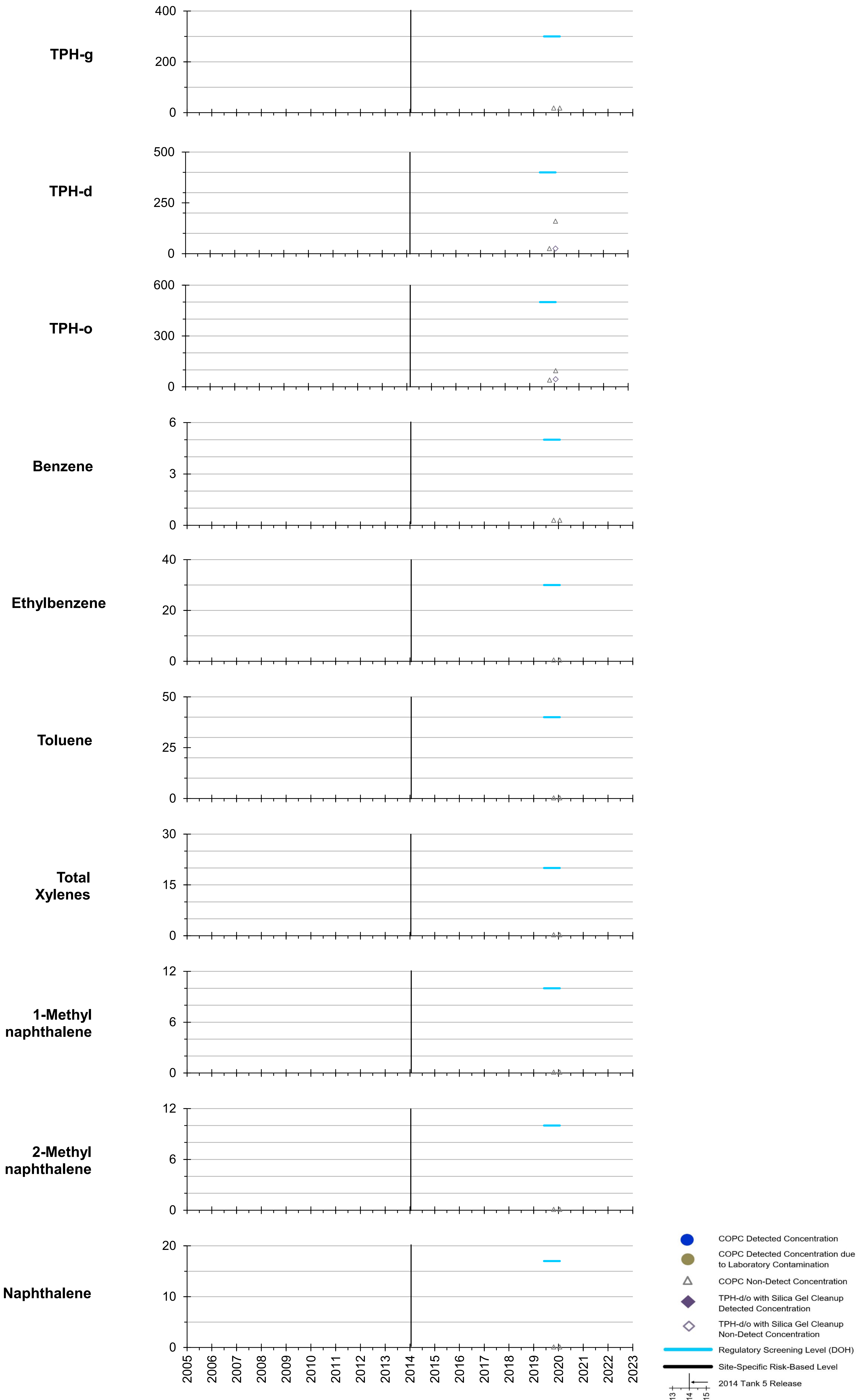

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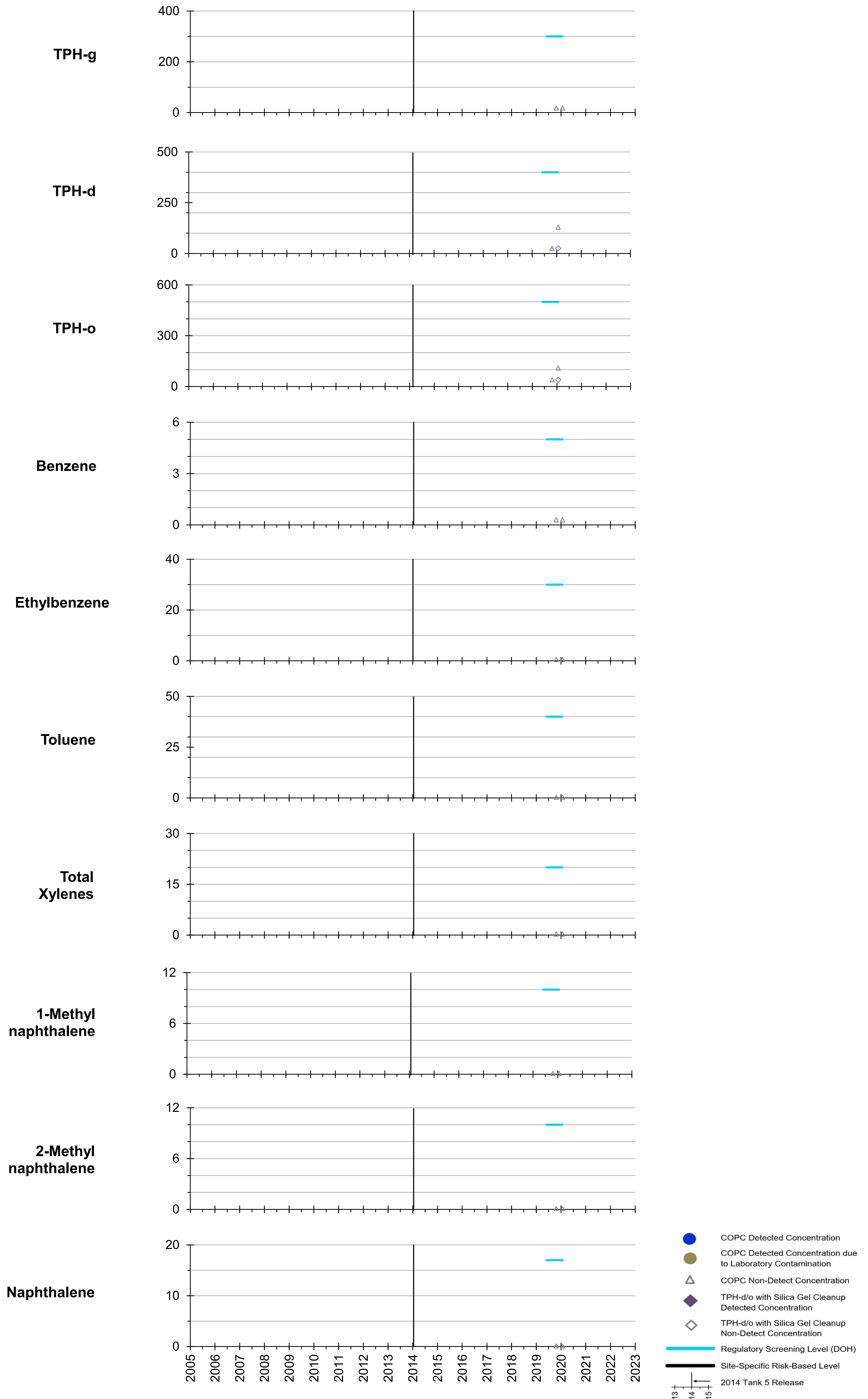
RHMW14 Zone 2



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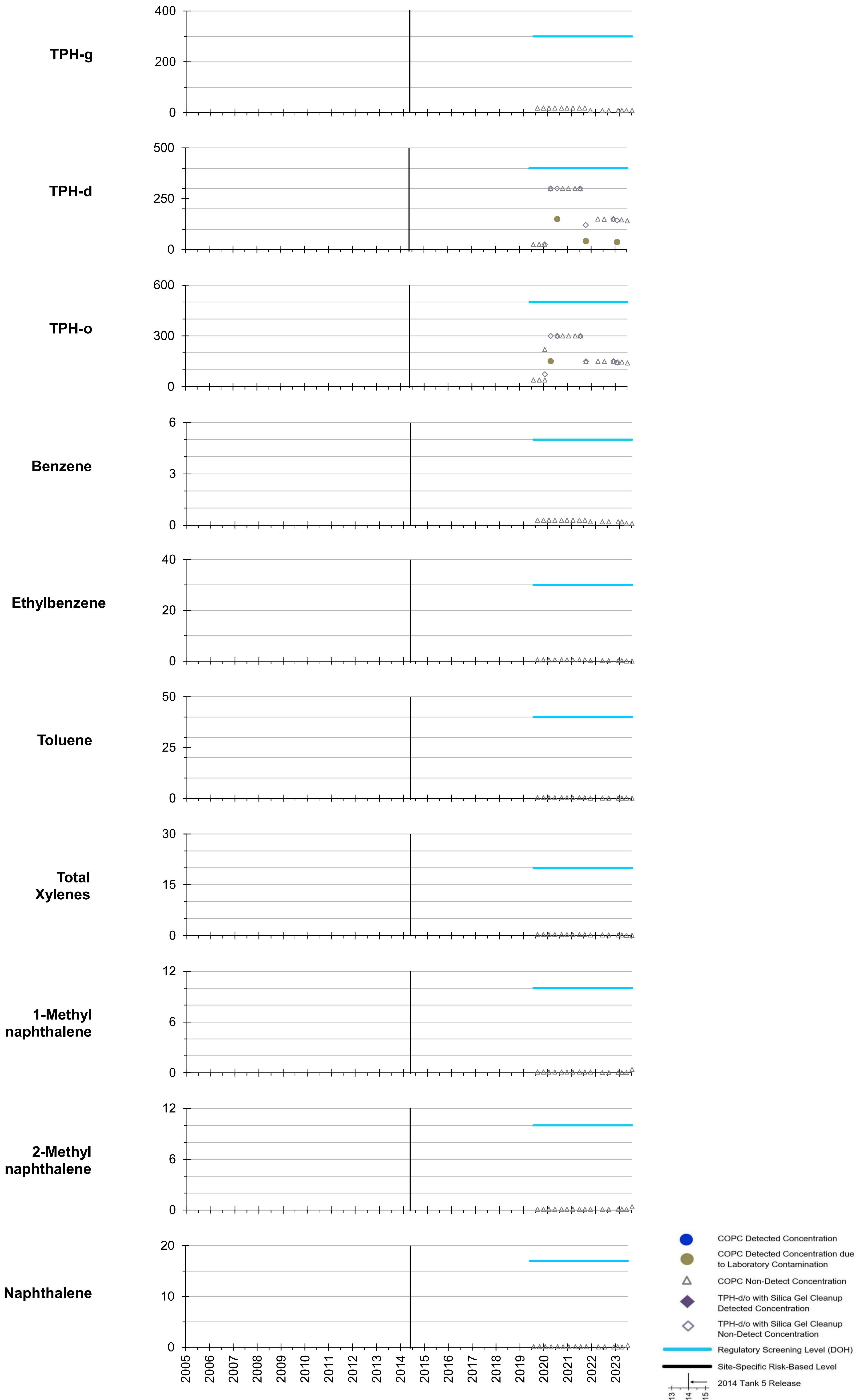
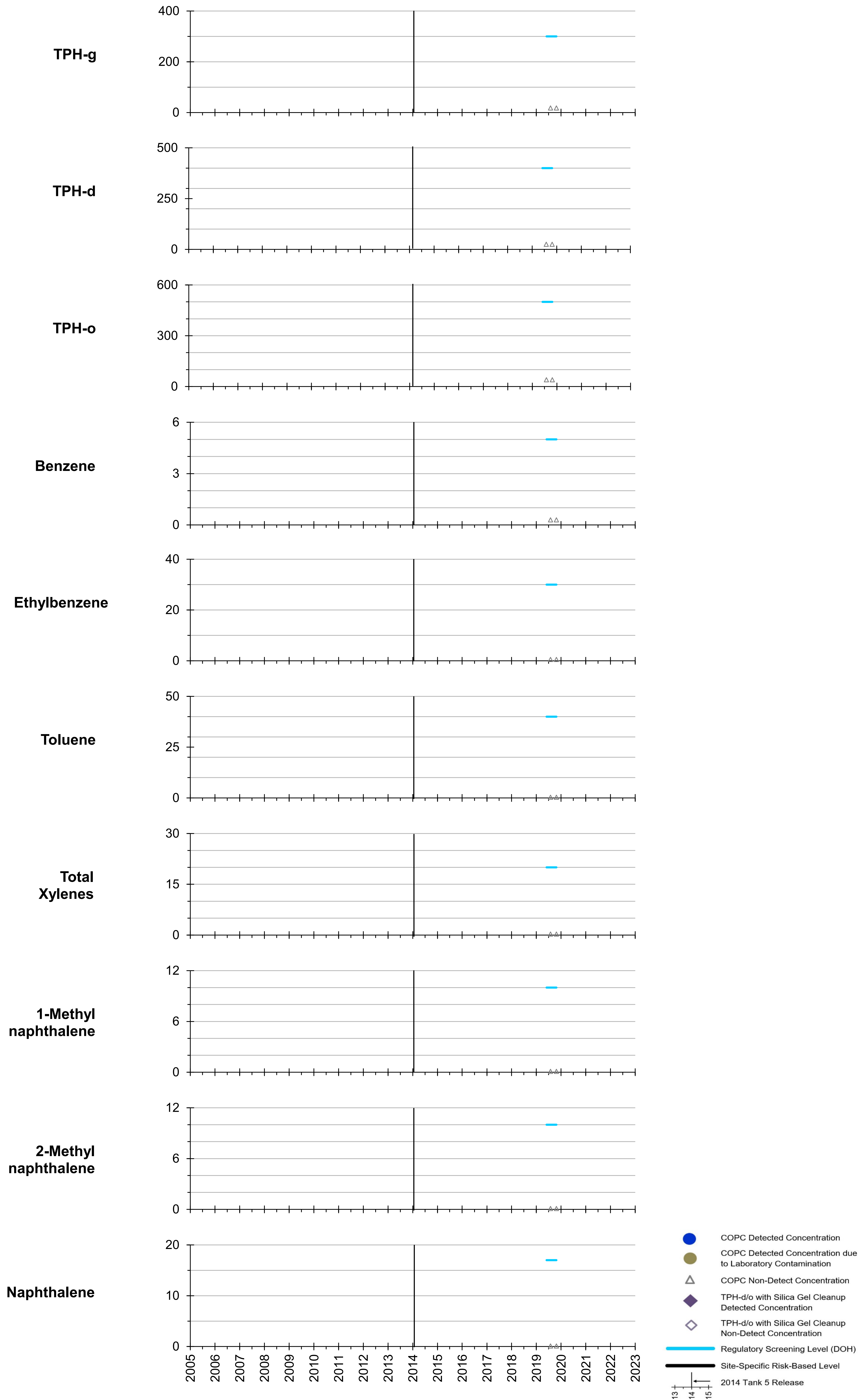
RHMW14 Zone 3



All results in micrograms per liter (µg/L or parts per billion).

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW14 Zone 4



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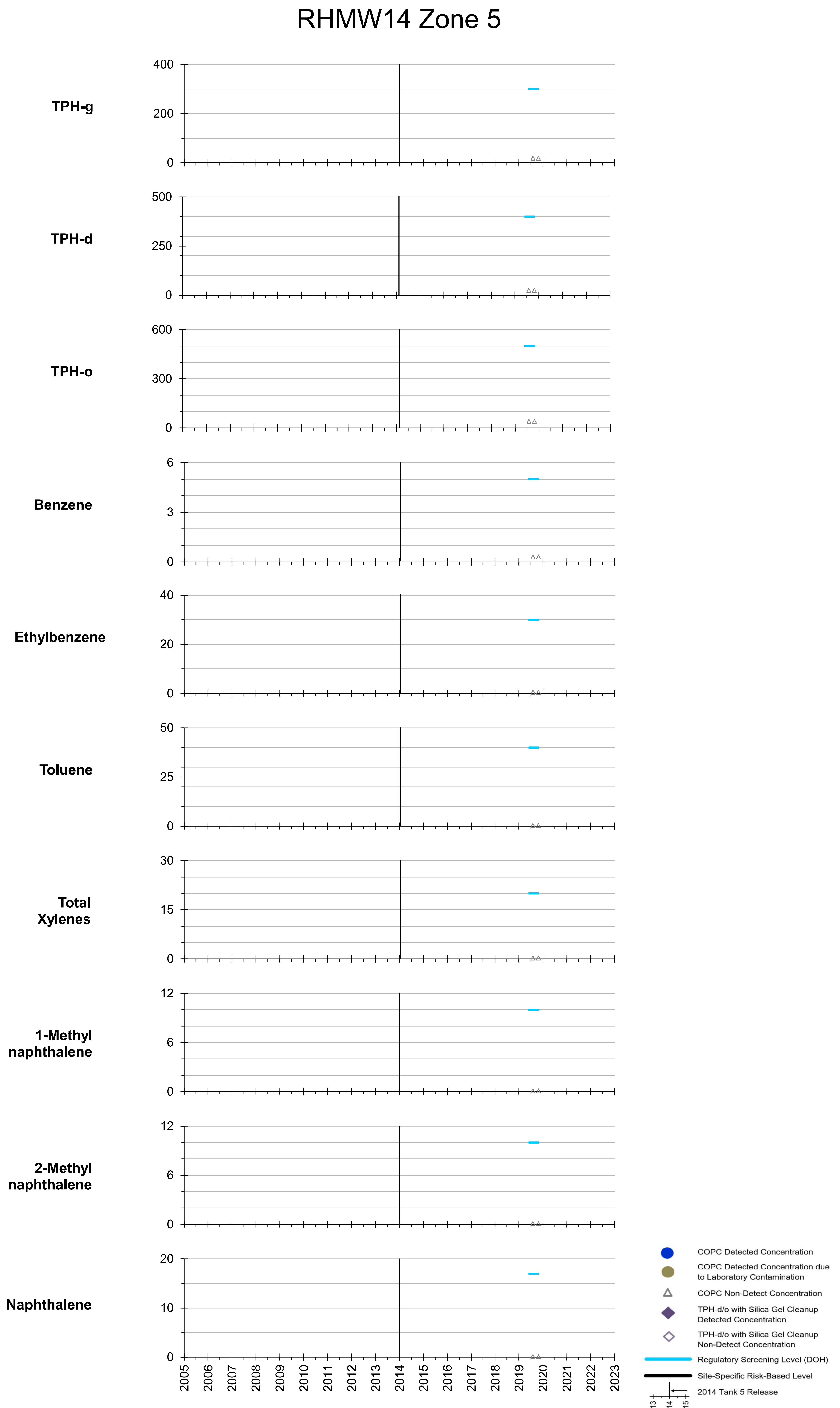

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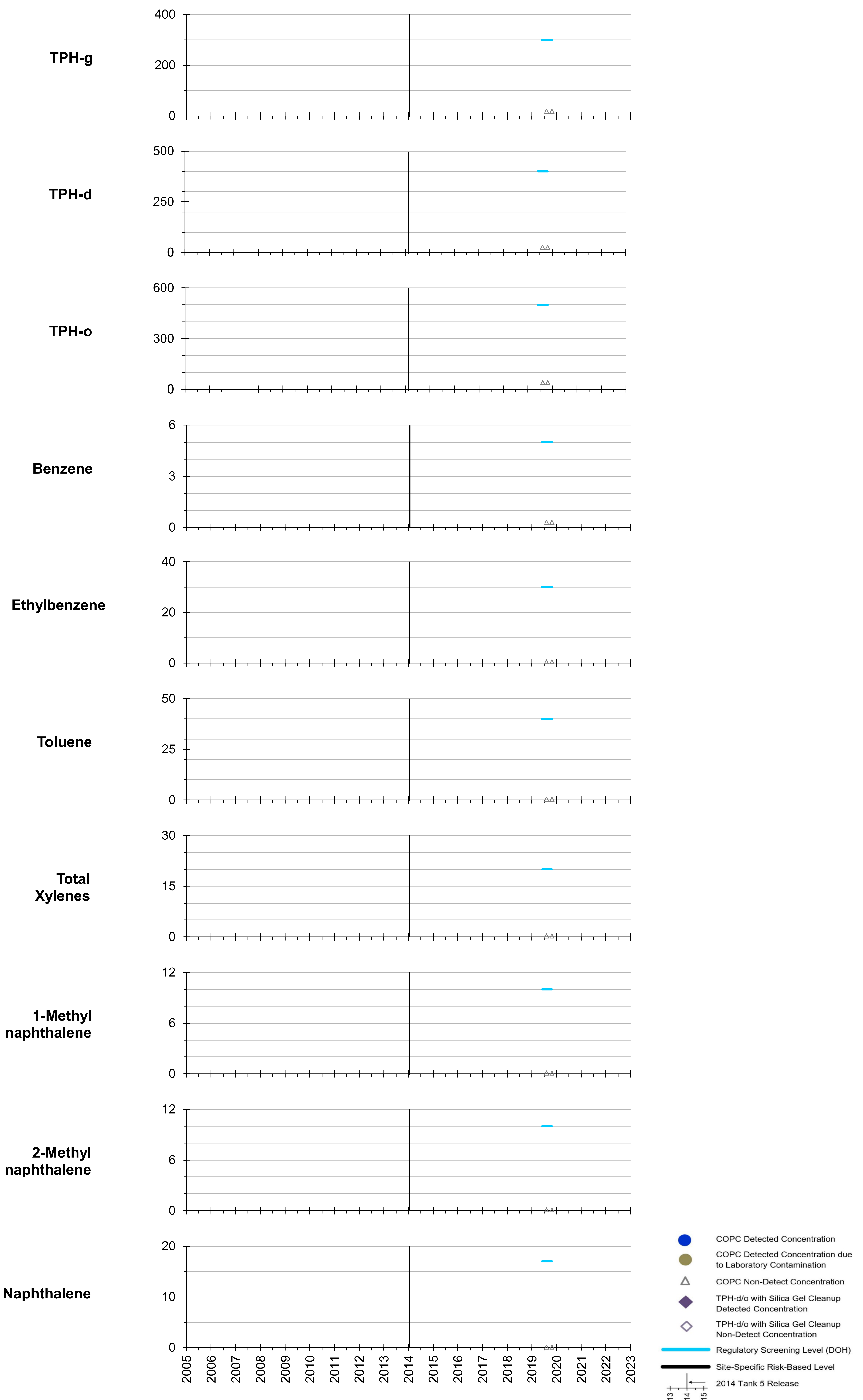
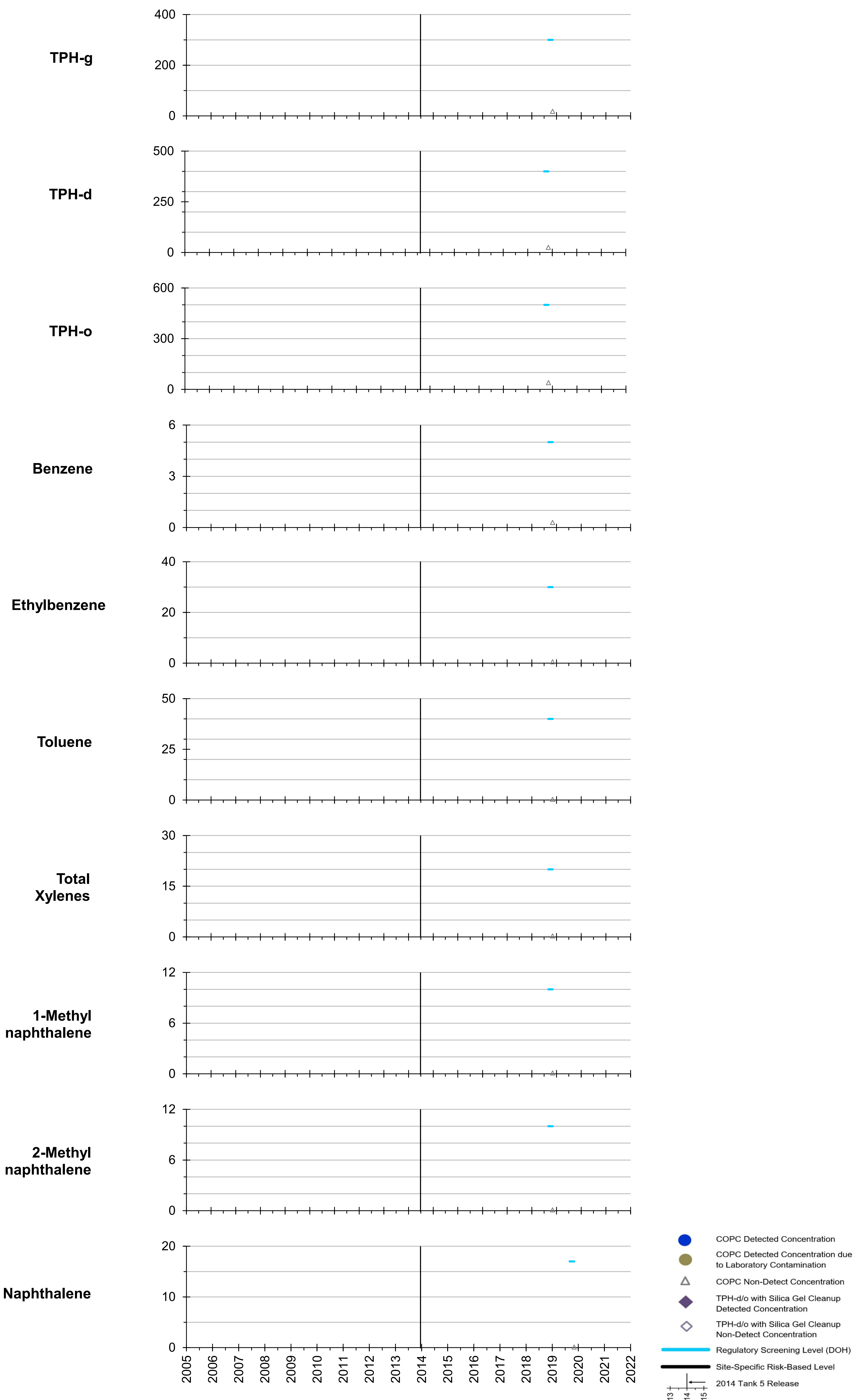
RHMW14 Zone 7

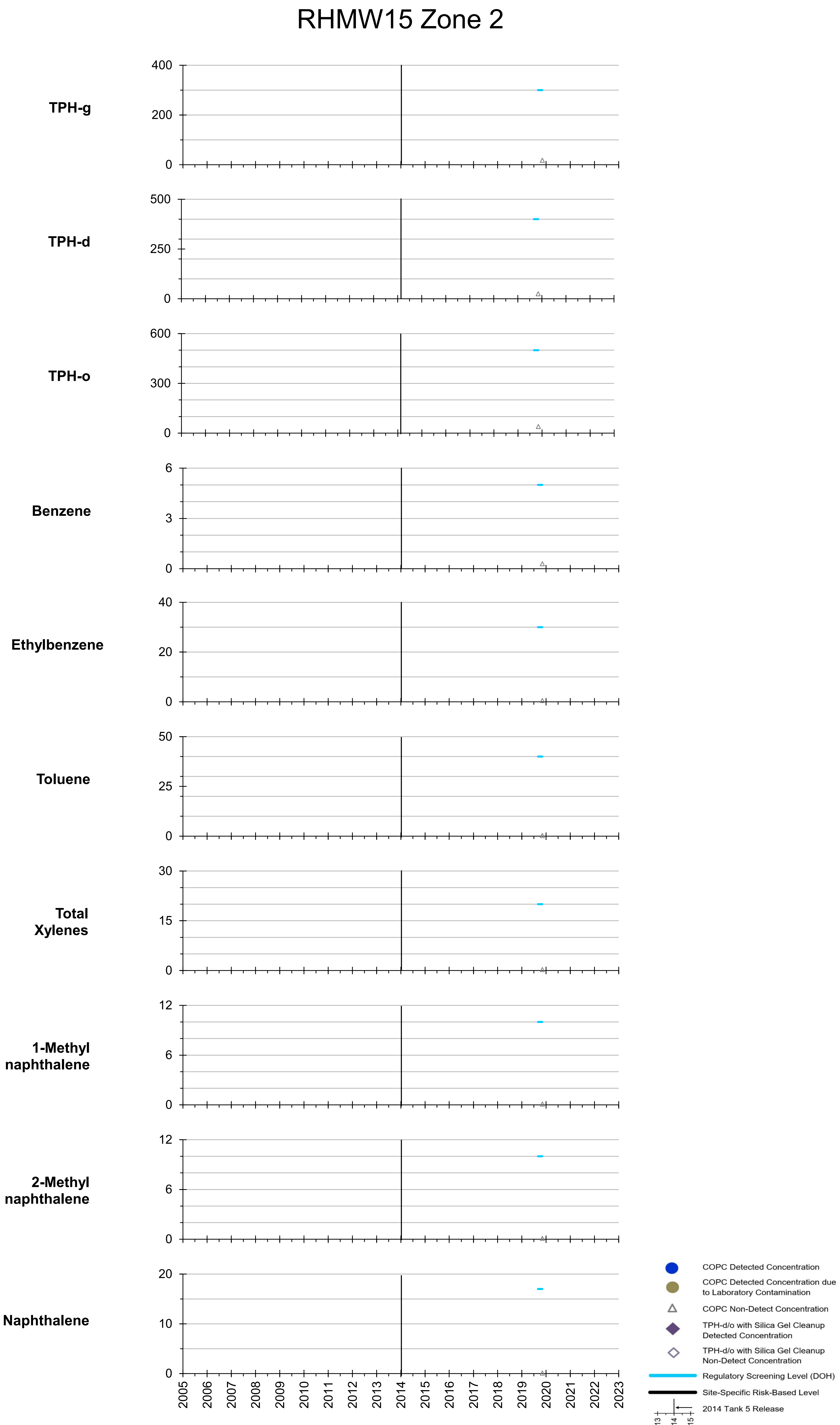


All results in micrograms per liter (µg/L or parts per billion).

RHMW15 Zone 1

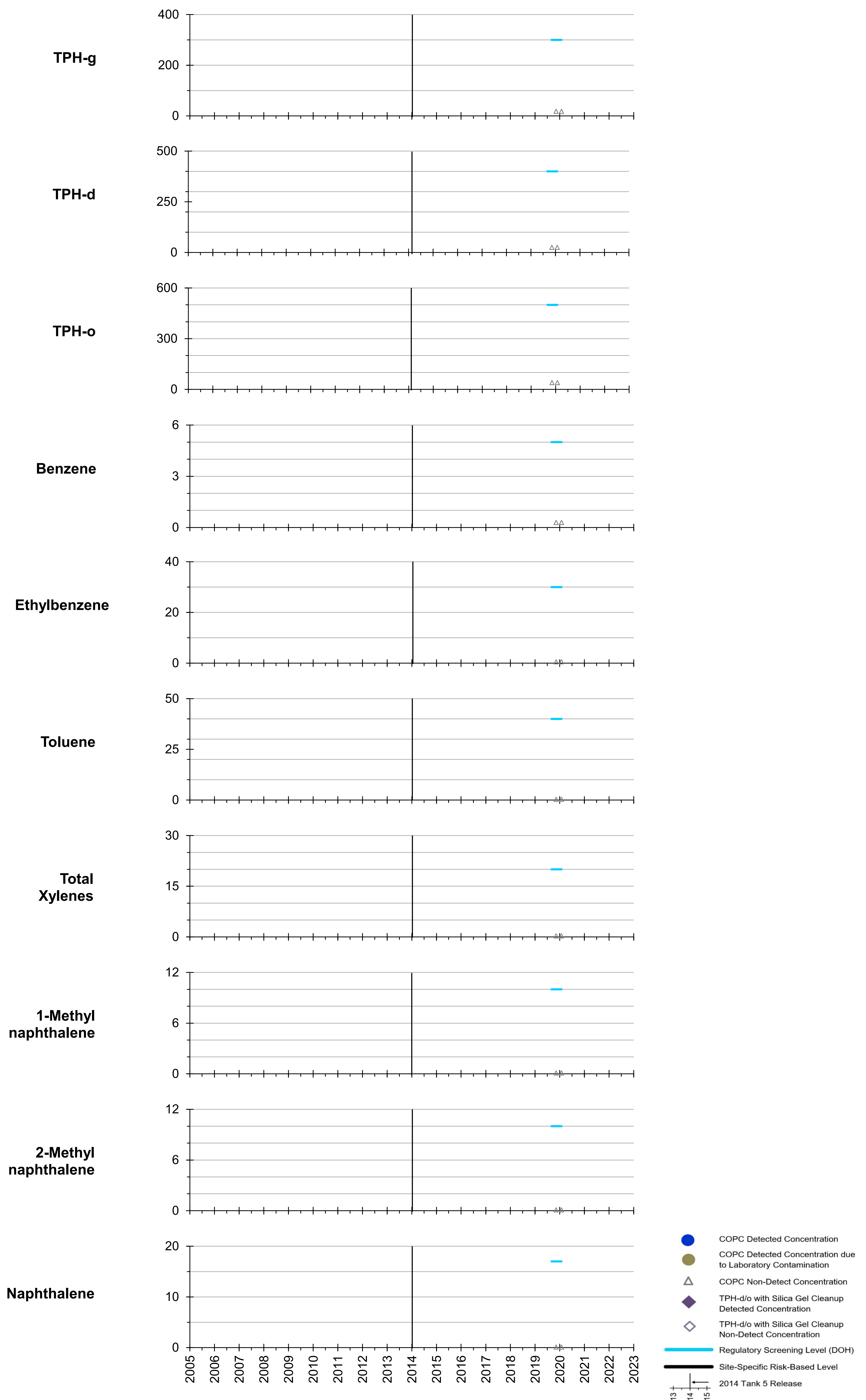


All results in micrograms per liter (µg/L or parts per billion).



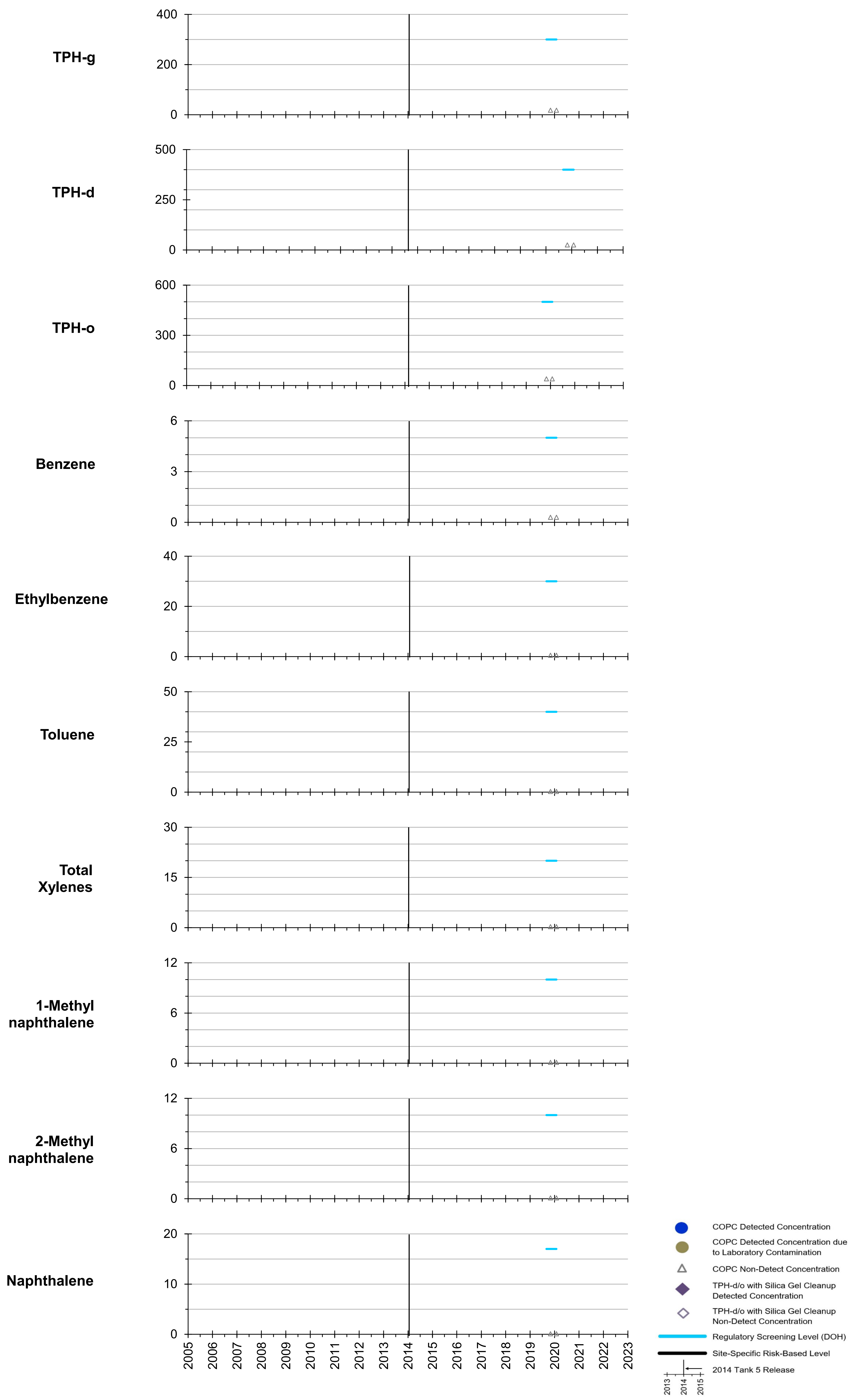
All results in micrograms per liter (µg/L or parts per billion).

RHMW15 Zone 3



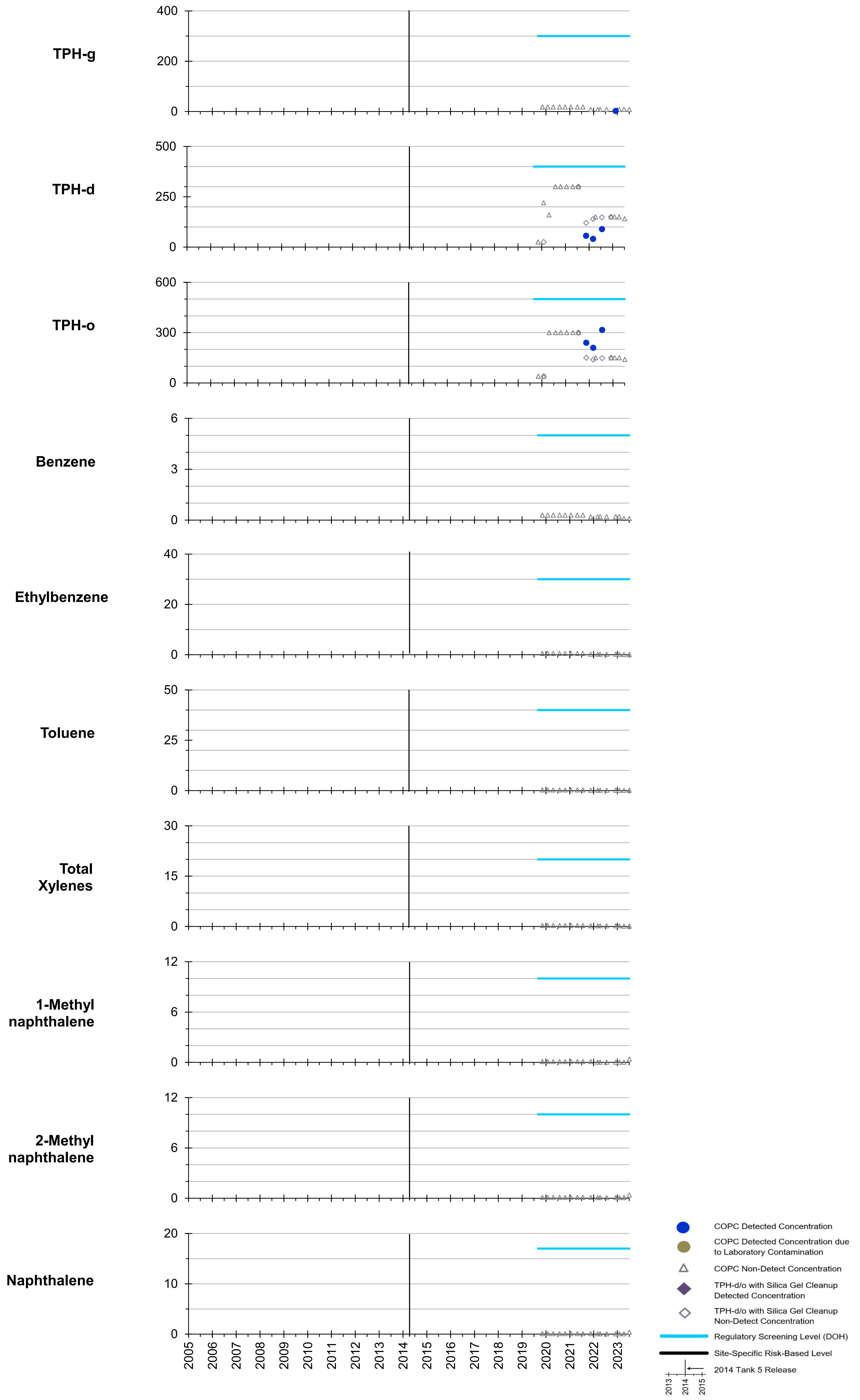
All results in micrograms per liter (µg/L or parts per billion).

RHMW15 Zone 4



All results in micrograms per liter (µg/L or parts per billion).

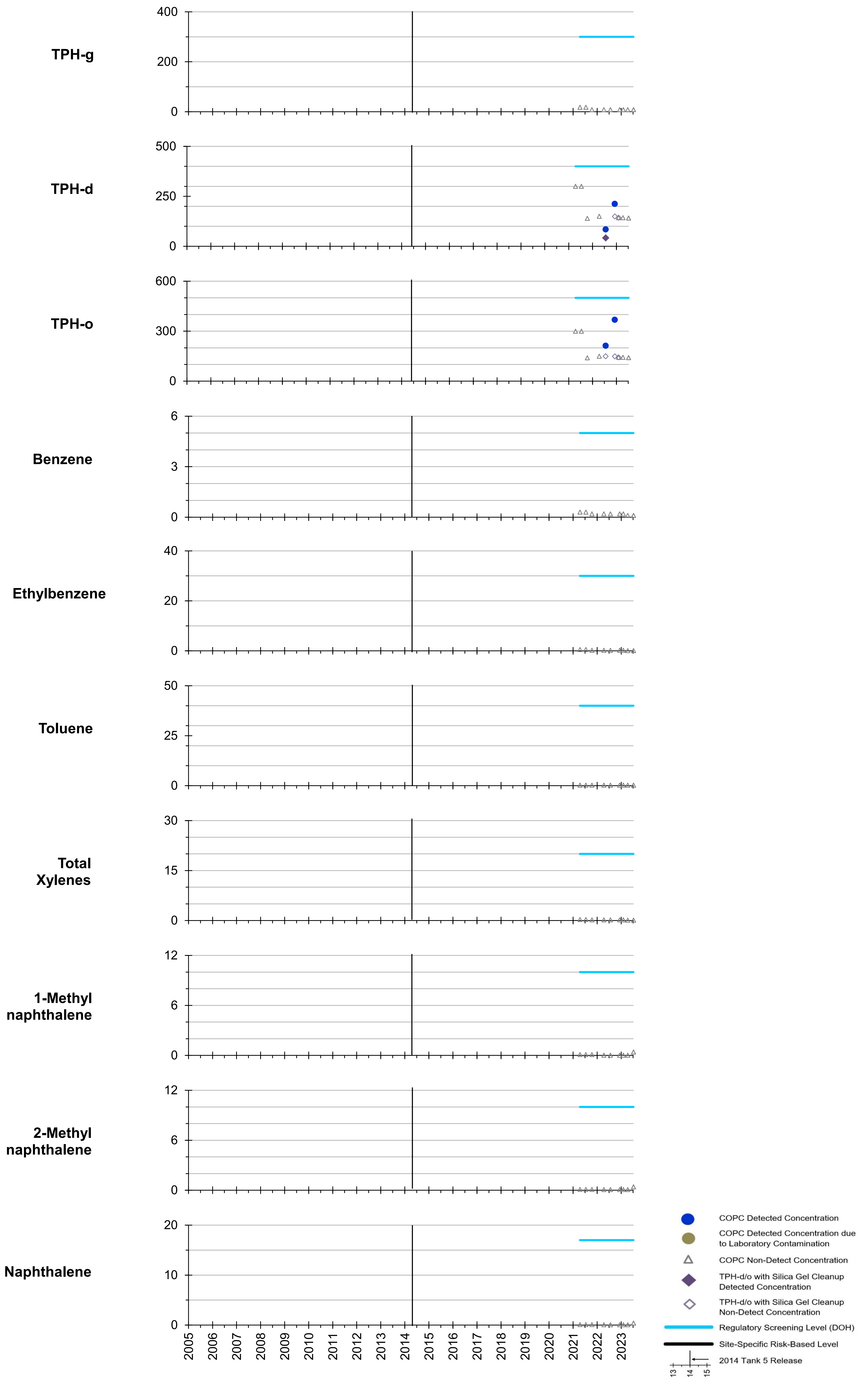
RHMW15 Zone 5



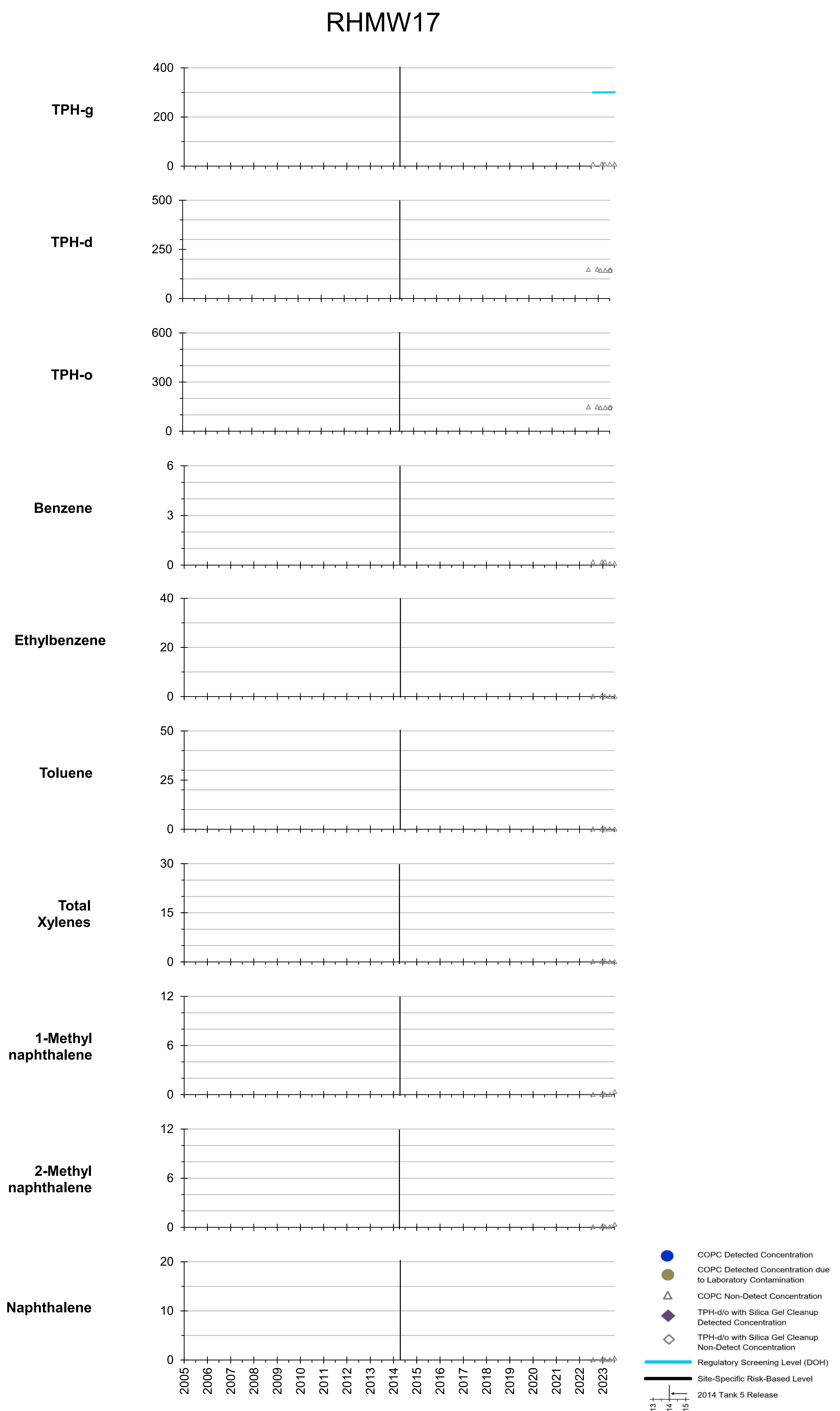
All results in micrograms per liter (µg/L or parts per billion).

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

RHMW16

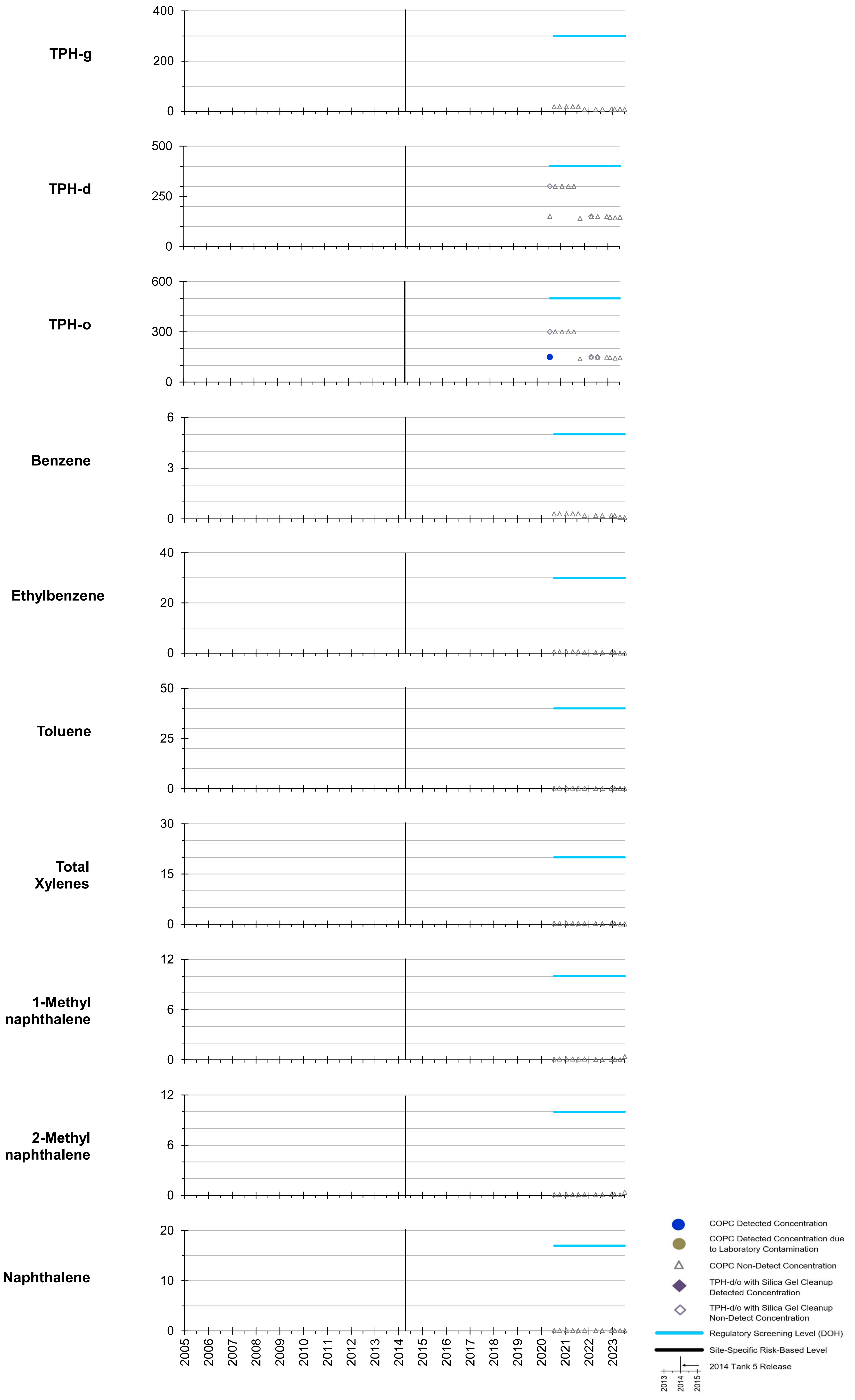


All results in micrograms per liter (µg/L or parts per billion).

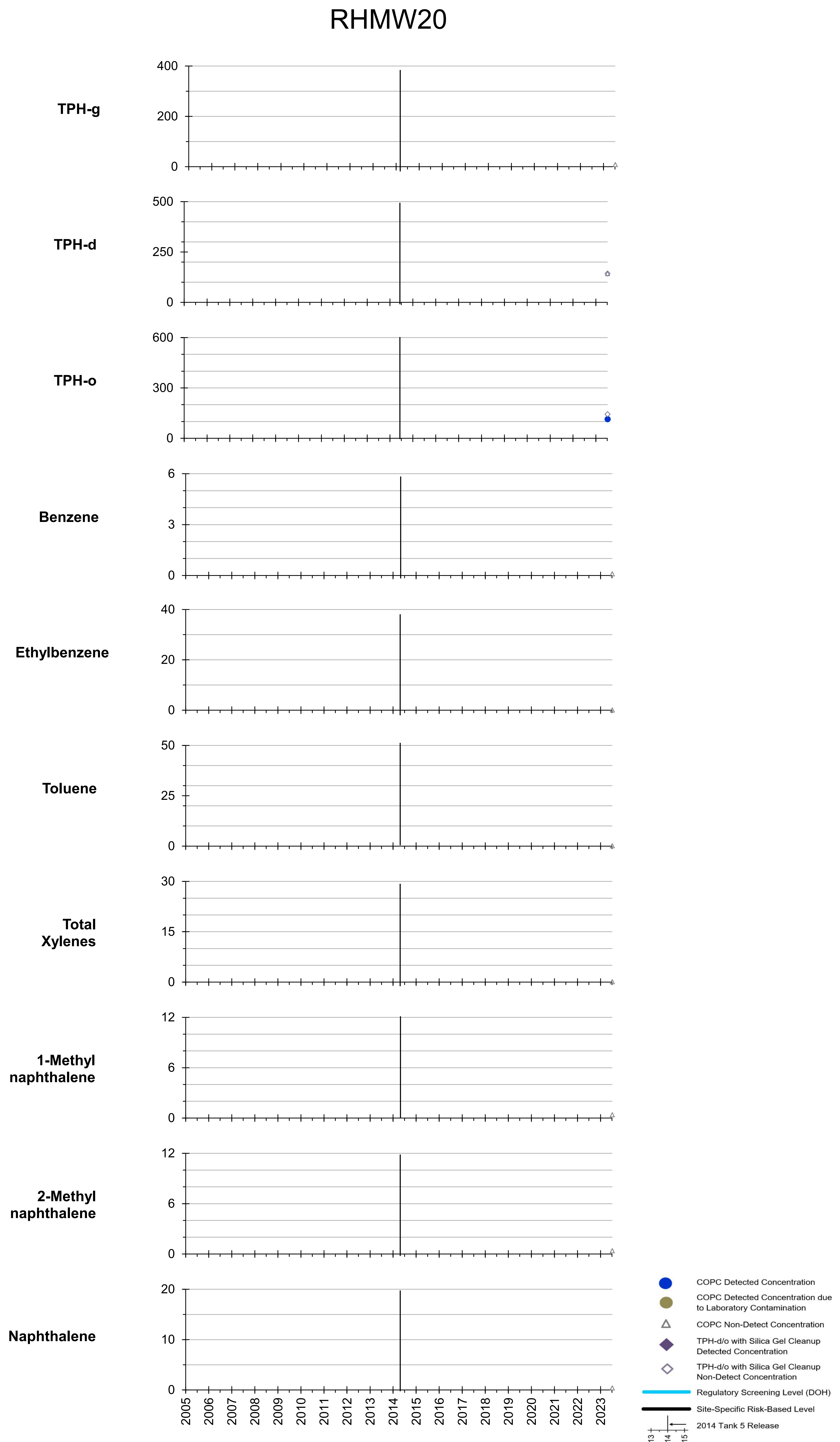


All results in micrograms per liter (µg/L or parts per billion).

RHMW19

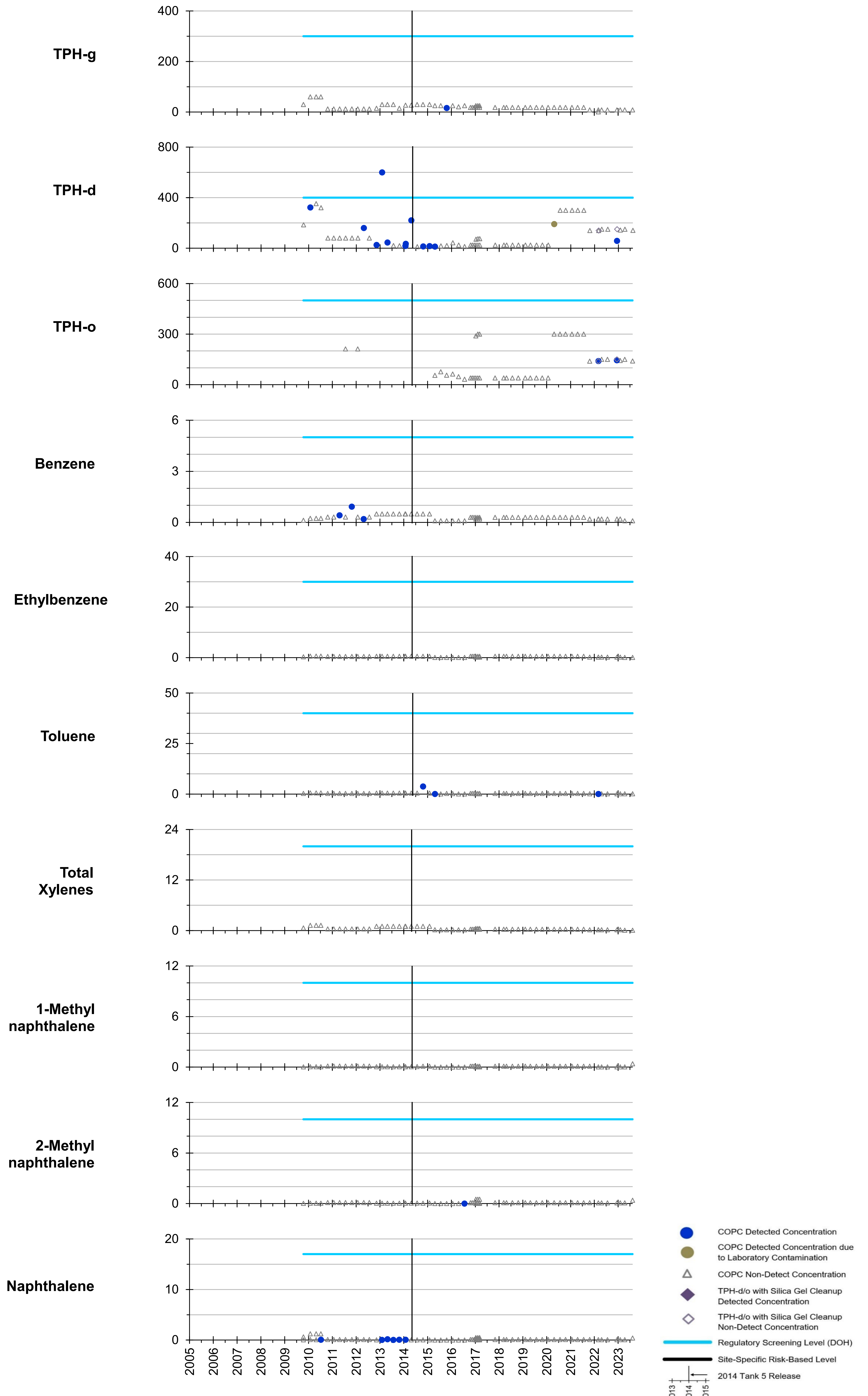


All results in micrograms per liter (µg/L or parts per billion).



All results in micrograms per liter (µg/L or parts per billion).

HDMW2253-03

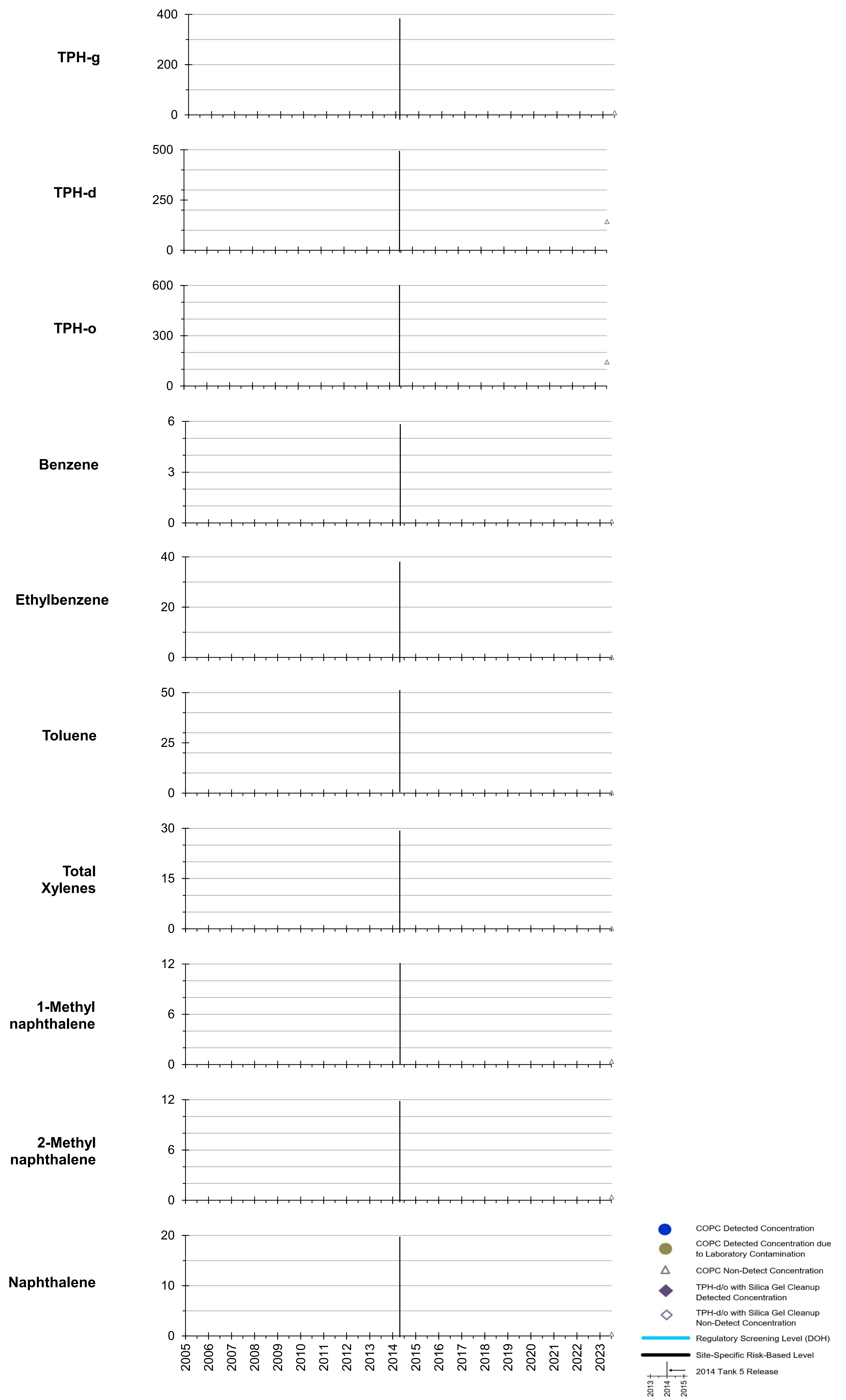


All results in micrograms per liter (µg/L or parts per billion).

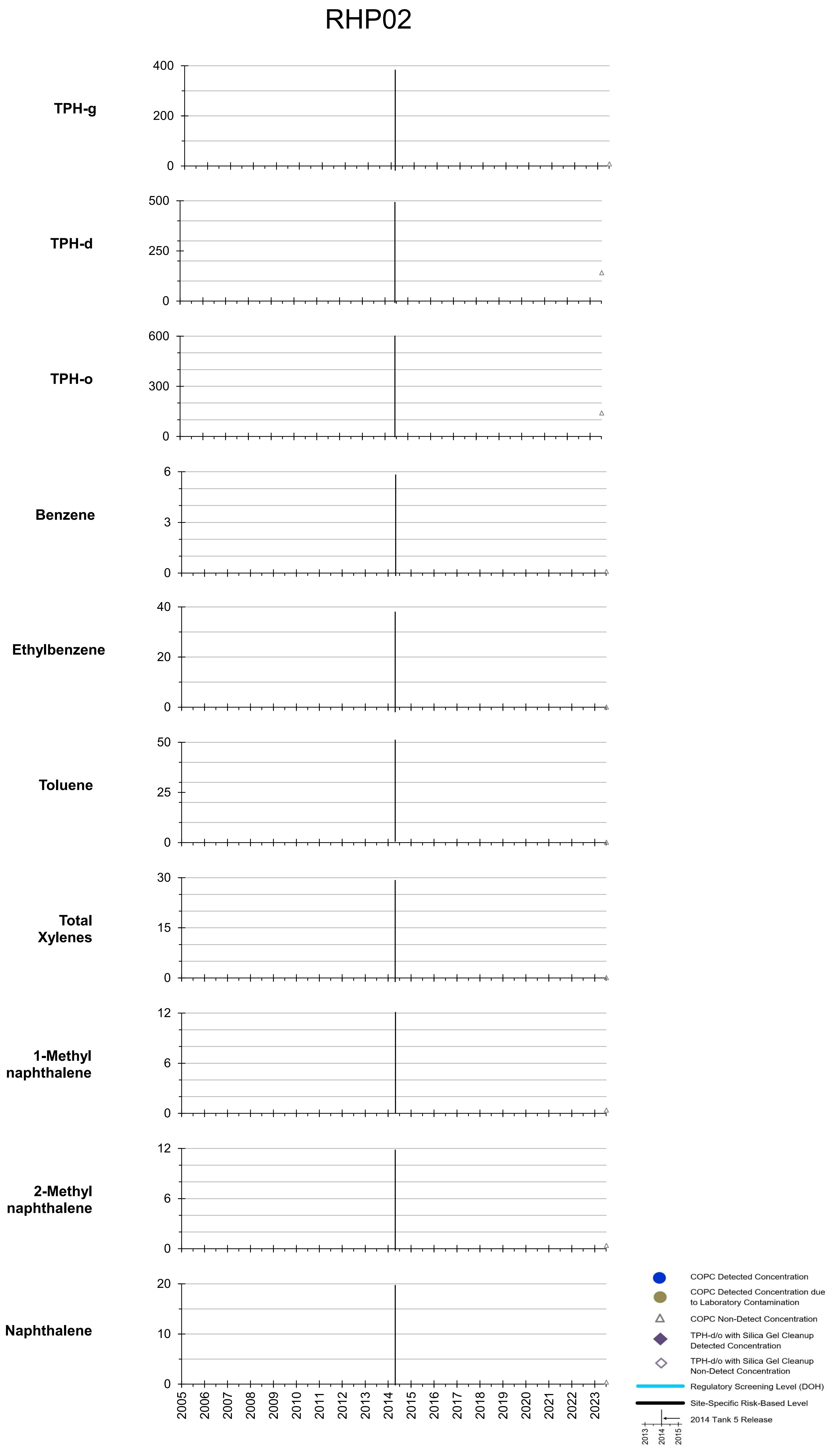
EPA Region 9 Laboratory split sampling data from First to Third Quarters 2017 included in the graphs.

Laboratory reporting limits for TPH-d and TPH-o were raised in March 2020 in accordance with the most current DoD QSM (2019), TNI Manual (2016), and 40 CFR Part 136 (Methods Update Rule 2017).

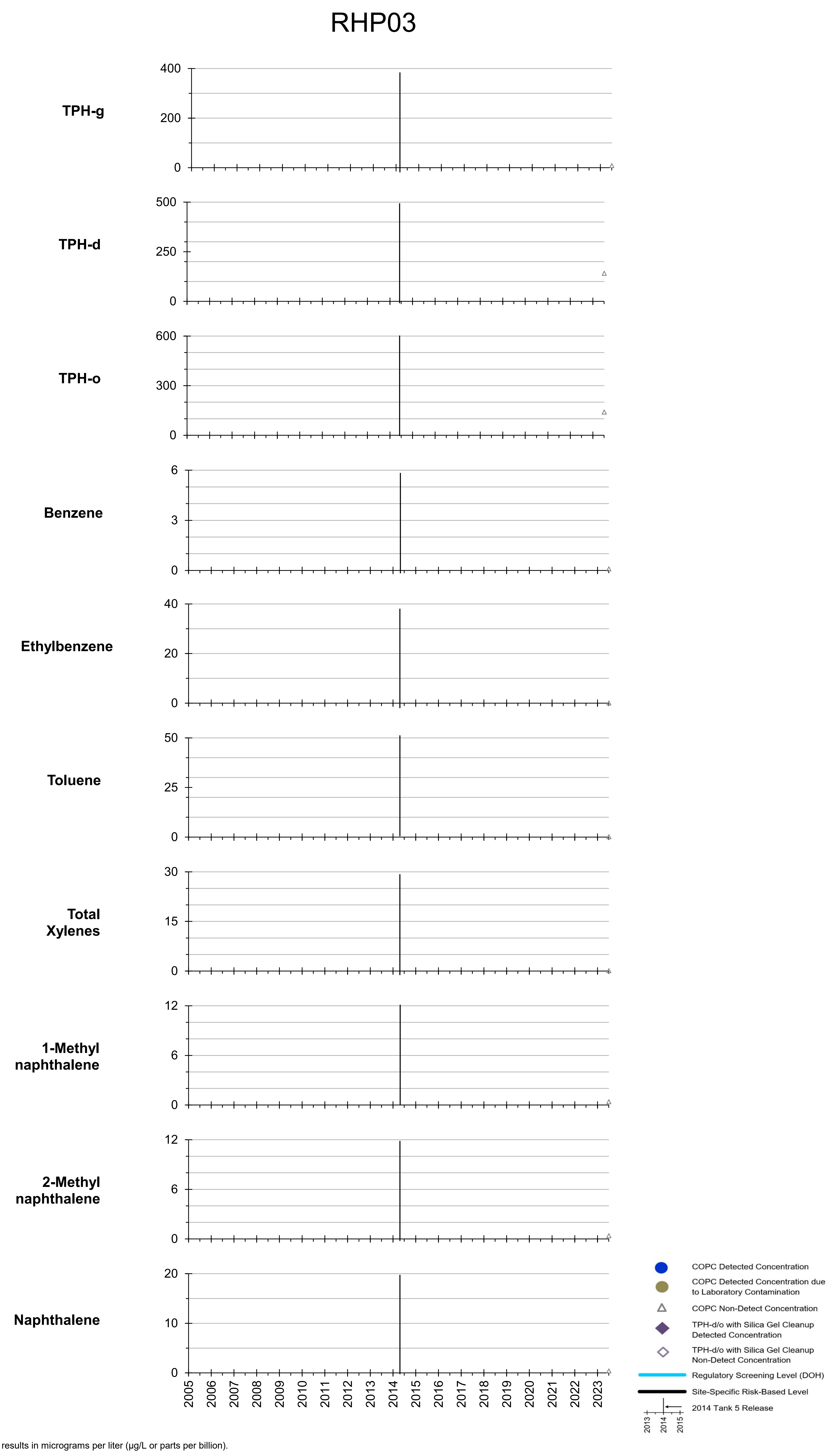
RHP01



All results in micrograms per liter (µg/L or parts per billion).

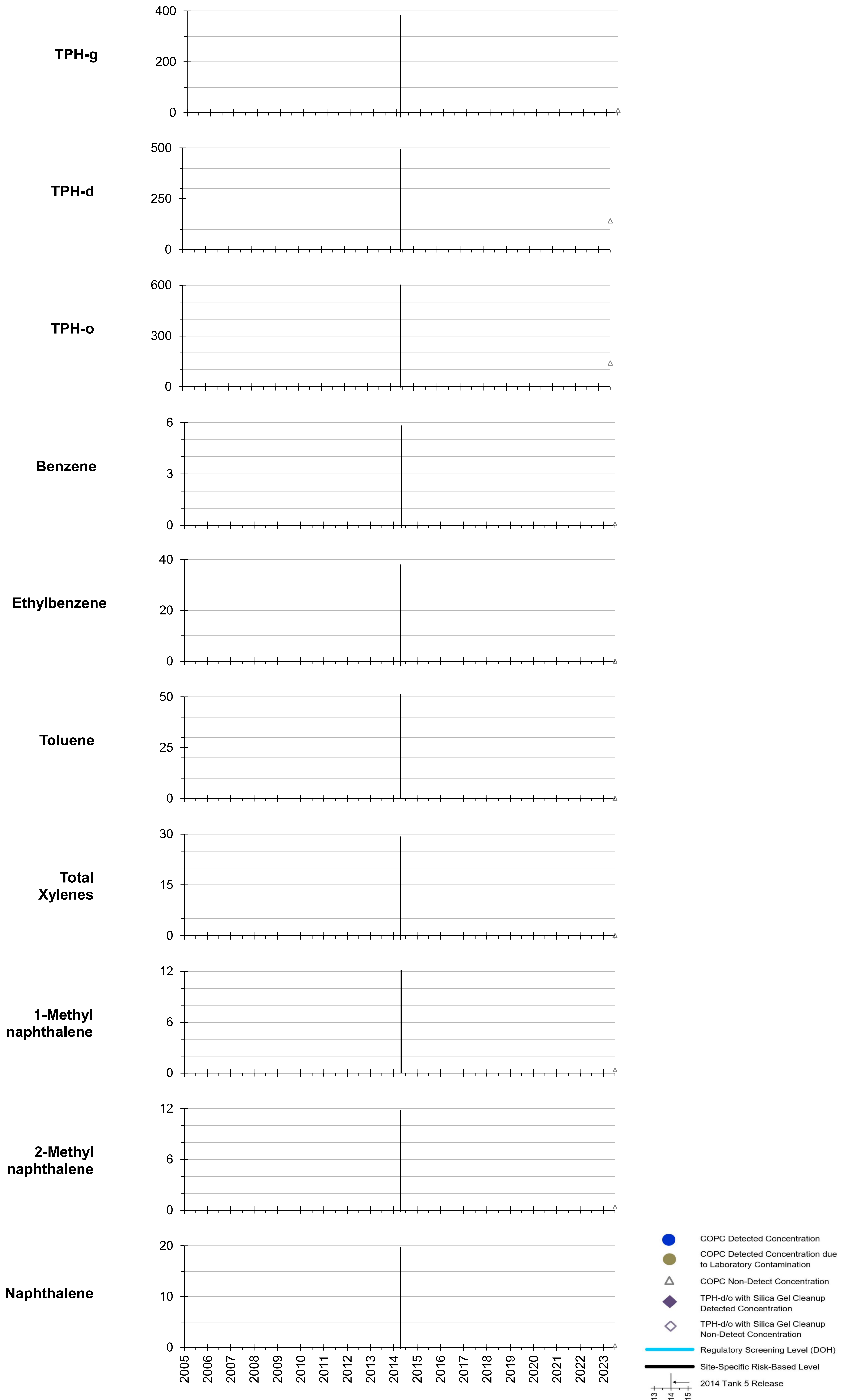


All results in micrograms per liter (µg/L or parts per billion).

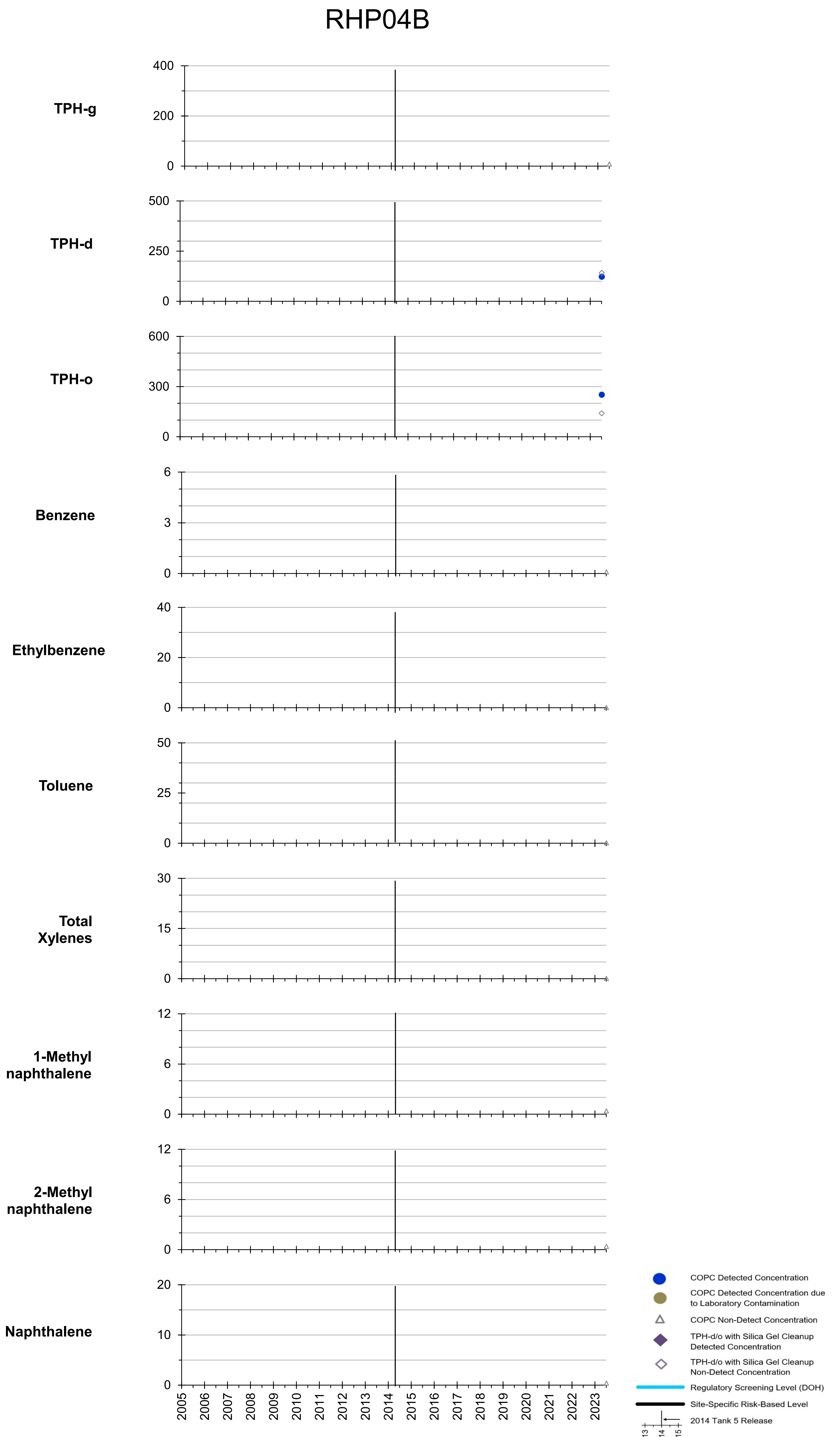


All results in micrograms per liter (µg/L or parts per billion).

RHP04A

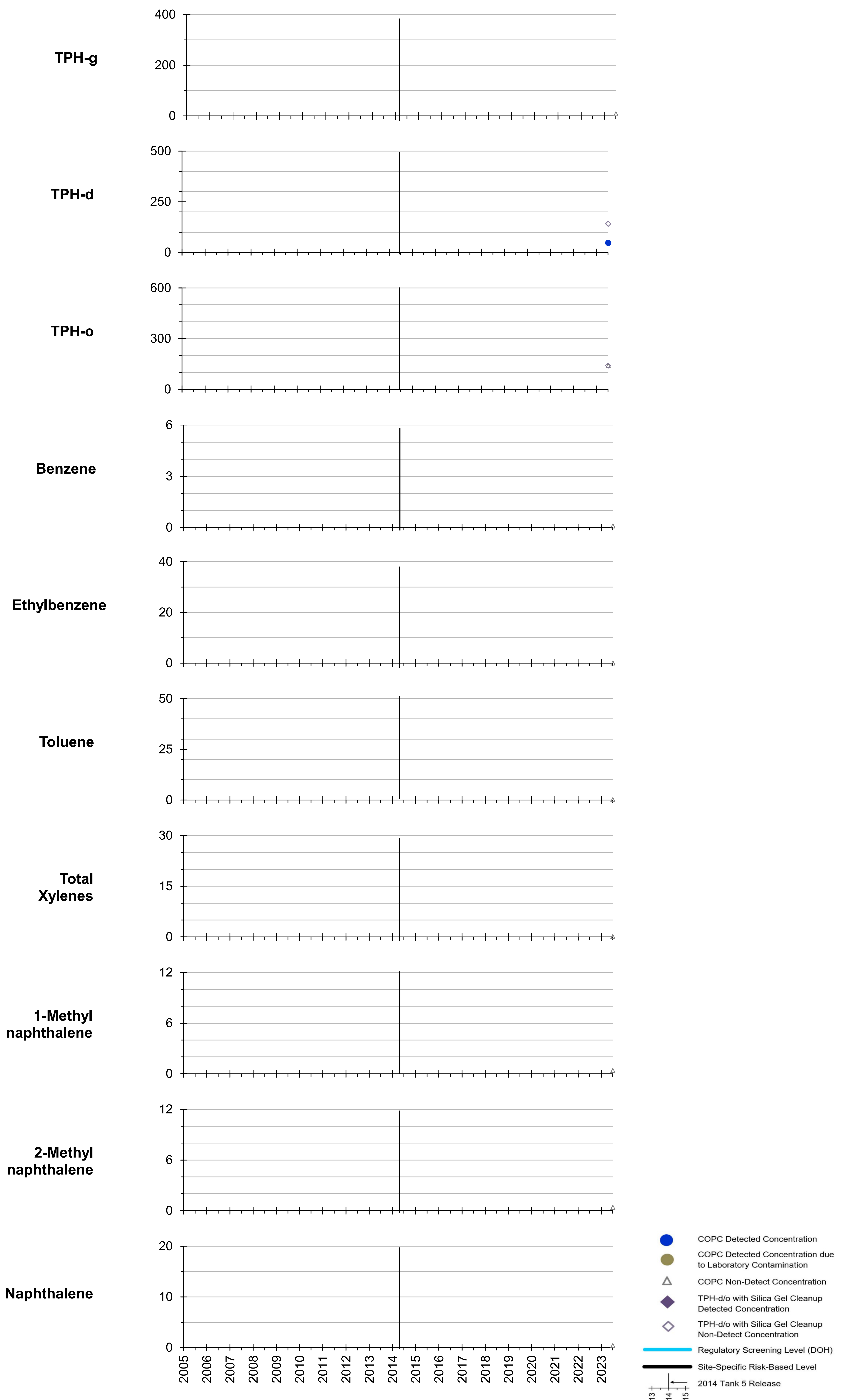


All results in micrograms per liter (µg/L or parts per billion).

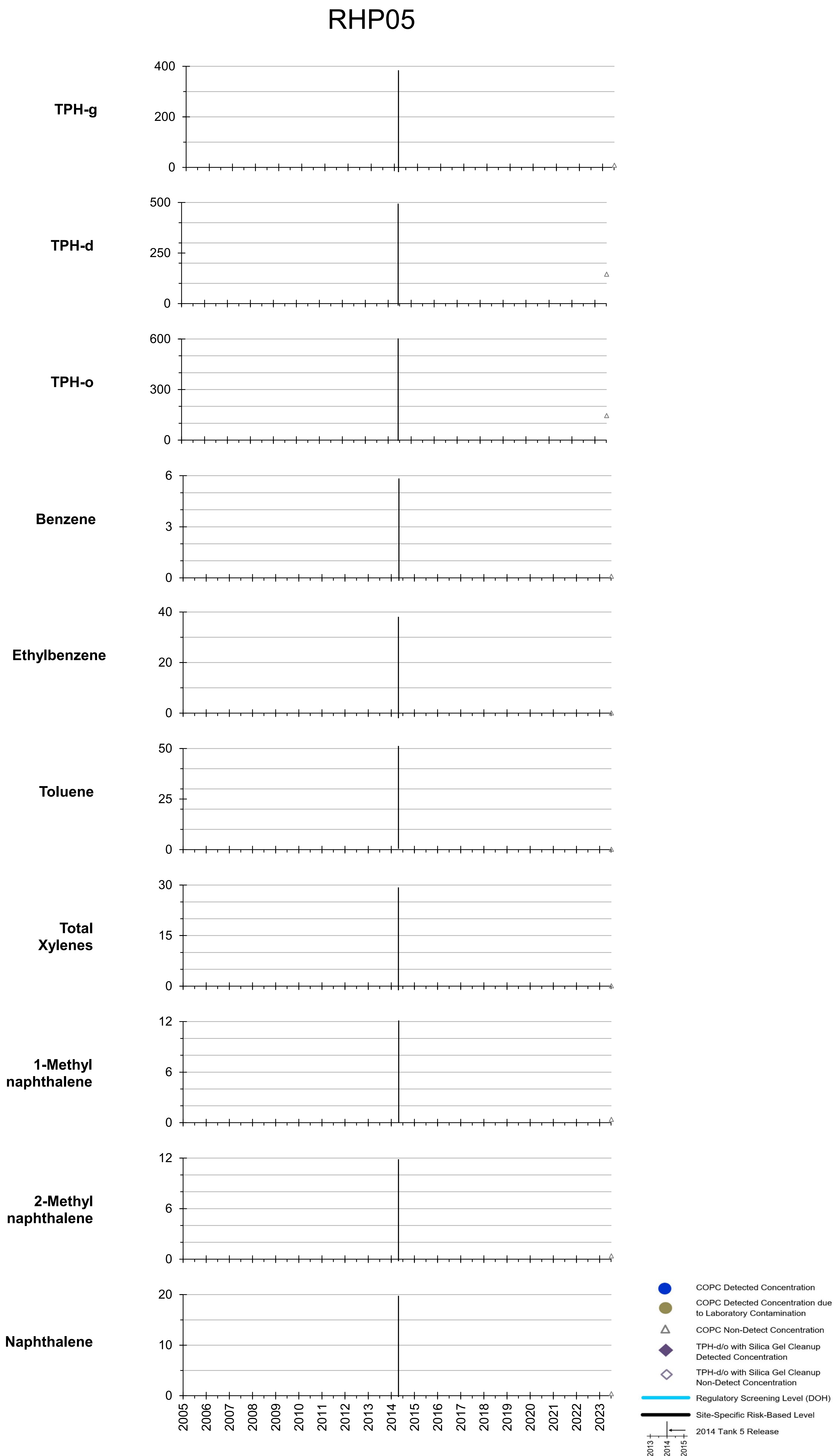


All results in micrograms per liter (µg/L or parts per billion).

RHP04C

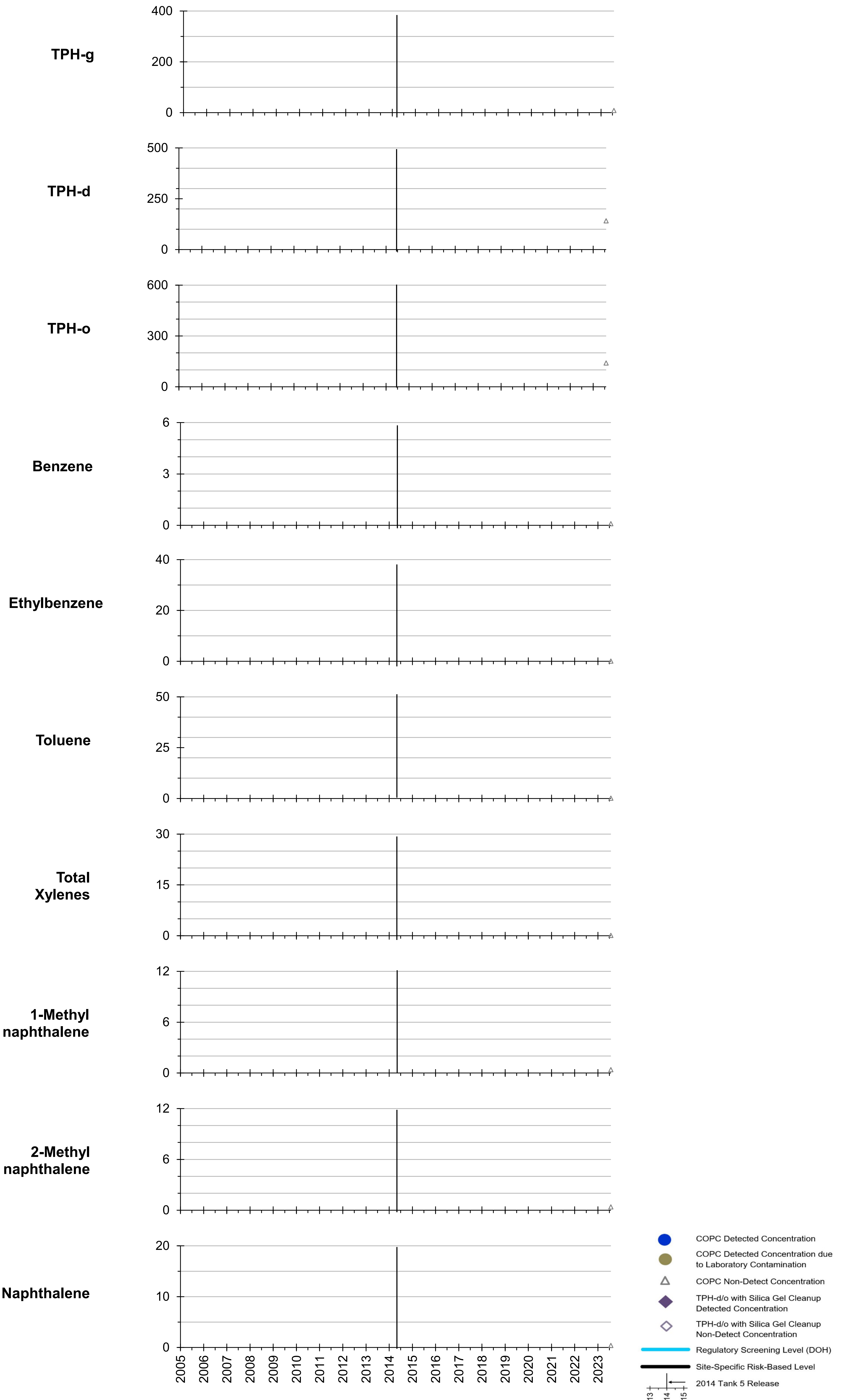


All results in micrograms per liter (µg/L or parts per billion).

