Navy Swarm Team Technical Meeting with BWS

10 December 2024

Apple Android

Administration & Agenda

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- Welcome & Introductions (Moderator: Ms. JoAnna Delfin)
- Opening Remarks by RDML M. Williams
- Meeting Administration
- Agenda
  - Presenter Introductions
  - Navy Response to Data Validator Comments
  - Discussion – Question & Answers
  - Break
  - Extended Drinking Water Monitoring
  - Discussion – Question & Answers

Presenter Introductions

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Deputy, Env. & Remediation, Navy Closure Task Force-Red Hill (NCTF-RH)

CDR Ben Dunn
Honolulu, HI

Consultant, PIONEER Technologies Corporation

Chris Waldron, P.E.
Olympia, WA

Chemist & Deputy Director NAVSEA Laboratory Quality & Accreditation Office (LQAO)

Dr. Ed Corl
Portsmouth, VA

BWS's Claims Addressed Today

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- Point 1 and Point 2: Method Compliance and Data Defensibility
  - The samples were not collected in compliance with EPA recommendations.
  - The data is technically not compliant or defensible.
  - The existing data was found to be very suspect and, thus, would be qualified as unusable for the purpose of proving the absence of TPH in the drinking water system
- Point 3
  - Data on how chlorine reacts with fuel is limited; it is difficult to know how the presence of free chlorine affects low TPH concentrations.
- Point 5
  - The surrogate does react with chlorine (and bromine); however:
  - The surrogate concentration was constant throughout the LTM period.
  - The frequency of TPH detections did not change with chlorine concentration.
- Point 6
  - The Lab Clipped Chromatograms or otherwise manipulated information.
- Point 7
  - The method blanks show that laboratory contamination does not appear to be a major cause for the increased frequency of TPH detections.
- Point 4
  - Significant method modification could result in datasets that are not comparable. Significant differences in sample preparation should not result in comparable MDLs.

Background: Timeline

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JOINT BASE PEARL HARBOR-HICKAM
DRINKING WATER MONITORING PROGRAM
ENSURING SAFE AND COMPLIANT DRINKING WATER

Emergency Response

Nov. 2021 - Dec. 2021

A Red Hill watchstander inadvertently strikes a drain valve, spilling fuel which contaminated the JBPHH drinking water well and distribution system. Hawaii Department of Health issued a health advisory on Nov. 29, 2021.

Interagency Drinking Water System Team

Dec. 2021 - Mar. 2022

A team of experts from the Hawaii Department of Health (DOH), Environmental Protection Agency (EPA), Navy and Army was formed to develop requirements to restore the JBPHH drinking water system.

JBPHH Drinking Water System Flushing

Dec. 2021 - Mar. 2022

Between Dec. 2021 to Mar. 2022, the Navy conducted a complete flush of the JBPHH drinking water distribution system to include all facilities and residences on the system in compliance with the IDWST approved Drinking Water Distribution System Recovery Plan. DOH lifts health advisory in Mar. 2022.

Drinking Water Long Term Monitoring

Mar. 2022 - Mar. 2024

From Mar. 2022 to Mar. 2024, Navy implemented a two-year period of LTM of the JBPHH drinking water system. Navy collected over 9,000 samples testing for over 50 analytes to include metals, hydrocarbons, Synthetic Organic Compounds, and Volatile Organic Compounds to ensure the water is safe.

Extended Drinking Water Monitoring

Apr. 2024 - Present

In Apr. 2024, Navy **voluntarily** implemented EDWM ensuring the JBPHH drinking water system remains safe for consumption and meets all state and federal drinking water standards. Navy has collected over 3,500 samples testing for over 50 analytes.

SAFE DRINKING WATER ACT COMPLIANCE MONITORING

NCTF RH SAFE DELIBERATE ENGAGED COMMITTED

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Background: LTM Objectives

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- *"…ensure that the water is safe to drink, meets all State and Federal drinking water standards and **continues to be non-detectable or below the designed incident specific limit for petroleum and other response by-product contamination**."*

- Fundamental Data Quality Objective and Use of Data
  - Numerical DQOs presented in Table 5 of the LTM Plan
    - MCLs, ALs, HDOH Incident Specific Parameters (ISP), and Project Screening Levels
    - The HDOH ISP (Safe Level) for Total TPH in Drinking Water was 266 ug/L.

