Click on the “Speaker” icon at the TOP LEFT of each slide to hear explanations of each slide’s information

Summary of the U.S. Navy Joint Base Pearl Harbor Hickam (JBPHH) Water Sample Practices/Reporting of TPH (Total Petroleum Hydrocarbon) Detections within RHSF & MW2254-01 DRINKING water samples (May-November 2021)

By Katherine McClanahan 9/6/2025
Questions? Contact me @
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Summary of Drinking Water Sample Reporting of RHSF & MW2254-01 Detections of TPH (July-November 2021)

Samples in chart ORDERED by **COLLECTION DATE**

- **3 EXCEEDENCES** in SAFE water levels occurred BEFORE the 11/20/2021 fuel leak as shown in RED HIGHLIGHTED Boxes in center column
- **Multiple** ORANGE boxes show "Near Exceedences" occurred between **May and November's fuel leak**
- **Multiple IRREGULAR reports seen** throughout **May to November of 2021** including but not limited to chain of custody issues, re-extraction & re-analysis outside of allowed hold time, and samples arriving with temperatures above allowed levels even prior to July 2021 TPH (fuel in the drinking water) detection
- Light Pink Shaded Areas= Samples with "NonDetect" or "U" results; however, note multiple IRREGULARITIES w/i those reports

Samples above this shaded area were COLLECTED PRIOR to the 11/20/21 fuel leak

RHSF/MW2254-01 Sample Number (ERH)	TPH results per sample (ug/L)	Collection Date per COC
1470	370	7/8/2021
1539	480 J+	7/15/2021
1547	U	7/22/2021
1555	230 J	7/29/2021
1582	540 1st Exceedence	8/5/2021
1590	480 J+	8/12/2021
1598	320	8/19/2021
1623	530 2nd Exceedence	8/26/2021
1646	480 J+	9/1/2021
1659	320 J+	9/8/2021
1668	270 J+	9/15/2021
1677	490 UJ	9/22/2021
1677	U	9/22/2021
1780	100 J-	10/5/2021
1796	170 J	10/6/2021
1818 1820	U**	10/13/2021
1916	165 J	11/10/2021
1907 1909 1915	U & 1915 Unknown b/c 1915 RESULTS Cancelled (lab completed results)	11/10/2021
1931 1934 1936 1938	457 diesel=j (Rpt says Total Extr 540) 540 3rd EXCEEDENCE 790 4th EXCEEDENCE	11/17/2021
Samples ABOVE this Shaded Area were COLLECTED PRIOR to the 11/20/2021 FUEL Leak		
2018	1222 Exceedence	12/1/2021

*Light Pink Shaded Areas=Samples with "NonDetect" or "U" results; however, note multiple IRREGULARITIES within the "U" report

Summary of Drinking Water Sample Reporting of RHSF & MW2254-01 Detections of TPH (July-November 2021) by REPORT DATE

Samples in chart ORDERED by REPORT DATE (Reflects the date on/around the time REGULATORS RECEIVED reports/results)

Samples ABOVE this SHADED AREA were REPORTED to Regulators PRIOR to the 11/20/2021 Fuel Leak

- **NONE** of the RHSF **drinking water EXCEEDENCE** samples from summer through fall of 2021 were reported to regulators **PRIOR** to the **11/20/2021 fuel leak**.
- **DELAYS in REPORTING** results to regulators prevented further in-depth analysis of water contaminants in the sample sets.
- **MULTIPLE** reports were **CREATED & VALIDATED** only to have modifications made months later & prior to reporting results to regulators.
- **Multiple SAMPLES** did **NOT** have **REPORTED RESULTS** for regulators **UNTIL SPRING of 2022** (some results took GREATER THAN 8 MONTHS to reach regulators).
- **Sample 1915's results WERE CANCELLED** after results were known so the lab did not report the results.

- Light Pink Shaded Areas=Samples with "NonDetect" or "U" results; however, note there were multiple IRREGULARITIES within the "U" reports

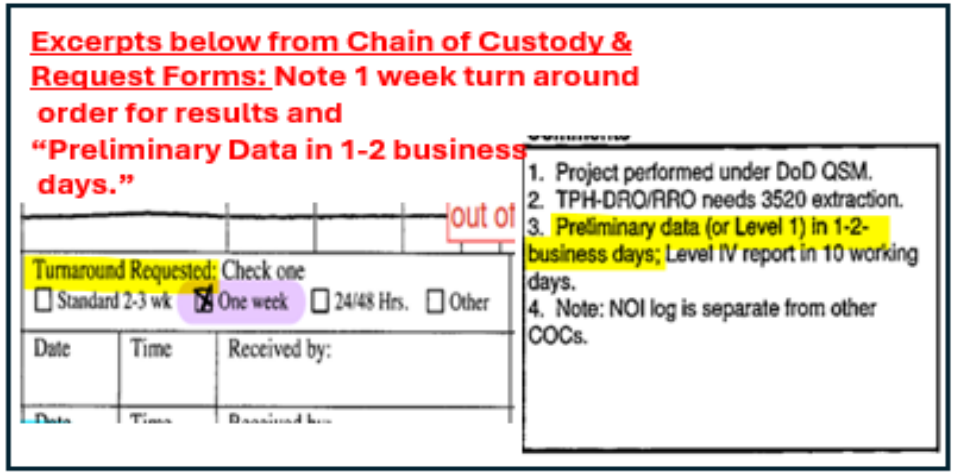
RHSF/MW2254-01 Sample Number (ERH)	TPH results per sample (ug/L)	Report Date
1555	230 J	9/27/2021
1646	480 J+	10/26/2021
1677	490 UJ	10/26/2021
1677	U	11/9/2021
1796	170 J	11/9/2021
1780	100 J-	11/9/2021
1818 1820	U**	11/11/2021
Samples Above this area were REPORTED to REGULATORS PRIOR to the 11/20/21 fuel leak		
1547	U	11/24/2021
1916	165 J	12/3/2021
1931 1934 1936 1938	457 diesel=j (Rpt says Total Extr 540) 540 3rd EXCEEDENCE 790 4th EXCEEDENCE	12/15/2021
2018	1222 Exceedence	1/10/2022
1659	320 J+	1/17/2022
1907 1909 1915	U & 1915 Unknown b/c 1915 RESULTS Cancelled although results completed by lab	1/17/2022
1623	530 2nd Exceedence	3/1/2022
1668	270 J+	3/1/2022
1590	480 J+	3/29/2022
1470	370	3/31/2022
1539	480 J+	3/31/2022
1598	320	4/1/2022
1582	540 1st Exceedence	4/1/2022

Summary of Drinking Water Sample Reporting of RHSF & MW2254-01 TPH Detections (July - November 2021

Samples now ORDERED by
ORIGINAL LAB REPORT DATE

- Laboratories **HAD GENERATED/ PROVIDED** multiple **reports showing EXCEEDENCES** in the drinking water **PRIOR** to the 11/20/2021 **Fuel Leak.**
- **BEFORE** reports were generated by the labs, the **NAVY** was **notified of PRELIMINARY RESULTS** within **1-2 business days** of receiving samples per chain of custody & request forms notating the request (see snippet of forms below).