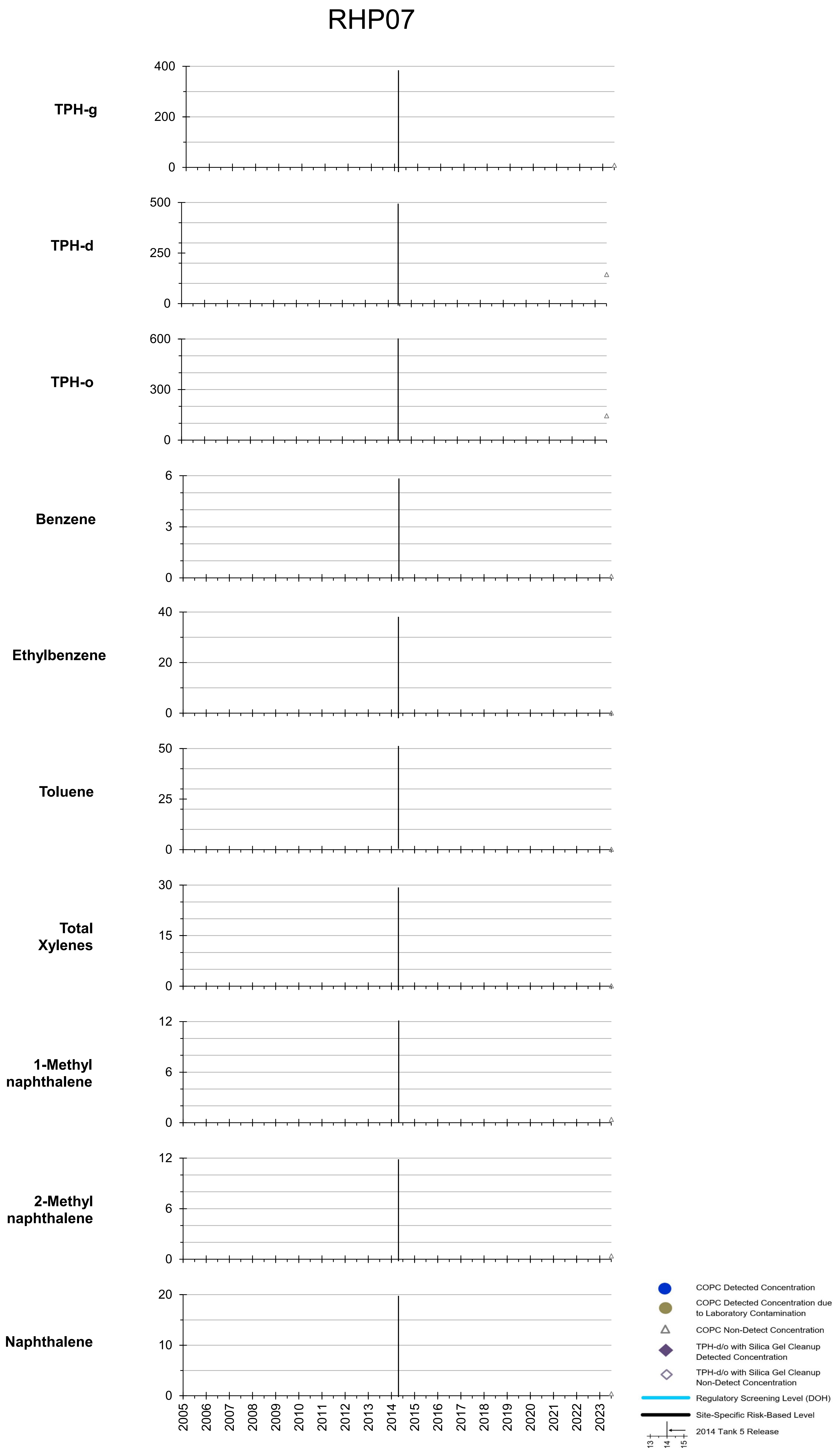


All results in micrograms per liter (µg/L or parts per billion).

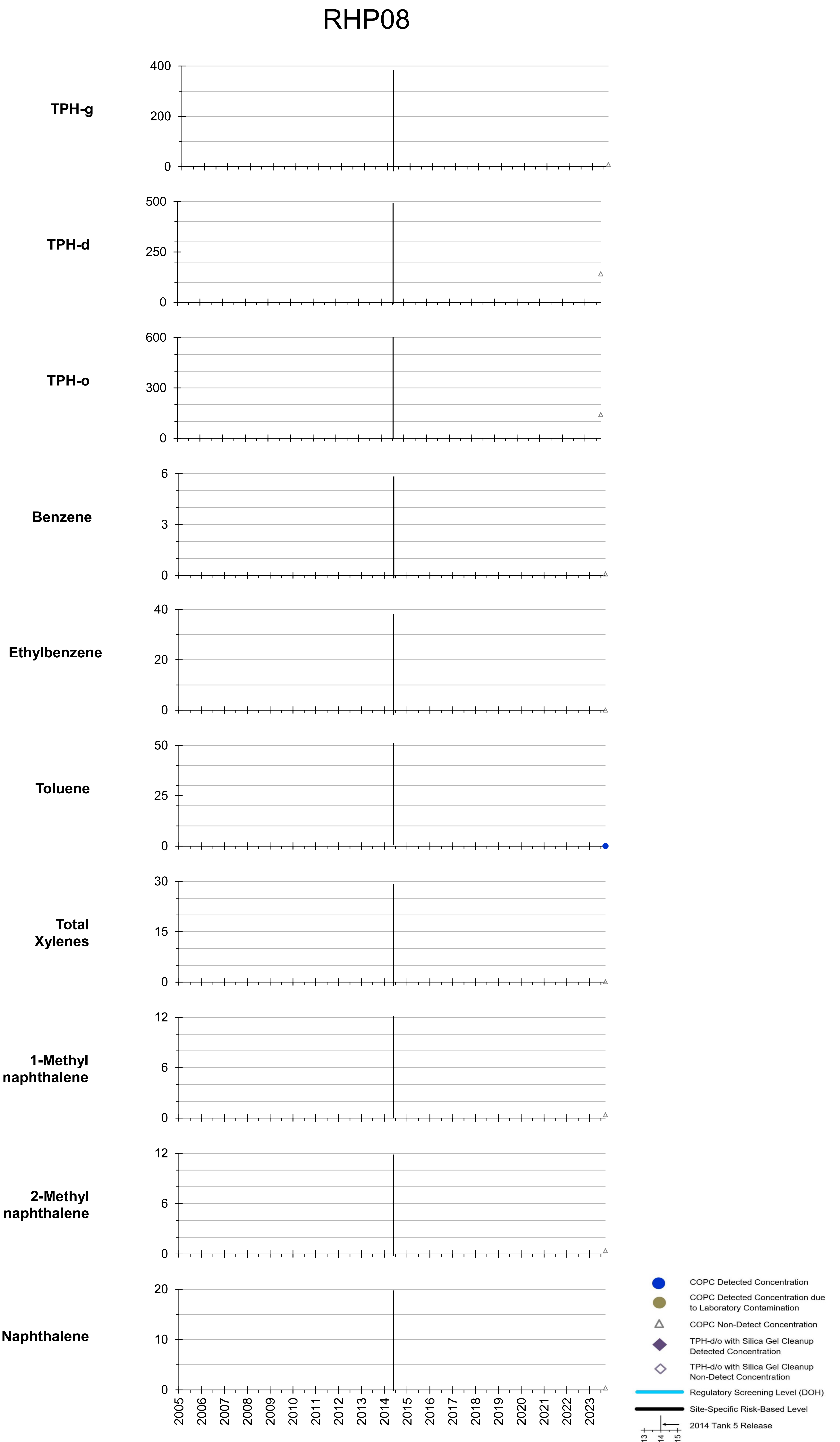
RHP06



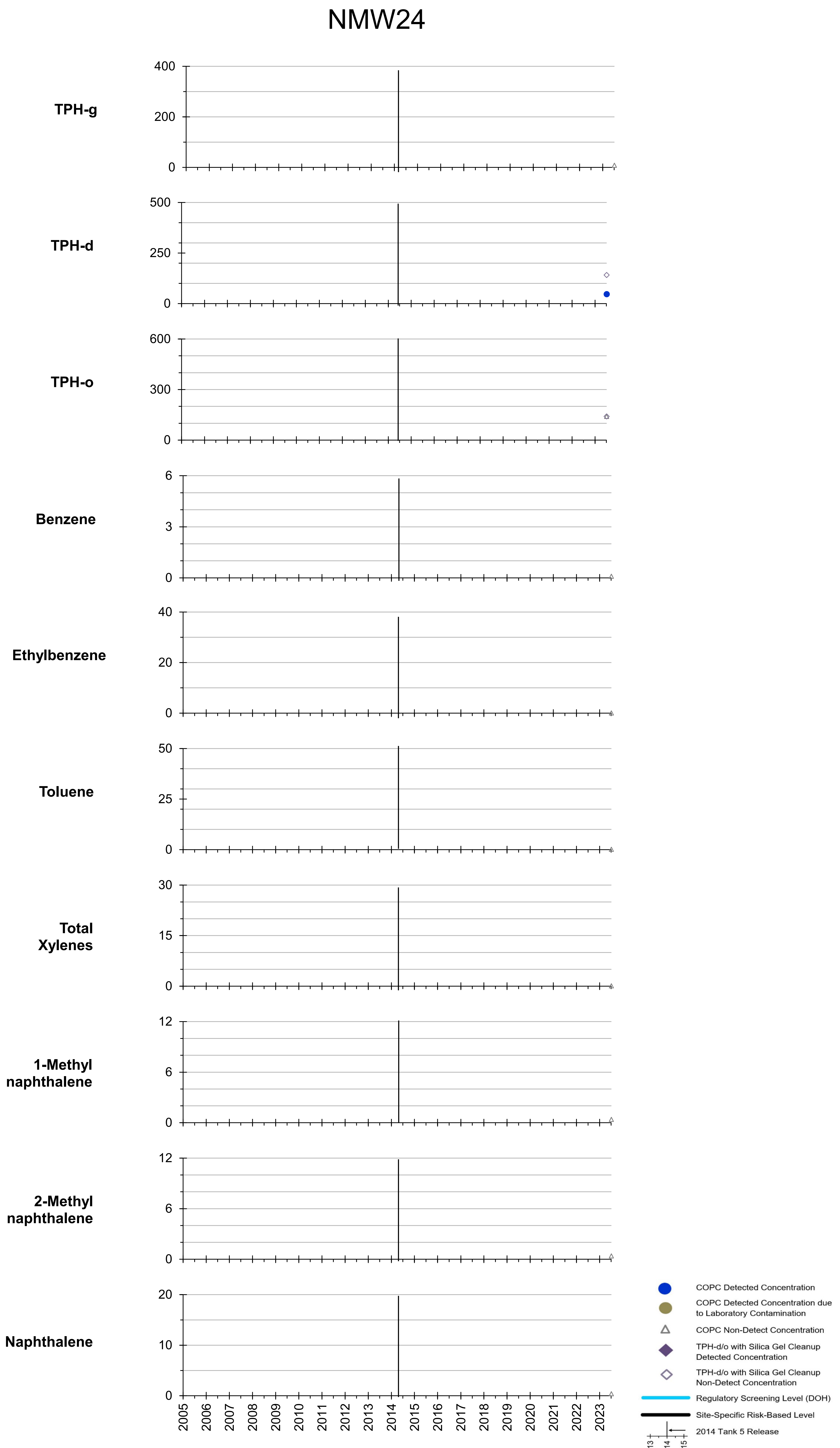
All results in micrograms per liter (µg/L or parts per billion).



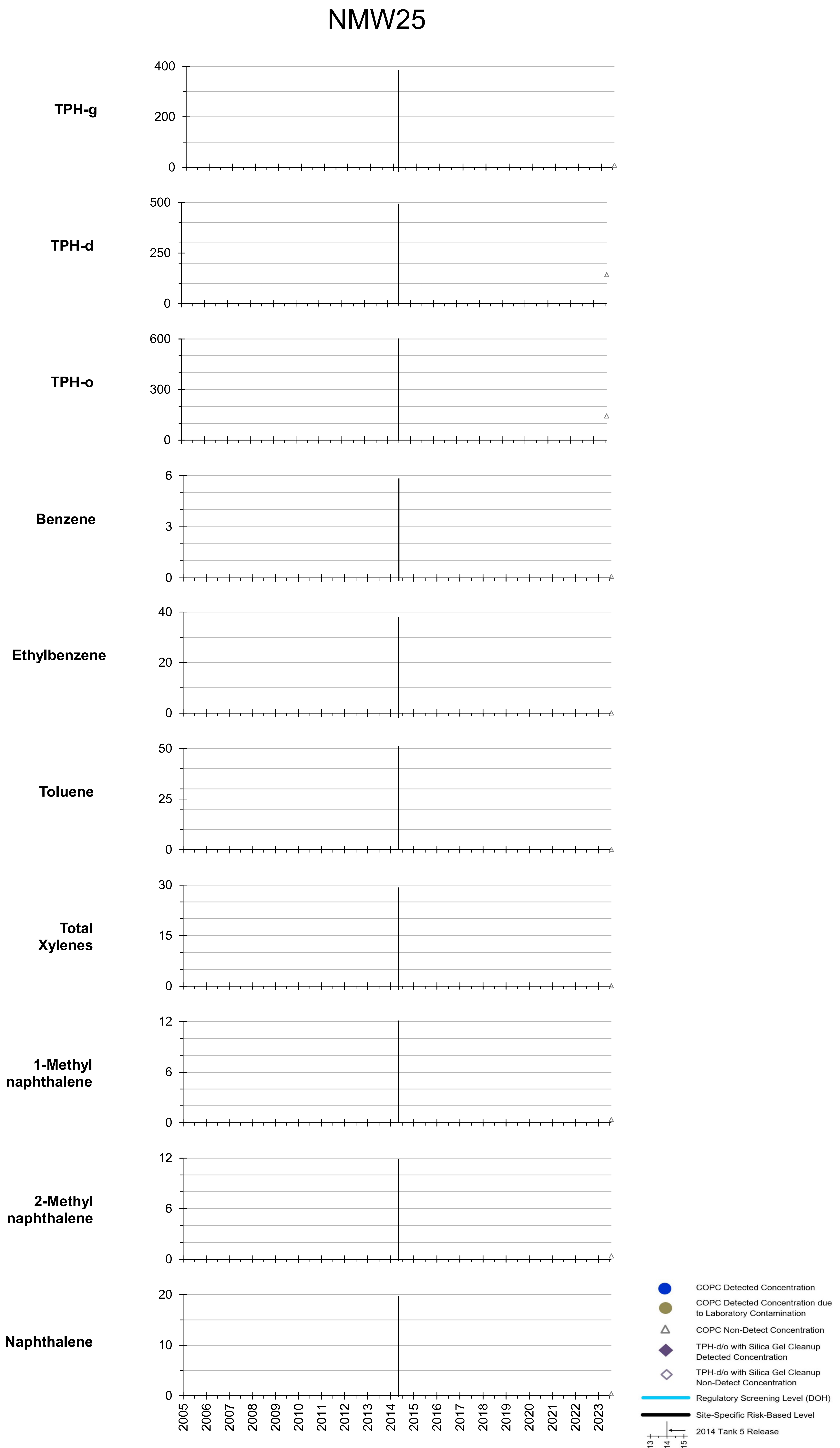
All results in micrograms per liter (µg/L or parts per billion).



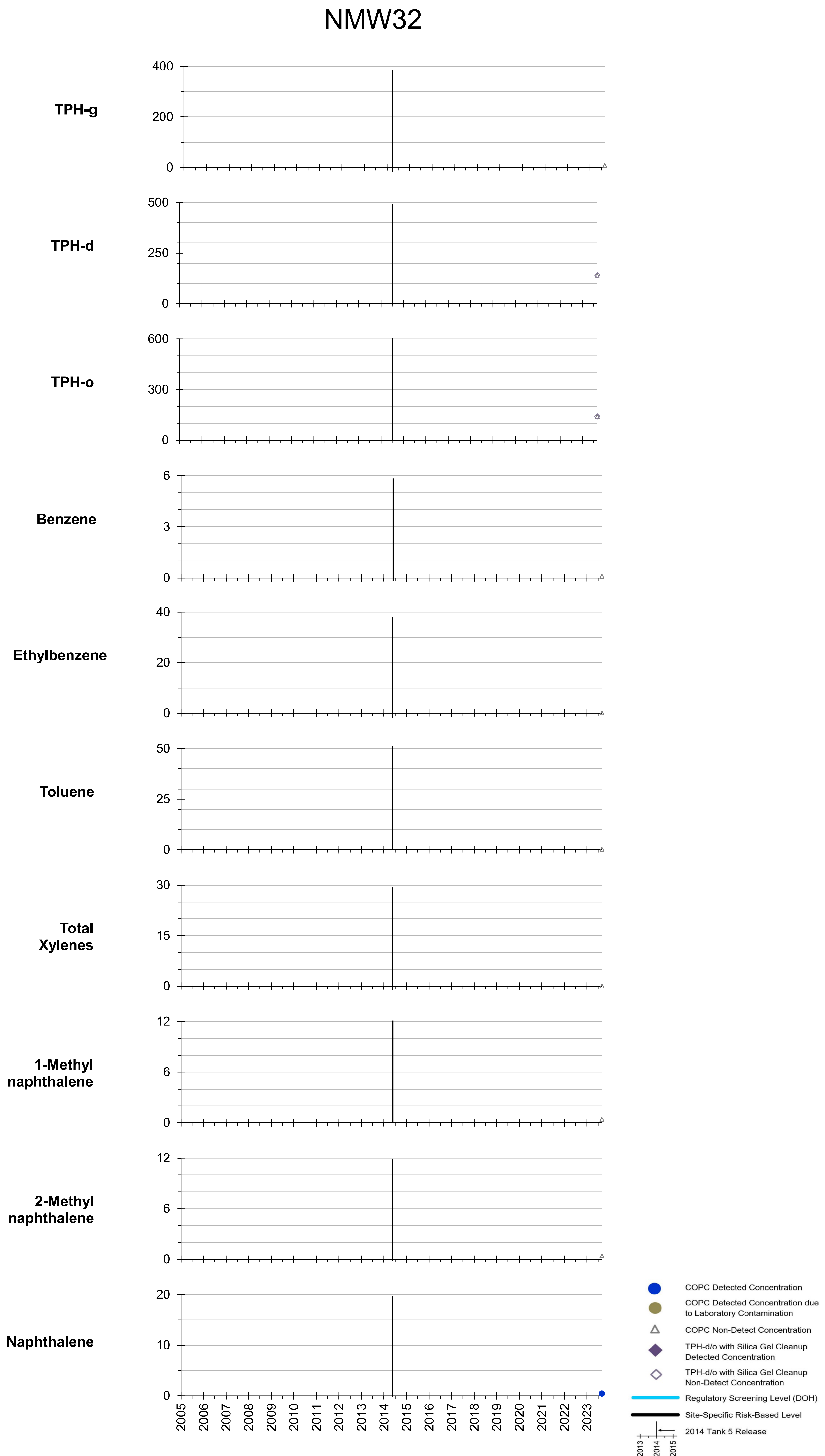
All results in micrograms per liter (µg/L or parts per billion).



All results in micrograms per liter (µg/L or parts per billion).



All results in micrograms per liter (µg/L or parts per billion).



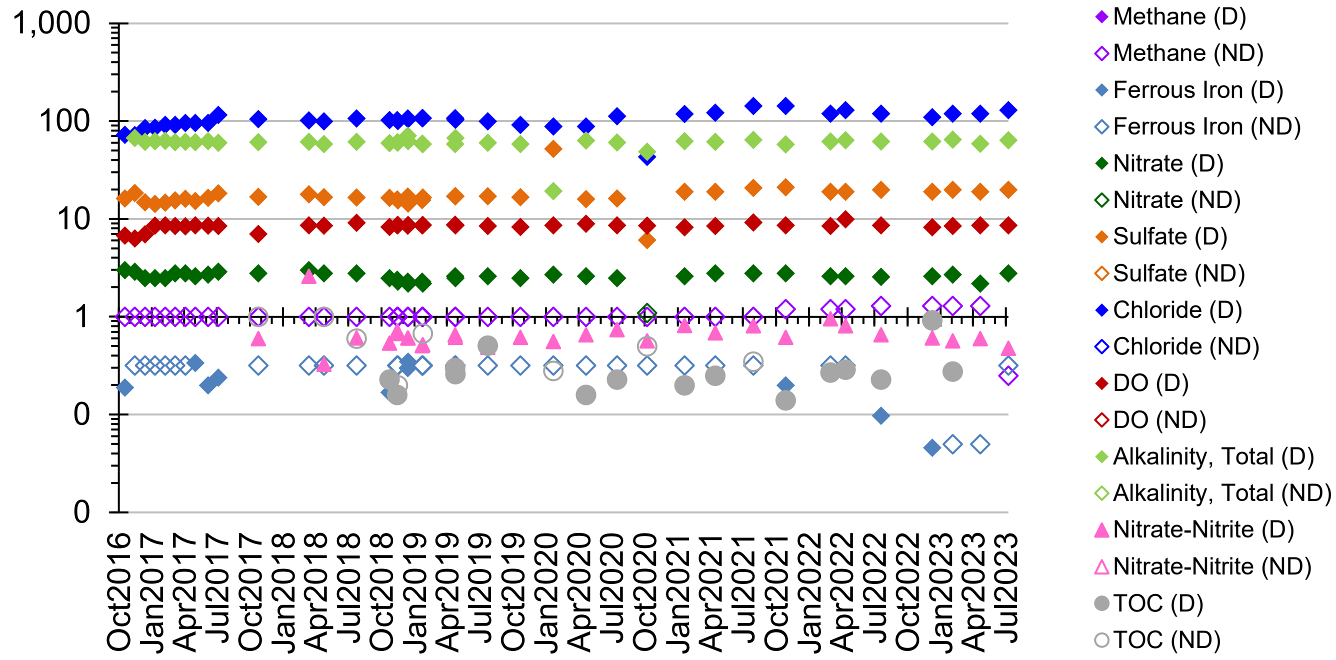
All results in micrograms per liter (µg/L or parts per billion).

Appendix A.3:
Natural Attenuation Parameter Graphs

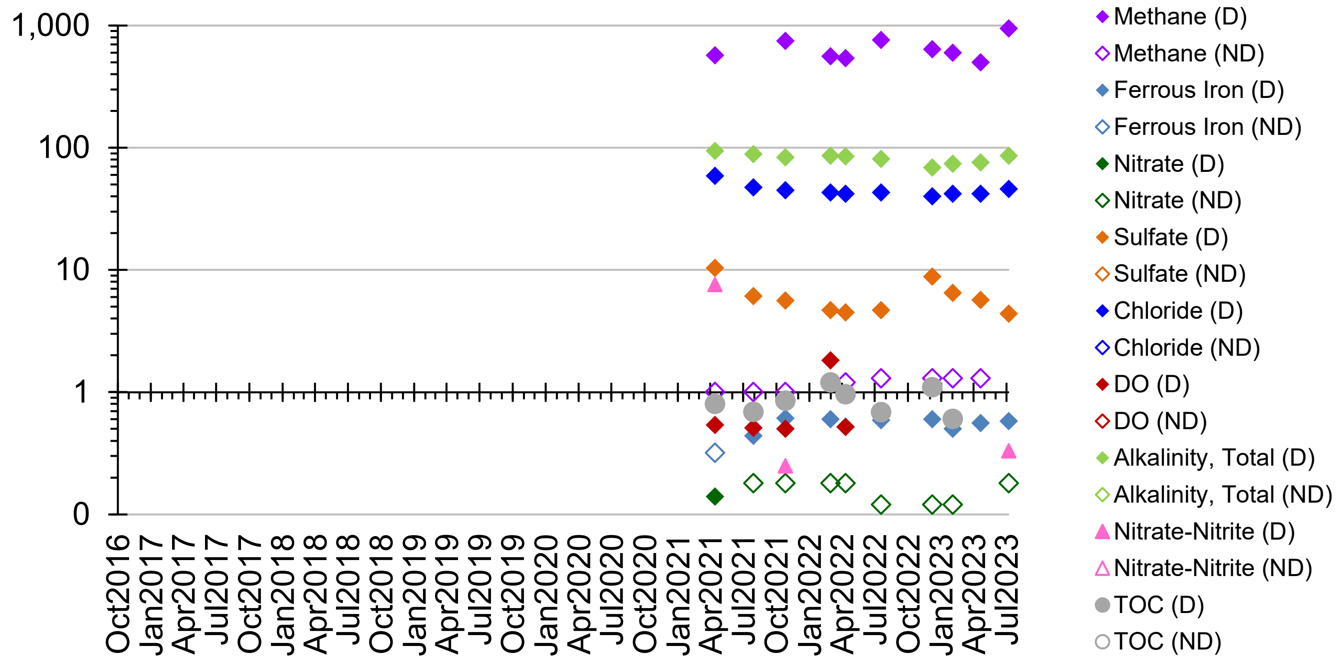
Appendix A.3.1:
Historical Natural Attenuation Parameter Graphs

Appendix A.3.1: Cumulative Natural Attenuation Parameter Graphs

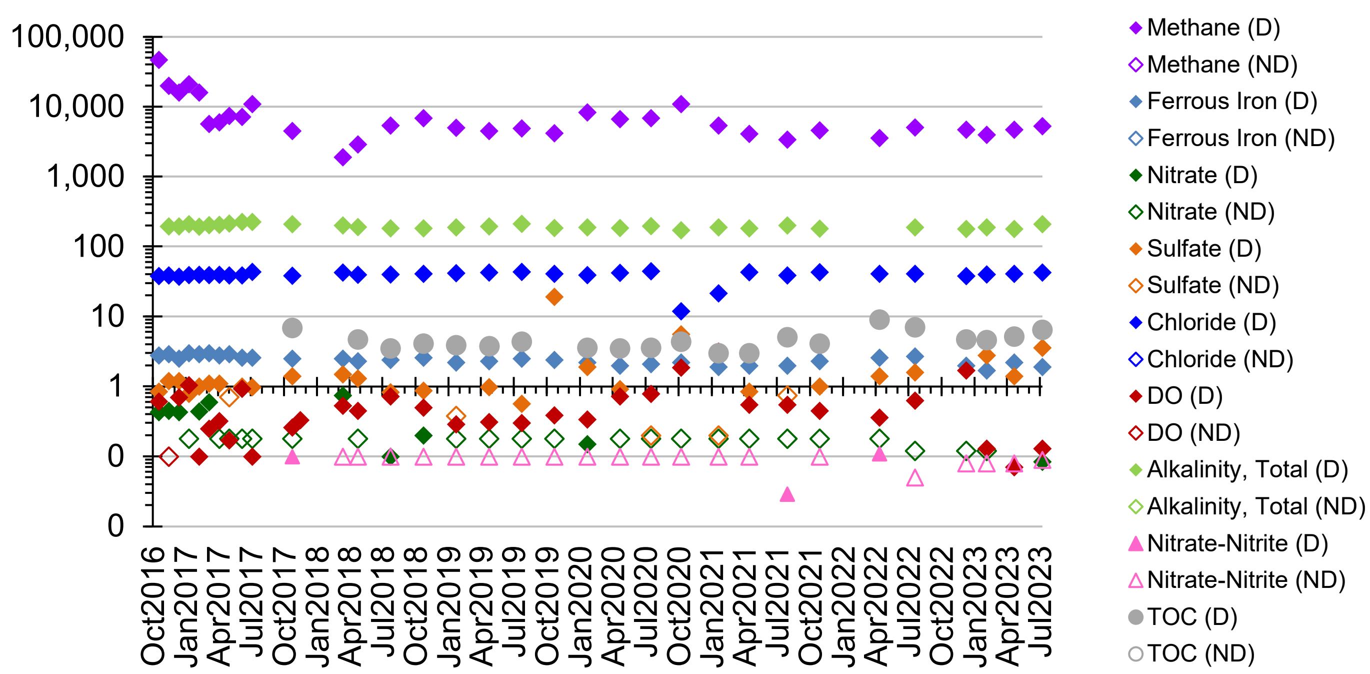
RHMW2254-01 NAPs



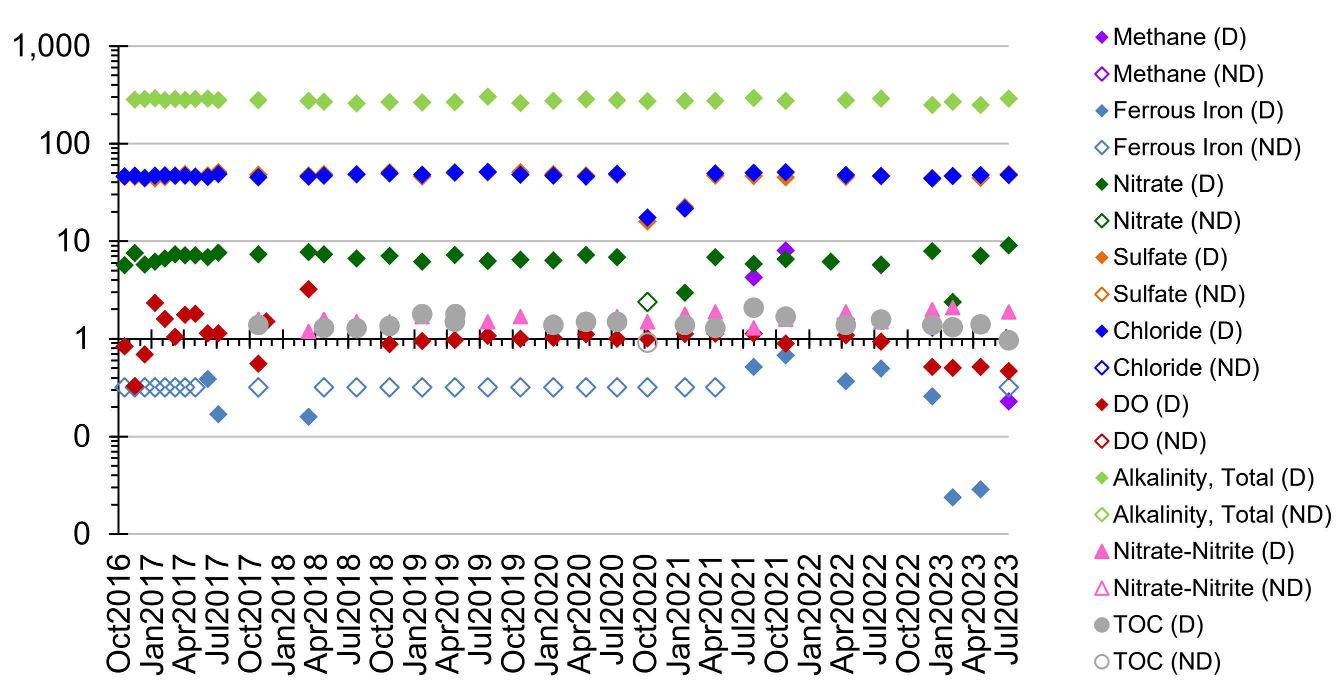
RHMW01R NAPs



RHMW02 NAPs



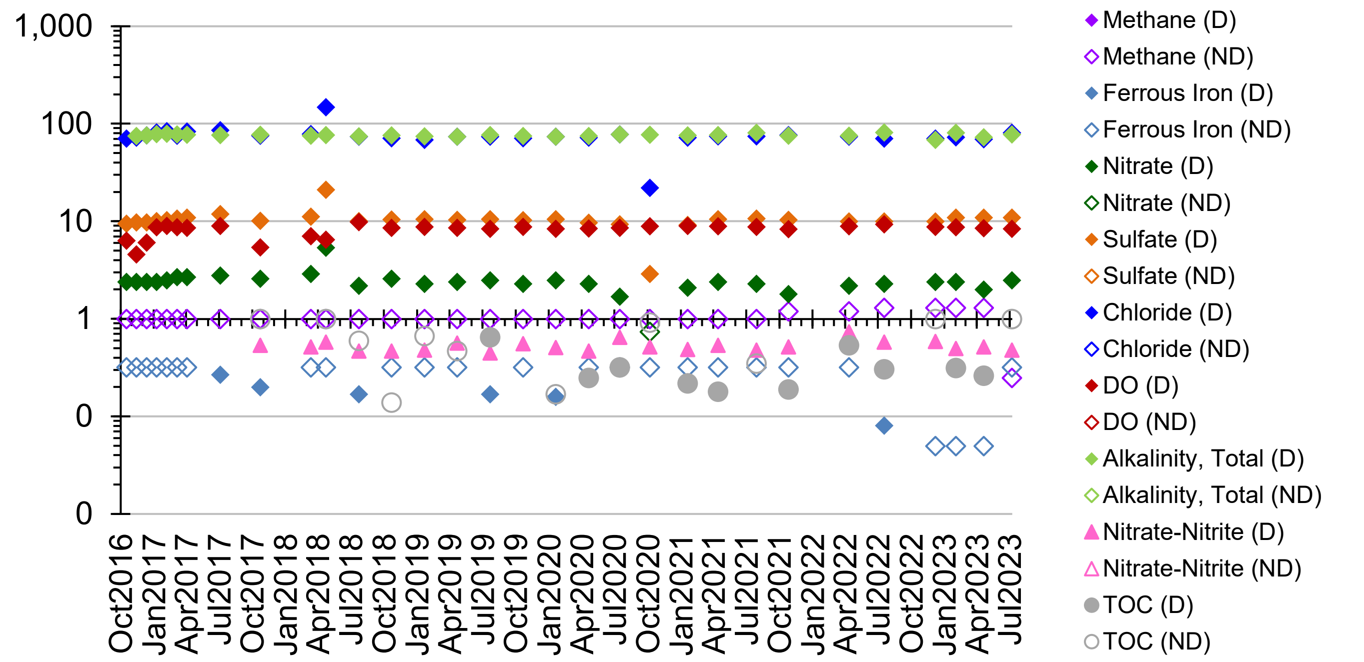
RHMW03 NAPs



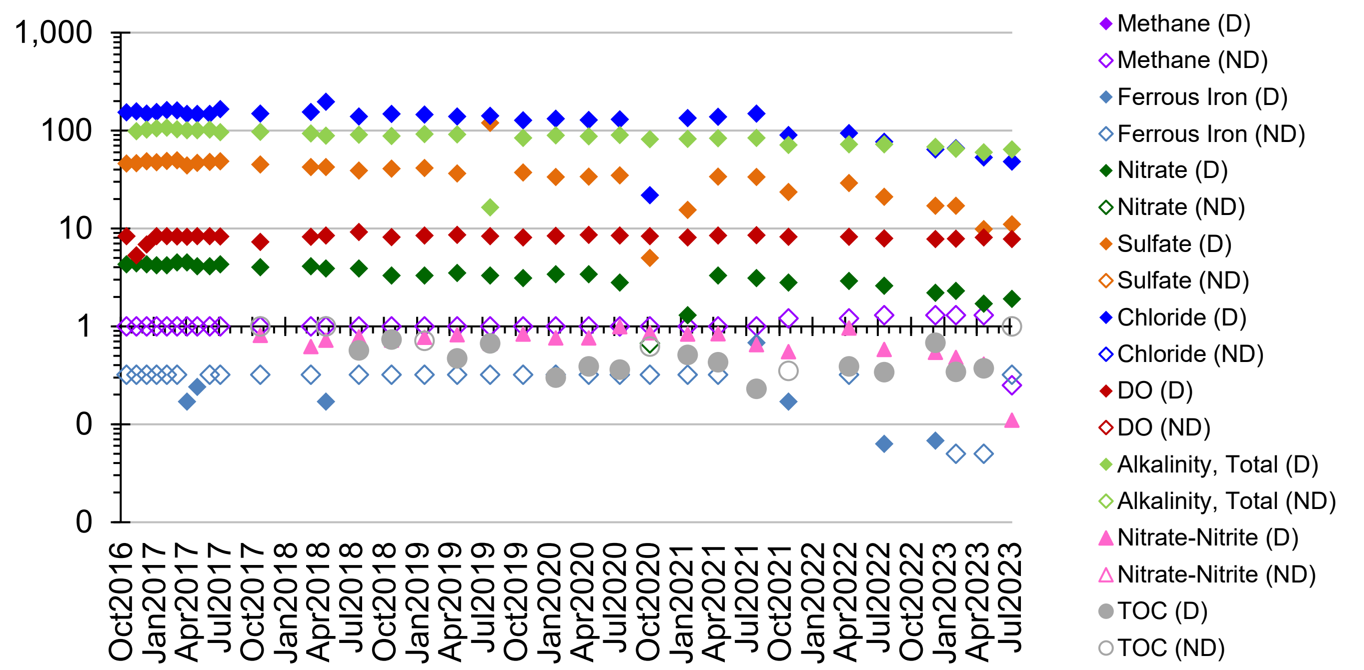
Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

Appendix A.3.1: Cumulative Natural Attenuation Parameter Graphs (cont'd)

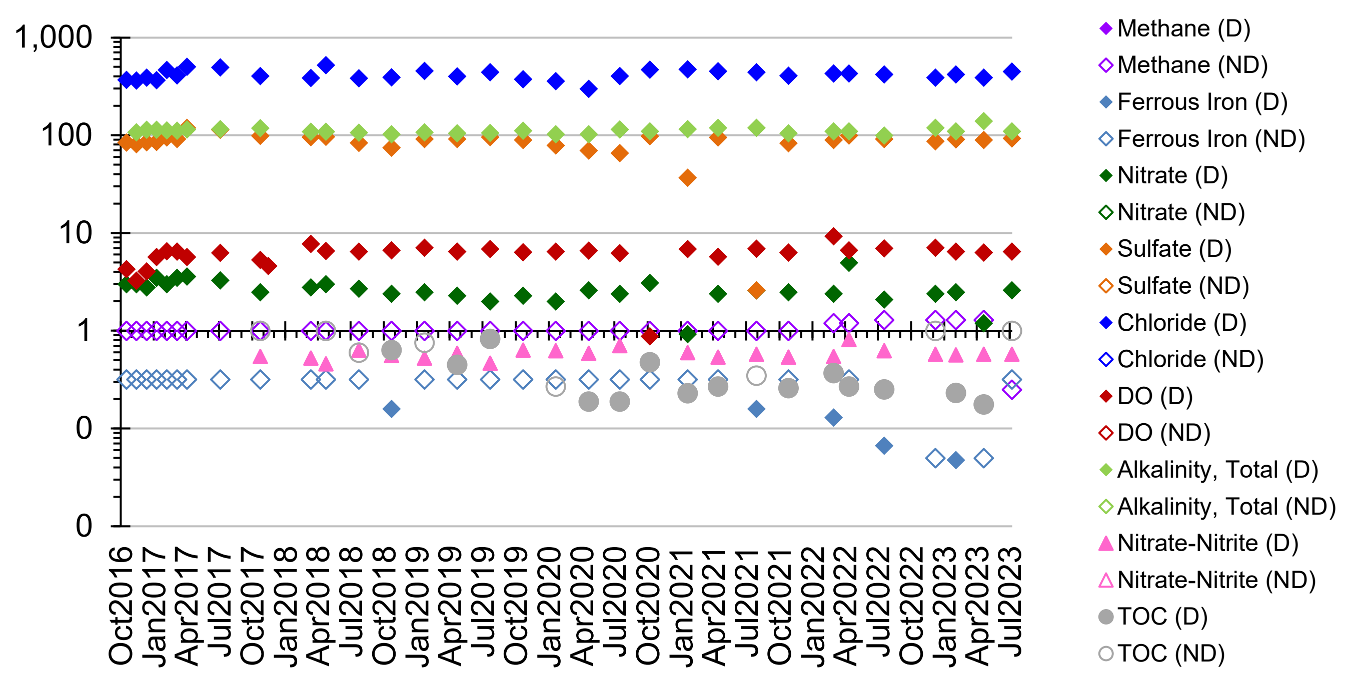
RHMW04 NAPs



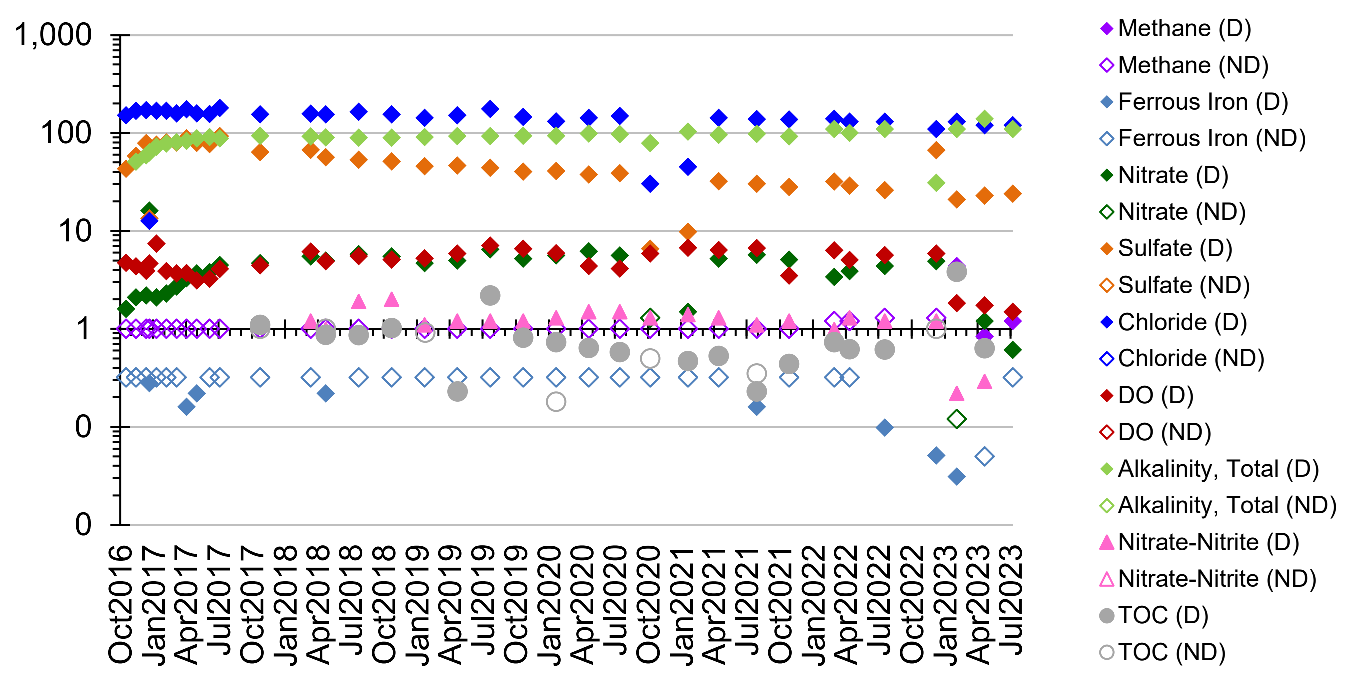
RHMW05 NAPs



RHMW06 NAPs



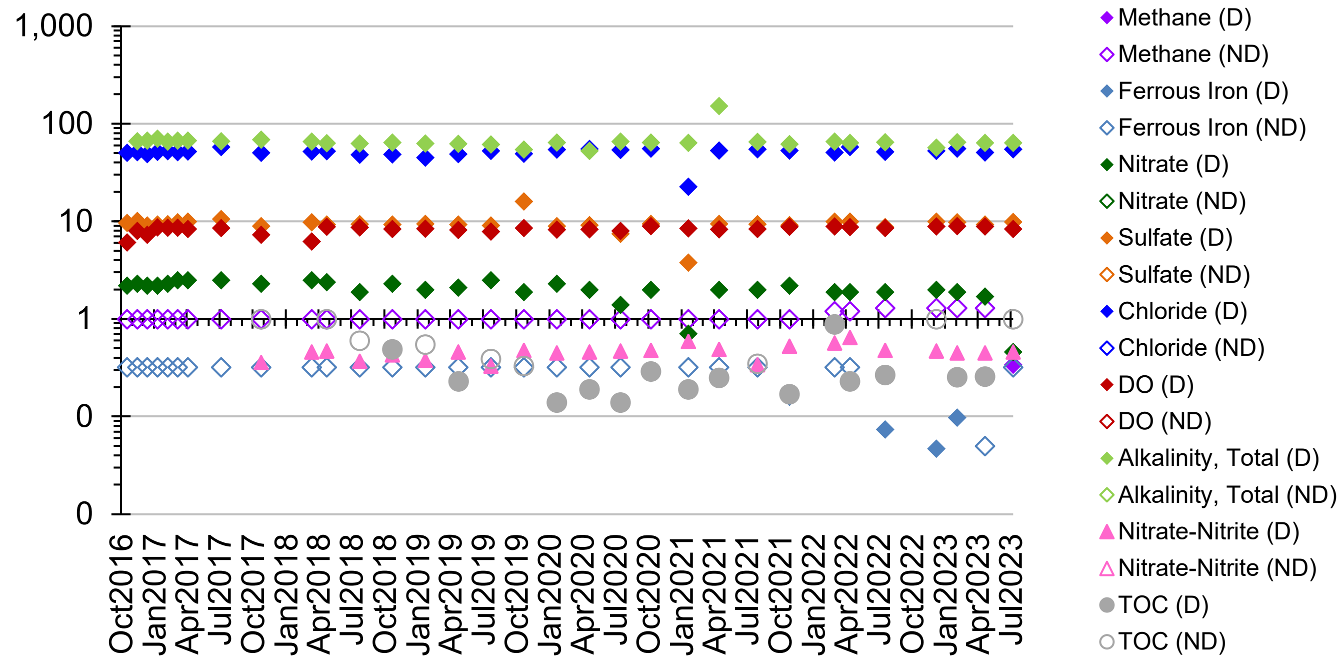
RHMW08 NAPs



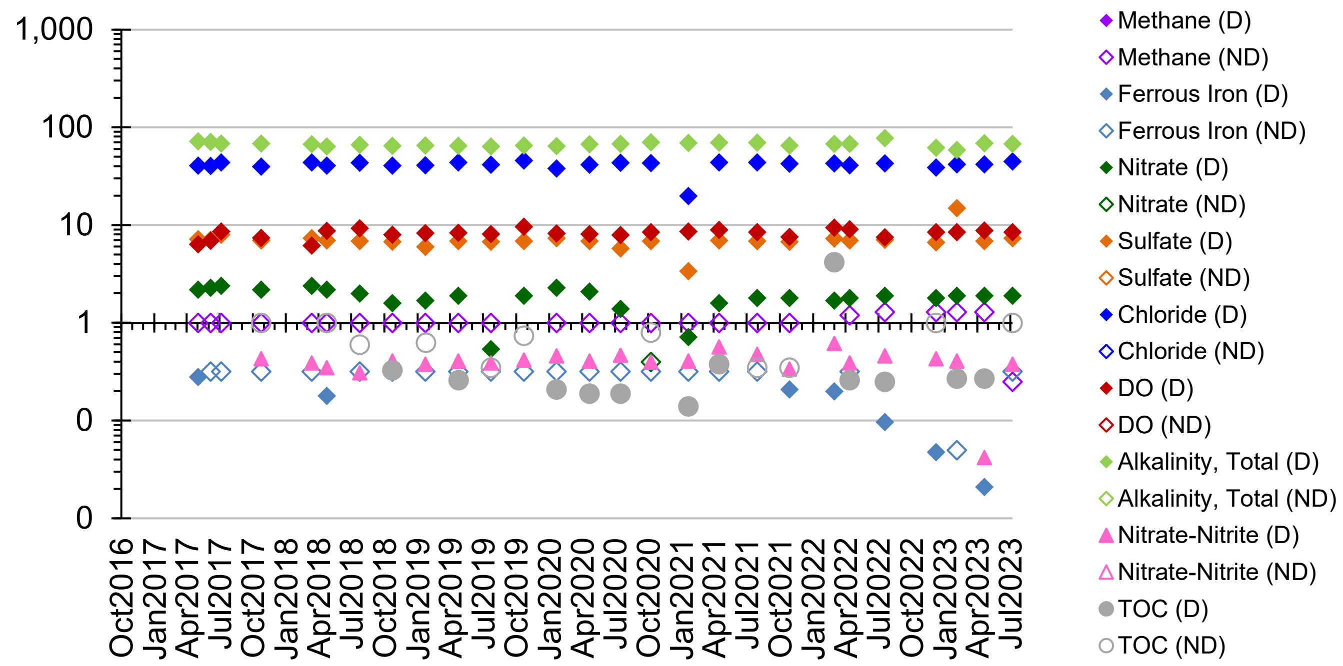
Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

Appendix A.3.1: Cumulative Natural Attenuation Parameter Graphs (cont'd)

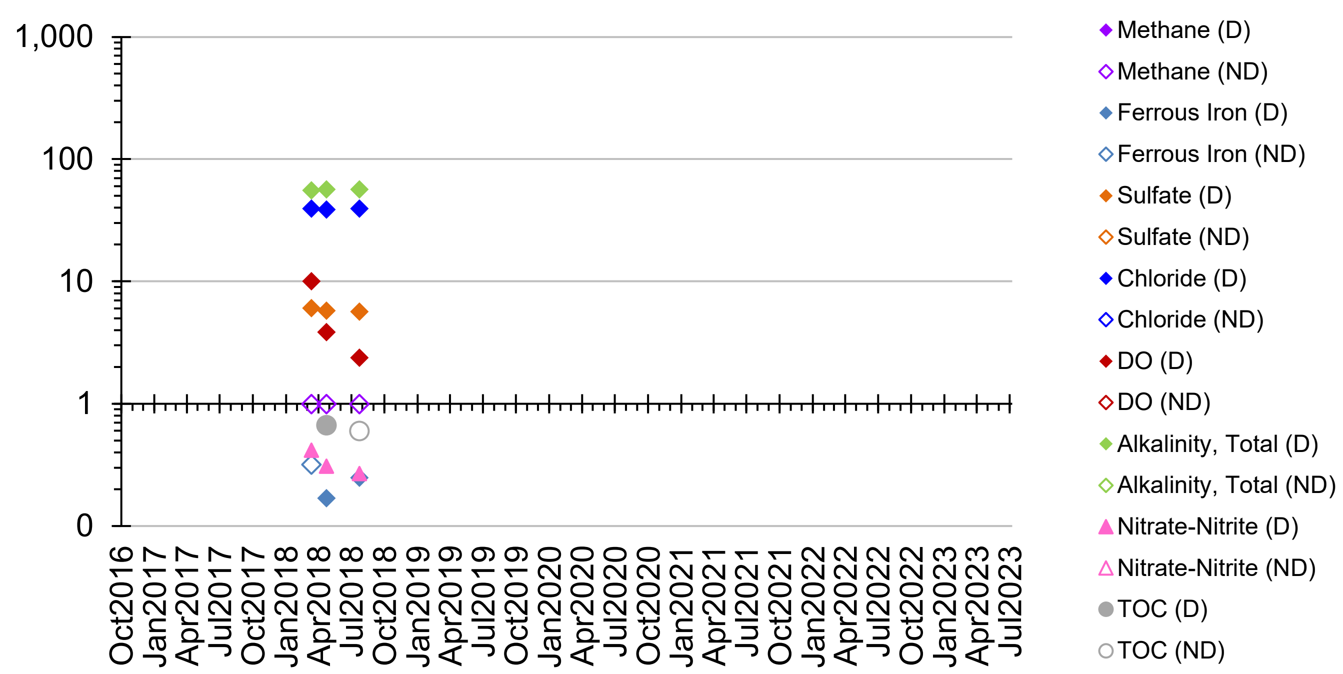
RHMW09 NAPs



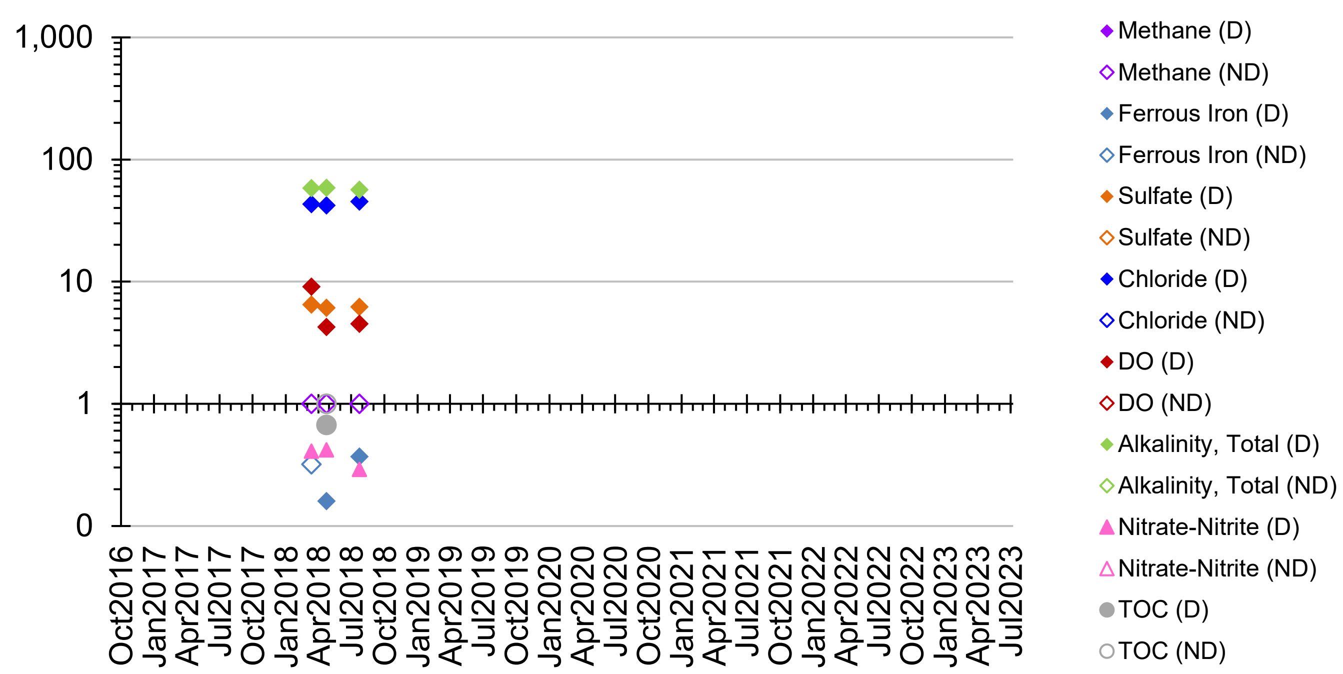
RHMW10 NAPs



RHMW11 Zone 1 NAPs

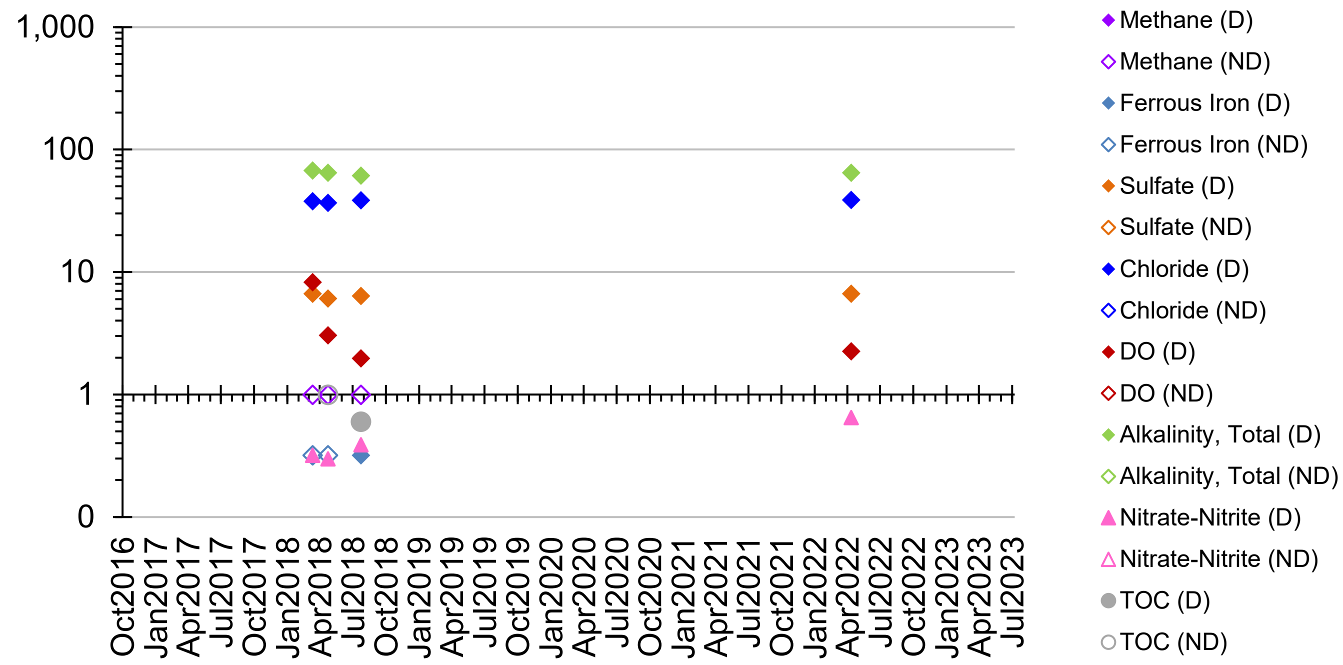


RHMW11 Zone 2 NAPs

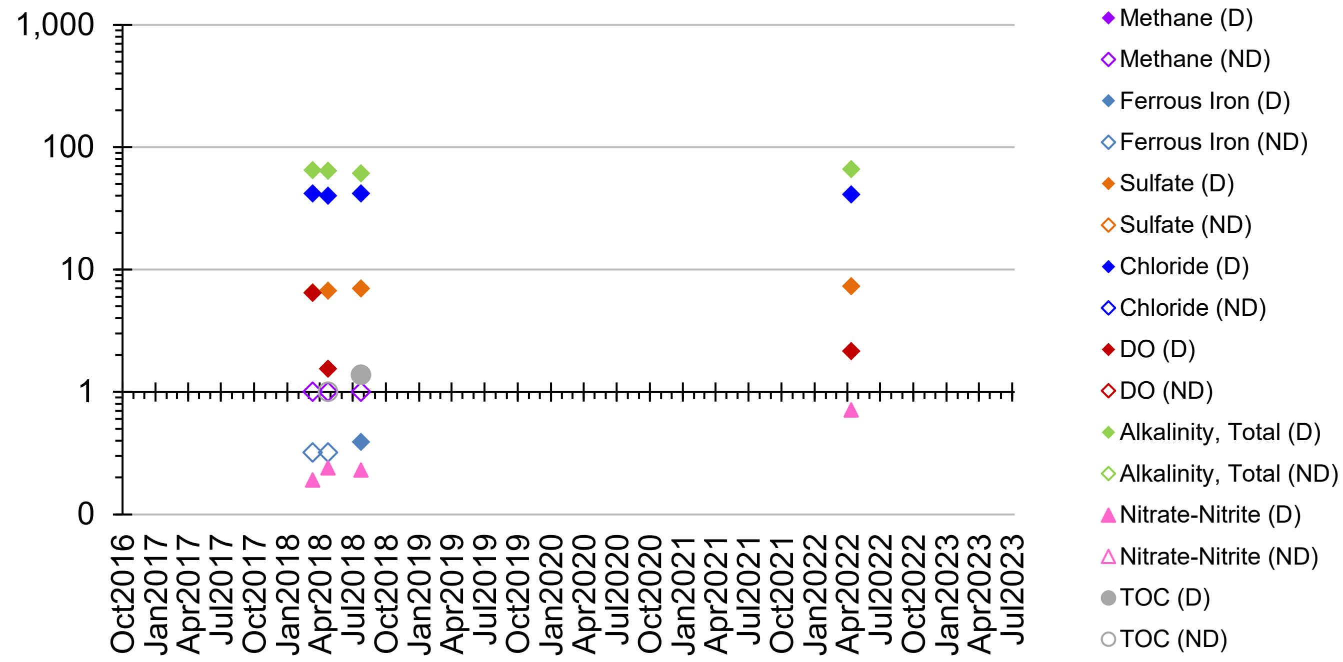


Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

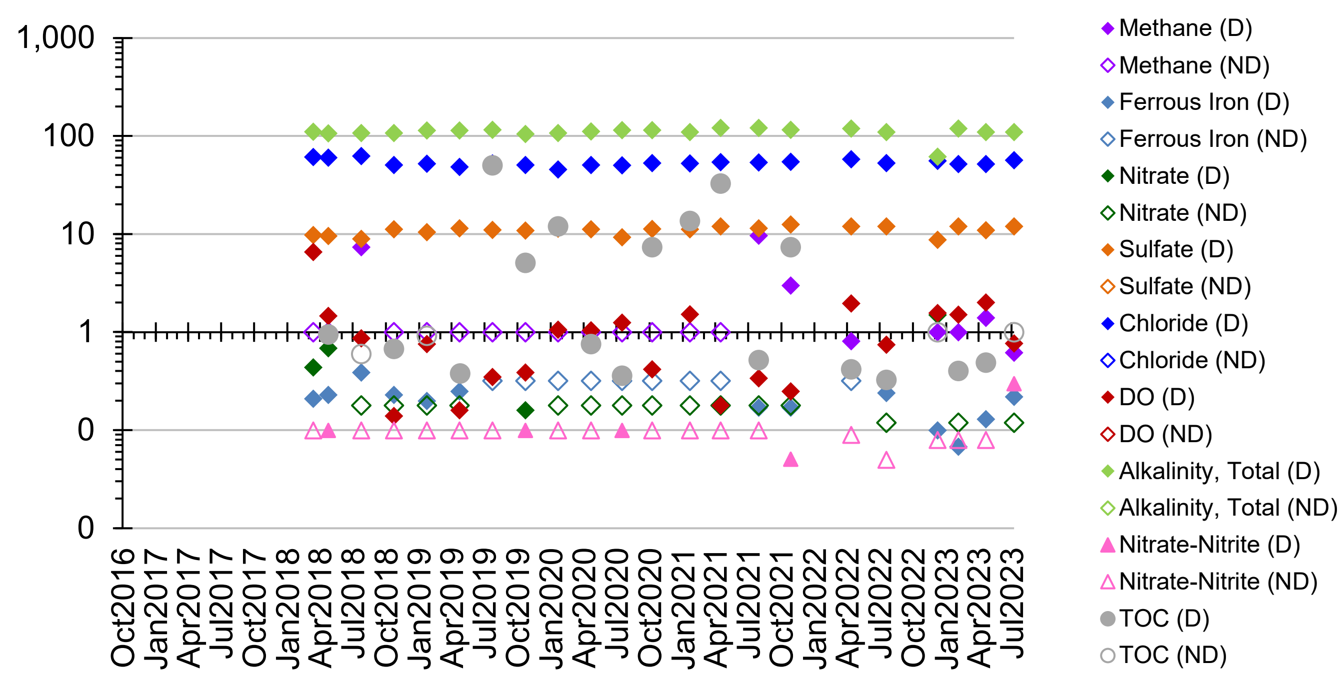
RHMW11 Zone 3 NAPs



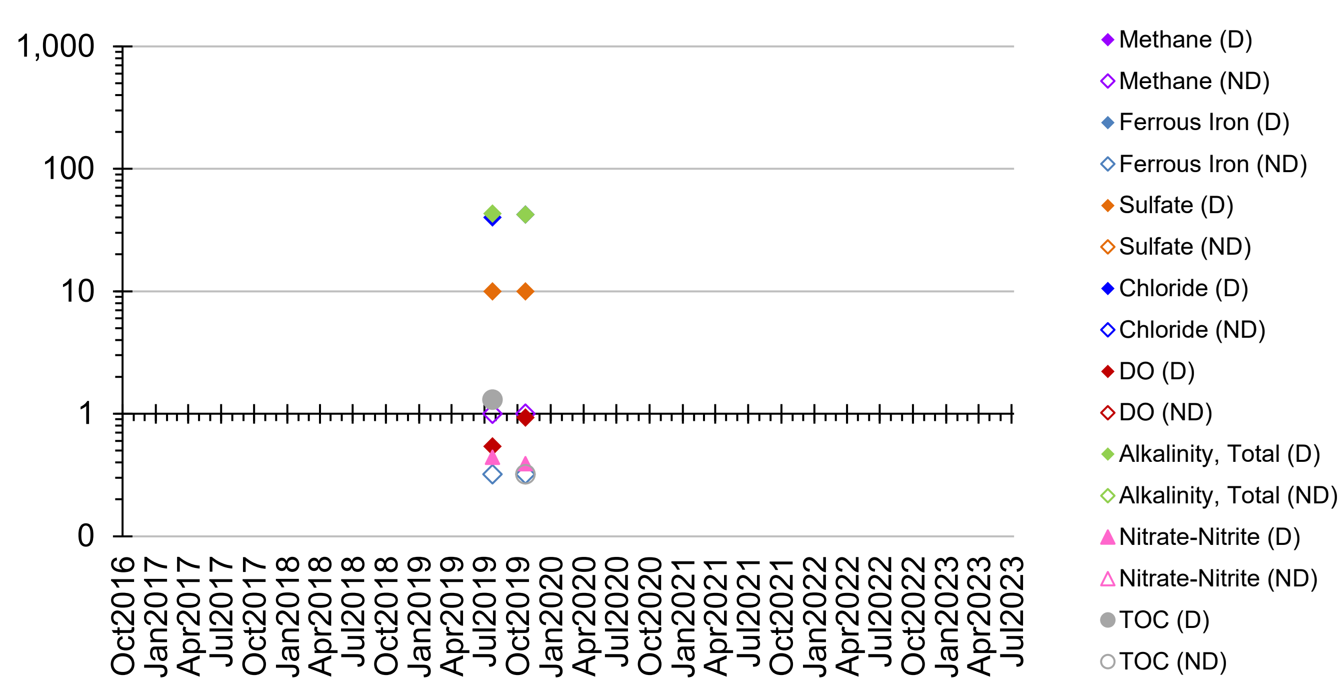
RHMW11 Zone 4 NAPs



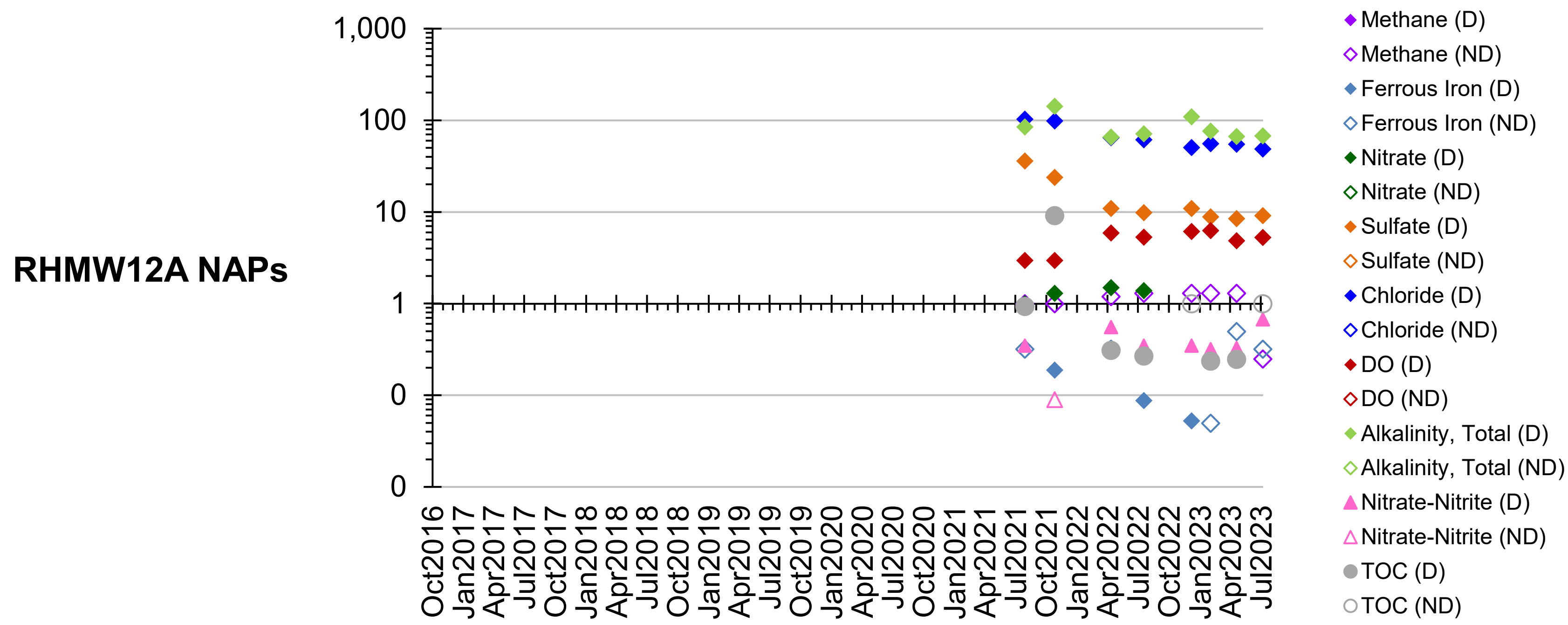
RHMW11 Zone 5 NAPs

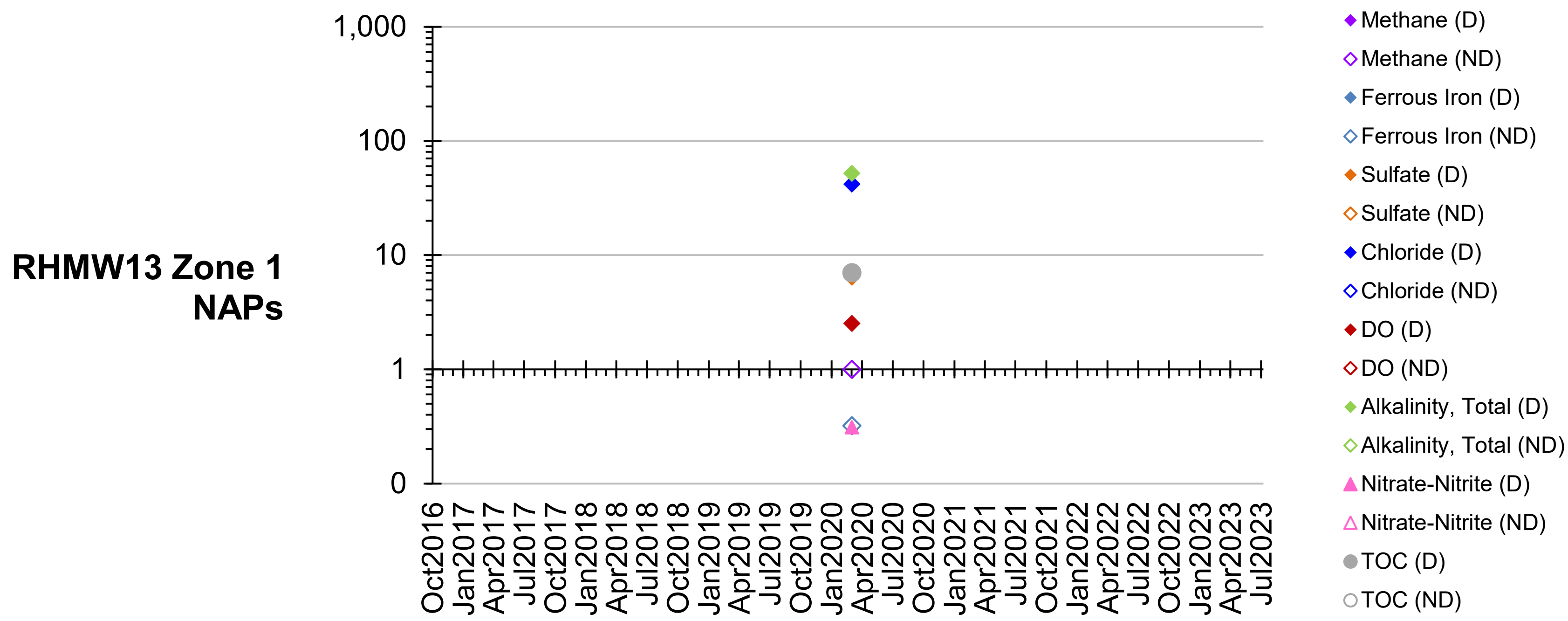


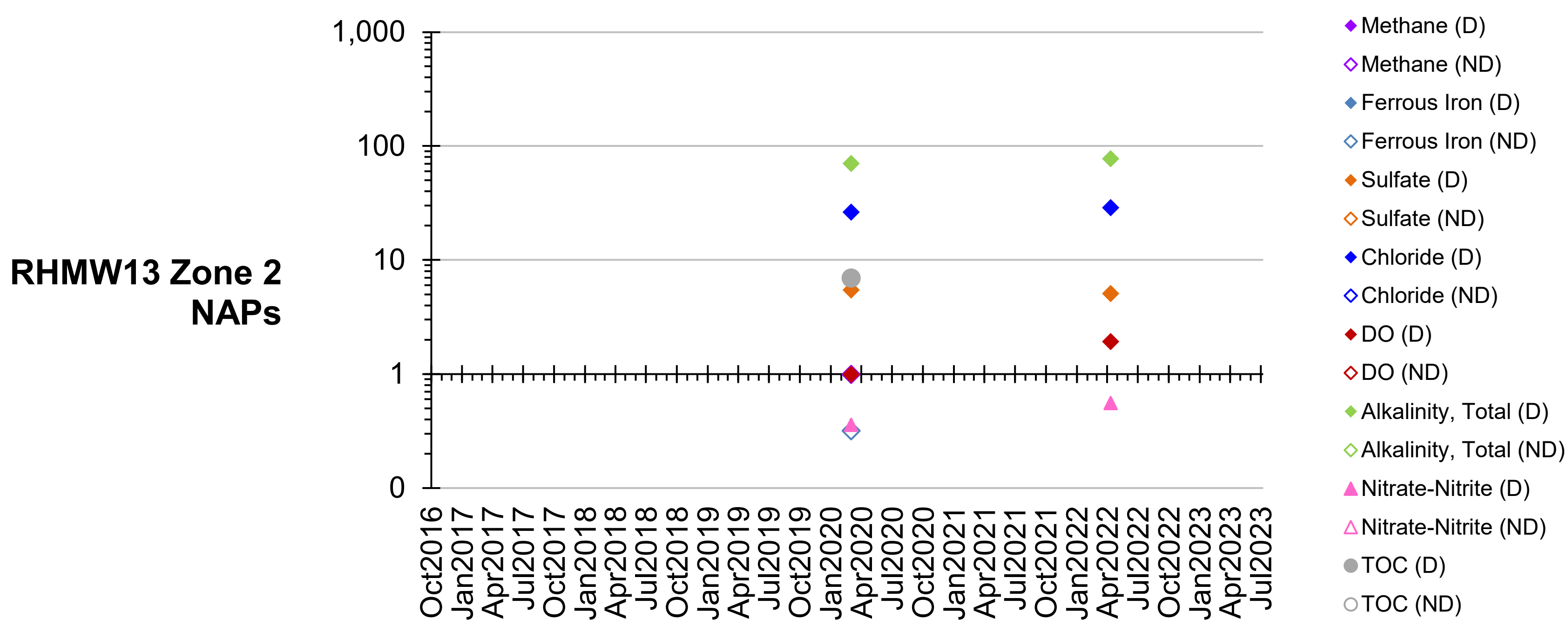
RHMW11 Zone 7 NAPs

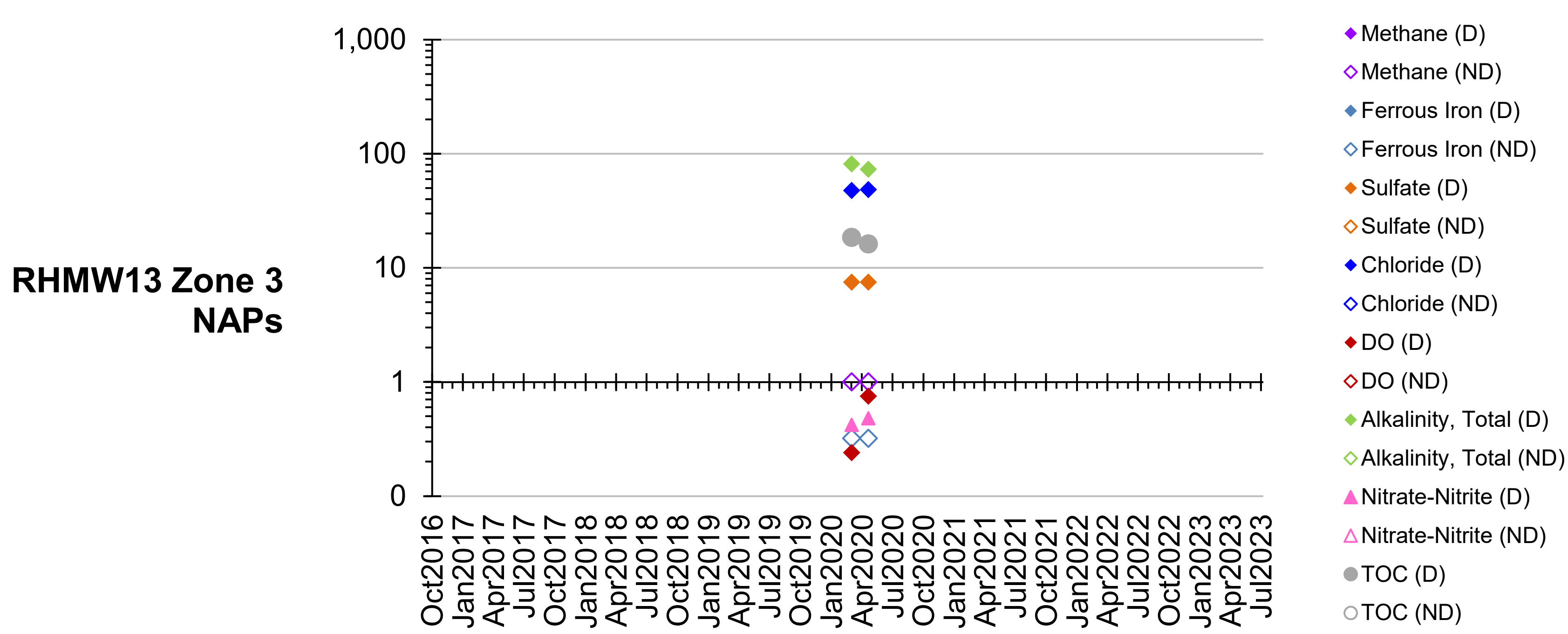


Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).





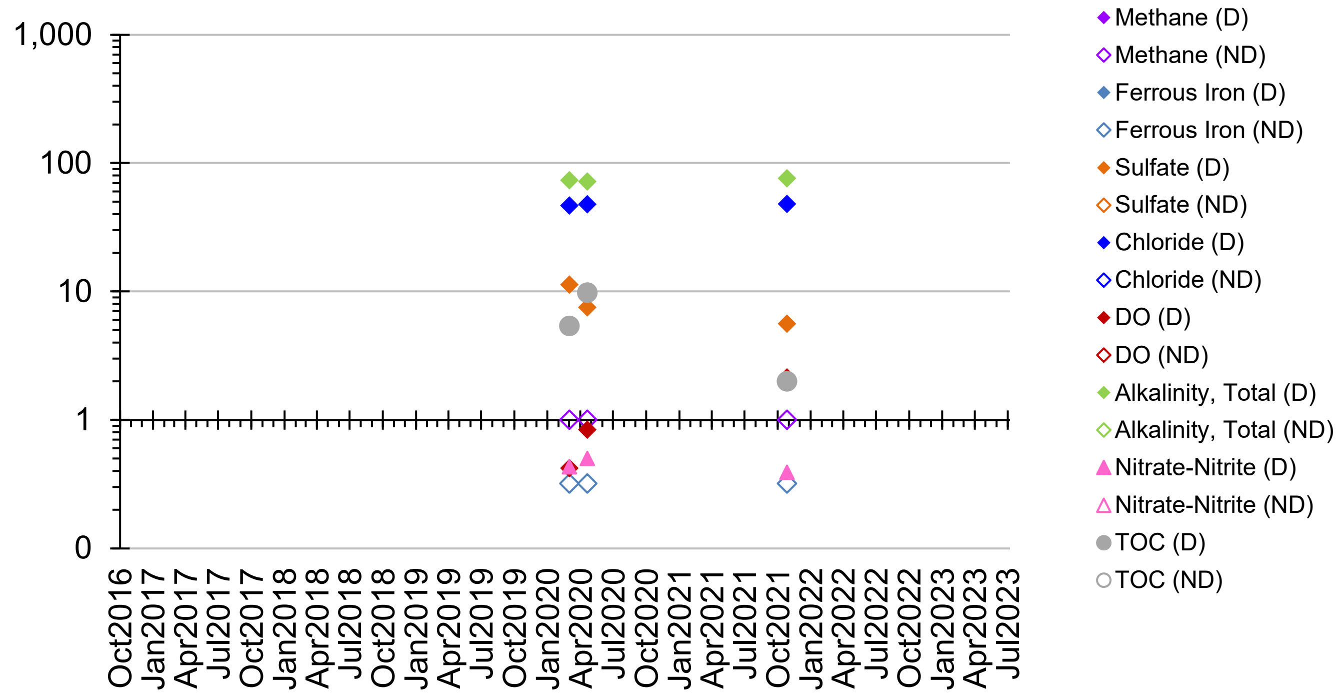




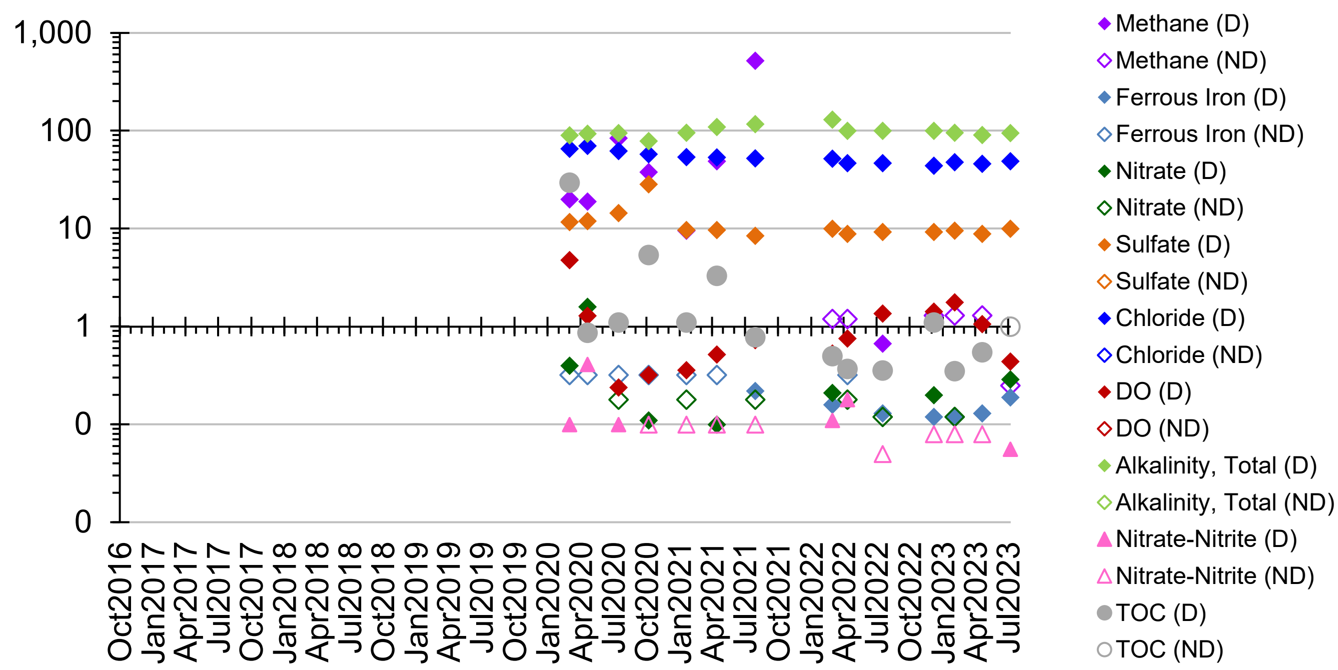
Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

Appendix A.3.1: Cumulative Natural Attenuation Parameter Graphs (cont'd)