All LTM Data had to meet

"If the tap water results collected from all the representative houses/buildings that were sampled comply with Table 5 of this Plan, then it will be confirmed that the drinking water in the area remains safe to drink."

Background:
LTM Method 8015 Residential Summary

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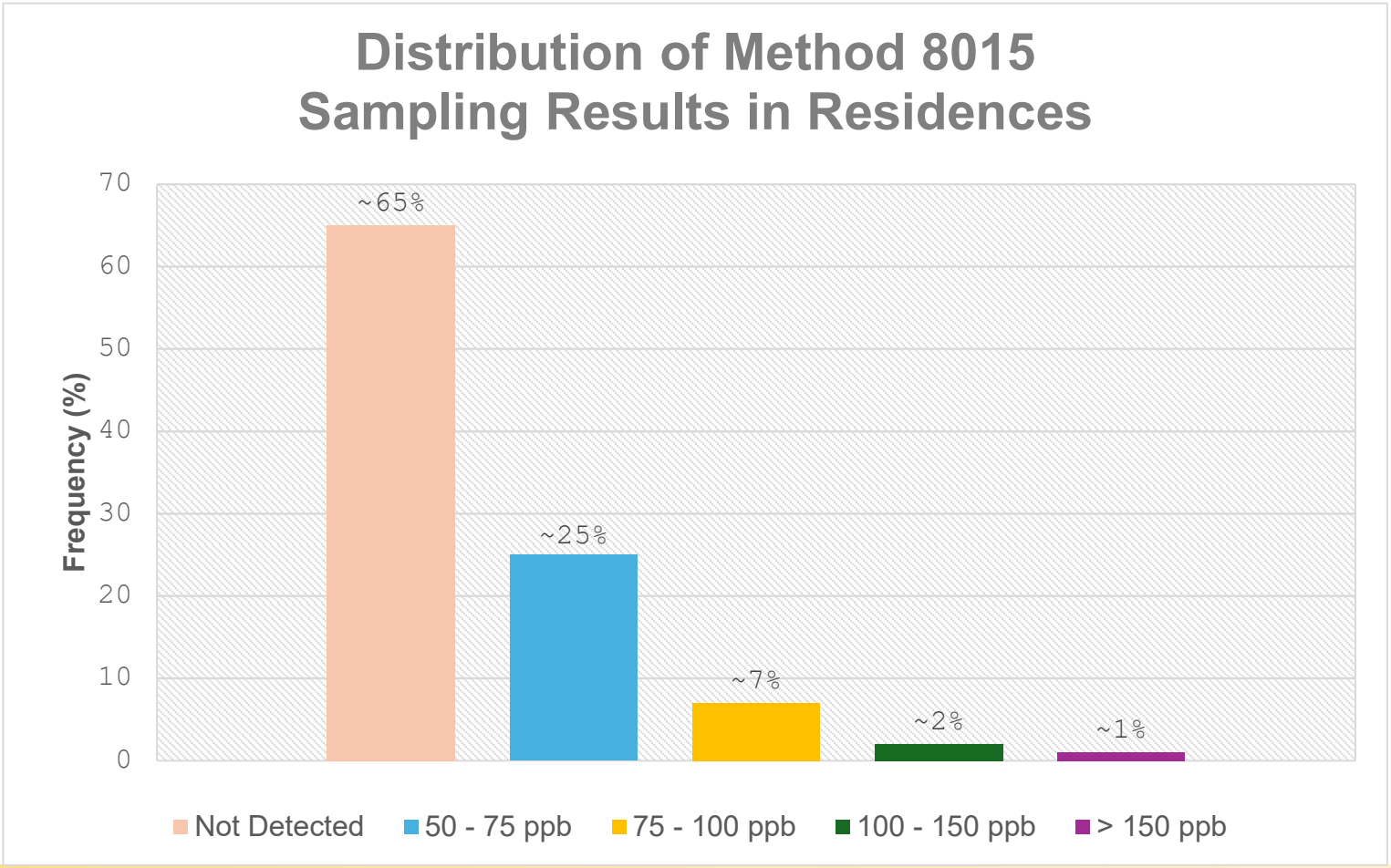

Method 8015 Detections are Not Necessarily Petroleum.