Labs provided REPORTS for Samples ABOVE this SHADED AREA PRIOR to the 11/20/2021 Fuel Leak



Sample Number (ERH)	TPH results per sample (ug/L)	ORIGINAL Date Report CREATED	Report MODIFIED Date	Report Date
1470	370	9/20/2021	3/31/2022	3/31/2022
1539	480 J+	9/21/2021	4/2/2022	3/31/2022
1590	480 J+	9/24/2021	3/29/2022	3/29/2022
1555	230 J	9/27/2021	9/27/2021	9/27/2021
1598	320	9/27/2021	4/3/2022	4/1/2022
1623	530 2nd Exceedence	10/12/2021	3/1/2022	3/1/2022
1582	540 1st Exceedence	10/13/2021	4/1/2022	4/1/2022
1646	480 J+	10/26/2021	10/26/2021	10/26/2021
1677	490 UJ	10/26/2021	3/1/2022	10/26/2021
1677	U	11/9/2021	11/9/2021	11/9/2021
1796	170 J	11/9/2021	11/9/2021	11/9/2021
1668	270 J+	11/11/2021	3/1/2022	3/1/2022
1818 1820	U**	11/11/2021	11/11/2021	11/11/2021
Labs had GENERATED REPORTS for Samples Listed ABOVE Shaded Area prior to 11/20/2021 fuel leak				
1547	U	11/24/2021	11/24/2021	11/24/2021
1916	165 J	12/3/2021	12/3/2021	12/3/2021
1931 1934 1936 1938	457 diesel=j (Rpt says Total Extr 540) 540 3rd EXCEEDENCE 790 4th EXCEEDENCE	12/15/2021	12/15/2021	12/15/2021
1659	320 J+	1/17/2022	1/17/2022	1/17/2022
1907 1909 1915	U & 1915 Unknown b/c 1915 RESULTS Cancelled	1/17/2022	1/17/2022	1/17/2022
2018	1222 Exceedence	3/18/2022	3/18/2022	1/10/2022
1780	100 J-	11/2/2021*	11/9/2021	11/9/2021

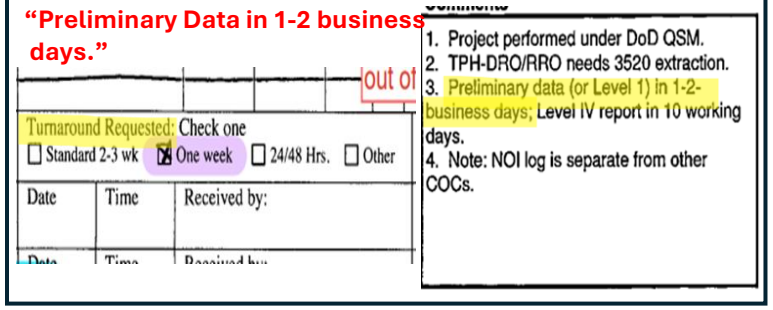
Summary of Drinking Water Sample Reporting of RHSF & MW2254-01 (July - November 2021)

Samples Ordered by **ORIGINAL LAB REPORT DATE**

- Laboratories **HAD GENERATED/ PROVIDED** multiple **reports showing EXCEEDENCES** in the drinking water **PRIOR** to the 11/20/2021 **Fuel Leak.**
- **BEFORE** reports were generated by the labs, the **NAVY** was **notified of PRELIMINARY RESULTS** within **1-2 business days** of receiving samples per chain of custody & request forms notating the request (see snippets below)

Labs provided REPORTS for Samples ABOVE this SHADED AREA PRIOR to the 11/20/2021 Fuel Leak

Excerpts below from Chain of Custody & Request Forms: Note 1 week turn around order for results and "Preliminary Data in 1-2 business days."



Report # Sample Delivery Group (SDG) Rev = REVISED Report	Sample Number (ERH)	TPH results per sample (ug/L)	Collection Date per COC	Lab Receipt Date	Date LAST Test Run in SDG	Report Date	ORIGINAL Date Report CREATED	Report MODIFIED Date
96778-rev	1470	370	7/8/2021	7/10/2021	8/9/2021	3/31/2022	9/20/2021	3/31/2022
96846-rev X 3	1539	480 J+	7/15/2021	7/16/2021	9/11/2021	3/31/2022	9/21/2021	4/2/2022
97159-rev	1590	480 J+	8/12/2021	8/13/2021	8/31/2021	3/29/2022	9/24/2021	3/29/2022
97004	1555	230 J	7/29/2021	7/31/2021	8/28/2021	9/27/2021	9/27/2021	9/27/2021
97221-rev	1598	320	8/19/2021	8/20/2021 8/23/2021	9/19/2021	4/1/2022	9/27/2021	4/3/2022
97307-rev	1623	530 2nd Exceedence	8/26/2021	8/27/2021	9/18/2021	3/1/2022	10/12/2021	3/1/2022
97057-rev X 2	1582	540 1st Exceedence	8/5/2021	8/6/2021 8/9/2021	8/25/2021	4/1/2022	10/13/2021	4/1/2022
97378	1646	480 J+	9/1/2021	8/9/2021 9/2/2021	9/30/2021	10/26/2021	10/26/2021	10/26/2021
97642	1677	490 UJ	9/22/2021	8/9/2021 9/24/2021	10/8/2021	10/26/2021	10/26/2021	3/1/2022
B21092272-rev X 3 Chain of Custody changed 10 days after results known w/ sample changed to groundwater vs drinking, bottom coc forms BLANK	1677	U	9/22/2021	9/25/2021	9/30/2021	11/9/2021	11/9/2021	11/9/2021
B21100806-rev	1796	170 J	10/6/2021	10/9/2021	10/14/2021	11/9/2021	11/9/2021	11/9/2021
97541-rev	1668	270 J+	9/15/2021	8/9/2021 9/17/2021	10/10/2021	3/1/2022	11/11/2021	3/1/2022
97833 Re-extracted/Analyzed Outside Allowed Hold time	1818 1820	U**	10/13/2021	8/27/2021 10/14/2021	11/4/2021	11/11/2021	11/11/2021	11/11/2021
Labs had REPORTS COMPLETED/GENERATED for the NAVY for Samples Listed ABOVE Shaded Area								
96919 Re-extracted/Re-analyzed Outside Allowed Hold Time	1547	U	7/22/2021	7/23/2021	9/30/2021	11/24/2021	11/24/2021	11/24/2021
B21111298	1916	165 J	11/10/2021	11/13/2021	11/19/2021	12/3/2021	12/3/2021	12/3/2021
B21111928 -revised Tests run twice & EXCEEDENCE KNOWN 11/24/21	1931 1934 1936 1938	457 diesel=j (Rpt says Total Extr 540) 540 3rd EXCEEDENCE, 790 4th EXCEEDENCE	11/17/2021	11/17/2021	11/29/2021 12/3/2021 12/3/2021 12/9/2021	12/15/2021	12/15/2021	12/15/2021
97466	1659	320 J+	9/8/2021	8/9/2021 9/10/2021	10/15/2021	1/17/2022	1/17/2022	1/17/2022
98212 Erh 1915 RESULTS CANCELLED so unknown although lab completed 1915 tests	1907 1909 1915	U & 1915 Unknown b/c 1915 RESULTS Cancelled	11/10/2021	11/12/2021	11/19/2021	1/17/2022	1/17/2022	1/17/2022
B21120381-revised: Re-extracted/Re-analyzed Outside Allowed Hold Time	2018	1222 Exceedence	12/1/2021	12/6/2021	2/25/2022	1/10/2022	3/18/2022	3/18/2022
B21100828-revised: Out of Temperature Compliance	1780	100 J-	10/5/2021	10/11/2021	10/13/2021	11/9/2021	11/2/2021*	11/9/2021