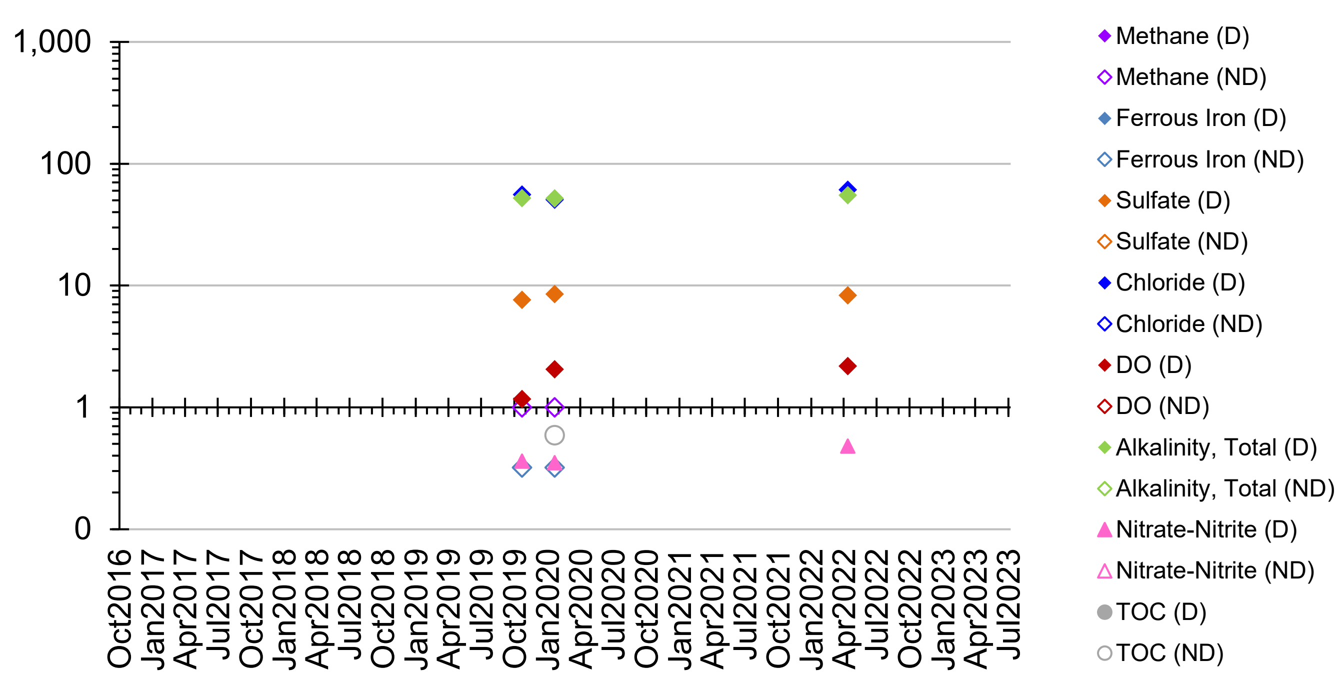
RHMW13 Zone 4 NAPs



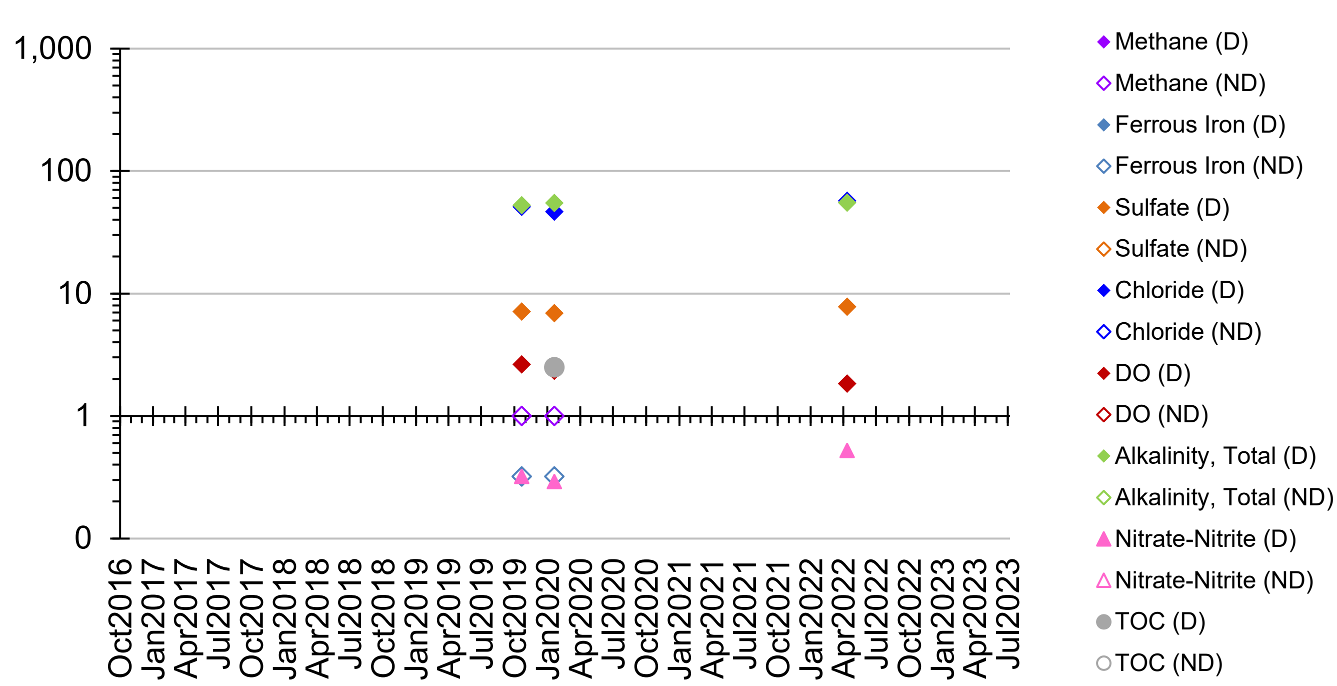
RHMW13 Zone 5 NAPs



RHMW14 Zone 1 NAPs

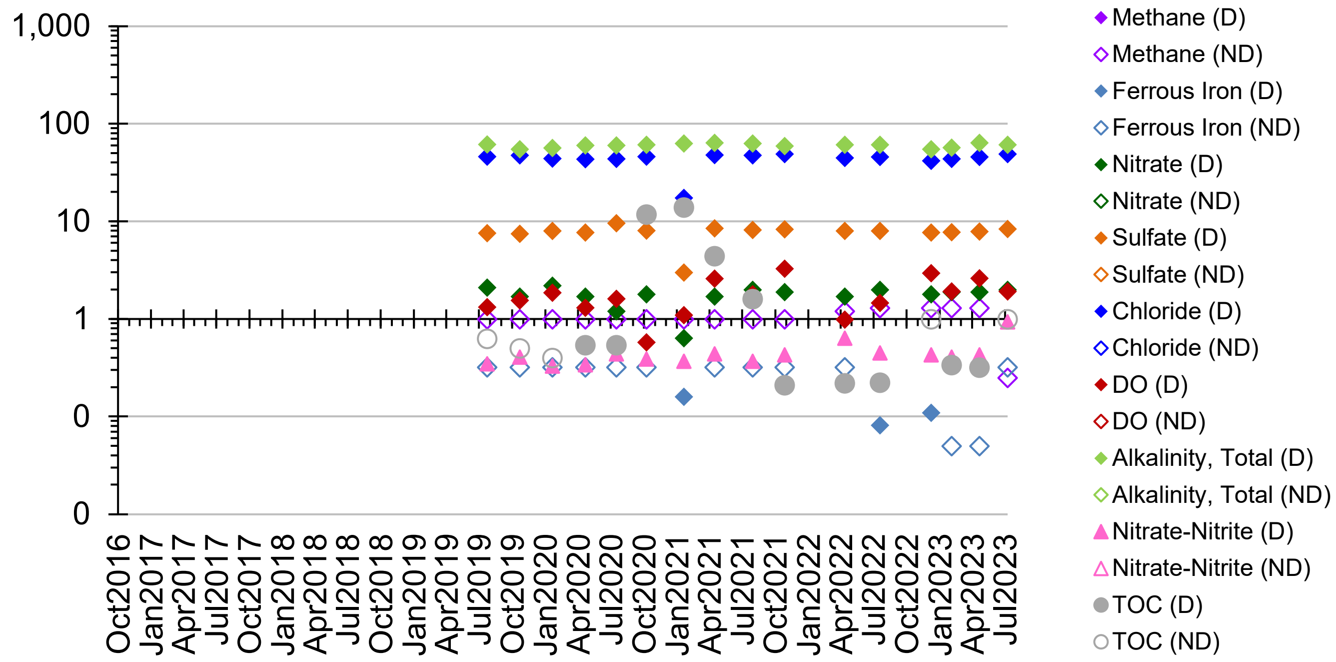


RHMW14 Zone 2 NAPs

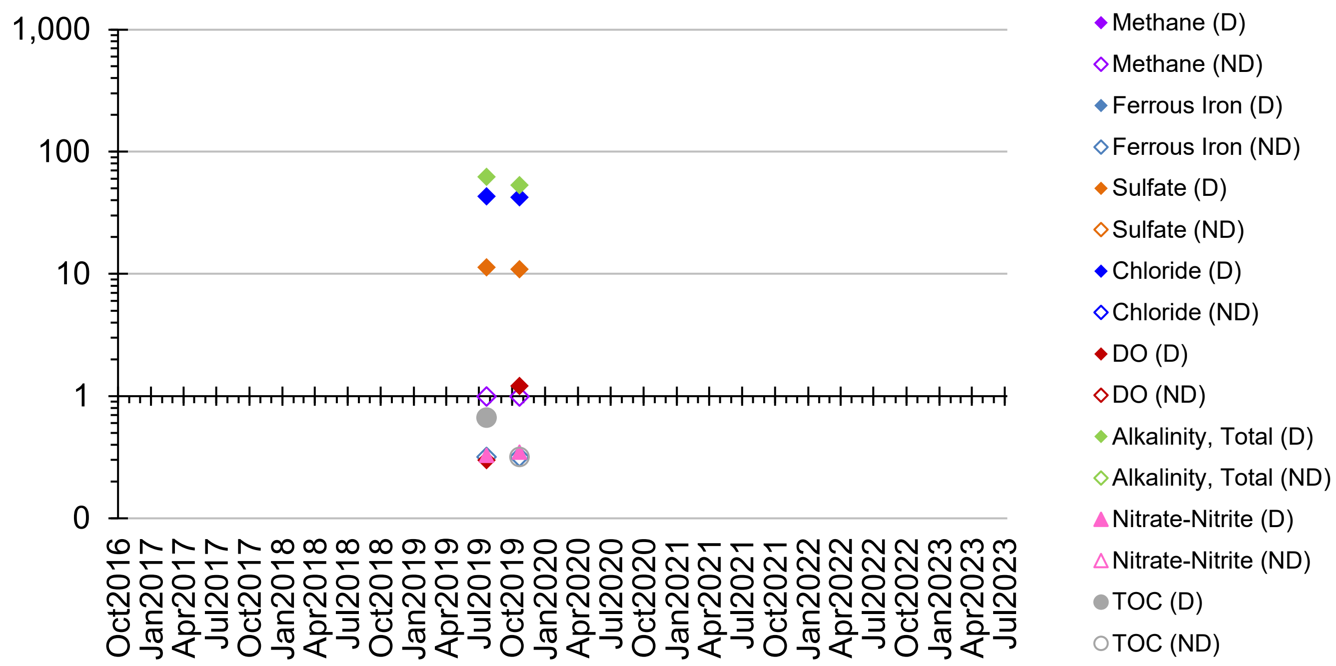


Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

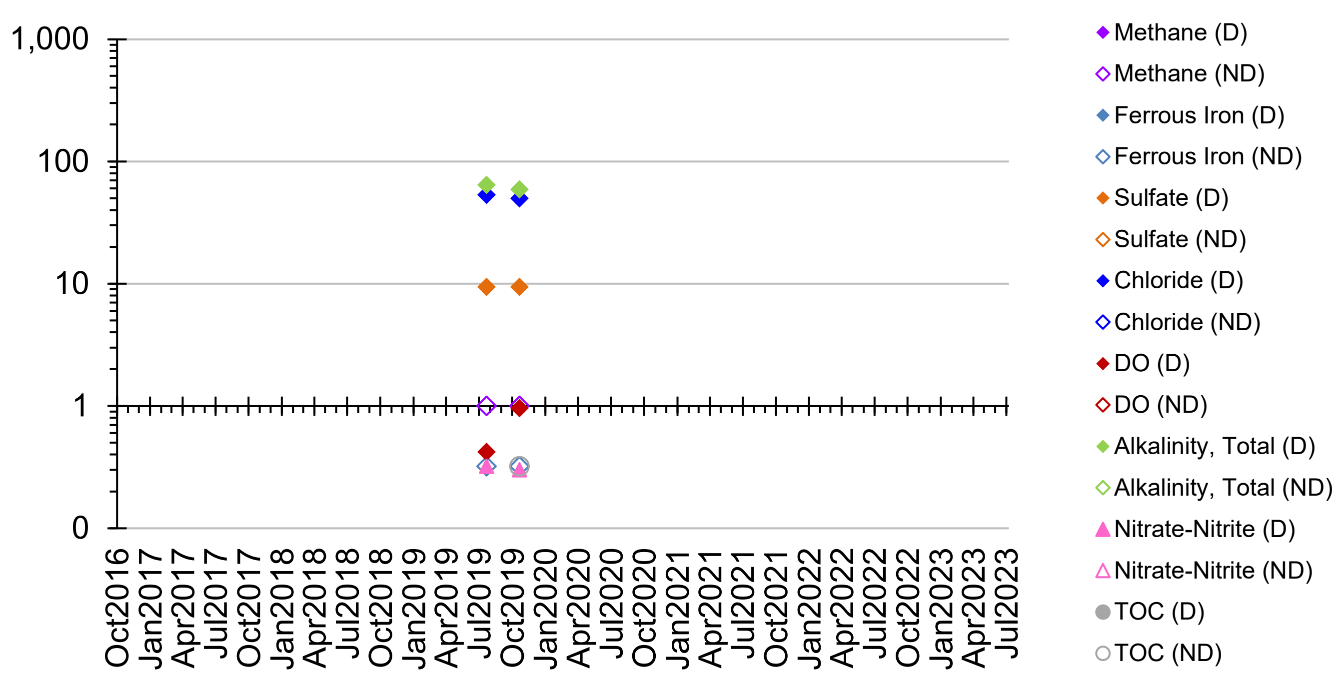
RHMW14 Zone 3 NAPs



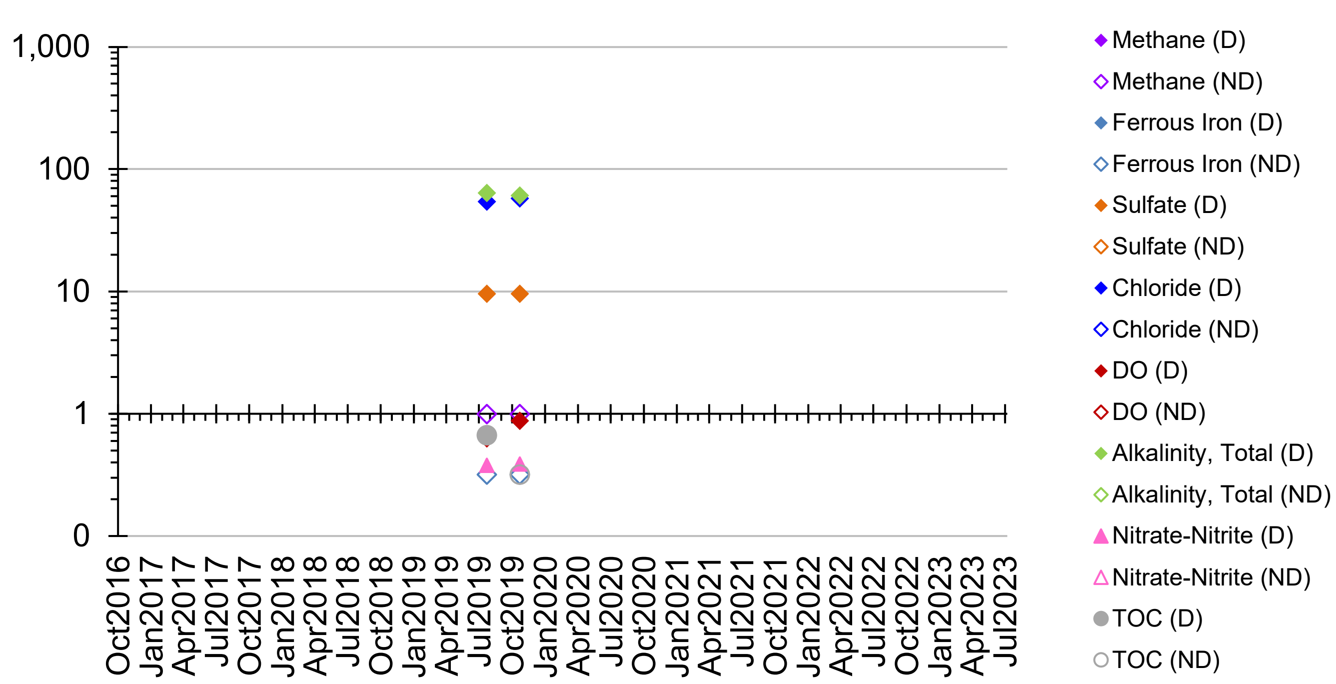
RHMW14 Zone 4 NAPs



RHMW14 Zone 5 NAPs

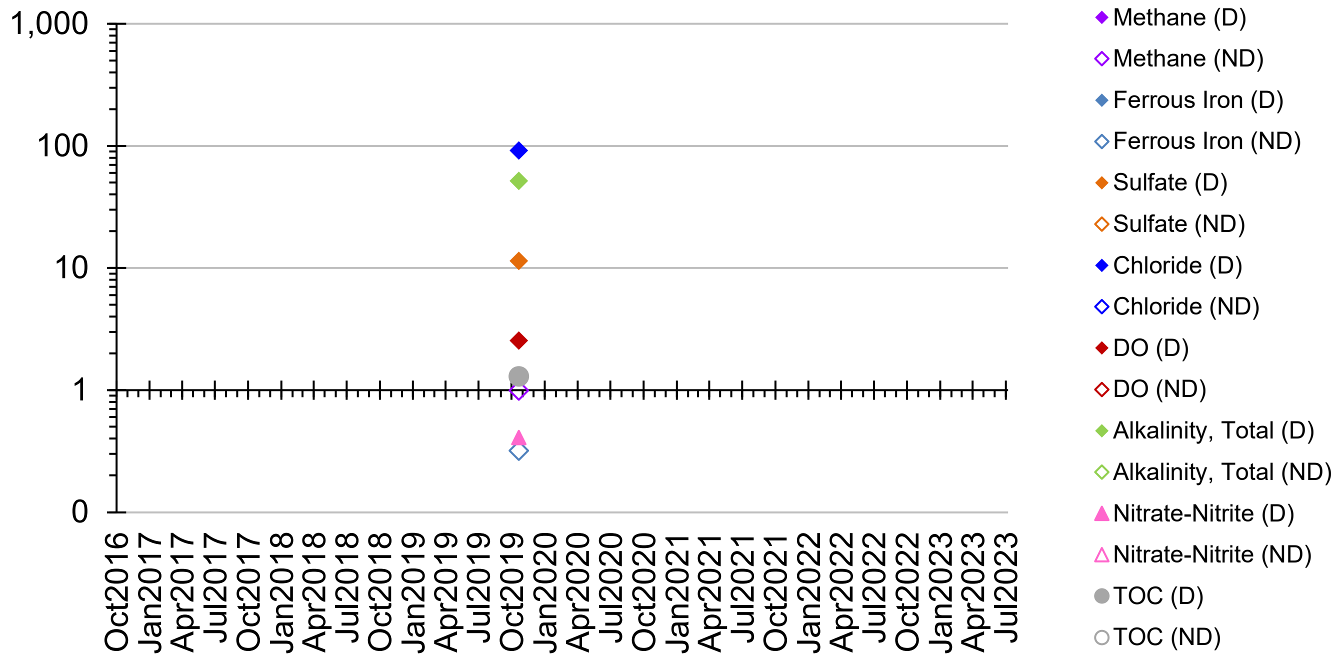


RHMW14 Zone 7 NAPs

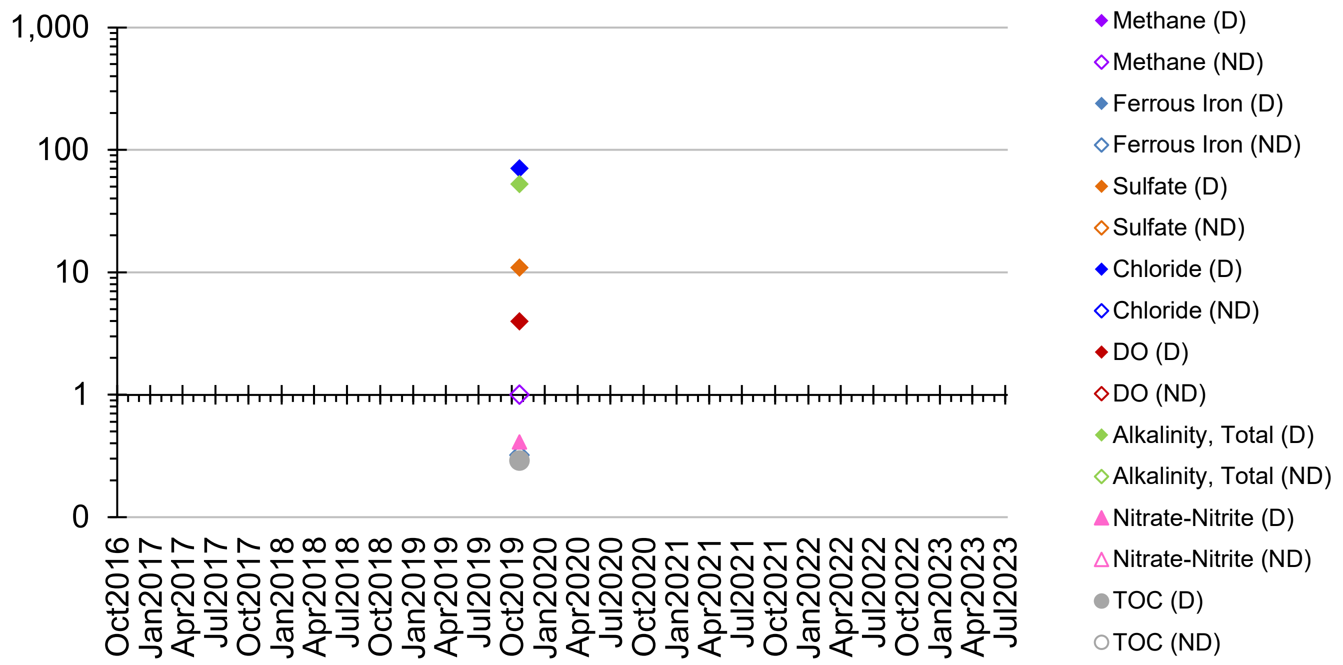


Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

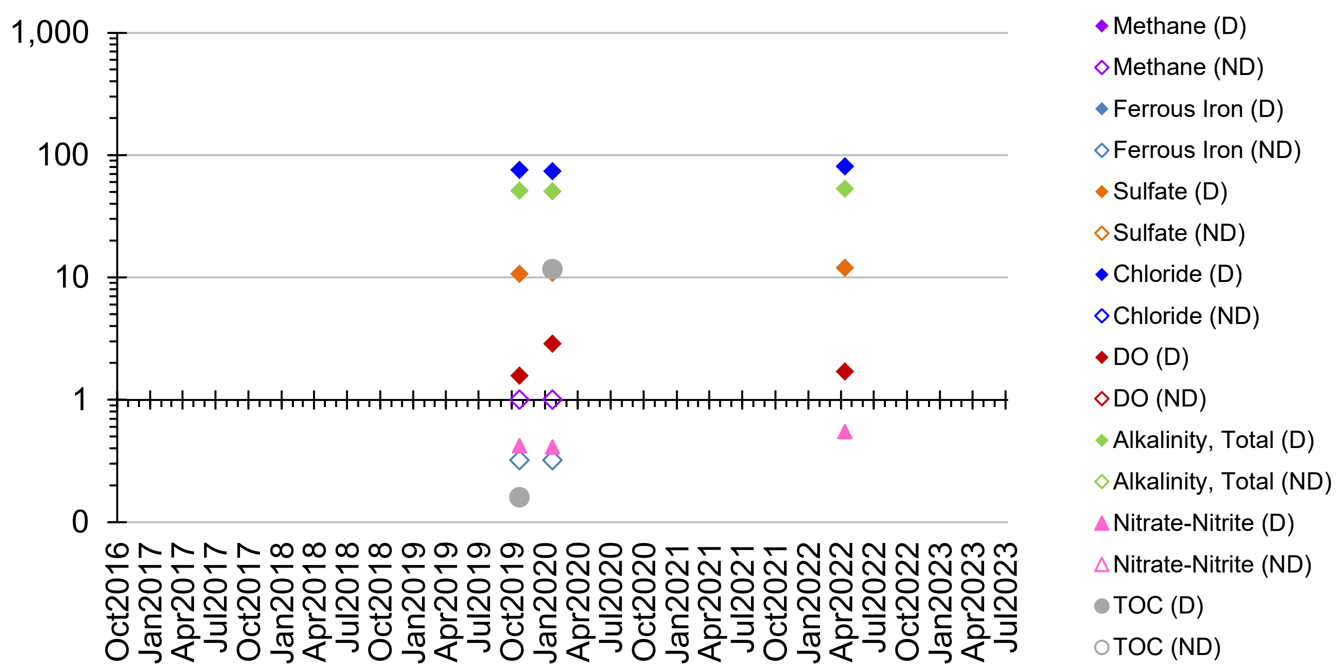
RHMW15 Zone 1 NAPs



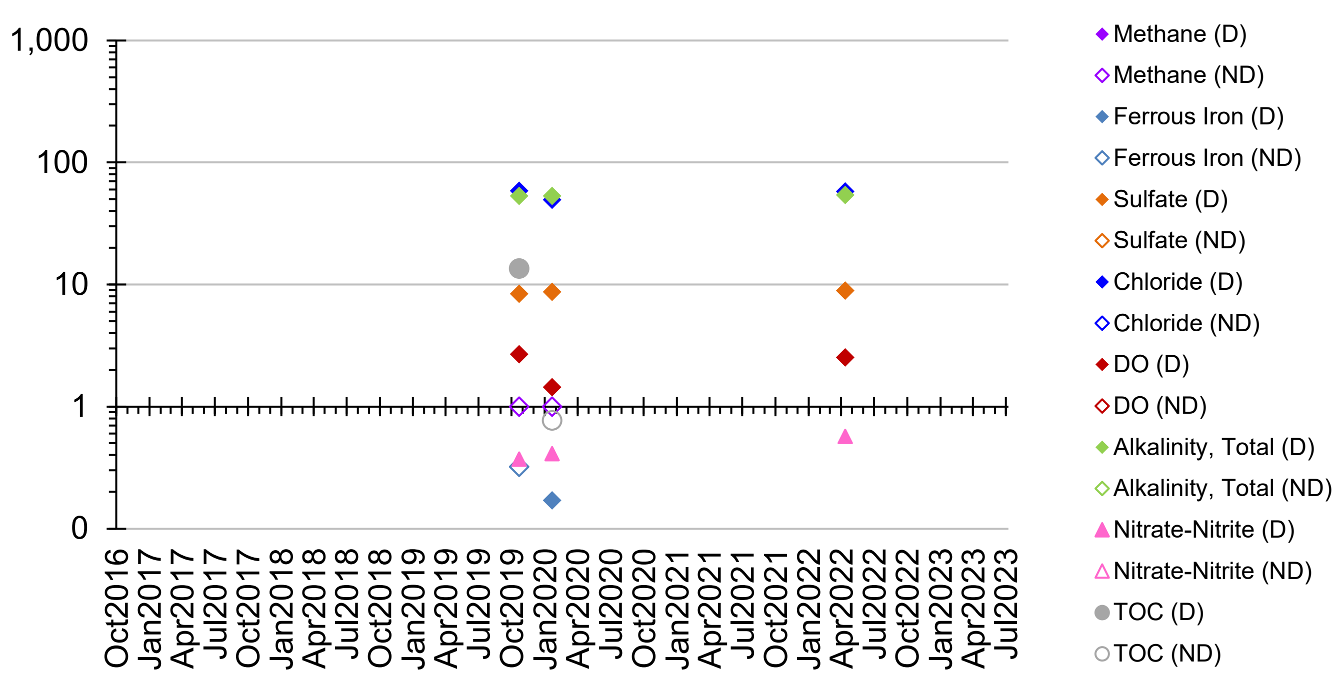
RHMW15 Zone 2 NAPs



RHMW15 Zone 3 NAPs



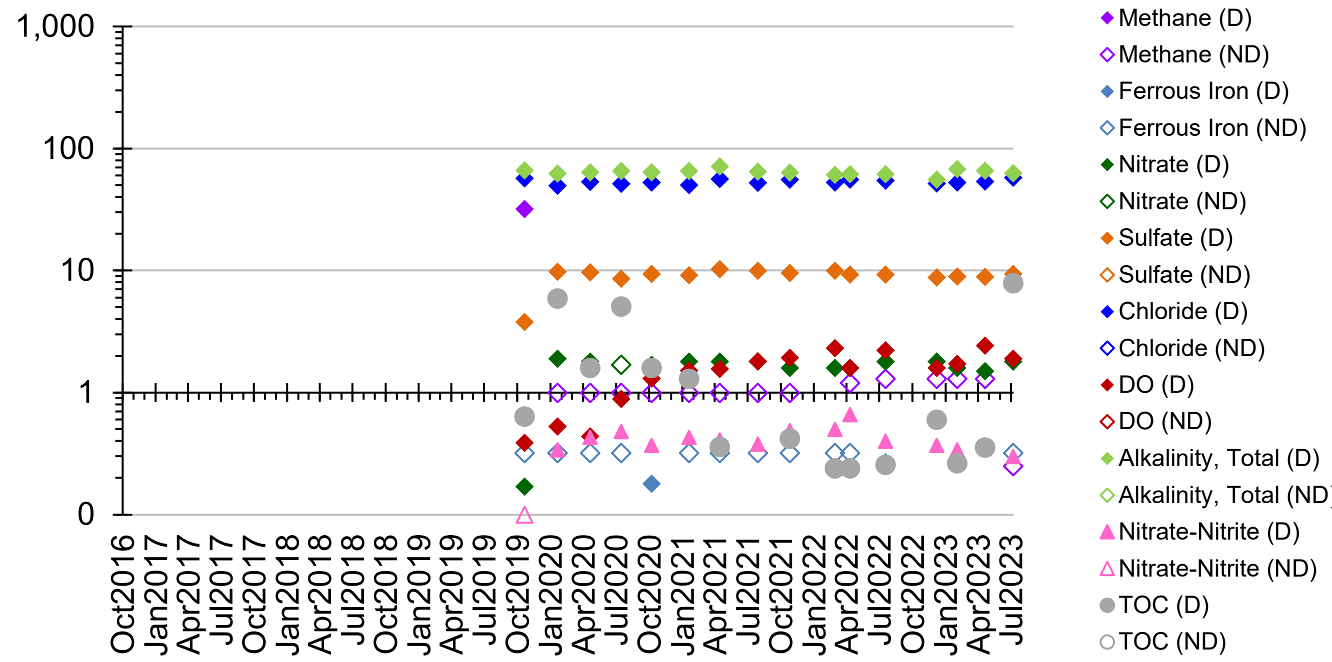
RHMW15 Zone 4 NAPs



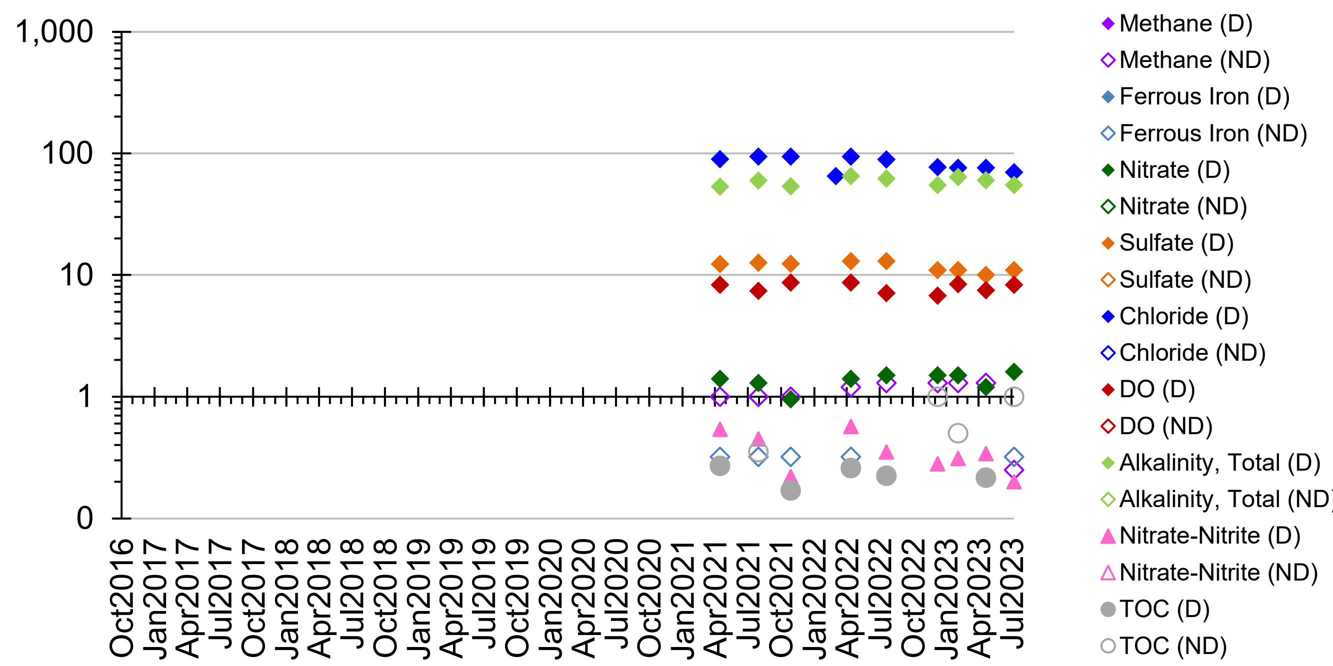
Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

Appendix A.3.1: Cumulative Natural Attenuation Parameter Graphs (cont'd)

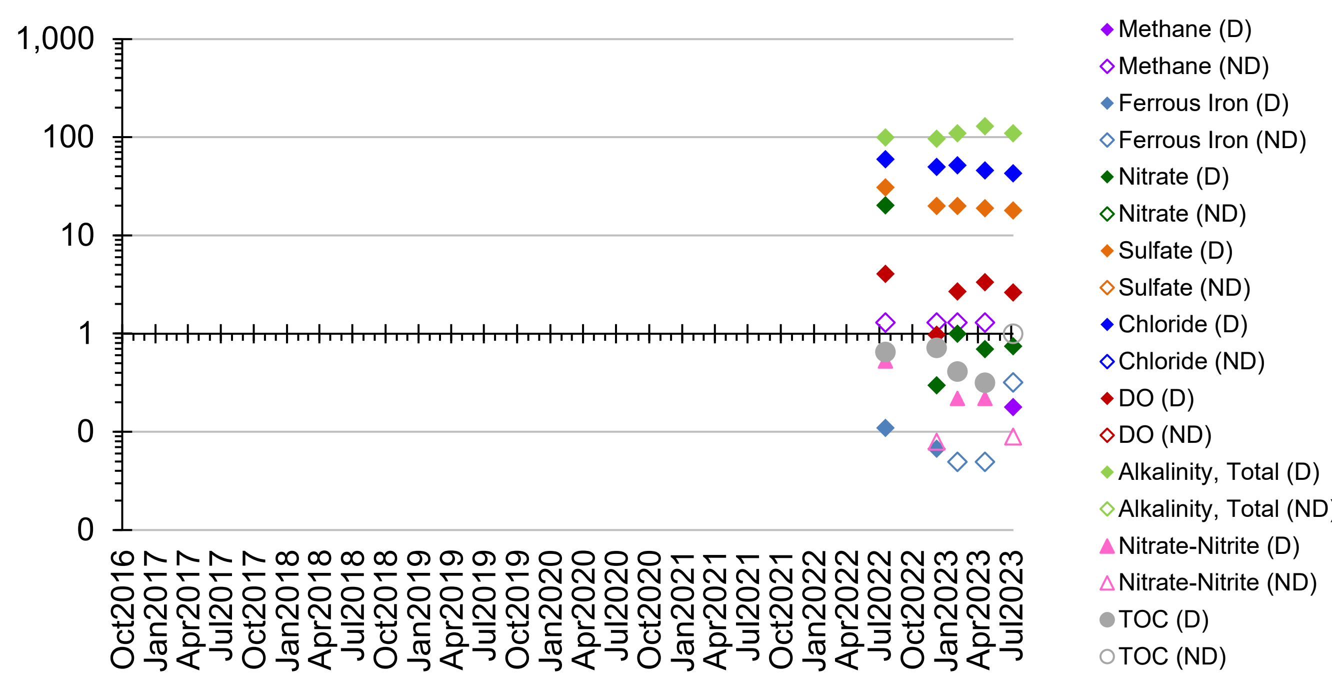
RHMW15 Zone 5 NAPs



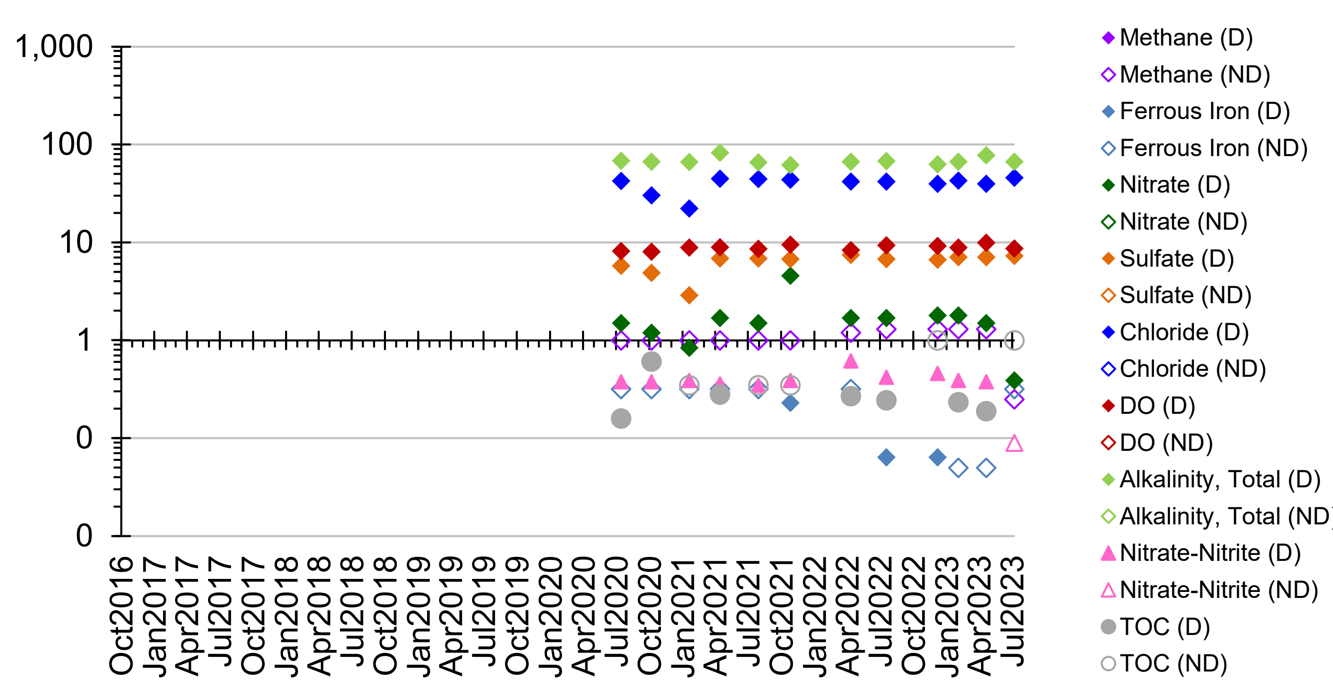
RHMW16 NAPs



RHMW17 NAPs

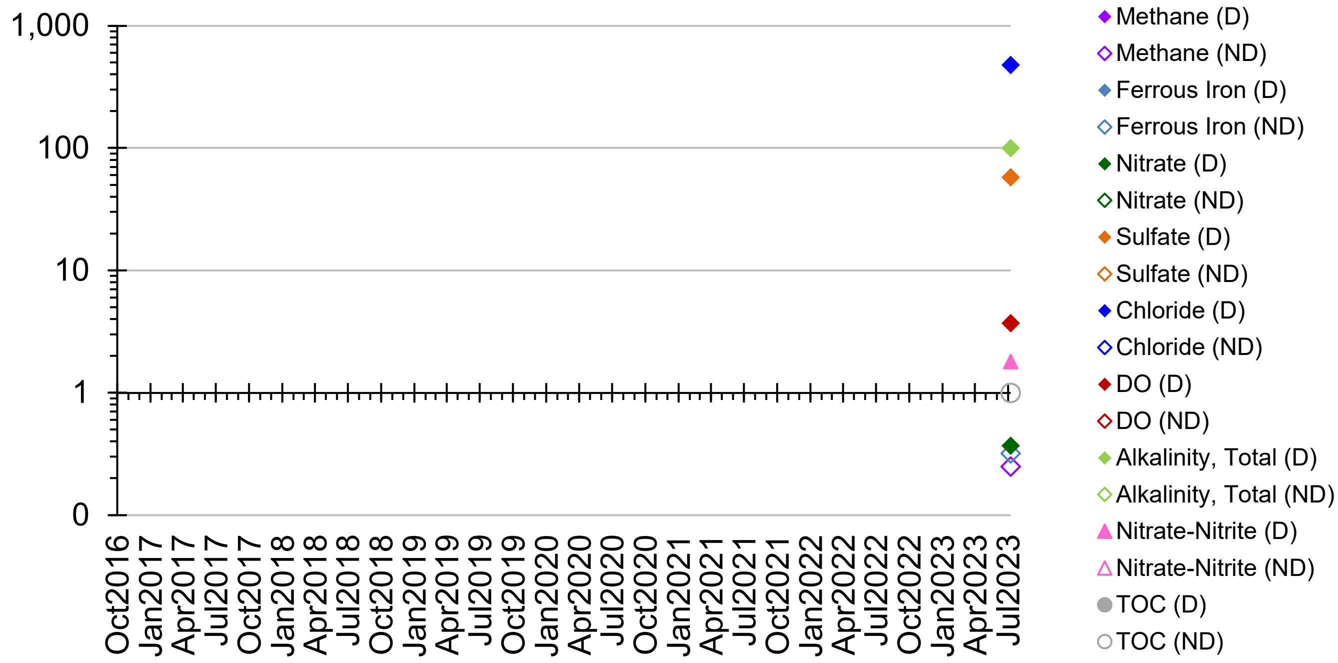


RHMW19 NAPs

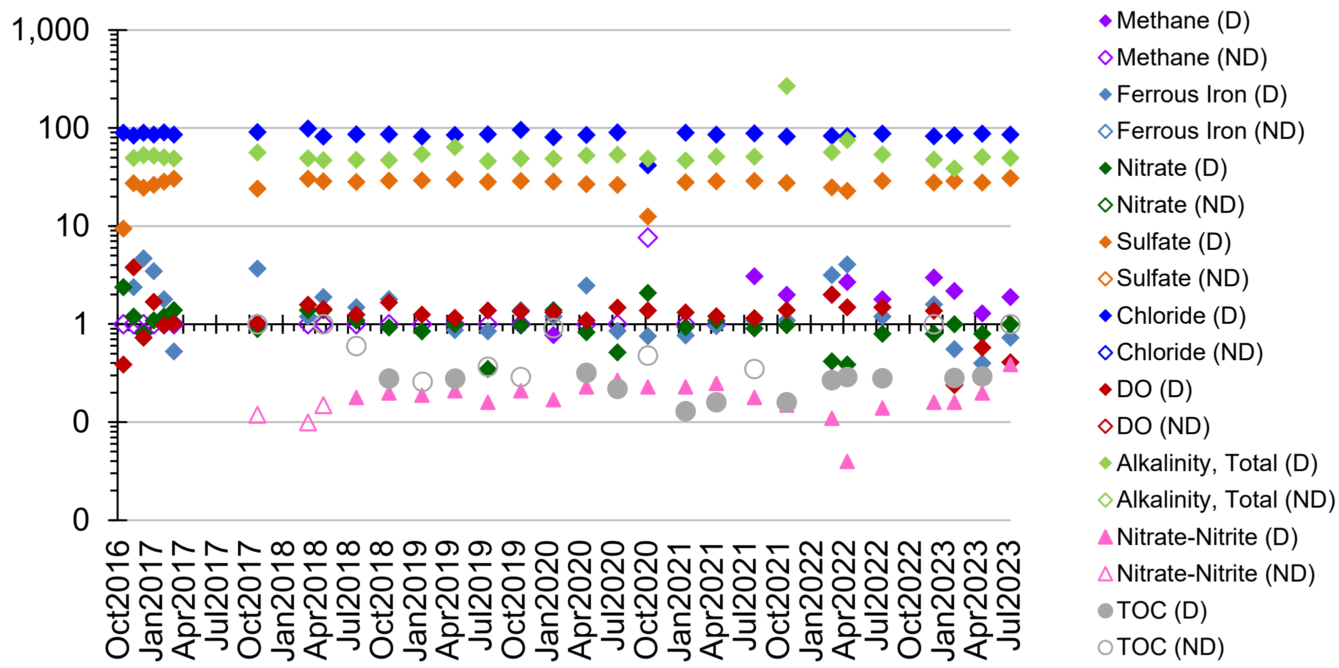


Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

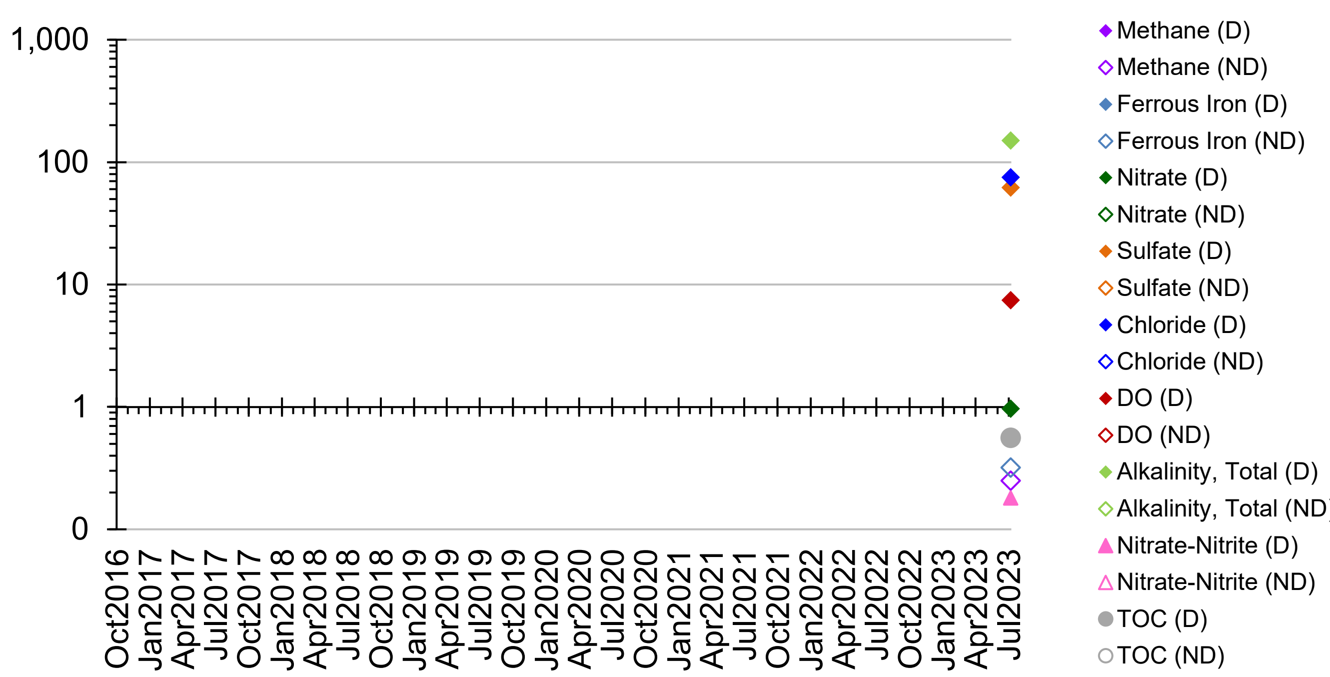
RHMW20 NAPs



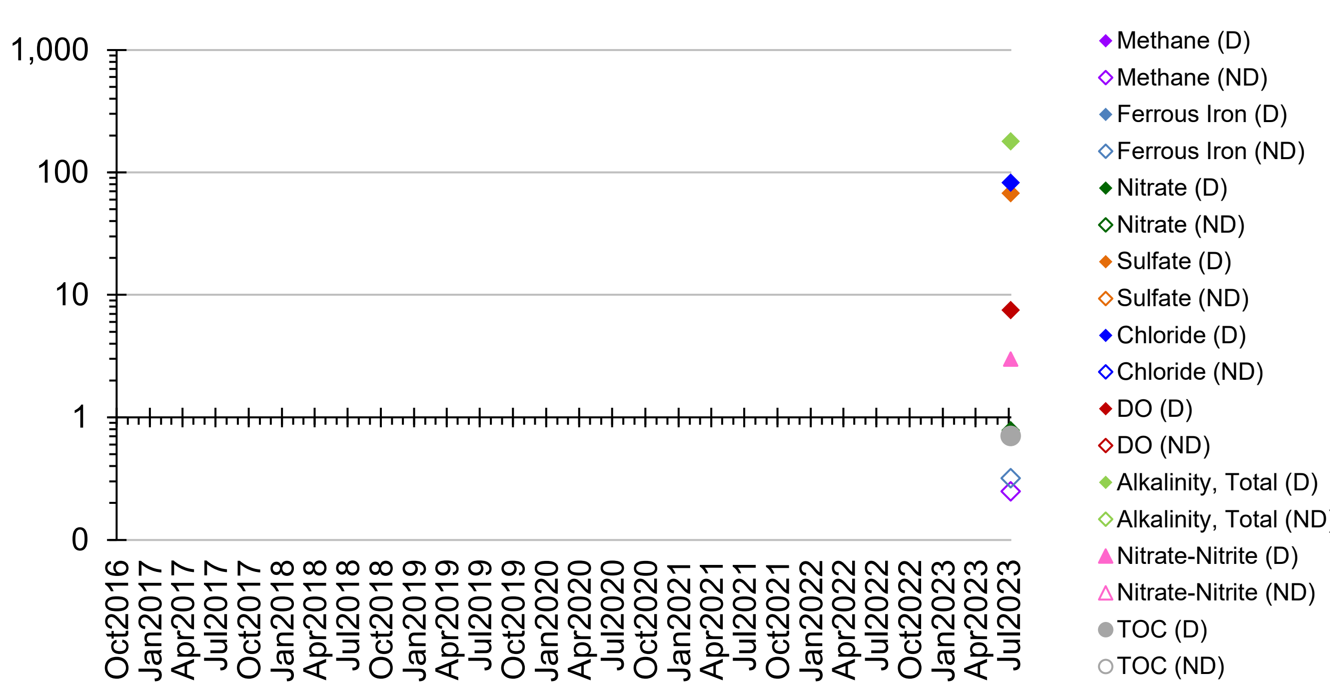
HDMW2253-03 NAPs



RHP01 NAPs



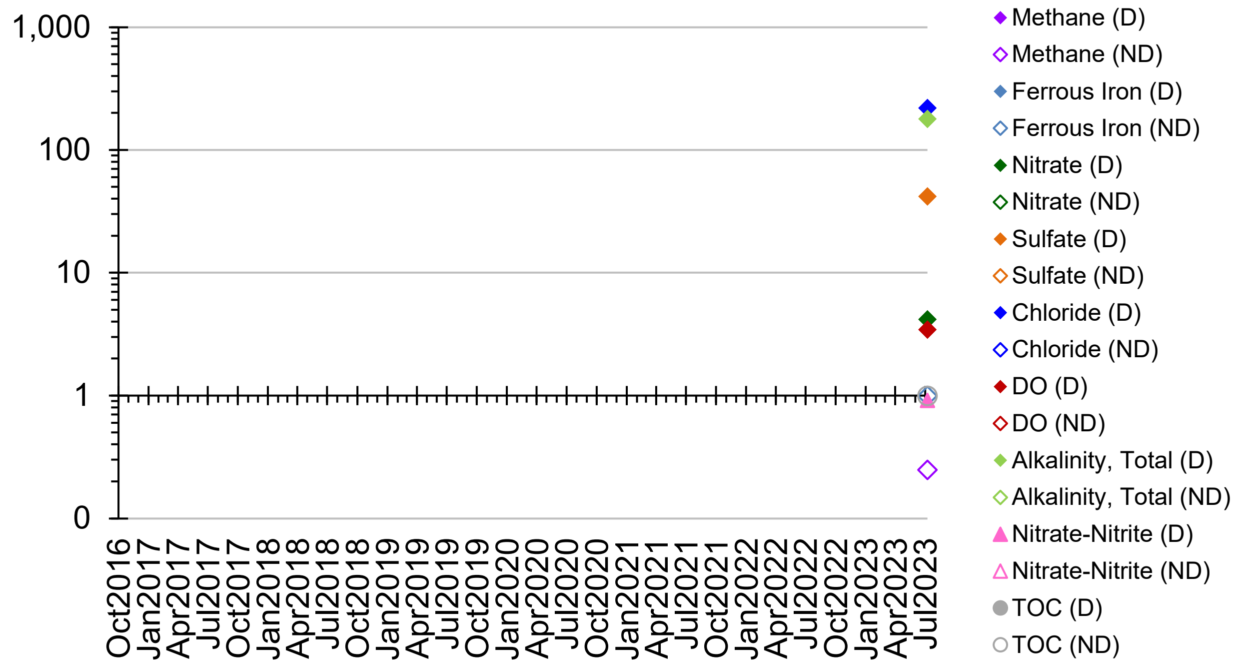
RHP02 NAPs



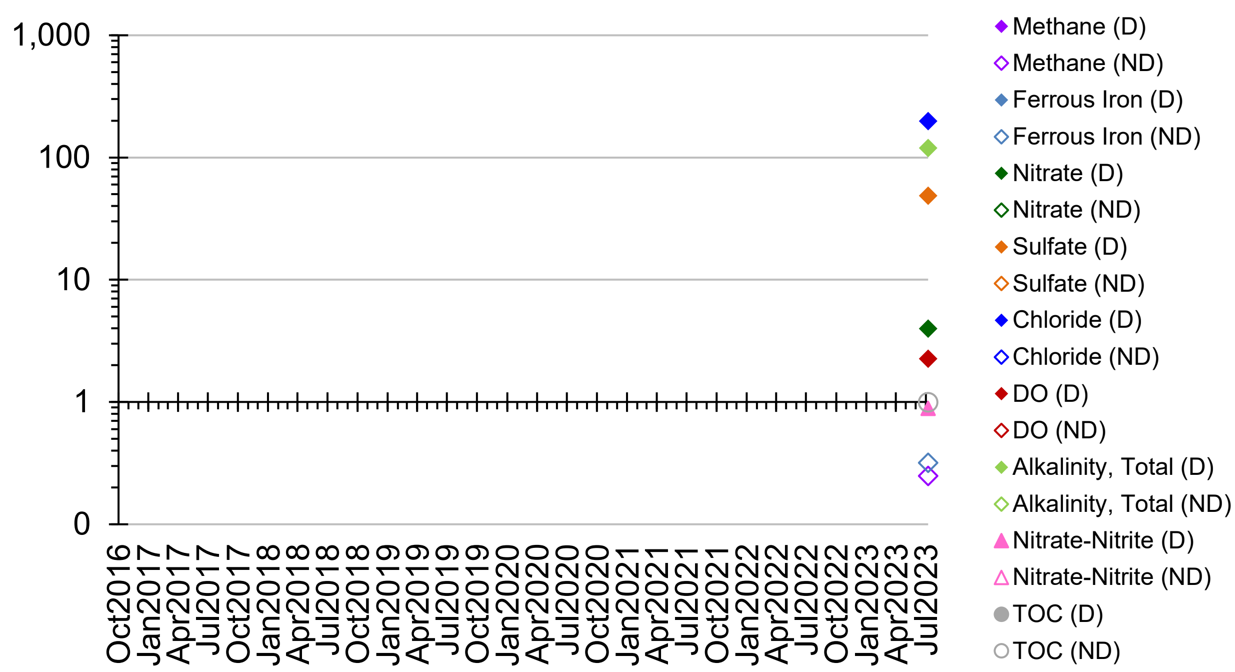
Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

Appendix A.3.1: Cumulative Natural Attenuation Parameter Graphs (cont'd)

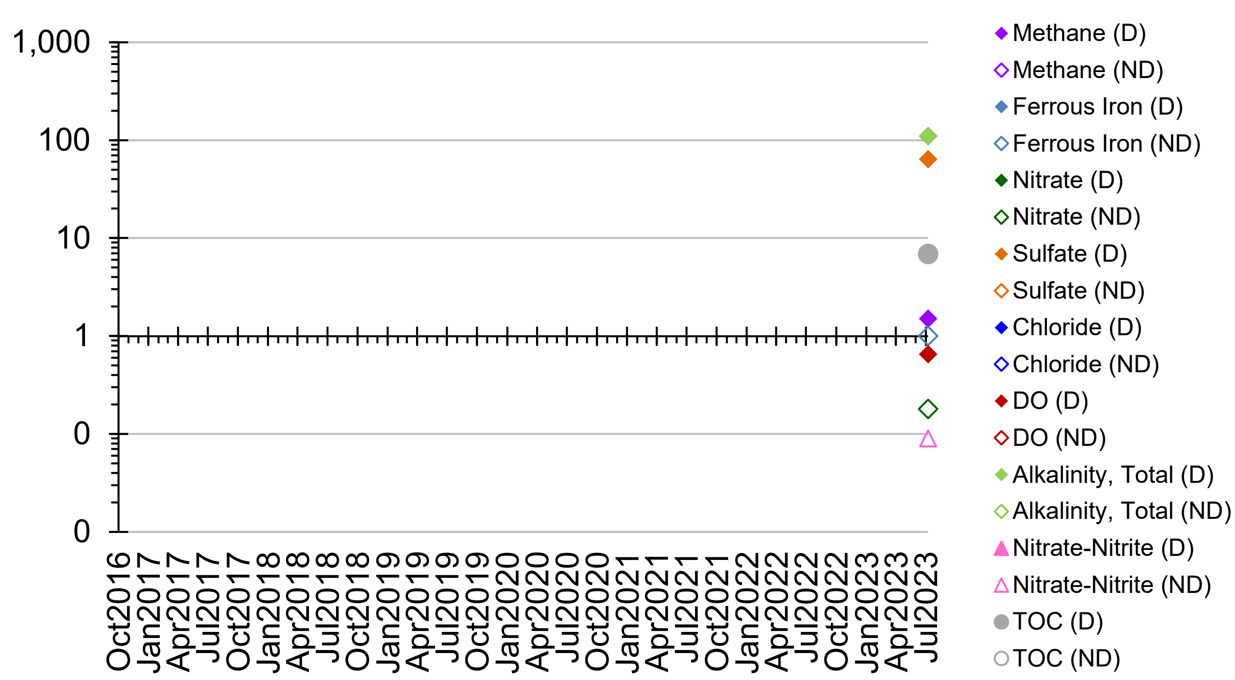
RHP03 NAPs



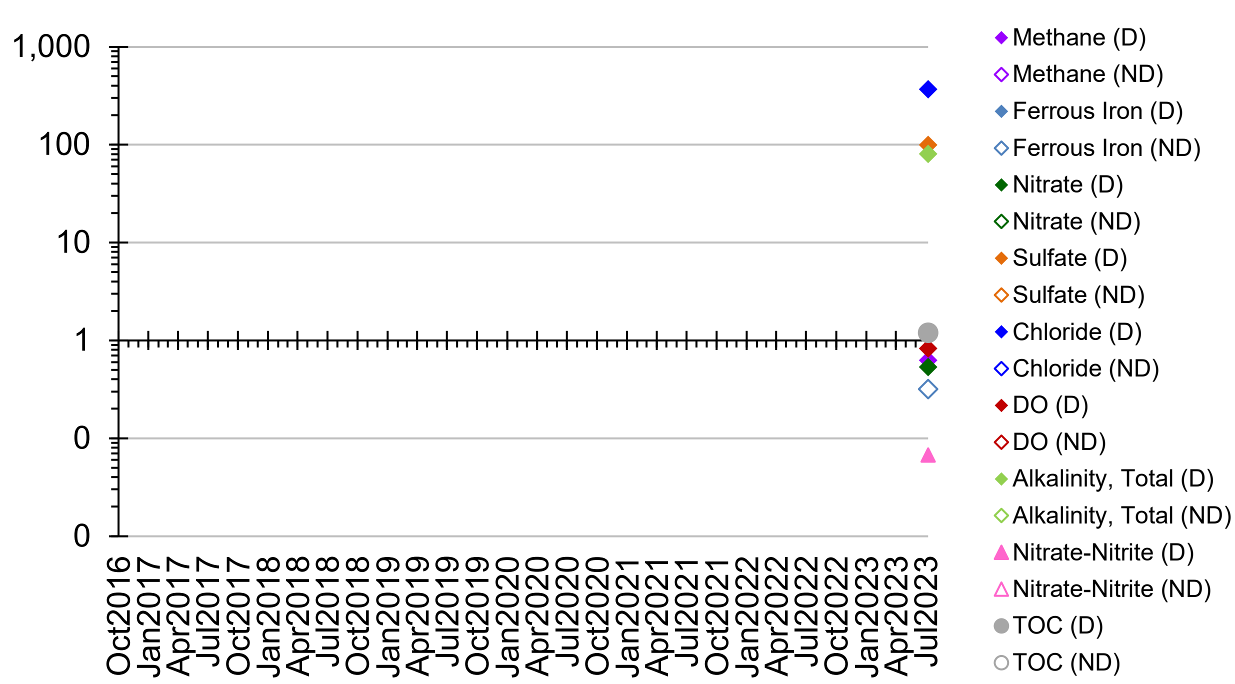
RHP04A NAPs



RHP04B NAPs

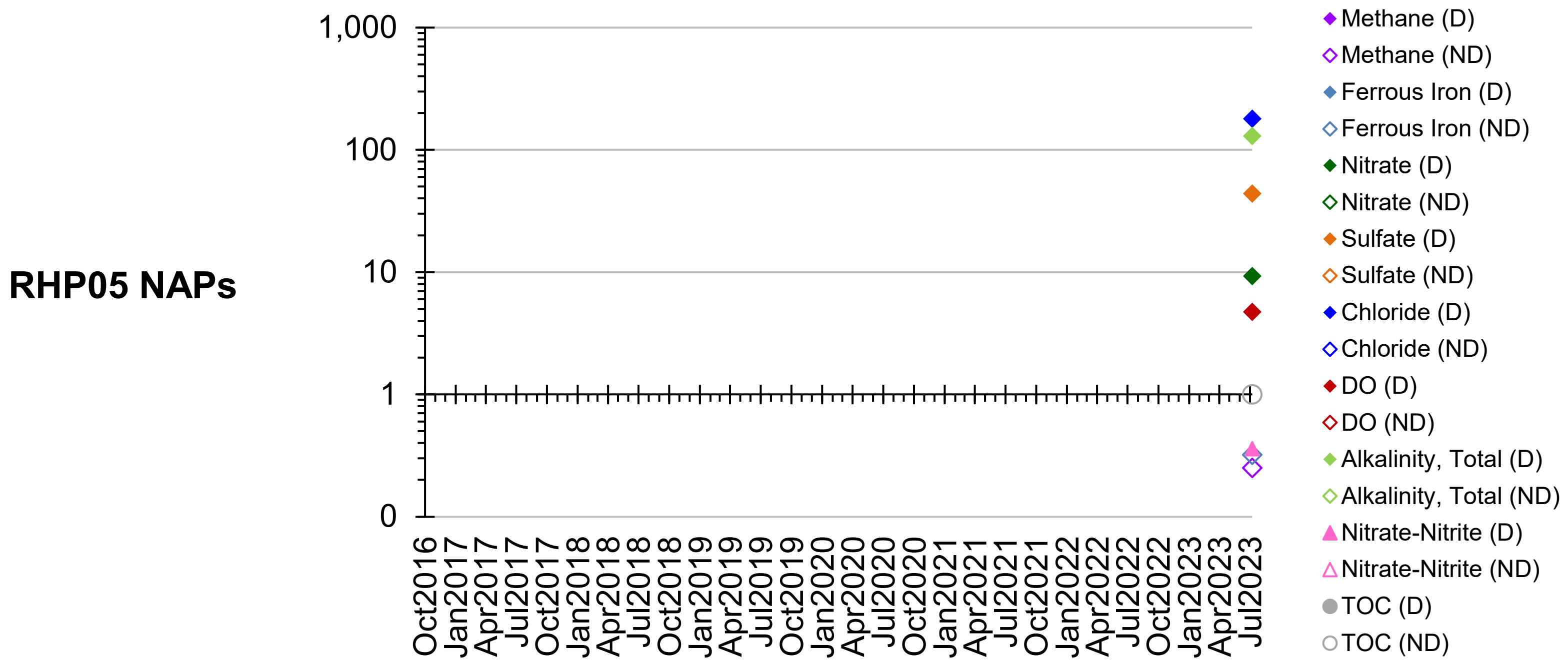


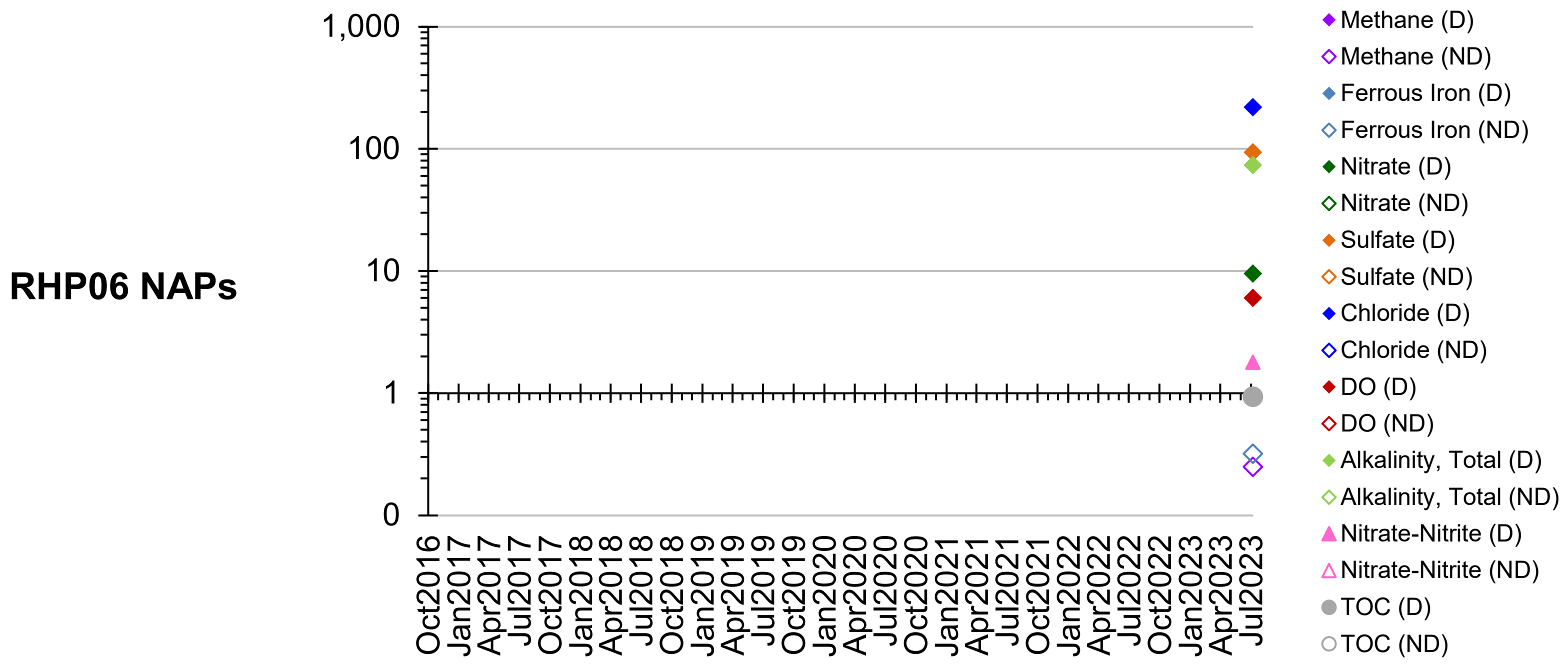
RHP04C NAPs

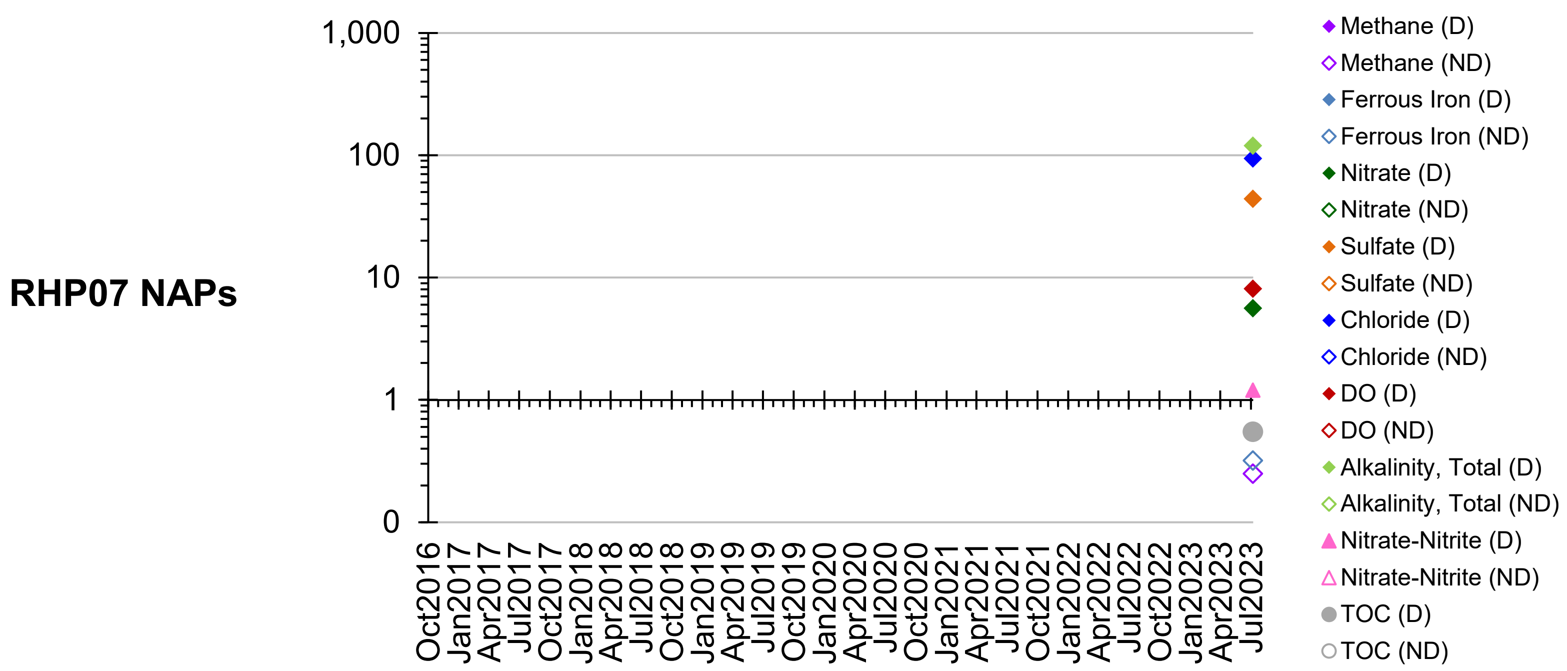


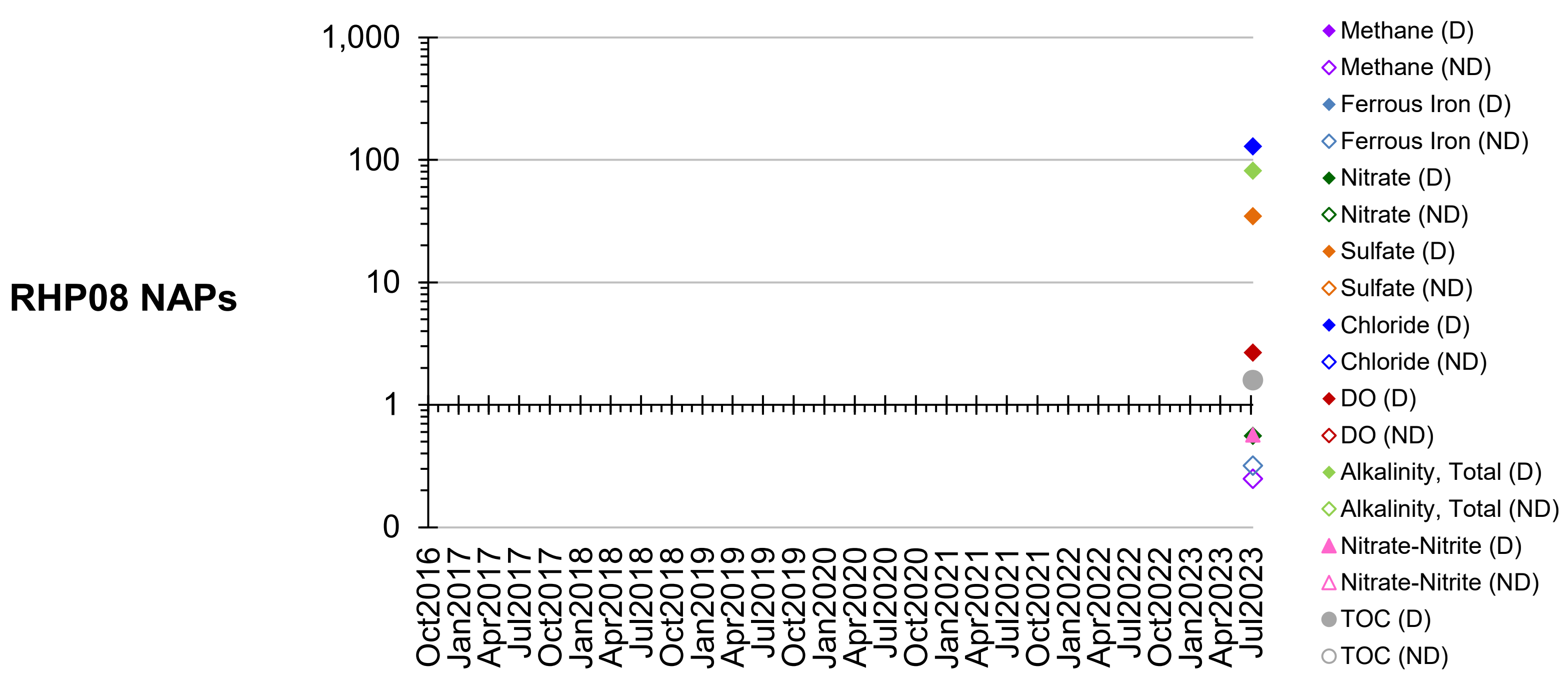
Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

Appendix A.3.1: Cumulative Natural Attenuation Parameter Graphs (cont'd)



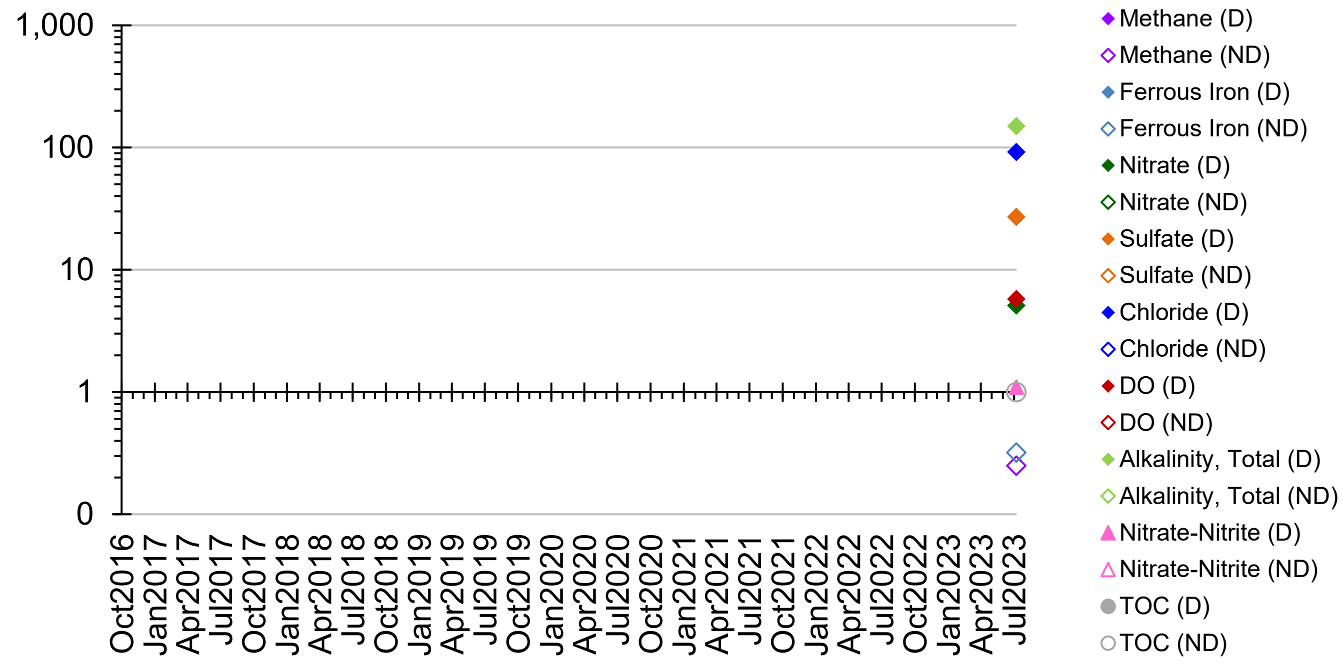




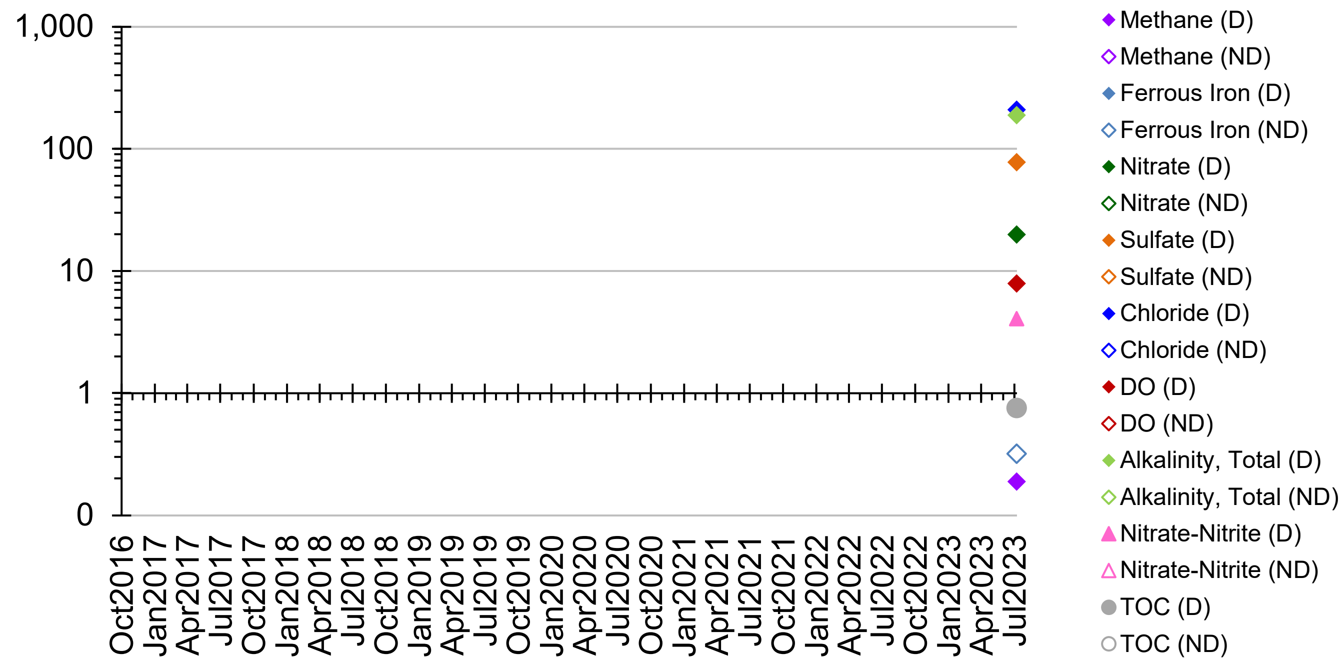


Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

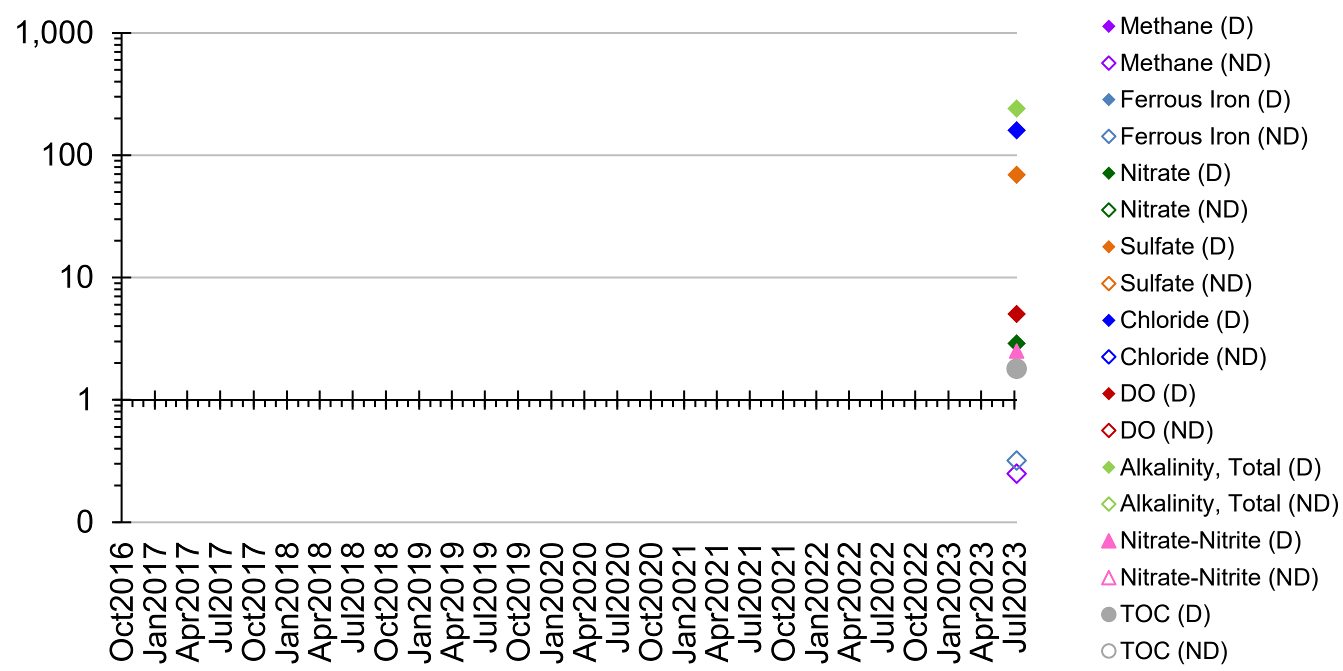
NMW24 NAPs



NMW25 NAPs



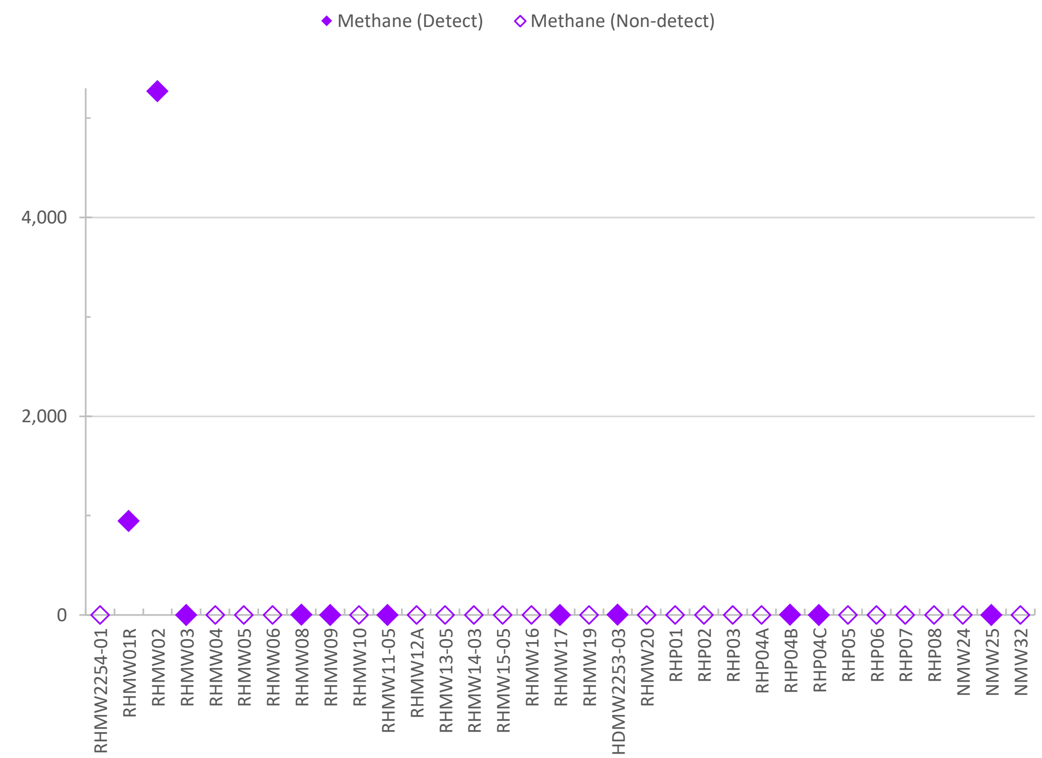
NMW32 NAPs

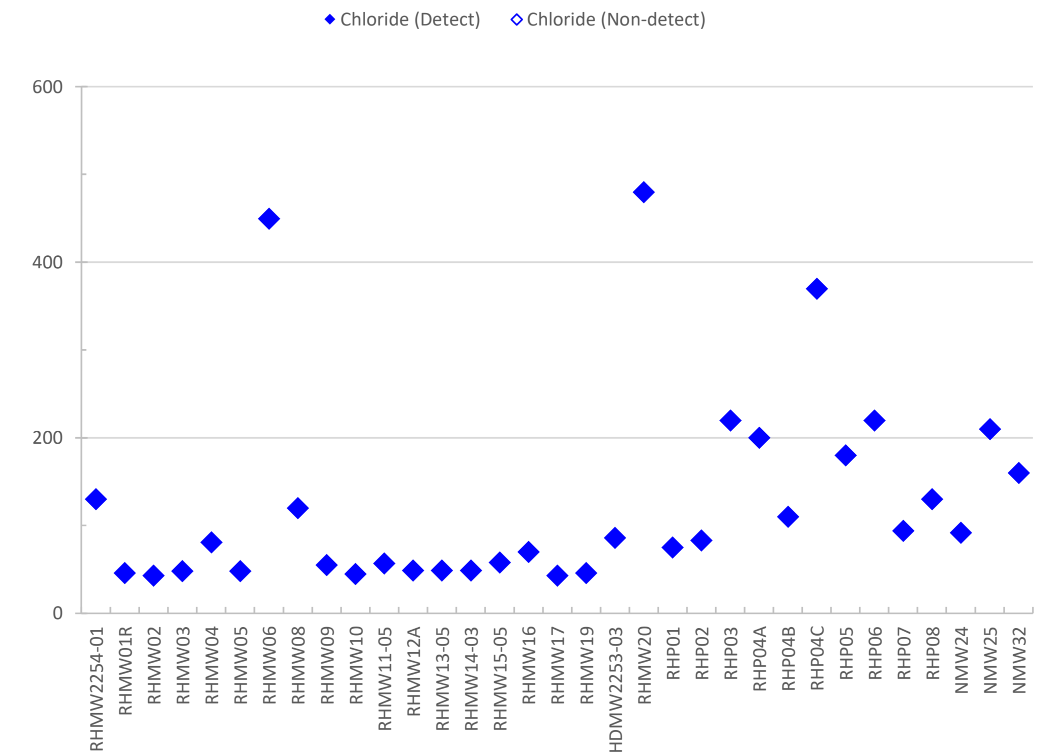


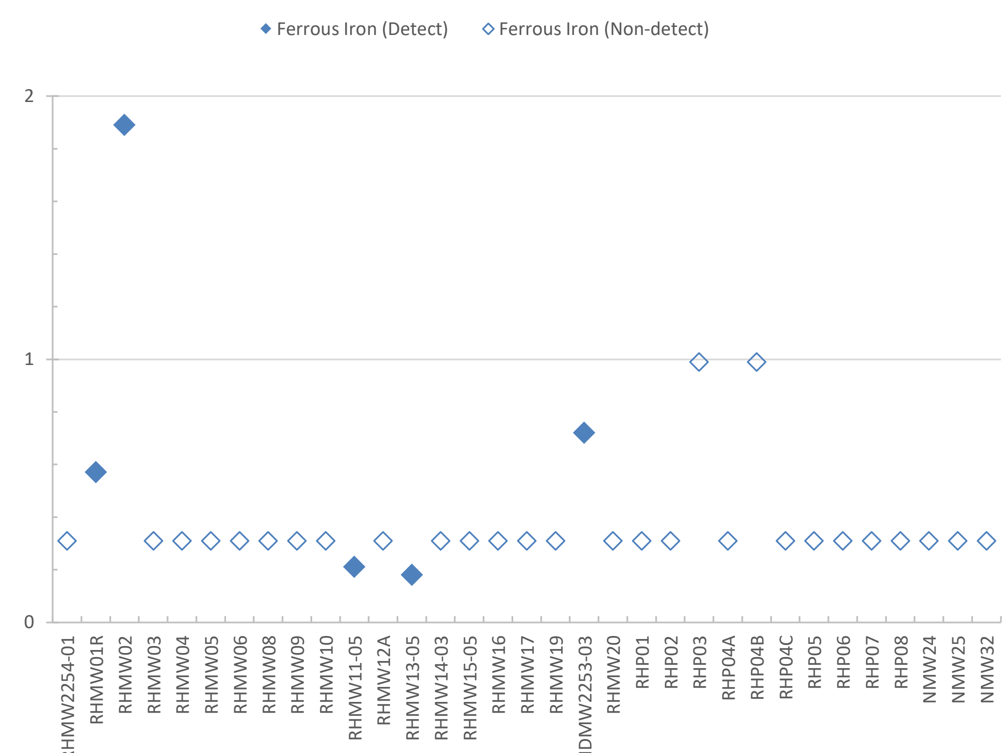
Methane results in micrograms per liter (µg/L or parts per billion).
All other results in milligrams per liter (mg/L or parts per million).