Background:
Residential TPH Sampling Summary

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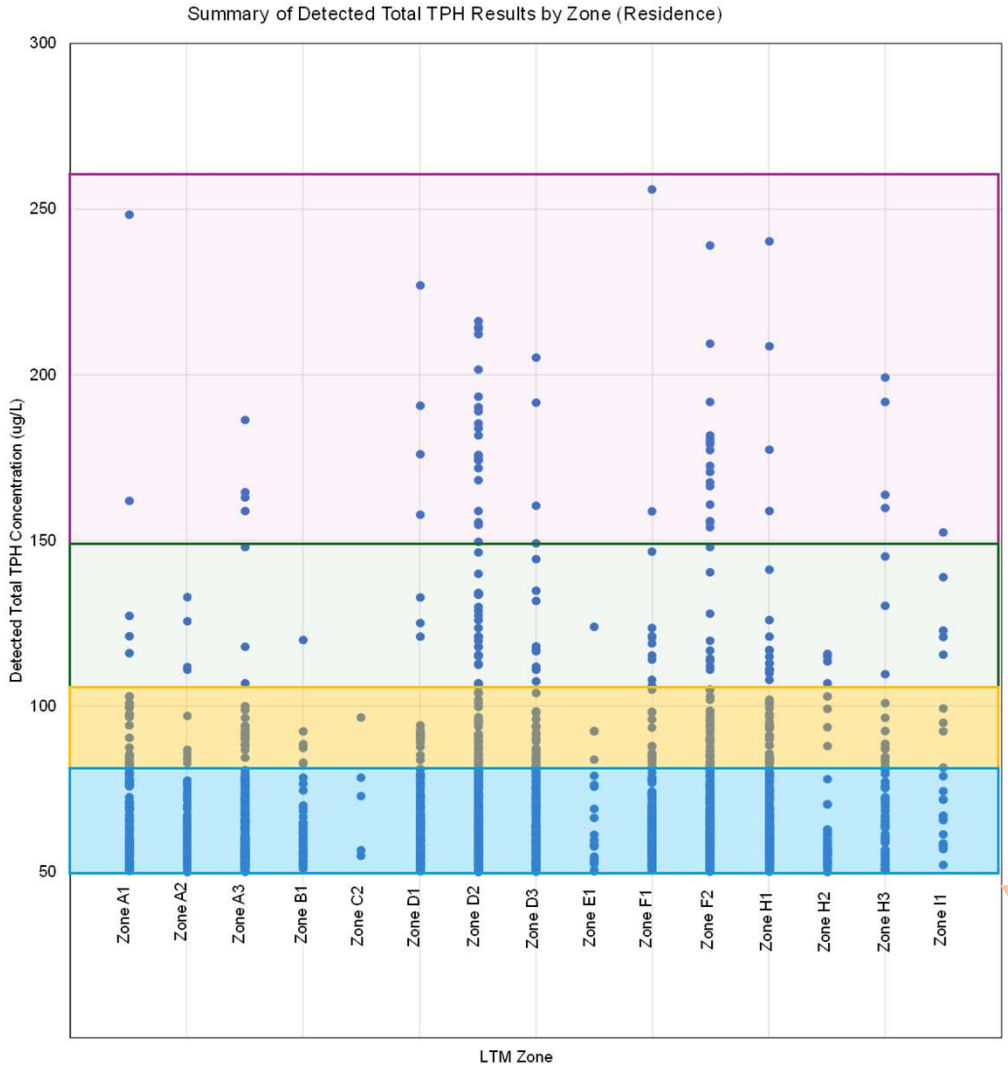

1% of Samples (> 150 ppb)

~2% of Samples (100 to 150 ppb)

~7% of Samples (75 to 100 ppb)

~25% of Samples (50 to 75 ppb)

~65% of Samples (Not Detected)

LTM – TPH Detections: Lines of Evidence

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- The SWARM team worked with the laboratory to identify some contributing peaks using mass spectral analysis. Most predominant contributors **other than the surrogate by-products**:
  - Fatty acids (naturally occurring in Fats [Lipids])
    - Hexadecanoic acid and octadecanoic acid
  - Phthalates (used in plastics – very, very common in laboratories and the environment)
  - These are **not** petrogenic hydrocarbons but will appear as TPH detections in Method 8015 results

There were no petroleum (JP-5/Fuels) signatures observed in any of the samples examined.