Summary

- **3 Drinking Water Reports**/Sample sets **showed UNSAFE** drinking water **levels/results of jet fuel** in the water between **May and November 20, 2021**, yet the Navy reported **ZERO** of those **EXCEEDENCES to regulators PRIOR to the 11/20/2021 fuel** leak.
- **DELAYS in REPORTING** results to regulators prevented further in-depth analysis of water contaminants in the sample sets.
- **MULTIPLE** reports were **CREATED & VALIDATED** only to have modifications made months later & prior to reporting results to regulators.
- **Multiple SAMPLES** did **NOT** have **REPORTED RESULTS** for regulators **UNTIL SPRING of 2022** (some results took GREATER THAN 8 MONTHS to reach regulators).
- Laboratories **HAD GENERATED/ PROVIDED** multiple **reports showing EXCEEDENCES** in the drinking water **PRIOR** to the 11/20/2021 **Fuel Leak.**
- **BEFORE** reports were generated by the labs, the **NAVY** was **notified of PRELIMINARY RESULTS** within **1-2 business days** of receiving samples per chain of custody & request forms notating the request.
- Aecom/Navy knew of a drinking water EXCEEDENCE just after 11/24/21 yet continued spouting "there are no indications the water is unsafe" when families began calling in late Nov 2021. Per their coc forms/lab request forms, they were provided preliminary results prior to reports being generated and the sample set containing the Exceedance was completed by 11/24/21.
- *Question: The Navy supposedly did NOT collect drinking water samples/or MW2254 samples after the May 6, 2021 leak until June 3, 2021; however, atypical sampling in reports is/was seen April, May & in June 2021 raising the question of whether labs had 1st received RHSF or MW2254-01 samples prior to 6/3/2021 & that the Navy utilized Re-extracting and Re-analyzing of samples outside their allowed hold times and only reporting the later result. This was seen in later summer to fall 2021 sampling so the practice is/was utilized by the Navy in order to avoid reporting 1st sample results. Labs do not own the sample results so authorities would have to subpoena labs in order to fully study the sample number practice (a fact experts noted as a factor during the Camp Lejeune congressional hearings & that acted as a barrier to laboratory staff sharing more information on what they knew/suspected regarding testing practices/results at Camp Lejeune).

Numerous types of irregularities found in the ~150 laboratory/water reports (May-Dec 2021)

Irregularities such as these create "under-reported" laboratory results

- **Chain of Custody Issues**
- **Delays**
- Lab **contamination** and/or surrogate recovery issues
- **Inadequate preservation** of samples
  - Samples shipped/stored at temperatures >4C when received or analyzed **decrease** TPH results
- **Extraction** step for TPH-diesel & TPH-oil carried out **after holding time exceeded**
  - SW-846: "Analytical data generated outside of the recommended holding times should typically be considered as **minimum** values only."
- **Analysis** performed at **end of** holding time or **after exceeding allowed hold time**
  - SW-846: "Although VOC samples may be held for up to 7 days unpreserved or 14 days or longer preserved, it is generally not recommended as good laboratory practice to hold them that long. VOC samples should be run as soon as possible after receipt by the laboratory."

The irregularities did not appear in isolation but were noted in multiple reports throughout the summer to fall of 2021

Multiple reports noted Re-extraction & Re-analysis (Retesting) occurring days to weeks apart: TPH-o(oil) in the initial RHSF Post-Chlorination sample **exceeded** the EAL – the sample that was re-extracted, re-analyzed **10 days later** was NonDetect (ND)
(**RHSF drinking water** sample was collected **11/17/21, 1st analyzed 11/24/21, Re-extracted and Re-analyzed 12/3/2021)**

530 ug/L= 530 parts per billion

530 ug/L

Client: AECOM - Honolulu
Client Sample ID: ERH1938 (Post-chlorination)
Project: CV18F0126/60571032.02.20.01
Matrix: Drinking Water

Collection Date: 11/17/2021 17:15
Date Received: 11/22/2021
Report Date: 12/15/2021