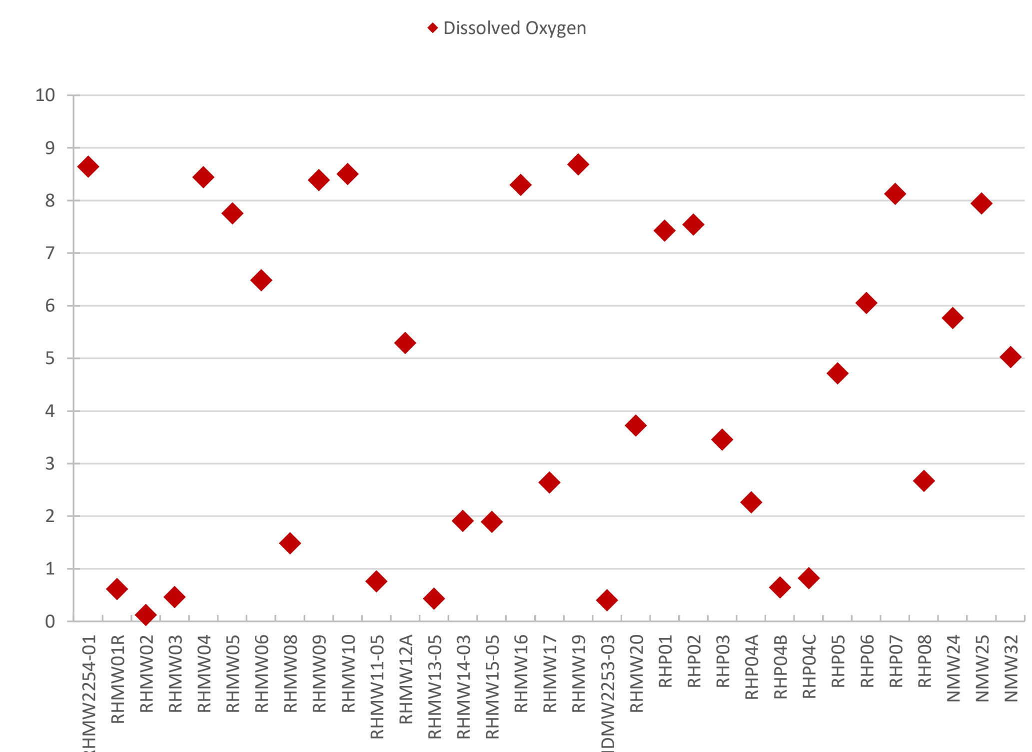
Appendix A.3.2:
Third Quarter 2023 Natural Attenuation Parameter Graphs

Appendix A.3.2: Natural Attenuation Parameters, Third Quarter 2023 GW LTM Event

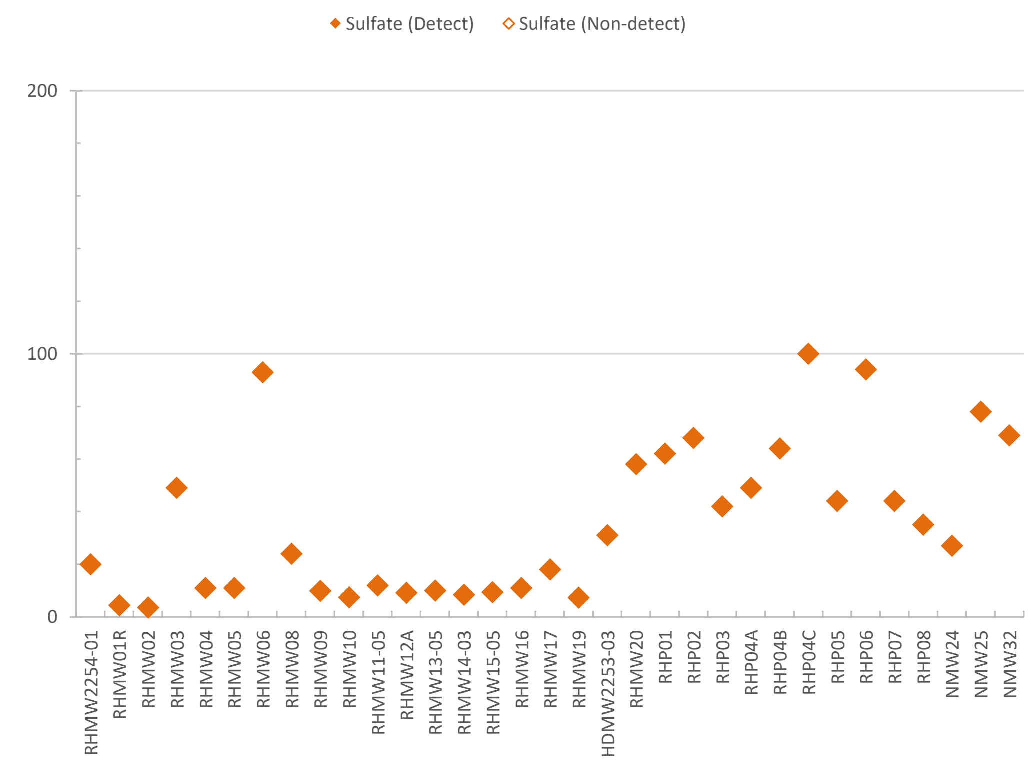


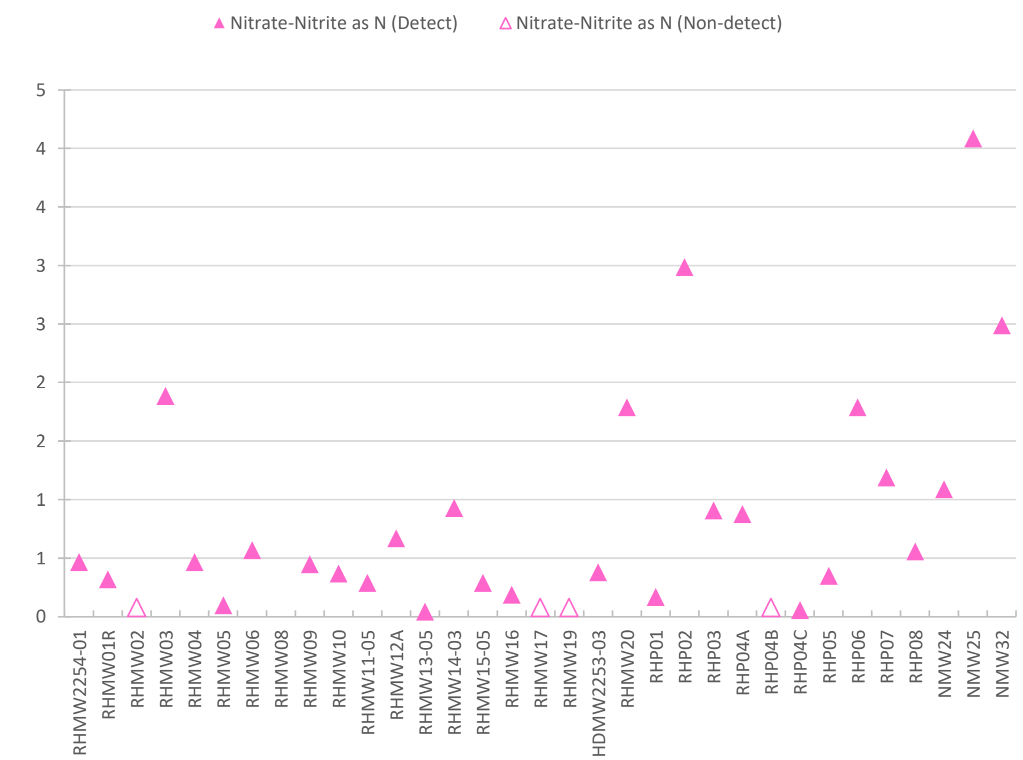


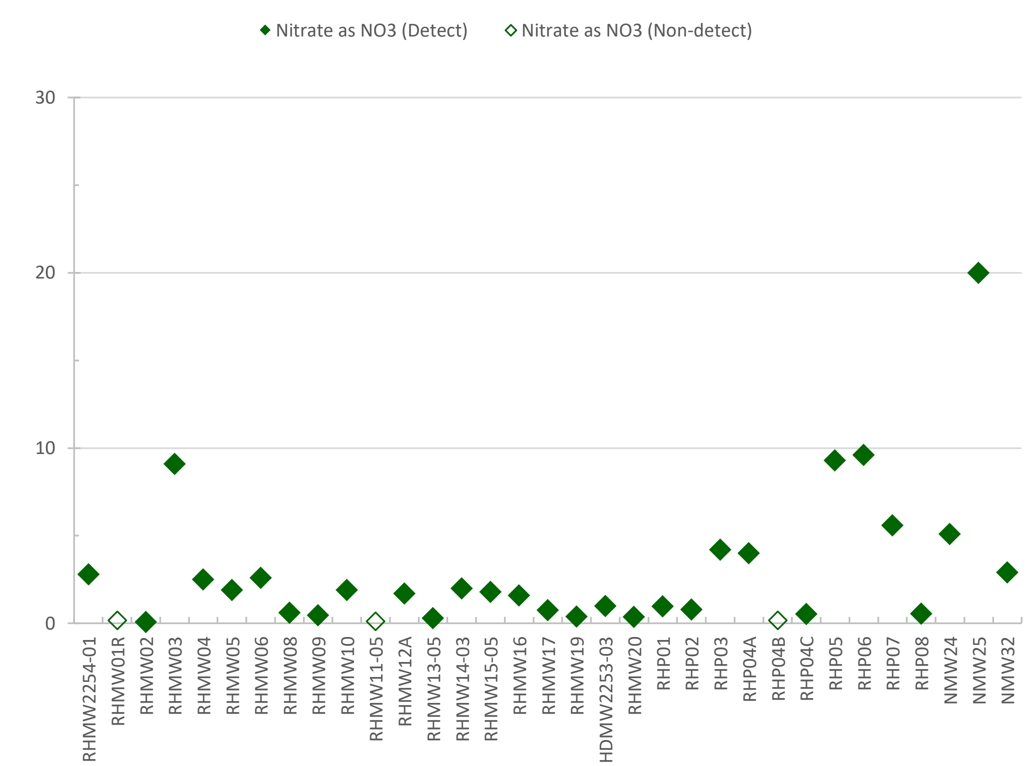


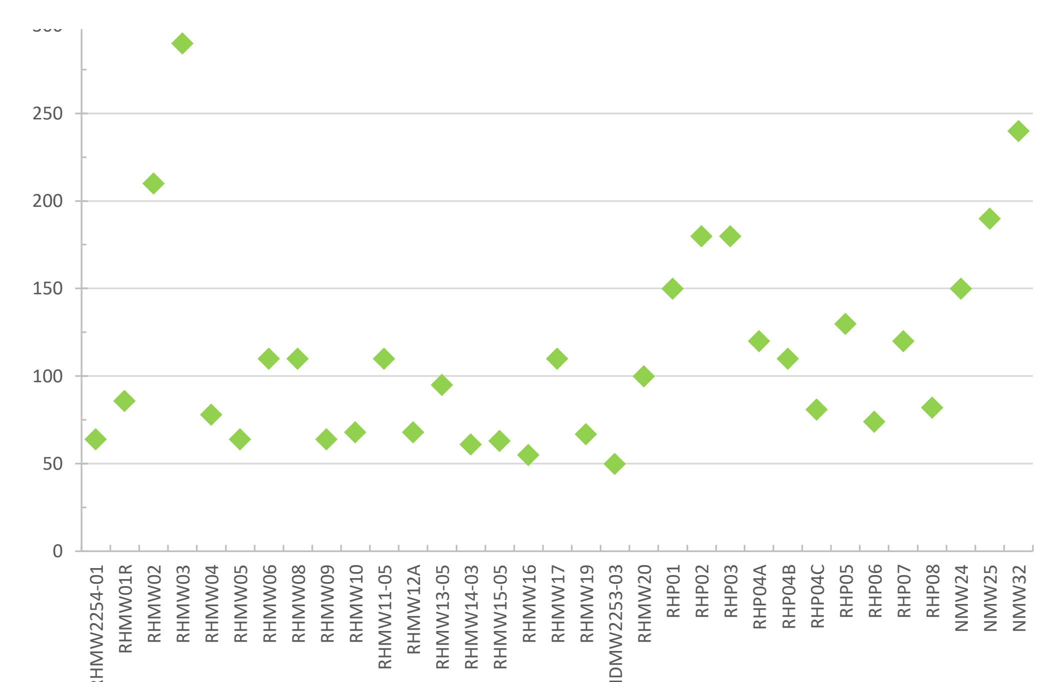


Appendix A.3.2: Natural Attenuation Parameters, Third Quarter 2023 GW LTM Event (cont'd)

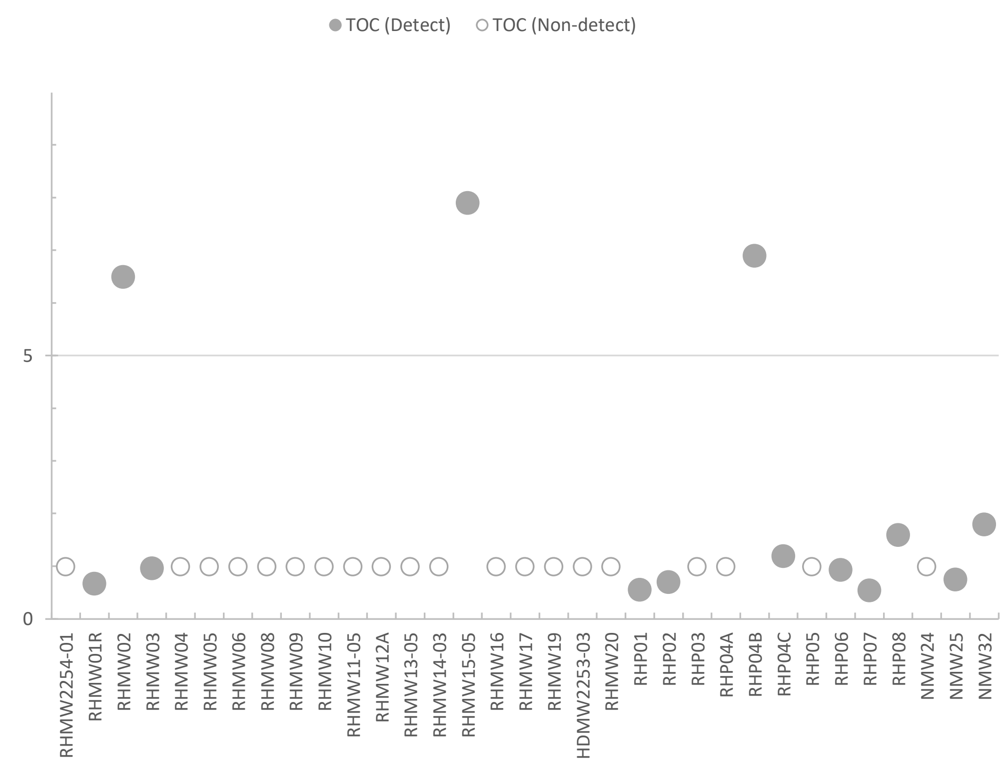








Appendix A.3.2: Natural Attenuation Parameters, Third Quarter 2023 GW LTM Event (cont'd)



Appendix A.4:
Depth to Water

Table A.4: Depth to Groundwater (ft btoc) in Red Hill Groundwater Monitoring Wells
Red Hill Bulk Fuel Storage Facility, JBPHH, Oʻahu, Hawaiʻi

Sample Date [a,b]	RHMW2254-01	RHMW01	RHMW01R	RHMW02	RHMW03	RHMW04	RHMW05	RHMW06	RHMW07	RHMW08	RHMW09	RHMW10	RHMW11-05	RHMW12A	RHMW13-05	RHMW14-03	RHMW15-05	RHMW16	RHMW16A	RHMW17	RHMW19	RHMW20	HDMW2253-03	OWDFMW01
11-Sept-2023 [e]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-Aug-2023 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Jul-2023 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Jul-2023 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17-Jul-2023	—	—	83.97	87.52	103.09	—	83.61	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11-Jul-2023 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	208.03	—
7-Jul-2023 [c,d]	—	—	83.39	—	—	—	83.47	—	—	—	—	—	—	220.71	—	162.24	—	201.08	—	234.54	—	—	—	—
6-Jul-2023 [c,d]	—	—	—	—	—	—	—	—	—	292.74	377.63	—	192.13	—	—	—	—	—	—	—	426.59	237.81	237.81	—
5-Jul-2023 [c,d]	—	—	—	86.57	102.93	294.26	—	241.22	—	—	—	477.80	—	—	230.02	—	—	—	—	—	—	—	—	—
3-Jul-2023 [c,d]	88.58	—	—	—	119.07	—	—	—	—	—	—	—	—	—	—	—	291.21	—	—	—	—	—	—	—
20-Apr-2023 [c,g]	—	—	—	—	—	—	—	—	—	292.46	—	—	—	—	—	—	—	—	—	234.31	426.35	—	—	—
19-Apr-2023 [c]	—	—	—	—	—	294.02	—	240.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Apr-2023 [c,g]	—	—	—	—	—	—	—	—	197.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17-Apr-2023 [c]	—	—	—	—	—	—	—	—	—	—	377.36	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Apr-2023 [c]	—	—	—	—	—	—	83.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13-Apr-2023 [c,f,g]	—	—	—	—	—	—	—	—	—	—	—	—	191.62	220.38	—	—	—	—	—	—	—	—	—	120.17
12-Apr-2023 [c,f,g]	—	—	—	86.43	102.67	—	—	—	—	—	—	—	—	—	230.05	—	—	200.80	—	—	—	—	—	—
11-Apr-2023 [c,f]	—	—	—	—	—	—	—	—	—	—	—	477.44	—	—	—	161.62	—	—	—	—	—	—	207.74	—
10-Apr-2023 [d,f,g]	—	83.60	83.33	—	—	—	—	—	—	—	—	—	—	—	—	—	290.54	—	179.56	—	—	—	—	—
21-Mar-2023	—	—	83.69	86.59	103.02	—	83.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9-Feb-2023 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	229.52	—	—	—	—	—	—	—	—	120.19
8-Feb-2023 [c]	—	—	—	—	—	—	—	—	198.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7-Feb-2023 [c]	—	—	—	—	—	—	—	—	—	292.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6-Feb-2023 [c]	—	—	—	—	—	—	—	—	—	—	377.40	—	—	—	—	—	—	—	—	—	—	—	—	—
2-Feb-2023 [c,d]	—	—	—	—	—	294.13	83.36	241.17	—	—	—	—	191.55	—	—	—	—	201.88	—	—	—	—	—	—
1-Feb-2023 [c,d]	—	—	—	—	—	—	—	—	—	—	—	477.63	—	—	—	—	—	—	—	234.51	426.69	—	—	—
31-Jan-2023 [c,d]	—	83.99	83.76	—	—	—	—	—	—	—	—	—	—	—	—	161.68	—	—	—	—	—	—	207.93	—
30-Jan-2023 [c,d]	—	—	—	86.59	102.80	—	—	—	—	—	—	—	—	220.67	—	—	291.09	—	179.89	—	—	—	—	—
17-Jan-2023	—	—	85.53	82.62	102.90	—	83.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Dec-2022	—	—	83.67	85.58	102.80	—	83.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Dec-2022 [e,f]	—	—	—	—	102.80	—	—	—	—	—	—	477.47	—	—	—	—	—	—	—	234.43	—	—	—	—
15-Dec-2022 [e]	—	—	—	—	—	—	—	—	198.02	292.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Dec-2022 [e]	—	—	—	—	—	294.11	—	241.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13-Dec-2022 [e,f]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	426.46	—	—	120.28
12-Dec-2022 [e]	—	—	—	—	—	—	—	—	—	—	377.42	—	—	—	—	—	—	—	—	—	—	—	—	—
8-Dec-2022 [e,f]	—	—	—	86.60	—	—	—	—	—	—	—	—	—	220.64	—	—	—	201.85	—	—	—	—	—	—
6-Dec-2022 [e,f]	—	83.91	83.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5-Dec-2022 [e,f]	—	—	—	—	—	—	83.27	—	—	—	—	—	—	—	—	—	—	—	179.70	—	—	—	—	—
1-Dec-2022 [e]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.80	—
29-Jul-2022 [f]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	234.28	—	—	—	119.92
28-Jul-2022 [f,e]	—	—	—	—	—	293.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Jul-2022 [f]	—	—	—	—	—	—	—	240.95	197.94	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Jul-2022 [f]	—	—	—	—	—	—	—	—	—	—	377.42	—	—	—	—	—	—	—	—	—	426.50	—	—	—
25-Jul-2022 [f]	—	—	—	—	—	—	—	—	—	—	—	477.44	—	—	—	—	—	—	—	—	—	—	—	—
22-Jul-2022 [f]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.55	—
21-Jul-2022 [f]	—	—	—	—	—	—	—	—	—	—	—	—	—	220.39	—	—	—	—	—	—	—	—	—	—
20-Jul-2022 [f,e]	—	—	—	86.33	102.58	—	—	—	—	—	—	—	—	—	—	—	—	201.63	—	—	—	—	—	—
19-Jul-2022 [f]	—	83.71	83.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Jul-2022 [f]	—	—	—	—	—	—	83.06	—	—	—	—	—	—	—	—	—	—	—	179.57	—	—	—	—	—
19-May-2022	—	—	83.20	86.10	102.35	—	82.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Apr-2022 [e]	—	84.43	—	86.16	104.26	—	82.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.30	—
20-Apr-2022 [f]	—	—	—	—	—	—	—	—	—	—	—	477.20	—	—	—	—	—	—	—	—	—	—	—	—
19-Apr-2022 [f,e]	—	—	—	—	—	—	—	—	—	292.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Apr-2022 [f,e]	—	—	—	—	—	—	—	—	197.81	—	377.05	—	—	220.14	—	—	—	—	—	—	—	—	—	—
15-Apr-2022 [f,e]	—	—	—	—	—	—	—	240.76	—	—	—	—	—	—	—	—	—	—	—	—	426.19	—	—	—
14-Apr-2022 [f,e]	—	83.52	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	201.41	181.28	—	—	—	—	—
13-Apr-2022 [c,f,e]	—	—	—	86.13	102.74	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12-Apr-2022 [f,e]	—	—	83.29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.29
11-Apr-2022 [f,e]	—	—	—	—	—	293.56	82.87	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Mar-2022	—	—	83.30	86.21	102.43	—	82.90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4-Mar-2022 [c,e]	—	—	—	—	—	—	—	—	—	—	—	477.18	—	—	—	—	—	—	—	—	—	—	207.37	—
3-Mar-2022 [c,e]	—	—	—	—	—	—	—	—	—	—	377.09	—	—	—	—	—	—	—	—	—	—	—	—	—
2-Mar-2022 [d]	—	—	82.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1-Mar-2022 [c]	—	—	—	—	—	—	—	—	197.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Feb-2022 [c]	—	—	—	—	—	—	—	240.60	—	292.04	—	—	—	—	—	—	—	—	179.29	—	—	—	—	—
18-Feb-2022	—	—	83.30	86.21	102.32	—	82.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17-Dec-2021	—	—	83.31	86.22	102.45	—	82.94	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Nov-2021	—	—	82.46	87.12	103.32	—	83.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-Nov-2021 [c]	—	—	—	—	—	—	—	—	—	293.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Oct-2021 [c,d]	—	—	—	87.04	103.28	—	—	—	—	—	—	—	—	221.34	—	—	—	—	—	—	—	—	—	—
26-Oct-2021 [c]	—	—	—	—	—	—	83.76	—	—	—	—	478.14	—	—	—	—	—	—	—	—	—	—	—	—
25-Oct-2021 [d]	—	84.31	83.92	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Oct-2021 [c,5]	—	—	—	—	—	294.60	—	241.64	—	—	—	—	—	—	—	—	—	—	—	—	427.10	—	208.15	120.73
18-Oct-2021 [c]	—	—	—	—	—	—	—	—	—	—	377.89	—	—	—	—	—	—	—	—	—	—	—	—	—
15-Oct-2021	—	—	84.17	87.06	103.26	—	83.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Oct-2021 [c]	—	—	—	—	—	—	—	—	198.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12-Oct-2021 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	202.19	—	—	—	—	—	—
11-Oct-2021 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	179.42	—	—	—	—	—
17-Sep-2021	—	—	84.14	87.02	103.22	—	83.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4-Aug-2021 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	220.83	—	—	—	—	—	—	—	—	—	—
2-Aug-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.50
27-Jul-2021 [c]	—	—	—	86.78	—	—	83.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Jul-2021 [c]	—	84.11	83.89	—	103.27	—	—	—	—	—	—	477.87	—	—	—	—	—	—	—	—	—	—	—	—
22-Jul-2021 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	427.03	—	—	—
21-Jul-2021 [c]	—	—	—	—	—	294.36	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.98	—
20-Jul-2021 [c]	—	—	—	—	—	—	—	241.43	—	292.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Jul-2021 [c]	—	—	—	—	—	—	—	—	—	—	377.76	—	—	—	—	—	—	—	—	—	—	—	—	—
16-Jul-2021	—	84.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15-Jul-2021 [c]	—	—	—	—	—	—	—	—	198.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Jul-2021 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	202.02	—	—	—	—	—	—
13-Jul-2021 [d]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	179.19	—	—	—	—	—
20-May-2021	—	84.00	—	—	—	—	83.42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3-May-2021 [c]	—	—	—	—	—	—	—	—	—	—	377.37	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Apr-2021 [c]	—	—	—	—	—	—	—	241.19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Apr-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	426.67	—	—	—
22-Apr-2021	—	83.85	—	86.53	102.72	—	83.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Apr-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	477.59	—	—	—	—	—	—	—	—	—	—	—	—
21-Apr-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.03
20-Apr-2021 [c]	—	—	—	86.30	102.57	293.93	83.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Apr-2021 [c]	—	83.80	83.45	—	—	—	—	—	—	292.34	—	—	—	—	—	—	—	—	—	—	—	—	207.63	—
15-Apr-2021 [c]	—	—	—	—	—	—	—	—	197.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Apr-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	201.77	178.49	—	—	—	—	—
27-Jan-2021	—	83.53	—	86.23	102.46	—	82.87	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Jan-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.95
26-Jan-2021 [c]	—	—	—	—	—	—	82.90	—	—	—	377.24	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Jan-2021 [c]	—	83.66	—	86.26	102.53	293.97	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Jan-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.61	—
20-Jan-2021 [c]	—	—	—	—	—	—	—	—	—	—	—	477.42	—	—	—	—	—	—	—	—	426.41	—	—	—
19-Jan-2021 [c]	—	—	—	—	—	—	—	241.03	197.91	292.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Oct-2020 [c]	—	—	—	—	—	—	—	—	—	—	377.33	—	—	—	—	—	—	—	—	—	—	—	—	—
15-Oct-2020	—	83.69	—	86.39	102.56	—	83.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15-Oct-2020 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.41	—
14-Oct-2020 [c]	—	—	—	—	—	—	—	—	197.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.68
13-Oct-2020 [c]	—	—	—	—	—	—	82.94	—	—	292.35	—	477.36	—	—	—	—	—	—	—	—	—	—	—	—
12-Oct-2020 [c]	—	83.68	—	86.29	102.48	293.86	—	240.97	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
07-Oct-2020 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	426.50	—	—	—
24-Jul-2020	—	83.28	—	85.94	102.13	—	82.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Jul-2020 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.97	—
22-Jul-2020 [c]	—	—	—	—	—	293.39	—	—	—	292.07	—	—	—	—	—	—	—	—	—	—	—	—	—	120.11
21-Jul-2020 [c]	—	—	—	—	—	—	82.54	—	—	—	376.81	476.91	—	—	—	—	—	—	—	—	—	—	—	—
20-Jul-2020 [c]	—	83.36	—	85.96	102.51	—	—	240.58	197.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15-Jul-2020	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	426.12	—	—	—
23-Apr-2020	—	82.93	—	85.68	101.82	—	82.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Apr-2020 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.82	—
22-Apr-2020 [c]	—	—	—	85.56	—	293.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.25
21-Apr-2020 [c]	—	—	—	—	—	—	82.31	—	—	—	376.56	476.70	—	—	—	—	—	—	—	—	—	—	—	—
20-Apr-2020 [c]	—	82.87	—	—	101.78	—	—	240.23	197.42	291.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Apr-2020	—	82.93	—	85.68	101.82	—	82.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-Jan-2020	—	—	—	85.88	102.17	—	82.52	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Jan-2020 [c]	—	—	—	—	—	—	—	—	—	—	—	476.89	—	—	—	—	—	—	—	—	—	—	—	—
23-Jan-2020 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.99	—
22-Jan-2020 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.22
21-Jan-2020 [c]	—	—	—	—	—	293.27	82.24	—	—	—	376.54	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Jan-2020 [c]	—	82.87	—	85.51	101.74	—	—	240.25	197.47	291.55	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13-Nov-2019 [c]	—	—	—	—	—	—	—	—	—	—	—	477.02	—	—	—	—	—	—	—	—	—	—	—	—
30-Oct-2019 [c]	—	—	—	—	—	—	—	—	—	291.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-Oct-2019	—	83.15	—	85.84	102.19	—	82.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Oct-2019 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.99	—
23-Oct-2019 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.34
22-Oct-2019 [c]	—	83.11	—	85.80	—	—	—	—	197.46	—	376.70	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Oct-2019 [c]	—	—	—	—	101.87	293.36	82.32	240.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7-Aug-2019 [c]	—	—	—	—	—	—	—	—	—	291.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-Jul-2019	—	82.67	—	85.34	101.57	—	82.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Jul-2019 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.23	—
24-Jul-2019 [c]	—	—	—	—	—	—	—	—	—	—	—	476.27	—	—	—	—	—	—	—	—	—	—	—	118.97
23-Jul-2019 [c]	—	82.58	—	85.25	—	292.80	—	—	—	—	376.14	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Jul-2019 [c]	—	—	—	—	101.48	—	82.04	239.83	196.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Apr-2019	—	82.45	—	85.18	101.41	—	81.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Apr-2019 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	205.97	118.92
24-Apr-2019 [c]	—	—	—	85.16	102.41	—	—	—	—	—	—	476.19	—	—	—	—	—	—	—	—	—	—	—	—
23-Apr-2019 [c]	—	82.47	—	—	—	—	—	—	—	291.08	375.98	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Apr-2019 [c]	—	—	—	—	—	292.81	81.98	239.91	197.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7-Feb-2019 [c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	205.81	—
24-Jan-2019	—	82.30	—	84.96	101.22	—	81.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Jan-2019 [c]	81.01	—	—	—	—	—	—	—	—	—	—	476.15	—	—	—	—	—	—	—	—	—	—	—	—
23-Jan-2019 [c]	82.64	—	—	—	—	—	—	—	196.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	118.85
22-Jan-2019 [c]	—	82.39	—	—	101.19	—	—	—	—	—	375.99	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Jan-2019 [c]	—	—	—	85.00	—	292.48	81.80	239.57	—	290.98	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table A.4: Depth to Groundwater (ft btoc) in Red Hill Groundwater Monitoring Wells
Red Hill Bulk Fuel Storage Facility, JBPHH, O‘ahu, Hawai‘i (cont'd)

Sample Date [a,b]	RHMW2254-01	RHMW01	RHMW01R	RHMW02	RHMW03	RHMW04	RHMW05	RHMW06	RHMW07	RHMW08	RHMW09	RHMW10	RHMW11-05	RHMW12A	RHMW13-05	RHMW14-03	RHMW15-05	RHMW16	RHMW16A	RHMW17	RHMW19	RHMW20	HDMW2253-03	OWDFMW01
13-Dec-2018 [c]	81.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12-Dec-2018 [c]	82.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Nov-2018 [c]	81.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13-Nov-2018 [c]	82.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-Oct-2018 [c]	—	—	—	—	—	—	—	—	—	—	—	476.54	—	—	—	—	—	—	—	—	—	—	—	—
30-Oct-2018	—	82.64	—	85.34	101.58	—	81.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Oct-2018 [c]	—	82.76	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Oct-2018 [c]	—	—	—	—	—	293.09	—	—	—	291.59	—	—	—	—	—	—	—	—	—	—	—	—	—	119.28
23-Oct-2018 [c]	—	—	—	85.53	101.71	—	—	240.16	197.58	—	376.39	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Oct-2018 [c]	81.73	—	—	—	—	—	82.14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.65	—
21-Aug-2018	—	—	—	86.32	102.58	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Jul-2018 [c]	—	—	—	—	—	293.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.74
25-Jul-2018	—	83.55	—	86.33	102.58	—	82.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Jul-2018 [c]	—	—	—	—	102.48	—	—	—	—	—	377.21	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Jul-2018 [c]	—	83.65	—	86.19	—	—	—	—	197.97	292.35	—	476.89	—	—	—	—	—	—	—	—	—	—	—	—
23-Jul-2018 [c]	82.26	—	—	—	—	—	82.92	240.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.36	—
Jun-2018	—	83.63	—	86.34	102.57	—	82.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-May-2018	—	83.61	—	86.29	102.56	—	82.97	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Apr-2018	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.80
25-Apr-2018	—	83.47	—	86.14	102.38	—	82.86	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Apr-2018	—	83.43	—	—	102.33	293.63	—	—	—	—	377.28	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Apr-2018	—	—	—	86.19	—	—	—	—	197.50	—	—	477.30	—	—	—	—	—	—	—	—	—	—	—	—
23-Apr-2018	82.08	—	—	—	—	—	82.73	240.65	—	292.04	—	—	—	—	—	—	—	—	—	—	—	—	207.33	—
20-Mar-2018	—	83.56	—	86.24	102.55	—	82.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Mar-2018	82.40	—	—	—	—	293.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.62
13-Mar-2018	—	—	—	86.24	—	—	82.92	—	198.30	—	377.40	477.40	—	—	—	—	—	—	—	—	—	—	—	—
12-Mar-2018	—	83.44	—	—	102.40	—	—	240.81	—	292.25	—	—	—	—	—	—	—	—	—	—	—	—	207.43	—
21-Nov-2017	—	83.66	—	—	102.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15-Nov-2017	—	—	—	86.28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Nov-2017	—	—	—	—	—	—	—	240.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-Oct-2017	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.59	—
26-Oct-2017	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.81
25-Oct-2017	—	83.79	—	—	—	—	—	—	198.06	—	—	477.79	—	—	—	—	—	—	—	—	—	—	—	—
24-Oct-2017	81.36	—	—	—	—	294.07	83.21	—	—	—	377.73	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Oct-2017	—	—	—	86.38	102.76	—	—	241.18	—	292.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Jul-2017	—	83.43	—	86.50	—	—	82.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-Jul-2017	—	—	—	85.88	102.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
05-Jul-2017	82.14	82.11	—	—	—	293.38	82.49	—	—	—	377.23	—	—	—	—	—	—	—	—	—	—	—	—	119.39
04-Jul-2017	—	—	—	—	—	—	—	240.55	197.78	292.14	—	477.26	—	—	—	—	—	—	—	—	—	—	—	—
22-Jun-2017	—	82.94	—	85.59	101.89	—	82.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
06-Jun-2017	82.66	—	—	—	101.76	—	82.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
05-Jun-2017	—	82.80	—	85.42	—	—	—	—	—	291.68	—	477.20	—	—	—	—	—	—	—	—	—	—	—	—
26-May-2017	—	82.45	—	85.13	101.39	—	81.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
04-May-2017	—	—	—	—	—	—	—	—	—	—	—	476.45	—	—	—	—	—	—	—	—	—	—	—	—
02-May-2017	80.12	—	—	—	—	—	—	—	—	291.42	—	—	—	—	—	—	—	—	—	—	—	—	—	—
01-May-2017	—	82.50	—	85.09	101.34	—	81.82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Apr-2017	—	82.59	—	85.25	101.50	—	81.94	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
04-Apr-2017	—	—	—	85.27	101.55	—	—	—	—	291.38	376.70	—	—	—	—	—	—	—	—	—	—	—	—	118.87
03-Apr-2017	80.23	82.43	—	—	—	292.78	81.81	239.86	197.07	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Mar-2017	—	82.49	—	85.19	101.45	—	81.84	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
08-Mar-2017	—	82.28	—	—	—	—	81.61	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.13	188.61
07-Mar-2017	—	—	—	84.99	101.30	—	—	239.63	197.08	—	376.30	—	—	—	—	—	—	—	—	—	—	—	—	—
06-Mar-2017	80.06	—	—	—	—	292.62	—	—	—	291.19	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Feb-2017	—	82.37	—	85.01	101.31	—	81.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
09-Feb-2017	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.03
08-Feb-2017	—	82.69	—	—	101.55	—	—	—	197.25	—	376.67	—	—	—	—	—	—	—	—	—	—	—	—	—
07-Feb-2017	—	—	—	85.24	—	—	81.91	239.90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.32	—
06-Feb-2017	80.29	—	—	—	—	292.85	—	—	—	291.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31-Jan-2017	—	82.45	—	85.13	101.46	—	82.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12-Jan-2017	—	—	—	—	101.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	118.93
11-Jan-2017	—	82.70	—	—	—	—	—	—	—	291.26	376.10	—	—	—	—	—	—	—	—	—	—	—	—	—
10-Jan-2017	—	—	—	85.29	—	—	82.10	—	197.02	—	—	—	—	—	—	—	—	—	—	—	—	—	206.12	—
09-Jan-2017	80.39	—	—	—	—	292.48	—	239.76	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Dec-2016	—	—	—	—	—	—	—	—	—	291.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Dec-2016	—	82.67	—	85.36	101.61	—	82.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Dec-2016	—	—	—	—	101.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.09
13-Dec-2016	—	82.88	—	85.51	—	292.61	—	—	197.13	—	—	—	—	—	—	—	—	—	—	—	—	—	206.33	—
12-Dec-2016	80.49	—	—	—	—	—	82.12	240.04	—	291.42	376.28	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Nov-2016	80.45	82.85	—	85.55	101.78	293.11	82.19	240.17	197.45	291.63	376.74	—	—	—	—	—	—	—	—	—	—	—	—	119.07
17-Nov-2016	—	82.92	—	85.56	101.82	—	82.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16-Nov-2016	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.83	—
15-Nov-2016	—	—	—	85.35	101.87	—	82.25	—	—	291.81	377.05	—	—	—	—	—	—	—	—	—	—	—	—	119.29
14-Nov-2016	80.52	82.87	—	—	—	293.22	—	240.31	197.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Oct-2016	—	—	—	—	—	293.33	—	—	—	—	377.09	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Oct-2016	80.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	119.39
19-Oct-2016	—	83.01	—	85.69	101.95	—	82.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Oct-2016	—	—	—	85.69	102.02	—	82.37	240.47	197.68	291.94	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Oct-2016	80.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.02	—
17-Oct-2016	—	83.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Sep-2016	—	83.13	—	85.74	102.06	—	82.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Aug-2016	—	83.27	—	85.96	102.20	—	82.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Jul-2016	80.96	83.32	—	85.99	102.31	—	82.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Jul-2016	—	—	—	—	—	293.60	—	240.70	197.79	—	—	—	—	—	—	—	—	—	—	—	—	—	207.42	119.65
21-Jun-2016	—	83.16	—	85.77	102.03	—	82.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-May-2016	—	83.14	—	85.81	102.03	—	82.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Apr-2016	80.57	82.97	—	85.63	101.91	—	82.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Apr-2016	—	—	—	—	—	293.21	—	240.35	197.76	—	—	—	—	—	—	—	—	—	—	—	—	—	206.97	119.28
15-Mar-2016	—	82.89	—	85.60	101.82	—	82.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17-Feb-2016	—	83.17	—	85.81	102.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Jan-2016	81.00	83.31	—	85.97	102.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Jan-2016	—	—	—	—	—	293.61	—	240.69	198.24	—	—	—	—	—	—	—	—	—	—	—	—	—	207.42	119.82
17-Dec-2015	—	83.76	—	86.36	102.56	—	83.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18-Nov-2015	—	84.25	—	86.93	103.24	—	84.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Oct-2015	82.34	84.00	—	86.38	103.38	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Oct-2015	—	—	—	—	—	294.61	—	241.69	198.88	—	—	—	—	—	—	—	—	—	—	—	—	—	208.40	120.88
23-Sep-2015	—	84.26	—	86.91	103.21	—	83.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Aug-2015	—	84.44	—	87.13	103.41	—	83.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Aug-2015	—	—	—	—	—	295.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Jul-2015	—	—	—	—	—	—	—	241.98	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Jul-2015	—	—	—	—	—	—	—	—	198.61	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Jul-2015	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	208.69	120.99
21-Jul-2015	82.24	—	—	—	—	—	83.76	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Jul-2015	—	84.58	—	87.24	103.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Jun-2015	—	84.58	—	87.28	103.57	—	83.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-May-2015	—	84.29	—	86.97	103.24	—	83.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Apr-2015	—	—	—	—	—	—	—	—	198.40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Apr-2015	—	—	—	—	—	294.43	—	241.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.68
21-Apr-2015	82.99	—	—	—	—	—	83.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Apr-2015	—	84.33	—	86.97	103.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Mar-2015	—	83.83	—	86.04	102.79	—	83.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Feb-2015	—	83.68	—	86.28	102.52	—	83.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-Jan-2015	—	—	—	—	—	293.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	206.67	—
28-Jan-2015	—	—	—	86.35	102.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Jan-2015	81.37	83.63	—	—	—	—	83.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Jan-2015	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.54
23-Dec-2014	—	83.67	—	86.37	102.64	—	83.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Nov-2014	—	83.87	—	86.56	102.78	—	83.35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Oct-2014	83.44	—	—	—	—	—	83.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Oct-2014	—	83.79	—	86.51	102.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Oct-2014	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.99	120.49
25-Sep-2014	—	84.64	—	87.27	103.51	—	84.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Aug-2014	—	84.01	—	86.65	102.87	—	83.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Jul-2014	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.57
23-Jul-2014	—	—	—	—	—	294.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	208.08	—
22-Jul-2014	82.19	—	—	—	102.98	—	83.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Jul-2014	—	84.13	—	86.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Jun-2014	—	84.06	—	86.72	103.99	—	83.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10-Jun-2014	—	83.93	—	86.55	—	—	83.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-May-2014	—	83.91	—	86.60	102.85	—	83.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-May-2014	—	83.81	—	86.47	—	—	83.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
08-May-2014	—	84.03	—	86.68	—	—	83.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Apr-2014	—	83.93	—	86.58	102.80	—	83.27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
07-Apr-2014	—	83.42	—	86.43	—	—	83.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Mar-2014	—	83.76	—	86.42	102.65	—	83.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Feb-2014	—	83.54	—	86.24	102.47	—	82.97	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10-Feb-2014	—	84.49	—	86.16	102.47	—	82.83	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
04-Feb-2014	81.08	83.54	—	86.20	—	—	82.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.72	—
03-Feb-2014	81.08	83.54	—	86.20	—	—	82.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.72	—
31-Jan-2014	81.03	83.53	—	86.19	—	—	82.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.73	—
30-Jan-2014	81.09	83.53	—	86.21	—	—	82.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.67	—
29-Jan-2014	80.35	83.56	—	86.22	—	—	82.94	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.75	—
28-Jan-2014	80.40	83.56	—	86.25	102.52	—	82.94	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.76	—
27-Jan-2014	80.33	83.55	—	86.23	—	—	82.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.8	—
24-Jan-2014	80.38	83.57	—	86.23	—	—	82.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.75	—
23-Jan-2014	80.40	83.58	—	86.24	—	—	82.94	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.8	—
22-Jan-2014	80.40	83.53	—	86.20	—	—	82.87	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.66	—
16-Jan-2014	80.60	—	—	—	—	—	83.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15-Jan-2014	—	83.94	—	86.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Dec-2013	—	84.09	—	86.72	103.00	—	83.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Nov-2013	—	84.26	—	86.91	103.16	—	83.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Oct-2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.74
22-Oct-2013	—	84.47	—	87.08	103.31	—	83.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21-Oct-2013	—	84.47	—	87.08	103.31	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Sep-2013	—	84.57	—	87.20	103.43	—	84.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29-Aug-2013	—	84.66	—	86.28	103.50	—	84.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Jul-2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	120.72
23-Jul-2013	82.56	—	—	—	—	—	83.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Jul-2013	—	84.29	—	86.96	103.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13-Jul-2013	—	84.29	—	86.96	103.23	—	83.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27-Jun-2013	—	84.22	—	86.86	103.12	—	83.66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30-May-2013	—	84.03	—	86.69	102.95	—	83.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25-Apr-2013	—	83.84	—	86.50	102.78	—	83.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Apr-2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	208.03	120.15
23-Apr-2013	82.61	—	—	—	—	—	83.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Apr-2013	—	83.84	—	86.50	102.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Mar-2013	—	83.82	—	86.48	102.75	—	83.19	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Feb-2013	—	84.04	—	86.62	102.87	—	83.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
04-Feb-2013	—	84.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
01-Feb-2013	—	—	—	86.62	102.87	—	83.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30-Jan-2013	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	208.15	120.55
29-Jan-2013	82.78	—	—	—	—	—	83.61	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Jan-2013	—	—	—	86.75	102.98	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13-Jan-2013	—	84.05	—	86.87	103.14	—	83.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12-Dec-2012	—	84.21	—	86.87	103.14	—	83.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
07-Nov-2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	208.20	—
12-Nov-2012	—	84.23	—	86.85	103.10	—	83.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23-Oct-2012	83.05	—	—	—	—	—	83.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Oct-2012	—	84.19	—	86.81	103.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct-2012	—	84.19	—	86.81	103.50	—	83.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aug-2012	—	84.19	—	86.81	103.30	—	83.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table A.4: Depth to Groundwater (ft btoc) in Red Hill Groundwater Monitoring Wells
Red Hill Bulk Fuel Storage Facility, JBPHH, O‘ahu, Hawai‘i (cont'd)

Sample Date [a,b]	RHMW2254-01	RHMW01	RHMW01R	RHMW02	RHMW03	RHMW04	RHMW05	RHMW06	RHMW07	RHMW08	RHMW09	RHMW10	RHMW11-05	RHMW12A	RHMW13-05	RHMW14-03	RHMW15-05	RHMW16	RHMW16A	RHMW17	RHMW19	RHMW20	HDMW2253-03	OWDFMW01
20-Jul-2012	—	84.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Jul-2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.87	120.15
18-Jul-2012	—	—	—	86.70	103.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17-Jul-2012	—	—	—	—	—	—	83.50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jul-2012	—	84.20	—	86.64	102.89	—	83.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jun-2012	—	84.34	—	86.95	103.17	—	83.97	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May-2012	—	84.09	—	86.71	102.98	—	83.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Apr-2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.76	120.29
17-Apr-2012	—	83.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16-Apr-2012	—	—	—	86.34	102.71	—	83.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mar-2012	—	83.41	—	86.51	102.45	—	82.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
14-Feb-2012	—	83.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
01-Feb-2012	—	—	—	—	—	—	83.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Feb-2012	—	83.80	—	86.41	102.71	—	83.20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Jan-2012	—	—	—	86.31	102.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Jan-2012	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.60	120.02
Jan-2012	—	83.57	—	86.18	102.56	—	82.90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dec-2011	—	83.49	—	86.10	102.36	—	82.85	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
02-Nov-2011	—	83.71	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nov-2011	—	83.60	—	86.25	102.47	—	83.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26-Oct-2011	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	207.73	120.12
25-Oct-2011	—	—	—	—	—	—	83.15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24-Oct-2011	—	—	—	86.38	102.90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct-2011	—	83.71	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sep-2011	—	83.81	—	86.44	102.69	—	83.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aug-2011	—	83.81	—	86.42	102.66	—	83.21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20-Jul-2011	—	83.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19-Jul-2011	—	—	—	86.28	102.49	—	83.08	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jul-2011	—	83.57	—	86.22	102.44	—	82.99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jun-2011	—	83.41	—	86.11	102.33	—	82.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May-2011	—	83.39	—	86.05	102.69	—	82.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apr-2011	—	83.54	—	86.18	102.39	—	82.90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mar-2011	—	83.77	—	86.39	102.87	—	83.20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Feb-2011	—	83.82	—	86.48	103.02	—	83.20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jan-2011	—	85.32	—	86.91	103.41	—	83.65	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dec-2010	—	84.87	—	87.55	103.98	—	84.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nov-2010	—	85.20	—	87.84	104.30	—	84.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct-2010	—	85.29	—	87.91	104.13	—	84.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sep-2010	—	85.30	—	87.92	104.13	—	84.71	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jul-2010	—	85.03	—	87.66	103.89	—	84.48	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jun-2010	—	84.87	—	87.51	103.74	—	84.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May-2010	—	84.80	—	87.43	103.66	—	84.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apr-2010	—	84.75	—	87.37	103.60	—	84.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mar-2010	—	84.53	—	87.15	103.38	—	83.96	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Feb-2010	—	84.24	—	86.89	103.14	—	83.60	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jan-2010	—	84.36	—	87.00	103.22	—	83.75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dec-2009	—	84.12	—	86.75	103.00	—	83.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nov-2009	—	83.91	—	86.56	102.81	—	83.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct-2009	—	84.24	—	86.87	103.07	—	83.62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sep-2009	—	84.21	—	86.84	103.07	—	83.61	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Aug-2009	—	84.04	—	86.71	102.84	—	83.51	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jul-2009	—	83.75	—	86.42	102.67	—	83.09	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
May-2009	—	83.50	—	86.15	102.41	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apr-2009 [b]	—	83.72	—	86.37	102.59	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mar-2009	—	83.82	—	86.44	102.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Feb-2009	—	—	—	86.35	102.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jan-2009	—	83.13	—	85.79	102.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nov-2008	—	83.91	—	86.56	102.80	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oct-2008	—	83.80	—	86.45	102.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jul-2008	—	83.37	—	86.10	102.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jan-2008	—	84.67	—	86.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sep-2007	—	—	—	86.80	103.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28-Jun-2005	87.00	83.56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17-Feb-2005	86.48	82.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Notes:

—	no data
btoc	below top of casing
ft	foot or feet
LTM	long-term monitoring
PVC	polyvinyl chloride

[a] Dates in month year format (e.g., Sep 2007) were obtained from oil/water interface reports, and exact dates were not available.

[b] The April 2009 measurements were pushed back a week (to 5/6/2009) due to the RHMW05 installation.

[c] The measurements have been corrected based on water level tape calibration and gyroscopic survey. See associated groundwater monitoring report.

[d] The measurements have been corrected only based on water level tape calibration. Gyroscopic surveys not yet available.

[e] The measurements have been corrected only based on gyroscopic survey. Water level tape calibrations are not yet available for tapes

[f] The measurements have not been corrected with water level tape calibration or gyroscopic survey.

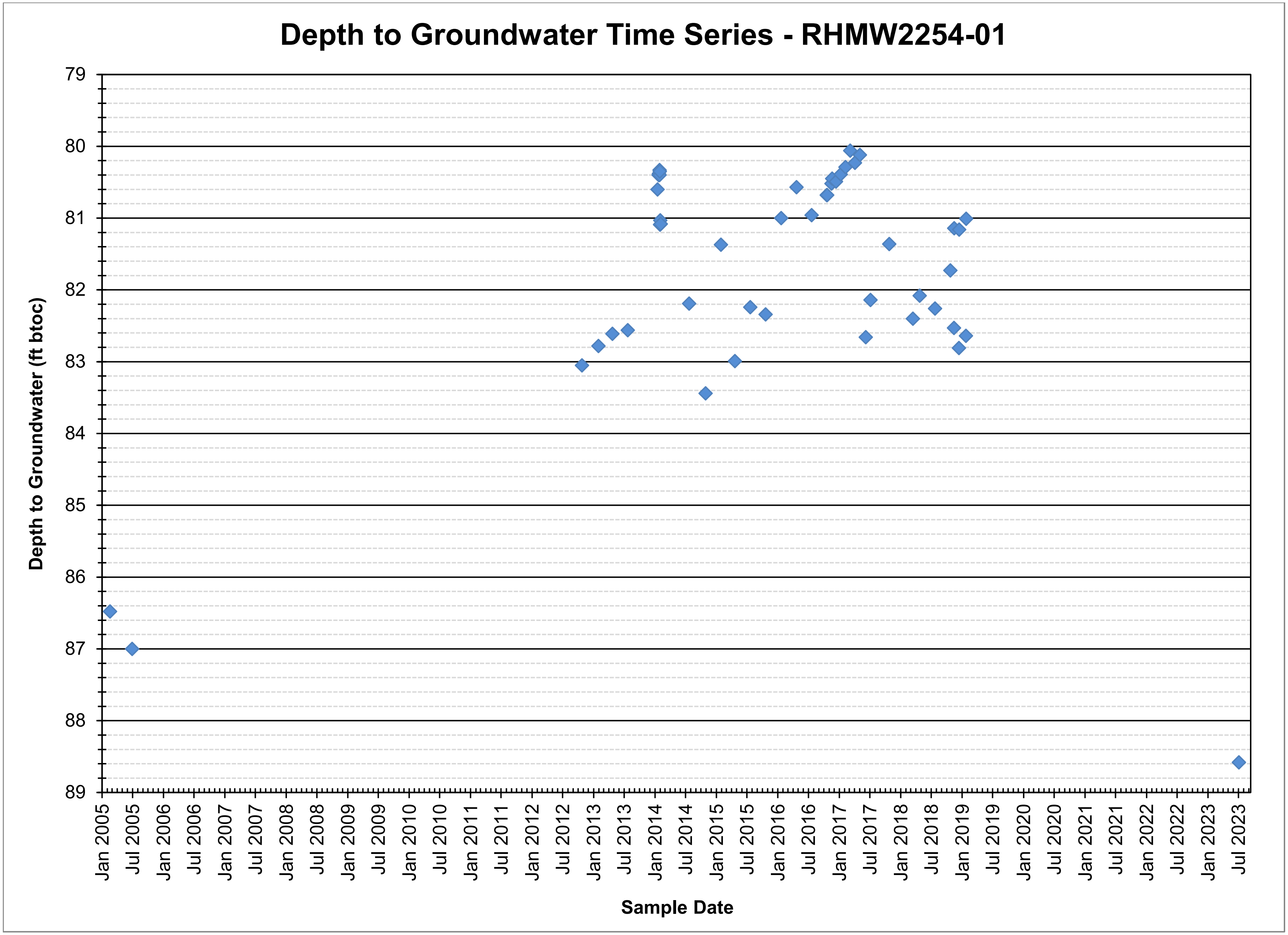
[g] Horizontal correction factors made available for 2023 Q2 LTM report for well locations RHMW01R, RHMW07, RHMW12A, RHMW16, RHMW17, and RHMW19

Source:

Depth to groundwater values from recent oil/water interface reports and from the Appendix A Groundwater Tables GW-9, GW-10, GW-14, GW-15, and GW-17 through GW-24 in:

Department of the Navy. 2007. *Existing Data Summary and Evaluation Report for Groundwater Flow and Contaminant Fate and Transport Modeling, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i; March 5, 2017 [Revision 00].* Prepared by AECOM Technical Services, Inc., Honolulu, HI. Prepared for Defense Logistics Agency Energy, Fort Belvoir, VA, under Naval Facilities Engineering Command, Hawaii, JBPHH HI.

Reference points for these depth to water measurements may have varied over time:
- Reference points for data prior to October 2016 are unknown.
- Reference points for RHMW01, RHMW01R, RHMW02, RHMW03, RHMW04, RHMW05, OWDFMW01, and HDMW2253-03 are the tops of permanent casings.
- Reference point for RHMW2254-01 was the top of the PVC casing for data prior to March 2018, and the high precision survey mark for data from March 2018 onwards.
- Reference points for RHMW06 to RHMW10 from October 2016 to July 2017 groundwater LTM events were the tops of the stand tubes (RHMW06 and RHMW07) and the tops of the slip rings (RHMW08, RHMW09, and RHMW10).
- Reference points for RHMW06 to RHMW19 from October 2017 groundwater LTM event onwards are the high precision survey mark on the tops of the gray plates.



Depth to Groundwater Time Series - RHMW2254-01
Depth to Groundwater (ft btoc)
79
80
81
82
83
84
85
86
87
88
89
Jan 2005
Jul 2005
Jan 2006
Jul 2006
Jan 2007
Jul 2007
Jan 2008
Jul 2008
Jan 2009
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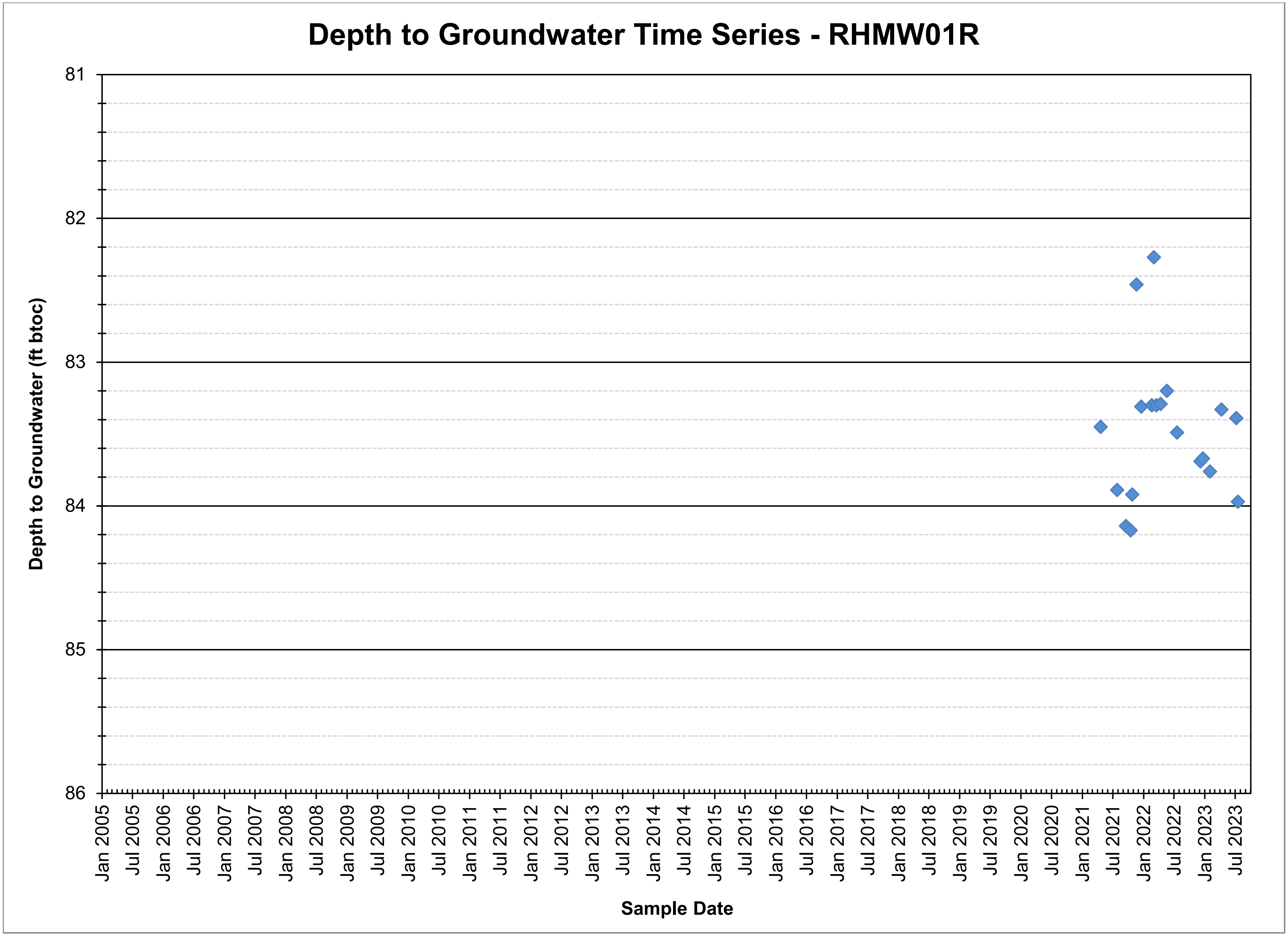
Sample Date


Depth to Groundwater Time Series - RHMW01R
Depth to Groundwater (ft btoc)
81
82
83
84
85
86
Jan 2005
Jul 2005
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Jan 2007
Jul 2007
Jan 2008
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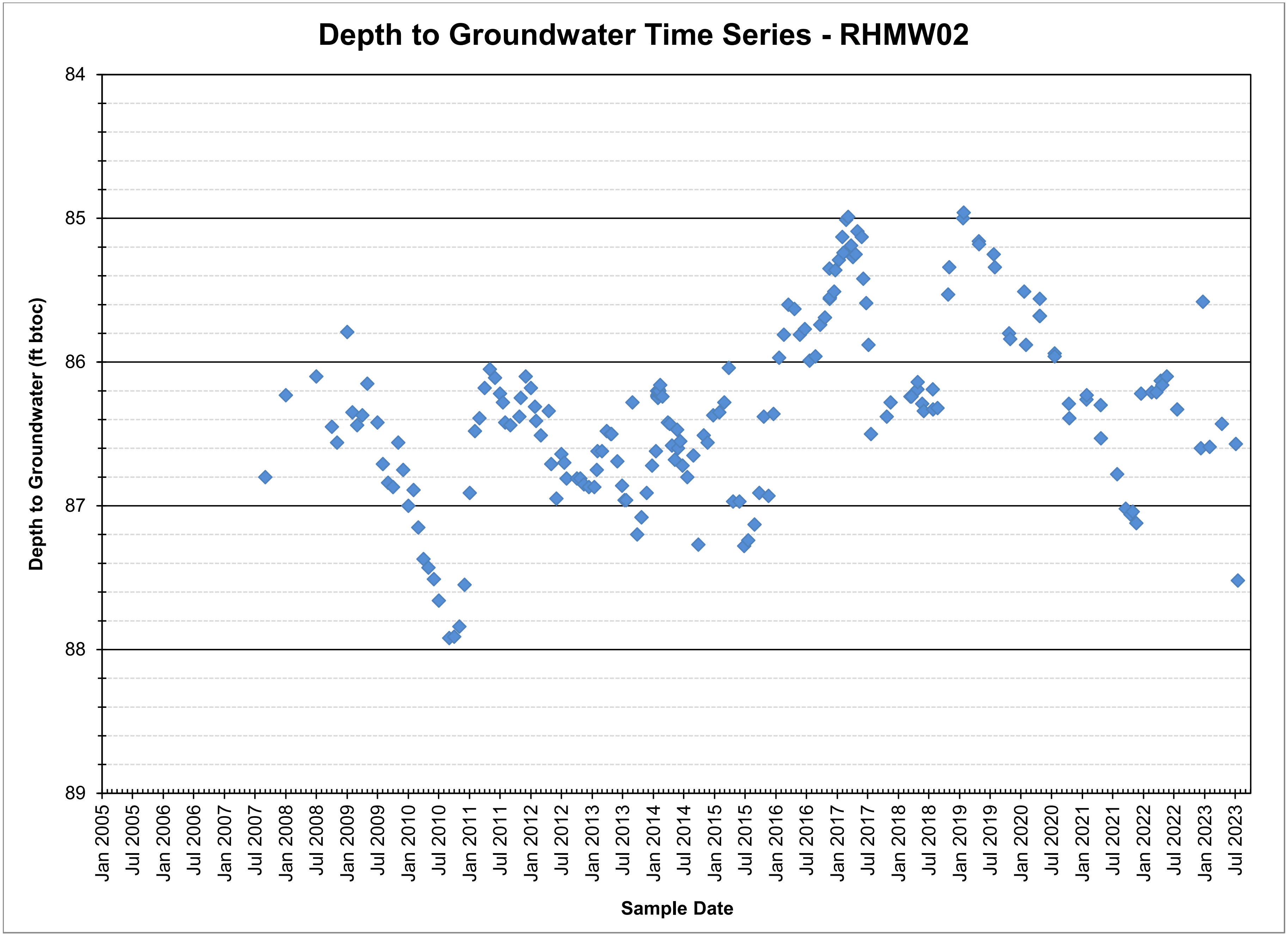
Sample Date



Depth to Groundwater Time Series - RHMW02
Depth to Groundwater (ft btoc)
84
85
86
87
88
89
Jan 2005
Jul 2005
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
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Jul 2010
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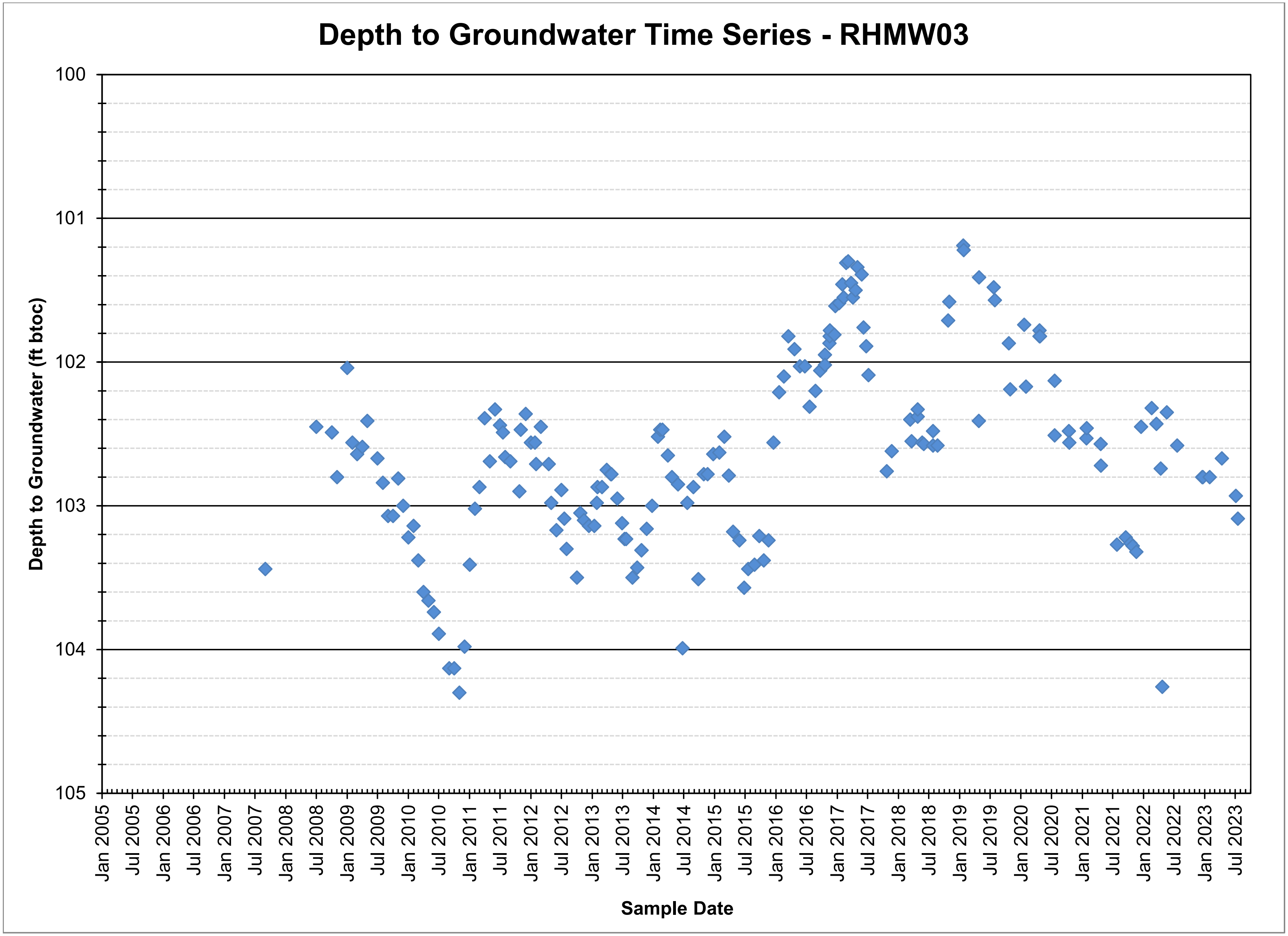
Sample Date



Depth to Groundwater Time Series - RHMW03
Depth to Groundwater (ft btoc)
100
101
102
103
104
105
Jan 2005
Jul 2005
Jan 2006
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
Jan 2009
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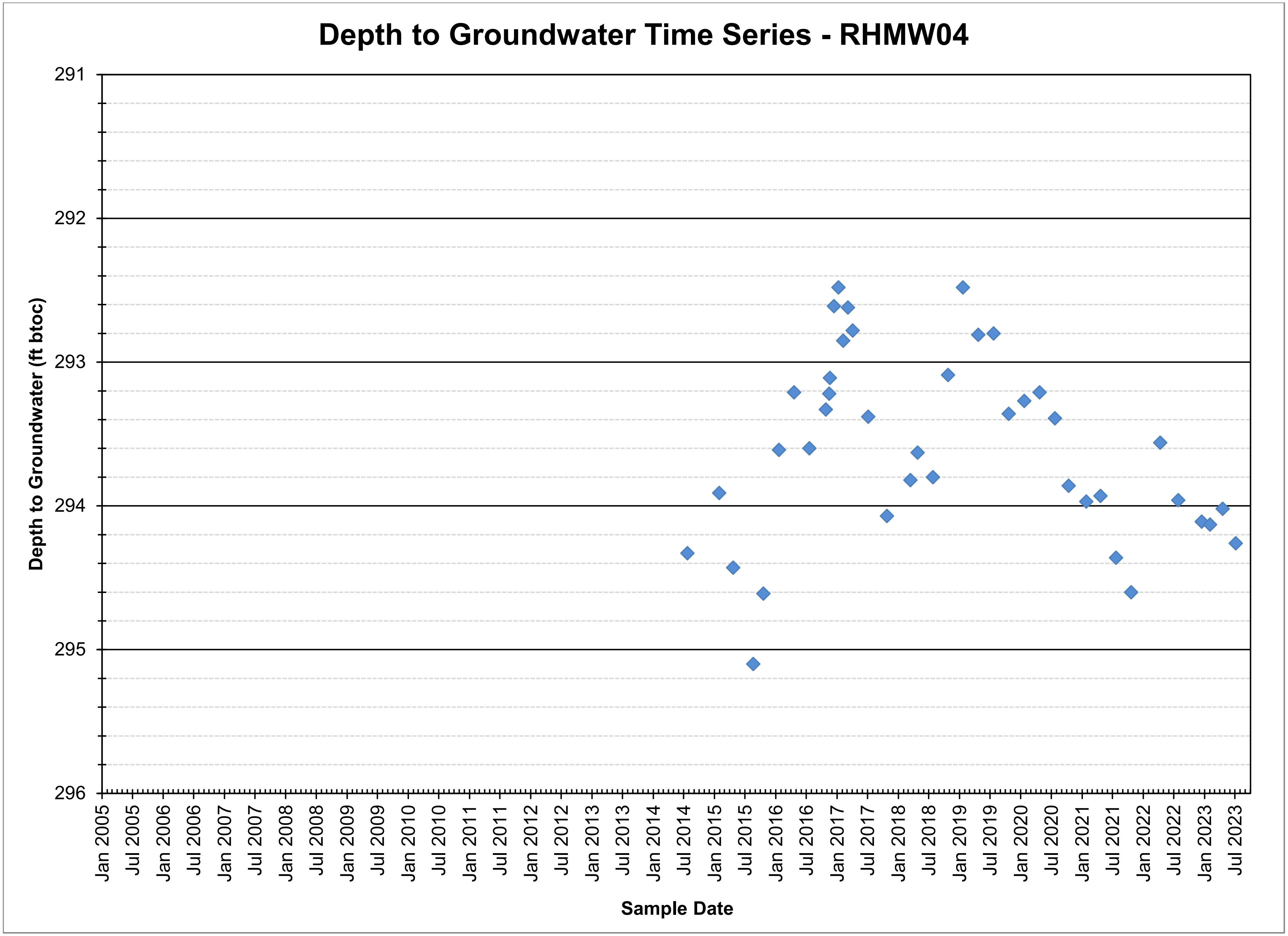
Sample Date


Depth to Groundwater Time Series - RHMW04
Depth to Groundwater (ft btoc)
291
292
293
294
295
296
Jan 2005
Jul 2005
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
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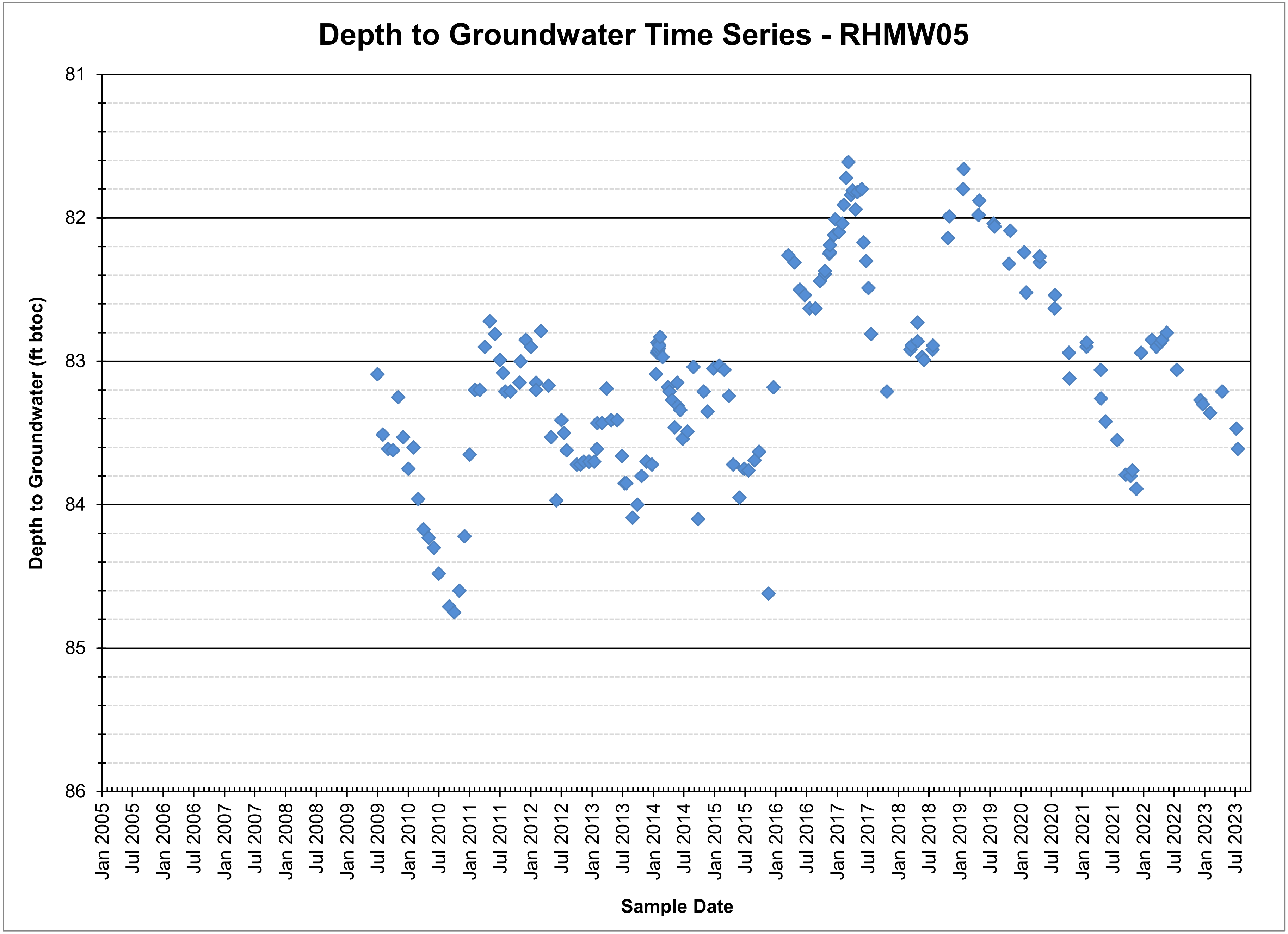
Depth to Groundwater Time Series - RHMW05
Depth to Groundwater (ft btoc)
81
82
83
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Jan 2005
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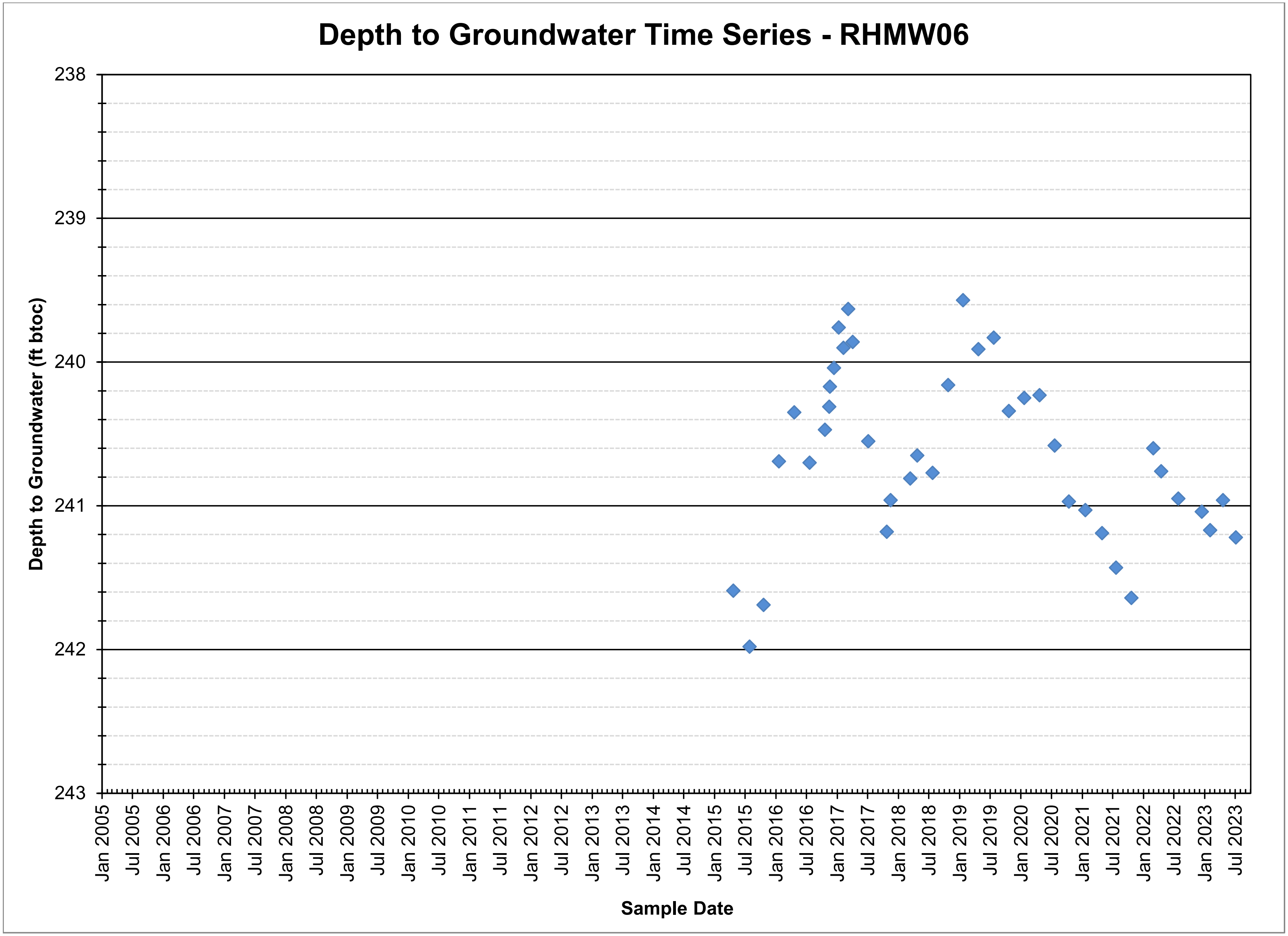
Depth to Groundwater Time Series - RHMW06
Depth to Groundwater (ft btoc)
238
239
240
241
242
243
Jan 2005
Jul 2005
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
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Jan 2010
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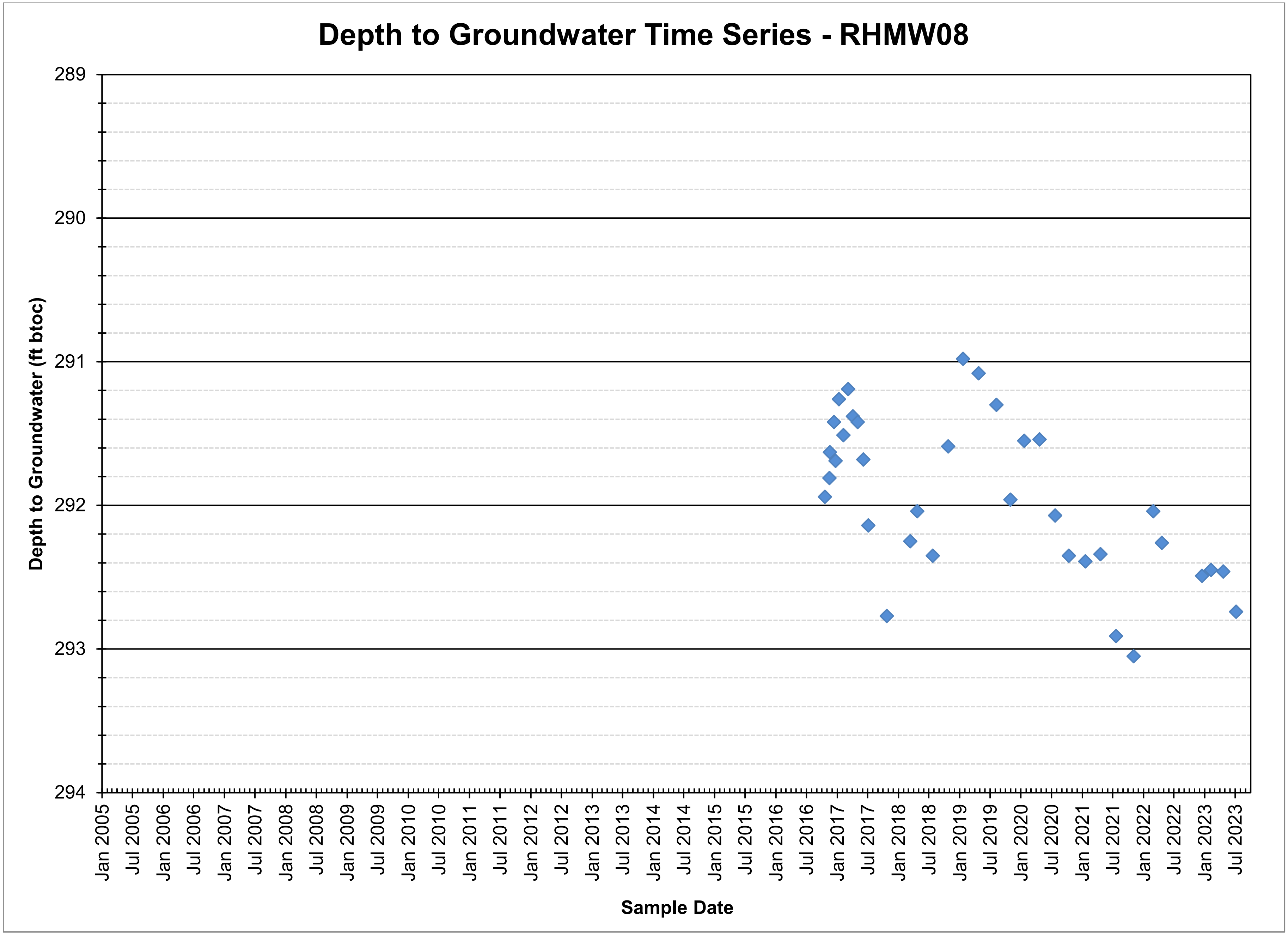
Depth to Groundwater Time Series - RHMW08
Depth to Groundwater (ft btoc)
289
290
291
292
293
294
Jan 2005
Jul 2005
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Jul 2007
Jan 2008
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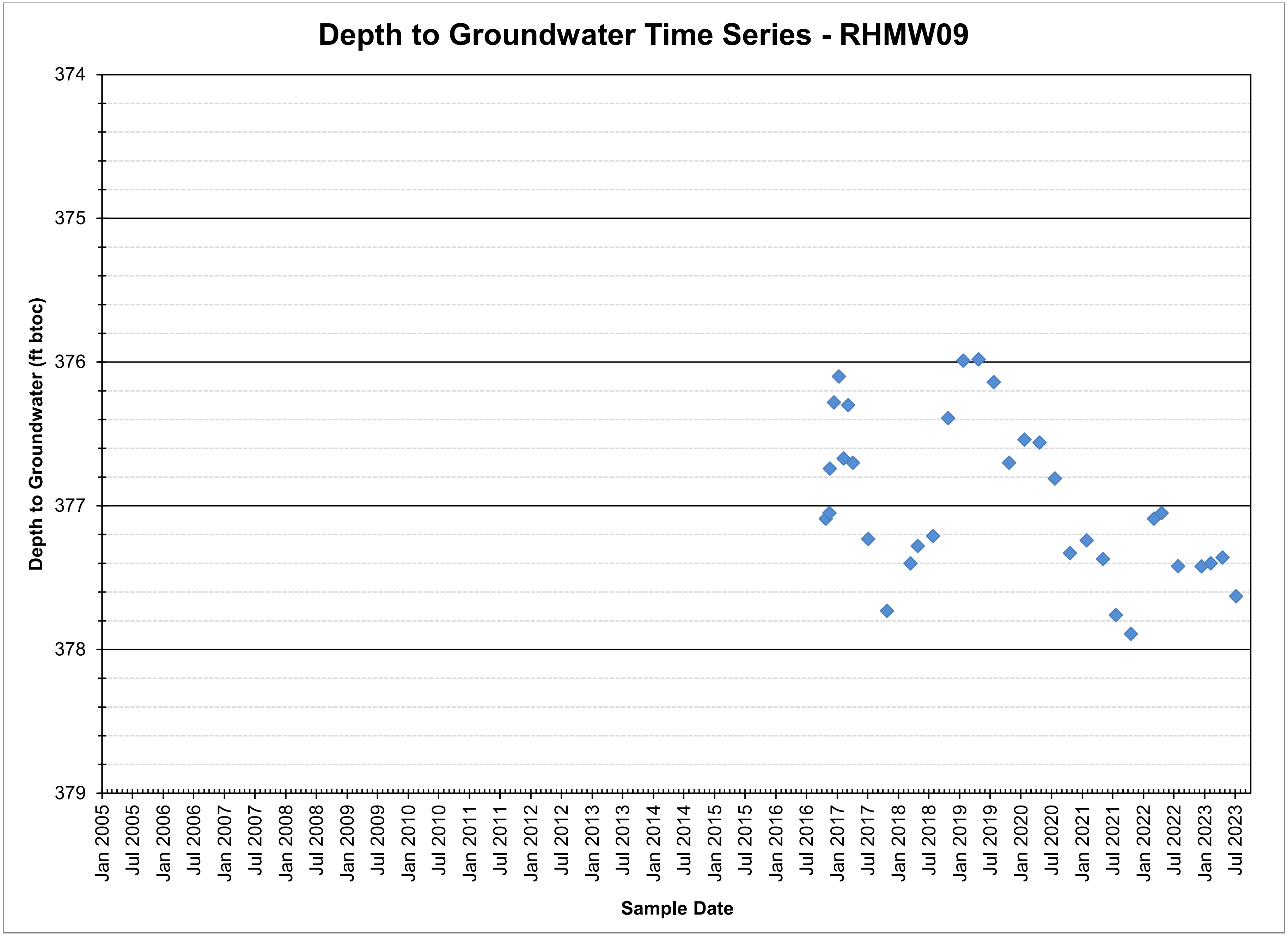

Depth to Groundwater Time Series - RHMW09
Depth to Groundwater (ft btoc)
374
375
376
377
378
379
Jan 2005
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Jan 2007
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Jan 2008
Jul 2008
Jan 2009
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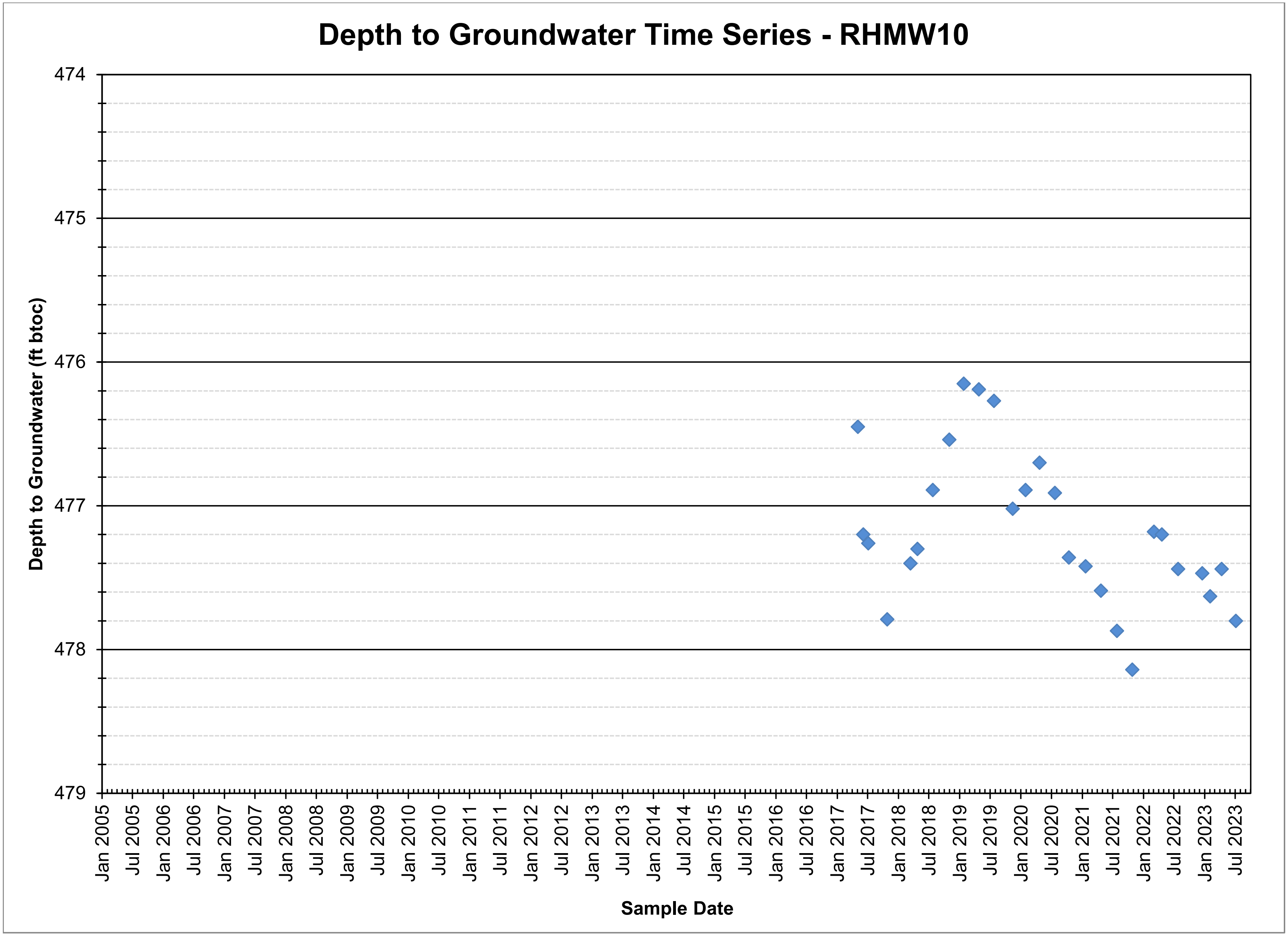
Sample Date



Depth to Groundwater Time Series - RHMW10
Depth to Groundwater (ft btoc)
474
475
476
477
478
479
Jan 2005
Jul 2005
Jan 2006
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
Jan 2009
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Jan 2010
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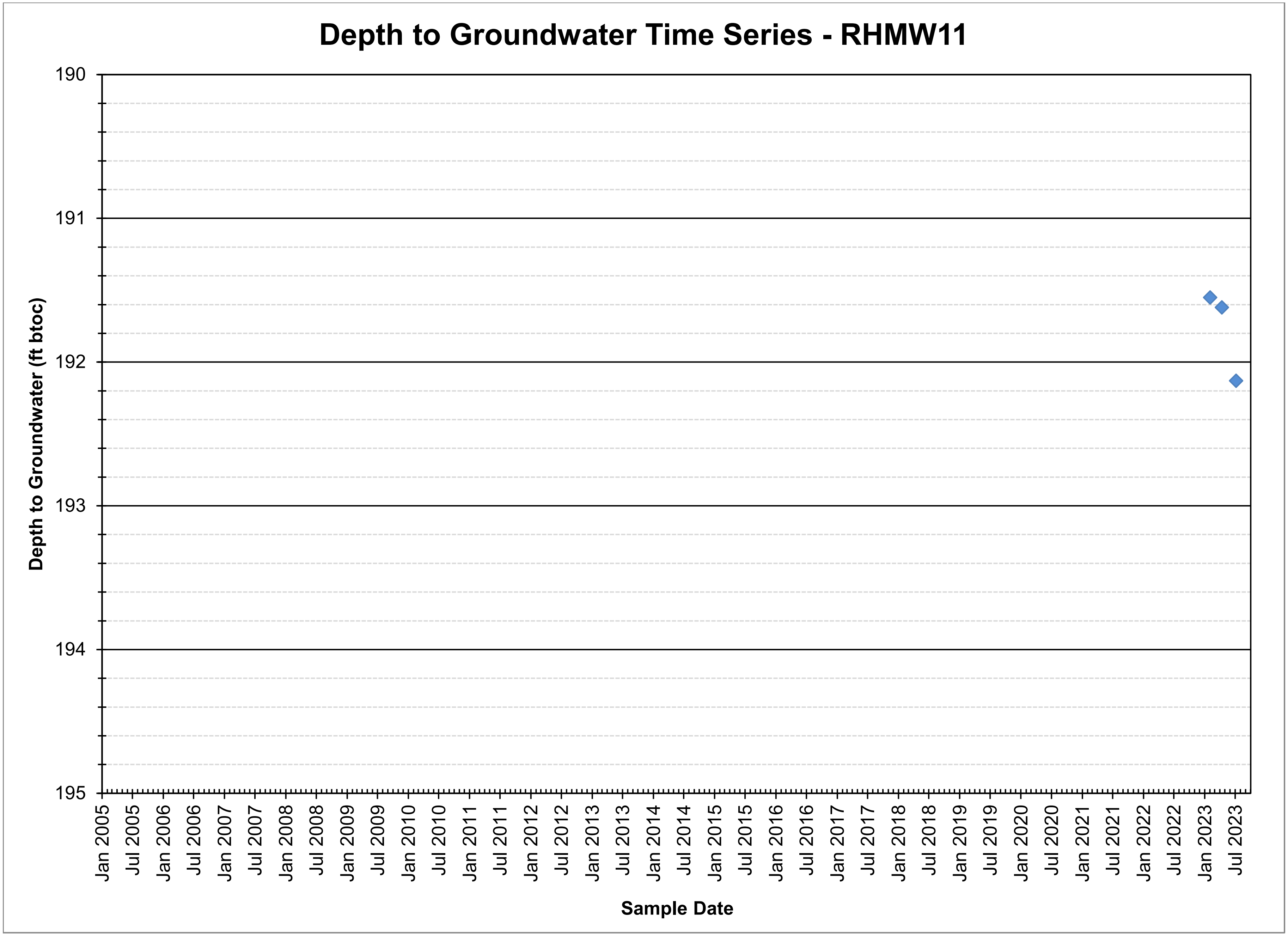

Depth to Groundwater Time Series - RHMW11
Depth to Groundwater (ft btoc)
190
191
192
193
194
195
Jan 2005
Jul 2005
Jan 2006
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
Jan 2009
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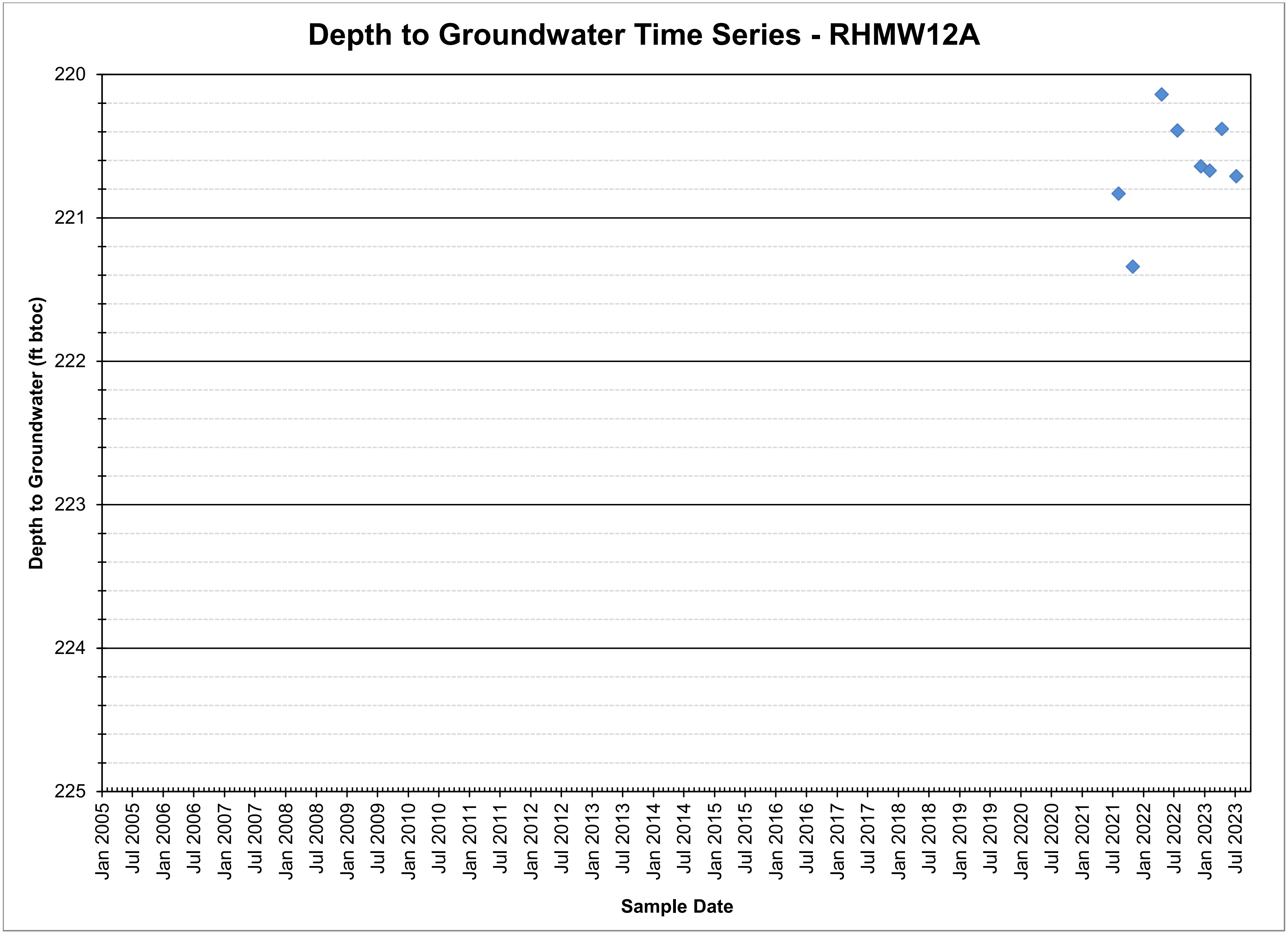