Point #1 and Point #2

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BWS Consultants' Claims:
"The existing data was found to be very suspect and, thus, would be qualified as unusable for the purpose of proving the absence of TPH in the drinking water system."

AND

"The data is technically not compliant or defensible and the samples were not collected in compliance with EPA recommendations."

Facts:

- The LTM Data are valid and are useable for the purposes established under the LTM Plan.
- The EPA and HDOH "generally agree" with the overall finding presented in the Swarm Tech Memo regarding LTM Data (i.e., that the low-level TPH detections were not associated with JP-5/fuel).
- **Science cannot detect to zero** - The objective of LTM was never to "prove the absence of TPH" **(No one can prove the absence of a contaminant because it is not possible to detect zero)** but was to demonstrate that the "…water is safe to drink, meets all State and Federal drinking water standards and continues to be non-detectable or below the designed incident specific limit for petroleum and other response by-product contamination."
- Data underwent rigorous quality control, including Level 2 and Level 4 data validation to ensure the highest quality data were evaluated under the LTM Program.
  - Example for Zone A1

Point #1 and Point #2 (Cont.)

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Facts:

1. All samples were collected in accordance with the approved sampling and analysis plan.

2. EPA **Method 8015 is NOT a drinking water method**. It is published in SW-846 (hazardous waste compendium) guidelines/recommendations. There are no existing EPA, method, or statutory requirements that suggest the LTM data are unusable.

3. The LTM Sampling Plan was developed by the IDWST (EPA, HDOH, Navy, Army) which purposely/deliberately decided that quenching with Sodium Thiosulfate was not necessary for Method 8015 samples collected under this program.
   a. The IDWST determined that not quenching the samples would not affect our ability to:
      I. Accurately and precisely quantify Total TPH concentrations below the ISP of 266 ug/L (and lower); or
      II. Identify petroleum fuel signatures/patterns on the Gas Chromatograph (if present).

The LTM Data are Valid and are Useable for the Purposes Established Under the LTM Plan.

Point #1 and Point #2 (Cont.)
EPA SW-846, Chapter 4

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Fact:

- Direct Quote from SW-846, Chapter 4: 4.1.2 Sample Handling and Preservation: General Considerations (emphasis added):

"The preservation and holding time information presented in Table 4-1 does not represent EPA requirements, but rather is intended solely as guidance. ***Selection of preservation techniques*** *and applicable holding times* ***should be based*** *on all available information, including the properties of the analytes of interest for the project, their anticipated concentration levels, the composition of the sample matrix itself, and the* ***stated project-specific DQOs.****"*

Source: EPA SW-846 Compendium Chapter 4: Section 4.1.2., 2nd paragraph, page 1

Table 4-1 lists "Suggestions" not "Requirements."

Point #3

SAFE. DELIBERATE. ENGAGED. COMMITTED.

BWS Consultants' Claim:
"Data on how chlorine reacts with fuel is limited; it is difficult to know how the presence of free chlorine affects low TPH concentrations."

Facts:

- The Navy DOES have the data and it confirms what we know about residual chlorine reactions with JP5.

- Would the chlorine reactions with fuel degrade the TPH and change/affect our decisions (i.e., are the LTM results "biased low") for TPH? The answer is **No**. Here's why:

  - Typical residual chlorine concentrations in distribution systems do not have the oxidizing power to breakdown linear hydrocarbons (major constituents of JP-5). Chlorine and Bromine can react with aromatics and olefins to form by-products, but those would also show up as TPH (analyzed per Method 8015).

  - The Navy has empirical data from JP-5 matrix spikes (with and without quenching) that show there is no significant difference in TPH concentrations and that unquenched samples may be slightly "biased-high."

Point #3 (Cont.)
LTM Matrix Spike Study (Side-by-Side)

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Facts:

- A Side-by-Side Matrix Spike study was performed from February 6-19, 2024 to Compare the Impact of Quenching Samples vs. Not Quenching the Samples on the TPH Analysis
  - Method 8015 with Separatory Funnel (3510)/Methylene Chloride Extraction (consistent with LTM).

- 23 site samples selected for side-by-side matrix spike analysis.

- Each of the Matrix Spike samples were spiked with 100 ug/L of JP-5.