Analyses	Result	Units	DF	Qual	LOQ	LOD	DL	MCL	Method	Analysis Date / By	RunID : Run Order	BatchID
PETROLEUM HYDROCARBONS-SEMI-VOLATILE												
Diesel Range Organics (C10 to C24)	0.064	mg/L	1	J	0.30	0.15	0.039		SW8015C	12/3/2021 12:03/amn	GCFID-HP5-B_211202B : 9	161809
Diesel Range Organics (C10 to C24)	0.26	mg/L	1	J	0.30	0.14	0.037		SW8015C	11/24/2021 15:18/amn	GCFID-HP5-B_211124A : 32	161631
Diesel Range Organics (SGT-C10 to C24)	ND	mg/L	1	U	0.30	0.12	0.037		SW8015C	11/30/2021 13:24/amn	GCFID-HP5-B_211129B : 25	161631
Diesel Range Organics (SGT-C10 to C24)	ND	mg/L	1	U	0.30	0.12	0.039		SW8015C	12/7/2021 18:18/amn	GCFID-HP5-B_211207A : 7	161809
Oil Range Hydrocarbons (C24 to C40)	ND	mg/L	1	U	0.30	0.15	0.088		SW8015C	12/3/2021 12:03/amn	GCFID-HP5-B_211202B : 9	161809
Oil Range Hydrocarbons (C24 to C40)	0.53	mg/L	1		0.30	0.14	0.085		SW8015C	11/24/2021 15:18/amn	GCFID-HP5-B_211124A : 32	161631
Oil Range Hydrocarbons (SGT-C24 to C40)	ND	mg/L	1	U	0.30	0.14	0.085		SW8015C	11/30/2021 13:24/amn	GCFID-HP5-B_211129B : 25	161631
Oil Range Hydrocarbons (SGT-C24 to C40)	ND	mg/L	1	U	0.30	0.15	0.088		SW8015C	12/7/2021 18:18/amn	GCFID-HP5-B_211207A : 7	161809
Total Extractable Hydrocarbons	0.13	mg/L	1	J	0.30	0.15	0.075		SW8015C	12/3/2021 12:03/amn	GCFID-HP5-B_211202B : 9	161809
Total Extractable Hydrocarbons	0.88	mg/L	1		0.30	0.14	0.072		SW8015C	11/24/2021 15:18/amn	GCFID-HP5-B_211124A : 32	161631
Total Extractable Hydrocarbons (SGT)	ND	mg/L	1	U	0.30	0.12	0.032		SW8015C	11/30/2021 13:24/amn	GCFID-HP5-B_211129B : 25	161631
Total Extractable Hydrocarbons (SGT)	ND	mg/L	1	U	0.30	0.12	0.033		SW8015C	12/7/2021 18:18/amn	GCFID-HP5-B_211207A : 7	161809
Surr: o-Terphenyl	107.0	%REC	1		56-125				SW8015C	12/3/2021 12:03/amn	GCFID-HP5-B_211202B : 9	161809
Surr: o-Terphenyl	101.0	%REC	1		56-125				SW8015C	11/24/2021 15:18/amn	GCFID-HP5-B_211124A : 32	161631
Surr: o-Terphenyl (SGT)	87.0	%REC	1		56-125				SW8015C	11/30/2021 13:24/amn	GCFID-HP5-B_211129B : 25	161631
Surr: o-Terphenyl (SGT)	99.0	%REC	1		56-125				SW8015C	12/7/2021 18:18/amn	GCFID-HP5-B_211207A : 7	161809
Surr: n-Triacontane	100.0	%REC	1		50-150				SW8015C	12/3/2021 12:03/amn	GCFID-HP5-B_211202B : 9	161809
Surr: n-Triacontane	95.0	%REC	1		50-150				SW8015C	11/24/2021 15:18/amn	GCFID-HP5-B_211124A : 32	161631
Surr: n-Triacontane (SGT)	77.0	%REC	1		50-150				SW8015C	11/30/2021 13:24/amn	GCFID-HP5-B_211129B : 25	161631
Surr: n-Triacontane (SGT)	89.0	%REC	1		50-150				SW8015C	12/7/2021 18:18/amn	GCFID-HP5-B_211207A : 7	161809

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

This is not confirmation testing

We do not know all the tests the Navy ordered nor all results ALTHOUGH the lab COMPLETED TESTING

What was the DRINKING WATER (RHSF) result 10 days BEFORE the 11/20/21 Red Hill fuel leak?

- **ERH1915** (RHSF) was analyzed
- AECOM requested that the sample be **'cancelled'**
- The lab **DID NOT report** the results

EPA 8015B-eHL

Form 2 & 8

Surrogate Recovery

Lab Name: APPL, Inc. SDG No: 98212
Case No: 98212 Date Analyzed: 11/19/2021
Matrix: WATER Instrument: Apollo

APPL ID.	Client Sample No.	SURROGATE: (R) DECANOIC ACID (S)			SURROGATE: OCTACOSANE (S)		
		Limits	Result	Qualifier	Limits	Result	Qualifier
211116A1-BLK	Blank	0-1	0.0		60-142	117	
211116A1-LCS	Lab Control Spike	0-1	0.0		60-142	124	
211116A1-LCSD	Lab Control SpikeD	0-1	0.0		60-142	111	
BA46115	ERH1907	0-1	0.0		60-142	86.8	
BA46116	ERH1909	0-1	0.0		60-142	108	
BA46117	ERH1915	0-1	0.0		60-142	94.1	

The Navy **detected a PESTICIDE** in the drinking water in June of 2021 but then asked labs NOT to test for the FULL EPA 8270 list of contaminants which would have continued the testing for the pesticide.

- In a June, 2021 drinking water (RHSF) sample, a **PESTICIDE** was detected.
- The Data validation report confirmed the presence of the compound/pesticide & its reported concentration.
- The Navy does not report the full list of 8270, so we do not know how often this was/is detected.
- This sample's **revised** report did not reach reach regulators until ~ 9/22/21.

AECOM
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Attn: Alethea Ramos
Project: 60571032 CV18F0126 Red Hill Fuel Storage
Sample ID: ERH1454 **RHSF**
Sample Collection Date: 06/24/21

APPL Inc.
908 North Temperance Avenue
Clovis, CA 93611

ARF: 96682
APPL ID: BA35282
QCG: #87D53-210628AK-265756

Method	Analyte	Result	LOQ	LOD	DL	Units	Extraction Date	Analysis Date
EPA 8270D	1,2,4-TRICHLOROBENZENE	5.00 U	10.0	5.00	1.30	ug/L	06/28/21	06/30/21
EPA 8270D	1,2-DICHLOROBENZENE	5.00 U	10.0	5.00	1.10	ug/L	06/28/21	06/30/21
EPA 8270D	1,3-DICHLOROBENZENE	5.00 U	10.0	5.00	1.00	ug/L	06/28/21	06/30/21
EPA 8270D	1,4-DICHLOROBENZENE	5.00 U	10.0	5.00	1.00	ug/L	06/28/21	06/30/21
EPA 8270D	1,4-DIOXANE	0.50 U	1.0	0.50	0.16	ug/L	06/28/21	06/30/21
EPA 8270D	1-METHYLNAPHTHALENE	5.00 U	10.0	5.00	1.80	ug/L	06/28/21	06/30/21
EPA 8270D	2,4,5-TRICHLOROPHENOL	5.00 U	10.0	5.00	2.30	ug/L	06/28/21	06/30/21
EPA 8270D	2,4,6-TRICHLOROPHENOL	5.00 U	10.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	2,4-DICHLOROPHENOL	5.00 U	10.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	2,4-DIMETHYLPHENOL	5.00 U	10.0	5.00	2.40	ug/L	06/28/21	06/30/21
EPA 8270D	2,4-DINITROPHENOL	5.00 U	20.0	5.00	1.80	ug/L	06/28/21	06/30/21
EPA 8270D	2,4-DINITROTOLUENE	5.00 U	20.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	2,6-DINITROTOLUENE	5.00 U	20.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	2-CHLORONAPHTHALENE	5.00 U	10.0	5.00	2.00	ug/L	06/28/21	06/30/21
EPA 8270D	2-CHLOROPHENOL	5.00 U	10.0	5.00	2.00	ug/L	06/28/21	06/30/21
EPA 8270D	2-METHYLNAPHTHALENE	5.00 U	10.0	5.00	1.80	ug/L	06/28/21	06/30/21
EPA 8270D	2-METHYLPHENOL	5.00 U	10.0	5.00	1.90	ug/L	06/28/21	06/30/21
EPA 8270D	2-NITROANILINE	5.00 U	20.0	5.00	2.40	ug/L	06/28/21	06/30/21
EPA 8270D	2-NITROPHENOL	5.00 U	10.0	5.00	2.10	ug/L	06/28/21	06/30/21
EPA 8270D	3,3'-DICHLOROBENZIDINE	5.00 U	10.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	3-NITROANILINE	5.00 U	10.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	3/4-METHYLPHENOL	5.00 U	10.0	5.00	1.70	ug/L	06/28/21	06/30/21
EPA 8270D	4,6-DINITRO-2-METHYLPHENOL	5.2 J	20.0	5.00	2.20	ug/L	06/28/21	06/30/21
EPA 8270D	4-BROMOPHENYL PHENYL ETHER	5.00 U	10.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	4-CHLORO-3-METHYLPHENOL	5.00 U	10.0	5.00	2.50	ug/L	06/28/21	06/30/21
EPA 8270D	4-CHLOROANILINE	5.00 U	10.0	5.00	2.50	ug/L	06/28/21	06/30/21