Depth to Groundwater Time Series - RHMW12A
Depth to Groundwater (ft btoc)
220
221
222
223
224
225
Jan 2005
Jul 2005
Jan 2006
Jul 2006
Jan 2007
Jul 2007
Jan 2008
Jul 2008
Jan 2009
Jul 2009
Jan 2010
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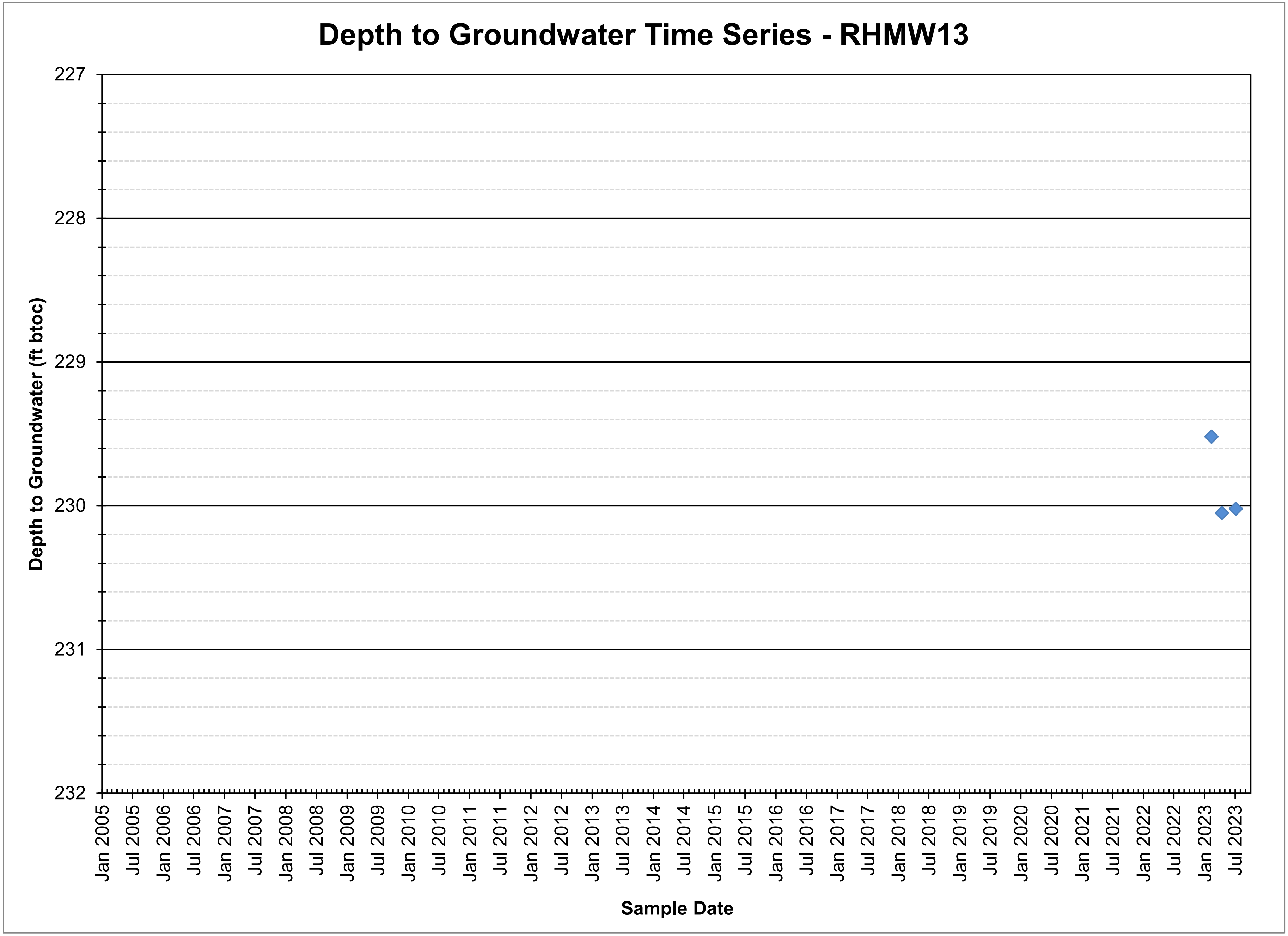
Depth to Groundwater Time Series - RHMW13
Depth to Groundwater (ft btoc)
227
228
229
230
231
232
Jan 2005
Jul 2005
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
Jan 2009
Jul 2009
Jan 2010
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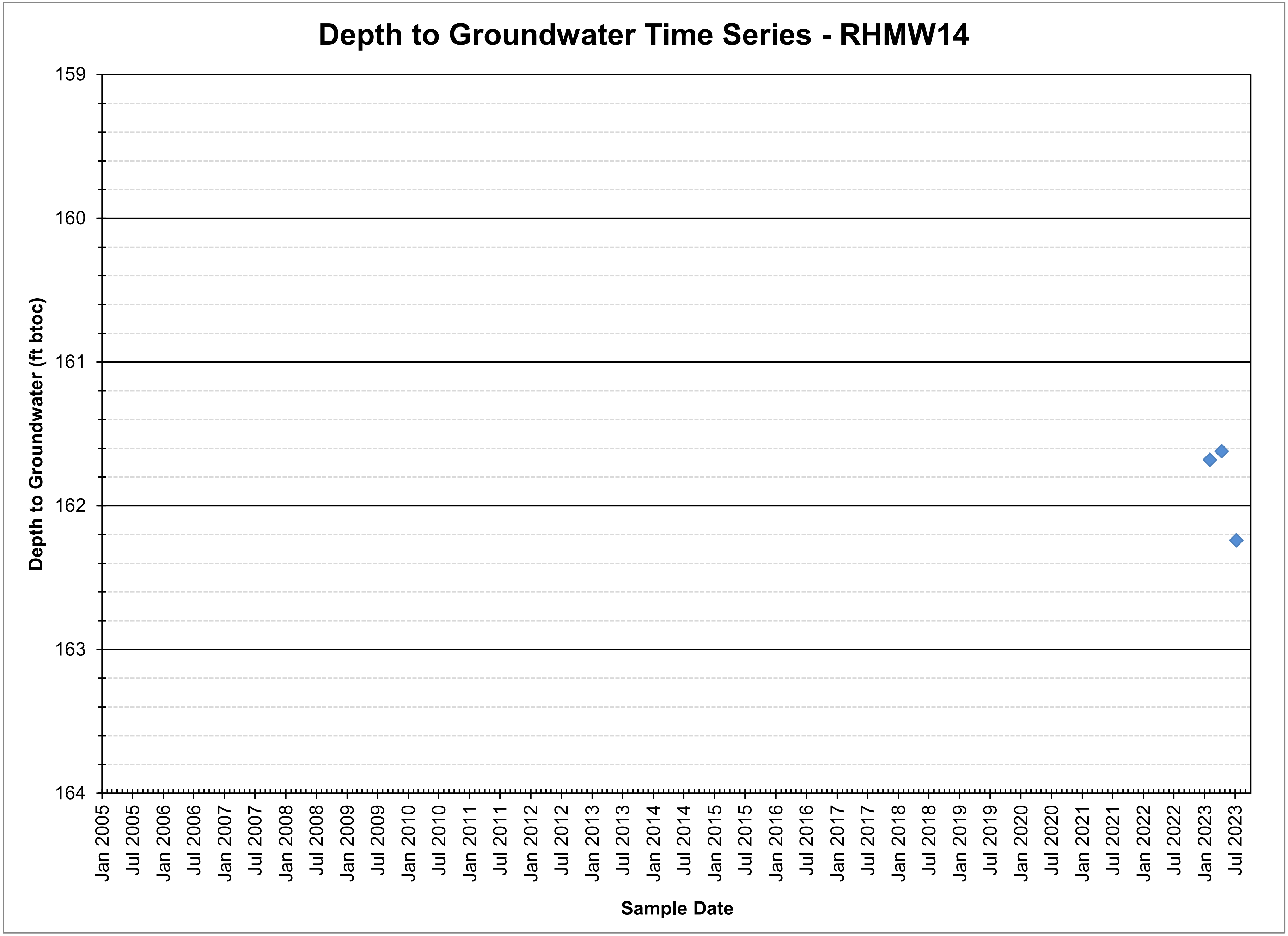

Depth to Groundwater Time Series - RHMW14
Depth to Groundwater (ft btoc)
159
160
161
162
163
164
Jan 2005
Jul 2005
Jan 2006
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Jan 2007
Jul 2007
Jan 2008
Jul 2008
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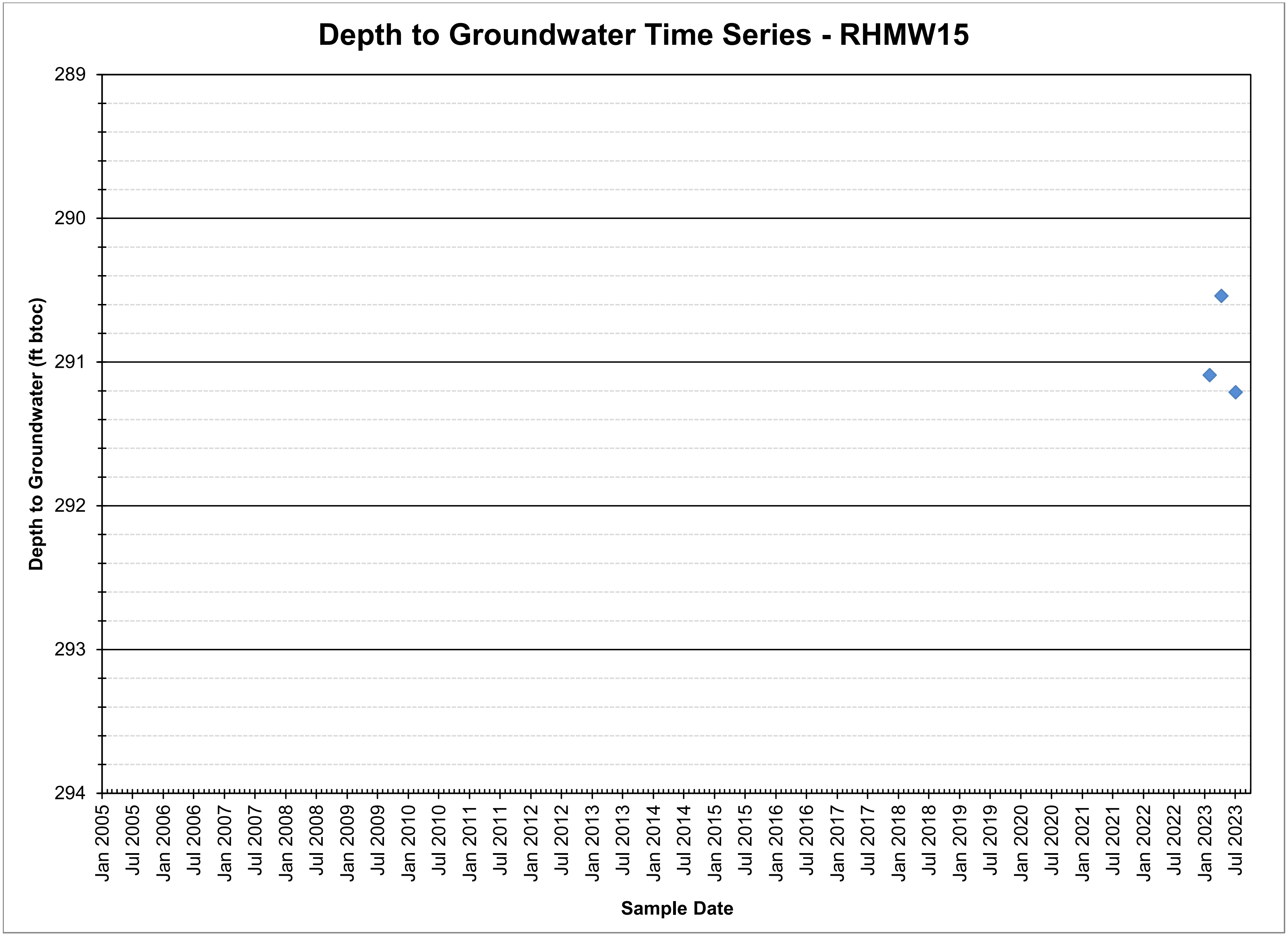
Depth to Groundwater Time Series - RHMW15
Depth to Groundwater (ft btoc)
289
290
291
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294
Jan 2005
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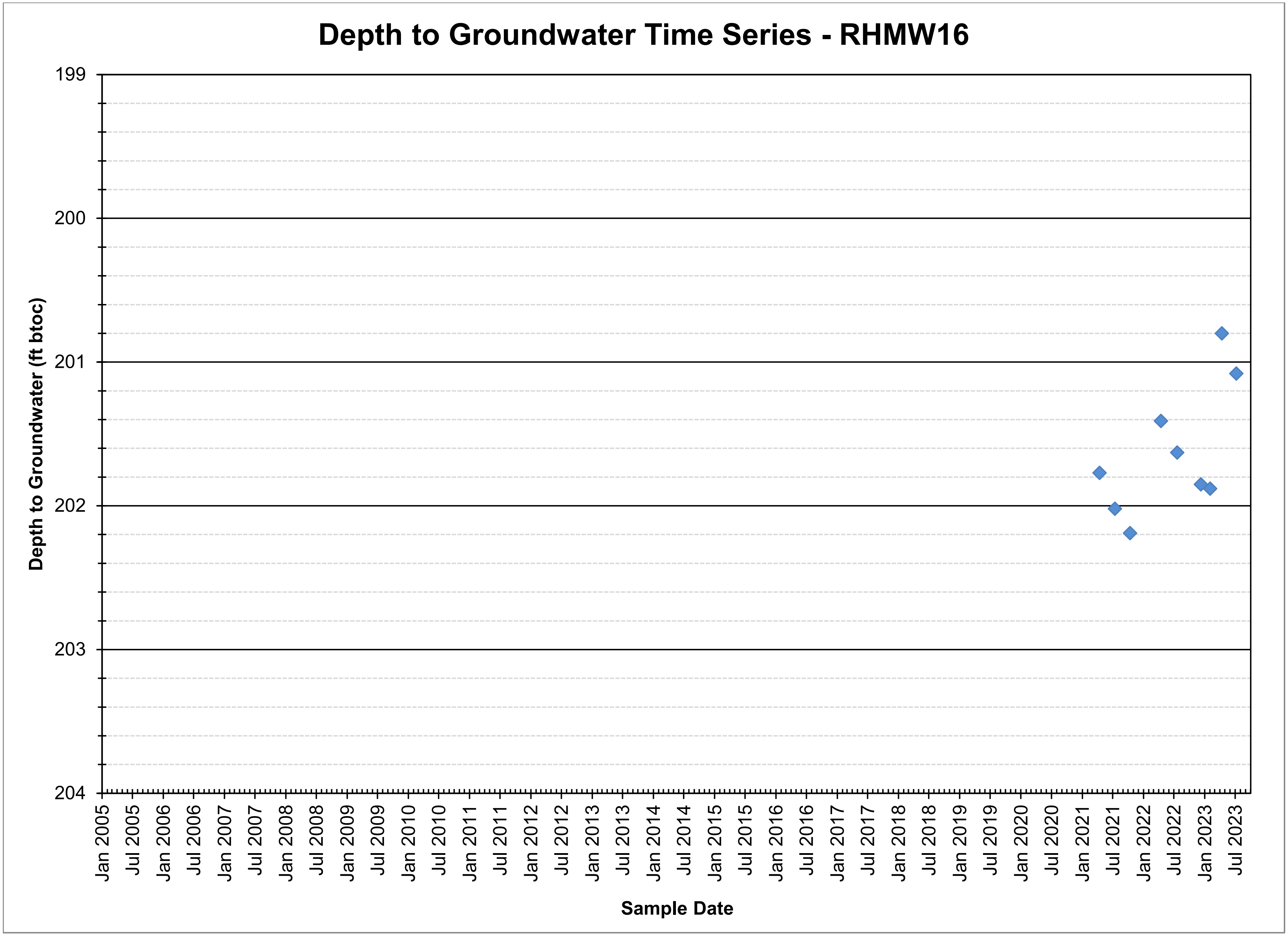
Sample Date



Depth to Groundwater Time Series - RHMW16
Depth to Groundwater (ft btoc)
199
200
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Jan 2005
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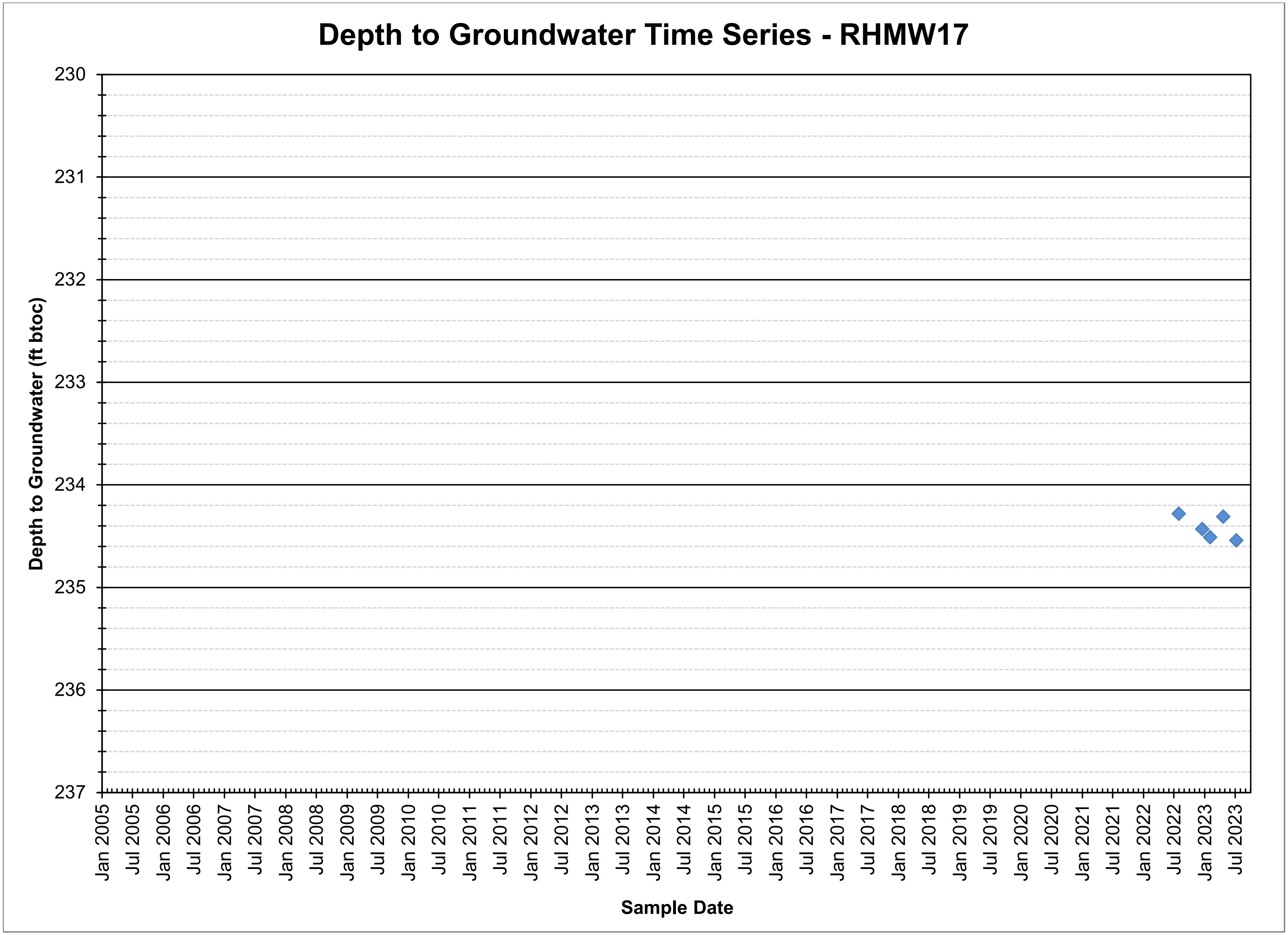
Sample Date



Depth to Groundwater Time Series - RHMW17
Depth to Groundwater (ft btoc)
230
231
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237
Jan 2005
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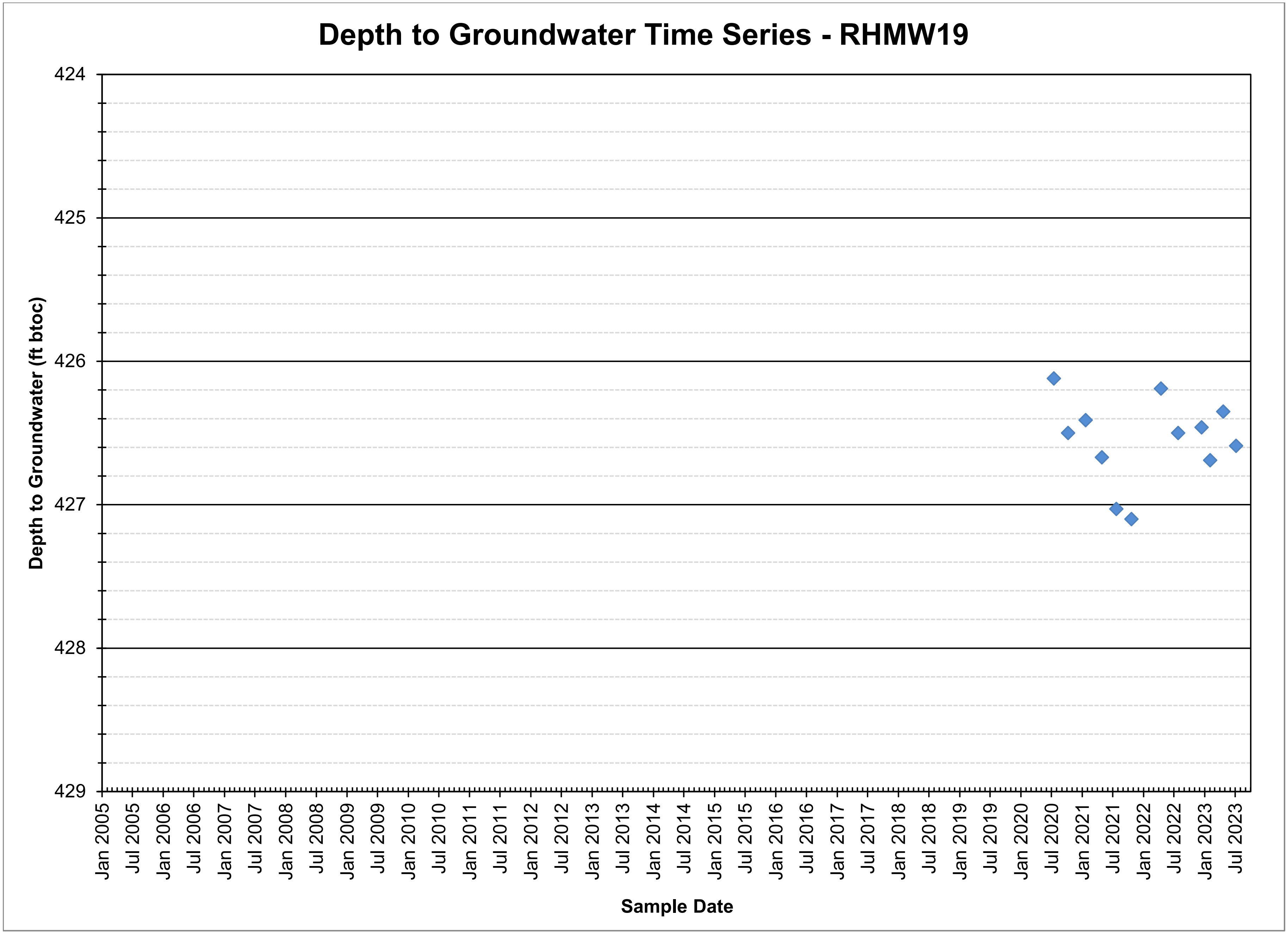
Sample Date


Depth to Groundwater Time Series - RHMW19
Depth to Groundwater (ft btoc)
424
425
426
427
428
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Jan 2005
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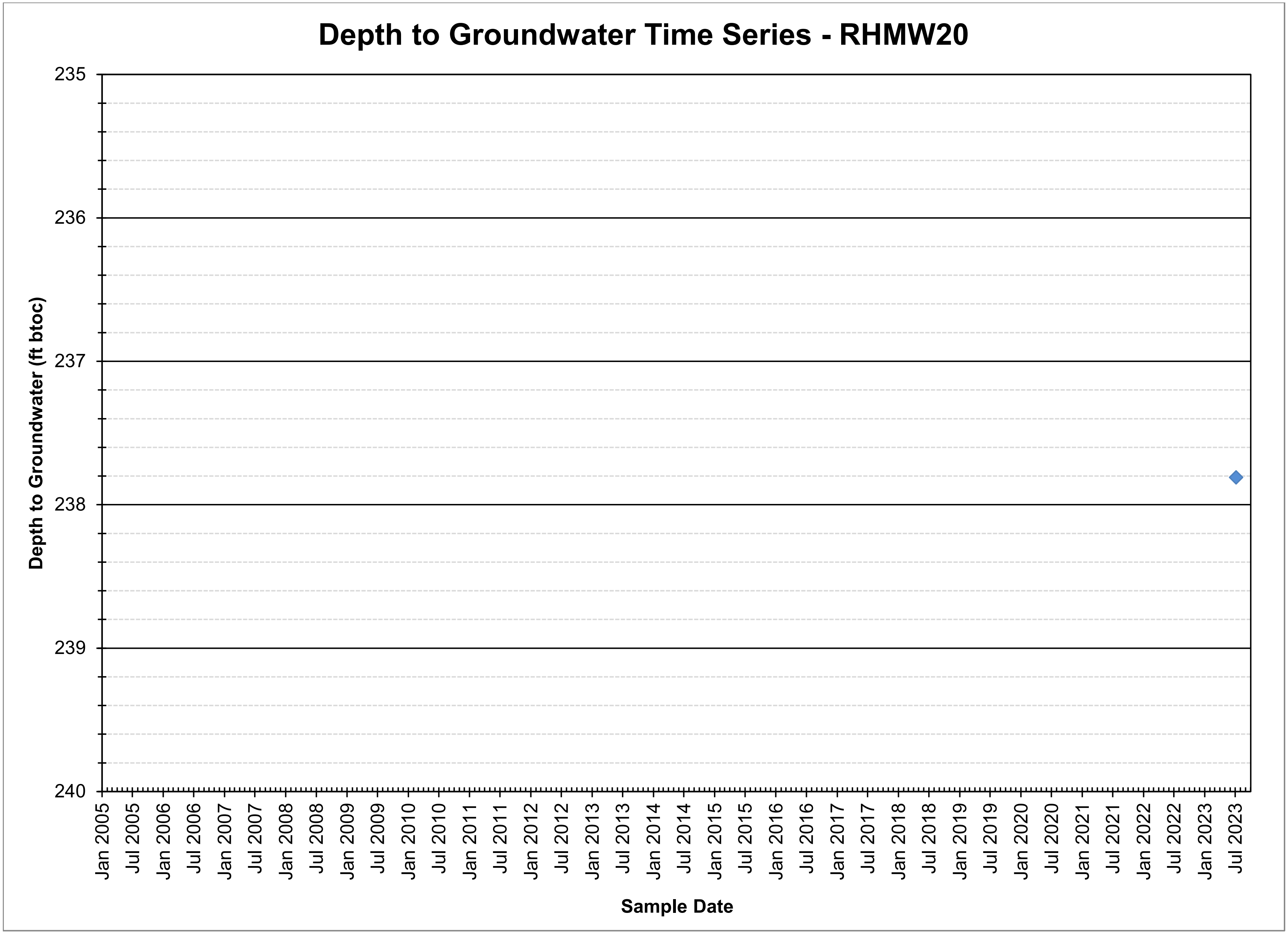

Depth to Groundwater Time Series - RHMW20
Depth to Groundwater (ft btoc)
235
236
237
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239
240
Jan 2005
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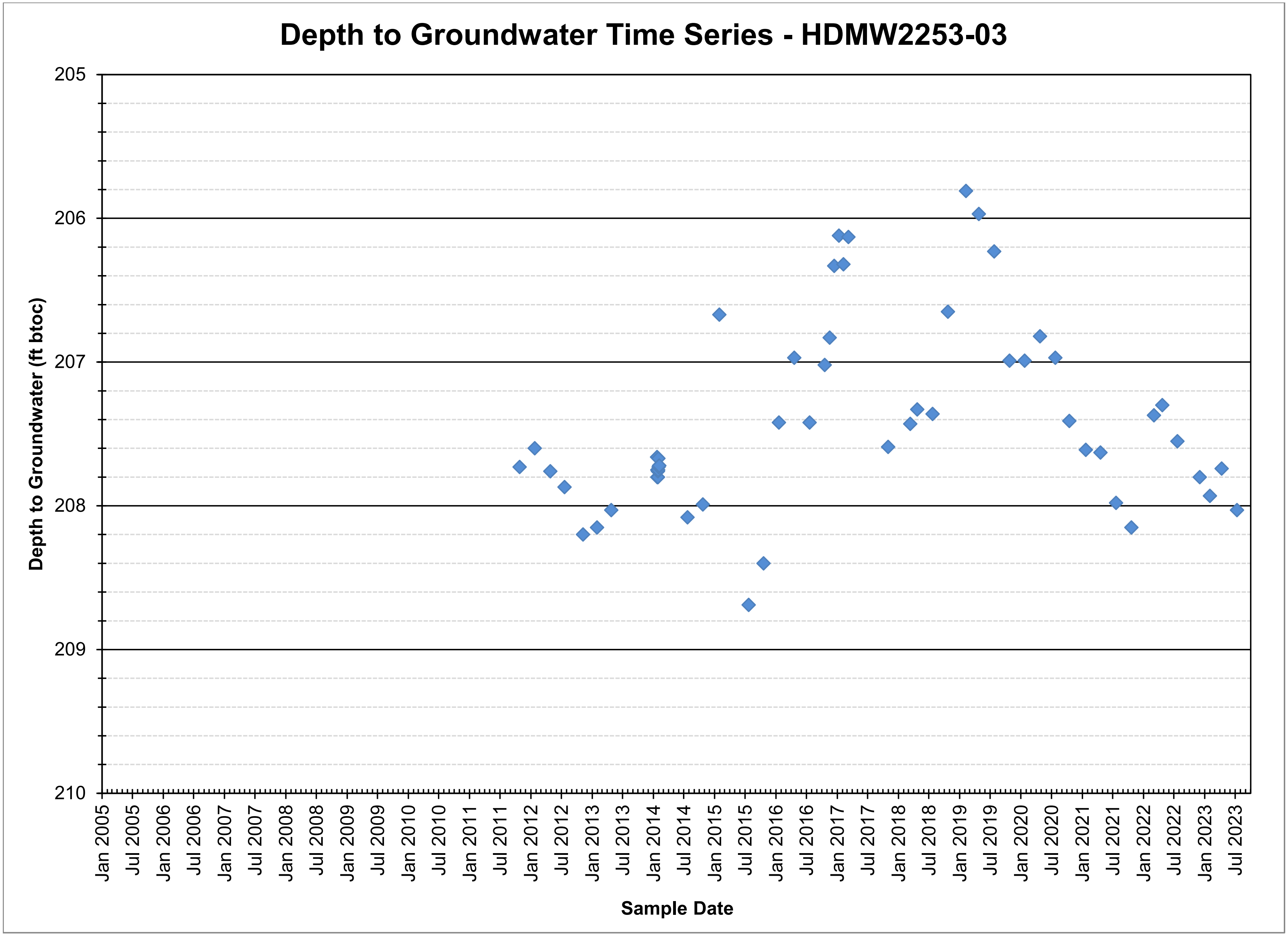
Sample Date



Depth to Groundwater Time Series - HDMW2253-03
Depth to Groundwater (ft btoc)
205
206
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Jan 2005
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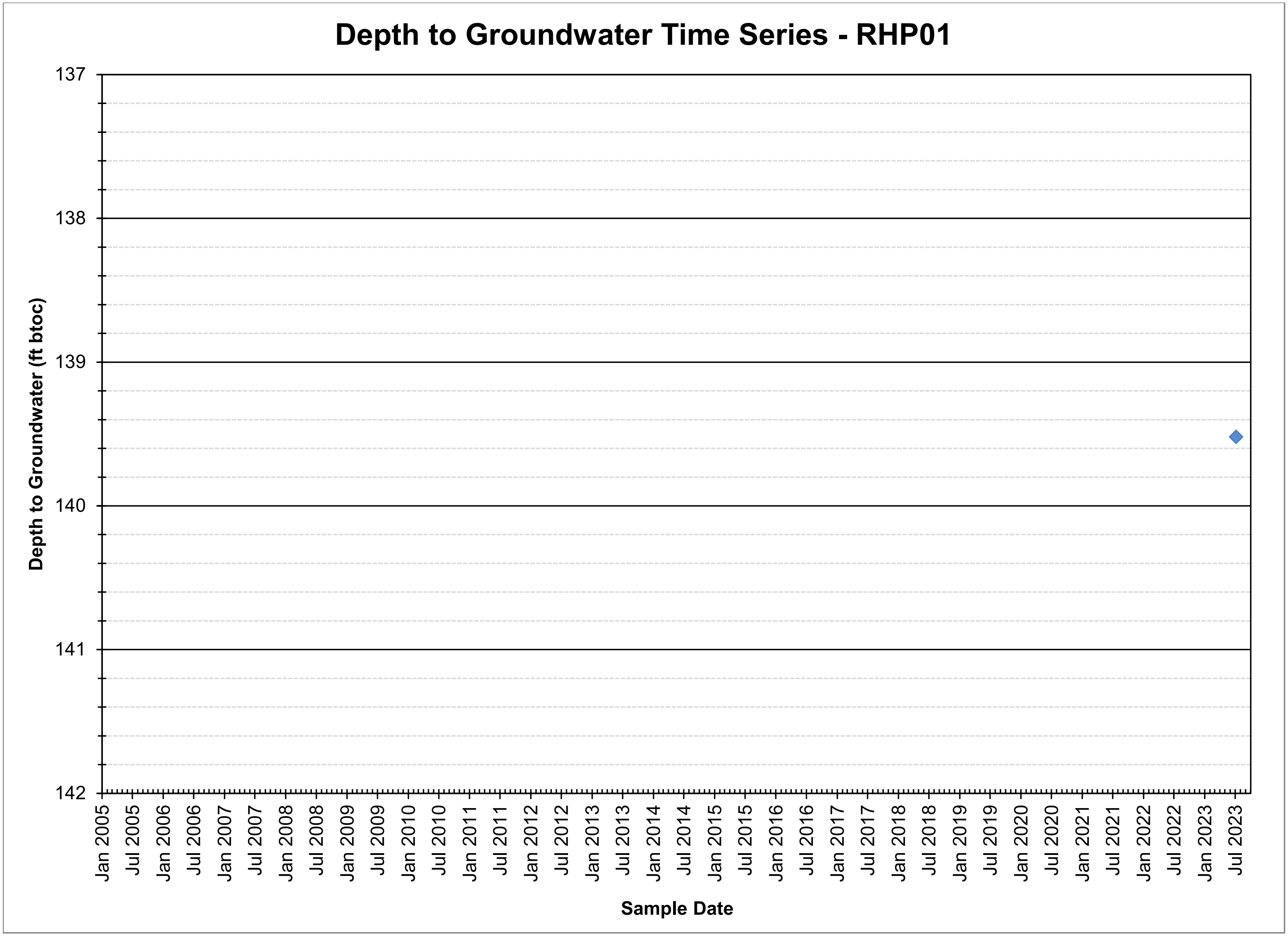
Depth to Groundwater Time Series - RHP01
Depth to Groundwater (ft btoc)
137
138
139
140
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142
Jan 2005
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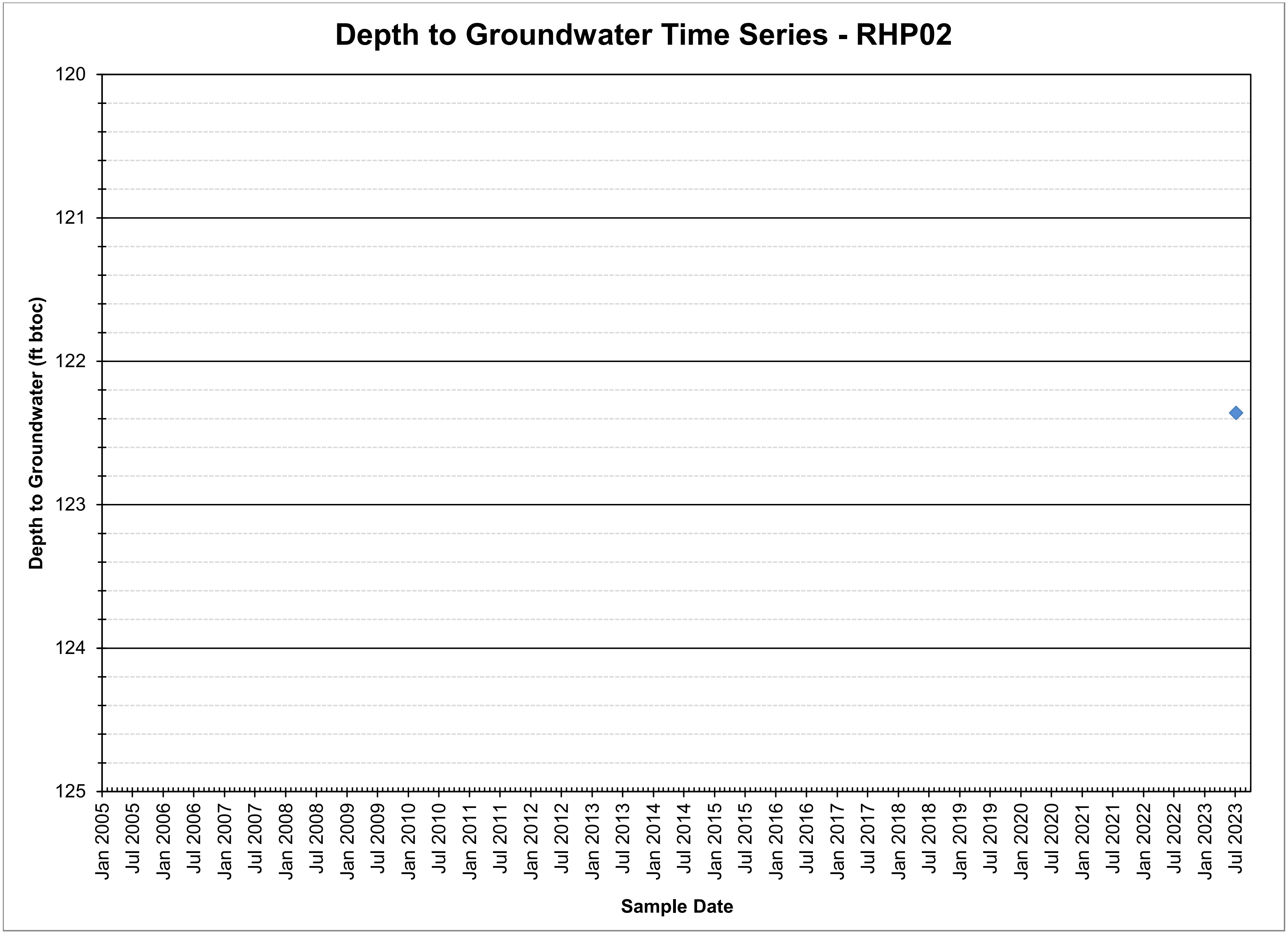
Sample Date



Depth to Groundwater Time Series - RHP02
Depth to Groundwater (ft btoc)
120
121
122
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125
Jan 2005
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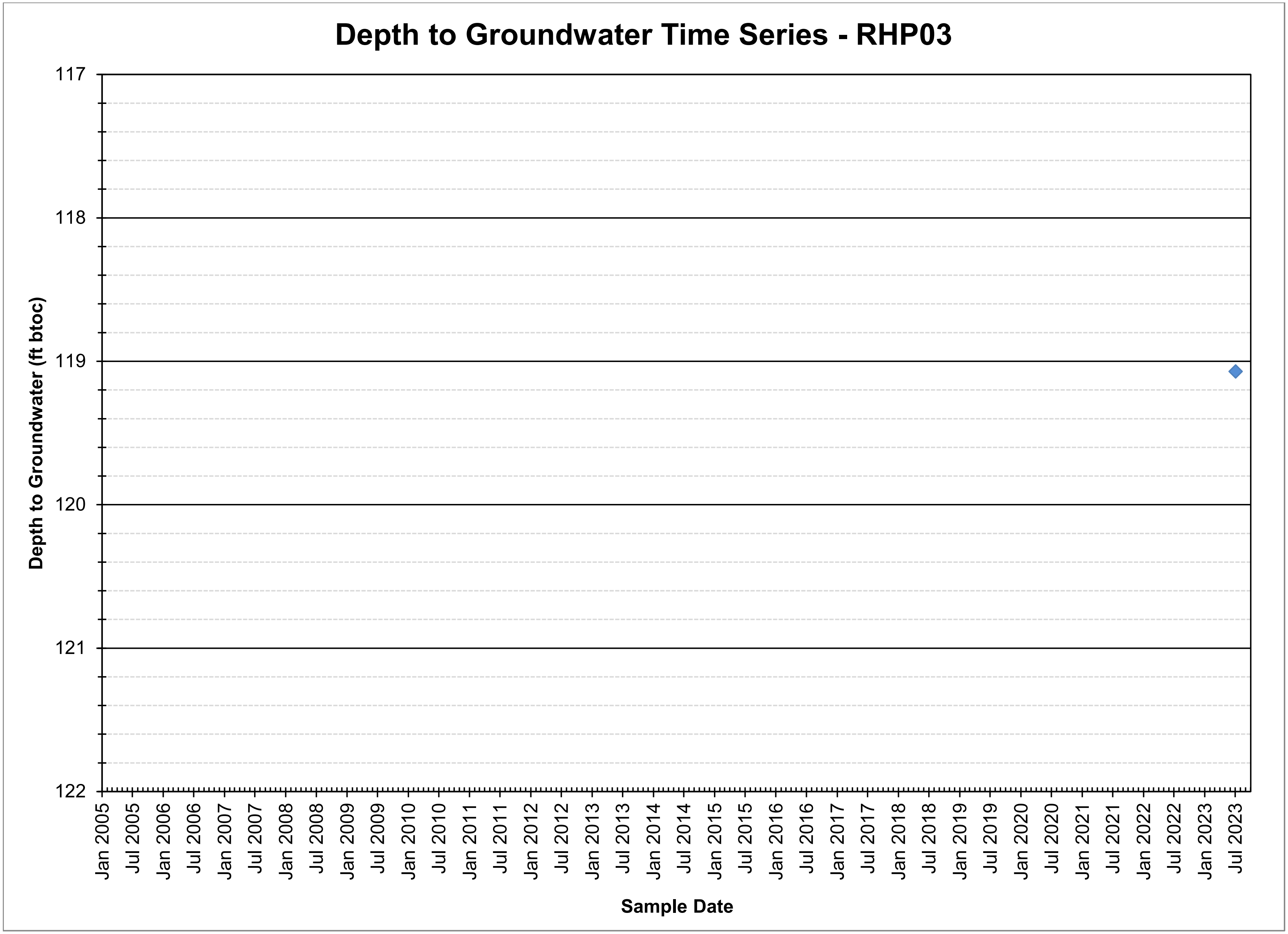

Depth to Groundwater Time Series - RHP03
Depth to Groundwater (ft btoc)
117
118
119
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122
Jan 2005
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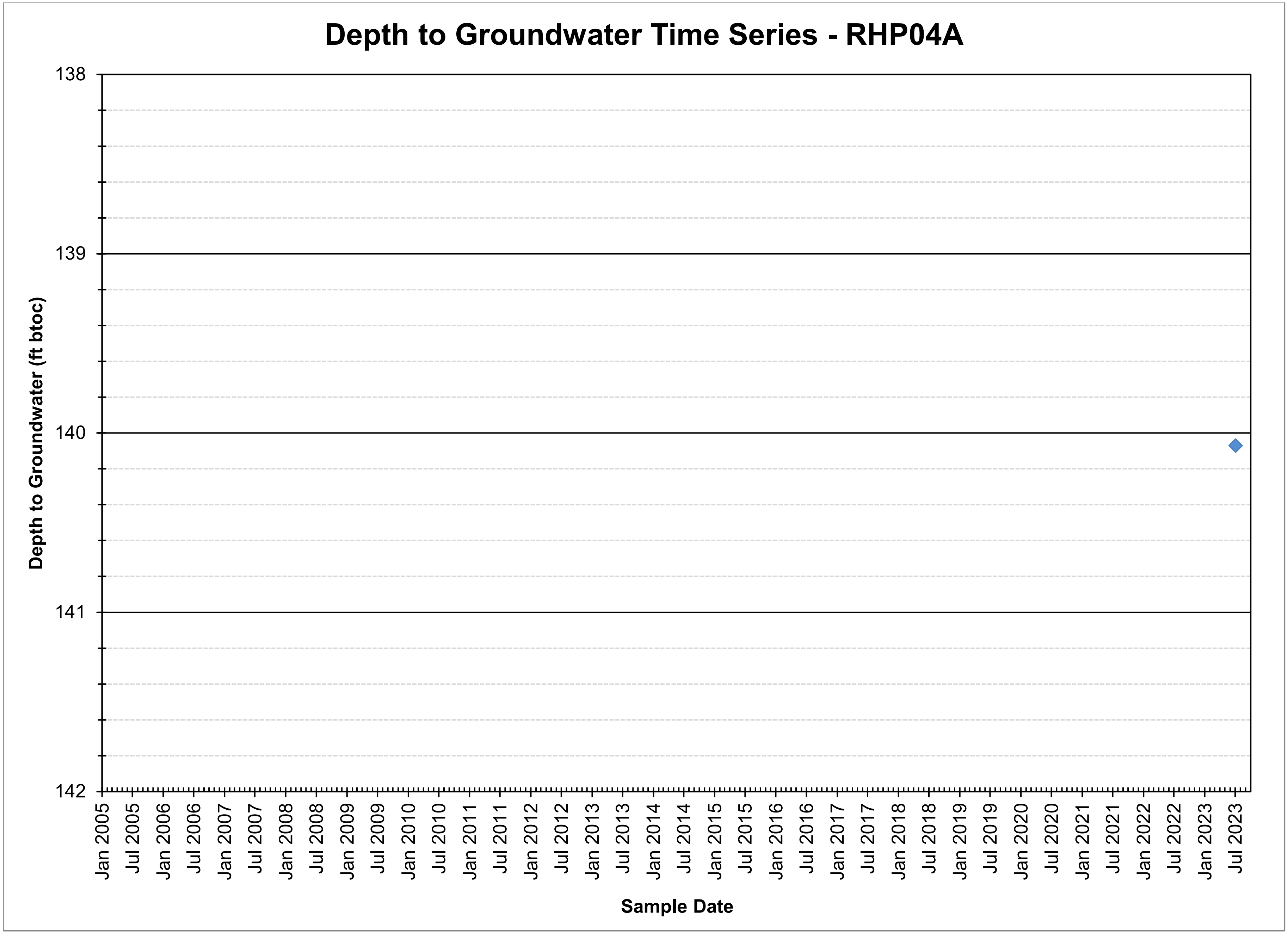

Depth to Groundwater Time Series - RHP04A
138
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142
Depth to Groundwater (ft btoc)
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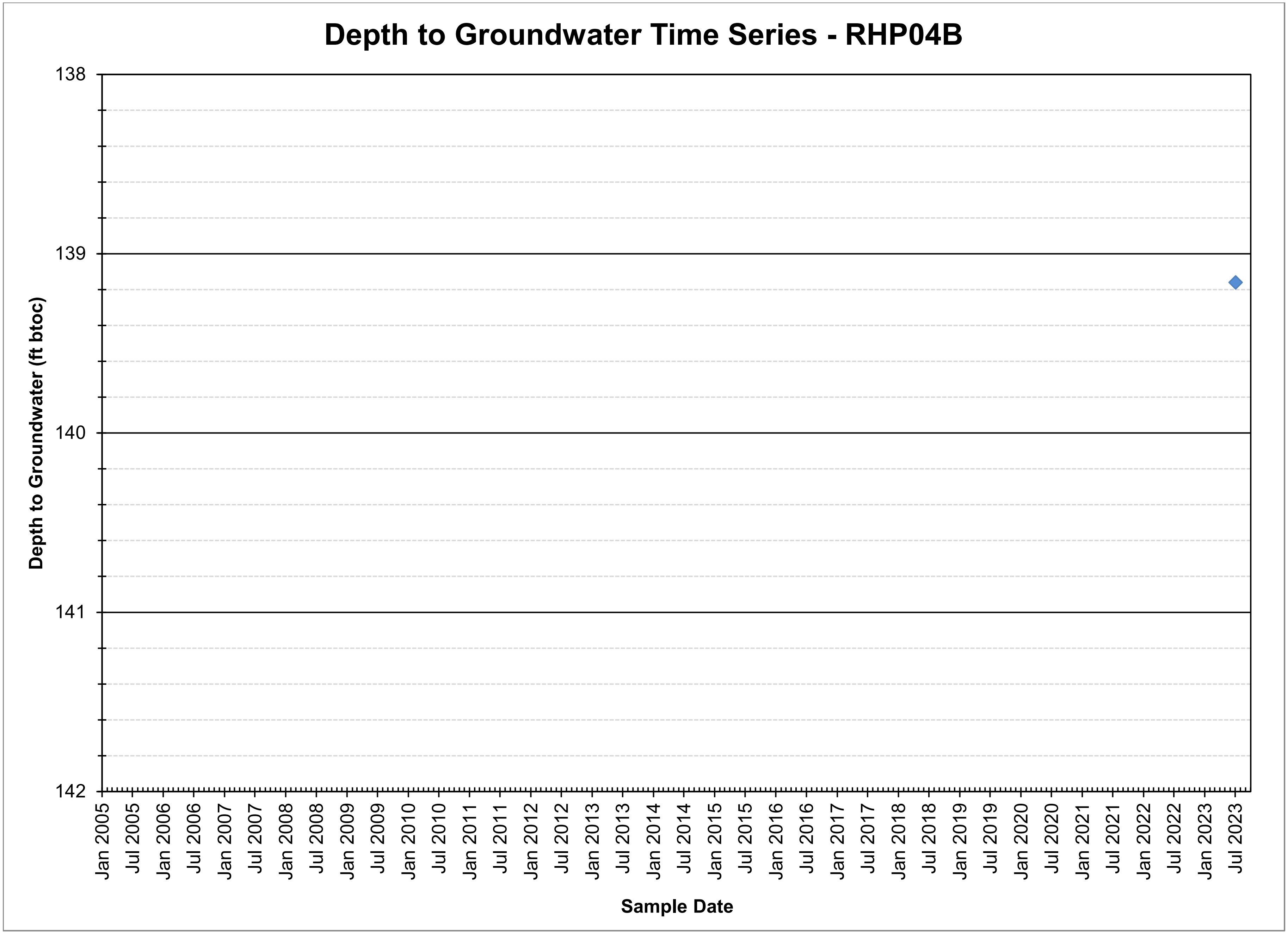
Depth to Groundwater Time Series - RHP04B
Depth to Groundwater (ft btoc)
138
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Jan 2005
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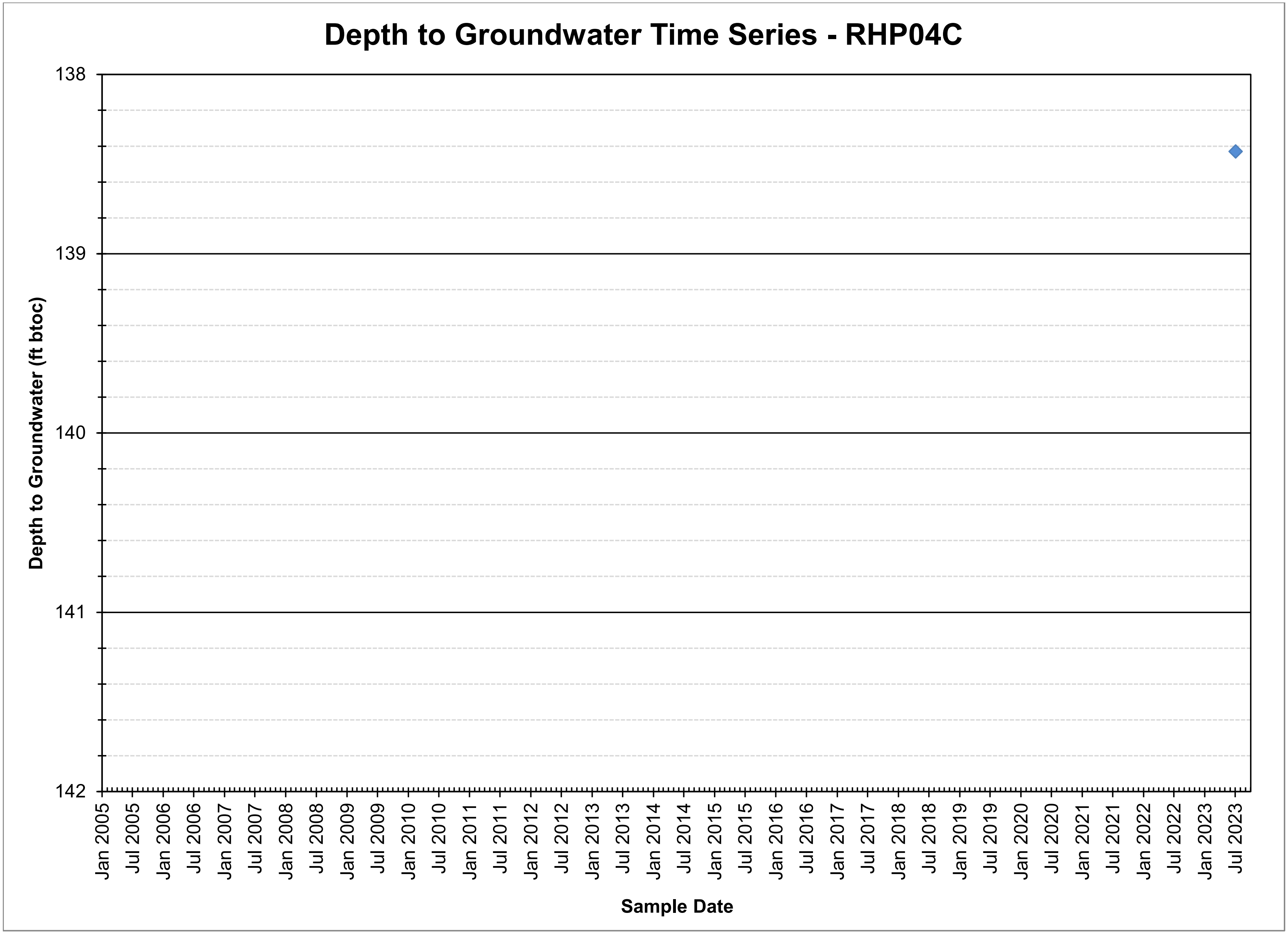
Depth to Groundwater Time Series - RHP04C
Depth to Groundwater (ft btoc)
138
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Jan 2005
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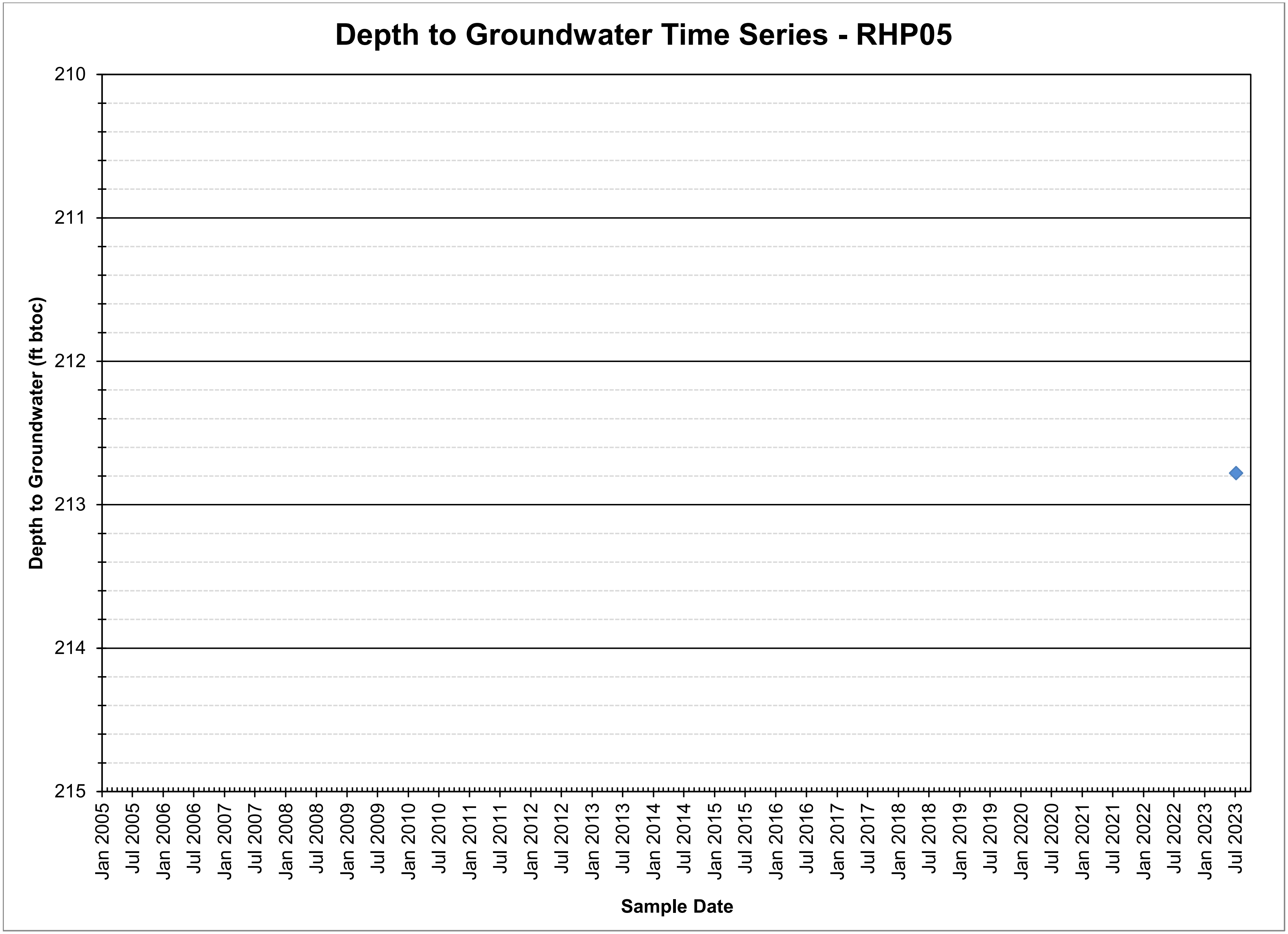
Sample Date


Depth to Groundwater Time Series - RHP05
Depth to Groundwater (ft btoc)
210
211
212
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Jan 2005
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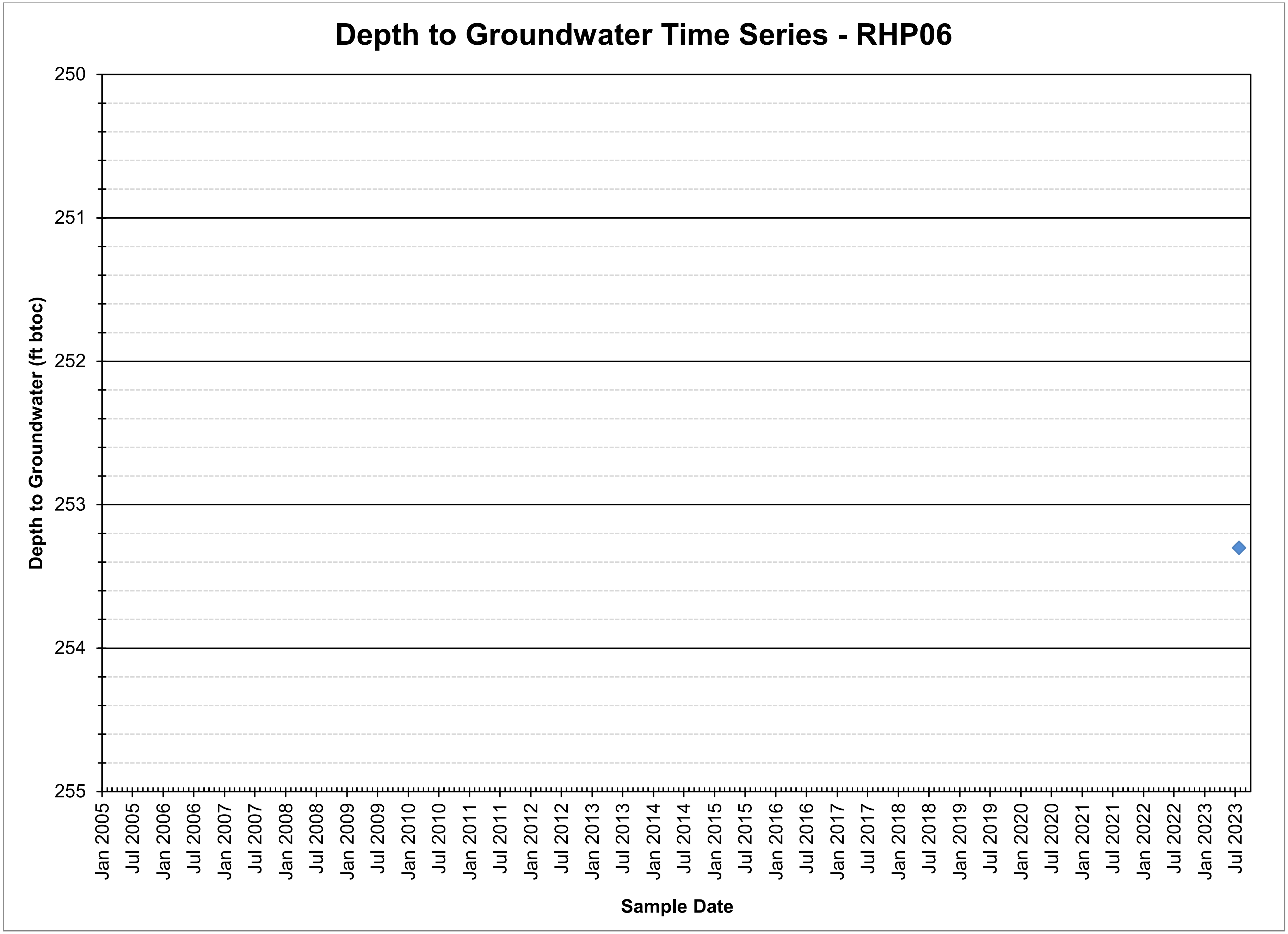
Sample Date



Depth to Groundwater Time Series - RHP06
Depth to Groundwater (ft btoc)
250
251
252
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255
Jan 2005
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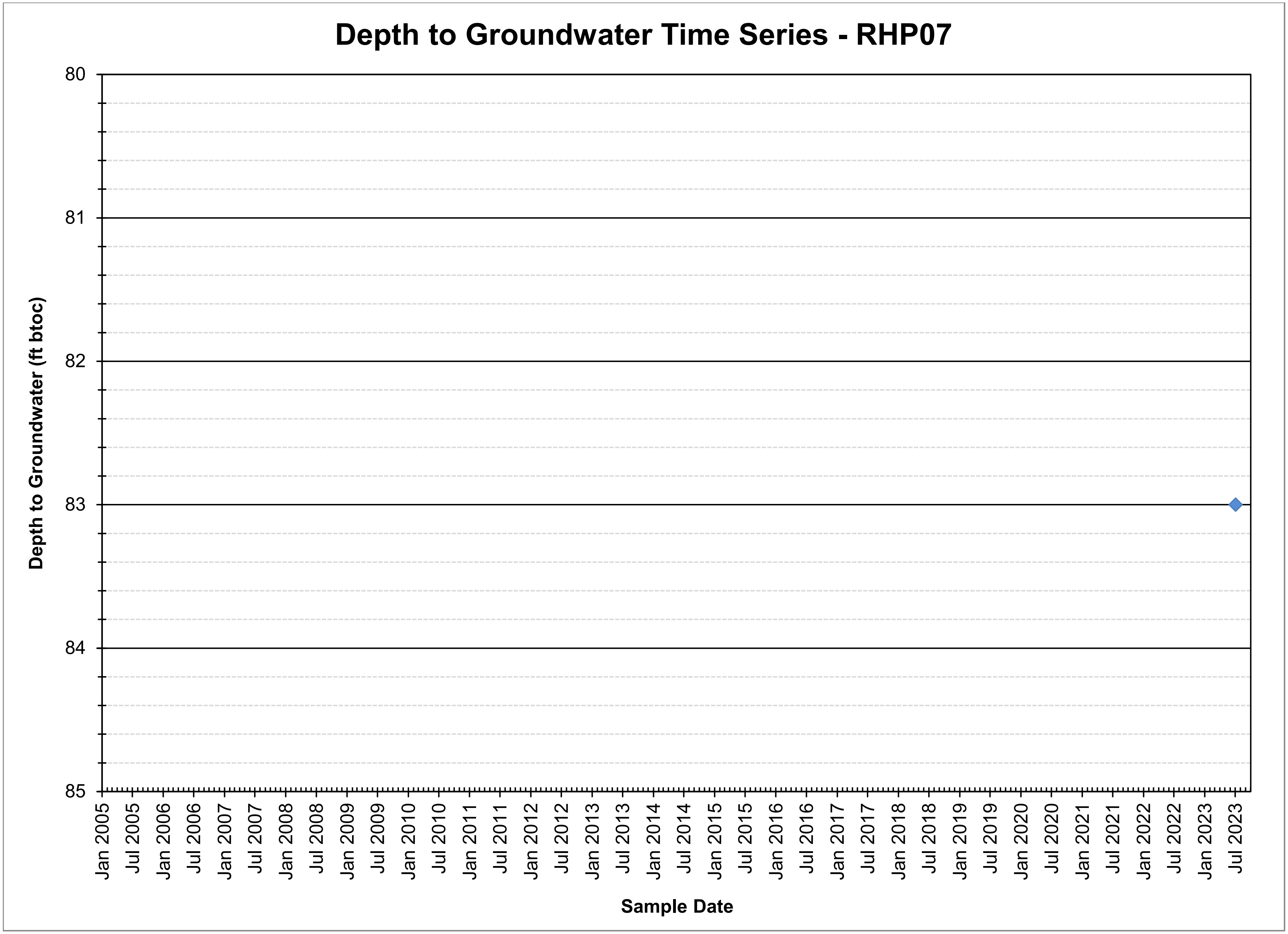
Depth to Groundwater Time Series - RHP07
Depth to Groundwater (ft btoc)
80
81
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Jan 2005
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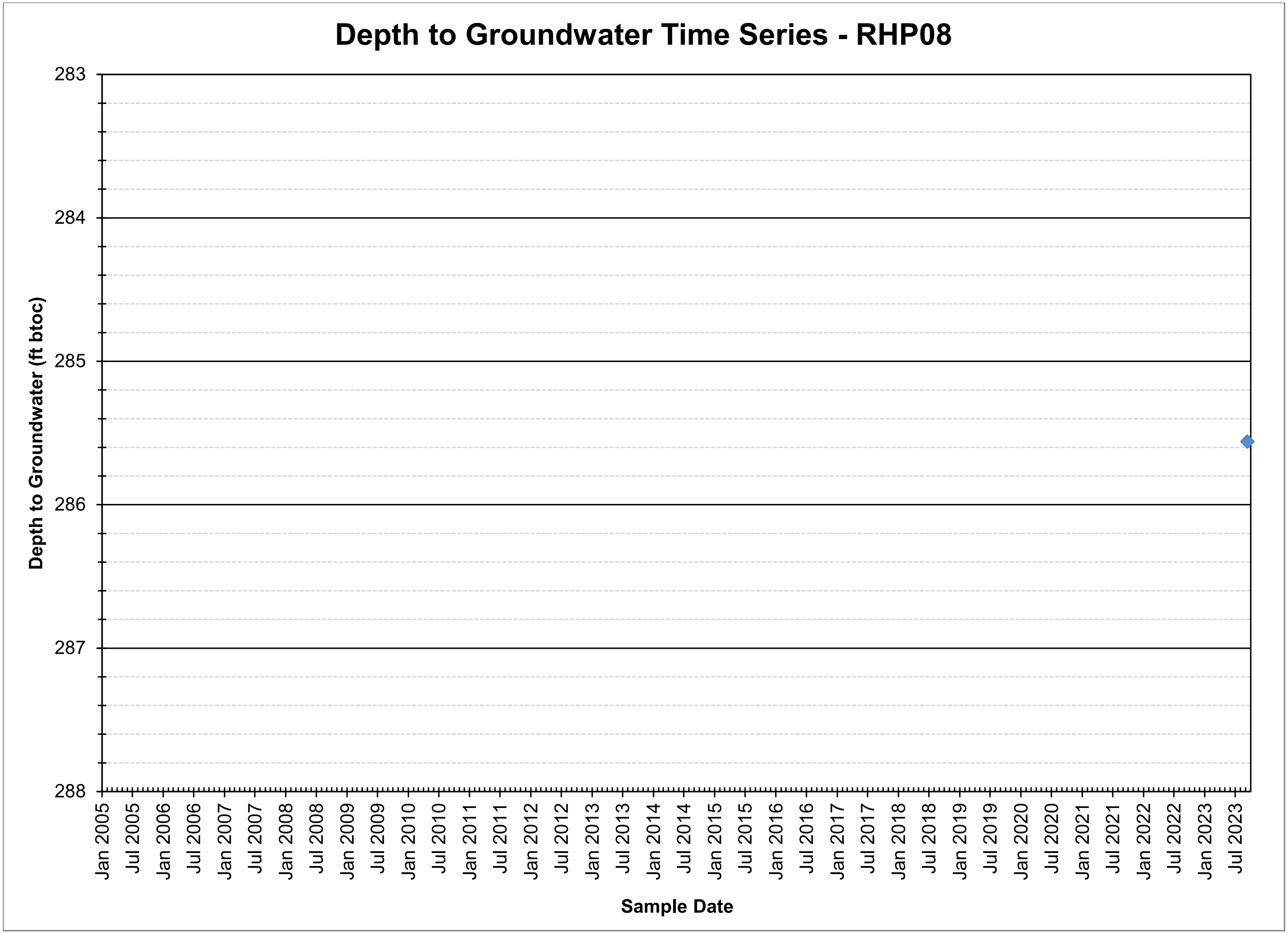

Depth to Groundwater Time Series - RHP08
Depth to Groundwater (ft btoc)
283
284
285
286
287
288
Jan 2005
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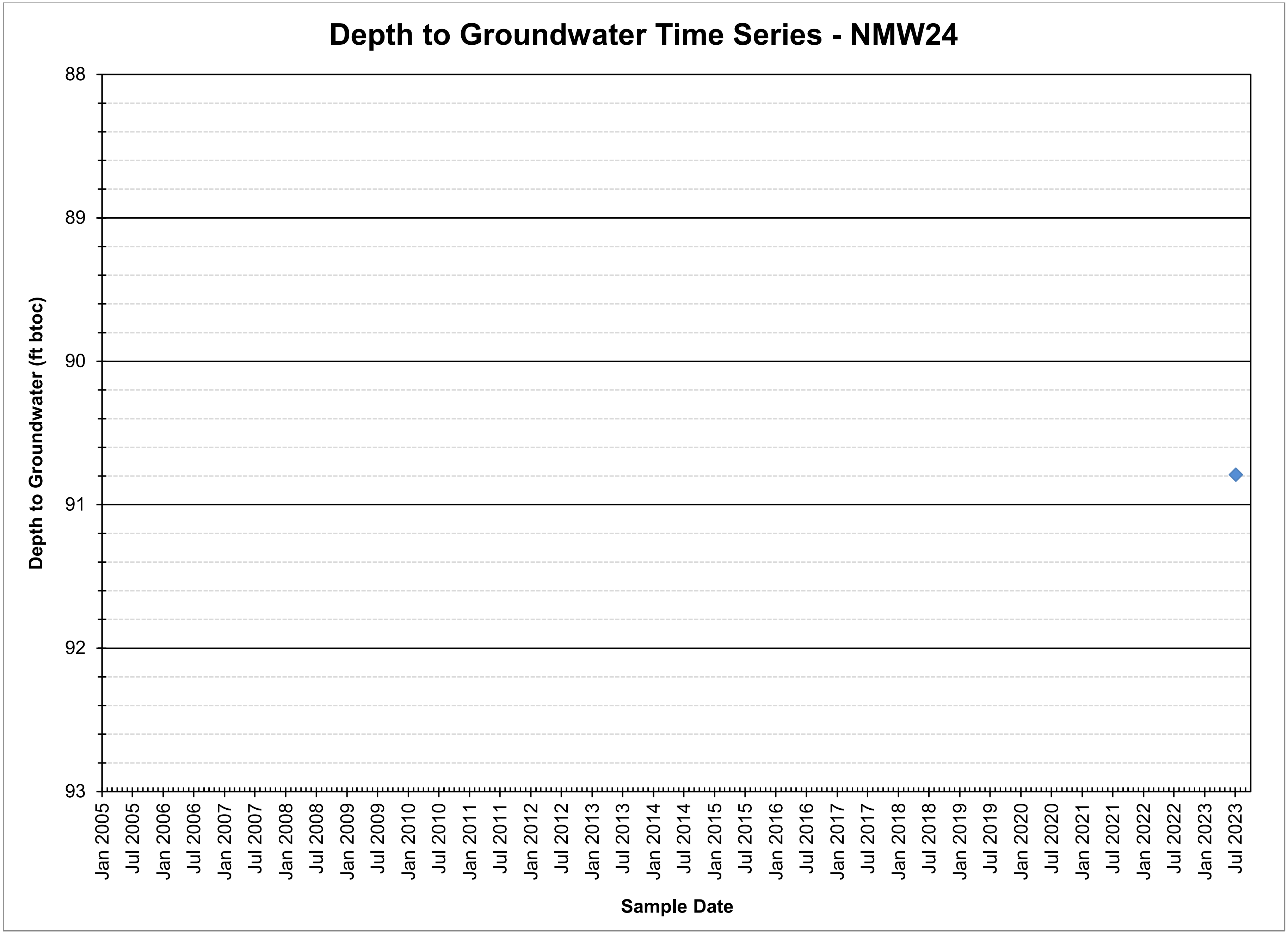

Depth to Groundwater Time Series - NMW24
Depth to Groundwater (ft btoc)
88
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Jan 2005
Jul 2005
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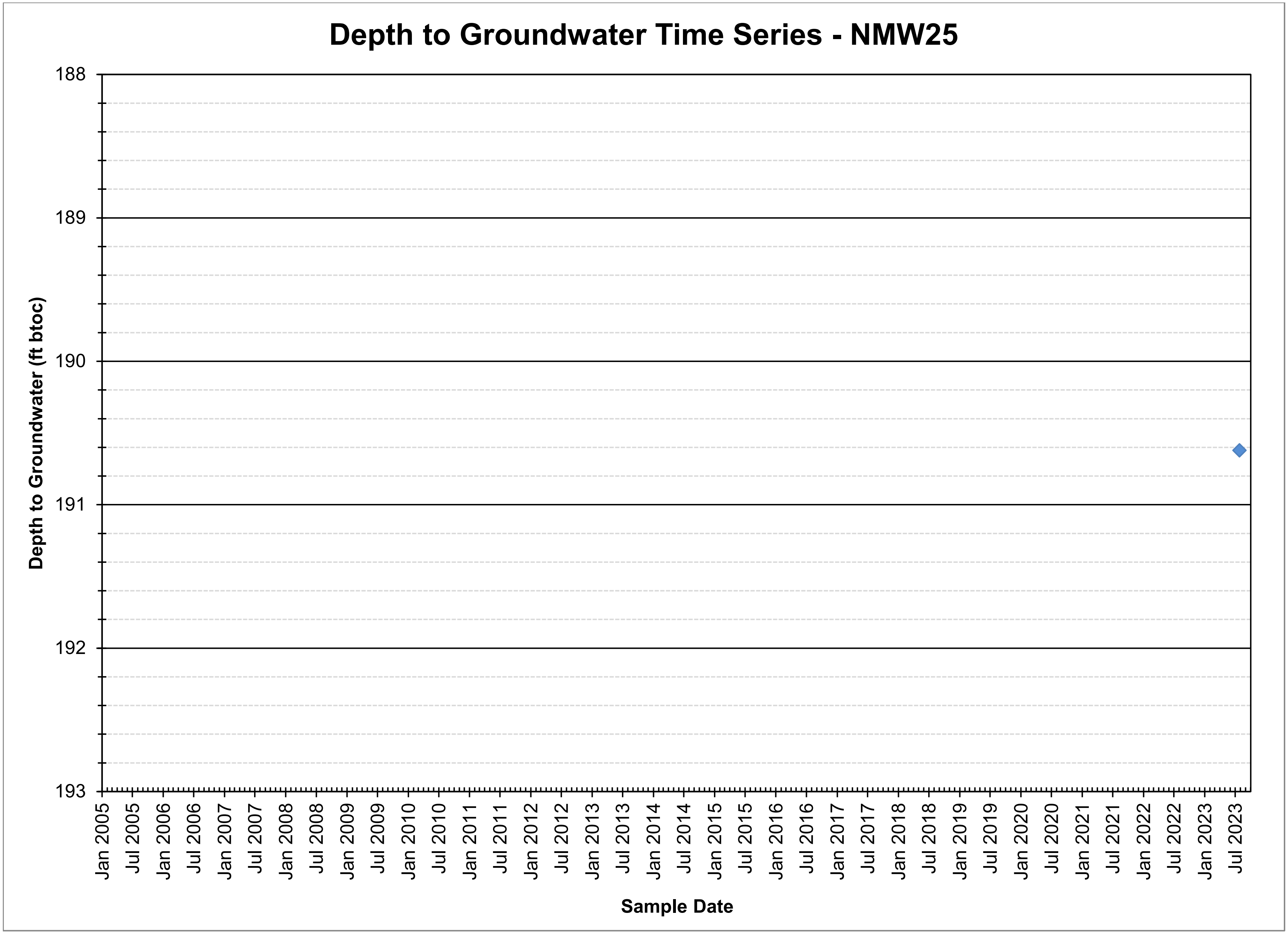
Depth to Groundwater Time Series - NMW25
Depth to Groundwater (ft btoc)
188
189
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Jan 2005
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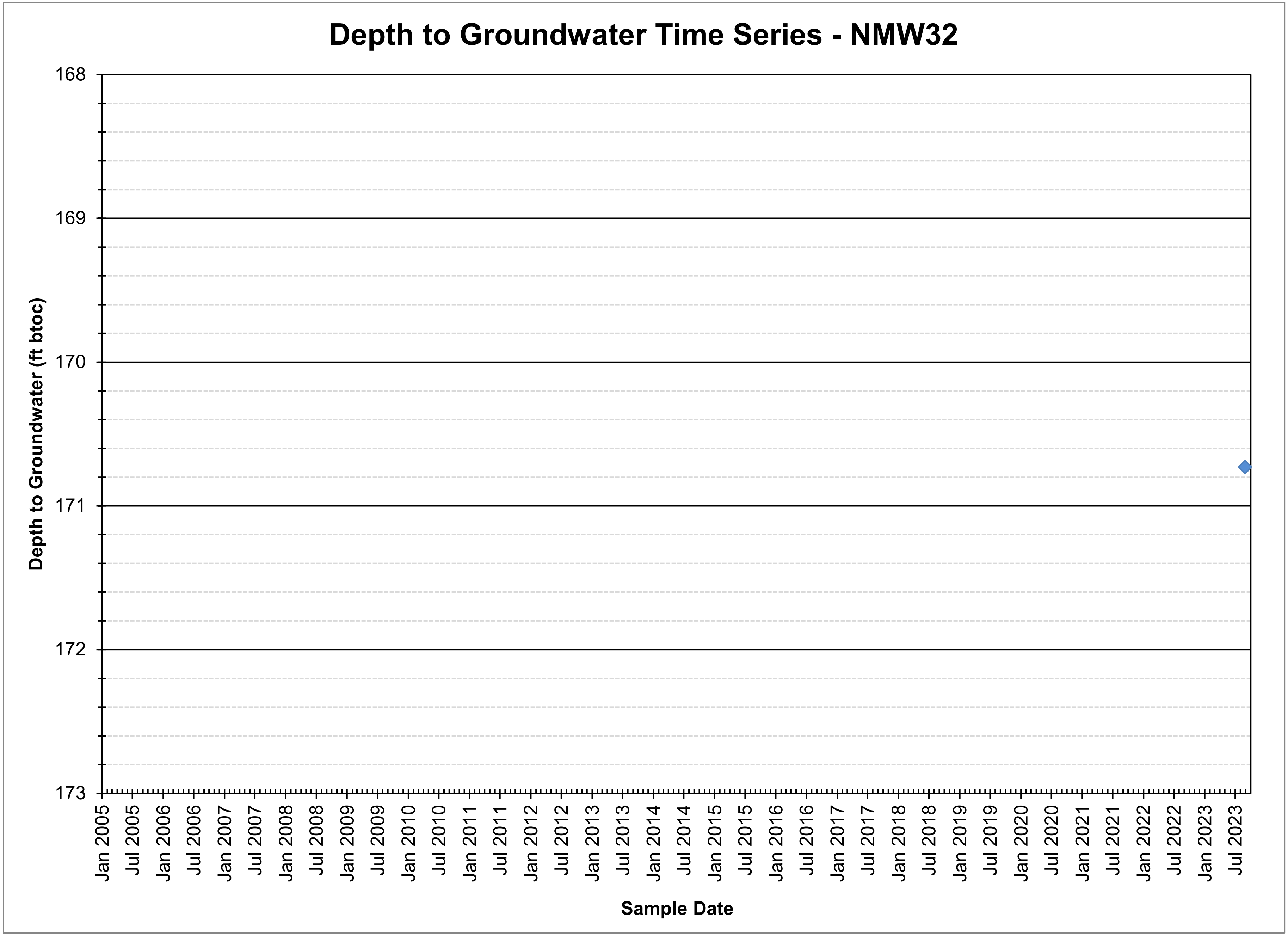

Depth to Groundwater Time Series - NMW32
Depth to Groundwater (ft btoc)
168
169
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Sample Date

Appendix A.5:
Cumulative Groundwater General Chemistry

Table A.5: Cumulative Groundwater General Chemistry
Red Hill Bulk Fuel Storage Facility, JBPHH, O'ahu, Hawai'i

		Analyte	Bromide	Calcium	Chloride	Fluoride	Iron	Dissolved Lead	Total Lead	Magnesium	Manganese	Nitrate	Potassium	Dissoved Silica	Total Silica	Dissolved Silica	Total Silica	Sodium	Sulfate
		Unit	mg/L	µg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L
		Analytical Method	300.0	6010C	300.0	300.0	6010C	6010C	6010C	6010C	6010C	300.0	6010C	4500-SI-D	4500-SI-D	4500-SIO2-C	4500-SIO2-C	6010C	300.0
		CAS No.	24959-67-9	7440-70-2	16887-00-6	16984-48-8	7439-89-6	7439-92-1	7439-92-1	7439-95-4	7439-96-5	14797-55-8_A	7440-09-7	7631-86-9	7631-86-9	7631-86-9	7631-86-9	7440-23-5	14808-79-8
Well Name	Sample ID	Date Sampled	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
RHMW2254-01	ERH115	11/14/2016	**0.36** J	**15800**	**72.3** J	**0.24**	—	—	—	**15400**	< 4.00 U	**2.9**	**2230** J	**53.0**	**51.9** J	—	—	**42200**	**18.5**
RHMW01R	ERH1350	4/19/2021	**0.18** J	**13300**	**58.8**	**0.37**	—	—	—	**14000**	**342**	**0.14** J	**3030** J	**63.4** J-	**59.7**	—	—	**51100**	**10.4**
RHMW02	ERH124	11/15/2016	**0.26** J	**12600**	**39.0**	**0.78**	—	—	—	**24800**	**1950**	**0.45** J	**2440** J	**84.4**	**83.7**	—	—	**53600**	**1.2**
RHMW03	ERH125	11/15/2016	**0.29** J	**25000**	**47.2**	**0.25**	—	—	—	**33400**	**36.7**	**7.6** J	**3700**	**83.5**	**87.4**	—	—	**104000**	**45.7**
RHMW04	ERH128	11/14/2016	**0.35** J	**16900**	**72.8**	**0.16**	—	—	—	**18600**	< 4.00 U	**2.4**	**1960** J	**62.4**	**57.2**	—	—	**34700**	**9.8**
RHMW05	ERH126	11/15/2016	**0.62**	**7850**	**157**	**0.39**	—	—	—	**13200**	< 4.00 U	**4.4**	**4930**	**85.4**	**82.6**	—	—	**136000**	**46.5**
RHMW06	ERH120	11/14/2016	**1.3**	**35100**	**365**	**0.23**	—	—	—	**54900**	< 4.00 U	**3.0**	**2330** J	**71.2**	**72.1**	—	—	**165000**	**81.8**
RHMW08	ERH122	11/15/2016	**0.63**	**32700**	**169**	**0.35**	—	—	—	**12000**	< 4.00 U	**2.1**	**5680**	**39.0**	**36.3**	—	—	**109000**	**58.2**
RHMW09	ERH129	11/15/2016	**0.29** J	**12900**	**51.5**	**0.17**	—	—	—	**11600**	< 4.00 U	**2.3** J	**2110** J	**53.7**	**46.7**	—	—	**36600**	**10.1**
RHMW09	ERH225	2/8/2017	**0.30** J	**12800**	**52.7**	**0.14**	< 25.0 U	< 4.0 U	< 4.0 U	**11800**	< 4.00 U	**2.3** J	**2060** J	—	—	—	—	**35700**	**9.4**
RHMW09	ERH307	4/4/2017	**0.37** J	**12900**	**52.3** J	**0.10** J	< 25.0 U	< 4.0 U	< 4.0 U	**12000**	< 4.00 U	**2.5**	**1960** J	**47.2** J	**44.0**	—	—	**35900**	**9.9**
RHMW10	ERH433	10/25/2017	**0.29** J	**9650**	**40.0**	< 0.09 U	< 25.0 U	—	< 4.0 U	**9420**	< 4.00 U	**2.2**	**1730** J	**41.3**	**37.5**	—	—	**32700**	**7.0**
RHMW11-01	ERH573	3/21/2018	**0.30** J	**10100**	**39.6**	< 0.09 U	—	—	—	**9340**	**3.3** J	**2.0**	**1850** J	**41.8**	**40.4**	—	—	**26600**	**6.1**
RHMW11-02	ERH575	3/22/2018	**0.30** J	**9300**	**43.2**	< 0.09 U	—	—	—	**8710**	**2.0** J	**2.0**	**1870** J	**42.0**	**41.8**	—	—	**28000**	**6.5**
RHMW11-03	ERH579	3/27/2018	**0.27** J	**8050**	**38.0**	< 0.09 U	—	—	—	**8040**	< 13.1 U	**4.0** J	**1780** J	**39.6**	**38.9**	—	—	**33800**	**6.7**
RHMW11-04	ERH577	3/27/2018	**0.29** J	**8320**	**41.9**	< 0.09 U	—	—	—	**8280**	**322**	**1.4** J	**1290** J	**33.9**	**33**	—	—	**36800**	**6.5**
RHMW11-05	ERH581	3/28/2018	**0.33** J	**19500**	**61.3**	**0.13**	**316**	—	< 4.0 U	**18900**	**482**	**0.44** J	**1150** J	**37.9**	**39.6**	—	—	**41500**	**9.8**
RHMW11-07 [a]	ERH874	8/5/2019	**0.44** J	**6200**	**40.0**	< 0.09 U	—	—	—	**6130**	< 4.00 U	**2.4** J	**737** J	—	—	**41.1**	**43.1**	**34700**	**10.0**
RHMW11-07 [a]	ERH940	10/30/2019	**0.15** J	**5620**	**42.4**	< 0.09 U	—	—	—	**5670**	**8.8** J	**1.7**	**655** J	—	—	**39.7**	**44.9**	**31400**	**10.0**
RHMW12A	ERH1572	8/4/2021	**0.27** J	**16300**	**104**	< 0.09 U	< 0.32 U	—	—	**13700**	**35.0**	**1.0**	**9660**	—	—	**32.5**	**35.1**	**77200**	**36.2**
RHMW13-01	ERH1023	3/3/2020	**0.21** J	**12100**	**41.8**	< 0.09 U	—	—	—	**9320**	**2.6** J	**< 1.3** UJ	**1870** J	—	—	**41.6**	**40.4**	**21600**	**6.4**
RHMW13-02	ERH1025	3/4/2020	**0.19** J	**10300**	**26.5**	< 0.09 U	—	—	—	**9710**	**5.9** J	**< 1.5** U	**1700** J	—	—	**42.9**	**47.9**	**23500**	**5.5**
RHMW13-03	ERH1027	3/5/2020	**0.22** J	**11400**	**47.5**	**0.25**	—	—	—	**12100**	**1.4** J	**1.8**	**1960** J	—	—	**46.5**	**51.1**	**33900**	**7.5**
RHMW13-04	ERH1029	3/9/2020	**0.33** J	**10600**	**46.6**	**0.19**	—	—	—	**11800**	**4.8** J	**1.8** J	**2000** J	—	—	**50.2**	**49.3**	**40700**	**11.3**
RHMW13-05	ERH1031	3/10/2020	**0.40** J	**21900**	**65.8**	**0.87**	—	—	—	**14900**	**117**	**0.40** J	**3380**	—	—	**9.0**	**9.0**	**47500**	**11.7**
RHMW14-01 [a]	ERH942	10/21/2019	**0.15** J	**10500**	**55.8** J	< 0.09 U	—	—	—	**10500**	< 3.5 U	**1.5** J	**1580** J	—	—	**44.5**	**43.4**	**31300**	**7.6**
RHMW14-02 [a]	ERH944	10/22/2019	**0.15** J	**10000**	**51.0**	< 0.09 U	—	—	—	**10300**	< 4.00 U	**1.5**	**1610** J	—	—	**40.1**	**42.5**	**35000**	**7.1**
RHMW14-03 [a]	ERH882	7/30/2019	**0.41** J	**8360**	**46.2**	**0.42**	—	—	—	**9530**	**24.9**	**2.1** J	**1840** J	—	—	**44.2**	**45.3**	**36200**	**7.6**
RHMW14-03 [a]	ERH946	10/28/2019	**0.14** J	**7740**	**47.8**	< 0.09 U	—	—	—	**8820**	**7.3** J	**1.7** J	**1390** J	—	—	**44.2**	**49.1**	**36100**	**7.5**
RHMW14-04 [a]	ERH880	7/29/2019	**0.43** J	**7780**	**43.3**	**0.42** J	—	—	—	**8840**	< 4.00 U	**0.45** J	**1480** J	—	—	**55.3**	**56.6**	**32100**	**11.4**
RHMW14-04 [a]	ERH949	10/24/2019	**0.13** J	**8100**	**42.6**	< 0.09 U	—	—	—	**9260**	< 4.00 U	**1.4**	**482** J	—	—	**54.8**	**55**	**32400**	**11.0**
RHMW14-05 [a]	ERH872	7/31/2019	**0.45** J	**9430**	**53.4**	< 0.09 U	—	—	—	**12700**	**64.5**	**1.5** J	**1600** J	—	—	**51.1**	**52.7**	**36200**	**9.4**
RHMW14-05 [a]	ERH951	10/23/2019	**0.18** J	**10300**	**49.8**	< 0.09 U	—	—	—	**14700**	**64.1**	**1.3**	**620** J	—	—	**52.7** J	**52.5** J	**39000**	**9.4**
RHMW14-07 [a]	ERH876	8/6/2019	**0.44** J	**12400**	**54.7**	< 0.09 U	—	—	—	**12200**	< 4.00 U	**2.1** J	**1540** J	—	—	**58.9**	**62.4**	**40100**	**9.6**
RHMW14-07 [a]	ERH953	10/23/2019	**0.15** J	**11400**	**58.0**	< 0.09 U	—	—	—	**11400** J	**15.8**	**1.6**	**799** J	—	—	**61.1**	**63.1**	**36200**	**9.6**
RHMW15-01	ERH955	11/4/2019	**0.22** J	**17200**	**92.4**	< 0.09 U	—	—	—	**16100**	< 4.00 U	**1.6**	**2130** J	—	—	**39.7**	**43.5**	**38600**	**11.5**
RHMW15-02	ERH957	11/5/2019	**0.22** J	**14900**	**70.4**	< 0.09 U	—	—	—	**15900**	< 4.00 U	**1.6**	**2310** J	—	—	**41.4**	**44.5**	**42600**	**10.9**
RHMW15-03	ERH959	11/7/2019	**0.22** J	**13200**	**75.4**	< 0.09 U	—	—	—	**13800**	**3.0** J	**1.6**	**2070** J	—	—	**44.9**	**45.3**	**35300**	**10.7**
RHMW15-04	ERH961	10/31/2019	**0.17** J	**9490**	**58.4**	< 0.09 U	—	—	—	**9990**	**11.6**	**1.6** J	**1730** J	—	—	**42.6**	**46.2**	**28300**	**8.4**
RHMW15-05	ERH963	11/6/2019	**0.19** J	**13800**	**57.3**	< 0.09 U	—	—	—	**10600** J	**191** J	**0.17** J	**1610** J	—	—	**13.7**	**14.6**	**39600** J	**3.8**
RHMW16	ERH1328	4/14/2021	**0.24** J	**18900**	**89.8**	< 0.09 U	—	—	—	**16900**	**20.8**	**1.4**	**2430** J	**44.4**	**44.6**	—	—	**39400**	**12.3**
RHMW17	RHMW17-WGN01LF-22Q3	7/29/2022	**0.13** J	**15000**	**60**	**0.14** J	**0.11** J	-	-	**14000**	<6.8 U	**4.6**	**2900** J+	**59.8**	**61.9**	-	-	**46000**	**31**
RHMW19	ERH1103	7/15/2020	< 0.16 UJ	**10600**	**42.7**	< 0.09 U	—	—	—	**9660**	< 4.00 U	**1.5** J	**2110** J	**41.3**	**45.5**	—	—	**31700**	**5.8**
RHMW20	RHMW20-WGN01LF-23Q3	7/6/2023	**1.2**	**45400**	**480**	<0.09 U	<0.32 UJ	—	—	**66700**	**3.6** J	**0.37**	**3510** J	**61**	**61**	—	—	**154000**	**58**
HDMW2253-03	ERH127	11/16/2016	**0.37** J	**12900**	**84.7**	**0.17**	—	—	—	**17500**	**56.1**	**1.2**	**608** J	**62.7**	**67.0**	—	—	**57100**	**27.6**
RHP01	RHP01-WGN01LF-23Q3	7/6/2023	**0.31** J	**27100**	**75**	<0.09 U	<0.32 UJ	—	—	**28200**	<2 U	**0.97**	**1690** J	**61**	**60**	—	—	**53400**	**62**
RHP02	RHP02-WGN01LF-23Q3	7/6/2023	**0.3** J	**35600**	**83**	<0.09 U	<0.32 U	—	—	**33500**	<2 U	**0.79**	**2040** J	**51**	**51**	—	—	**53200**	**68**
RHP03	RHP03-WGN01LF-23Q3	7/3/2023	**0.39** J	**59100**	**220** J-	<0.09 U	<1 U	—	—	**47200**	**4** J	**4.2**	**3110** J	**49**	**48**	—	—	**64600**	**42**
RHP04A	RHP04A-WGN01LF-23Q3	7/3/2023	**0.55**	**25100**	**200** J-	<0.09 U	<0.32 U	—	—	**27200**	**2.9** J	**4**	**2710** J	**56**	**55**	—	—	**99400**	**49** J-
RHP04B	RHP04B-WGN01LF-23Q3	7/3/2023	**0.26** J	**20400**	**110** J-	<0.09 U	<1 U	—	—	**26500**	**98**	<0.18 U	**3670** **J**	**57**	**58**	—	—	**71100**	**64** J-
RHP04C	RHP04C-WGN01LF-23Q3	7/3/2023	**0.88**	**67400**	**370** J-	<0.09 U	<0.32 U	—	—	**55300**	**35.8**	**0.54**	**6370** **J**	**40**	**40**	—	—	**105000**	**100** J-
RHP05	RHP05-WGN01LF-23Q3	7/6/2023	**0.61**	**26600**	**180**	<0.09 U	<0.32 UJ	—	—	**27100**	**1.2** **J**	**9.3**	**2830** **J**	**57**	**56**	—	—	**101000**	**44**
RHP06	RHP06-WGN01LF-23Q3	7/24/2023	**0.56**	**34900**	**220**	<1.8 U	<0.32 U	—	—	**32600**	**34.9**	**9.6**	**4150** **J**	**42**	**42**	—	—	**95800**	**94**
RHP07	RHP07-WGN01LF-23Q3	7/3/2023	**0.3** **J**	**21500**	**94** J-	<0.09 U	<0.32 U	—	—	**21000**	**4.1** J	**5.6**	**1690** **J**	**52**	**53**	—	—	**66300**	**44**
RHP08	RHP08-WGN01LF-23Q3	9/11/2023	**0.4** **J**	**16000**	**130** J-	0.29	<0.32 U	—	—	**12000**	**11** J	**0.56**	**3000** **J**	**57** J-	**57** J-	—	—	**90000**	**35**
NMW24	NMW24-WGN01LF-23Q3	7/5/2023	**0.25** J	**18100**	**92**	**0.2** J+	<0.32 U	—	—	**12500**	**1.8** J	**5.1**	**3830** J	**67**	**68**	—	—	**91200**	**27**
NMW25	NMW25-WGN01LF-23Q3	7/26/2023	**0.94**	**30200**	**210**	<0.09 U	<0.32 U	—	—	**33300**	**13.2** J	**20**	**5740** J	**52**	**51**	—	—	**146000** J-	**78**
NMW32	NMW32-WGN01LF-23Q3	8/29/2023	**0.61** **J**	**34000**	**160**	**0.047** J	<0.32 U	—	—	**38000**	**36**	**2.9**	**16000**	**260** **J**	**260** J	—	—	**130000** **J+**	**69**

Table A.5 Notes:

— No result

Bold Detected value

Table A.5: Cumulative Groundwater General Chemistry (cont'd)

		Analyte	Bromide		Calcium		Chloride		Fluoride		Iron		Dissolved Lead		Total Lead		Magnesium		Manganese		Nitrate		Potassium		Dissoved Silica		Total Silica		Dissolved Silica		Total Silica		Sodium		Sulfate	
		Unit	mg/L		μg/L		mg/L		mg/L		mg/L		μg/L		μg/L		μg/L		μg/L		mg/L		μg/L		mg/L		mg/L		mg/L		mg/L		μg/L		mg/L	
		Analytical Method	300.0		6010C		300.0		300.0		6010C		6010C		6010C		6010C		6010C		300.0		6010C		4500-SI-D		4500-SI-D		4500-SIO2-C		4500-SIO2-C		6010C		300.0	
		CAS No.	24959-67-9		7440-70-2		16887-00-6		16984-48-8		7439-89-6		7439-92-1		7439-92-1		7439-95-4		7439-96-5		14797-55-8_A		7440-09-7		7631-86-9		7631-86-9		7631-86-9		7631-86-9		7440-23-5		14808-79-8	
Well Name	Sample ID	Date Sampled	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q

μg/L micrograms per liter
mg/L miligrams per liter
No. number
ID identification
— No result

Result Qualifiers (Q)
J Estimated value
U The compound was analyzed for but not detected above the stated limit

[a]The results for RHMW11-07 that were collected in August 2019 and the results for RHMW14 from July-August 2019 were recollected in October 2019 after additional zone purging was performed.

Appendix A.6:
Groundwater and QC Sample Analytical Results, Third Quarter 2023 GW LTM Event

Table A.6: Groundwater and QC Sample Analytical Results, Third Quarter 2023 GW LTM Event

Analyte	Unit	RHMW2254-01	RHMW01R	RHMW02	RHMW03	RHMW04	RHMW05	RHMW06	RHMW08	RHMW08	RHMW08	RHMW09	RHMW09	RHMW10	RHMW10	RHMW11-05	RHMW11-05	RHMW12A	RHMW13-05	RHMW14-03	RHMW15-05	RHMW16	RHMW16	RHMW17	RHMW19	RHMW19	RHMW20	RHMW20	HDMW2253-03
COC ID		RHMW2254-01-WGN01LF-23Q3	RHMW01R-WGN01LF-23Q3	RHMW02-WGN01LF-23Q3	RHMW03-WGN01LF-23Q3	RHMW04-WGN01LF-23Q3	RHMW05-WGN01LF-23Q3	RHMW06-WGN01LF-23Q3	RHMW08-WGN01LF-23Q3	RHMW08-WGN03LF-23Q3	RHMW08-WGFD01LF-23Q3	RHMW09-WGN01LF-23Q3	RHMW09-WGN03LF-23Q3	RHMW10-WGN01LF-23Q3	RHMW10-WGFD01LF-23Q3	RHMW11-05-WGN01G-23Q3	RHMW11-05-WGN03G-23Q3	RHMW12A-WGN01LF-23Q3	RHMW13-05-WGN01G-23Q3	RHMW14-03-WGN01G-23Q3	RHMW15-05-WGN01G-23Q3	RHMW16-WGN01LF-23Q3	RHMW16-WGFD01LF-23Q3	RHMW17-WGN01LF-23Q3	RHMW19-WGN03LF-23Q3	RHMW19-WGN01LF-23Q3	RHMW20-WGN03LF-23Q3	RHMW20-WGN01LF-23Q3	HDMW2253-03-WGN02LF-23Q3
Collection Date		7/3/2023	7/7/2023	7/5/2023	7/5/2023	7/5/2023	7/7/2023	7/5/2023	7/6/2023	9/6/2023	7/6/2023	7/6/2023	9/5/2023	7/5/2023	7/5/2023	7/6/2023	9/6/2023	7/7/2023	7/5/2023	7/7/2023	7/3/2023	7/7/2023	7/7/2023	7/7/2023	9/5/2023	7/6/2023	9/6/2023	7/6/2023	8/11/2023
Sample Type		N	N	N	N	N	N	N	N	N	FD	N	N	N	FD	N	N	N	N	N	N	N	FD	N	N	N	N	N	N
FD Parent Sample		—	—	—	—	—	—	—	—	—	RHMW08-WGN01LF-23Q3	—	—	—	RHMW10-WGN01LF-23Q3	—	—	—	—	—	—	—	RHMW16-WGN01LF-23Q3	—	—	—	—	—	—
		Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Chemicals of Potential Concern																													
Benzene	µg/L	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	—	<0.1 U	<0.1 U
Ethylbenzene	µg/L	<0.1 U	<0.1 U	**0.0862 J**	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	—	<0.1 U	<0.1 U
Toluene	µg/L	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	—	<0.2 U	<0.2 U	—	<0.2 U	<0.2 U	<0.2 U	—	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	—	<0.2 U	—	<0.2 U	<0.2 U
Xylenes	µg/L	<0.1 U	<0.1 U	**0.051 J**	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	—	<0.1 U	<0.1 U
TPH-g (C6-C10)	µg/L	<8.5 U	<8.5 U	**14.4 J+**	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	—	<8.5 U	<8.5 U	—	<8.5 U	<8.5 U	<8.5 U	—	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	—	<8.5 U	—	<8.5 U	<8.5 U
TPH-d (C10-C24) [b]	µg/L	<141 U	**248 J**	**2170**	**63.4 J**	<143 U	<141 U	<141 U	**58.3 J**	—	<143 U	<148 U	—	<144 U	<141 U	<141 U	—	<141 U	<141 U	<141 U	<141 U	<141 U	<141 U	<143 U	—	<145 U	—	<143 U	<141 U
TPH-d (C10-C24) with Silica Gel Cle	µg/L	—	**65.5 J**	**149 J**	<141 U	—	—	—	<143 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<143 U	—	—	—	<143 U	—
TPH-o (C24-C40) [b]	µg/L	<141 U	**75.7 J**	**218 J**	**138 J**	<143 U	<141 U	<141 U	<143 U	—	<143 U	<148 U	—	<144 U	<141 U	<141 U	—	<141 U	<141 U	<141 U	<141 U	<141 U	<141 U	<143 U	—	<145 U	—	**114 J**	<141 U
TPH-o (C24-C40) with Silica Gel Cle	µg/L	—	<141 U	<142 U	<141 U	—	—	—	<143 U	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<143 U	—	—	—	<143 U	—
1-Methylnaphthalene	µg/L	<0.42 U	**1.1**	**0.65 J**	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
2-Methylnaphthalene	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Naphthalene	µg/L	<0.42 U	<0.4 U	**1.2**	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Acenaphthene (SIM)	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Acenaphthylene (SIM)	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Anthracene (SIM)	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Benzo(a)anthracene (SIM)	µg/L	<0.042 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	—	<0.04 U	<0.04 U	—	<0.042 U	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.038 U	—	<0.04 U	—	<0.04 U	—
Benzo(a)pyrene (SIM)	µg/L	<0.042 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	—	<0.04 U	<0.04 U	—	<0.042 U	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.038 U	—	<0.04 U	—	<0.04 U	—
Benzo(b)fluoranthene (SIM)	µg/L	<0.042 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	—	<0.04 U	<0.04 U	—	<0.042 U	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.038 U	—	<0.04 U	—	<0.04 U	—
Benzo(g,h,i)perylene (SIM)	µg/L	<0.042 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	—	<0.04 U	<0.04 U	—	<0.042 U	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.038 U	—	<0.04 U	—	<0.04 U	—
Benzo(k)fluoranthene (SIM)	µg/L	<0.042 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	—	<0.04 U	<0.04 U	—	<0.042 U	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.038 U	—	<0.04 U	—	<0.04 U	—
Chrysene (SIM)	µg/L	<0.083 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.083 U	<0.08 U	—	<0.08 U	<0.08 U	—	<0.083 U	<0.08 U	<0.08 U	—	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.077 U	—	<0.08 U	—	<0.08 U	—
Dibenzo(a,h)anthracene (SIM)	µg/L	<0.042 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	—	<0.04 U	<0.04 U	—	<0.042 U	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.038 U	—	<0.04 U	—	<0.04 U	—
Fluoranthene (SIM)	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Fluorene (SIM)	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Indeno(1,2,3-cd)pyrene (SIM)	µg/L	<0.042 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	—	<0.04 U	<0.04 U	—	<0.042 U	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.038 U	—	<0.04 U	—	<0.04 U	—
Phenanthrene (SIM)	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Pyrene (SIM)	µg/L	<0.42 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	—	<0.4 U	<0.4 U	—	<0.42 U	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.38 U	—	<0.4 U	—	<0.4 U	—
Fuel Additives																													
Phenol	µg/L	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	—	<2 U	<2 U	—	<2 U	<2 U	<2 U	—	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	—	<2 U	—	<2 U	—
2-(2-Methoxyethoxy)-ethanol	µg/L	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	—	<80 UJ	<80 UJ	—	<80 UJ	<80 UJ	<80 UJ	—	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	—	<80 UJ	—	<80 UJ	—
Lead Scavengers																													
1,2-Dibromomethane (Ethylene Dibro	µg/L	—	—	—	<0.0098 U	—	—	—	—	—	—	—	—	—	—	—	—	<0.005 U	—	—	—	—	—	—	—	<0.01 U	—	<0.0049 U	—
1,2-Dichloroethane	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.1 U	—
Natural Attenuation Parameters																													
Methane	µg/L	<0.25 U	**946**	**5270**	**0.23 J**	<0.25 U	<0.25 U	<0.25 U	**1.2**	—	—	**0.34 J**	—	<0.25 U	—	**0.62**	—	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	—	**0.18 J**	—	<0.25 U	—	<0.25 U	—
Iron, Ion (Fe2+)	mg/L	<0.32 U	**0.58 J**	**1.9**	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 UJ	—	—	<0.32 U	—	<0.32 U	—	**0.22 J**	—	<0.32 U	**0.19 J**	<0.32 UJ	<0.32 U	<0.32 UJ	—	<0.32 U	—	<0.32 U	—	<0.32 UJ	—
Nitrate (as N)	mg/L	**2.8**	<0.18 U	**0.084 J**	**9.1**	**2.5**	**1.9**	**2.6**	—	**0.61**	—	—	**0.46**	**1.9**	—	—	<0.12 U	**1.7**	**0.29 J**	**2**	**1.8**	**1.6**	—	**0.75**	**0.39**	—	**0.37**	—	—
Nitrate (as NO_3 anion)[c]	mg/L	**12.4**	—	**0.4 J**	**40.3**	**11.1**	**8.4**	**11.5**	—	**2.7**	—	—	**2**	**8.4**	—	—	—	**7.5**	**1.3 J**	**8.9**	**8**	**7.1**	—	**3.3**	**1.7**	—	**1.6**	—	—
Sulfate (as SO_4)	mg/L	**20**	**4.4**	**3.6**	**49**	**11**	**11**	**93**	**24**	—	—	**9.9**	—	**7.4**	—	**12**	—	**9.2**	**10**	**8.4**	**9.4**	**11**	—	**18**	—	**7.3**	—	**58**	—
Chloride (as Cl)	mg/L	**130 J-**	**46**	**43**	**48**	**81**	**48**	**450**	**120**	—	—	**55**	—	**45**	—	**57**	—	**49**	**49**	**49**	**58 J-**	**70**	—	**43**	—	**46**	—	**480**	—
Nitrogen, Nitrate-Nitrite	mg/L	**0.48 J**	**0.33 J**	<0.09 UJ	**1.9**	**0.48 J**	**0.11 J**	**0.58**	**0.44 J**	—	—	**0.46 J**	—	**0.38 J**	—	**0.3 J**	—	**0.68**	**0.056 J**	**0.94**	**0.3 J**	**0.2 J**	—	<0.09 U	—	<0.09 U	—	**1.8**	—
Alkalinity, Bicarbonate	mg/L	**64**	**86**	**210**	**290**	**78**	**64**	**110**	**110**	—	—	**64**	—	**68**	—	**110**	—	**68**	**95**	**61**	**63**	**55**	—	**110**	—	**67**	—	**100**	—
Alkalinity, Carbonate (as CO_3)	mg/L	<1.7 U	<1.7 U	<1.7 U	<1.7 U	<1.7 U	<1.7 U	<1.7 U	<1.7 U	—	—	<1.7 U	—	<1.7 U	—	<1.7 U	—	<1.7 U	<1.7 U	<1.7 U	<1.7 U	<1.7 U	—	<1.7 U	—	<1.7 U	—	<1.7 U	—
Alkalinity, Total (as $CaCO_3$)	mg/L	**64**	**86**	**210**	**290**	**78**	**64**	**110**	**110**	—	—	**64**	—	**68**	—	**110**	—	**68**	**95**	**61**	**63**	**55**	—	**110**	—	**67**	—	**100**	—
Total Organic Carbon	mg/L	< 1 U	**0.68 J**	**6.5**	**0.97 J**	< 1 U	< 1 U	< 1 U	< 1 U	—	—	< 1 U	—	< 1 U	—	< 1 U	—	< 1 U	< 1 U	< 1 U	**7.9**	< 1 U	—	< 1 U	—	< 1 U	—	< 1 U	—
Dissolved Organic Carbon	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**530 J**	—
General Chemistry																													
Bromide	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**1.2**	—
Fluoride	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.09 U	—
Dissolved Silica	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**61**	—
Total Silica	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**61**	—
Total Calcium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**45400**	—
Total Magnesium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**66700**	—
Total Manganese	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**3.6 J**	—
Total Potassium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**3510 J**	—
Total Sodium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**154000**	—
Field Parameters																													
Total Dissolved Solids	ppm	**360.16**	**206.66**	**350.94**	**492.15**	**249.1**	**209.61**	**1077.26**	**408.1**	—	—	**211.56**	—	**181.56**	—	**262.18**	—	**210.41**	**222.65**	**188.24**	**205.82**	**242.73**	—	**264.19**	**181.73**	—	**1082.32**	—	**296.16**
pH	—	**7.66**	**7.08**	**6.68**	**7.03**	**7.31**	**7.42**	**6.81**	**7.86**	—	—	**7.48**	—	**7.32**	—	**7.93**	—	**8.31**	**7.77**	**7.95**	**7.82**	**7.91**	—	**7.46**	**7.74**	—	**7.24**	—	**6.2**
Specific Conductivity	mS/cm	**0.55**	**0.32**	**0.54**	**0.76**	**0.38**	**0.32**	**1.66**	**0.63**	—	—	**0.33**	—	**0.28**	—	**0.40**	—	**0.32**	**0.34**	**0.29**	**0.32**	**0.37**	—	**0.41**	**0.28**	—	**1.67**	—	**0.46**
Dissolved Oxygen	mg/L	**8.65**	**0.62**	**0.13**	**0.47**	**8.45**	**7.76**	**6.49**	**1.49**	—	—	**8.39**	—	**8.51**	—	**0.77**	—	**5.3**	**0.44**	**1.92**	**1.9**	**8.3**	—	**2.65**	**8.69**	—	**3.73**	—	**0.41**
Turbidity	NTU	**0**	**0**	**0.23**	**0.17**	**0.85**	**0.21**	**0.75**	**16.68**	—	—	**0.24**	—	**0**	—	**0.42**	—	**0.03**	**8.11**	**0.59**	**0.79**	**0.17**	—	**0.27**	**0.74**	—	**0.17**	—	**15**
Temperature	°C	**22.26**	**23.52**	**24.44**	**27.24**	**24.35**	**23.48**	**26.29**	**24.73**	—	—	**24.07**	—	**24.48**	—	**25.11**	—	**25.1**	**26.03**	**25.79**	**28.15**	**25.29**	—	**24.07**	**25.49**	—	**25.71**	—	**23.6**
ORP	mV	**278.61**	**-103.87**	**-219.54**	**0.56**	**209.89**	**283.76**	**200.47**	**-117.5**	—	—	**137.63**	—	**120.72**	—	**-13.18**	—	**176.55**	**121.22**	**190.25**	**166.96**	**196.49**	—	**65.53**	**148.64**	—	**205.16**	—	**-126.3**
Salinity	PSU	**0.27**	**0.15**	**0.26**	**0.37**	**0.19**	**0.16**	**0.85**	**0.31**	—	—	**0.16**	—	**0.13**	—	**0.2**	—	**0.16**	**0.17**	**0.14**	**0.15**	**0.18**	—	**0.2**	**0.13**	—	**0.85**	—	**0.22**

Table A.6: Groundwater and QC Sample Analytical Results, Third Quarter 2023 GW LTM Event (cont'd)

Location		HDMW2253-03	RHP01	RHP01	RHP02	RHP02	RHP03	RHP04A	RHP04B	RHP04C	RHP05	RHP06	RHP06	RHP07	RHP08	NMW24	NMW25	NMW32	NMW32	Trip Blanks										
COC ID		HDMW2253-03-WGN01LF-23Q3	RHP01-WGN03LF-23Q3	RHP01-WGN01LF-23Q3	RHP02-WGN01LF-23Q3	RHP02-WGN03LF-23Q3	RHP03-WGN01LF-23Q3	RHP04A-WGN01LF-23Q3	RHP04B-WGN01LF-23Q3	RHP04C-WGN01LF-23Q3	RHP05-WGN01LF-23Q3	RHP06-WGN01LF-23Q3	RHP06-WGFD01LF-23Q3	RHP07-WGN01LF-23Q3	RHP08-WGN01LF-23Q3	NMW24-WGN01LF-23Q3	NMW25-WGN01LF-23Q3	NMW32-WGN01LF-23Q3	NMW32-WGFD01LF-23Q3	RHMW2254-01-TB01LF-23Q3	NMW24-TB01LF-23Q3	NMW25-TB01LF-23Q3	NMW32-TB01LF-23Q3	RHMW01R-TB01LF-23Q3	RHMW02-TB01LF-23Q3	RHMW03-TB01LF-23Q3	RHMW04-TB01LF-23Q3	RHMW05-TB01LF-23Q3	RHMW06-TB01LF-23Q3	RHMW08-TB01LF-23Q3
Collection Date		7/11/2023	9/6/2023	7/6/2023	7/6/2023	9/6/2023	7/3/2023	7/3/2023	7/3/2023	7/3/2023	7/6/2023	7/24/2023	7/24/2023	7/3/2023	9/11/2023	7/5/2023	7/26/2023	8/29/2023	8/29/2023	7/3/2023	7/5/2023	7/26/2023	8/29/2023	7/7/2023	7/5/2023	7/5/2023	7/5/2023	7/7/2023	7/5/2023	7/6/2023
Sample Type		N	N	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	FD	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB
FD Parent Sample		—	—	—	—	—	—	—	—	—	—	—	RHP06-WGN01LF-23Q3	—	—	—	—	—	NMW32-WGN01LF-23Q3	—	—	—	—	—	—	—	—	—	—	—
Analyte	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Chemicals of Potential Concern																														
Benzene	µg/L	—	—	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U
Ethylbenzene	µg/L	—	—	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	0.0554 J	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U
Toluene	µg/L	—	—	<0.2 U	<0.2 U	—	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.0855 J	<0.2 U	<0.2 U	<0.2 U	<0.2 U	0.203 J	0.222 J	0.108 J	0.092 J	<0.2 U	0.267 J	0.338 J	0.171 J	0.238 J	0.268 J	0.257 J
Xylenes	µg/L	—	—	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U
TPH-g (C6-C10)	µg/L	—	—	<8.5 U	<8.5 U	—	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	3.28 J	<8.5 U	<8.5 U	<8.5 U	4.66 J	5.42 J	5 J	7.16 J	<8.5 U	8.58 J	<8.5 U
TPH-d (C10-C24) [b]	µg/L	—	—	<143 U	<141 U	—	<141 U	<141 U	122 J	47.2 J	<145 U	<141 U	<141 U	<144 U	<141 U	46.3 J	<143 U	<141 U	<141 U	—	—	—	—	—	—	—	—	—	—	—
TPH-d (C10-C24) with Silica Gel Cle	µg/L	—	—	—	—	—	—	—	<141 U	<141 U	—	—	—	—	—	<141 U	—	<141 U	<141 U	—	—	—	—	—	—	—	—	—	—	—
TPH-o (C24-C40) [b]	µg/L	—	—	<143 U	<141 U	—	<141 U	<141 U	251 J	<141 U	<145 U	<141 U	<141 U	<144 U	<141 U	<141 U	<143 U	<141 U	<141 U	—	—	—	—	—	—	—	—	—	—	—
TPH-o (C24-C40) with Silica Gel Cle	µg/L	—	—	—	—	—	—	—	<141 U	<141 U	—	—	—	—	—	<141 U	—	<141 U	<141 U	—	—	—	—	—	—	—	—	—	—	—
1-Methylnaphthalene	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
2-Methylnaphthalene	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Naphthalene	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	0.43 J	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Acenaphthene (SIM)	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Acenaphthylene (SIM)	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Anthracene (SIM)	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)anthracene (SIM)	µg/L	<0.04 U	—	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	—	—	—	—	—	—	—	—	—	—	—
Benzo(a)pyrene (SIM)	µg/L	<0.04 U	—	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	—	—	—	—	—	—	—	—	—	—	—
Benzo(b)fluoranthene (SIM)	µg/L	<0.04 U	—	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	—	—	—	—	—	—	—	—	—	—	—
Benzo(g,h,i)perylene (SIM)	µg/L	<0.04 U	—	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	—	—	—	—	—	—	—	—	—	—	—
Benzo(k)fluoranthene (SIM)	µg/L	<0.04 U	—	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	—	—	—	—	—	—	—	—	—	—	—
Chrysene (SIM)	µg/L	<0.08 U	—	<0.08 U	<0.08 U	—	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	<0.08 U	—	—	—	—	—	—	—	—	—	—	—
Dibenzo(a,h)anthracene (SIM)	µg/L	<0.04 U	—	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	—	—	—	—	—	—	—	—	—	—	—
Fluoranthene (SIM)	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Fluorene (SIM)	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Indeno(1,2,3-cd)pyrene (SIM)	µg/L	<0.04 U	—	<0.04 U	<0.04 U	—	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	<0.04 U	—	—	—	—	—	—	—	—	—	—	—
Phenanthrene (SIM)	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Pyrene (SIM)	µg/L	<0.4 U	—	<0.4 U	<0.4 U	—	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	<0.4 U	—	—	—	—	—	—	—	—	—	—	—
Fuel Additives																														
Phenol	µg/L	<2 U	—	<2.2 U	<2 U	—	<1.9 U	<2 U	<1.9 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	—	—	—	—	—	—	—	—	—	—	—
2-(2-Methoxyethoxy)-ethanol	µg/L	<80 UJ	—	<80 UJ	<80 UJ	—	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	—	—	—	—	—	—	—	—	—	—	—
Lead Scavengers																														
1,2-Dibromomethane (Ethylene Dibro	µg/L	—	—	<0.0098 U	<0.005 U	—	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.005 U	<0.0049 U	—	<0.01 U	<0.0049 U	<0.0098 U	<0.0049 U	<0.0051 U	—	—	<0.0098 U	<0.0049 U	<0.005 U	—	—	<0.01 U	—	—	—	—
1,2-Dichloroethane	µg/L	—	—	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	—	—	—	—	—	—	—
Natural Attenuation Parameters																														
Methane	µg/L	1.9	—	<0.25 U	<0.25 U	—	<0.25 U	<0.25 U	1.5	0.63	<0.25 U	<0.25 U	—	<0.25 U	<0.25 U	<0.25 U	0.19 J	<0.25 U	—	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	0.26 J	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
Iron, Ion (Fe2+)	mg/L	0.73 J-	—	<0.32 UJ	<0.32 U	—	<1 U	<0.32 U	<1 U	<0.32 U	<0.32 UJ	<0.32 U	—	<0.32 U	<0.32 U	<0.32 U	<0.32 U	<0.32 U	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate (as N)	mg/L	1	0.97	—	—	0.79	4.2	4	<0.18 U	0.54	9.3	9.6	—	5.6	0.56	5.1	20	2.9	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate (as NO_3 anion)[c]	mg/L	4.4	4.3	—	—	3.5	18.6	17.7	—	2.4	41.2	42.5	—	24.8	2.5	22.6	88.5	12.8	—	—	—	—	—	—	—	—	—	—	—	—
Sulfate (as SO_4)	mg/L	31	—	62	68	—	42	49 J-	64 J-	100 J-	44	94	—	44	35	27	78	69	—	—	—	—	—	—	—	—	—	—	—	—
Chloride (as Cl)	mg/L	86	—	75	83	—	220 J-	200 J-	110 J-	370 J-	180	220	—	94 J-	130 J-	92	210	160	—	—	—	—	—	—	—	—	—	—	—	—
Nitrogen, Nitrate-Nitrite	mg/L	0.39 J	—	0.18 J	3	—	0.92	0.89	<0.09 UJ	0.068 J	0.36 J	1.8	—	1.2	0.57	1.1	4.1	2.5	—	—	—	—	—	—	—	—	—	—	—	—
Alkalinity, Bicarbonate	mg/L	50	—	150	180	—	180	120	110	81	130	74	—	120	82	150	190	240	—	—	—	—	—	—	—	—	—	—	—	—
Alkalinity, Carbonate (as CO_3)	mg/L	<1.7 U	—	<1.7 U	<1.7 U	—	<1.7 U	<1.7 U	<1.7 U	<1.7 U	<1.7 U	<1.7 U	—	<1.7 U	<7 U	<1.7 U	<1.7 U	<7 U	—	—	—	—	—	—	—	—	—	—	—	—
Alkalinity, Total (as $CaCO_3$)	mg/L	50	—	150	180	—	180	120	110	81	130	74	—	120	82	150	190	240	—	—	—	—	—	—	—	—	—	—	—	—
Total Organic Carbon	mg/L	< 1 U	—	0.56 J	0.71 J	—	< 1 U	< 1 U	6.9	1.2 J	< 1 U	0.94 J	—	0.55 J	1.6 J	< 1 U	0.76 J	1.8 J	—	—	—	—	—	—	—	—	—	—	—	—
Dissolved Organic Carbon	mg/L	—	—	8800	2700	—	7100	640 J	6600	9300 J-	1400	1500 J-	—	1100	1400	990 J	830 J	2200	—	—	—	—	—	—	—	—	—	—	—	—
General Chemistry																														
Bromide	mg/L	—	—	0.31 J	0.3 J	—	0.39 J	0.55	0.26 J	0.88	0.61	0.56	—	0.3 J	0.4 J	0.25 J	0.94	0.61 J	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	mg/L	—	—	<0.09 U	<0.09 U	—	<0.09 U	<0.09 U	<0.09 U	<0.09 U	<0.09 U	<1.8 U	—	<0.09 U	0.29	0.2 J+	<0.09 U	0.047 J	—	—	—	—	—	—	—	—	—	—	—	—
Dissolved Silica	mg/L	—	—	61	51	—	49	56	57	40	57	42	—	52	57 J-	67	52	260 J	—	—	—	—	—	—	—	—	—	—	—	—
Total Silica	mg/L	—	—	60	51	—	48	55	58	40	56	42	—	53	57 J-	68	51	260 J	—	—	—	—	—	—	—	—	—	—	—	—
Total Calcium	µg/L	—	—	27100	35600	—	59100	25100	20400	67400	26600	34900	—	21500	16000	18100	30200	34000	—	—	—	—	—	—	—	—	—	—	—	—
Total Magnesium	µg/L	—	—	28200	33500	—	47200	27200	26500	55300	27100	32600	—	21000	12000	12500	33300	38000	—	—	—	—	—	—	—	—	—	—	—	—
Total Manganese	µg/L	—	—	<2 U	<2 U	—	4 J	2.9 J	98	35.8	1.2 J	34.9	—	4.1 J	11 J	1.8 J	13.2 J	36	—	—	—	—	—	—	—	—	—	—	—	—
Total Potassium	µg/L	—	—	1690 J	2040 J	—	3110 J	2710 J	3670 J	6370 J	2830 J	4150 J	—	1690 J	3000 J	3830 J	5740 J	16000	—	—	—	—	—	—	—	—	—	—	—	—
Total Sodium	µg/L	—	—	53400	53200	—	64600	99400	71100	105000	101000	95800	—	66300	90000	91200	146000 J-	130000 J+	—	—	—	—	—	—	—	—	—	—	—	—
Field Parameters																														
Total Dissolved Solids	ppm	296.16	426.86	—	478.01	—	643.15	602.08	447.81	895.19	576.85	688.87	—	388.13	415.92	409.4	769.27	725.49	—	—	—	—	—	—	—	—	—	—	—	—
pH	—	6.2	6.89	—	6.78	—	7.31	7.55	7.71	7.49	7.42	7.5	—	7.43	8.08	7.07	7.26	8	—	—	—	—	—	—	—	—	—	—	—	—
Specific Conductivity	mS/cm	0.46	0.66	—	0.74	—	0.99	0.93	0.69	1.38	0.89	1.06	—	0.60	0.64	0.63	1.18	1.12	—	—	—	—	—	—	—	—	—	—	—	—
Dissolved Oxygen	mg/L	0.41	7.43	—	7.55	—	3.46	2.27	0.65	0.83	4.72	6.06	—	8.13	2.68	5.77	7.95	5.03	—	—	—	—	—	—	—	—	—	—	—	—
Turbidity	NTU	15	0.09	—	0	—	4.06	9.26	1.24	0.05	0.44	13.59	—	0.02	0.84	0	0.79	9.31	—	—	—	—	—	—	—	—	—	—	—	—
Temperature	°C	23.6	24.72	—	25.65	—	25.78	26.71	26.62	27.02	26.9	26.96	—	23.32	26.86	25.94	27.91	28.72	—	—	—	—	—	—	—	—	—	—	—	—
ORP	mV	-126.3	186.15	—	185.46	—	157.47	-131.69	-279.03	121.66	140.77	73.22	—	269.64	-50.3	129.43	81.58	36.78	—	—	—	—	—	—	—	—	—	—	—	—
Salinity	PSU	0.22	0.32	—	0.36	—	0.49	0.46	0.34	0.7	0.44	0.53	—	0.29	0.31	0.31	0.6	0.56	—	—	—	—	—	—	—	—	—	—	—	—

Table A.6: Groundwater and QC Sample Analytical Results, Third Quarter 2023 GW LTM Event (cont'd)

Location											Trip Blanks													Field Blanks			Equipment Blanks			
COC ID		RHMW09-TB01LF-23Q3	RHMW10-TB01LF-23Q3	RHMW11-05-TB01G-23Q3	RHMW12A-TB01LF-23Q3	RHMW13-05-TB01G-23Q3	RHMW14-03-TB01G-23Q3	RHMW15-05-TB01G-23Q3	RHMW16-TB01LF-23Q3	RHMW17-TB01LF-23Q3	RHMW19-TB01LF-23Q3	RHMW20-TB01LF-23Q3	RHP01-TB01LF-23Q3	RHP02-TB01LF-23Q3	RHP03-TB01LF-23Q3	RHP04A-TB01LF-23Q3	RHP04B-TB01LF-23Q3	RHP04C-TB01LF-23Q3	RHP05-TB01LF-23Q3	RHP06-TB01LF-23Q3	RHP07-TB01LF-23Q3	RHP08-TB01LF-23Q3	HDMW2253-03-TB02LF-23Q3	HDMW2253-03-TB01LF-23Q3	NMW32-FB01LF-23Q3	RHMW09-FB01LF-23Q3	RHMW14-03-FB01G-23Q3	NMW32-EB01LF-23Q3	RHMW09-EB01LF-23Q3	RHMW14-03-EB01G-23Q3	RHP02-EB01LF-23Q3
Collection Date		7/6/2023	7/5/2023	7/6/2023	7/7/2023	7/5/2023	7/7/2023	7/3/2023	7/7/2023	7/7/2023	7/6/2023	7/6/2023	7/6/2023	7/6/2023	7/3/2023	7/3/2023	7/3/2023	7/3/2023	7/6/2023	7/24/2023	7/3/2023	9/11/2023	8/11/2023	7/11/2023	8/29/2023	7/6/2023	7/7/2023	8/29/2023	7/6/2023	7/7/2023	7/6/2023
Sample Type		TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	TB	FB	FB	FB	EB	EB	EB	EB
FD Parent Sample		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Analyte	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Chemicals of Potential Concern																															
Benzene	µg/L	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U
Ethylbenzene	µg/L	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U
Toluene	µg/L	**0.227 J**	**0.256 J**	**0.319 J**	**0.444 J**	**0.28 J**	**0.258 J**	**0.113 J**	**0.271 J**	**0.158 J**	**0.287 J**	**0.398 J**	**0.233 J**	**0.258 J**	**0.299 J**	**0.159 J**	**0.149 J**	**0.482 J**	**0.253 J**	**0.0722 J**	**0.257 J**	<0.2 U	**0.51 J**	—	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<0.2 U
Xylenes	µg/L	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U
TPH-g (C6-C10)	µg/L	**7.4 J**	**4.13 J**	<8.5 U	**4.1 J**	**4.84 J**	**3.72 J**	**4.19 J**	**3.14 J**	<8.5 U	<8.5 U	**3.65 J**	**3.87 J**	**3.95 J**	**7.21 J**	**4.32 J**	**3.91 J**	**4.41 J**	<8.5 U	<8.5 U	**3.21 J**	<8.5 U	<8.5 U	—	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U	<8.5 U
TPH-d (C10-C24) [b]	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<141 U	<141 U	<141 U	**48.8 J**	<150 U	<143 U	<145 U
TPH-d (C10-C24) with Silica Gel Cle	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<141 U	—	—	<143 U	—	—	—
TPH-o (C24-C40) [b]	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**94.9 J**	<141 U	<141 U	<143 U	<150 U	<143 U	<145 U
TPH-o (C24-C40) with Silica Gel Cle	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	**95.1 J**	—	—	<143 U	—	—	—
1-Methylnaphthalene	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
2-Methylnaphthalene	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Naphthalene	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Acenaphthene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Acenaphthylene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Anthracene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Benzo(a)anthracene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.042 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	<0.04 U	<0.04 U
Benzo(a)pyrene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.042 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	<0.04 U	<0.04 U
Benzo(b)fluoranthene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.042 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	<0.04 U	<0.04 U
Benzo(g,h,i)perylene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.042 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	<0.04 U	<0.04 U
Benzo(k)fluoranthene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.042 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	<0.04 U	<0.04 U
Chrysene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.083 U	<0.08 U	<0.08 U	<0.083 U	<0.08 U	<0.08 U	<0.08 U
Dibenzo(a,h)anthracene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.042 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	<0.04 U	<0.04 U
Fluoranthene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Fluorene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Indeno(1,2,3-cd)pyrene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.042 U	<0.04 U	<0.04 U	<0.042 U	<0.04 U	<0.04 U	<0.04 U
Phenanthrene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Pyrene (SIM)	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.42 U	<0.4 U	<0.4 U	<0.42 U	<0.4 U	<0.4 U	<0.4 U
Fuel Additives																															
Phenol	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U	<2 U
2-(2-Methoxyethoxy)-ethanol	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ	<80 UJ
Lead Scavengers																															
1,2-Dibromomethane (Ethylene Dibro	µg/L	—	—	—	<0.005 U	—	—	—	—	—	<0.01 U	<0.0051 U	<0.01 U	<0.005 U	<0.01 U	<0.01 U	<0.0098 U	<0.01 U	<0.0051 U	<0.005 U	<0.0098 U	<0.0049 U	—	—	—	—	—	—	—	—	—
1,2-Dichloroethane	µg/L	—	—	—	—	—	—	—	—	—	—	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	<0.1 U	—	—	<0.1 U	—	—	<0.1 U	—	—	<0.1 U
Natural Attenuation Parameters																															
Methane	µg/L	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	—	<0.25 U	—	—	—	—	—	—	—
Iron, Ion (Fe2+)	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate (as N)	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate (as NO_3 anion)[c]	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfate (as SO_4)	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chloride (as Cl)	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrogen, Nitrate-Nitrite	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Alkalinity, Bicarbonate	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Alkalinity, Carbonate (as CO_3)	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Alkalinity, Total (as $CaCO_3$)	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Organic Carbon	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dissolved Organic Carbon	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General Chemistry																															
Bromide	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Fluoride	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dissolved Silica	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Silica	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Calcium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Magnesium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Manganese	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Potassium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Sodium	µg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Field Parameters																															
Total Dissolved Solids	ppm	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
pH	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Specific Conductivity	mS/cm	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dissolved Oxygen	mg/L	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Turbidity	NTU	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Temperature	°C	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
ORP	mV	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Salinity	PSU	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Table A.6: Groundwater and QC Sample Analytical Results, Third Quarter 2023 GW LTM Event (cont'd)

	Location
	COC ID
	Collection Date
	Sample Type
	FD Parent Sample
Analyte	Unit
Chemicals of Potential Concern	
Benzene	µg/L
Ethylbenzene	µg/L
Toluene	µg/L
Xylenes	µg/L
TPH-g (C6-C10)	µg/L
TPH-d (C10-C24) [b]	µg/L
TPH-d (C10-C24) with Silica Gel Cle	µg/L
TPH-o (C24-C40) [b]	µg/L
TPH-o (C24-C40) with Silica Gel Cle	µg/L
1-Methylnaphthalene	µg/L
2-Methylnaphthalene	µg/L
Naphthalene	µg/L
Acenaphthene (SIM)	µg/L
Acenaphthylene (SIM)	µg/L
Anthracene (SIM)	µg/L
Benzo(a)anthracene (SIM)	µg/L
Benzo(a)pyrene (SIM)	µg/L
Benzo(b)fluoranthene (SIM)	µg/L
Benzo(g,h,i)perylene (SIM)	µg/L
Benzo(k)fluoranthene (SIM)	µg/L
Chrysene (SIM)	µg/L
Dibenzo(a,h)anthracene (SIM)	µg/L
Fluoranthene (SIM)	µg/L
Fluorene (SIM)	µg/L
Indeno(1,2,3-cd)pyrene (SIM)	µg/L
Phenanthrene (SIM)	µg/L
Pyrene (SIM)	µg/L
Fuel Additives	
Phenol	µg/L
2-(2-Methoxyethoxy)-ethanol	µg/L
Lead Scavengers	
1,2-Dibromomethane (Ethylene Dibro	µg/L
1,2-Dichloroethane	µg/L
Natural Attenuation Parameters	
Methane	µg/L
Iron, Ion (Fe2+)	mg/L
Nitrate (as N)	mg/L
Nitrate (as NO_3 anion)[c]	mg/L
Sulfate (as SO_4)	mg/L
Chloride (as Cl)	mg/L
Nitrogen, Nitrate-Nitrite	mg/L
Alkalinity, Bicarbonate	mg/L
Alkalinity, Carbonate (as CO_3)	mg/L
Alkalinity, Total (as $CaCO_3$)	mg/L
Total Organic Carbon	mg/L
Dissolved Organic Carbon	mg/L
General Chemistry	
Bromide	mg/L
Fluoride	mg/L
Dissolved Silica	mg/L
Total Silica	mg/L
Total Calcium	µg/L
Total Magnesium	µg/L
Total Manganese	µg/L
Total Potassium	µg/L
Total Sodium	µg/L
Field Parameters	
Total Dissolved Solids	ppm
pH	—
Specific Conductivity	mS/cm
Dissolved Oxygen	mg/L
Turbidity	NTU
Temperature	°C
ORP	mV
Salinity	PSU

Notes:

Bold text indicates detected value.
Bold and shaded text indicates analyte exceeds the screening criterion.
— = not analyzed or not applicable
°C = degrees Celsius
µg/L = microgram per liter
CAS = Chemical Abstracts Service
COC = chain-of-custody
EB = equipment blank (rinsate)
FB = field blank (source water)
FD = field duplicate
ID = identification
J = estimated value
J- = estimated value, low bias
J+ = estimated value, high bias
mg/L = milligram per liter
mS/cm = millisiemens per centimeter
mV = millivolt
NTU = nephelometric turbidity unit
N = normal (primary) sample
no. = number
ppm = parts per million
PSU= practical salinity unit
QC = quality control
U = nondetect value
R = Rejected
SSRBL = Site-Specific Risk-Based Level
TB = trip blank
TPH-g = total petroleum hydrocarbons-gasoline range organics
TPH-d = total petroleum hydrocarbons-diesel range organics
TPH-o = total petroleum hydrocarbons-residual range organics (i.e., TPH-oil)
[a] SSRBL applies to RHMW01, RHMW02, and RHMW03.
[b] For EPA 8015 TPH-d and TPH-o, analysis of silica gel cleanup extract was performed on samples with TPH-d and/or TPH-o
[c] Nitrate as N result converted to nitrate as NO3 anion by multiplying nitrate result by a factor of 0.2259 (CalEPA 2011).

Appendix B:
Field Activity Documentation

Appendix B.1:
Groundwater Sampling Logs

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	**LTM - CTO 23F0142**	LTM YEAR & QUARTER:	23Q3
WELL NO.	**HDMW2253-03**	LOCATION:	
DATE:	07/11/2023	TIME:	09:17

CLIMATIC CONDITIONS: 72-85F, Drizzle, 75%RH, 14MPH ENE

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
*	* 208.12	* 208.12	None		NM	200	09:25	16.5	2.2K-1k 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:					130		8		22

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark:

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: Comments: NA

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	%	Ambient O_2:	%
Headspace LEL:	%	Ambient LEL:	%
Headspace H_2S:	ppm	Ambient H_2S:	ppm
Headspace CO:	ppm	Ambient CO:	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N6
Gas Detector Type:	Mini Rae	Serial Number:	592-601285
Water Quality Meter Type:	AquaTroll MP	Serial Number:	1034890
Sampling Equipment:	Dedicated bladder pump: QED PFAS-Free		

Appearance of Sample

COLOR: Very light yellow tint

SEDIMENT: None/Clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
HDMW2253-03-TB01LF-23Q3	TB	SGS/Energy	09:30	09:30
HDMW2253-03-WGN01LF-23Q3	N	SGS/Energy/APPL	10:55	11:55

Sampled By: Samples Delivered To: SGS, Energy, APPL Transporter: FedEx

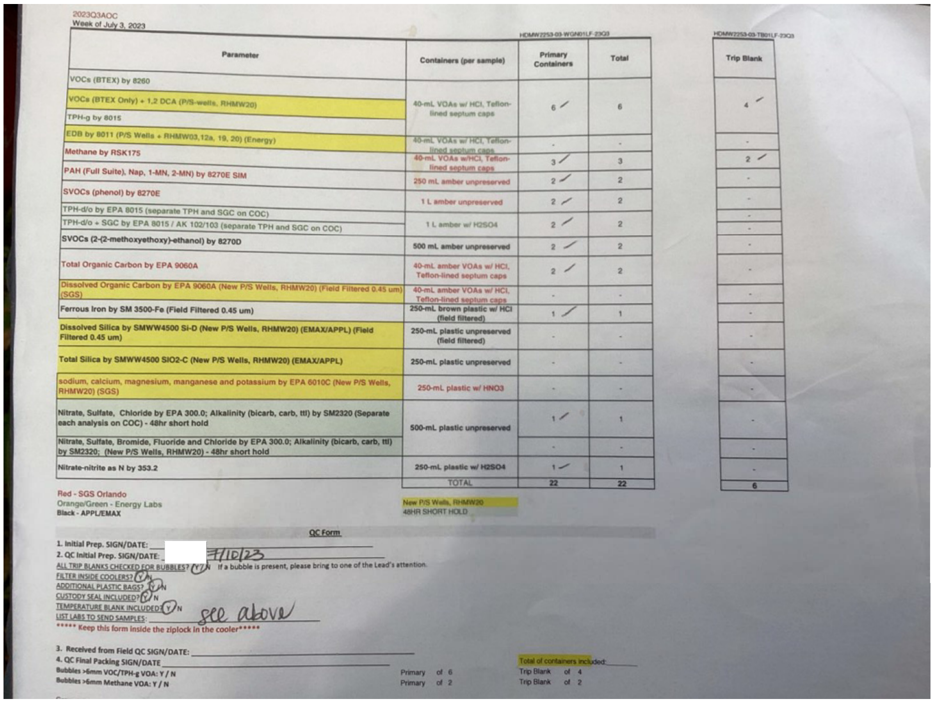
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged tubing + bladder vol. (3.5L) prior to collecting parameters for stabilization.
Logbook reference: LB1p.47-48

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers (HDMW2253-03-WGN01LF-23Q3)	Total	Trip Blank (HDMW2253-03-TB01LF-23Q3)
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2	2	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	22	22	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: [redacted]
2. QC Initial Prep. SIGN/DATE: 7/10/23
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y/N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y/N
CUSTODY SEAL INCLUDED? Y/N
TEMPERATURE BLANK INCLUDED? Y/N
LIST LABS TO SEND SAMPLES: see above
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE:
4. QC Final Packing SIGN/DATE
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N

Primary of 6
Primary of 2

Total of containers included:
Trip Blank of 4
Trip Blank of 2

Back to Top

(b) (6)

Red Hill Groundwater Sampling Log

SAMPLING PROGRAM: **LTM - CTO 23F0142**

WELL NO. **NMW24** LOCATION: Outside

DATE: 07/05/2023 TIME: 08:15

CLIMATIC CONDITIONS: 79°, mostly cloudy, 67% humidity, 13mph NE

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 90.63	* 90.85	* 90.85	None	152.43	NM	275	920	6	2700 2000
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				60	53	10	10	20	20

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Black Mark Top of Casing**

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: % Ambient O_2: %

Headspace LEL: % Ambient LEL: %

Headspace H_2S: ppm Ambient H_2S: ppm

Headspace CO: ppm Ambient CO: ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-6

Gas Detector Type: Multi Rae Serial Number: 592-925476

Water Quality Meter Type: AquaTroll MP Serial Number: 613224

Sampling Equipment: Dedicated Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
NMW24-WGN01LF-23Q3	N	Energy/SGS/APPL	10:35	11:52
NMW24-TB01LF-23Q3	TB	SGS/Energy	08:45	08:50

Sampled By: Samples Delivered To: Energy,SGS, APPL Transporter: FedEx/A

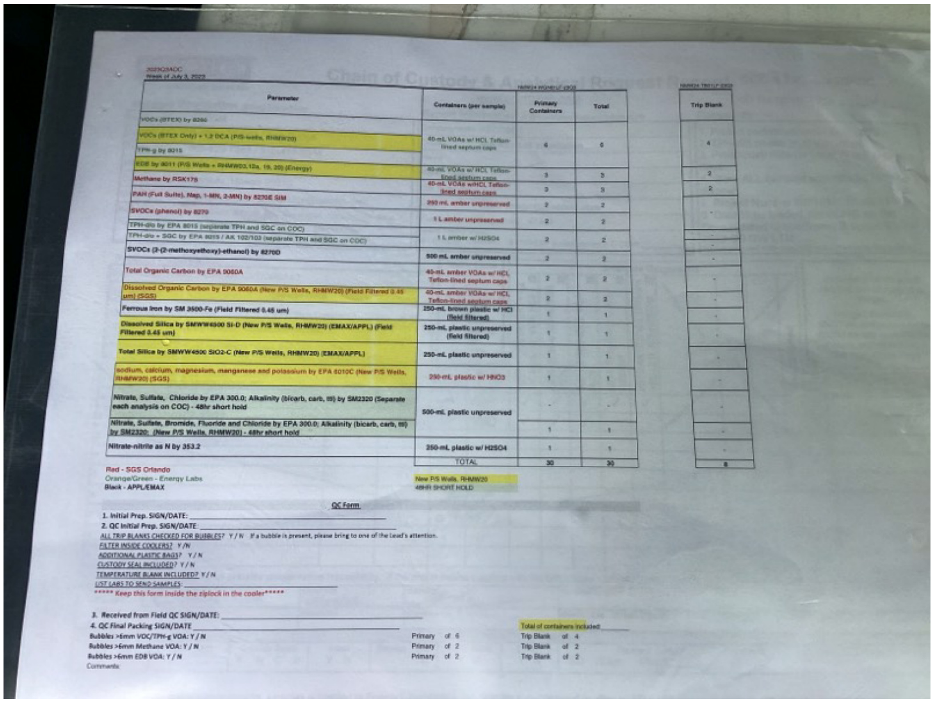
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Logbook reference: LB2p.34-35

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCL Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03, 12a, 19, 20) (Energy)	40-mL VOAs w/ HCL Teflon-lined septum caps	3	3	2
Methane by RSK175	40-mL VOAs w/HCL Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2	2	
TPH-dro by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-dro + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCL, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCL, Teflon-lined septum caps	2	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1	1	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, tll) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, tll) by SM2320: (New P/S Wells, RHMW20) - 48hr short hold		1	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	30	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ______
2. QC Initial Prep. SIGN/DATE: ______

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: ______
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ______
4. QC Final Packing SIGN/DATE ______

Total of containers included ______

Bubbles >6mm VOC/TPH-g VOA: Y / N — Primary of 6 — Trip Blank of 4
Bubbles >6mm Methane VOA: Y / N — Primary of 2 — Trip Blank of 2
Bubbles >6mm EDB VOA: Y / N — Primary of 2 — Trip Blank of 2
Comments

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	LTM - CTO 23F0142	LTM YEAR & QUARTER:	23Q3
WELL NO.	NMW25	LOCATION:	
DATE:	07/26/2023	TIME:	08:55

CLIMATIC CONDITIONS: 74-86F, partly cloudy, 72% humidity, 12mph ENE wind

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
*	* 190.64	* 190.66	None		NM	200	0925	5	2k-0 60ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:					95		16		14

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark:

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: Comments:

Air Readings

Headspace VOCs 0.1 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:		%	Ambient O_2:		%
Headspace LEL:		%	Ambient LEL:		%
Headspace H_2S:		ppm	Ambient H_2S:		ppm
Headspace CO:		ppm	Ambient CO:		ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N5
Gas Detector Type:	Mini Rae	Serial Number:	594-000620
Water Quality Meter Type:	AquaTroll MP	Serial Number:	959874
Sampling Equipment:	Dedicated bladder pump		

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/Clear

ODOR/OTHER: None/Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
NMW25-TB01LF-23Q3	TB	Energy/SGS	09:25	09:25
NMW25-WGN01LF-23Q3	N	Energy/SGS/APPL	10:05	11:25

Sampled By: Samples Delivered To: SGS,Energy,APPL Transporter: FedEx

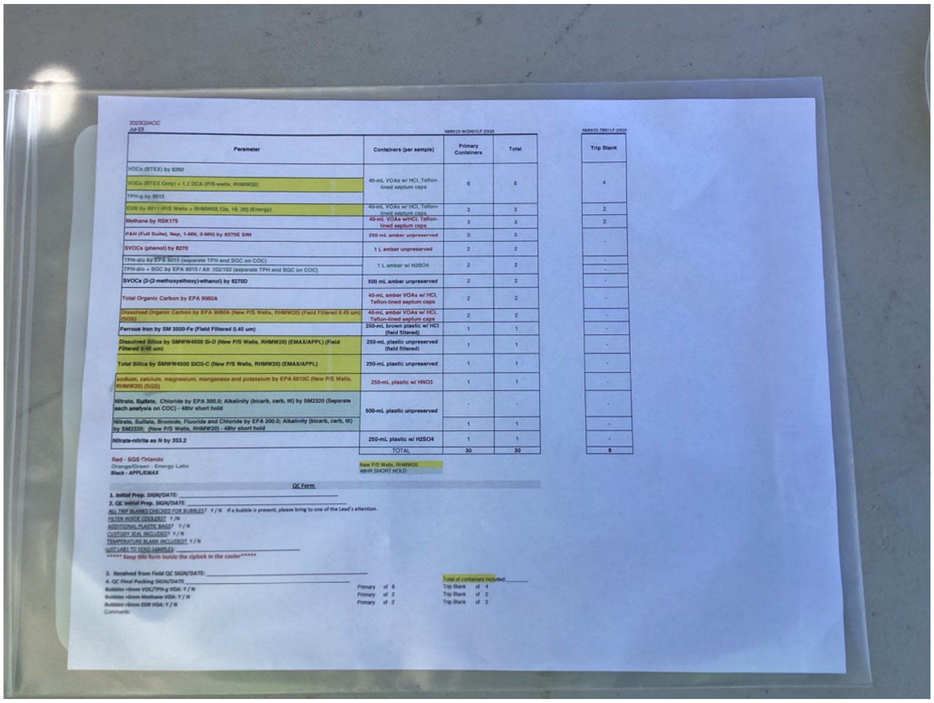
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: PFAS free bailer. Logbook reference: LB2p.47-48

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Jul-23

NMW25-WGN01LF-23Q3 | NMW25-TB01LF-23Q3

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	3	2
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1	1	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		1	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	30	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ______
2. QC Initial Prep. SIGN/DATE ______
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: ______
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ______
4. QC Final Packing SIGN/DATE ______

Total of containers included: ______

Bubbles >6mm VOC/TPH-g VOA: Y / N Primary of 6 Trip Blank of 4
Bubbles >6mm Methane VOA: Y / N Primary of 2 Trip Blank of 2
Bubbles >6mm EDB VOA: Y / N Primary of 2 Trip Blank of 2
Comments:

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Red Hill Groundwater Sampling Log V12

SAMPLING PROGRAM: **RHCP - CTO 23F0142**

LTM YEAR & QUARTER:

WELL NO. **NMW32**

LOCATION:

DATE: 08/29/2023

TIME: 10:25

CLIMATIC CONDITIONS: 82f, Mostly Sunny, occasional light showers, 14mph winds, 62%RH

Depth to groundwater			Depth to Product	Depth to bottom		Purge				
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used	
*	* 170.85	* 170.77	None		NM	200	1240	12	2.2k-700	250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)		
Reference/Actual:					110		9		21	

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark:

Air Readings

Headspace VOCs: 0.0 ppm

Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: %

Ambient O_2: %

Headspace LEL: %

Ambient LEL: %

Headspace H_2S: ppm

Ambient H_2S: ppm

Headspace CO: ppm

Ambient CO: ppm

Bailer Picture

Initial Half Bail: ☐

Camera Serial Number:

Comments:

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst — Serial Number: N-4

Gas Detector Type: Mini Rae — Serial Number: 592-925476

Water Quality Meter Type: AquaTroll MP — Serial Number: 872584

Sampling Equipment: PFAS-Free clear bailer and QED SamplePro bladder pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
NMW32-TB01LF-23Q3	TB	SGS,Energy	12:37	12:37
NMW32-WGN01LF-23Q3	N	SGS,Energy,Eur	13:56	18:10
NMW32-WGFD01LF-23Q3	FD	SGS,Energy,Eur	13:56	18:10
NMW32-EB01LF-23Q3	EB	SGS,Energy,Eur	19:45	20:10
NMW32-FB01LF-23Q3	FB	SGS,Energy,Eur	18:00	15:50

Sampled By:

Samples Delivered To: SGS,Energy,Eurofins,APE

Transporter: FedEx

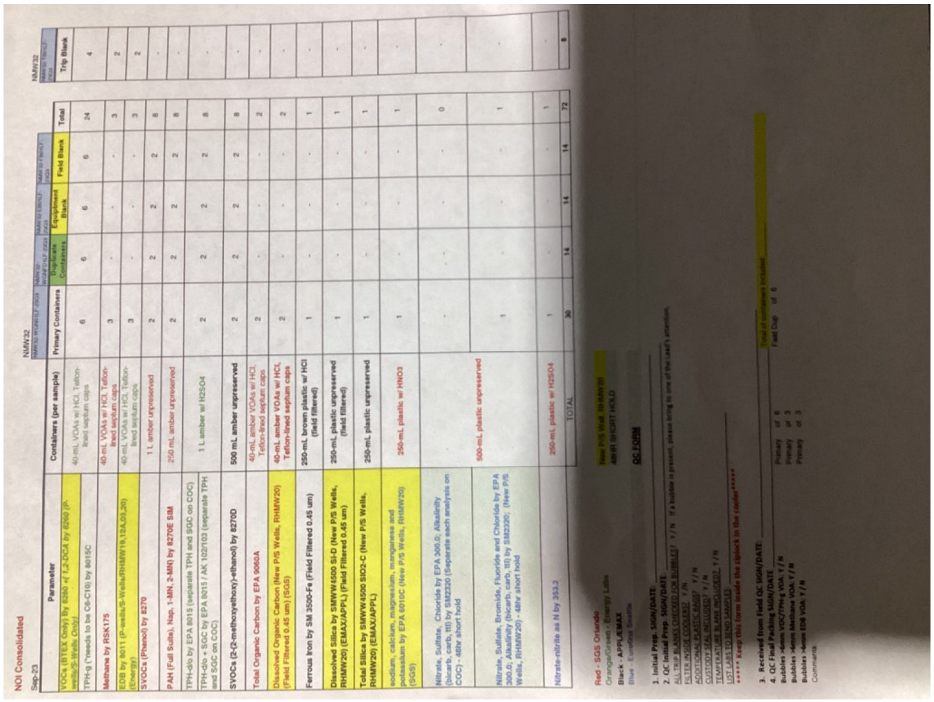
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 6L prior to collecting parameters for stabilization. Logbook reference: LB1p.56-57

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



NOI Consolidated

Sep-23

Parameter	Containers (per sample)	Primary Containers	Duplicate Containers	Equipment Blank	Field Blank	Total	Trip Blank
		NMW32					NMW32
VOCs (BTEX Only) By 8260 +(1,2-DCA by 8260 (P-wells/S-Wells Only)	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	6	6	24	4
TPH-g (*needs to be C6-C10) by 8015C							
Methane by RSK175	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	-	-	-	3	2
EDB by 8011 (P-wells/S-Wells/RHMW19,12A,03,20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	-	-	-	3	2
SVOCs (Phenol) by 8270	1 L amber unpreserved	2	2	2	2	8	-
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	2	2	8	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	2	2	8	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)							
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	2	2	8	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	-	-	-	2	-
Dissolved Organic Carbon (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	-	-	-	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	-	-	-	1	-
Dissolved Silica by SMWW4500 SI-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1	-	-	-	1	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1	-	-	-	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1	-	-	-	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-	-	0	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		1	-	-	-	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	-	-	-	1	-
	TOTAL	30	14	14	14	72	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX
Blue - Eurofins Seattle

New P/S Well: RHMW20
48HR SHORT HOLD

QC FORM

1. Initial Prep. SIGN/DATE: ____
2. QC Initial Prep. SIGN/DATE: ____

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: ____
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ____ Total of containers included ____
4. QC Final Packing SIGN/DATE ____

Bubbles >6mm VOC/TPH-g VOA: Y / N Primary of 6 Field Dup of 6
Bubbles >6mm Methane VOA: Y / N Primary of 3
Bubbles >6mm EDB VOA: Y / N Primary of 3
Comments:

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **Consolidated - CTO 23F** LTM YEAR & QUARTER: 23 Q3

WELL NO. **RHMW01R** LOCATION: Inside

DATE: 07/07/2023 TIME: 13:07

CLIMATIC CONDITIONS: Inside tunnel

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 83.43	* 83.50	* 83.50	None	98.5	NM	200	13:22	6.5	1600 900
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				45	45	30	10	30	50

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Bailer Picture

Initial Half Bail ✔ Camera Serial Number: BRAVO 2 PANA · Comments: Clear, no sheen

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	20.9	%	Ambient O_2:	20.9	%
Headspace LEL:	0	%	Ambient LEL:	0	%
Headspace H_2S:	0	ppm	Ambient H_2S:	0	ppm
Headspace CO:	0	ppm	Ambient CO:	0	ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-3

Gas Detector Type: Multi Rae Serial Number: 5039

Water Quality Meter Type: AquaTroll MP Serial Number: 920480

Sampling Equipment: Dedicated pump and tubing

Appearance of Sample

COLOR: Colorless

SEDIMENT: No sediment

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW01R-TB01LF-23Q3	TB	Energy/SGS	13:45	13:45
RHMW01R-WGN01LF-23Q3	N	Energy/SGS/APPL/	14:10	15:24

Sampled By: Samples Delivered To: Energy/SGS/APPL/EMAX Transporter: FedEx

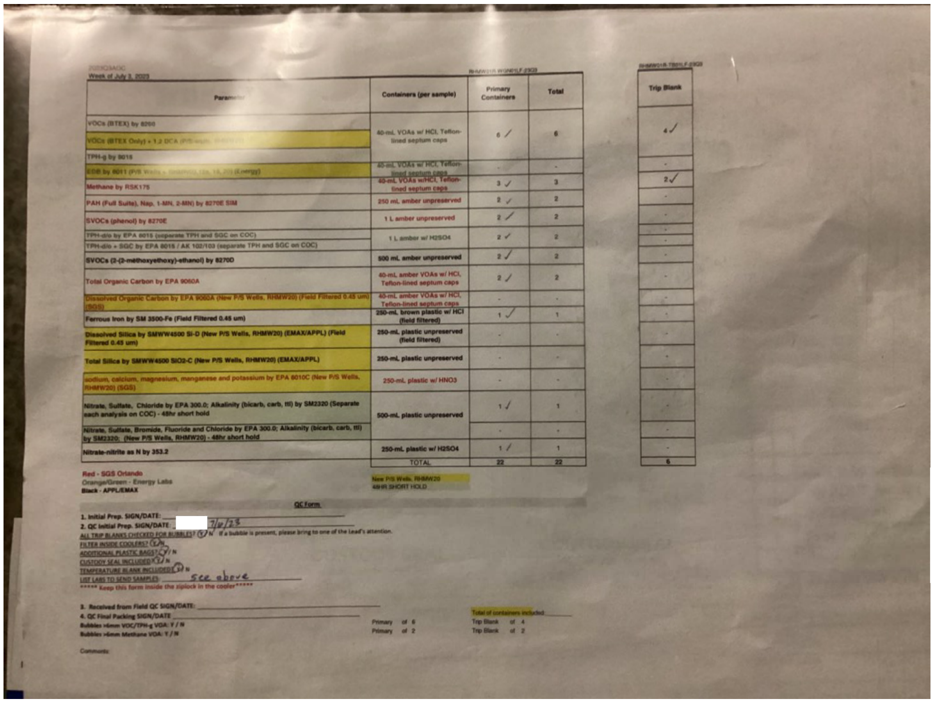
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: 2 L purged before collecting parameters. Logbook reference: LB2p.40-42

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AGC
Week of July 3, 2023

RHMW01R-WGN01LF-23Q3

Parameter	Containers (per sample)	Primary Containers	Total
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6 ✓	6
VOCs (BTEX Only) + 1,2 DCA (P/S wells, [illegible])			
TPH-g by 8015			
EDB by 8011 (P/S Wells + [illegible], 12a, 18, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3 ✓	3
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2 ✓	2
SVOCs (phenol) by 8270E	1 L amber unpreserved	2 ✓	2
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2 ✓	2
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)			
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2 ✓	2
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2 ✓	2
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1 ✓	1
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1 ✓	1
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1 ✓	1
	TOTAL	22	22

RHMW01R-TB01LF-23Q3

Trip Blank
4 ✓
-
2 ✓
-
-
-
-
-
-
-
-
-
-
-
-
-
-
6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ____
2. QC Initial Prep. SIGN/DATE: [redacted] 7/6/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: see above
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ____
4. QC Final Packing SIGN/DATE ____
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N

Primary of 6
Primary of 2

Total of containers included ____
Trip Blank of 4
Trip Blank of 2

Comments:

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM: **RHCP - CTO 23F0142**

LTM YEAR & QUARTER:

WELL NO. **RHMW02**

LOCATION: Inside

CLIMATIC CONDITIONS: Inside tunnel

DATE: 07/05/2023

TIME: 09:15

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 86.56	* 86.86	* 86.86	None	99	NM	200	0935	10.5	2000 / 1000
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				45	50	25	16	35	44

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Bailer Picture

Initial Half Bail ☑ Camera Serial Number: CAM3 Comments: Clear, no sheen, flocculent

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings: N/A

Headspace O_2:	12.1	%	Ambient O_2:	20.9	%
Headspace LEL:	0	%	Ambient LEL:	0	%
Headspace H_2S:	0	ppm	Ambient H_2S:	0	ppm
Headspace CO:	0	ppm	Ambient CO:	0	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-3
Gas Detector Type:	Multi Rae	Serial Number:	5029
Water Quality Meter Type:	AquaTroll MP	Serial Number:	887121
Sampling Equipment:	Disposable Bailer (1.66in x 36in FEP)		

Appearance of Sample

COLOR: Clear

SEDIMENT: None

ODOR/OTHER: Strong sulfuric odor

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW02-TB01LF-23Q3	TB	SGS/Energy	10:10	10:10
RHMW02-WGN01LF-23Q3	N	SGS/Energy/APPL/	10:35	11:50

Sampled By:

Samples Delivered To: Energy, SGS, APPL/EMA

Transporter: FedEx/A

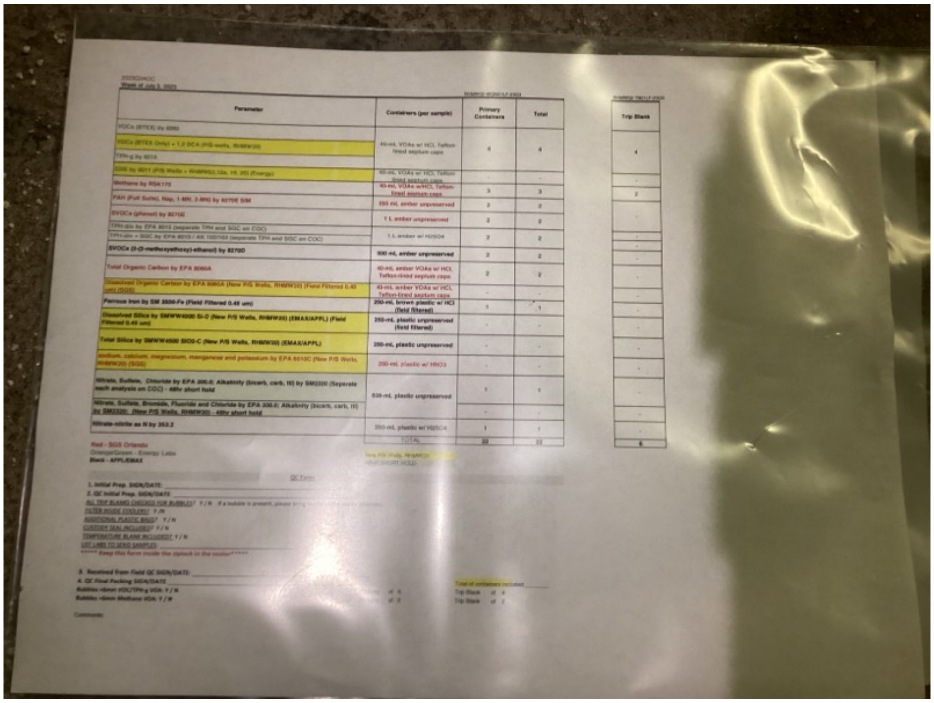
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 1.5L before parameter collection. Logbook reference: LB1p.39-41

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCL Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW[illegible]) (Energy)	40-mL VOAs w/ HCL Teflon-lined septum caps	-	-	-
Methane by RSK175	40-mL VOAs w/HCL Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270D	1 L amber unpreserved	2	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCL, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCL, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, tt) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, tt) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	22	22	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

QC Form

1. Initial Prep. SIGN/DATE:
2. QC Initial Prep. SIGN/DATE
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES:

3. Received from Field QC SIGN/DATE:
4. QC Final Packing SIGN/DATE:

Comments:

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **RHCP - CTO 23F0142**

LTM YEAR & QUARTER:

WELL NO. **RHMW03**

LOCATION: Inside

CLIMATIC CONDITIONS: Inside tunnel

DATE: 07/05/2023

TIME: 12:10

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 102.79	* 103.03	* 103.14	None	117.3	NM	200	12:31	9.5	1000 400
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				53	56	10	13	20	47

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Bailer Picture

Initial Half Bail ✔ Camera Serial Number: CAM3 Comments: No sheen

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	8.8	%	Ambient O_2:	0	%
Headspace LEL:	0	%	Ambient LEL:	0	%
Headspace H_2S:	0	ppm	Ambient H_2S:	0	ppm
Headspace CO:	0	ppm	Ambient CO:	0	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-3
Gas Detector Type:	Multi Rae	Serial Number:	5029
Water Quality Meter Type:	AquaTroll MP	Serial Number:	887121
Sampling Equipment:	Disposable Bailer (1.66in x 36in FEP)		

Appearance of Sample

COLOR: Colorless

SEDIMENT: No sediment

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW03-TB01LF-23Q3	TB	SGS/Energy	12:50	12:50
RHMW03-WGN01LF-23Q3	N	SGS/Energy/APPL	13:20	14:22

Sampled By: Samples Delivered To: SGS/Energy/APPL Transporter: FedEx/A

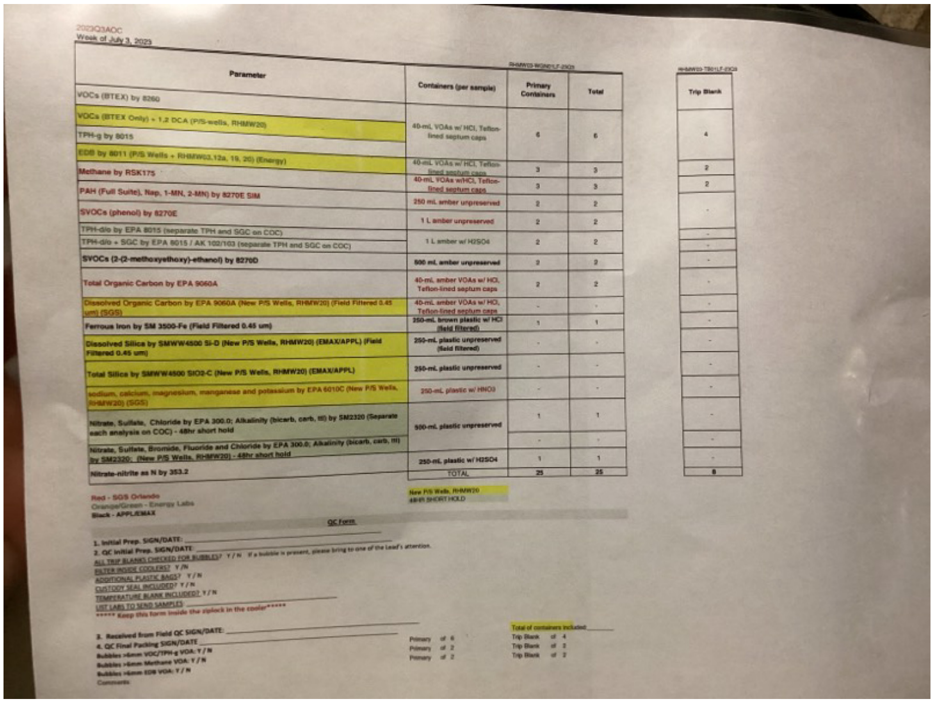
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 1.6L before parameter collection. Logbook reference: LB1p.39-41

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	3	2
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	25	25	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ________
2. QC Initial Prep. SIGN/DATE ________
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: ________
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ________
4. QC Final Packing SIGN/DATE ________
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N
Bubbles >6mm EDB VOA: Y / N
Comments

Primary of 6
Primary of 2
Primary of 2

Total of containers included ______
Trip Blank of 4
Trip Blank of 2
Trip Blank of 2

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	**LTM - CTO 22F0142**	LTM YEAR & QUARTER:	23Q3
WELL NO.	**RHMW04**	LOCATION:	Outside
DATE:	07/05/2023	TIME:	08:25

CLIMATIC CONDITIONS: 75-85F, Mostly cloudy, 12mph ENE, 66%RH

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 294.24	* 294.42	* 294.42	None	305	NM	200	0855	6.5	2.2k-1k 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				130	135	25	20	35	40

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: ______ Comments: ______

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	%	Ambient O_2:	%
Headspace LEL:	%	Ambient LEL:	%
Headspace H_2S:	ppm	Ambient H_2S:	ppm
Headspace CO:	ppm	Ambient CO:	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-4
Gas Detector Type:	Mini Rae	Serial Number:	592-901728
Water Quality Meter Type:	AquaTroll MP	Serial Number:	1034825
Sampling Equipment:	Dedicated bladder pump: QED PFAS-Free		

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW04-TB01LF-23Q3	TB	SGS/Energy	09:00	09:00
RHMW04-WGN01LF-23Q3	N	ALS/SGS/Energy	10:25	11:55

Sampled By: ______ Samples Delivered To: SGS, Energy, ALS Transporter: FedEx/A

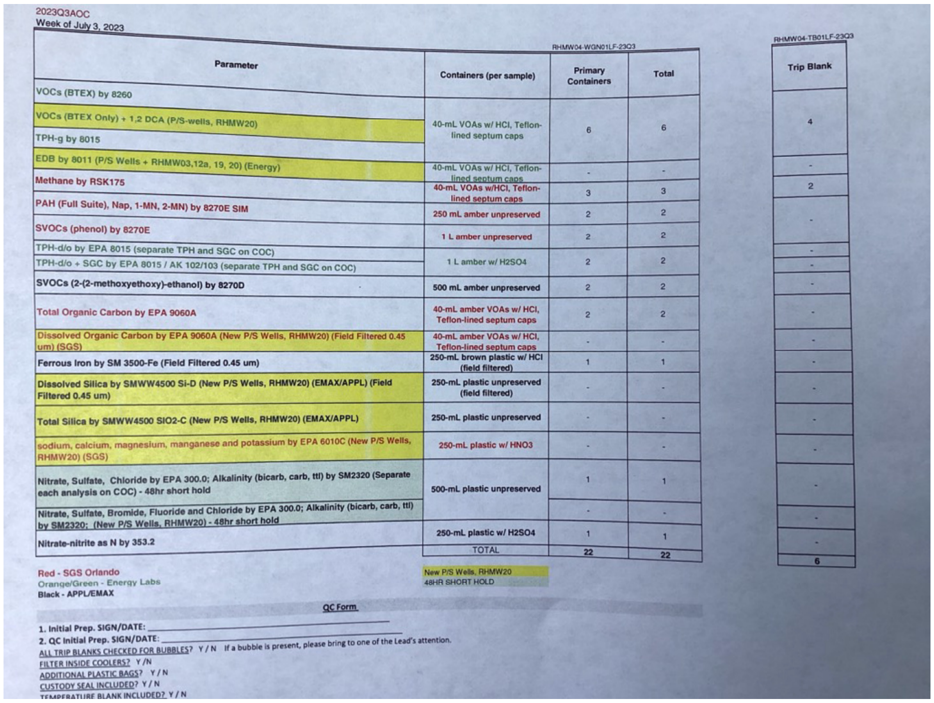
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 3.5L (bladder+tubing vol.) prior to collecting parameters for stabilization.
Logbook reference: LB4p.24-25

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

RHMW04-WGN01LF-23Q3 / RHMW04-TB01LF-23Q3

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	22	22	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ______
2. QC Initial Prep. SIGN/DATE: ______

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	**Consolidated - CTO 23F**	LTM YEAR & QUARTER:	23 Q3
WELL NO.	**RHMW05**	LOCATION:	Inside
DATE:	07/07/2023	TIME:	09:50

CLIMATIC CONDITIONS: In tunnel

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 83.25	* 83.53	* 83.53	None	93	NM	200	10:10	6	1800 / 500
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				45	47	25	13	35	47

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ✔ Camera Serial Number: BRAVO 2 PANA Comments: Clear, no sheen

Air Readings

Headspace VOCs 0.1 ppm Ambient VOCs: 0.1 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	20.9	%	Ambient O_2:	20.9	%
Headspace LEL:	0	%	Ambient LEL:	0	%
Headspace H_2S:	0	ppm	Ambient H_2S:	0	ppm
Headspace CO:	0	ppm	Ambient CO:	0	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-3
Gas Detector Type:	Multi Rae	Serial Number:	5039
Water Quality Meter Type:	AquaTroll MP	Serial Number:	920480
Sampling Equipment:	Dedicated pump and tubing		

Appearance of Sample

COLOR: Colorless

SEDIMENT: No sediment

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW05-TB01LF-23Q3	TB	SGS/Energy	10:15	10:15
RHMW05-WGN01LF-23Q3	N	SGS/Energy/APPL	10:50	17:07

Sampled By: Samples Delivered To: SGS/Energy/APPL Transporter: FedEx/A

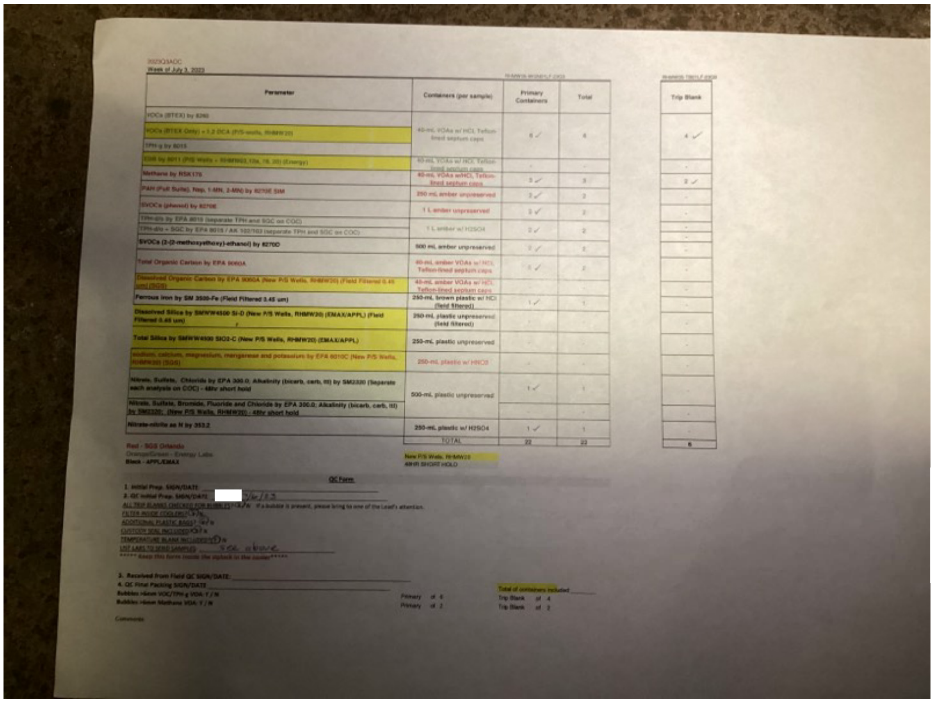
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 2 L before collecting parameters. Logbook reference: LB2p.40-42

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6 ✓	6	4 ✓
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW02, 13a, 18, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3 ✓	3	2 ✓
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2 ✓	2	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2 ✓	2	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H_2SO_4	2 ✓	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2 ✓	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2 ✓	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1 ✓	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO_3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, tt) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1 ✓	1	
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, tt) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H_2SO_4	1 ✓	1	-
	TOTAL	22	22	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE
2. QC Initial Prep. SIGN/DATE [redacted] 7/6/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y/N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y/N
CUSTODY SEAL INCLUDED? Y/N
TEMPERATURE BLANK INCLUDED? Y/N
LIST LABS TO SEND SAMPLES: see above
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE:
4. QC Final Packing SIGN/DATE

Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N

Primary of 6
Primary of 3

Total of containers included
Trip Blank of 4
Trip Blank of 2

Comments:

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	**LTM - CTO 22F0142**	LTM YEAR & QUARTER:	23Q3
WELL NO.	**RHMW06**	LOCATION:	Outside
DATE:	07/05/2023	TIME:	12:10

CLIMATIC CONDITIONS: 75-85F, Mostly cloudy, 12mph ENE, 66%RH

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 241.05	* 241.37	* 241.37	None	363.2	NM	200	1231	6	1k-0 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				115	115	30	12	30	18

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: ______ Comments: ______

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: ______ % Ambient O_2: ______ %

Headspace LEL: ______ % Ambient LEL: ______ %

Headspace H_2S: ______ ppm Ambient H_2S: ______ ppm

Headspace CO: ______ ppm Ambient CO: ______ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-4

Gas Detector Type: Mini Rae Serial Number: 592-901728

Water Quality Meter Type: AquaTroll MP Serial Number: 1034825

Sampling Equipment: Dedicated bladder pump: QED PFAS-Free

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW06-TB01LF-23Q3	TB	SGS/Energy	12:30	12:30
RHMW06-WGN01LF-23Q3	N	ALS/SGS/Energy	13:15	14:20

Sampled By: ______ Samples Delivered To: SGS,Energy,ALS Transporter: FedEx/A

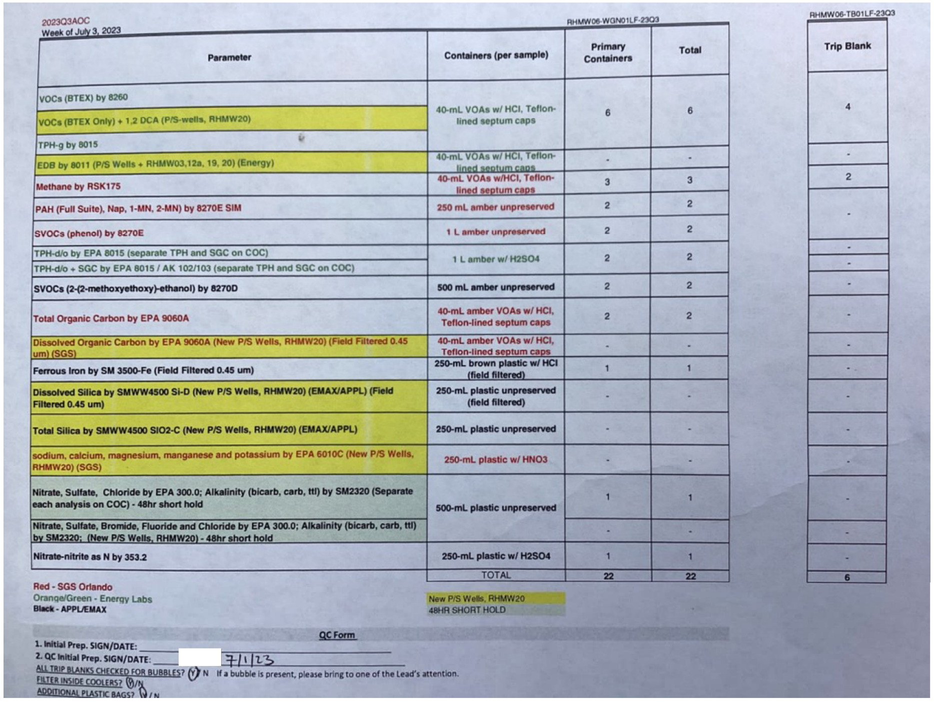
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 3.0L (bladder+tubing vol.) prior to collecting parameters for stabilization.
Logbook reference: LB4p.24-25

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

RHMW06-WGN01LF-23Q3 | RHMW06-TB01LF-23Q3

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	22	22	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ______
2. QC Initial Prep. SIGN/DATE: [redacted] 7/1/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y/N

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(b) (6)

Red Hill Groundwater Sampling Log

SAMPLING PROGRAM	LTM - CTO 23F0142
WELL NO.	RHMW08
DATE:	07/06/2023
LOCATION:	Outside
TIME:	07:55
CLIMATIC CONDITIONS:	78°, 13mph NE, 64% humidity, Partly cloudy - light showers

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 292.52	* 292.91	* 292.91	None	305	NM	200	822	17	2700/140 0/500
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				160	160	16	18	44	42

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	%	Ambient O_2:	%
Headspace LEL:	%	Ambient LEL:	%
Headspace H_2S:	ppm	Ambient H_2S:	ppm
Headspace CO:	ppm	Ambient CO:	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-4
Gas Detector Type:	Multi Rae	Serial Number:	592-908187
Water Quality Meter Type:	AquaTroll MP	Serial Number:	1034825
Sampling Equipment:	Dedicated Low Flow Bladder Pump		

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW08-WGN01LF-23Q3	N	Energy/SGS/APPL	09:55	11:54
RHMW08-TB01LF-23Q3	TB	SGS/Energy	08:00	08:05
RHMW08-WGFD01LF-23Q3	FD	SGS/Energy/APPL	09:55	11:54

Sampled By: Samples Delivered To: Energy,SGS, APPL Transporter: FedEx/A

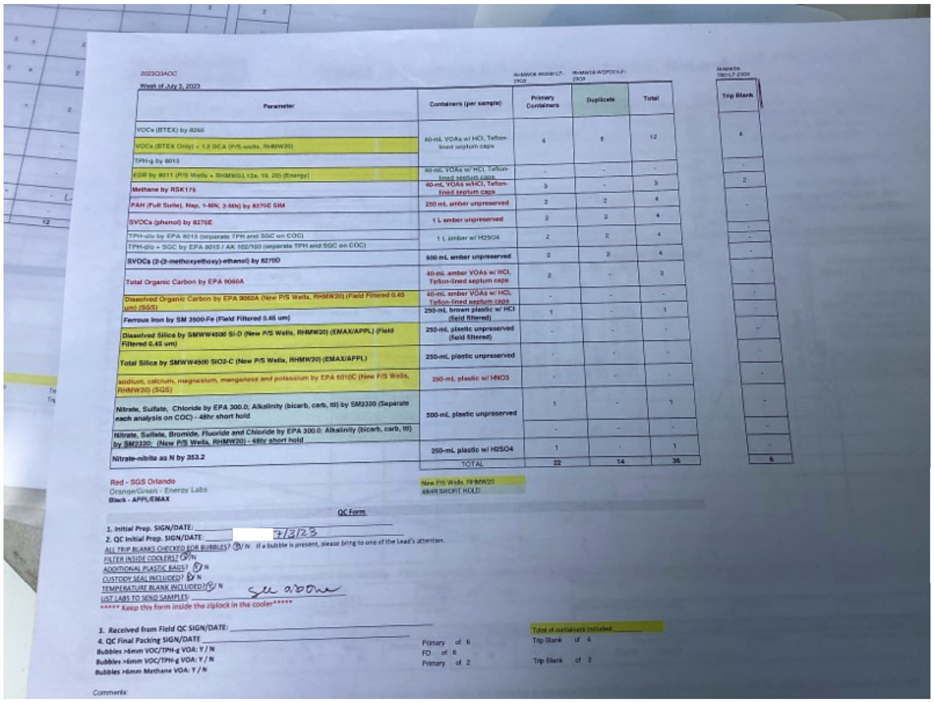
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Logbook reference: LB4p.26-28