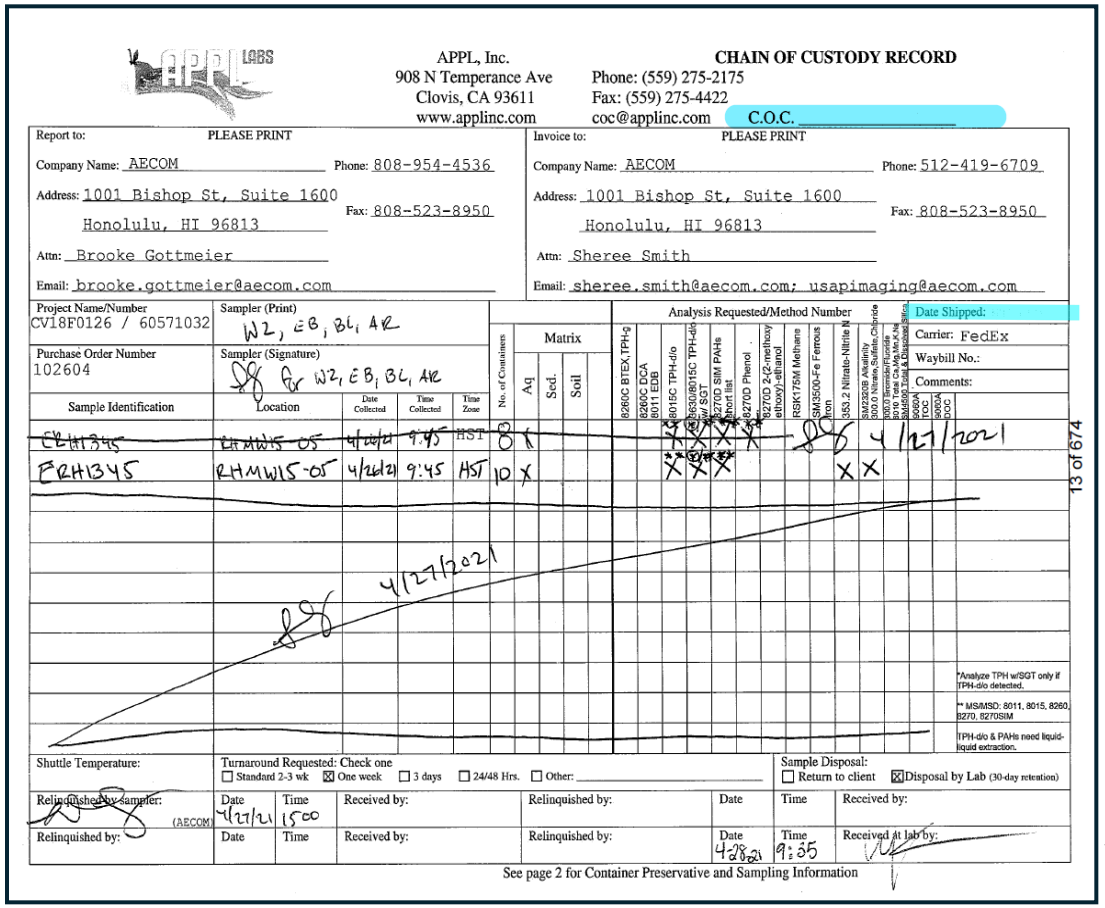
ERH1454 BA35282 1 4,6-DINITRO-2-METHYLPHENOL 6/24/2021 9:00:00 AM 6/30/2021 4:45:00 PM 4 5.2 UG_L J 20.0 5.00 J

Numerous Chain of Custody (coc) Irregularities Observed

- **Custody records** document the “chain of custody”; the date and person responsible for the various sample handling steps associated with each sample. Custody records also provide a reviewable trail for quality assurance purposes and as evidence in legal proceedings.
- Of the ~150 reports reviewed (April-Dec 2021), >35 reports, ~17-20% contained chain of custody irregularities *including such things as missing coc seals, missing temperature blanks, forms that had no coc form #s, missing “date of collection” and “sample location” information, missing carrier shipping dates among issues*.

These chain of custody Irregularities raise the question of the **reliability** of the data and **results reported**

- Examples: Missing Form #s
- No Date Collected or Time written in
- No carrier shipping date filled out



APPL, Inc.
908 N Temperance Ave
Clovis, CA 93611
www.applinc.com

Phone: (559) 275-2175
Fax: (559) 275-4422
coc@applinc.com

CHAIN OF CUSTODY RECORD

C.O.C. _____

Report to: PLEASE PRINT	Invoice to: PLEASE PRINT
Company Name: AECOM Phone: 808-954-4536	Company Name: AECOM Phone: 512-419-6709
Address: 1001 Bishop St, Suite 1600 Honolulu, HI 96813 Fax: 808-523-8950	Address: 1001 Bishop St, Suite 1600 Honolulu, HI 96813 Fax: 808-523-8950
Attn: Brooke Gottmeier	Attn: Sheree Smith
Email: brooke.gottmeier@aecom.com	Email: sheree.smith@aecom.com; usapimaging@aecom.com

Project Name/Number: CV18F0126 / 60571032
Purchase Order Number: 102604
Sampler (Print): W2, EB, BL, AR
Sampler (Signature): for W2, EB, BL, AR
Date Shipped:
Carrier: FedEx
Waybill No.:
Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Matrix: Aq	Sed.	Soil	Analysis Requested/Method Number
~~EB111345~~	~~RHMW15-05~~	~~4/26/21~~	~~9:45~~	HST	8	X			
ERH1345	RHMW15-05	4/26/21	9:45	HST	10	X			

4/27/2021

*Analyze TPH w/SGT only if TPH-d/o detected.
** MS/MSD: 8011, 8015, 8260, 8270, 8270SIM
TPH-d/o & PAHs need liquid-liquid extraction.

Shuttle Temperature:
Turnaround Requested: Check one ☐ Standard 2-3 wk ☒ One week ☐ 3 days ☐ 24/48 Hrs. ☐ Other:
Sample Disposal: ☐ Return to client ☒ Disposal by Lab (30-day retention)

Relinquished by sampler: (AECOM)	Date 4/27/21	Time 1500	Received by:	Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date 4-28-21	Time 9:35	Received at lab by:

See page 2 for Container Preservative and Sampling Information

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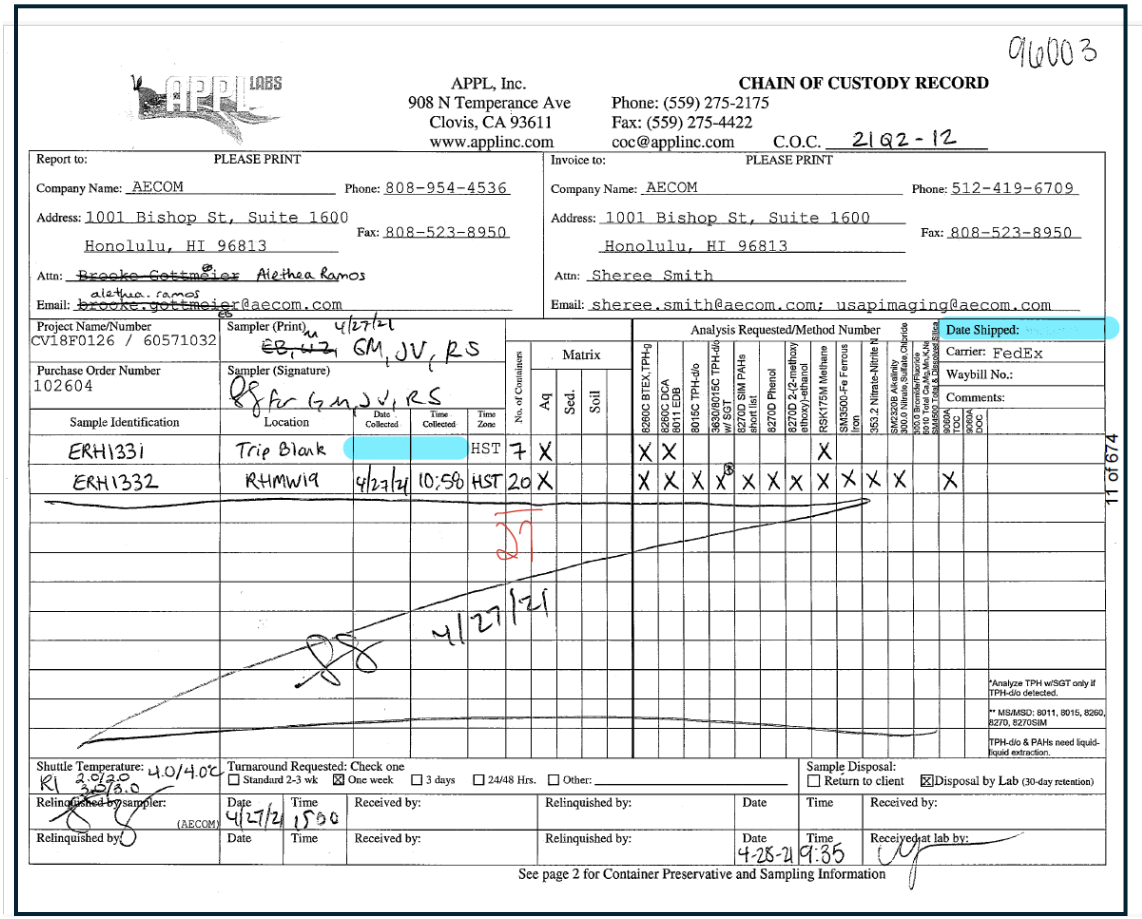

96003

APPL, Inc.
908 N Temperance Ave
Clovis, CA 93611
www.applinc.com

Phone: (559) 275-2175
Fax: (559) 275-4422
coc@applinc.com

CHAIN OF CUSTODY RECORD

C.O.C. 2192-12

Report to: PLEASE PRINT	Invoice to: PLEASE PRINT
Company Name: AECOM Phone: 808-954-4536	Company Name: AECOM Phone: 512-419-6709
Address: 1001 Bishop St, Suite 1600 Honolulu, HI 96813 Fax: 808-523-8950	Address: 1001 Bishop St, Suite 1600 Honolulu, HI 96813 Fax: 808-523-8950
Attn: ~~Brooke Gottmeier~~ Alethea Ramos	Attn: Sheree Smith
Email: ~~brooke.gottmeier~~ alethea.ramos@aecom.com	Email: sheree.smith@aecom.com; usapimaging@aecom.com

Project Name/Number: CV18F0126 / 60571032
Purchase Order Number: 102604
Sampler (Print): EB, WZ, 4/27/21 GM, JV, RS
Sampler (Signature): for GM, JV, RS
Date Shipped:
Carrier: FedEx
Waybill No.:
Comments:

Sample Identification	Location	Date Collected	Time Collected	Time Zone	No. of Containers	Matrix: Aq	Sed.	Soil	Analysis Requested/Method Number
ERH1331	Trip Blank			HST	7	X			
ERH1332	RHMW19	4/27/21	10:50	HST	20	X			

4/27/21

*Analyze TPH w/SGT only if TPH-d/o detected.
** MS/MSD: 8011, 8015, 8260, 8270, 8270SIM
TPH-d/o & PAHs need liquid-liquid extraction.