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC

Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Duplicate	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	12	4
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)					
TPH-g by 8015					-
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	-	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	4	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2	2	4	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	4	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)					-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	4	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	-	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	-	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1	-	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	-	1	-
	TOTAL	22	14	36	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ____
2. QC Initial Prep. SIGN/DATE: [redacted] 7/3/23
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y/N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y/N
CUSTODY SEAL INCLUDED? Y/N
TEMPERATURE BLANK INCLUDED? Y/N
LIST LABS TO SEND SAMPLES: see above
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ____
4. QC Final Packing SIGN/DATE ____
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N

Primary of 6
FD of 6
Primary of 2

Total of containers included ____
Trip Blank of 4
Trip Blank of 2

Comments:

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **LTM - CTO 23F0142** LTM YEAR & QUARTER: 23Q3

WELL NO. **RHMW09** LOCATION: Outside CLIMATIC CONDITIONS: 73-83F, Mostly sunny, 11mph ENE, 75%RH

DATE: 07/06/2023 TIME: 08:15

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 377.71	* 377.97	* 377.97	None	396.69	NM	200	0845	10	2.2k-900 / 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				200	185	30	20	30	40

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: Comments:

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: % Ambient O_2: %

Headspace LEL: % Ambient LEL: %

Headspace H_2S: ppm Ambient H_2S: ppm

Headspace CO: ppm Ambient CO: ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-6

Gas Detector Type: Mini Rae Serial Number: 592-601285

Water Quality Meter Type: AquaTroll MP Serial Number: 920480

Sampling Equipment: Dedicated bladder pump: QED PFAS-Free

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW09-TB01LF-23Q3	TB	SGS,Energy	08:40	08:40
RHMW09-WGN01LF-23Q3	N	SGS,Energy,APPL	09:35	10:55
RHMW09-FB01LF-23Q3	FB	SGS,Energy,APPL	08:50	09:05
RHMW09-EB01LF-23Q3	EB	SGS,Energy,APPL	09:30	10:00

Sampled By: Samples Delivered To: SGS, Energy, APPL Transporter: FedEx/A

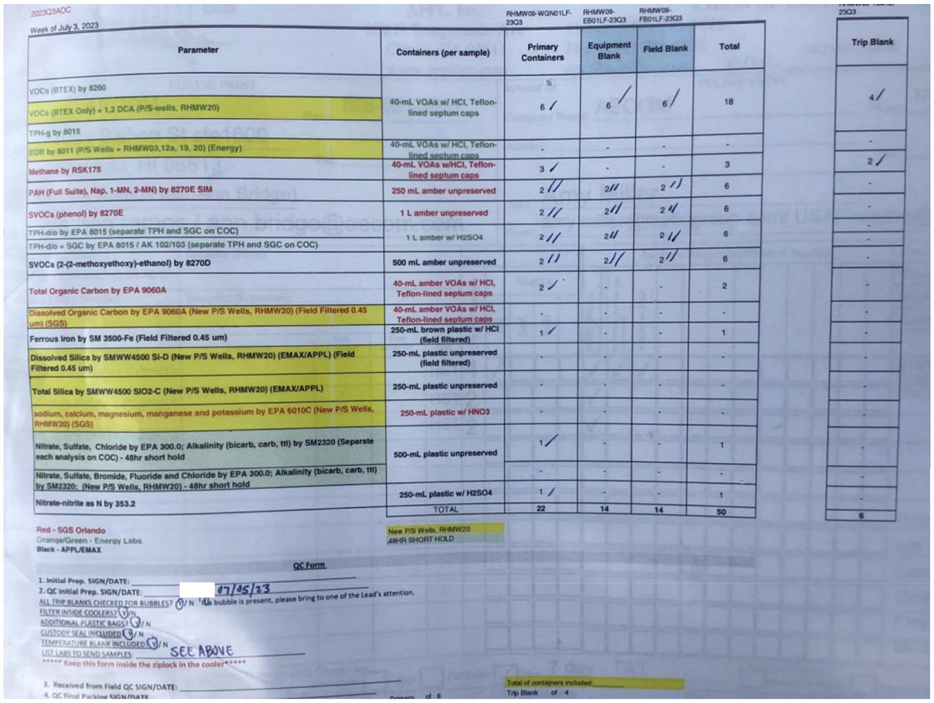
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 4.5L (bladder+tubing vol.) prior to collecting parameters for stabilization.
Logbook reference: LB1p.42-44

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC

Week of July 3, 2023

Parameter	Containers (per sample)	RHMW09-WGN01LF-23Q3 Primary Containers	RHMW09-EB01LF-23Q3 Equipment Blank	RHMW09-FB01LF-23Q3 Field Blank	Total	23Q3 Trip Blank
VOCs (BTEX) by 8260 VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20) TPH-g by 8015	40-mL VOAs w/ HCl, Teflon-lined septum caps	6 ✓	6 ✓	6 ✓	18	4 ✓
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3 ✓	-	-	3	2 ✓
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2 ✓✓	2 ✓✓	2 ✓✓	6	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2 ✓✓	2 ✓✓	2 ✓✓	6	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC) TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2 ✓✓	2 ✓✓	2 ✓✓	6	- -
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2 ✓✓	2 ✓✓	2 ✓✓	6	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2 ✓	-	-	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1 ✓	-	-	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1 ✓	-	-	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1 ✓	-	-	1	-
	TOTAL	22	14	14	50	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ____________
2. QC Initial Prep. SIGN/DATE: [redacted] 07/05/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: SEE ABOVE
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ____________
4. QC Final Packing SIGN/DATE ____________

Primary of 6

Total of containers included: ________
Trip Blank of 4

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(b) (6)

Red Hill Groundwater Sampling Log

SAMPLING PROGRAM: LTM - CTO 23F0142

WELL NO. RHMW10

LOCATION: Outside

DATE: 07/05/2023

TIME: 12:55

CLIMATIC CONDITIONS: 81°, partly cloudy, 14mph NE, 66% humidity

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 477.74	* 477.99	* 477.99	None	497.37	NM	275	1326	10.5	2000/140 0/700

Pump settings:	Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:	250	240	20	20	40	40

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Air Readings

Headspace VOCs: 0.0 ppm

Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: ____ %

Ambient O_2: ____ %

Headspace LEL: ____ %

Ambient LEL: ____ %

Headspace H_2S: ____ ppm

Ambient H_2S: ____ ppm

Headspace CO: ____ ppm

Ambient CO: ____ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst — Serial Number: N-6

Gas Detector Type: Multi Rae — Serial Number: 592-925476

Water Quality Meter Type: AquaTroll MP — Serial Number: 613224

Sampling Equipment: PFAS Free Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW10-WGN01LF-23Q3	N	APPL/SGS/Energy	14:25	15:37
RHMW10-WGFD01LF-23Q3	FD	APPL/SGS/Energy	14:25	15:37
RHMW10-TB01LF-23Q3	TB	SGS/Energy	13:15	13:20

Sampled By: ____

Samples Delivered To: Energy, SGS, APPL

Transporter: FedEx/A

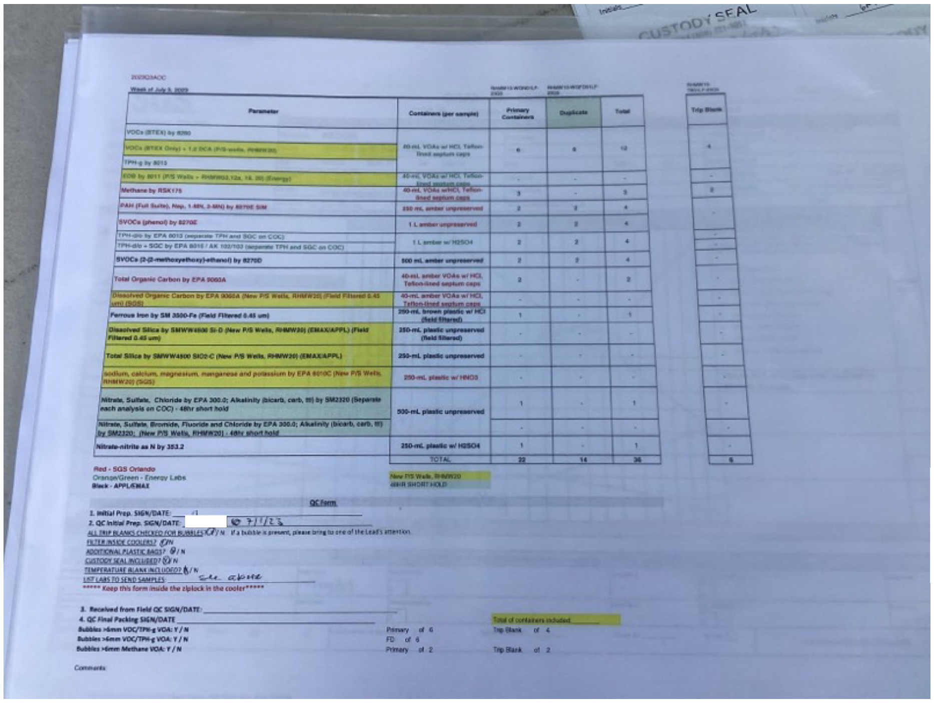
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Logbook reference: LB2p.34-35

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Duplicate	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	12	4
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)					
TPH-g by 8015					
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	-	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	4	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2	2	4	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	4	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)					-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	4	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	-	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	-	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1	-	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	-	1	-
	TOTAL	22	14	36	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ____
2. QC Initial Prep. SIGN/DATE: [redacted] 7/1/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y/N
TEMPERATURE BLANK INCLUDED? Y/N
LIST LABS TO SEND SAMPLES: see above

***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ____
4. QC Final Packing SIGN/DATE ____

Total of containers included ____

Bubbles >6mm VOC/TPH-g VOA: Y / N — Primary of 6 — Trip Blank of 4
Bubbles >6mm VOC/TPH-g VOA: Y / N — FD of 6
Bubbles >6mm Methane VOA: Y / N — Primary of 2 — Trip Blank of 2

Comments:

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(b) (6)

(b) (6)

Westbay Well Groundwater Sampling

Field Data Sheet

Project: 60571032 Red Hill

Monitoring Well No.: RHMW11

Sampling Zone No(s).: 5

Sampled by:

Ambient VOCs (ppm): 0.0

Headspace VOCs (ppm): 0.0

Start Time: 09:02 Atm. Reading: 14.8

End Time: 14:10 Atm. Reading: 14.8

Date: 7/6/2023

Sheet: 1 of 2

Sampling Equipment: EMS 5551

Sample Information

Sample ID	Lab	Type	Start	End
RHMW11-05-WGN01G-23Q3	SGS/Energy/APPL	N	09:20	14:10
RHMW11-05-TB01G-23Q3	SGS/Energy	TB	08:15	08:15

Appearance of Sample

Color: Clear

Sediment: None

Other: Slight hydrocarbon odor

Time	Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)								VOCs (ppm)	Comments (volume recovered)
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)		
09:02	5	1	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.86	✔	55.19	✔	55.19	✔	✔	60.86	0.8	parameters, methane,
09:21	5	2	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.84	✔	55.19	✔	55.19	✔	✔	60.83	0.9	- - -
09:40	5	3	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.84	✔	55.19	✔	55.19	✔	✔	60.82	0.2	- - -
10:05	5	4	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.83	✔	55.19	✔	55.19	✔	✔	60.80	0.0	- - -
10:25	5	5	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.78	✔	55.19	✔	55.19	✔	✔	60.79	0.0	Ferrous Iron
10:45	5	6	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.72	✔	55.19	✔	55.19	✔	✔	60.76	0.0	Parameters, ferrous ir
11:10	5	7	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.74	✔	55.19	✔	55.19	✔	✔	60.74	0.0	PAHs,
11:33	5	8	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.73	✔	55.19	✔	55.19	✔	✔	60.72	0.0	TPH, SVOC
11:55	5	9	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.70	✔	55.18	✔	55.18	✔	✔	60.70	0.0	SVOC
12:19	5	10	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.69	✔	55.19	✔	55.19	✔	✔	60.68	0.0	SVOC
12:42	5	11	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.67	✔	55.19	✔	55.19	✔	✔	60.67	0.0	SVOC
13:07	5	12	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.64	✔	55.19	✔	55.18	✔	✔	60.66	0.0	SVOC, nitrates
13:29	5	13	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	60.64	✔	55.19	✔	55.18	✔	✔	60.62	0.0	EPA by 300 (Short ho
13:51	5	14	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	59.64	✔	55.19	✔	55.18	✔	✔	59.62	0.0	Parameters

Notes Dashed line indicates that we filled the other programs bottles. Here, we filled the consolidated VOAs. Logbook reference: LB3p.35-37

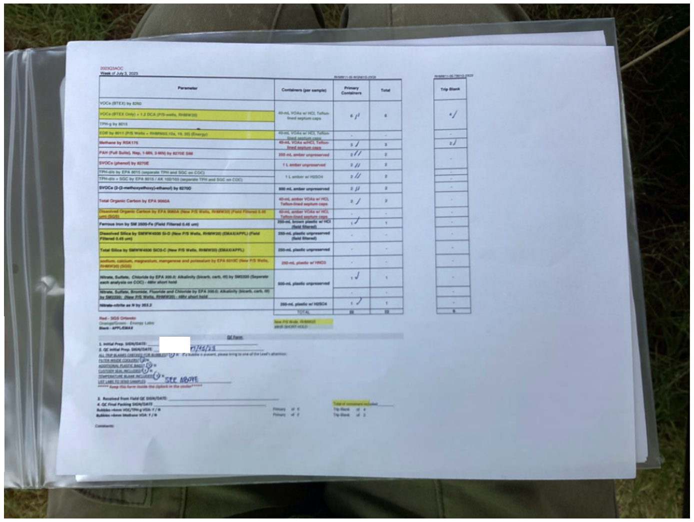
(b) (6)

Westbay Well Groundwater Sampling

Field Data Sheet

Time	Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)								VOCs (ppm)	Comments (volume recovered)
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)		

Bottle Count: Click in the box to the right and take a picture of the bottle count on top of the cooler



Bottle Count Notes:

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **LTM - CTO 23F0142**
LTM YEAR & QUARTER: 23Q3

WELL NO. **RHMW12A**
LOCATION: Outside

CLIMATIC CONDITIONS: 71-83F, Drizzle, 14mph ENE, 69%RH

DATE: 07/07/2023
TIME: 08:10

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 220.69	* 220.86	* 220.86	None	433	NM	200	0903	10	2.2k-0 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				140	150	40	10	20	20

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: ______ Comments: ______

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	%	Ambient O_2:	%
Headspace LEL:	%	Ambient LEL:	%
Headspace H_2S:	ppm	Ambient H_2S:	ppm
Headspace CO:	ppm	Ambient CO:	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-6
Gas Detector Type:	Mini Rae	Serial Number:	592-908187
Water Quality Meter Type:	AquaTroll MP	Serial Number:	1034825
Sampling Equipment:	Dedicated Bladder Pump: QED PFAS-Free		

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW12A-TB01LF-23Q3	TB	SGS/Energy	08:25	08:25
RHMW12A-WGN01LF-23Q3	N	SGS/Energy/APPL	09:30	11:02

Sampled By: ______ Samples Delivered To: SGS, Energy, APPL Transporter: FedEx

DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 5.5L (bladder+tubing vol.) prior to collecting parameters for stabilization.
Logbook reference: LB4p.29-31

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:

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(b) (6)

Westbay Well Groundwater Sampling

Field Data Sheet

Project: 60571032 Red Hill

Monitoring Well No.: RHMW13

Sampling Zone No(s).: 5a

Sampled by:

Ambient VOCs (ppm): 0.0

Headspace VOCs (ppm): 0.0

Start Time: 09:30 Atm. Reading: 14.7

End Time: 16:50 Atm. Reading: 14.7

Date: 7/5/2023

Sheet: 1 of 2

Sampling Equipment: EMS5551

Sample Information

Sample ID	Lab	Type	Start	End
RHMW13-05-WGN01G-23Q3	Energy/SGS/APPL	N	10:00	16:50
RHMW13-05-TB01G-23Q3	SGS/Energy	TB	08:20	08:20

Appearance of Sample

Color: Clear

Sediment: None

Other: No odor

Time	Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)								VOCs (ppm)	Comments (volume recovered)
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)		
09:33	5a	1	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	14.97	✔	14.99	✔	✔	14.88	0.0	VOAs, parameters
10:01	5a	2	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	14.97	✔	14.99	✔	✔	14.88	0.0	Voas
10:28	5a	3	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	15.00	✔	14.99	✔	✔	14.89	0.0	PAH, 8270D
10:55	5a	4	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	15.00	✔	14.99	✔	✔	14.89	0.0	-
11:21	5a	5	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	14.99	✔	14.99	✔	✔	14.88	0.0	Phenol
11:51	5a	6	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.93	✔	14.99	✔	✔	14.88	0.0	Phenol
12:18	5a	7	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.94	✔	14.99	✔	✔	14.88	0.0	TPH
12:44	5a	8	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.91	✔	14.99	✔	✔	14.88	0.0	TPH, nitrate-nitrite, Fe
13:12	5a	9	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.80	✔	14.96	✔	14.99	✔	✔	14.88	0.0	Parameters, ferrous ir
13:38	5a	10	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.93	✔	14.99	✔	✔	14.88	0.0	PAH
14:05	5a	11	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.96	✔	14.99	✔	✔	14.88	0.0	-
14:33	5a	12	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.93	✔	14.99	✔	✔	14.88	0.0	SVOC
14:58	5a	13	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.91	✔	14.98	✔	✔	14.86	0.0	SVOC
15:24	5a	14	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.91	✔	14.98	✔	✔	14.86	0.0	SVOC, tph
15:48	5a	15	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.77	✔	14.92	✔	14.98	✔	✔	14.86	0.0	TPH, EPA by 300
16:14	5a	16	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.78	✔	14.93	✔	14.98	✔	✔	14.85	0.0	Parameters, EPA by 3

Notes Logbook reference: LB3p.33-34

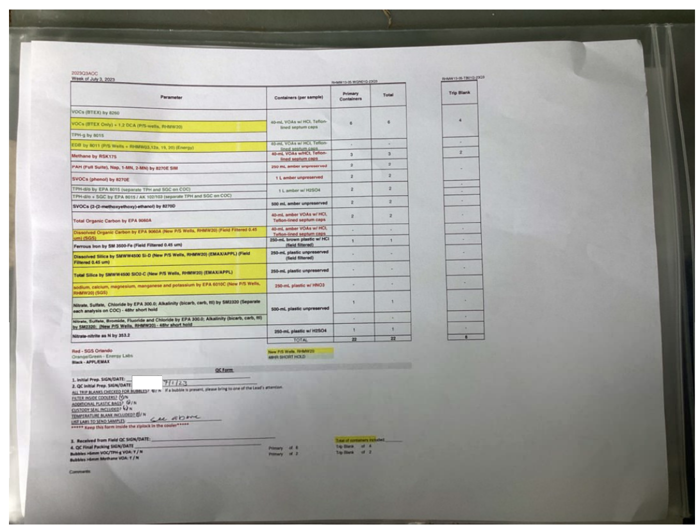
(b) (6)

Westbay Well Groundwater Sampling

Field Data Sheet

Time	Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)								VOCs (ppm)	Comments (volume recovered)
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)		

Bottle Count: Click in the box to the right and take a picture of the bottle count on top of the cooler



Bottle Count Notes:

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(b) (6)

Westbay Well Groundwater Sampling

Field Data Sheet

Project: 60571032 Red Hill

Monitoring Well No.: RHMW14

Sampling Zone No(s).: 3

Sampled by:

Ambient VOCs (ppm): 0.0

Headspace VOCs (ppm): 0.0

Start Time: 08:45 Atm. Reading: 14.8

End Time: 12:30 Atm. Reading:

Date: 7/7/2023

Sheet: of

Sampling Equipment: EMS 5551

Sample Information

Sample ID	Lab	Type	Start	End
RHMW14-03-TB01G-23Q3	SGS, Energy	TB	08:00	08:00
RHMW14-03-EB01G-23Q3	SGS, Energy, APPL	EB	08:05	08:10
RHMW14-03-FB01G-23Q3	SGS, Energy, APPL	FB	08:10	08:15
RHMW14-03-WGN01G-23Q3	SGS, Energy, APPL	N	09:00	12:30

Appearance of Sample

Color: Colorless

Sediment: Clear

Other: Odorless

Time	Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)								VOCs (ppm)	Comments (volume recovered)
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)		
08:45	3	1	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.30	✔	85.40	✔	85.41	✔	✔	84.27	0.0	Parameters, VOAs
09:55	3	5	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.20	✔	85.40	✔	85.41	✔	✔	84.20	0.0	Field filters
10:12	3	6	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.14	✔	85.40	✔	85.41	✔	✔	84.16	0.0	Parameters, PAHs, SV
10:25	3	7	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.11	✔	85.39	✔	85.41	✔	✔	84.14	0.0	SVOCs, Phenol
10:45	3	8	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.07	✔	85.39	✔	85.39	✔	✔	84.12	0.0	Phenol
11:00	3	9	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.09	✔	85.40	✔	85.41	✔	✔	84.10	0.0	Phenol, TPH
11:17	3	10	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.11	✔	85.39	✔	85.41	✔	✔	84.07	0.0	TPH
11:34	3	11	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.12	✔	85.39	✔	85.41	✔	✔	84.05	0.0	TPH, Nitrates
11:55	3	12	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	84.04	✔	85.39	✔	85.40	✔	✔	84.05	0.0	EPA 300, Alkalinity
12:15	3	13	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	83.07	✔	85.40	✔	85.40	✔	✔	83.04	0.0	Parameters

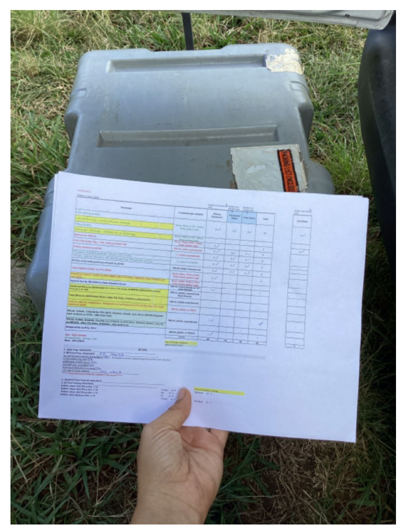
Notes Logbook reference: LB3p.38-39

Westbay Well Groundwater Sampling

Field Data Sheet

			Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)									
Time	Port No.	Run No.	Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)	VOCs (ppm)	Comments (volume recovered)

Bottle Count: Click in the box to the right and take a picture of the bottle count on top of the cooler



Bottle Count Notes:

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(b) (6)

Westbay Well Groundwater Sampling

Field Data Sheet

Project: 60571032 Red Hill

Monitoring Well No.: RHMW15

Sampling Zone No(s).: 5a

Sampled by:

Ambient VOCs (ppm): 0.0

Headspace VOCs (ppm): 0.0

Start Time: 09:23 Atm. Reading: 14.7

End Time: 14:20 Atm. Reading: 14.7

Date: 7/3/2023

Sheet: 1 of 2

Sampling Equipment: EMS5551

Sample Information

Sample ID	Lab	Type	Start	End
RHMW15-05-TB01G-23Q3	Energy/SGS	TB	08:25	08:25
RHMW15-05-WGN01G-23Q3	APPL/Energy/SGS	N	09:45	17:10

Appearance of Sample

Color: Clear

Sediment: None

Other: None

Time	Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)								VOCs (ppm)	Comments (volume recovered)
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)		
09:24	5a	1	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.83	✔	17.21	✔	17.24	✔	✔	14.86	0.0	Parameters, VOAS
10:02	5a	2	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.84	✔	17.23	✔	17.24	✔	✔	14.85	0.0	VOAS,
10:25	5a	3	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.83	✔	17.19	✔	17.23	✔	✔	14.85	0.0	TOC, pah
10:56	5a	4	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.83	✔	17.21	✔	17.23	✔	✔	14.85	0.0	PAH, SVOC
11:23	5a	5	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	17.21	✔	17.23	✔	✔	14.85	0.0	SVOC
11:50	5a	6	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	17.21	✔	17.23	✔	✔	14.85	0.0	SVOC
12:23	5a	7	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	17.21	✔	17.23	✔	✔	14.88	0.0	SVOC
12:50	5a	8	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	17.21	✔	17.23	✔	✔	14.88	0.0	SVOC, TPH
13:12	5a	9	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	17.21	✔	17.23	✔	✔	14.88	0.0	TPH
13:33	5a	10	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	17.21	✔	17.23	✔	✔	14.88	0.0	TPH, nitrates
13:56	5a	11	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	14.82	✔	17.21	✔	17.23	✔	✔	14.87	0.0	Ferrous iron

Notes Logbook reference: LB3p.31-32

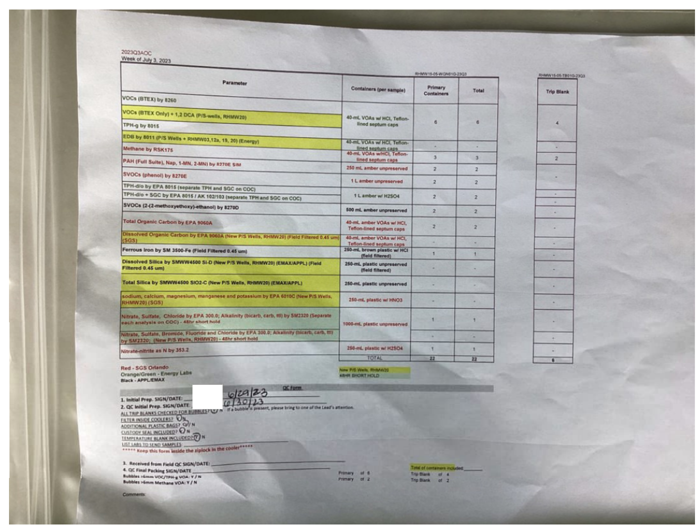
[redacted] (b) (6)

Westbay Well Groundwater Sampling

Field Data Sheet

Time	Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler					Sample Collection Checks (probe located at sampling zone in Westbay casing)								VOCs (ppm)	Comments (volume recovered)
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Evacuate Bottles (3-5 psi)	Close Valve	Shoe In	Arm In	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)		

Bottle Count: Click in the box to the right and take a picture of the bottle count on top of the cooler



2023Q3AOC
Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H_2SO_4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO_3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	1000-mL plastic unpreserved	1	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H_2SO_4	1	1	-
	TOTAL	22	22	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: [redacted] 6/29/23
2. QC Initial Prep. SIGN/DATE: 6/30/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y/N
CUSTODY SEAL INCLUDED? Y/N
TEMPERATURE BLANK INCLUDED? Y/N
LIST LABS TO SEND SAMPLES:
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE:
4. QC Final Packing SIGN/DATE
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N

Primary of 6
Primary of 2

Total of containers included
Trip Blank of 4
Trip Blank of 2

Comments:

Bottle Count Notes:

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	**LTM - CTO 23F0142**	LTM YEAR & QUARTER:	23Q3
WELL NO.	**RHMW16**	LOCATION:	Outside
DATE:	07/07/2023	TIME:	11:45

CLIMATIC CONDITIONS: 81F, Mostly sunny, 15mph ENE, 63%RH

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 201.71	* 202.06	* 202.06	None	508	NM	200	1155	10	2.2k-0 / 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				110	100	40	12	20	18

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: ______ Comments: ______

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	%	Ambient O_2:	%
Headspace LEL:	%	Ambient LEL:	%
Headspace H_2S:	ppm	Ambient H_2S:	ppm
Headspace CO:	ppm	Ambient CO:	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-6
Gas Detector Type:	Mini Rae	Serial Number:	592-908187
Water Quality Meter Type:	AquaTroll MP	Serial Number:	1034825
Sampling Equipment:	Dedicated Bladder Pump: QED PFAS-Free		

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW16-TB01LF-23Q3	TB	SGS/Energy	12:00	12:00
RHMW16-WGN01LF-23Q3	N	SGS/Energy/APPL	12:55	14:25
RHMW16-WGFD01LF-23Q3	FD	SGS/Energy/APPL	12:55	14:25

Sampled By: ______ Samples Delivered To: SGS, Energy, APPL Transporter: FedEx

DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 5.5L (bladder+tubing vol.) prior to collecting parameters for stabilization.
Logbook reference: LB4p.29-31

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:

2023Q3AOC

Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers (RHMW16-WGN01LF-23Q3)	Duplicate (RHMW16-WGFD01LF-23Q3)	Total	Trip Blank (RHMW16-TB01LF-23Q3)
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6✓	6✓	12	4✓
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)					
TPH-g by 8015					
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3✓	-	3	2✓
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2✓	2✓	4	-
SVOCs (phenol) by 8270E	1 L amber unpreserved	2✓	2✓	4	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2✓	2✓	4	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)					-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2✓	2✓	4	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2✓	-	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1✓	-	1	-
Dissolved Silica by SMWW4500 SI-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1✓	-	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1✓	-	1	-
	TOTAL	22	14	36	6

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: [redacted] 07/03/23
2. QC Initial Prep. SIGN/DAT[redacted] 7/6/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y/N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y/N
CUSTODY SEAL INCLUDED? Y/N
TEMPERATURE BLANK INCLUDED? Y/N
LIST LABS TO SEND SAMPLES: see above

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(b) (6)

Red Hill Groundwater Sampling Log

SAMPLING PROGRAM: **LTM - CTO 23F0142**

WELL NO. **RHMW17** LOCATION: Outside CLIMATIC CONDITIONS: 74°F, partly cloudy, 12mph W, 78% humidity

DATE: 07/07/2023 TIME: 08:20

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 234.09	* 234.69	* 234.70	None	253.5	NM	225	0945	8.5	1600 500
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				135	115	10	20	20	40

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings: N/A

Headspace O_2: ______ % Ambient O_2: ______ %

Headspace LEL: ______ % Ambient LEL: ______ %

Headspace H_2S: ______ ppm Ambient H_2S: ______ ppm

Headspace CO: ______ ppm Ambient CO: ______ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-4

Gas Detector Type: Multi Rae Serial Number: 592-919958

Water Quality Meter Type: AquaTroll MP Serial Number: 887121

Sampling Equipment: PFAS Free Dedicated Low Flow Bladder Pump & Disposable Bailer (1.66in x 36in)

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW17-TB01LF-23Q3	TB	SGS, Energy	09:20	09:20
RHMW17-WGN01LF-23Q3	N, MS/MSD	SGS, Energy, APPL	10:35	13:40

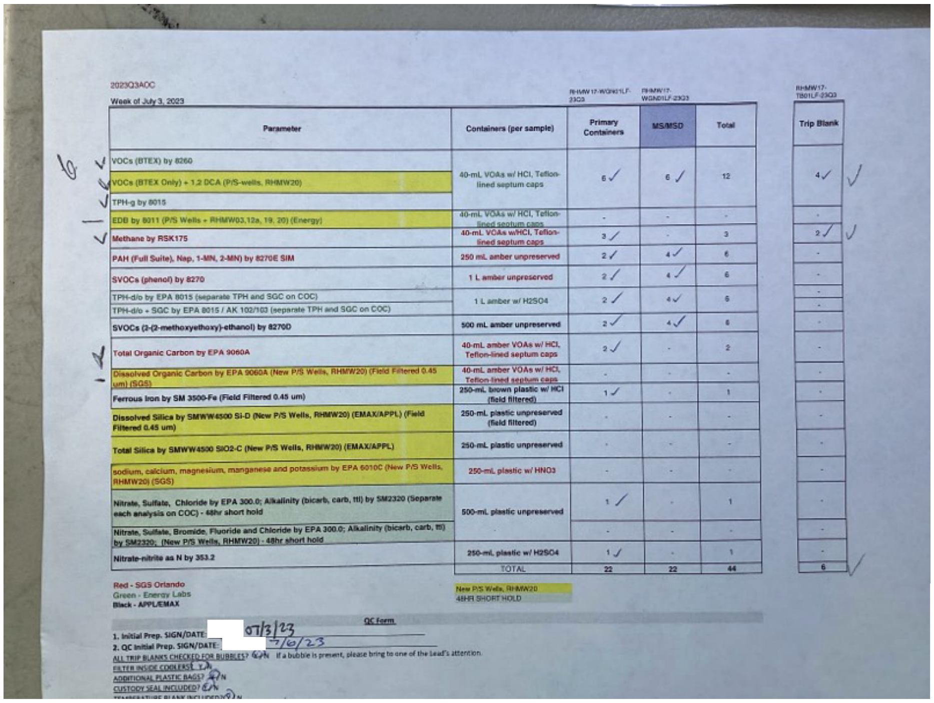
Sampled By: [redacted] Samples Delivered To: SGS, Energy, APPL/EMA Transporter: FedEx/A

DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Logbook reference: LB1p.45-46

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC

Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers (RHMW17-WGN01LF-23Q3)	MS/MSD (RHMW17-WGN01LF-23Q3)	Total	Trip Blank (RHMW17-TB01LF-23Q3)
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6 ✓	6 ✓	12	4 ✓
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)					
TPH-g by 8015					
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3 ✓	-	3	2 ✓
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2 ✓	4 ✓	6	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2 ✓	4 ✓	6	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2 ✓	4 ✓	6	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)					-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2 ✓	4 ✓	6	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2 ✓	-	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1 ✓	-	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1 ✓	-	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1 ✓	-	1	-
	TOTAL	22	22	44	6

Red - SGS Orlando
Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: [redacted] 07/3/23
2. QC Initial Prep. SIGN/DATE: [redacted] 7/6/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y/N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N
ADDITIONAL PLASTIC BAGS? Y/N
CUSTODY SEAL INCLUDED? Y/N
TEMPERATURE BLANK INCLUDED? Y/N

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	LTM - CTO 23F0142	LTM YEAR & QUARTER:	23Q3
WELL NO.	RHMW19	LOCATION:	Outside
DATE:	07/06/2023	TIME:	11:10

CLIMATIC CONDITIONS: 73-83F, Mostly sunny, 11mph ENE, 75%RH

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 426.68	* 426.90	* 426.90	None	447.97	NM	200	1135	10	2.2-250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				210	205	30	22	30	38

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: ______ Comments: ______

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	%	Ambient O_2:	%
Headspace LEL:	%	Ambient LEL:	%
Headspace H_2S:	ppm	Ambient H_2S:	ppm
Headspace CO:	ppm	Ambient CO:	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-6
Gas Detector Type:	Mini Rae	Serial Number:	592-601285
Water Quality Meter Type:	AquaTroll MP	Serial Number:	920480
Sampling Equipment:	Dedicated bladder pump: Geotech GEO1.66SS36		

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW19-TB01LF-23Q3	TB	SGS,Energy	11:30	11:30
RHMW19-WGN01LF-23Q3	N	SGS,Energy,APPL	12:55	14:05

Sampled By: ______ Samples Delivered To: SGS, Energy, APPL Transporter: FedEx/A

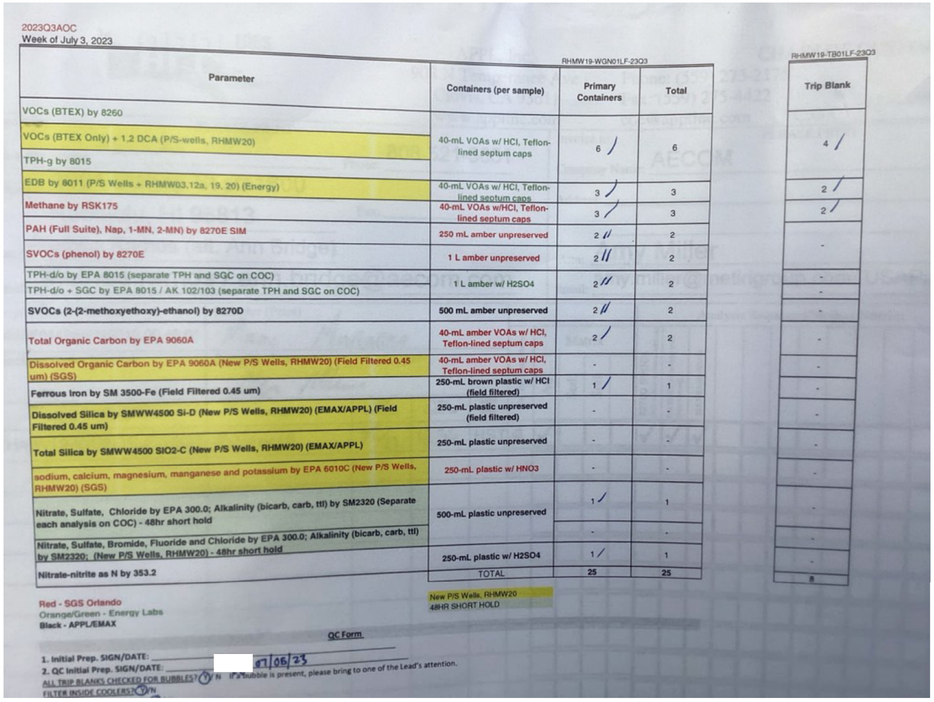
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 5.0L (bladder+tubing vol.) prior to collecting parameters for stabilization.
Logbook reference: LB1p.42-44

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

Parameter	Containers (per sample)	RHMW19-WGN01LF-23Q3 Primary Containers	Total	RHMW19-TB01LF-23Q3 Trip Blank
VOCs (BTEX) by 8260				
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)	40-mL VOAs w/ HCl, Teflon-lined septum caps	6 ✓	6	4 ✓
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3 ✓	3	2 ✓
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3 ✓	3	2 ✓
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2 ✓✓	2	
SVOCs (phenol) by 8270E	1 L amber unpreserved	2 ✓✓	2	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2 ✓✓	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2 ✓✓	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2 ✓	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1 ✓	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	-	-	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	-	-	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	-	-	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	1 ✓	1	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		-	-	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1 ✓	1	-
	TOTAL	25	25	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ____
2. QC Initial Prep. SIGN/DATE: [redacted] 07/05/23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y/N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y/N

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **LTM - CTO 23F0142** LTM YEAR & QUARTER:

WELL NO. **RHMW20** LOCATION: Outside CLIMATIC CONDITIONS: 77°F, 75% humidity, partly cloudy, 8 mph E, some sprinkles

DATE: 07/06/2023 TIME: 14:35

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 294.24	* 237.90	* 237.92	None	305	NM	200	1502	8	1200 / 300
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				130	115	25	16	35	44

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ✔ Camera Serial Number: ENV-06 Comments: No Sheen

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: ______ % Ambient O_2: ______ %

Headspace LEL: ______ % Ambient LEL: ______ %

Headspace H_2S: ______ ppm Ambient H_2S: ______ ppm

Headspace CO: ______ ppm Ambient CO: ______ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-6

Gas Detector Type: Mini Rae Serial Number: 592-901728

Water Quality Meter Type: AquaTroll MP Serial Number: 762234

Sampling Equipment: PFAS Free Disposable Bailer (1.66in x 36in FEP)

Appearance of Sample

COLOR: Clear

SEDIMENT: None

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW20-TB01LF-2307	TB	SGS/Energy	15:00	15:00
RHMW20-WGN01LF-2307	N	SGS/APPL/Energy	15:50	16:55

Sampled By: ______ Samples Delivered To: SGS/Energy/APPL Transporter: FedEx/A

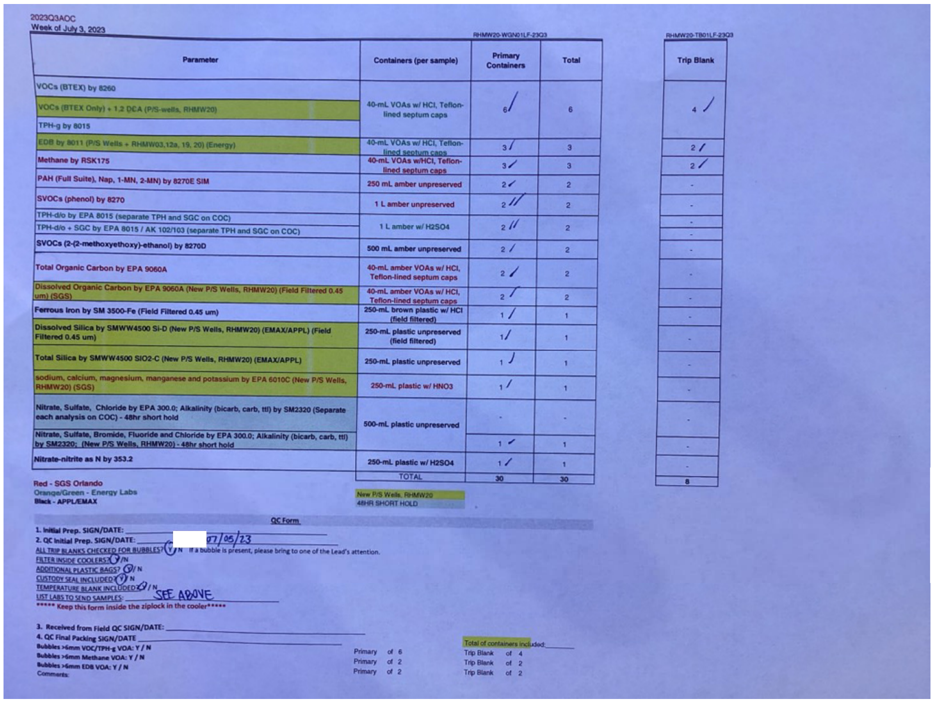
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged out 3.5 L prior to connecting to AT600. Logbook reference: LB3p.35-37

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

RHMW20-WGN01LF-23Q3 | RHMW20-TB01LF-23Q3

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	3	2
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2	2	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1	1	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		1	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	30	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ____
2. QC Initial Prep. SIGN/DATE: 07/05/23
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: SEE ABOVE
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ____
4. QC Final Packing SIGN/DATE ____
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N
Bubbles >6mm EDB VOA: Y / N
Comments:

Primary of 6
Primary of 2
Primary of 2

Total of containers included: ____
Trip Blank of 4
Trip Blank of 2
Trip Blank of 2

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM	**LTM - CTO 23F0142**	LTM YEAR & QUARTER:	23Q3
WELL NO.	**RHMW2254_01**	LOCATION:	Inside Tunnel
DATE:	07/03/2023	TIME:	13:45

CLIMATIC CONDITIONS: 78-84F, 67% humidity, partly cloudy

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 87.90	* 88.66	* 88.66	None	115.79	NM	200	1415	6.5	Battery Battery
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				45	45	25	10	35	20

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: White 'S' on Manhole Rim

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: Comments:

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	20.9	%	Ambient O_2:	20.9	%
Headspace LEL:	0	%	Ambient LEL:	0	%
Headspace H_2S:	0	ppm	Ambient H_2S:	0	ppm
Headspace CO:	0	ppm	Ambient CO:	0	ppm

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N-4
Gas Detector Type:	Multi Rae	Serial Number:	07Q1
Water Quality Meter Type:	AquaTroll MP	Serial Number:	887121
Sampling Equipment:	Dedicated bladder pump: Geotech GEO1.66SS36		

Appearance of Sample

COLOR: None/colorless

SEDIMENT: None/clear

ODOR/OTHER: None/odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHMW2254-01-WGN01-LF-23Q3	N	ALS/SGS/Energy/Is	14:45	15:32
RHMW2254-01-TB01LF-23Q3	TB	SGS/Energy	14:05	14:05

Sampled By: Samples Delivered To: ALS, SGS, Energy, Isotec Transporter: FedEx

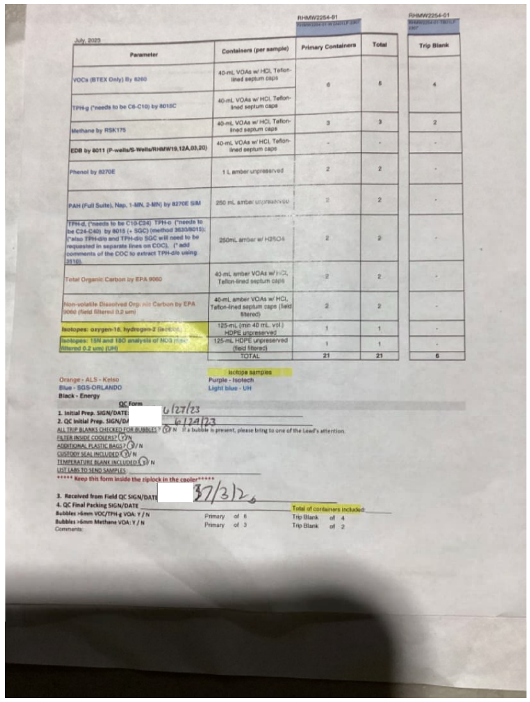
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 2L prior to collecting parameters for stabilization. Logbook reference: LB2p.31-33

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



RHMW2254-01

RHMW2254-01

July, 2023

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX Only) By 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
TPH-g (*needs to be C6-C10) by 8015C	40-mL VOAs w/ HCl, Teflon-lined septum caps			
Methane by RSK175	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	3	2
EDB by 8011 (P-wells/S-Wells/RHMW19,12A,03,20)	40-mL VOAs w/ HCl, Teflon-lined septum caps	-	-	-
Phenol by 8270E	1 L amber unpreserved	2	2	-
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
TPH-d, (*needs to be C10-C24) TPH-o (*needs to be C24-C40) by 8015 (+ SGC) (method 3630/8015); (*also TPH-d/o and TPH-d/o SGC will need to be requested in separate lines on COC). (* add comments of the COC to extract TPH-d/o using 3510).	250mL amber w/ H2SO4	2	2	-
Total Organic Carbon by EPA 9060	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Non-volatile Dissolved Organic Carbon by EPA 9060 (field filtered 0.2 um)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps (field filtered)	2	2	-
Isotopes: oxygen-18, hydrogen-2 (isotech)	125-mL (min 40 mL vol.) HDPE unpreserved	1	1	-
Isotopes: 15N and 18O analysis of NO3 (field filtered 0.2 um) (UH)	125-mL HDPE unpreserved (field filtered)	1	1	-
	TOTAL	21	21	6

Isotope samples

Orange - ALS - Kelso
Blue - SGS-ORLANDO
Black - Energy

Purple - Isotech
Light blue - UH

QC Form

1. Initial Prep. SIGN/DATE: 6/27/23
2. QC Initial Prep. SIGN/DA 6/24/23
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES:
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE 7/3/26
4. QC Final Packing SIGN/DATE

Total of containers included:

Bubbles >6mm VOC/TPH-g VOA: Y / N — Primary of 6 — Trip Blank of 4
Bubbles >6mm Methane VOA: Y / N — Primary of 3 — Trip Blank of 2
Comments:

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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **LTM - CTO 23F0142** LTM YEAR & QUARTER:

WELL NO. **RHP01** LOCATION: Outside

DATE: 07/06/2023 TIME: 08:10

CLIMATIC CONDITIONS: Mostly sunny, 77 F, 74% Humidity, 11pmh wind WSW

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 139.20	* 139.56	* 139.56	NA	159.43	NA	200	0845	5	1650 / 900
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				75	72.5	15	15	45	45

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Bailer Picture

Initial Half Bail ☑ Camera Serial Number: BRAVO2PANA1 Comments: Clear, no sheen

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: _____ % Ambient O_2: _____ %

Headspace LEL: _____ % Ambient LEL: _____ %

Headspace H_2S: _____ ppm Ambient H_2S: _____ ppm

Headspace CO: _____ ppm Ambient CO: _____ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-3

Gas Detector Type: Mini Rae Serial Number: 592-601285

Water Quality Meter Type: AquaTroll MP Serial Number: 611792

Sampling Equipment: Dedicated pump

Appearance of Sample

COLOR: Clear

SEDIMENT: No sediment

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP01-TB01LF-23Q3	TB	Energy/SGS	08:50	08:50
RHP01-WGN01LF-23Q3	N	SGS/APPL/Energy	09:20	10:37

Sampled By: Samples Delivered To: SGS/APPL/Energy Transporter: FedEx

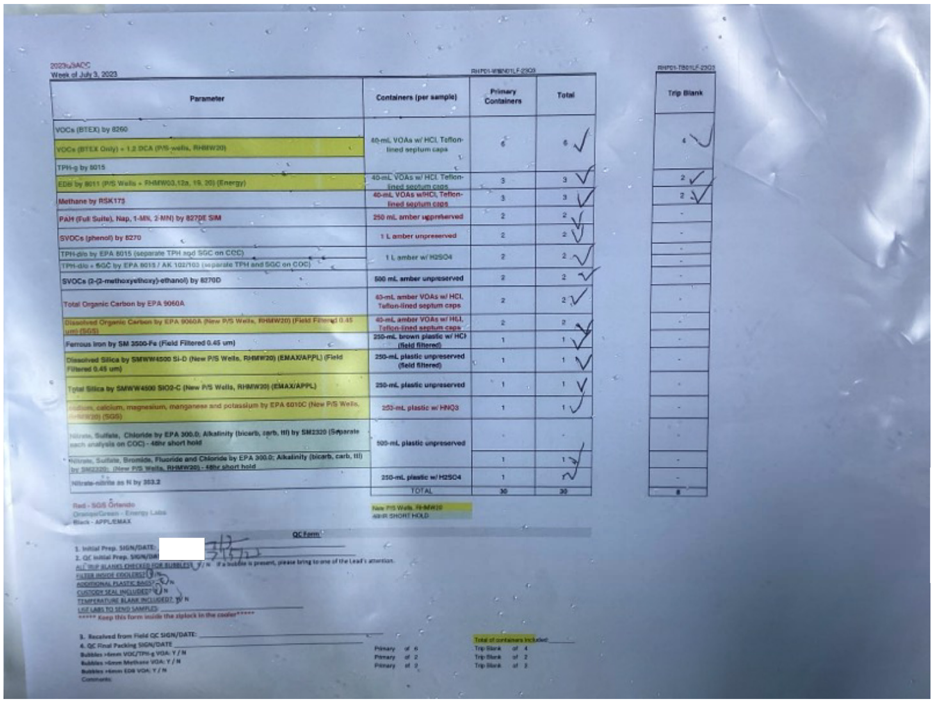
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 2 L before collecting parameters. Logbook reference: LB2p.36-39

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3ACC
Week of July 3, 2023

RHP01-WBN01LF-23Q3 | RHP01-TB01LF-23Q3

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	3	2
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2	2	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1	1	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1	1	-
Sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (New P/S Wells, RHMW20) - 48hr short hold		1	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	30	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: [redacted]
2. QC Initial Prep. SIGN/DATE:

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES:
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE:
4. QC Final Packing SIGN/DATE
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N
Bubbles >6mm EDB VOA: Y / N
Comments:

Primary of 6
Primary of 2
Primary of 2

Total of containers included:
Trip Blank of 4
Trip Blank of 2
Trip Blank of 2

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM LTM - CTO 23F0142

LTM YEAR & QUARTER:

WELL NO. RHP02 LOCATION: Outside

CLIMATIC CONDITIONS: Mostly sunny, 77 F, 74% Humidity, 11pmh wind WSW

DATE: 07/06/2023 TIME: 11:12

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 122.20	* 122.41	* 122.38	None	143.43	NM	200	1145	13	1500 500
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				65	67	15	12	45	48

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ✔ Camera Serial Number: BRAVO2PANA1 Comments: Clear, no sheen

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: % Ambient O_2: %

Headspace LEL: % Ambient LEL: %

Headspace H_2S: ppm Ambient H_2S: ppm

Headspace CO: ppm Ambient CO: ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-3

Gas Detector Type: Mini Rae Serial Number: 592-601285

Water Quality Meter Type: AquaTroll MP Serial Number: 611792

Sampling Equipment: Dedicated pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: No sediment

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP02-TB01LF-23Q3	TB	SGS/Energy	11:40	11:40
RHP02-WGN01LF-23Q3	N	SGS/APPL/Energy	14:55	16:20
RHP02-EB01LF-23Q3	EB	SGS/APPL/Energy	12:00	12:10

Sampled By: Samples Delivered To: SGS/APPL/Energy Transporter: FedEx

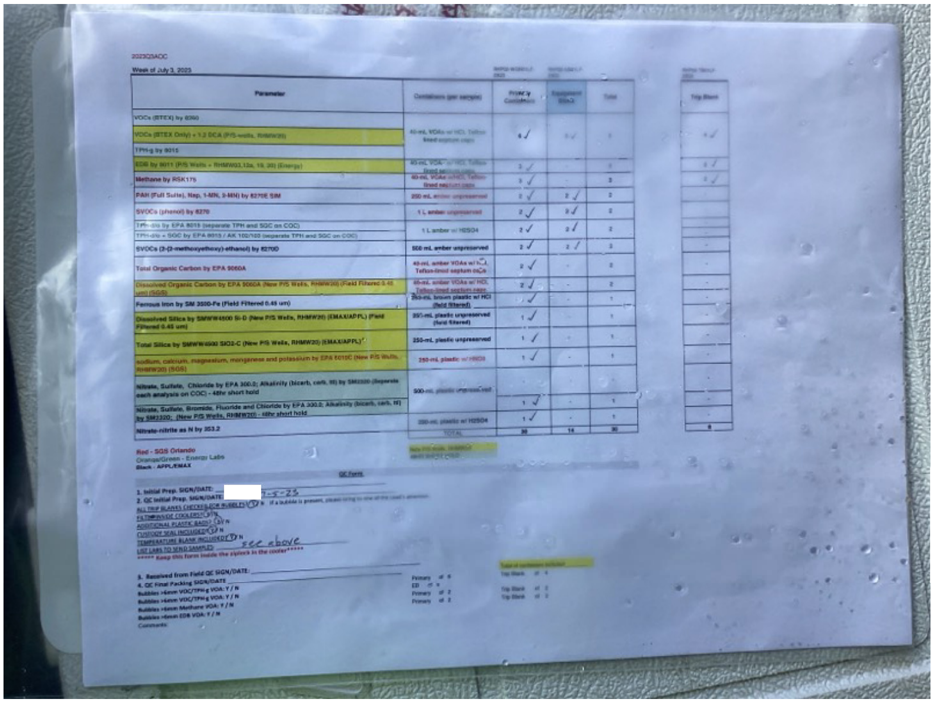
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 13 L before collecting parameters. Logbook reference: LB2p.36-39

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC

Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Equipment Blank	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon lined septum caps	6 ✓	[illegible]	[illegible]	[illegible]
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)					
TPH-g by 8015					
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon lined septum caps	3 ✓	-	[illegible]	[illegible]
Methane by RSK175	40-mL VOAs w/HCl, Teflon lined septum caps	3 ✓	-	3	[illegible]
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2 ✓	2 ✓	2	
SVOCs (phenol) by 8270	1 L amber unpreserved	2 ✓	2 ✓	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2 ✓	2 ✓	2	
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)					
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2 ✓	2 ✓	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2 ✓	-	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2 ✓	-	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	✓	-	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1 ✓	-	1	-
Total Silica by SMWW4500 SiO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1 ✓	-	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1 ✓	-	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, tt) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-		-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, tt) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		1 ✓	-	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1 ✓	-	1	-
	TOTAL	30	14	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

QC Form

1. Initial Prep. SIGN/DATE: [redacted] 7-5-23
2. QC Initial Prep. SIGN/DATE:
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the lead's attention
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: see above
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE:
4. QC Final Packing SIGN/DATE
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N
Bubbles >6mm EDB VOA: Y / N
Comments:

Primary of 6
EB of 6
Primary of 2
Primary of 2

Trip Blank of 4
Trip Blank of 2
Trip Blank of 2

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(b) (6)

Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **LTM - CTO 23F0142**   LTM YEAR & QUARTER: 23Q3

WELL NO. **RHP03**   LOCATION: Outside   CLIMATIC CONDITIONS: 76F, 83% humidity, 11mph W, Light Drizzle

DATE: 07/03/2023   TIME: 07:48

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 118.95	* 119.12	* 119.12	None	129.66	NM	175	0858	6	2k-1.6k 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				65	65	30	12	30	48

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Bailer Picture

Initial Half Bail ☑   Camera Serial Number: Bravo2 Pana1   Comments: no sheen

Air Readings

Headspace VOCs 0.0 ppm   Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: ______ %   Ambient O_2: ______ %

Headspace LEL: ______ %   Ambient LEL: ______ %

Headspace H_2S: ______ ppm   Ambient H_2S: ______ ppm

Headspace CO: ______ ppm   Ambient CO: ______ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst   Serial Number: N-3

Gas Detector Type: Mini Rae   Serial Number: 592-901728

Water Quality Meter Type: AquaTroll MP   Serial Number: 920480

Sampling Equipment: PFAS Free Bailer, Dedicated Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: No sediment

ODOR/OTHER: No odor

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP03-WGN01LF-23Q3	N	SGS/Energy/APPL	09:55	11:43
RHP03-TB01LF-23Q3	TB	SGS/Energy	09:30	09:30

Sampled By: ______   Samples Delivered To: SGS, Energy, APPL   Transporter: FedEx/A

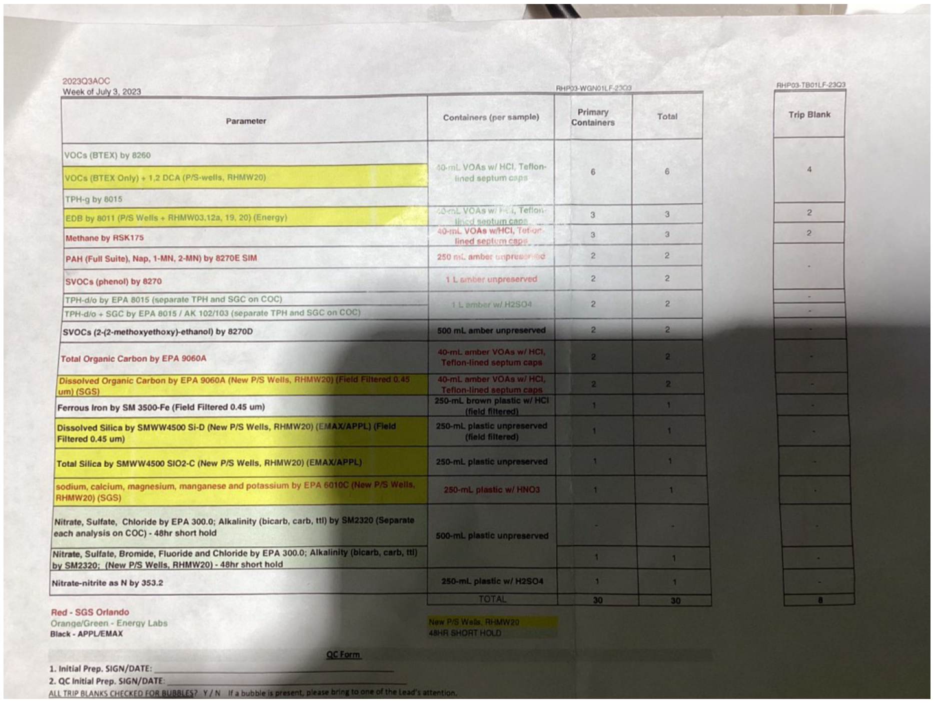
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 2L before collecting parameters. Logbook reference: LB4p.21-23

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

		RHP03-WGN01LF-23Q3		RHP03-TB01LF-23Q3
Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	3	2
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2	2	
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1	1	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		1	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	30	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form
1. Initial Prep. SIGN/DATE: ____________________
2. QC Initial Prep. SIGN/DATE: ____________________
ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.

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Red Hill Groundwater Sampling Log

SAMPLING PROGRAM **LTM - CTO 23F0142**

WELL NO. **RHP04A** LOCATION: Outside

DATE: 07/03/2023 TIME: 07:55

CLIMATIC CONDITIONS: 79°F 73% humidity sunny 12 mph

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 139.98	* 140.10	* 140.10	None		NM	150	0830	16	600/1500 0/900
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				70	75	20	10	40	50

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: _____ % Ambient O_2: _____ %

Headspace LEL: _____ % Ambient LEL: _____ %

Headspace H_2S: _____ ppm Ambient H_2S: _____ ppm

Headspace CO: _____ ppm Ambient CO: _____ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-6

Gas Detector Type: Mini Rae Serial Number: 592-601269

Water Quality Meter Type: AquaTroll MP Serial Number: 1034890

Sampling Equipment: Dedicated Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP04A-TB01LF-23Q3	TB	SGS/Energy	08:20	08:20
RHP04A-WGN01LF-23Q3	N	SGS/Energy/APPL	14:23	16:23

Sampled By: _____ Samples Delivered To: SGS, Energy, APPL Transporter: FedEx

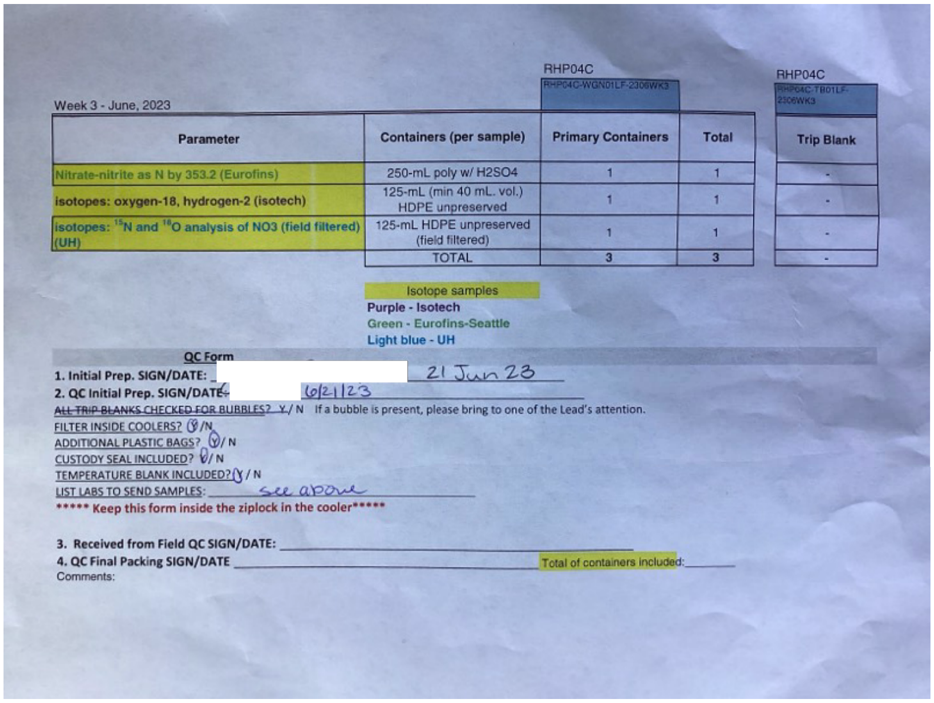
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Logbook reference: LB1p.36-38

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



Week 3 - June, 2023

Parameter	Containers (per sample)	Primary Containers RHP04C RHP04C-WGN01LF-2306WK3	Total	Trip Blank RHP04C RHP04C-TB01LF-2306WK3
Nitrate-nitrite as N by 353.2 (Eurofins)	250-mL poly w/ H_2SO_4	1	1	-
isotopes: oxygen-18, hydrogen-2 (isotech)	125-mL (min 40 mL. vol.) HDPE unpreserved	1	1	-
isotopes: ^{15}N and ^{18}O analysis of NO_3 (field filtered) (UH)	125-mL HDPE unpreserved (field filtered)	1	1	-
	TOTAL	3	3	-

Isotope samples
Purple - Isotech
Green - Eurofins-Seattle
Light blue - UH

QC Form

1. Initial Prep. SIGN/DATE: 21 Jun 23
2. QC Initial Prep. SIGN/DATE 6/21/23

~~ALL TRIP BLANKS CHECKED FOR BUBBLES? Y~~ / N If a bubble is present, please bring to one of the Lead's attention.

FILTER INSIDE COOLERS? Y/N

ADDITIONAL PLASTIC BAGS? Y/ N

CUSTODY SEAL INCLUDED? Y/ N

TEMPERATURE BLANK INCLUDED? Y / N

LIST LABS TO SEND SAMPLES: see above

***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE: ____

4. QC Final Packing SIGN/DATE ____ Total of containers included: ____

Comments:

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(b) (6) (b) (6)

Red Hill Groundwater Sampling Log

SAMPLING PROGRAM **LTM - CTO 23F0142**

WELL NO. **RHP04B** LOCATION: Outside CLIMATIC CONDITIONS: 79°F 73% humidity sunny 12 mph

DATE: 07/03/2023 TIME: 14:10

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 139.05	* 139.23	* 139.23	None		NM	200	1430	7	2100 1500
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				85	70	20	15	40	45

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: **Blue Mark Top of Casing**

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: ____ % Ambient O_2: ____ %

Headspace LEL: ____ % Ambient LEL: ____ %

Headspace H_2S: ____ ppm Ambient H_2S: ____ ppm

Headspace CO: ____ ppm Ambient CO: ____ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-6

Gas Detector Type: Mini Rae Serial Number: 592-601269

Water Quality Meter Type: AquaTroll MP Serial Number: 1034890

Sampling Equipment: Dedicated Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP04A-TB01LF-23Q3	TB	SGS/Energy	15:45	15:45
RHP04A-WGN01LF-23Q3	N	SGS/Energy/APPL	15:50	17:40

Sampled By: ____ Samples Delivered To: SGS, Energy, APPL Transporter: FedEx

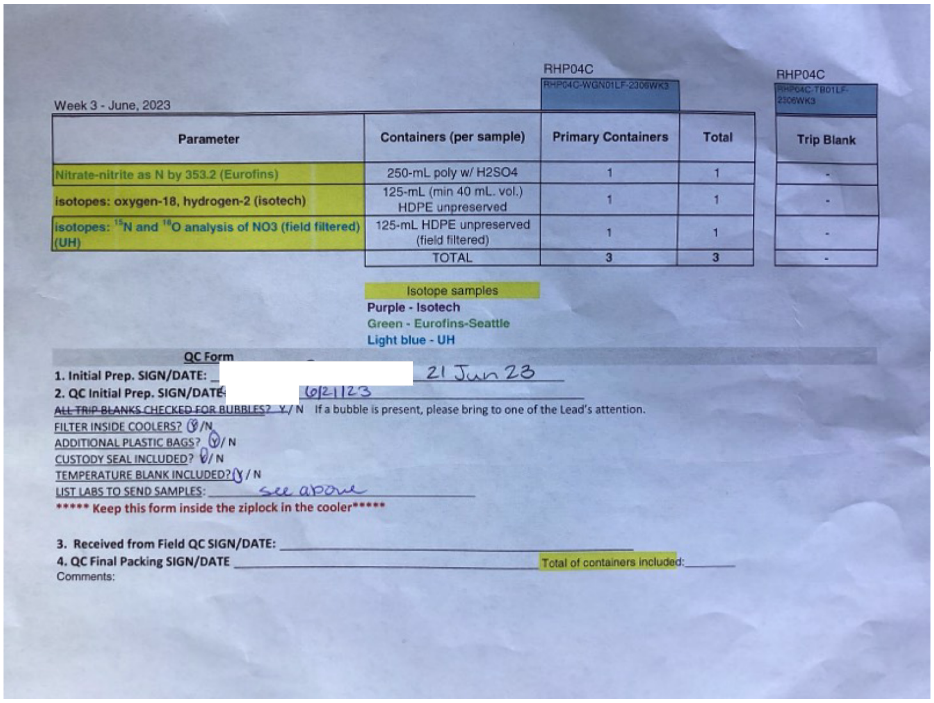
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Logbook reference: LB1p.36-38

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



Week 3 - June, 2023

Parameter	Containers (per sample)	Primary Containers (RHP04C, RHP04C-WGN01LF-2306WK3)	Total	Trip Blank (RHP04C, RHP04C-TB01LF-2306WK3)
Nitrate-nitrite as N by 353.2 (Eurofins)	250-mL poly w/ H2SO4	1	1	-
isotopes: oxygen-18, hydrogen-2 (isotech)	125-mL (min 40 mL vol.) HDPE unpreserved	1	1	-
isotopes: ^{15}N and ^{18}O analysis of NO3 (field filtered) (UH)	125-mL HDPE unpreserved (field filtered)	1	1	-
	TOTAL	3	3	-

Isotope samples
Purple - Isotech
Green - Eurofins-Seattle
Light blue - UH

QC Form

1\. Initial Prep. SIGN/DATE: 21 Jun 23

2\. QC Initial Prep. SIGN/DATE 6/21/23

~~ALL TRIP BLANKS CHECKED FOR BUBBLES?~~ Y / N If a bubble is present, please bring to one of the Lead's attention.

FILTER INSIDE COOLERS? Y / N

ADDITIONAL PLASTIC BAGS? Y / N

CUSTODY SEAL INCLUDED? Y / N

TEMPERATURE BLANK INCLUDED? Y / N

LIST LABS TO SEND SAMPLES: see above

***** Keep this form inside the ziplock in the cooler*****

3\. Received from Field QC SIGN/DATE: __________

4\. QC Final Packing SIGN/DATE __________ Total of containers included: _____

Comments:

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(b) (6) (b) (6)

Red Hill Groundwater Sampling Log

SAMPLING PROGRAM: **LTM - CTO 23F0142** LTM YEAR & QUARTER: 23Q3

WELL NO. **RHP04C** LOCATION: Outside CLIMATIC CONDITIONS: 84F, 61% humidity, 12mph W,

DATE: 07/03/2023 TIME: 12:17

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 138.08	* 138.50	* 138.45	None	NM	NM	200	1254	15	1.6k-600 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				85	85	10	8	20	22

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Bailer Picture

Initial Half Bail ✔ Camera Serial Number: Bravo2 Pana1 Comments: No sheen

Air Readings

Headspace VOCs 2.6 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: ____ % Ambient O_2: ____ %

Headspace LEL: ____ % Ambient LEL: ____ %

Headspace H_2S: ____ ppm Ambient H_2S: ____ ppm

Headspace CO: ____ ppm Ambient CO: ____ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-6

Gas Detector Type: Mini Rae Serial Number: 592-901728

Water Quality Meter Type: AquaTroll MP Serial Number: 920480

Sampling Equipment: PFAS Free Bailer, Dedicated Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: No sediment

ODOR/OTHER: No odor

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP04C-WGN01LF-23Q3	N	SGS/Energy/APPL	14:20	16:28
RHP04C-TB01LF-23Q3	TB	SGS/Energy	13:05	13:05

Sampled By: ____ Samples Delivered To: SGS, Energy, APPL Transporter: FedEx/A

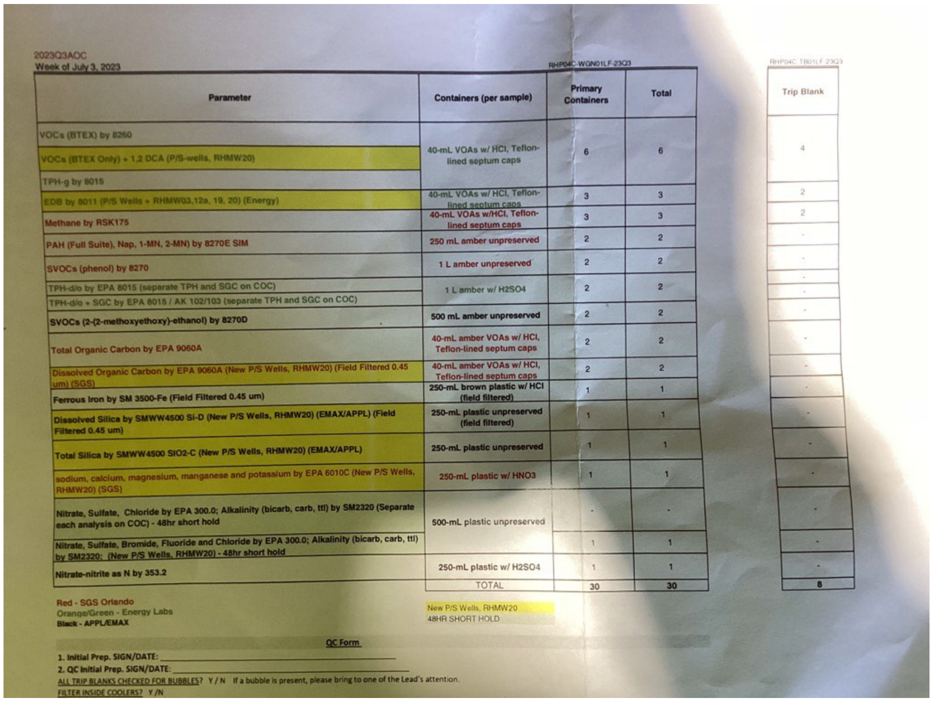
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 5.5L before collecting parameters. Logbook reference: LB4p.21-23

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

RHP04C-WGN01LF-23Q3

RHP04C TB01LF-23Q3

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCl, Teflon-lined septum caps	6	6	4
VOCs (BTEX Only) + 1,2 DCA (P/S-wells, RHMW20)				
TPH-g by 8015				
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)	40-mL VOAs w/ HCl, Teflon-lined septum caps	3	3	2
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3	3	2
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2	2	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2	2	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCl, Teflon-lined septum caps	2	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1	1	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320; (New P/S Wells, RHMW20) - 48hr short hold		1	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1	1	-
	TOTAL	30	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE: ____________________
2. QC Initial Prep. SIGN/DATE: ____________________

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y /N

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Red Hill Groundwater Sampling Log

SAMPLING PROGRAM: **LTM - CTO 23F0142** 2023 Q3

WELL NO. **RHP05** LOCATION: Outside CLIMATIC CONDITIONS: 81°, partly cloudy, 14mph NE, 66% humidity

DATE: 07/06/2023 TIME: 12:38

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 212.52	* 212.92	* 212.92	None	NM	NM	150	1708	10	2400 / 400
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				110	110	18	10	42	50

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Blue Mark Top of Casing

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: ______ % Ambient O_2: ______ %

Headspace LEL: ______ % Ambient LEL: ______ %

Headspace H_2S: ______ ppm Ambient H_2S: ______ ppm

Headspace CO: ______ ppm Ambient CO: ______ ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-4

Gas Detector Type: Multi Rae Serial Number: 592-908187

Water Quality Meter Type: AquaTroll MP Serial Number: 1034825

Sampling Equipment: Dedicated Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP05-WGN01LF-23Q3	N	Energy/APPL/SGS	18:05	19:51
RHP05-TB01LF-23Q3	TB	Energy/SGS	13:05	13:10

Sampled By: ______ Samples Delivered To: Energy, APPL, SGS Transporter: FedEx/A

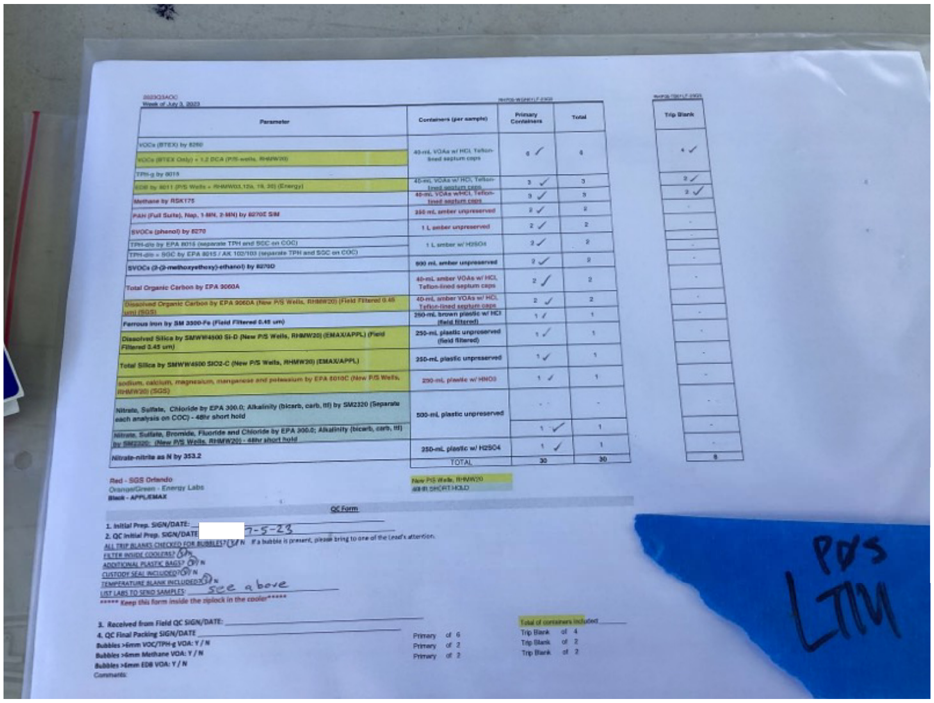
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Logbook reference: LB4p.26-28

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



2023Q3AOC
Week of July 3, 2023

Parameter	Containers (per sample)	Primary Containers	Total	Trip Blank
VOCs (BTEX) by 8260	40-mL VOAs w/ HCL Teflon-lined septum caps	6 ✓	6	4 ✓
VOCs (BTEX Only) + 1,2 DCA (P/S wells, RHMW20)				
TPH-g by 8015	40-mL VOAs w/ HCl, Teflon-lined septum caps	3 ✓	3	2 ✓
EDB by 8011 (P/S Wells + RHMW03,12a, 19, 20) (Energy)				
Methane by RSK175	40-mL VOAs w/HCl, Teflon-lined septum caps	3 ✓	3	2 ✓
PAH (Full Suite), Nap, 1-MN, 2-MN) by 8270E SIM	250 mL amber unpreserved	2 ✓	2	-
SVOCs (phenol) by 8270	1 L amber unpreserved	2 ✓	2	-
TPH-d/o by EPA 8015 (separate TPH and SGC on COC)	1 L amber w/ H2SO4	2 ✓	2	-
TPH-d/o + SGC by EPA 8015 / AK 102/103 (separate TPH and SGC on COC)				-
SVOCs (2-(2-methoxyethoxy)-ethanol) by 8270D	500 mL amber unpreserved	2 ✓	2	-
Total Organic Carbon by EPA 9060A	40-mL amber VOAs w/ HCL Teflon-lined septum caps	2 ✓	2	-
Dissolved Organic Carbon by EPA 9060A (New P/S Wells, RHMW20) (Field Filtered 0.45 um) (SGS)	40-mL amber VOAs w/ HCL Teflon-lined septum caps	2 ✓	2	-
Ferrous Iron by SM 3500-Fe (Field Filtered 0.45 um)	250-mL brown plastic w/ HCl (field filtered)	1 ✓	1	-
Dissolved Silica by SMWW4500 Si-D (New P/S Wells, RHMW20) (EMAX/APPL) (Field Filtered 0.45 um)	250-mL plastic unpreserved (field filtered)	1 ✓	1	-
Total Silica by SMWW4500 SIO2-C (New P/S Wells, RHMW20) (EMAX/APPL)	250-mL plastic unpreserved	1 ✓	1	-
sodium, calcium, magnesium, manganese and potassium by EPA 6010C (New P/S Wells, RHMW20) (SGS)	250-mL plastic w/ HNO3	1 ✓	1	-
Nitrate, Sulfate, Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320 (Separate each analysis on COC) - 48hr short hold	500-mL plastic unpreserved	-	-	-
Nitrate, Sulfate, Bromide, Fluoride and Chloride by EPA 300.0; Alkalinity (bicarb, carb, ttl) by SM2320: (New P/S Wells, RHMW20) - 48hr short hold		1 ✓	1	-
Nitrate-nitrite as N by 353.2	250-mL plastic w/ H2SO4	1 ✓	1	-
	TOTAL	30	30	8

Red - SGS Orlando
Orange/Green - Energy Labs
Black - APPL/EMAX

New P/S Wells, RHMW20
48HR SHORT HOLD

QC Form

1. Initial Prep. SIGN/DATE:
2. QC Initial Prep. SIGN/DATE [redacted] 7-5-23

ALL TRIP BLANKS CHECKED FOR BUBBLES? Y / N If a bubble is present, please bring to one of the Lead's attention.
FILTER INSIDE COOLERS? Y / N
ADDITIONAL PLASTIC BAGS? Y / N
CUSTODY SEAL INCLUDED? Y / N
TEMPERATURE BLANK INCLUDED? Y / N
LIST LABS TO SEND SAMPLES: see above
***** Keep this form inside the ziplock in the cooler*****

3. Received from Field QC SIGN/DATE:
4. QC Final Packing SIGN/DATE
Bubbles >6mm VOC/TPH-g VOA: Y / N
Bubbles >6mm Methane VOA: Y / N
Bubbles >6mm EDB VOA: Y / N
Comments:

Primary of 6
Primary of 2
Primary of 2

Total of containers included
Trip Blank of 4
Trip Blank of 2
Trip Blank of 2

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(b) (6)

Red Hill Groundwater Sampling Log

SAMPLING PROGRAM **LTM - CTO 23F0142** LTM YEAR & QUARTER: 23Q3

WELL NO. **RHP06** LOCATION:

DATE: 07/24/2023 TIME: 08:45 CLIMATIC CONDITIONS: 84F, mostly sunny, 60% humidity, 14mph ENE wnd

Depth to groundwater			**Depth to Product**	**Depth to bottom**		**Purge**			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
*	* 253.33	* 253.33	None		NM	200	1120	8	2.1k-500 125ft^3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:					125		17		43

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark:

Air Readings

Headspace VOCs: 0.0 ppm Ambient VOCs: 0.0 ppm

Jar Test VOCs: ppm

Additional Tunnel Air Readings : N/A

Headspace O_2: % Ambient O_2: %

Headspace LEL: % Ambient LEL: %

Headspace H_2S: ppm Ambient H_2S: ppm

Headspace CO: ppm Ambient CO: ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-5

Gas Detector Type: Mini Rae Serial Number: 592-904362

Water Quality Meter Type: AquaTroll MP Serial Number: 959874

Sampling Equipment: Dedicated Low Flow Bladder Pump

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/Clear

ODOR/OTHER: None/odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP06-TB01LF-23Q3	TB	SGS/ Energy	11:25	11:25
RHP06-WGN01LF-23Q3	N	SGS/Energy/Appl	12:35	14:14
RHP06-WGFD01LF-23Q3	FD	SGS/Energy/Appl	12:35	14:14

Sampled By: Samples Delivered To: SGS,Energy,APPL Transporter: AC/FedE

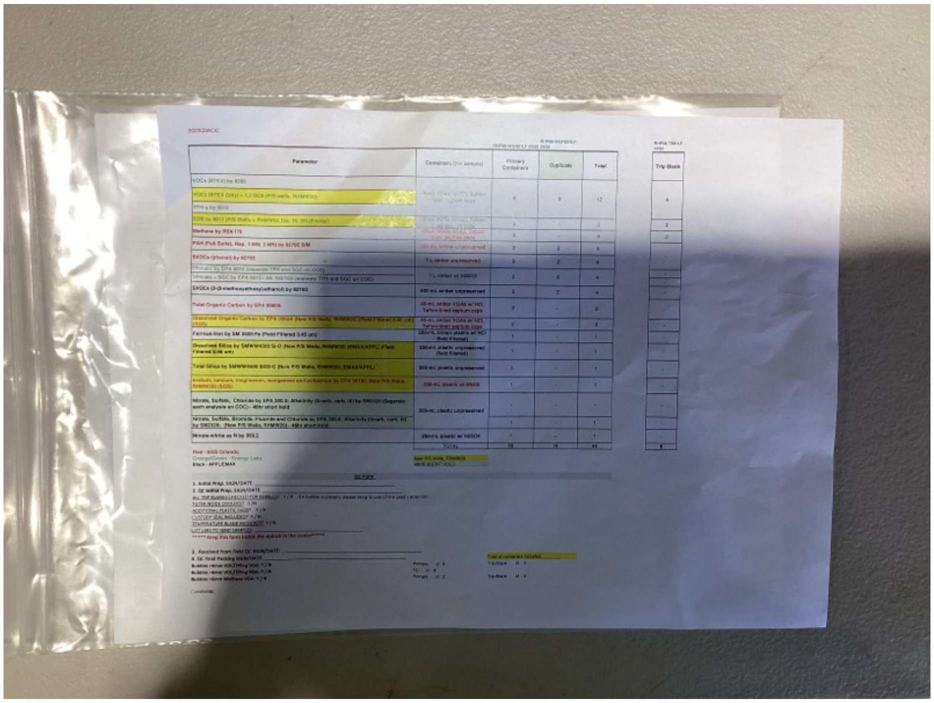
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 3L prior to connecting to flow cell for parameters. Logbook reference: LB2p.43-45

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



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Red Hill Groundwater Sampling Log V11

SAMPLING PROGRAM **LTM - CTO 23F0142**

LTM YEAR & QUARTER: 23Q3

WELL NO. **RHP07**

LOCATION: Inside

DATE: 07/03/2023

TIME: 09:35

CLIMATIC CONDITIONS: 78-84F, 67% humidity, partly cloudy

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
* 82.75	* 83.08	* 83.08	None	NM	NM	200	1010	6	400-0 60ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:				40	42	9	8	21	22

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark: Top of Casing

Bailer Picture

Initial Half Bail ☐ Camera Serial Number: ____ Comments: ____

Air Readings

Headspace VOCs 0.0 ppm Ambient VOCs: 0.0 ppm

Additional Tunnel Air Readings : N/A

Headspace O_2:	20.9	%	Ambient O_2:	20.9	%
Headspace LEL:	0	%	Ambient LEL:	0	%
Headspace H_2S:	0	ppm	Ambient H_2S:	0	ppm
Headspace CO:	0	ppm	Ambient CO:	0	ppm

Instruments and Equipment

Calibrated DTW Type: Calibrated O/W Probe - Solinst Serial Number: N-4

Gas Detector Type: Multi Rae Serial Number: 07Q1

Water Quality Meter Type: AquaTroll MP Serial Number: 887121

Sampling Equipment: Dedicated bladder pump: QED PFAS Free

Appearance of Sample

COLOR: None/Colorless

SEDIMENT: None/Clear

ODOR/OTHER: None/Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP07-WGN01LF-23Q3	N	SGS/Energy/APPL	10:45	12:10
RHP07-TB01LF-23Q3	TB	SGS/Energy	10:05	10:05

Sampled By: ____ Samples Delivered To: SGS,Energy,APPL Transporter: FedEx

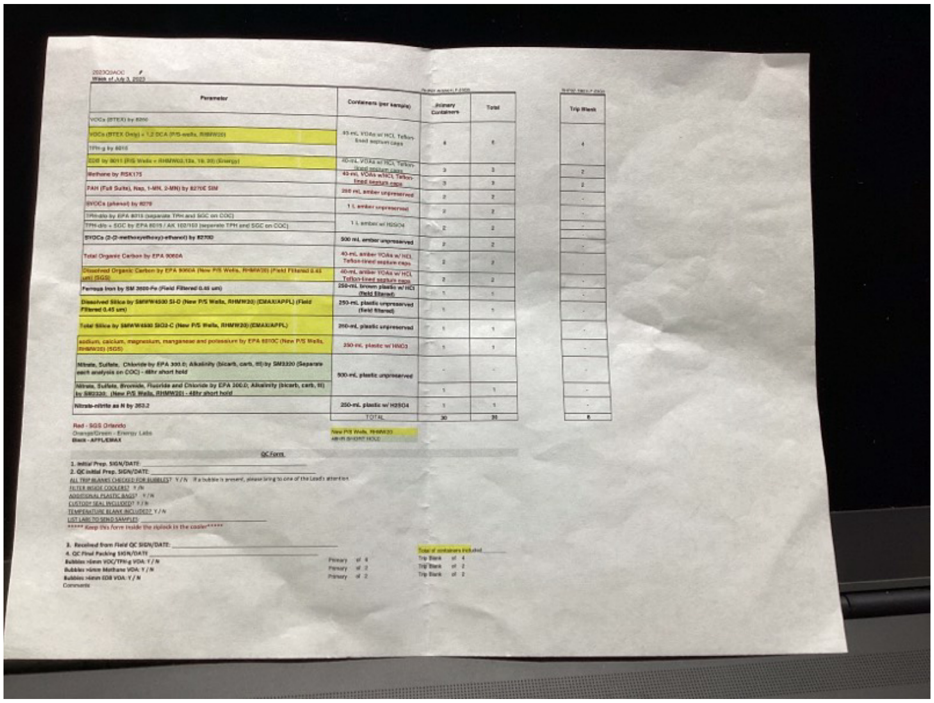
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 1.4L prior to collecting parameters for stabilization. Logbook reference: LB2p.31-33

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



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Red Hill Groundwater Sampling Log V12

SAMPLING PROGRAM: **RHCP - CTO 23F0142**

LTM YEAR & QUARTER: 23Q3

WELL NO. **RHP08**

LOCATION:

CLIMATIC CONDITIONS: 77F, light drizzle on/off, 14mph ENE, 69% RH

DATE: 09/11/2023

TIME: 14:50

Depth to groundwater			Depth to Product	Depth to bottom		Purge			
Reference (ft btoc)	Initial (ft btoc)	Final (ft btoc)	(ft btoc)	Reference (ft btoc)	Current (ft btoc)	Flow rate (mL/min)	Start Time	Total Volume (L)	Nitrogen Used
*	* 285.70	* 285.70	NM		NM	200	1623	10	1.2k-0 / 250ft3
Pump settings:				Pressure (PSI)		Discharge (sec)		Fill (sec)	
Reference/Actual:					145		15		45

Depth to water measured from outside casing (free fall). * Depth to water measured with a calibrated meter

Measure to survey mark:

Air Readings

Headspace VOCs: 0.4 ppm   Ambient VOCs: 0.0 ppm

Additional Air Readings :

Headspace O_2:	NM	Ambient O_2:	NM
Headspace LEL:	NM	Ambient LEL:	NM
Headspace H_2S:	NM	Ambient H_2S:	NM
Headspace CO:	NM	Ambient CO:	NM

Bailer Picture

Initial Half Bail: ☐   Camera Serial Number: Comments:

Instruments and Equipment

Calibrated DTW Type:	Calibrated O/W Probe - Solinst	Serial Number:	N4
Gas Detector Type:	Mini Rae	Serial Number:	592-601266
Water Quality Meter Type:	AquaTroll MP	Serial Number:	867242
Sampling Equipment:	Dedicated bladder pump, QED PFAS free		

Appearance of Sample

COLOR: Colorless

SEDIMENT: None/clear

ODOR/OTHER: Odorless

Sample Identification Number(s)

ID Number	Type	Lab	Start	End
RHP08-WGN01LF-23Q3	N	SGS/Energy/APl	17:15	19:45
RHP08-TB01LF-23Q3	TB	SGS/Energy	16:35	16:35

Sampled By: Samples Delivered To: SGS,APPL,Energy   Transporter: FedEx

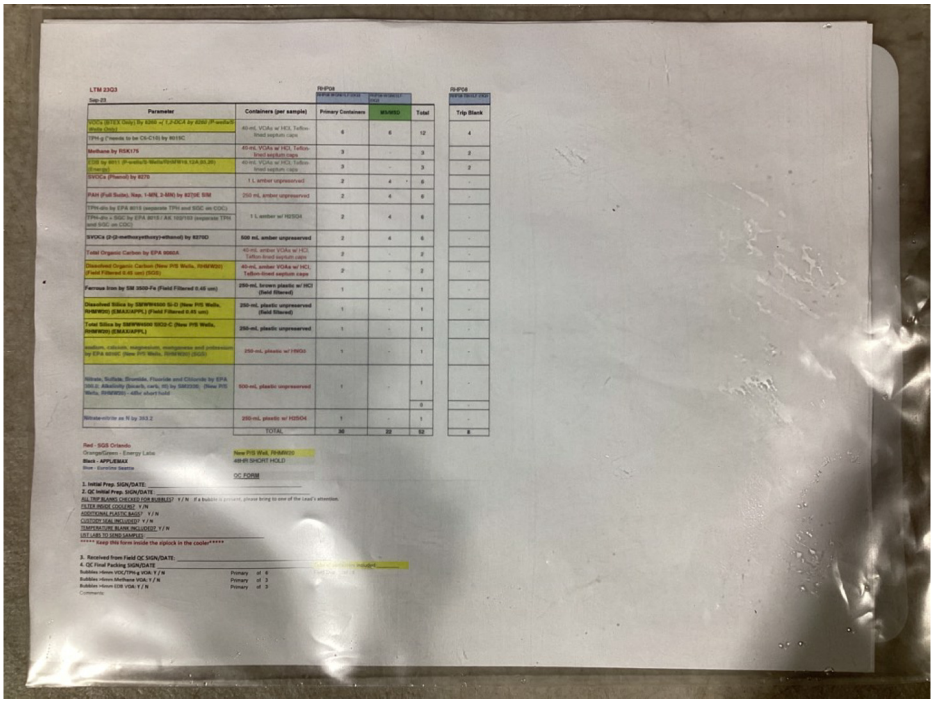
DECONTAMINATION PROCEDURES: (1) Alconox > (2) Distilled Water > (3) Isopropyl > (4) Distilled Water

NOTES: Purged 3.5L prior to collecting parameters for stabilization. Logbook reference: LB1p.68-70

(b) (6)

Bottle Count: Click in the box below and take a picture of the bottle count on top of the cooler

Bottle Count Notes:



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Appendix B.2:
Tape Correction

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
Inouye Regional Center
1845 Wasp Blvd., Bldg. 176
Honolulu, HI 96818

December 14, 2022

Mr.
Navy Facilities Engineering Command, Hawaii
400 Marshall Road
Joint Base Pearl Harbor-Hickam, Hawaii 96860-3139

Dear Mr. :

Subject: Results from calibration of groundwater-level measuring tapes

Thank you for participating in the September 2022 interagency calibration of groundwater-level measuring tapes.