Shuttle Temperature: 4.0/4.0°C RL 2.9/2.0
Turnaround Requested: Check one ☐ Standard 2-3 wk ☒ One week ☐ 3 days ☐ 24/48 Hrs. ☐ Other:
Sample Disposal: ☐ Return to client ☒ Disposal by Lab (30-day retention)

Relinquished by sampler: (AECOM)	Date 4/27/21	Time 1500	Received by:	Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:	Relinquished by:	Date 4-28-21	Time 9:35	Received at lab by:

See page 2 for Container Preservative and Sampling Information

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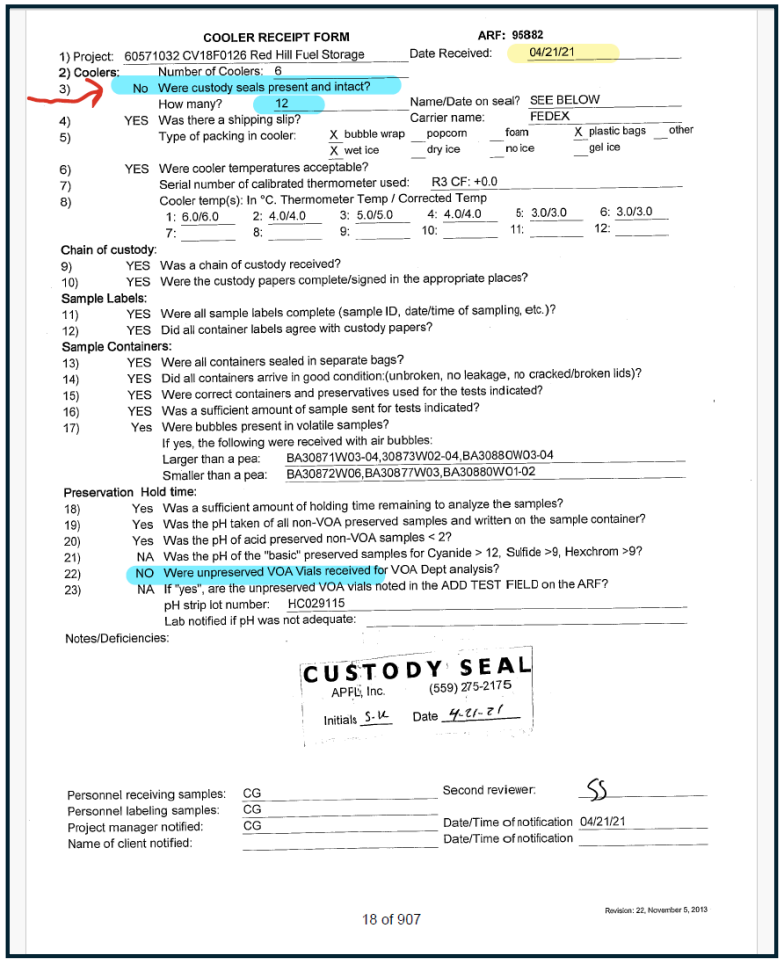
Both Energy & APPL Labs marked **Custody Seals "NOT present or intact"** in multiple reports along with notations of missing temperature blanks-**samples were still analyzed & reported**



COOLER RECEIPT FORM ARF: 95882

1) Project: 60571032 CV18F0126 Red Hill Fuel Storage Date Received: 04/21/21
2) Coolers: Number of Coolers: 6
3) No Were custody seals present and intact?
How many? 12 Name/Date on seal? SEE BELOW
4) YES Was there a shipping slip? Carrier name: FEDEX
5) Type of packing in cooler: X bubble wrap popcorn foam X plastic bags other
X wet ice dry ice no ice gel ice
6) YES Were cooler temperatures acceptable?
7) Serial number of calibrated thermometer used: R3 CF: +0.0
8) Cooler temp(s): In °C. Thermometer Temp / Corrected Temp
1: 6.0/6.0 2: 4.0/4.0 3: 5.0/5.0 4: 4.0/4.0 5: 3.0/3.0 6: 3.0/3.0
7: 8: 9: 10: 11: 12:

Chain of custody:
9) YES Was a chain of custody received?
10) YES Were the custody papers complete/signed in the appropriate places?

Sample Labels:
11) YES Were all sample labels complete (sample ID, date/time of sampling, etc.)?
12) YES Did all container labels agree with custody papers?

Sample Containers:
13) YES Were all containers sealed in separate bags?
14) YES Did all containers arrive in good condition:(unbroken, no leakage, no cracked/broken lids)?
15) YES Were correct containers and preservatives used for the tests indicated?
16) YES Was a sufficient amount of sample sent for tests indicated?
17) Yes Were bubbles present in volatile samples?
If yes, the following were received with air bubbles:
Larger than a pea: BA30871W03-04,30873W02-04,BA3088ØW03-04
Smaller than a pea: BA30872W06,BA30877W03,BA30880W01-02

Preservation Hold time:
18) Yes Was a sufficient amount of holding time remaining to analyze the samples?
19) Yes Was the pH taken of all non-VOA preserved samples and written on the sample container?
20) Yes Was the pH of acid preserved non-VOA samples < 2?
21) NA Was the pH of the "basic" preserved samples for Cyanide > 12, Sulfide >9, Hexchrom >9?
22) NO Were unpreserved VOA Vials received for VOA Dept analysis?
23) NA If "yes", are the unpreserved VOA vials noted in the ADD TEST FIELD on the ARF?
pH strip lot number: HC029115
Lab notified if pH was not adequate:

Notes/Deficiencies:

CUSTODY SEAL
APPL Inc. (559) 275-2175
Initials S-W Date 4-21-21

Personnel receiving samples: CG Second reviewer: SS
Personnel labeling samples: CG
Project manager notified: CG Date/Time of notification 04/21/21
Name of client notified: Date/Time of notification

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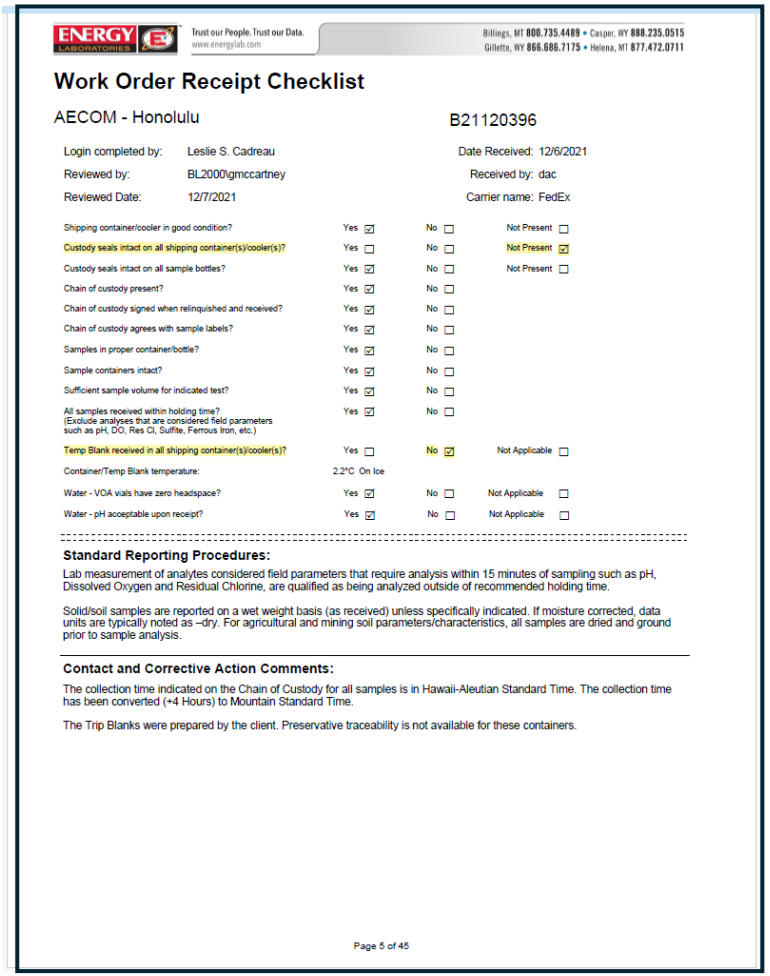
Revision: 22, November 5, 2013