Enclosed for your convenience are results from the 2022 calibration for each of your groundwater-level measuring tapes. For each tape, we are providing two tables. The first table (table 1) contains corrections to apply to depth-to-water measurements, and the second table (table 2) lists the calibration measurements made at each site.

Table 1 for each tape lists corrections to apply to depth-to-water measurements within each indicated tape interval. Linear or 2nd order equations were selected to provide a best fit between depth-to-water calibration measurements and errors. Values from these equations were computed to develop the correction tables. Corrections applied to tape intervals greater than the deepest depth measured by the given tape were extrapolated and are shown in red italics on the correction table.

Table 2 for each tape lists the calibration measurements made at each well site, which consists of the reference-tape measurements, your tape measurements, and the differences (errors) between the two. Reference-tape measurements have been corrected for temperature and mechanical stretch, and account for possible water-level change during the measurement period at the well site.

The U.S. Geological Survey (USGS) Pacific Islands Water Science Center has established a criterion to retire USGS tapes with an error greater than 0.05 percent of the depth-to-water measurement (±0.05 foot per 100 feet). Results from calibration of U.S. Navy (USN) tapes are shown on the provided plot (fig. 1). The plot shows that the USN tapes have errors that occasionally exceed the 0.05-percent criterion, possibly the result of tape shrinkage or damage.

(b) (6)

We recommend that agencies continue to exercise care in handling their groundwater measuring equipment to reduce wear on the instruments.

As part of our protocol, we physically attach a laminated version of the correction table to the measuring tape to help ensure that the appropriate correction is applied to each measurement. We also note the tape identifier on the field sheet, which is needed to verify that the appropriate correction has been applied. In addition, we try to consistently use the same tape at a given well through time.

Thank you for helping to continue to improve the quality of groundwater-level data collected in Hawaii. If you have any questions, please feel free to contact at @usgs.gov, or at .

Sincerely,

Center Director

Enclosures

(b) (6)

For Participant

Owner:	**U.S. Navy**
Tape ID:	**N-1**
Make:	**Solinst**
Serial number:	**133795**
Length:	**500 feet**
Dates:	**9/20/2022 – 9/22/2022**

Table 1. Correction table for Solinst 500-foot tape (serial number 133795; tape identifier N-1), tested 9/20/2022 to 9/22/2022. Values in red italics are extrapolated outside the range defined by the shallowest and deepest calibration measurements.

Tape interval, in feet		[1]Correction to add to depth to water, in feet
From	**To**	
0.00	*18.17*	*0.01*
18.18	24.44	0.01
24.45	49.50	0.00
49.51	74.57	-0.01
74.58	99.64	-0.02
99.65	124.71	-0.03
124.72	149.78	-0.04
149.79	174.84	-0.05
174.85	199.91	-0.06
199.92	224.98	-0.07
224.99	250.05	-0.08
250.06	275.11	-0.09
275.12	393.17	-0.10
393.18	*500.00*	*-0.10*

[1]Use of the indicated correction values is expected to improve accuracy in water-level measurements made with this tape. However, because of scatter in the calibration data, the indicated corrections for this tape may contain uncertainty on the order of 0.01–0.02 feet.

Table 2. Depth-to-water measurements and errors for Solinst 500-foot tape (serial number 133795; tape identifier N-1), tested 9/20/2022 to 9/22/2022.

Well site	Reference tape depth to water, in feet	N-1 depth to water, in feet	[2]Error, in feet
Moanalua	18.17	18.18	-0.01
Halawa	43.39	43.38	0.01
Waiawa	70.62	70.63	-0.01
Waialae Shaft	152.88	152.92	-0.04
Waialae Nui	300.74	300.85	-0.11
Waipio	393.08	393.17	-0.09

[2]Negative error indicates tape shortening; positive error indicates tape stretch.

For Participant

Owner: U.S. Navy
Tape ID: N-2
Make: Solinst
Serial number: 133937
Length: 1,000 feet
Dates: 9/20/2022 – 9/23/2022

Table 1. Correction table for Solinst 1,000-foot tape (serial number 133937; tape identifier N-2), tested 9/20/2022 to 9/23/2022. Values in red italics are extrapolated outside the range defined by the shallowest and deepest calibration measurements.

Tape interval, in feet		[1]Correction to add to depth to water, in feet
From	To	
0.00	*7.39*	*-0.01*
7.40	*18.18*	*-0.02*
18.19	28.82	-0.02
28.83	51.17	-0.03
51.18	74.58	-0.04
74.59	99.21	-0.05
99.22	125.27	-0.06
125.28	153.06	-0.07
153.07	182.96	-0.08
182.97	215.55	-0.09
215.56	251.71	-0.10
251.72	292.97	-0.11
292.98	342.39	-0.12
342.40	408.44	-0.13
408.45	685.51	-0.14
685.52	751.56	-0.13
751.57	800.98	-0.12
800.99	831.56	-0.11
831.57	*842.44*	*-0.11*
842.45	*882.26*	*-0.10*
882.27	*922.08*	*-0.09*
922.09	*961.90*	*-0.08*
961.91	*1000.00*	*-0.07*

[1]Use of the indicated correction values is expected to improve accuracy in water-level measurements made with this tape. However, because of scatter in the calibration data, the indicated corrections for this tape may contain uncertainty on the order of 0.01–0.02 feet.

Table 2. Depth-to-water measurements and errors for Solinst 1,000-foot tape (serial number 133937; tape identifier N-2), tested 9/20/2022 to 9/23/2022.

Well site	Reference tape depth to water, in feet	N-2 depth to water, in feet	[2]Error, in feet
Moanalua	18.17	18.19	-0.02
Halawa	43.39	43.41	-0.02
Waiawa	70.62	70.67	-0.05
Waialae Shaft	152.88	152.96	-0.08
Waialae Nui	300.74	300.87	-0.13
Waipio	393.08	393.20	-0.12
Poliwai	593.75	593.89	-0.14
Kunia Basal	831.45	831.56	-0.11

[2]Negative error indicates tape shortening; positive error indicates tape stretch.

For Participant

Owner:	**U.S. Navy**
Tape ID:	**N-3**
Make:	**Solinst**
Serial number:	**349311**
Length:	**500 feet**
Dates:	**9/20/2022 – 9/22/2022**

Table 1. Correction table for Solinst 500-foot tape (serial number 349311; tape identifier N-3), tested 9/20/2022 to 9/22/2022. Values in red italics are extrapolated outside the range defined by the shallowest and deepest calibration measurements.

Tape interval, in feet		[1]Correction to add to depth to water, in feet
From	To	
0.00	*7.03*	*0.00*
7.04	*18.18*	*-0.01*
18.19	20.83	-0.01
20.84	35.47	-0.02
35.48	51.15	-0.03
51.16	68.11	-0.04
68.12	86.74	-0.05
86.75	107.64	-0.06
107.65	131.96	-0.07
131.97	162.22	-0.08
162.23	208.21	-0.09
208.22	308.99	-0.10
309.00	354.98	-0.09
354.99	385.24	-0.08
385.25	393.15	-0.07
393.16	*410.56*	*-0.07*
410.57	*435.64*	*-0.06*
435.65	*460.72*	*-0.05*
460.73	*485.80*	*-0.04*
485.81	*500.00*	*-0.03*

[1]Use of the indicated correction values is expected to improve accuracy in water-level measurements made with this tape. However, because of scatter in the calibration data, the indicated corrections for this tape may contain uncertainty on the order of 0.01–0.02 feet.

Table 2. Depth-to-water measurements and errors for Solinst 500-foot tape (serial number 349311; tape identifier N-3), tested 9/20/2022 to 9/22/2022.

Well site	Reference tape depth to water, in feet	N-3 depth to water, in feet	[2]Error, in feet
Moanalua	18.17	18.19	-0.02
Halawa	43.39	43.41	-0.02
Waiawa	70.62	70.67	-0.05
Waialae Shaft	152.88	152.96	-0.08
Waialae Nui	300.74	300.84	-0.10
Waipio	393.08	393.15	-0.07

[2]Negative error indicates tape shortening; positive error indicates tape stretch.

For Participant

Owner:	**U.S. Navy**
Tape ID:	**N-4**
Make:	**Solinst**
Serial number:	**250335**
Length:	**500 feet**
Dates:	**9/20/2022 – 9/22/2022**

Table 1. Correction table for Solinst 500-foot tape (serial number 250335; tape identifier N-4), tested 9/20/2022 to 9/22/2022. Values in red italics are extrapolated outside the range defined by the shallowest and deepest calibration measurements.

Tape interval, in feet		[1]Correction to add to depth to water, in feet
From	To	
0.00	*0.48*	*-0.01*
0.49	*11.83*	*-0.02*
11.84	*18.19*	*-0.03*
18.20	23.66	-0.03
23.67	36.04	-0.04
36.05	49.06	-0.05
49.07	62.83	-0.06
62.84	77.49	-0.07
77.50	93.25	-0.08
93.26	110.39	-0.09
110.40	129.36	-0.10
129.37	150.90	-0.11
150.91	176.49	-0.12
176.50	209.96	-0.13
209.97	368.42	-0.14
368.43	393.21	-0.13
393.22	*402.24*	*-0.13*
402.25	*433.12*	*-0.12*
433.13	*463.99*	*-0.11*
464.00	*494.86*	*-0.10*
494.87	*500.00*	*-0.09*

[1]Use of the indicated correction values is expected to improve accuracy in water-level measurements made with this tape. However, because of scatter in the calibration data, the indicated corrections for this tape may contain uncertainty on the order of 0.01–0.02 feet.

Table 2. Depth-to-water measurements and errors for Solinst 500-foot tape (serial number 250335; tape identifier N-4), tested 9/20/2022 to 9/22/2022.

Well site	Reference tape depth to water, in feet	N-4 depth to water, in feet	[2]Error, in feet
Moanalua	18.17	18.20	-0.03
Halawa	43.39	43.44	-0.05
Waiawa	70.62	70.69	-0.07
Waialae Shaft	152.87	152.99	-0.12
Waialae Nui	300.75	300.89	-0.14
Waipio	393.08	393.21	-0.13

[2]Negative error indicates tape shortening; positive error indicates tape stretch.

For Participant

Owner:	**U.S. Navy**
Tape ID:	**N-5**
Make:	**Solinst**
Serial number:	**485269**
Length:	**500 feet**
Dates:	**9/20/2022 – 9/22/2022**

Table 1. Correction table for Solinst 500-foot tape (serial number 485269; tape identifier N-5), tested 9/20/2022 to 9/22/2022. Values in red italics are extrapolated outside the range defined by the shallowest and deepest calibration measurements.

Tape interval, in feet		[1]Correction to add to depth to water, in feet
From	To	
0.00	*3.66*	*0.03*
3.67	*18.14*	*0.02*
18.15	32.69	0.02
32.70	64.83	0.01
64.84	101.37	0.00
101.38	144.83	-0.01
144.84	201.87	-0.02
201.88	393.11	-0.03
393.12	*500.00*	*-0.03*

[1]Use of the indicated correction values is expected to improve accuracy in water-level measurements made with this tape. However, because of scatter in the calibration data, the indicated corrections for this tape may contain uncertainty on the order of 0.01–0.02 feet.

Table 2. Depth-to-water measurements and errors for Solinst 500-foot tape (serial number 485269; tape identifier N-5), tested 9/20/2022 to 9/22/2022.

Well site	Reference tape depth to water, in feet	N-5 depth to water, in feet	[2]Error, in feet
Moanalua	18.17	18.15	0.02
Halawa	43.39	43.35	0.04
Waiawa	70.62	70.62	0.00
Waialae Shaft	152.87	152.88	-0.01
Waialae Nui	300.75	300.79	-0.04
Waipio	393.08	393.11	-0.03

[2]Negative error indicates tape shortening; positive error indicates tape stretch.

For Participant

Owner:	**U.S. Navy**
Tape ID:	**N-6**
Make:	**Solinst**
Serial number:	**485270**
Length:	**750 feet**
Dates:	**9/20/2022 – 9/22/2022**

Table 1. Correction table for Solinst 750-foot tape (serial number 485270; tape identifier N-6), tested 9/20/2022 to 9/22/2022. Values in red italics are extrapolated outside the range defined by the shallowest and deepest calibration measurements.

Tape interval, in feet		[1]Correction to add to depth to water, in feet
From	To	
0.00	*6.02*	*-0.03*
6.03	*18.20*	*-0.04*
18.21	37.84	-0.04
37.85	72.83	-0.05
72.84	112.18	-0.06
112.19	158.10	-0.07
158.11	215.65	-0.08
215.66	305.93	-0.09
305.94	393.17	-0.10
393.18	*750.00*	*-0.10*

[1]Use of the indicated correction values is expected to improve accuracy in water-level measurements made with this tape. However, because of scatter in the calibration data, the indicated corrections for this tape may contain uncertainty on the order of 0.01–0.02 feet.

Table 2. Depth-to-water measurements and errors for Solinst 750-foot tape (serial number 485270; tape identifier N-6), tested 9/20/2022 to 9/22/2022.

Well site	Reference tape depth to water, in feet	N-6 depth to water, in feet	[2]Error, in feet
Moanalua	18.17	18.21	-0.04
Halawa	43.39	43.41	-0.02
Waiawa	70.63	70.68	-0.05
Waialae Shaft	152.87	152.95	-0.08
Waialae Nui	300.75	300.84	-0.09
Waipio	393.07	393.17	-0.10

[2]Negative error indicates tape shortening; positive error indicates tape stretch.

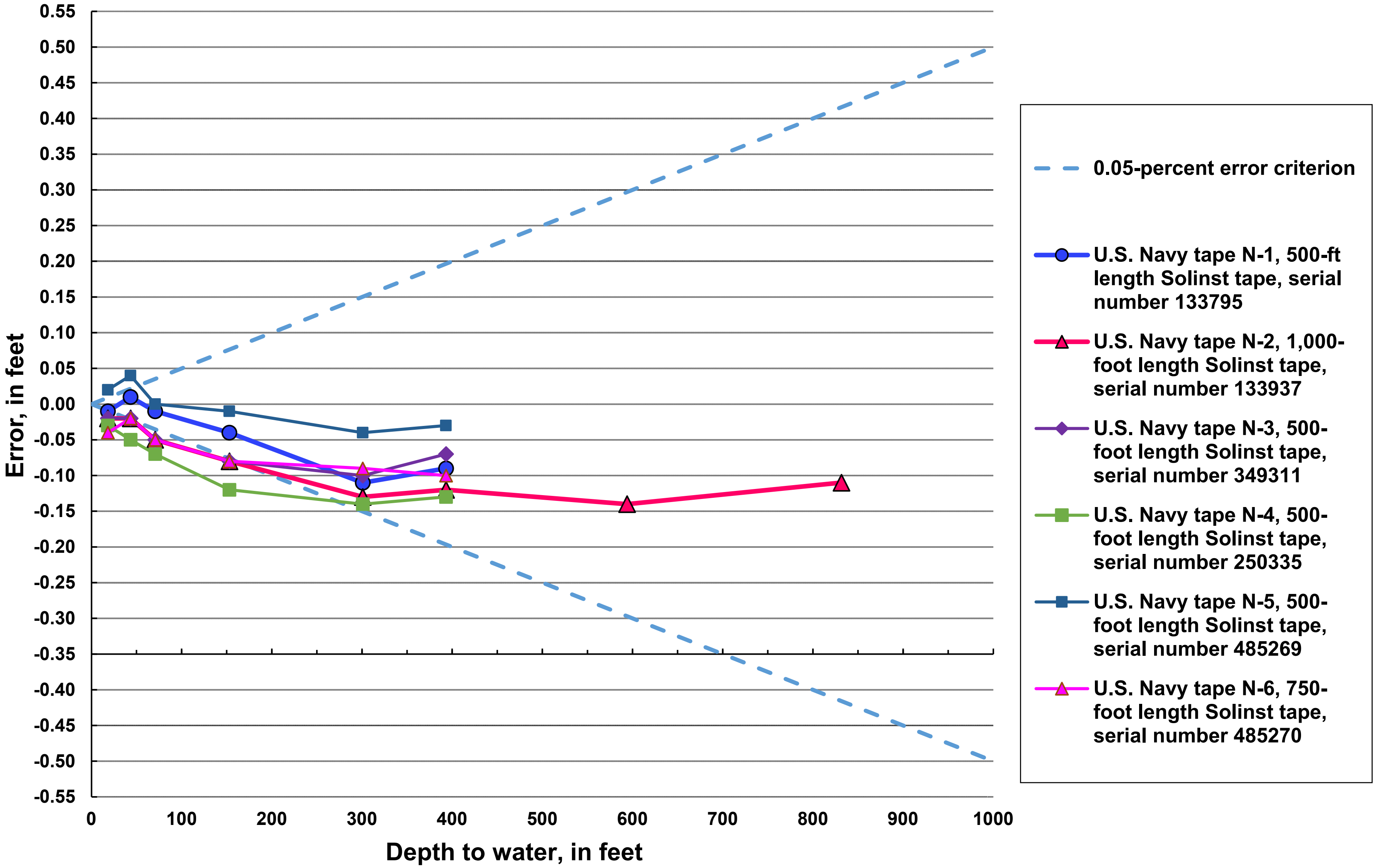

Figure 1. Tape error relative to measured depth-to-water value and 0.05-percent error criterion for U.S. Navy groundwater-level tapes, U.S. Geological Survey interagency tape calibration, September 20–23, 2022, Honolulu, Hawaii.

Appendix B.3:
Instrument Calibration Log

Save As

Gas Calibration Results

Instrument: MiniRae (●) MultiRae ( )	**Manufacturer: Rae Systems**
SN#: 592-601285	**Last Service Date:** See Certificate of Calibration
Date: 07/11/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 — CO:
Signature(s):	VOCs: 100.2 — H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: HDMW2253, OWDFMW04A, OWDFMW05A	

Calibration Solution Infomation

AquaTroll

SN #: 1034890

	Lot #:	Exp. Date:
Quick Cal	16323-C	1/31/24
pH 10	2GD857	4/30/24

Calibration Gas

	Lot #:	Exp. Date:
Isobutylene 100 ppm	304-402716666-1	4/27/27
Mixed Gas		

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Americas

AECOM

Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (selected) MultiRae	**Manufacturer: Rae Systems**
SN#: 592-000620	**Last Service Date:** See Certificate of Calibration
Date: 07/26/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.0 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: NMW25	

Calibration Solution Infomation

AquaTroll

SN #: 959874

Quick Cal	**Lot #:**	16323-c	**Exp. Date:**	1/31/24
pH 10	**Lot #:**	2GD857	**Exp. Date:**	4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:**	304-402716666-1	**Exp. Date:**	4/27/27
Mixed Gas	**Lot #:**		**Exp. Date:**	

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

Americas

Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (●) MultiRae ( )	**Manufacturer: Rae Systems**
SN#: 592-925476	**Last Service Date:** See Certificate of Calibration
Date: 08/29/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.0 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: NMW32	

Calibration Solution Infomation

AquaTroll

SN #: 872584

Quick Cal	**Lot #:**	8323-A	**Exp. Date:**	10/31/23
pH 10	**Lot #:**	2GD857	**Exp. Date:**	4/1/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:**	304-402716666	**Exp. Date:**	4/27/27
Mixed Gas	**Lot #:**		**Exp. Date:**	

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

(b) (6)

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Americas

AECOM

Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results	
Instrument: MiniRae ○ MultiRae ◉	**Manufacturer: Rae Systems**
SN#: 5039	**Last Service Date:** See Certificate of Calibration
Date: 07/07/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO: Pass
Signature(s):	VOCs: 100.4 H2S: Pass
	Methane: Pass
Team: LTM Low Flow	Oxygen: Pass
Notes: RHMW01R+05	

Calibration Solution Infomation

AquaTroll

SN #: 920480	**Quick Cal**	**Lot #:** 14523-C	**Exp. Date:** 12/31/23
	pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402716666-1	**Exp. Date:** 4/27/27
Mixed Gas	**Lot #:** 304-402689416-1	**Exp. Date:** 3/20/25

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

(b) (6)

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Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (●) MultiRae ( )	**Manufacturer: Rae Systems**
SN#: 5029	**Last Service Date:** See Certificate of Calibration
Date: 07/05/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.7 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHMW02, RHMW03	

Calibration Solution Infomation

AquaTroll

SN #: 887121

	Lot #:	Exp. Date:
Quick Cal	14223	12/31/23
pH 10	2GD857	4/30/24

Calibration Gas

	Lot #:	Exp. Date:
Isobutylene 100 ppm	304-402526602-1	8/29/26
Mixed Gas		

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

Americas

Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (●) MultiRae ( )	**Manufacturer: Rae Systems**
SN#: 592-905971	**Last Service Date:** See Certificate of Calibration
Date: 07/05/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.7 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHMW04 & RHMW06	

Calibration Solution Infomation

AquaTroll

SN #: 1034825

Quick Cal	**Lot #:**	14523-C	**Exp. Date:**	12/31/23
pH 10	**Lot #:**	2GD857	**Exp. Date:**	4/1/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:**	304-402716666-1	**Exp. Date:**	4/27/27
Mixed Gas	**Lot #:**		**Exp. Date:**	

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Americas

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Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results

Instrument: **MiniRae** (●) **MultiRae** ( )	**Manufacturer: Rae Systems**
SN#: 592-905971	**Last Service Date:** See Certificate of Calibration
Date: 07/06/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.1 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHMW09 and 19	

Calibration Solution Infomation

AquaTroll

SN #: 1034825

Quick Cal	**Lot #:** 14223-B	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/10/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402716666-1	**Exp. Date:** 4/27/27
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results

Instrument: **MiniRae** (selected) **MultiRae**	**Manufacturer: Rae Systems**
SN#: 592-925476	**Last Service Date:** See Certificate of Calibration
Date: 06/23/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.0 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHMW10 and NMW24	

Calibration Solution Infomation

AquaTroll

SN #: 613224

Quick Cal	**Lot #:** 14223-B	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402526602-1	**Exp. Date:** 8/29/26
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Americas

Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (selected) MultiRae	**Manufacturer: Rae Systems**
SN#: 592-901728	**Last Service Date:** See Certificate of Calibration
Date: 07/06/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s)	VOCs: 100.0 H2S:
	Methane:
Team: LTM Westbay & Low Flow	Oxygen:
Notes: RHMW11 & RHMW20	

Calibration Solution Infomation

AquaTroll

SN #: 762234

Quick Cal	**Lot #:** 14523-C	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402716666-1	**Exp. Date:** 4/27/27
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results	
Instrument: **MiniRae** (●) **MultiRae** ( )	**Manufacturer: Rae Systems**
SN#: 592-908187	**Last Service Date:** See Certificate of Calibration
Date: 07/07/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.1 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHMW12A&16	

Calibration Solution Infomation						
AquaTroll						
SN #: 1034825	**Quick Cal**	**Lot #:**	14523-C	**Exp. Date:**	12/31/23
	pH 10	**Lot #:**	2GD857	**Exp. Date:**	4/1/24
Calibration Gas					
	Isobutylene 100 ppm	**Lot #:**	304-402716666-1	**Exp. Date:**	4/27/27
	Mixed Gas	**Lot #:**		**Exp. Date:**	

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: **MiniRae** (●) **MultiRae** ( )	**Manufacturer: Rae Systems**
SN#: 592-908187	**Last Service Date:** See Certificate of Calibration
Date: 07/05/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 — CO:
Signature(s):	VOCs: 100.1 — H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHMW13	

Calibration Solution Infomation

AquaTroll

SN #: 762234

Quick Cal	**Lot #:** 14523-C	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402716666-1	**Exp. Date:** 4/27/27
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

Gas Calibration Results	
Instrument: **MiniRae** (selected) **MultiRae**	**Manufacturer: Rae Systems**
SN#: 592-901728	**Last Service Date:** See Certificate of Calibration
Date: 07/07/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.1 H2S:
	Methane:
Team: LTM Westbay	Oxygen:
Notes: RHMW14	

Calibration Solution Infomation

AquaTroll

SN #: 762234	**Quick Cal**	**Lot #:**	14523-C	**Exp. Date:**	12/31/23
	pH 10	**Lot #:**	2GD857	**Exp. Date:**	4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:**	304-402716666-1	**Exp. Date:**	4/27/27
Mixed Gas	**Lot #:**		**Exp. Date:**	

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: **MiniRae** (●) **MultiRae** ( )	**Manufacturer: Rae Systems**
SN#: 592-601285	**Last Service Date:** See Certificate of Calibration
Date: 07/03/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.1 H2S:
	Methane:
Team: LTM Westbay	Oxygen:
Notes: RHMW15	

Calibration Solution Infomation

AquaTroll

SN #: 762234

Quick Cal	**Lot #:** 14523-C	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402526602-1	**Exp. Date:** 8/29/26
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

(b) (6)

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Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (selected) MultiRae	**Manufacturer: Rae Systems**
SN#: 592-919958	**Last Service Date:** See Certificate of Calibration
Date: 07/07/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 99.9 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHMW17+17S+17D	

Calibration Solution Infomation

AquaTroll

SN #: 887121

Quick Cal	**Lot #:** 14223-B	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402716666-1	**Exp. Date:** 4/27/27
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: **MiniRae** ○ **MultiRae** ◉	**Manufacturer: Rae Systems**
SN#: MBB3Z007Q1	**Last Service Date:** See Certificate of Calibration
Date: 07/03/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 — CO: Pass
Signature(s)	VOCs: 101.0 — H2S: Pass
	Methane: Pass
Team: LTM Low Flow	Oxygen: Pass
Notes: RHP07, RHMW2254-01	

Calibration Solution Infomation

AquaTroll

SN #: 887121

Quick Cal	**Lot #:** 13223-A	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402686802-1	**Exp. Date:** 3/24/27
Mixed Gas	**Lot #:** 304-402689416-1	**Exp. Date:** 3/20/25

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (selected) MultiRae

Manufacturer: Rae Systems

SN#: 592-601285

Last Service Date: See Certificate of Calibration

Date: 07/06/2023

Name(s):

Signature(s):

Team: LTM Low Flow

Calibration Result

Fresh Air:	0.0	CO:	
VOCs:	100.1	H2S:	
		Methane:	
		Oxygen:	

Notes: RHP01+RHP02

Calibration Solution Infomation

AquaTroll

SN #: 611792

Quick Cal	**Lot #:** 13223-B	**Exp. Date:** 12/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/30/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402716666-1	**Exp. Date:** 4/27/27
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

AECOM

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (selected) MultiRae	**Manufacturer: Rae Systems**
SN#: 592-901728	**Last Service Date:** See Certificate of Calibration
Date: 07/03/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 — CO:
Sigr	VOCs: 99.5 — H2S:
	Methane:
Team: LTM Low Flow	Oxygen:

Notes: RHP03+RHP04C

Calibration Solution Infomation

AquaTroll

SN #: 920480

Quick Cal	**Lot #:** 14523	**Exp. Date:** 12/1/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/1/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402526602-1	**Exp. Date:** 8/29/26
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

Americas

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Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (selected) MultiRae	**Manufacturer: Rae Systems**
SN#: 592-908187	**Last Service Date:** See Certificate of Calibration
Date: 07/03/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s)	VOCs: 100.0 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHP04A and 4B	

Calibration Solution Infomation

AquaTroll

SN #: 0074030

Quick Cal	**Lot #:**	16323-c	**Exp. Date:**	1/1/24
pH 10	**Lot #:**	2gd857	**Exp. Date:**	4/20/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:**	304-402526602-1	**Exp. Date:**	8/29/26
Mixed Gas	**Lot #:**		**Exp. Date:**	

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Instrument Calibration Log

S3AM-127-FM10

Gas Calibration Results

Instrument: MiniRae (selected) / MultiRae	**Manufacturer: Rae Systems**
SN#: 592-904362	**Last Service Date:** See Certificate of Calibration
Date: 07/24/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 — CO:
Signature(s):	VOCs: 100.1 — H2S:
	Methane:
Team: LTM Low flow	Oxygen:
Notes: RHP06	

Calibration Solution Infomation

AquaTroll

SN #: 959874

	Lot #:	Exp. Date:
Quick Cal	16323-C	12/1/23
pH 10	2GD857	4/1/24

Calibration Gas

	Lot #:	Exp. Date:
Isobutylene 100 ppm	304-402526602-01	8/29/26
Mixed Gas		

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

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Gas Calibration Results

Instrument: MiniRae (●) MultiRae ( )	**Manufacturer: Rae Systems**
SN#: 592-601266	**Last Service Date:** See Certificate of Calibration
Date: 09/11/2023	**Calibration Result**
Name(s):	Fresh Air: 0.0 CO:
Signature(s):	VOCs: 100.3 H2S:
	Methane:
Team: LTM Low Flow	Oxygen:
Notes: RHP08	

Calibration Solution Infomation

AquaTroll

SN #: 867242

Quick Cal	**Lot #:** 8323-A	**Exp. Date:** 10/31/23
pH 10	**Lot #:** 2GD857	**Exp. Date:** 4/1/24

Calibration Gas

Isobutylene 100 ppm	**Lot #:** 304-402716666	**Exp. Date:** 4/27/27
Mixed Gas	**Lot #:**	**Exp. Date:**

Calibration Procedure

Mini Rae

Parameters Measured: VOCs
Calibration Gas Used: Isobutylene 100 ppm

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Isobutylene calibration and hook up Isobutylene gas canister to the Mini Rae filter after opening canister regulator. Ensure Mini Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed.

Multi Rae

Parameters Measured: VOCs, Oxygen, Hydrogen Sulfide, Methane, and Carbon Monoxide
Calibration Gas Used: Isobutylene 100 ppm, Mixed Gas: O2, H2S, CH4, and CO

Calibration Procedure:

1. Turn on device and wait instrument and sensors to warm up
2. Press and hold middle and right buttons to navigate to the meu.
3. Select 'Calibtarion' and then 'Fresh Air'.
4. Find an open area to start calibration and wait 60 seconds until calibration is complete. Calibration should say Passed before continuing
5. Proceed to Mixed Gas calibration and hook up Mixed gas canister to the Multi Rae filter after opening canister regulator. Ensure Multi Rae fan does not stop during calibration.
6. Wait 30-60 sec indicated on the calibration screen and unit should say passed before continuing.
7. Repeat steps 5 and 6 with Isobutylene cannister.

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	1034890
Created	7/11/2023

Sensor	**Conductivity**
Serial Number	866779
Last Calibrated	7/11/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.992
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,974.8 µS/cm
Specific Conductivity	7,998.9 µS/cm

Post Measurement

Actual Conductivity	7,975.8 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	936659
Last Calibrated	7/11/2023

Calibration Details

Slope	1
Offset	0.71 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	952765
Last Calibrated	7/11/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	0.1 mV
Temperature	24.83 °C

Pre Measurement

pH	7.00 pH

pH mV	0.1 mV

Post Measurement

pH	7.00 pH
pH mV	0.1 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-170.8 mV
Temperature	24.24 °C

Pre Measurement

pH	10.00 pH
pH mV	-170.3 mV

Post Measurement

pH	10.00 pH
pH mV	-170.4 mV

Slope and Offset 1

Slope	-56.96 mV/pH
Offset	0.1 mV

ORP

ORP Solution	ORP Standard
Offset	-98.3 mV
Temperature	24.63 °C
Pre Measurement	331.2 mV
Post Measurement	227.0 mV

Sensor	**RDO**
Serial Number	1022930
Last Calibrated	7/11/2023

Calibration Details

Slope	1.087964
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.69 mg/L
Pre Measurement	101.51 %Sat
Post Measurement	100.00 %Sat
Temperature	24.61 °C
Barometric Pressure	1,017.9 mbar

Sensor	**Barometric Pressure**
Serial Number	1034890
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	959874
Created	7/26/2023

Sensor	**pH/ORP**
Serial Number	927061
Last Calibrated	7/26/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	0.2 mV
Temperature	26.16 °C

Pre Measurement

pH	7.00 pH
pH mV	0.2 mV

Post Measurement

pH	7.00 pH
pH mV	0.2 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-174.1 mV
Temperature	26.10 °C

Pre Measurement

pH	9.93 pH
pH mV	-174.0 mV

Post Measurement

pH	10.00 pH
pH mV	-174.8 mV

Slope and Offset 1

Slope	-58.11 mV/pH
Offset	0.2 mV

ORP

ORP Solution	Quick Cal
Offset	-111.4 mV
Temperature	26.00 °C
Pre Measurement	225.3 mV
Post Measurement	222.0 mV

Sensor	**RDO**

Serial Number	777135
Last Calibrated	7/26/2023

Calibration Details

Slope	1.054491
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.55 mg/L
Pre Measurement	99.82 %Sat
Post Measurement	100.00 %Sat
Temperature	27.41 °C
Barometric Pressure	1,019.7 mbar

Sensor	**Conductivity**
Serial Number	689107
Last Calibrated	7/26/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.973
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,148.8 µS/cm
Specific Conductivity	7,996.4 µS/cm

Post Measurement

Actual Conductivity	8,152.5 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	935921
Last Calibrated	7/26/2023

Calibration Details

Slope	1
Offset	-0.98 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**Barometric Pressure**
Serial Number	959874
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	872584
Created	8/29/2023

Sensor	**pH/ORP**
Serial Number	997049
Last Calibrated	8/29/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-53.4 mV
Temperature	26.76 °C

Pre Measurement

pH	7.91 pH
pH mV	-53.8 mV

Post Measurement

pH	7.00 pH
pH mV	-53.7 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-174.2 mV
Temperature	26.33 °C

Pre Measurement

pH	9.86 pH
pH mV	-173.3 mV

Post Measurement

pH	10.00 pH
pH mV	-175.0 mV

Slope and Offset 1

Slope	-40.27 mV/pH
Offset	-53.4 mV

ORP

ORP Solution	Quick Cal
Offset	-126.2 mV
Temperature	26.74 °C
Pre Measurement	258.7 mV
Post Measurement	220.9 mV

Sensor	**Turbidity**

Serial Number	998189
Last Calibrated	8/29/2023

Calibration Details

Slope	1
Offset	-0.50 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**RDO**
Serial Number	1014453
Last Calibrated	8/29/2023

Calibration Details

Slope	1.072875
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.58 mg/L
Pre Measurement	100.70 %Sat
Post Measurement	100.00 %Sat
Temperature	26.20 °C
Barometric Pressure	1,018.9 mbar

Sensor	**Conductivity**
Serial Number	1004902
Last Calibrated	8/29/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.937
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,335.9 µS/cm
Specific Conductivity	8,067.1 µS/cm

Post Measurement

Actual Conductivity	8,266.6 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Barometric Pressure**
Serial Number	872584
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	920480
Created	7/7/2023

Sensor	**Conductivity**
Serial Number	1034748
Last Calibrated	7/7/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.968
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,173.3 µS/cm
Specific Conductivity	8,145.3 µS/cm

Post Measurement

Actual Conductivity	8,027.6 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1030580
Last Calibrated	7/7/2023

Calibration Details

Slope	1
Offset	1.97 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	1007327
Last Calibrated	7/7/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	2.9 mV
Temperature	25.06 °C

Pre Measurement

pH	7.03 pH

pH mV	2.9 mV

Post Measurement

pH	7.00 pH
pH mV	2.9 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-168.4 mV
Temperature	24.17 °C

Pre Measurement

pH	10.01 pH
pH mV	-167.9 mV

Post Measurement

pH	10.00 pH
pH mV	-167.9 mV

Slope and Offset 1

Slope	-57.11 mV/pH
Offset	2.9 mV

ORP

ORP Solution	Quick Cal
Offset	13.3 mV
Temperature	25.18 °C
Pre Measurement	116.1 mV
Post Measurement	223.2 mV

Sensor	**RDO**
Serial Number	756714
Last Calibrated	7/7/2023

Calibration Details

Slope	1.035065
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.10 mg/L
Pre Measurement	100.67 %Sat
Post Measurement	100.00 %Sat
Temperature	24.52 °C
Barometric Pressure	1,019.4 mbar

Sensor	**Barometric Pressure**
Serial Number	920480
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	1034890
Created	7/3/2023

Sensor	**Conductivity**
Serial Number	866779
Last Calibrated	7/3/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.969
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,854.5 µS/cm
Specific Conductivity	7,923.5 µS/cm

Post Measurement

Actual Conductivity	7,930.3 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	936659
Last Calibrated	7/3/2023

Calibration Details

Slope	1
Offset	0.41 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	952765
Last Calibrated	7/3/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	0.2 mV
Temperature	24.54 °C

Pre Measurement

pH	7.11 pH

pH mV	0.1 mV

Post Measurement

pH	7.00 pH
pH mV	0.2 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-170.5 mV
Temperature	24.42 °C

Pre Measurement

pH	10.18 pH
pH mV	-170.4 mV

Post Measurement

pH	10.00 pH
pH mV	-170.2 mV

Slope and Offset 1

Slope	-56.88 mV/pH
Offset	0.2 mV

ORP

ORP Solution	Quick Cal
Offset	20.0 mV
Temperature	24.54 °C
Pre Measurement	207.7 mV
Post Measurement	224.2 mV

Sensor	**RDO**
Serial Number	1022930
Last Calibrated	7/3/2023

Calibration Details

Slope	1.102648
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.56 mg/L
Pre Measurement	98.41 %Sat
Post Measurement	100.00 %Sat
Temperature	24.81 °C
Barometric Pressure	1,018.4 mbar

Sensor	**Barometric Pressure**
Serial Number	1034890
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	1034825
Created	7/5/2023

Sensor	**RDO**
Serial Number	1022920
Last Calibrated	7/5/2023

Calibration Details

Slope	1.105615
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.17 mg/L
Pre Measurement	101.42 %Sat
Post Measurement	100.00 %Sat
Temperature	27.02 °C
Barometric Pressure	1,008.2 mbar

Sensor	**Conductivity**
Serial Number	1035047
Last Calibrated	7/5/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.968
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,231.1 µS/cm
Specific Conductivity	7,941.7 µS/cm

Post Measurement

Actual Conductivity	8,291.6 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1006142
Last Calibrated	7/5/2023

Calibration Details

Slope	1
Offset	-1.23 NTU

Calibration Point 1

Pre Measurement	1.24 NTU

Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	953052
Last Calibrated	7/5/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	0.9 mV
Temperature	26.40 °C

Pre Measurement

pH	7.26 pH
pH mV	0.5 mV

Post Measurement

pH	7.00 pH
pH mV	0.9 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-169.0 mV
Temperature	26.06 °C

Pre Measurement

pH	10.40 pH
pH mV	-169.2 mV

Post Measurement

pH	10.00 pH
pH mV	-169.6 mV

Slope and Offset 1

Slope	-56.65 mV/pH
Offset	0.9 mV

ORP

ORP Solution	Zobell's
Offset	23.6 mV
Temperature	26.50 °C
Pre Measurement	174.0 mV
Post Measurement	227.2 mV

Sensor	**Barometric Pressure**
Serial Number	1034825
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	1034825
Created	7/6/2023

Sensor	**RDO**
Serial Number	1022920
Last Calibrated	7/6/2023

Calibration Details

Slope	1.105444
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.37 mg/L
Pre Measurement	99.98 %Sat
Post Measurement	100.00 %Sat
Temperature	26.10 °C
Barometric Pressure	1,019.4 mbar

Sensor	**Conductivity**
Serial Number	1035047
Last Calibrated	7/6/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.953
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,226.1 µS/cm
Specific Conductivity	8,125.2 µS/cm

Post Measurement

Actual Conductivity	8,099.3 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1006142
Last Calibrated	7/6/2023

Calibration Details

Slope	1
Offset	-1.11 NTU

Calibration Point 1

Pre Measurement	0.00 NTU

Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	953052
Last Calibrated	7/6/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	3.6 mV
Temperature	25.63 °C

Pre Measurement

pH	6.95 pH
pH mV	3.7 mV

Post Measurement

pH	7.00 pH
pH mV	3.6 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-165.1 mV
Temperature	24.92 °C

Pre Measurement

pH	9.94 pH
pH mV	-164.6 mV

Post Measurement

pH	10.00 pH
pH mV	-165.1 mV

Slope and Offset 1

Slope	-56.23 mV/pH
Offset	3.6 mV

ORP

ORP Solution	Quick Cal
Offset	-12.9 mV
Temperature	25.65 °C
Pre Measurement	258.9 mV
Post Measurement	222.5 mV

Sensor	**Barometric Pressure**
Serial Number	1034825
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	1034825
Created	7/6/2023

Sensor	**RDO**
Serial Number	1022920
Last Calibrated	7/6/2023

Calibration Details

Slope	1.101724
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.05 mg/L
Pre Measurement	100.46 %Sat
Post Measurement	100.00 %Sat
Temperature	28.29 °C
Barometric Pressure	1,010.3 mbar

Sensor	**Conductivity**
Serial Number	1035047
Last Calibrated	7/6/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.953
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,226.1 µS/cm
Specific Conductivity	8,125.2 µS/cm

Post Measurement

Actual Conductivity	8,099.3 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1006142
Last Calibrated	7/6/2023

Calibration Details

Slope	1
Offset	-1.11 NTU

Calibration Point 1

Pre Measurement	0.00 NTU

Post Measurement 0.00 NTU

Sensor	**pH/ORP**
Serial Number	953052
Last Calibrated	7/6/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	3.6 mV
Temperature	25.63 °C

Pre Measurement

pH	6.95 pH
pH mV	3.7 mV

Post Measurement

pH	7.00 pH
pH mV	3.6 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-165.1 mV
Temperature	24.92 °C

Pre Measurement

pH	9.94 pH
pH mV	-164.6 mV

Post Measurement

pH	10.00 pH
pH mV	-165.1 mV

Slope and Offset 1

Slope	-56.23 mV/pH
Offset	3.6 mV

ORP

ORP Solution	Quick Cal
Offset	-12.9 mV
Temperature	25.65 °C
Pre Measurement	258.9 mV
Post Measurement	222.5 mV

Sensor	**Barometric Pressure**
Serial Number	1034825
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	920480
Created	7/6/2023

Sensor	**Conductivity**
Serial Number	1034748
Last Calibrated	7/6/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.986
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,017.5 µS/cm
Specific Conductivity	8,005.7 µS/cm

Post Measurement

Actual Conductivity	8,011.7 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1030580
Last Calibrated	7/6/2023

Calibration Details

Slope	1
Offset	1.95 NTU

Calibration Point 1

Pre Measurement	0.15 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	1007327
Last Calibrated	7/6/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	4.8 mV
Temperature	25.10 °C

Pre Measurement

pH	6.99 pH

pH mV	4.8 mV

Post Measurement

pH	7.00 pH
pH mV	4.8 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-167.8 mV
Temperature	25.06 °C

Pre Measurement

pH	9.96 pH
pH mV	-167.8 mV

Post Measurement

pH	10.00 pH
pH mV	-167.9 mV

Slope and Offset 1

Slope	-57.55 mV/pH
Offset	4.8 mV

ORP

ORP Solution	Quick Cal
Offset	-93.5 mV
Temperature	25.08 °C
Pre Measurement	327.7 mV
Post Measurement	223.4 mV

Sensor	**RDO**
Serial Number	756714
Last Calibrated	7/6/2023

Calibration Details

Slope	1.041263
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.95 mg/L
Pre Measurement	99.58 %Sat
Post Measurement	100.00 %Sat
Temperature	25.28 °C
Barometric Pressure	1,019.9 mbar

Sensor	**Barometric Pressure**
Serial Number	920480
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	613224
Created	7/5/2023

Sensor	**Conductivity**
Serial Number	1018390
Last Calibrated	7/5/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.95
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,288.3 µS/cm
Specific Conductivity	8,168.9 µS/cm

Post Measurement

Actual Conductivity	8,116.9 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1032039
Last Calibrated	7/5/2023

Calibration Details

Slope	1
Offset	1.49 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	778881
Last Calibrated	7/5/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	0.3 mV
Temperature	25.81 °C

Pre Measurement

pH	7.04 pH

pH mV	0.3 mV

Post Measurement

pH	7.00 pH
pH mV	0.3 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-170.3 mV
Temperature	25.05 °C

Pre Measurement

pH	10.05 pH
pH mV	-169.7 mV

Post Measurement

pH	10.00 pH
pH mV	-170.3 mV

Slope and Offset 1

Slope	-56.86 mV/pH
Offset	0.3 mV

ORP

ORP Solution	Quick Cal
Offset	-94.8 mV
Temperature	25.77 °C
Pre Measurement	308.7 mV
Post Measurement	222.4 mV

Sensor	**RDO**
Serial Number	1023569
Last Calibrated	7/5/2023

Calibration Details

Slope	1.103974
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.41 mg/L
Pre Measurement	100.71 %Sat
Post Measurement	100.00 %Sat
Temperature	25.87 °C
Barometric Pressure	1,019.3 mbar

Sensor	**Barometric Pressure**
Serial Number	613224
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	613224
Created	7/5/2023

Sensor	**Conductivity**
Serial Number	1018390
Last Calibrated	7/5/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.934
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,701.8 µS/cm
Specific Conductivity	8,137.2 µS/cm

Post Measurement

Actual Conductivity	8,555.1 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1032039
Last Calibrated	7/5/2023

Calibration Details

Slope	1
Offset	1.49 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	778881
Last Calibrated	7/5/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	0.3 mV
Temperature	25.81 °C

Pre Measurement

pH	7.04 pH

pH mV	0.3 mV

Post Measurement	
pH	7.00 pH
pH mV	0.3 mV

Calibration Point 2	
pH of Buffer	10.00 pH
pH mV	-170.3 mV
Temperature	25.05 °C

Pre Measurement	
pH	10.05 pH
pH mV	-169.7 mV

Post Measurement	
pH	10.00 pH
pH mV	-170.3 mV

Slope and Offset 1	
Slope	-56.86 mV/pH
Offset	0.3 mV

ORP	
ORP Solution	Quick Cal
Offset	-94.8 mV
Temperature	25.77 °C
Pre Measurement	308.7 mV
Post Measurement	222.4 mV

Sensor	**RDO**
Serial Number	1023569
Last Calibrated	7/5/2023

Calibration Details	
Slope	1.103974
Offset	0.00 mg/L

Calibration point 100%	
Concentration	7.41 mg/L
Pre Measurement	100.71 %Sat
Post Measurement	100.00 %Sat
Temperature	25.87 °C
Barometric Pressure	1,019.3 mbar

Sensor	**Barometric Pressure**
Serial Number	613224
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	762234
Created	7/6/2023

Sensor	**Conductivity**
Serial Number	789695
Last Calibrated	7/6/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.955
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,027.9 µS/cm
Specific Conductivity	7,971.7 µS/cm

Post Measurement

Actual Conductivity	8,056.4 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1032040
Last Calibrated	7/6/2023

Calibration Details

Slope	1
Offset	1.99 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	858435
Last Calibrated	7/6/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-0.9 mV
Temperature	25.34 °C

Pre Measurement

pH	6.98 pH

pH mV	-0.9 mV

Post Measurement

pH	7.00 pH
pH mV	-0.9 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-172.0 mV
Temperature	24.93 °C

Pre Measurement

pH	9.96 pH
pH mV	-171.5 mV

Post Measurement

pH	10.00 pH
pH mV	-172.0 mV

Slope and Offset 1

Slope	-57.04 mV/pH
Offset	-0.9 mV

ORP

ORP Solution	Quick Cal
Offset	-15.2 mV
Temperature	25.37 °C
Pre Measurement	225.8 mV
Post Measurement	223.0 mV

Sensor	**RDO**
Serial Number	838391
Last Calibrated	7/6/2023

Calibration Details

Slope	1.038293
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.00 mg/L
Pre Measurement	100.09 %Sat
Post Measurement	100.00 %Sat
Temperature	25.04 °C
Barometric Pressure	1,019.3 mbar

Sensor	**Barometric Pressure**
Serial Number	762234
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	1034825
Created	7/7/2023

Sensor	**RDO**
Serial Number	1022920
Last Calibrated	7/7/2023

Calibration Details

Slope	1.104476
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.52 mg/L
Pre Measurement	99.87 %Sat
Post Measurement	100.00 %Sat
Temperature	25.07 °C
Barometric Pressure	1,019.2 mbar

Sensor	**Conductivity**
Serial Number	1035047
Last Calibrated	7/7/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.984
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,739.7 µS/cm
Specific Conductivity	7,755.2 µS/cm

Post Measurement

Actual Conductivity	7,984.1 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1006142
Last Calibrated	7/7/2023

Calibration Details

Slope	1
Offset	-1.13 NTU

Calibration Point 1

Pre Measurement	0.00 NTU

Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	953052
Last Calibrated	7/7/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-0.4 mV
Temperature	24.97 °C

Pre Measurement

pH	7.07 pH
pH mV	-0.3 mV

Post Measurement

pH	7.00 pH
pH mV	-0.4 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-166.5 mV
Temperature	24.58 °C

Pre Measurement

pH	10.03 pH
pH mV	-166.4 mV

Post Measurement

pH	10.00 pH
pH mV	-166.3 mV

Slope and Offset 1

Slope	-55.38 mV/pH
Offset	-0.4 mV

ORP

ORP Solution	Quick Cal
Offset	7.1 mV
Temperature	24.90 °C
Pre Measurement	203.6 mV
Post Measurement	223.7 mV

Sensor	**Barometric Pressure**
Serial Number	1034825
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	762234
Created	7/5/2023

Sensor	**Conductivity**
Serial Number	789695
Last Calibrated	7/5/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.952
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,136.9 µS/cm
Specific Conductivity	8,012.0 µS/cm

Post Measurement

Actual Conductivity	8,124.7 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1032040
Last Calibrated	7/5/2023

Calibration Details

Slope	1
Offset	1.92 NTU

Calibration Point 1

Pre Measurement	0.05 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	858435
Last Calibrated	7/5/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-2.1 mV
Temperature	25.75 °C

Pre Measurement

pH	7.03 pH

pH mV	-2.2 mV

Post Measurement

pH	7.00 pH
pH mV	-2.1 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-174.0 mV
Temperature	24.86 °C

Pre Measurement

pH	10.04 pH
pH mV	-173.7 mV

Post Measurement

pH	10.00 pH
pH mV	-173.9 mV

Slope and Offset 1

Slope	-57.28 mV/pH
Offset	-2.1 mV

ORP

ORP Solution	Quick Cal
Offset	-12.2 mV
Temperature	25.82 °C
Pre Measurement	226.3 mV
Post Measurement	222.3 mV

Sensor	**RDO**
Serial Number	838391
Last Calibrated	7/5/2023

Calibration Details

Slope	1.037935
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.02 mg/L
Pre Measurement	100.43 %Sat
Post Measurement	100.00 %Sat
Temperature	24.87 °C
Barometric Pressure	1,018.6 mbar

Sensor	**Barometric Pressure**
Serial Number	762234
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	762234
Created	7/7/2023

Sensor	**Conductivity**
Serial Number	789695
Last Calibrated	7/7/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.955
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,062.3 µS/cm
Specific Conductivity	8,004.8 µS/cm

Post Measurement

Actual Conductivity	8,057.4 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1032040
Last Calibrated	7/7/2023

Calibration Details

Slope	1
Offset	2.02 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	858435
Last Calibrated	7/7/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-1.9 mV
Temperature	25.31 °C

Pre Measurement

pH	7.02 pH

pH mV	-2.0 mV

Post Measurement

pH	7.00 pH
pH mV	-1.9 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-172.1 mV
Temperature	24.06 °C

Pre Measurement

pH	10.00 pH
pH mV	-171.3 mV

Post Measurement

pH	10.00 pH
pH mV	-171.6 mV

Slope and Offset 1

Slope	-56.73 mV/pH
Offset	-1.9 mV

ORP

ORP Solution	Quick Cal
Offset	-15.3 mV
Temperature	25.38 °C
Pre Measurement	222.8 mV
Post Measurement	223.0 mV

Sensor	**RDO**
Serial Number	838391
Last Calibrated	7/7/2023

Calibration Details

Slope	1.03858
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.14 mg/L
Pre Measurement	99.91 %Sat
Post Measurement	100.00 %Sat
Temperature	24.10 °C
Barometric Pressure	1,018.9 mbar

Sensor	**Barometric Pressure**
Serial Number	762234
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	762234
Created	7/3/2023

Sensor	**Conductivity**
Serial Number	789695
Last Calibrated	7/3/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.954
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,258.0 µS/cm
Specific Conductivity	8,149.1 µS/cm

Post Measurement

Actual Conductivity	8,106.9 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1032040
Last Calibrated	7/3/2023

Calibration Details

Slope	1
Offset	1.97 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	858435
Last Calibrated	7/3/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-0.2 mV
Temperature	25.67 °C

Pre Measurement

pH	7.14 pH

pH mV	-0.2 mV

Post Measurement

pH	7.00 pH
pH mV	-0.2 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-172.1 mV
Temperature	24.61 °C

Pre Measurement

pH	10.25 pH
pH mV	-171.3 mV

Post Measurement

pH	10.00 pH
pH mV	-171.8 mV

Slope and Offset 1

Slope	-57.27 mV/pH
Offset	-0.2 mV

ORP

ORP Solution	Quick Cal
Offset	-7.9 mV
Temperature	25.70 °C
Pre Measurement	216.8 mV
Post Measurement	222.5 mV

Sensor	**RDO**
Serial Number	838391
Last Calibrated	7/3/2023

Calibration Details

Slope	1.043079
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.95 mg/L
Pre Measurement	99.41 %Sat
Post Measurement	100.00 %Sat
Temperature	25.07 °C
Barometric Pressure	1,018.0 mbar

Sensor	**Barometric Pressure**
Serial Number	762234
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	887121
Created	7/7/2023

Sensor	**RDO**
Serial Number	1023618
Last Calibrated	7/7/2023

Calibration Details

Slope	1.084648
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.72 mg/L
Pre Measurement	104.61 %Sat
Post Measurement	100.00 %Sat
Temperature	24.58 °C
Barometric Pressure	1,019.3 mbar

Sensor	**Conductivity**
Serial Number	755751
Last Calibrated	7/7/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.921
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,882.6 µS/cm
Specific Conductivity	7,888.0 µS/cm

Post Measurement

Actual Conductivity	7,994.5 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1028808
Last Calibrated	7/7/2023

Calibration Details

Slope	1
Offset	0.22 NTU

Calibration Point 1

Pre Measurement	0.00 NTU

Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	1007366
Last Calibrated	7/7/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-3.0 mV
Temperature	24.86 °C

Pre Measurement

pH	7.04 pH
pH mV	-3.1 mV

Post Measurement

pH	7.00 pH
pH mV	-3.0 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-173.8 mV
Temperature	24.19 °C

Pre Measurement

pH	9.93 pH
pH mV	-173.4 mV

Post Measurement

pH	10.00 pH
pH mV	-173.4 mV

Slope and Offset 1

Slope	-56.93 mV/pH
Offset	-3.0 mV

ORP

ORP Solution	Quick Cal
Offset	-86.5 mV
Temperature	24.96 °C
Pre Measurement	217.2 mV
Post Measurement	223.6 mV

Sensor	**Barometric Pressure**
Serial Number	887121
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	887121
Created	7/3/2023

Sensor	**RDO**
Serial Number	1023618
Last Calibrated	7/3/2023

Calibration Details

Slope	1.0844
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.61 mg/L
Pre Measurement	99.78 %Sat
Post Measurement	100.00 %Sat
Temperature	25.33 °C
Barometric Pressure	1,017.8 mbar

Sensor	**Conductivity**
Serial Number	755751
Last Calibrated	7/3/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.88
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,929.6 µS/cm
Specific Conductivity	7,941.3 µS/cm

Post Measurement

Actual Conductivity	7,988.2 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1028808
Last Calibrated	7/3/2023

Calibration Details

Slope	1
Offset	-0.02 NTU

Calibration Point 1

Pre Measurement	0.00 NTU

Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	1007366
Last Calibrated	7/3/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	2.5 mV
Temperature	25.04 °C

Pre Measurement

pH	6.96 pH
pH mV	2.5 mV

Post Measurement

pH	7.00 pH
pH mV	2.5 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-172.2 mV
Temperature	24.66 °C

Pre Measurement

pH	9.91 pH
pH mV	-171.9 mV

Post Measurement

pH	10.00 pH
pH mV	-172.0 mV

Slope and Offset 1

Slope	-58.22 mV/pH
Offset	2.5 mV

ORP

ORP Solution	Quick Cal
Offset	19.9 mV
Temperature	24.92 °C
Pre Measurement	203.8 mV
Post Measurement	223.6 mV

Sensor	**Barometric Pressure**
Serial Number	887121
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	887121
Created	7/6/2023

Sensor	**RDO**
Serial Number	1023618
Last Calibrated	7/6/2023

Calibration Details

Slope	1.13695
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.64 mg/L
Pre Measurement	99.82 %Sat
Post Measurement	100.00 %Sat
Temperature	25.21 °C
Barometric Pressure	1,067.3 mbar

Sensor	**Conductivity**
Serial Number	755751
Last Calibrated	7/6/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.906
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,848.8 µS/cm
Specific Conductivity	7,735.8 µS/cm

Post Measurement

Actual Conductivity	8,116.8 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1028808
Last Calibrated	7/6/2023

Calibration Details

Slope	1
Offset	-0.07 NTU

Calibration Point 1

Pre Measurement	0.00 NTU

Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	1007366
Last Calibrated	7/6/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-0.5 mV
Temperature	25.64 °C

Pre Measurement

pH	7.09 pH
pH mV	-0.6 mV

Post Measurement

pH	7.00 pH
pH mV	-0.5 mV

Slope and Offset 1

Slope	-59.29 mV/pH
Offset	-0.5 mV

ORP

ORP Solution	Quick Cal
Offset	-92.4 mV
Temperature	25.76 °C
Pre Measurement	221.0 mV
Post Measurement	222.4 mV

Sensor	**Barometric Pressure**
Serial Number	887121
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	920480
Created	7/3/2023

Sensor	**Conductivity**
Serial Number	1034748
Last Calibrated	7/3/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.955
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,297.6 µS/cm
Specific Conductivity	8,156.9 µS/cm

Post Measurement

Actual Conductivity	8,138.0 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	1030580
Last Calibrated	7/3/2023

Calibration Details

Slope	1
Offset	1.83 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	1007327
Last Calibrated	7/3/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	7.6 mV
Temperature	25.86 °C

Pre Measurement

pH	7.06 pH

pH mV	7.6 mV

Post Measurement

pH	7.00 pH
pH mV	7.6 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-166.3 mV
Temperature	24.91 °C

Pre Measurement

pH	10.08 pH
pH mV	-165.7 mV

Post Measurement

pH	10.00 pH
pH mV	-166.2 mV

Slope and Offset 1

Slope	-57.95 mV/pH
Offset	7.6 mV

ORP

ORP Solution	Quick Cal
Offset	6.8 mV
Temperature	25.90 °C
Pre Measurement	221.6 mV
Post Measurement	222.2 mV

Sensor	**RDO**
Serial Number	756714
Last Calibrated	7/3/2023

Calibration Details

Slope	1.048794
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.82 mg/L
Pre Measurement	97.97 %Sat
Post Measurement	100.00 %Sat
Temperature	25.69 °C
Barometric Pressure	1,018.4 mbar

Sensor	**Barometric Pressure**
Serial Number	920480
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	1034890
Created	7/3/2023

Sensor	**Conductivity**
Serial Number	866779
Last Calibrated	7/3/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.969
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,854.5 µS/cm
Specific Conductivity	7,923.5 µS/cm

Post Measurement

Actual Conductivity	7,930.3 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	936659
Last Calibrated	7/3/2023

Calibration Details

Slope	1
Offset	0.41 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

Sensor	**pH/ORP**
Serial Number	952765
Last Calibrated	7/3/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	0.2 mV
Temperature	24.54 °C

Pre Measurement

pH	7.11 pH

pH mV	0.1 mV

Post Measurement

pH	7.00 pH
pH mV	0.2 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-170.5 mV
Temperature	24.42 °C

Pre Measurement

pH	10.18 pH
pH mV	-170.4 mV

Post Measurement

pH	10.00 pH
pH mV	-170.2 mV

Slope and Offset 1

Slope	-56.88 mV/pH
Offset	0.2 mV

ORP

ORP Solution	Quick Cal
Offset	20.0 mV
Temperature	24.54 °C
Pre Measurement	207.7 mV
Post Measurement	224.2 mV

Sensor	**RDO**
Serial Number	1022930
Last Calibrated	7/3/2023

Calibration Details

Slope	1.102648
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.56 mg/L
Pre Measurement	98.41 %Sat
Post Measurement	100.00 %Sat
Temperature	24.81 °C
Barometric Pressure	1,018.4 mbar

Sensor	**Barometric Pressure**
Serial Number	1034890
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	959874
Created	7/24/2023

Sensor	**Conductivity**
Serial Number	689107
Last Calibrated	7/24/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.977
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	8,991.5 µS/cm
Specific Conductivity	7,934.4 µS/cm

Post Measurement

Actual Conductivity	9,065.8 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	777135
Last Calibrated	7/24/2023

Calibration Details

Slope	1.044636
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.32 mg/L
Pre Measurement	95.99 %Sat
Post Measurement	100.00 %Sat
Temperature	29.16 °C
Barometric Pressure	1,010.8 mbar

Sensor	**pH/ORP**
Serial Number	927061
Last Calibrated	7/24/2023

Calibration Details

Calibration Point 1

pH of Buffer	6.99 pH
pH mV	0.3 mV
Temperature	32.18 °C

Pre Measurement

pH	7.00 pH
pH mV	0.2 mV

Post Measurement

pH	6.99 pH
pH mV	0.3 mV

Calibration Point 2

pH of Buffer	9.95 pH
pH mV	-176.2 mV
Temperature	32.12 °C

Pre Measurement

pH	9.91 pH
pH mV	-176.2 mV

Post Measurement

pH	9.95 pH
pH mV	-180.4 mV

Slope and Offset 1

Slope	-59.62 mV/pH
Offset	-0.3 mV

ORP

ORP Solution	Quick Cal
Offset	-113.3 mV
Temperature	31.98 °C
Pre Measurement	231.0 mV
Post Measurement	213.0 mV

Sensor	**Turbidity**
Serial Number	935921
Last Calibrated	7/24/2023

Calibration Details

Slope	1
Offset	-1.34 NTU

Calibration Point 1

Pre Measurement	1.34 NTU
Post Measurement	0.00 NTU

Sensor	**Barometric Pressure**
Serial Number	959874
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	867242
Created	9/11/2023

Sensor	**Conductivity**
Serial Number	1005531
Last Calibrated	9/11/2023

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.887
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	9,002.2 µS/cm
Specific Conductivity	8,937.8 µS/cm

Post Measurement

Actual Conductivity	8,057.7 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**Turbidity**
Serial Number	956577
Last Calibrated	9/11/2023

Calibration Details

Slope	1
Offset	0.97 NTU

Calibration Point 1

Pre Measurement	0.24 NTU
Post Measurement	0.00 NTU

Sensor	**RDO**
Serial Number	959243
Last Calibrated	9/11/2023

Calibration Details

Slope	1.043605
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.86 mg/L
Pre Measurement	99.93 %Sat
Post Measurement	100.00 %Sat
Temperature	25.61 °C

Barometric Pressure	1,017.6 mbar

Sensor	**pH/ORP**
Serial Number	982874
Last Calibrated	9/11/2023

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	3.2 mV
Temperature	25.38 °C

Pre Measurement

pH	6.95 pH
pH mV	3.1 mV

Post Measurement

pH	7.00 pH
pH mV	3.2 mV

Calibration Point 2

pH of Buffer	10.00 pH
pH mV	-170.7 mV
Temperature	26.46 °C

Pre Measurement

pH	9.88 pH
pH mV	-171.2 mV

Post Measurement

pH	10.00 pH
pH mV	-171.5 mV

Slope and Offset 1

Slope	-57.93 mV/pH
Offset	3.2 mV

ORP

ORP Solution	Quick Cal
Offset	-96.5 mV
Temperature	25.38 °C
Pre Measurement	319.6 mV
Post Measurement	223.0 mV

Sensor	**Barometric Pressure**
Serial Number	867242
Last Calibrated	Factory Defaults

Appendix C:
Analytical Documentation

Appendix C.1:
Cross Reference for Monitoring Well#, SDG#, DVR#, and COC ID

Table C-1: Cross Reference for Monitoring Well#, SDG#, DVR#, and COC ID
Third Quarter 2023 Groundwater Monitoring Event

Monitoring Well #	Laboratory	SDG #	DVR #	COC ID
NMW24	APPL	23G0068	Data Validation Report Level S2BVEM 23G0068	NMW24-WGN01LF-23Q3
		23G0047	Data Validation Report Level S2BVEM 23G0047	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
NMW25	APPL	23G0272	Data Validation Report Level S2BVEM 23G0272	NMW25-WGN01LF-23Q3
	Energy	B23071979	Data Validation Report Level S2BVEM B23071979	
	SGS	FC8221	Data Validation Report Level S2BVEM FC8221	
NMW32	APPL	23H0251	Data Validation Report Level S2BVEM 23H0251	NMW32-WGN01LF-23Q3
	Energy	B23082891	Data Validation Report Level S2BVEM B23082891	
	Eurofins	580-131002-1	Data Validation Report Level S2BVEM 580-131002-1	
	SGS	FC9241	Data Validation Report Level S2BVEM FC9241	
	Energy	B23082891	Data Validation Report Level S2BVEM B23082891	NMW32-WGFD01LF-23Q3
	SGS	FC9241	Data Validation Report Level S2BVEM FC9241	
RHMW2254-01	APPL	23G0057	Data Validation Report Level S4BVEM 23G0057	RHMW2254-01-WGN01LF-23Q3
		23G0034	Data Validation Report Level S2BVEM 23G0034	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHMW01R	APPL	23G0086	Data Validation Report Level S2BVEM 23G0086	RHMW01R-WGN01LF-23Q3
		23G0075	Data Validation Report Level S2BVEM 23G0075	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7719	Data Validation Report Level S2BVEM FC7719	
RHMW02	APPL	23G0067	Data Validation Report Level S2BVEM 23G0067	RHMW02-WGN01LF-23Q3
		23G0047	Data Validation Report Level S2BVEM 23G0047	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHMW03	APPL	23G0067	Data Validation Report Level S2BVEM 23G0067	RHMW03-WGN01LF-23Q3
		23G0047	Data Validation Report Level S2BVEM 23G0047	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHMW04	APPL	23G0068	Data Validation Report Level S2BVEM 23G0068	RHMW04-WGN01LF-23Q3
		23G0047	Data Validation Report Level S2BVEM 23G0047	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHMW05	APPL	23G0087	Data Validation Report Level S2BVEM 23G0087	RHMW05-WGN01LF-23Q3
		23G0075	Data Validation Report Level S2BVEM 23G0075	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7719	Data Validation Report Level S2BVEM FC7719	
RHMW06	APPL	23G0068	Data Validation Report Level S2BVEM 23G0068	RHMW06-WGN01LF-23Q3
		23G0047	Data Validation Report Level S2BVEM 23G0047	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHMW08	APPL	23G0088	Data Validation Report Level S2BVEM 23G0088	RHMW08-WGN01LF-23Q3
		23G0072	Data Validation Report Level S2BVEM 23G0072	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
	APPL	23G0088	Data Validation Report Level S2BVEM 23G0088	RHMW08-WGFD01LF-23Q3
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
	Eurofins	580-131274-1	Data Validation Report Level S2BVEM 580-131274-1	RHMW08-WGN03LF-23Q3
RHMW09	APPL	23G0069	Data Validation Report Level S2BVEM 23G0069	RHMW09-WGN01LF-23Q3
		23G0072	Data Validation Report Level S2BVEM 23G0072	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
	Eurofins	580-131214-1	Data Validation Report Level S4VEM 580-131214-1	RHMW09-WGN03LF-23Q3
RHMW10	APPL	23G0067	Data Validation Report Level S2BVEM 23G0067	RHMW10-WGN01LF-23Q3
		23G0047	Data Validation Report Level S2BVEM 23G0047	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
	APPL	23G0067	Data Validation Report Level S2BVEM 23G0067	RHMW10-WGFD01LF-23Q3
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
RHMW11-05	APPL	23G0086	Data Validation Report Level S2BVEM 23G0086	RHMW11-05-WGN01G-23Q3
		23G0072	Data Validation Report Level S2BVEM 23G0072	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
	Eurofins	580-131274-1	Data Validation Report Level S2BVEM 580-131274-1	RHMW11-05-WGN03G-23Q3

Table C-1: Cross Reference for Monitoring Well#, SDG#, DVR#, and COC ID
Third Quarter 2023 Groundwater Monitoring Event (cont'd)

Monitoring Well #	Laboratory	SDG #	DVR #	COC ID
RHMW12A	APPL	23G0086	Data Validation Report Level S2BVEM 23G0086	RHMW12A-WGN01LF-23Q3
		23G0075	Data Validation Report Level S2BVEM 23G0075	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7719	Data Validation Report Level S2BVEM FC7719	
RHMW13-05	APPL	23G0069	Data Validation Report Level S2BVEM 23G0069	RHMW13-05-WGN01G-23Q3
		23G0047	Data Validation Report Level S2BVEM 23G0047	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
RHMW14-03	APPL	23G0088	Data Validation Report Level S2BVEM 23G0088	RHMW14-03-WGN01G-23Q3
		23G0075	Data Validation Report Level S2BVEM 23G0075	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7719	Data Validation Report Level S2BVEM FC7719	
RHMW15-05	APPL	23G0057	Data Validation Report Level S4BVEM 23G0057	RHMW15-05-WGN01G-23Q3
		23G0034	Data Validation Report Level S2BVEM 23G0034	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHMW16	APPL	23G0093	Data Validation Report Level S4VEM 23G0093	RHMW16-WGN01LF-23Q3
		23G0075	Data Validation Report Level S2BVEM 23G0075	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7719	Data Validation Report Level S2BVEM FC7719	
	APPL	23G0093	Data Validation Report Level S4VEM 23G0093	RHMW16-WGFD01LF-23Q3
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7719	Data Validation Report Level S2BVEM FC7719	
RHMW17	APPL	23G0087	Data Validation Report Level S2BVEM 23G0087	RHMW17-WGN01LF-23Q3
		23G0075	Data Validation Report Level S2BVEM 23G0075	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7719	Data Validation Report Level S2BVEM FC7719	
RHMW19	APPL	23G0086	Data Validation Report Level S2BVEM 23G0086	RHMW19-WGN01LF-23Q3
		23G0072	Data Validation Report Level S2BVEM 23G0072	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7610	Data Validation Report Level S2BVEM FC7610	
	Eurofins	580-131214-1	Data Validation Report Level S4VEM 580-131214-1	RHMW19-WGN03LF-23Q3
RHMW20	APPL	23G0093	Data Validation Report Level S4VEM 23G0093	RHMW20-WGN01LF-23Q3
		23G0072	Data Validation Report Level S2BVEM 23G0072	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7613	Data Validation Report Level S2BVEM FC7613	
	Eurofins	580-131274-1	Data Validation Report Level S2BVEM 580-131274-1	RHMW20-WGN03LF-23Q3
RHP01	APPL	23G0088	Data Validation Report Level S2BVEM 23G0088	RHP01-WGN01LF-23Q3
		23G0072	Data Validation Report Level S2BVEM 23G0072	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7613	Data Validation Report Level S2BVEM FC7613	
	Eurofins	580-131274-1	Data Validation Report Level S2BVEM 580-131274-1	RHP01-WGN03LF-23Q3
RHP02	APPL	23G0086	Data Validation Report Level S2BVEM 23G0086	RHP02-WGN01LF-23Q3
		23G0072	Data Validation Report Level S2BVEM 23G0072	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7613	Data Validation Report Level S2BVEM FC7613	
	Eurofins	580-131274-1	Data Validation Report Level S2BVEM 580-131274-1	RHP02-WGN03LF-23Q3
RHP03	APPL	23G0057	Data Validation Report Level S4BVEM 23G0057	RHP03-WGN01LF-23Q3
		23G0034	Data Validation Report Level S2BVEM 23G0034	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7492	Data Validation Report Level S2BVEM FC7492	
RHP04A	APPL	23G0056	Data Validation Report Level S2BVEM 23G0056	RHP04A-WGN01LF-23Q3
		23G0034	Data Validation Report Level S2BVEM 23G0034	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHP04B	APPL	23G0055	Data Validation Report Level S2BVEM 23G0055	RHP04B-WGN01LF-23Q3
		23G0034	Data Validation Report Level S2BVEM 23G0034	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHP04C	APPL	23G0055	Data Validation Report Level S2BVEM 23G0055	RHP04C-WGN01LF-23Q3
		23G0034	Data Validation Report Level S2BVEM 23G0034	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHP05	APPL	23G0093	Data Validation Report Level S4VEM 23G0093	RHP05-WGN01LF-23Q3
		23G0075	Data Validation Report Level S2BVEM 23G0075	
	Energy	B23070715	Data Validation Report Level S2BVEM B23070715	
	SGS	FC7613	Data Validation Report Level S2BVEM FC7613	

Table C-1: Cross Reference for Monitoring Well#, SDG#, DVR#, and COC ID
Third Quarter 2023 Groundwater Monitoring Event (cont'd)

Monitoring Well #	Laboratory	SDG #	DVR #	COC ID
RHP06	APPL	23G0228	Data Validation Report Level S2BVEM 23G0228	RHP06-WGN01LF-23Q3
	Energy	B23071671	Data Validation Report Level S2BVEM B23071671	
	SGS	FC8173	Data Validation Report Level S2BVEM FC8173	
	APPL	23G0228	Data Validation Report Level S2BVEM 23G0228	RHP06-WGFD01LF-23Q3
	Energy	B23071671	Data Validation Report Level S2BVEM B23071671	
	SGS	FC8173	Data Validation Report Level S2BVEM FC8173	
RHP07	APPL	23G0056	Data Validation Report Level S2BVEM 23G0056	RHP07-WGN01LF-23Q3
		23G0034	Data Validation Report Level S2BVEM 23G0034	
	Energy	B23070304	Data Validation Report Level S2BVEM B23070304	
	SGS	FC7589	Data Validation Report Level S4VEM FC7589	
RHP08	APPL	23I0090	Data Validation Report Level S2BVEM 23I0090	RHP08-WGN01LF-23Q3
	Energy	B23090974	Data Validation Report Level S2BVEM B23090974	
	SGS	FC9541	Data Validation Report Level S2BVEM FC9541	
	Eurofins	580-131392-1	Data Validation Report Level S2BVEM 580-131392-1	
HDMW2253-03	APPL	23G0097	Data Validation Report Level S2BVEM 23G0097	HDMW2253-03-WGN01LF-23Q3
	Energy	B23081405	Data Validation Report Level S2BVEM B23081405	
	SGS	FC7757	Data Validation Report Level S2BVEM FC7757	
	Energy	B23081405	Data Validation Report Level S2BVEM B23081405	HDMW2253-03-WGN02LF-23Q3

Appendix C.2:
Analytical Laboratory Reports
[uploaded to JBPHH Environmental Data Management System at https://synectics.net]

Appendix C.3:
Data Validation Reports
[uploaded to JBPHH Environmental Data Management System at https://synectics.net]

Appendix C.4:
Detection and Quantitation Fact Sheet

Fact Sheet: Detection and Quantitation – What Project Managers and Data Users Need to Know

As a Project Manager or decision-maker, you may use environmental data to accomplish one or more of the following tasks:

- Determine whether a chemical substance is present in an environmental sample at or above some threshold value or action level;
- Verify that a pollutant concentration remains below a permit limit;
- Evaluate potential risks to human health or the environment;
- Monitor changes in concentrations of contaminants; or
- Determine the effectiveness of remediation activities.

Making correct decisions in these cases often depends on the ability of an analytical method to detect and measure extremely low concentrations of a substance.

This Fact Sheet has been prepared to: 1) provide Project Managers and data users with basic information about detection and quantitation concepts; and 2) acquaint the reader with detection and quantitation terminology and requirements contained in the *DoD Quality Systems Manual for Environmental Laboratories (DoD QSM),* Version 5.1. This information should help clarify the uncertainty associated with reporting low-concentration data. It should also help project teams understand the importance of selecting analytical methods that are sensitive enough for their intended uses, i.e., capable of generating reliable data (data of known precision and bias) at the project-specific decision levels.[1]

Measures of Sensitivity – Basic Concepts

The following terms are used to describe the routine sensitivity of analytical procedures:

- DL – Detection Limit
- LOD – Limit of Detection
- LOQ – Limit of Quantitation

All measures of sensitivity are specific to the analyte, sample matrix, test method, instrumentation, and analyst/laboratory performance. Therefore, analytical performance must be demonstrated for each variable (e.g., it is possible that two “identical” instruments from the same manufacturer may exhibit different sensitivities). A graphical representation of these terms is shown as Figure 1.

The Detection Limit (DL) is the smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration with 99% confidence. At the DL, the false positive rate (Type I error) is 1% (red shaded region in Figure 1). A DL may be used as the lowest

[1] A discussion on the Minimum Detectable Concentration (or Minimum Detectable Activity) for radiological data is beyond the scope of this Fact Sheet. For a discussion on this, see DoD/DOE QSM 5.1 Module 6, Section 1.5.2.1.1.

concentration for reliably reporting a detection of a specific analyte in a specific matrix with a specific method with 99% confidence.

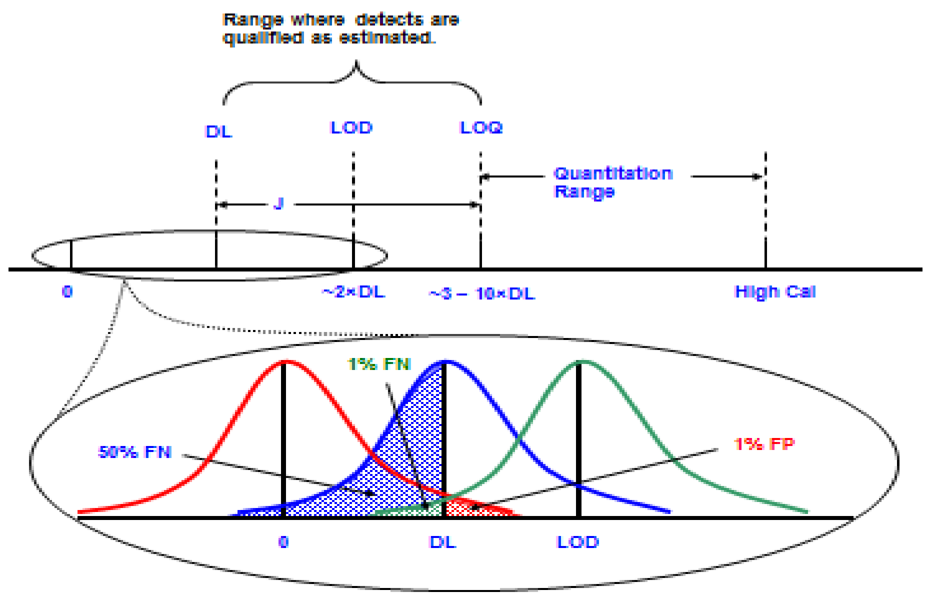

Figure 1: Summary of data quality characteristics below and above DL, LOD, and LOQ. The red trace shows the distribution of results given a sample with a true concentration of zero. The blue trace shows the distribution of results given a sample with a true concentration at the Detection Limit. The green trace shows the distribution of results given a sample with a true concentration at the Limit of Detection. The red shaded region represents those results which would yield a false positive (i.e., the true concentration is zero but the analytical result is detection). The blue and green shaded regions represent those results which would yield a false negative if the true concentration is at the reporting limit and the reporting limit is set at the DL or LOD, respectively (i.e., a sample with a true concentration at the DL has a 50% chance of yielding a false negative, and a sample with a true concentration at the LOD has a 1% chance of yielding a false negative).

Note that for reporting purposes, any result at or above the DL must also meet qualitative identification criteria required by the test method. Although a result at or above the DL indicates that the analyte is present, the absence of a result at or above the DL is inconclusive (i.e., one cannot confidently state whether the analyte is present or absent), because the false negative rate if the analyte is present at the DL is 50% (blue shaded region in Figure 1).

The Limit of Detection (LOD) is defined as the lowest concentration for reliable reporting of a non-detect of a specific analyte in a specific matrix with a specific method at 99% confidence. At the LOD, the false negative rate (Type II error) is 1% (green shaded region in Figure 1). In other words, if a sample has a true concentration at the LOD, there is at least a 99% probability of reporting a “detection” (a measured value ≥ DL) and a 1% chance of falsely reporting a non-detect (a false negative).

For reporting purposes, the failure to obtain a "detection" should be reported as "<LOD," because the false negative rate at the LOD is only 1%. Reporting the sample result as "<DL," is inappropriate because the false negative rate at the DL is 50%.

The Limit of Quantitation (LOQ) is the smallest concentration that produces a quantitative result with known and recorded precision and bias. For DoD/DOE projects, the LOQ shall be set at or above the concentration of the lowest initial calibration standard and within the calibration range. Because of the requirements on precision and bias, the LOQ is larger than the LOD[2]; therefore, the following is true:

$$DL < LOD < LOQ$$

Quantitative results, with a known degree of precision and bias, can only be achieved at or above the LOQ. Detections between the DL and the LOQ assure the *presence* of the analyte, but their numeric values are estimates and are therefore indicated as such on test reports. Figure 2 summarizes the differences and the relationship between DL, LOD, and LOQ.

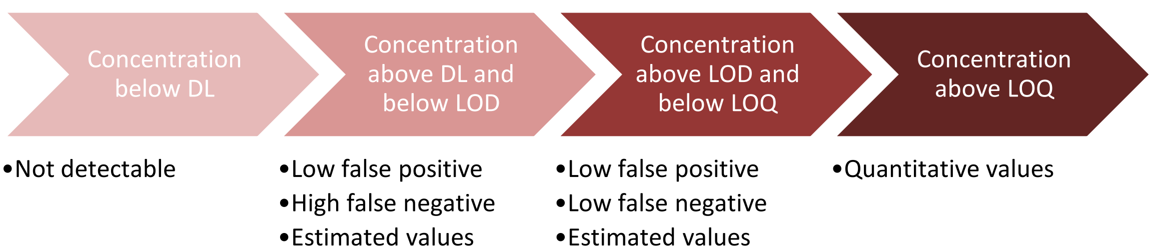

Figure 2: Summary of data quality characteristics below and above DL, LOD, and LOQ.

Types of Procedures for Estimating Sensitivity

Numerical estimates of the DL, LOD, or LOQ for a specific analyte, matrix, and method can be calculated using various statistical procedures, which involve spiking reagent water or other specific matrix with low concentrations of the analyte of interest. At this time, unfortunately, universally accepted statistical procedures do not exist.

The estimator that has been most commonly used by environmental laboratories is the EPA Method Detection Limit (MDL), which is an approximation of the DL. EPA has defined the MDL as "the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero."[3] Calculating the MDL at 99% confidence means there is a 1% probability of a false positive when a sample has a result at the MDL. The EPA MDL was designed to protect against <u>false positives</u>; however, it does not protect against false negatives.

[2] See TNI Module 4, Section 1.5.2.2d.
[3] 40 Code of Federal Regulations (CFR) Part 136, Appendix B, rev.2

Uses and Limitations of the MDL

When performed correctly and consistently, MDLs determined using the EPA procedure can be useful for comparing the performance of different laboratories using the same methods or the performance of different methods within the same laboratory. Laboratories typically determine the MDL in reagent water, resulting in a "best-case" MDL, which provides limited information about method performance on real-world samples.

The EPA MDL procedure as originally defined in 40 CFR Part 136, (Appendix B, 1984) has been criticized as a poor estimator of the DL for numerous reasons including but not limited to:

1. It is a single laboratory, short-term estimator that fails to account for analytical bias, changing instrument conditions or analyst skill.
2. It assumes uniform variance across all possible spike concentrations, failing to account for the fact that variance changes at higher concentrations.
3. It assumes that measured values at the spike concentration are normally distributed. By using the procedure and spiking at very low concentrations, laboratories have been able to calculate MDLs that cannot be achieved in practice.
4. It does not require a demonstration of the ability to detect an analyte at the calculated MDL.
5. It is not reproducible from day-to-day, lab-to-lab, etc.

Since 2000 the EPA has increased efforts to address these issues. In 2016 the EPA updated the MDL procedure in 40 CFR 136 which did include provisions for addressing background contamination, multiple analysts and instruments, and included verification requirements; however, the MDL calculation of spikes remains unchanged.

DoD QSM Requirements

Requirements for the DL, LOD and the LOQ which are designed to address some of the concerns discussed in the previous paragraph are contained in DoD QSM Module 4 Sections 1.5.2.1 and 1.5.2.2. Requirements that may be of particular note to Project Managers and Data Users are:

- Laboratories are required to verify measures of sensitivity, in terms of the LOD and LOQ, at least quarterly.
- Laboratories shall establish a detection limit (DL) for each suite of analyte-matrix-method, including surrogates. The DL shall be used to determine the LOD for each analyte and matrix as well as for all preparatory and cleanup methods routinely used on samples.
- After each DL determination, the laboratory must establish the LOD. It is specific to each suite of analyte, matrix, and method (including sample preparation).
- The laboratory must establish the LOD by spiking a quality system matrix at a concentration of at least 2 times but no greater than four times the DL.
- The signal to noise (S/N) ratio at the LOD must be at least three, and the results must meet all method requirements for analyte identification.

- The DL and LOD must be reported for all analyte-matrix-method suites unless it is not applicable to the test or specifically excluded by project requirements.
- The laboratory procedure for establishing the LOQ must empirically demonstrate precision and bias at the LOQ for each suite of analyte-matrix-method, including surrogates. The LOQ and associated precision and bias must meet client requirements and must be reported. If the method is modified, precision and bias at the new LOQ must be demonstrated and reported For DoD/DOE projects, the LOQ must be set within the calibration range, including the lowest calibration level.

Establishing Project-Specific Requirements for Method Sensitivity

Project teams should establish their project-specific requirements for method sensitivity in terms of a Reporting Limit (RL) for each analyte and matrix. As defined in the DoD QSM, the RL is a customer-specified lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix. The RL cannot be less than the LOQ, if precision and bias of the RL and the LOQ are identical. If the LOQ for a particular analytical method or laboratory cannot meet the RL, then a project team has four options:

1. Consult with the laboratory to improve method performance or modify the method to achieve a lower LOQ.
2. Select a different method with an LOQ less than or equal to the RL.
3. Raise the RL.
4. If no other options are available to meet project needs, allow for increased level of uncertainty such that adjusted LOQ can meet RL. This LOQ must be verified.

Please note that precision and bias must be taken into consideration when assessing the LOQ versus the RL. Also note that data below the RL may be reported; however, they are estimated values if less than the LOQ. Although data reporting and flagging requirements are project-specific, all reported LOD and LOQ shall be adjusted for the size of sample aliquots, concentration/dilution factors, and percent solids.

Reporting and Flagging Analytical Data

The following example (based on QSM 5.1 Module 2 section 5.10.3.1.1) illustrates the proper use of the “U” and “J” data qualifier flags for non-detect and estimated analytical results, respectively.

Data Qualifier flags in this example are defined as:
U- Analyte was not detected and is reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J- The reported result is an estimated value (e.g. matrix interference was observed, or the analyte was detected at a concentration outside the calibration range).

Example: Detection Limit (DL) = 2, Limit of Detection (LOD) = 4, Limit of Quantitation (LOQ) = 20, Reporting Limit (RL) for the project = 30, with precision and bias of the LOQ meeting precision and bias of the RL. All samples are undiluted.

Sample #1:	Analytical Result: Non-detect	Reported Result: 4U
Sample #2:	Analytical Result: 2	Reported Result: 2J
Sample #3:	Analytical Result: 10	Reported Result: 10J
Sample #4:	Analytical Result: 20	Reported Result: 20
Sample #5:	Analytical Result: 30	Reported Result: 30

Note that the laboratory may use additional data qualifiers or different letters or symbols to denote the qualifiers as long as they are appropriately defined and their use is consistent with project-specific requirements. Additionally, the laboratory-defined data qualifiers are for laboratory use only. Data usability must be determined by the project team.

Understanding and Documenting Uncertainty for Low-Concentration Data

As mentioned above, detection and quantitation limits are laboratory specific. The following are some steps Project Managers can take to document measurement uncertainty for low concentration data.

- As part of the laboratory selection process, provide the laboratory with project-specific RLs, including precision and bias, for each analyte and matrix. Ask the laboratory to provide its DL, LOD, and LOQ with associated precision and bias for each target analyte in each matrix of concern (e.g., reagent water, clean sand, etc.) and verify that these values meet project-specific RLs. Request laboratory SOPs for establishing the DL and for establishing and verifying the LOD and LOQ.
- Ask the laboratory to verify the LOD by processing an LOD verification check sample with each batch of samples. This is a quality control sample that is spiked at a concentration at or slightly above the LOD to evaluate whether the analyte of interest is in fact “detectable” in the matrix of interest. To accurately report non-detects, set the reporting for non-detects to “less than the LOD” or report the LOD with a “U” flag.
- If the project involves the collection of unusual or difficult matrices, or if the project-specific RL is near the LOQ, ask the laboratory to verify the LOQ in the project-specific matrix by analyzing a minimum of four replicate samples with known concentrations at the LOQ.
- Review low concentration raw data (e.g., chromatograms). If a result is reported above the DL, make sure that the signal-to-noise ratio is at least 3.
- Compare sample result with blank results. If sample results (including chromatograms) cannot be distinguished from blank results, the data may not be useable for decision making.