ENERGY LABORATORIES
Trust our People. Trust our Data. www.energylab.com
Billings, MT 800.735.4489 • Casper, WY 888.235.0515
Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

Work Order Receipt Checklist

AECOM - Honolulu B21120396

Login completed by: Leslie S. Cadreau Date Received: 12/6/2021
Reviewed by: BL2000\gmccartney Received by: dac
Reviewed Date: 12/7/2021 Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☑	No ☐	Not Present ☐
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	2.2°C On Ice		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	Not Applicable ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

The collection time indicated on the Chain of Custody for all samples is in Hawaii-Aleutian Standard Time. The collection time has been converted (+4 Hours) to Mountain Standard Time.

The Trip Blanks were prepared by the client. Preservative traceability is not available for these containers.

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Even the NUMBER of days used to COLLECT samples for Long Term Monitoring grew in 2nd, 3rd & 4th Qtr 2021
There were also Irregular Dates for LONG TERM Monitoring SAMPLING
The atypically LONG Sampling PERIOD for 4th Qtr 2021 extended **through the 11/20/21** fuel leak at Red Hill and included sample ID #s far outside of the sampling sequential number count.

Long Term Monitoring(LTM) Year	LTM Period	# of DAYS for LTM Sampling	Beginning Date of Sampling	End Date of Sampling
2020				
	1st	11	1/20/2020	1/30/2020
	2nd	9	4/20/2020	4/28/2020
	(addtl for new well MW13)	8	3/3/2020	3/10/2020
	3rd	19	7/15/2020	8/3/2020
	4th	16	10/7/2020	10/22/2020
2021				
	1st	10	1/18/2021	1/27/2021
	2nd	**20**	4/14/2021	5/3/2021
	3rd	**29**	7/7/2021	8/4/2021
	4th	**42**	10/12/2021	11/22/2021
2022				
	1st	5	2/28/2022	3/4/2022
	2nd	12	4/11/2022	4/22/2022
	3rd	12	7/18/2022	7/29/2022
	4th	12	12/5/2022	12/16/2022
2023				
	1st	11	1/30/2023	2/9/2023
	2nd	11	4/10/2023	4/20/2023
	3rd			

AECOM/Navy placed numerous requests of the labs to RE-EXTRACT & RE-ANALYZE TPH-diesel and TPH-oil samples

This occurred on multiple occasions for drinking water samples (RHSF & MW2254-01) throughout summer and fall of 2021
The re-extractions/re-analysis was requested on multiple samples OUTSIDE the EPA's standard for ALLOWED time between collection of the sample and completion of testing.

In other words, the Navy/Aecom and the labs knew the "retesting" was being completed knowing the samples were so degraded that results would not yield results that represented the true level of contaminant at the time the sample was collected for testing.

“out of hold (out of allowed time) and has been OUT OF REFRIGERATION (against EPA standard) for over a month, client said to proceed.”

LCS-164471-RRO			1000	0	0	1.00	0.001	3/13/2022	3/14/2022
SGT on remaining sample by ALN on 3/15/2022.									
B22030703-041C	Ground Water	2	1050	0	0	1.00	0.000952	3/13/2022	3/14/2022
Bottle 1/2 Clear SGT on remaining sample by ALN on 3/15/2022.									
B22030703-041CMS	Ground Water	2	1050	0	0	1.00	0.000952	3/13/2022	3/14/2022
Bottle 2/2 Clear SGT on remaining sample by ALN on 3/15/2022.									
B22030703-042AMS-RRO	Ground Water	2	1050	0	0	1.00	0.000952	3/13/2022	3/14/2022
Bottle 2/2 Clear SGT on remaining sample by ALN on 3/15/2022.									
B22030703-042A	Ground Water	2	1050	0	0	1.00	0.000952	3/13/2022	3/14/2022
Bottle 1/2 Clear SGT on remaining sample by ALN on 3/15/2022.									
B21120396-001E	Ground Water	2	1040	0	0	1.00	0.000962	3/13/2022	3/14/2022
Bottle 2/2 Reextract Out of hold and has been out of refridgeration for over a month, client said to proceed.									
B22030703-001C	Ground Water	2	1050	0	0	1.00	0.000952	3/13/2022	3/14/2022
Botlle 1/2 Light sediment.									
B22030703-006C	Ground Water	2	1050	0	0	1.00	0.000952	3/13/2022	3/14/2022
Bottle 1/2 Clear									
B22030703-011C	Ground Water	2	1050	0	0	1.00	0.000952	3/13/2022	3/14/2022
Bottle 1/2 Clear									

This sample had originally been collected 12/2/21, was 60 days past the 40 day hold limit (100 days after initial sample collection), was out of refrigeration for over a month, but Aecom/Navy “the client” requested the lab Re-extract and Re-analyze anyway.

Conclusions

- Delays in analysis and/or lab contamination caused low bias to results – particularly for TPH-d & TPH-o. In other words, **concentrations/levels of contaminants** in drinking water samples **were underreported in 2021**
- Frequent sampling of source water (RHSF) was not initiated until **1 month** after the May 2021 spill
- Delays in reporting **prevented more in-depth analysis** of the hydrocarbon patterns/**contaminants** seen in the drinking water samples beginning in August of 2021
- The analytical methods are **not ideal** for detecting petroleum hydrocarbons in JP-5 as many of JP-5 components are not analyzed for by EPA methods
- Appears there were **other contaminants present** in the drinking water that **have not been identified**
- Test/Sampling irregularities observed coupled with the chronic delays in reporting sample results from May to November 2021, **lower the reliability of test results** and likely caused **underreporting of the dose and extended the duration of the exposure to families**