Matrix Spike Study

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Measure	Unquench MS Samples	Quenched MS Samples
Number of Samples	23	22
Percent Recovery	51.6 - 131.4%	37.9 - 109.5%
Average % Recovery	91.7%	81.4%
QSM Limits (DRO)	36 – 132%	

*There was one outlier in the quenched sample group. The parent sample A2-TW-0002130-23325-N-Q yielded a detection of 105 ppb that was attributed to unknown contamination in the parent sample.

Excellent recoveries.

Point #5

SAFE. DELIBERATE. ENGAGED. COMMITTED.

BWS Consultants' Claim:

"The surrogate does react with chlorine (and bromine); however:

a. The surrogate concentration was constant throughout the LTM period.

b. The frequency of TPH detections did not change with chlorine concentration."

AND

"The surrogate concentration was the same throughout LTMs 1-6, therefore, the contribution to the total TPH signal from the chlorinated surrogate is expected to be constant."

Facts:

- This comment oversimplifies the reaction between chlorine (and bromine) and the surrogate.
- We do not fully understand the details of the reaction – however, we know:
  - Many factors affect the reaction between chlorine (and bromine) and the surrogate:
    - Chlorine/Bromine concentration, reaction time, temperature, light, and others.
    - The relationship between chlorine/surrogate and halogenated by-product is not constant as indicated by BWS's consultant.
- Surrogate retention time experiment demonstrates significance of reaction time on formation of false-positive TPH detection.
- Chlorine concentrations slightly increased over LTM.
- Chlorine (and bromine) react with surrogate and result in false positive TPH detections.
  - Eliminate/reduce one or both, and probability of TPH detections decreases significantly
- Surrogate concentration was reduced in Period 7 of LTM and TPH detections dropped dramatically.

Point #5 (Cont.)
Surrogate Residence Time Study

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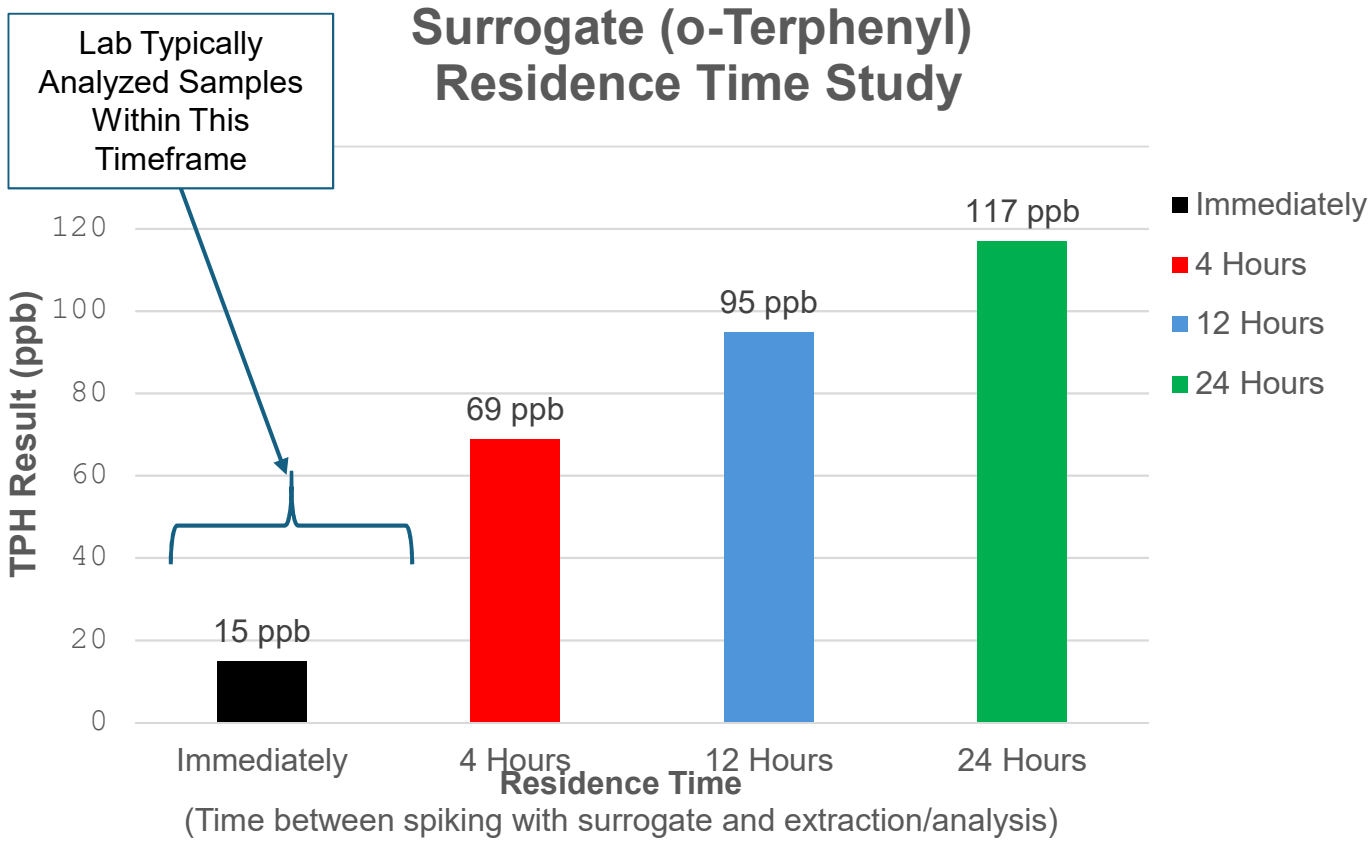
Facts:



Higher TPH concentrations (false positives) were observed as residence time increased, demonstrating that unquenched TPH results are "biased high."

Point #5 (Cont.) Chlorine Residual

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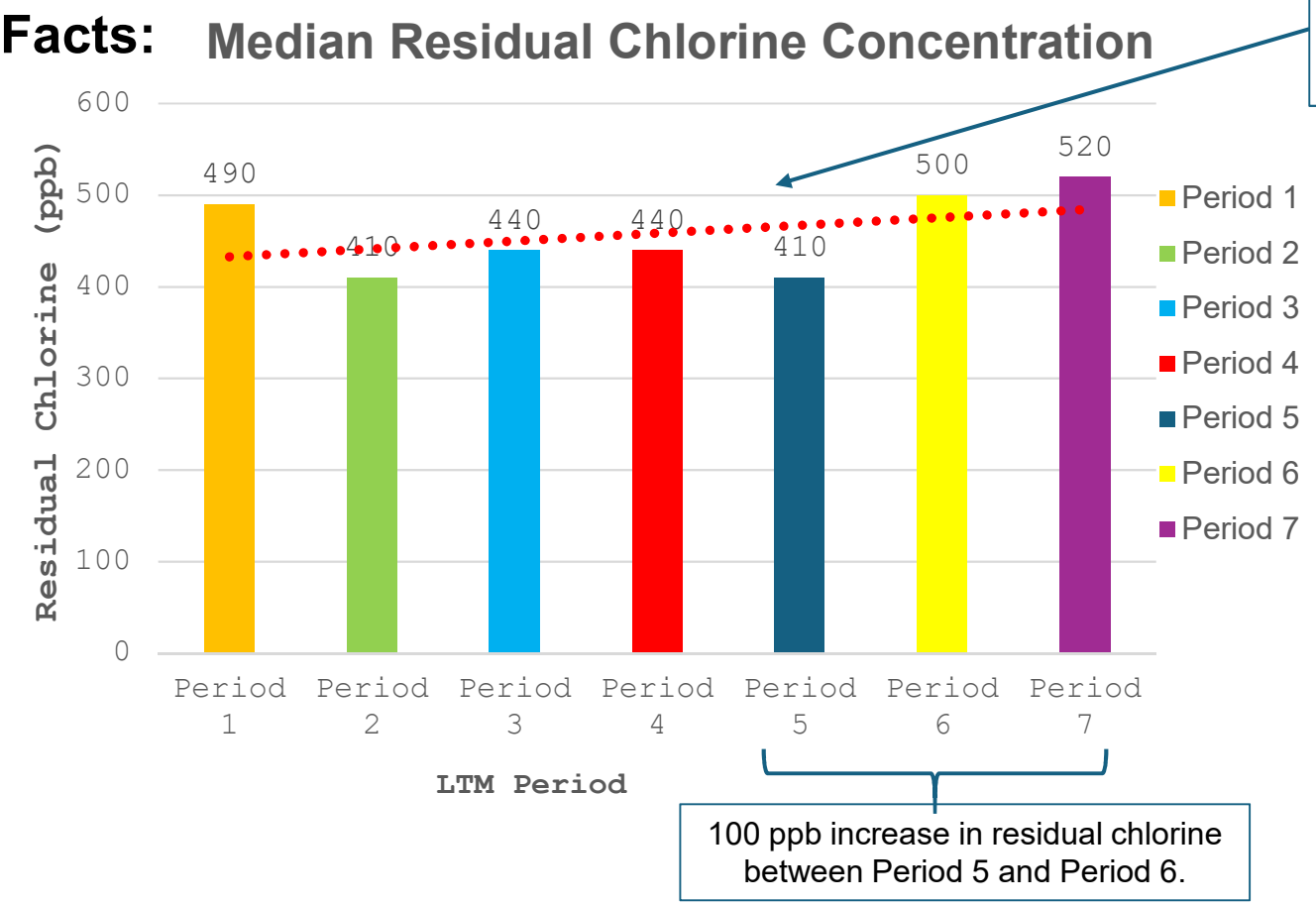
Facts:



The Swarm Team suspected bromine also reacted with the surrogate and contributed to false positive TPH detections; however, bromine data were not collected as part of LTM.

The Median Residual Chlorine Concentrations has Increased by 100 ppb Since the Second Half of 2023 (LTM 5 to LTM 6).

Point #5 (Cont.)
Chlorine and Surrogate

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Facts: Logistic Model to Predict the Odds of a TPH-d Detection as a Function of Chlorine Residual and Surrogate Concentration

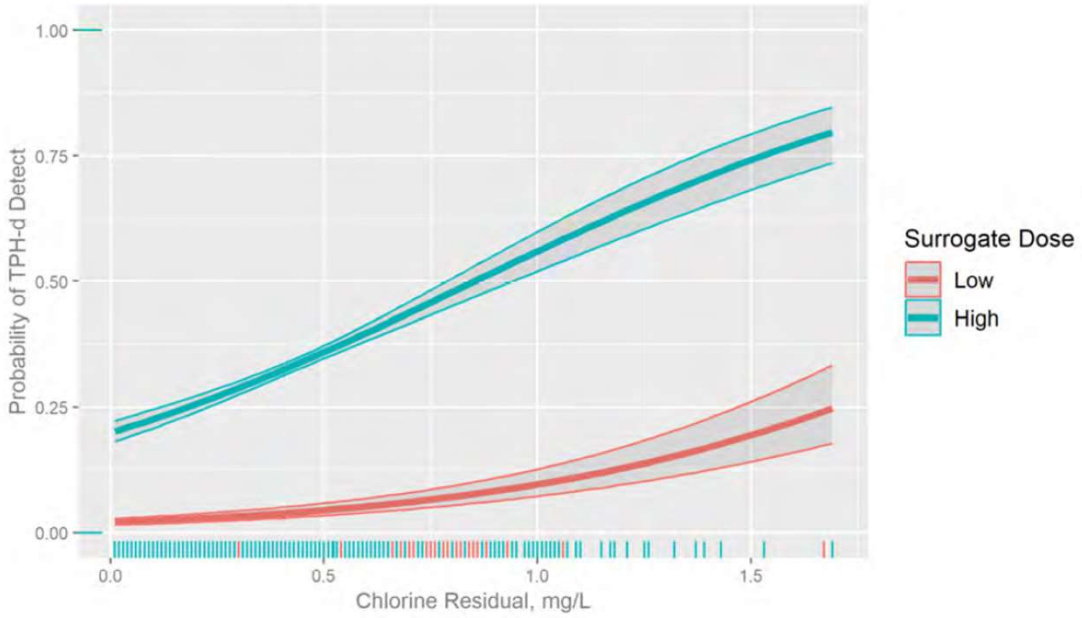

Figure F-2. Model-Predicted Probability of TPH-d Detects.

On January 18, 2024 the laboratory reduced the Surrogate concentration from 2,000 ppb to 100 ppb in all samples analyzed under LTM via EPA Method 8015/Method 3510 (Separatory Funnel).

Higher Residual Chlorine Concentrations and Higher Surrogate Concentrations Resulted in Higher Probability of TPH-d Detections.

Point #5 (Cont.)
Contribution to TPH Detections

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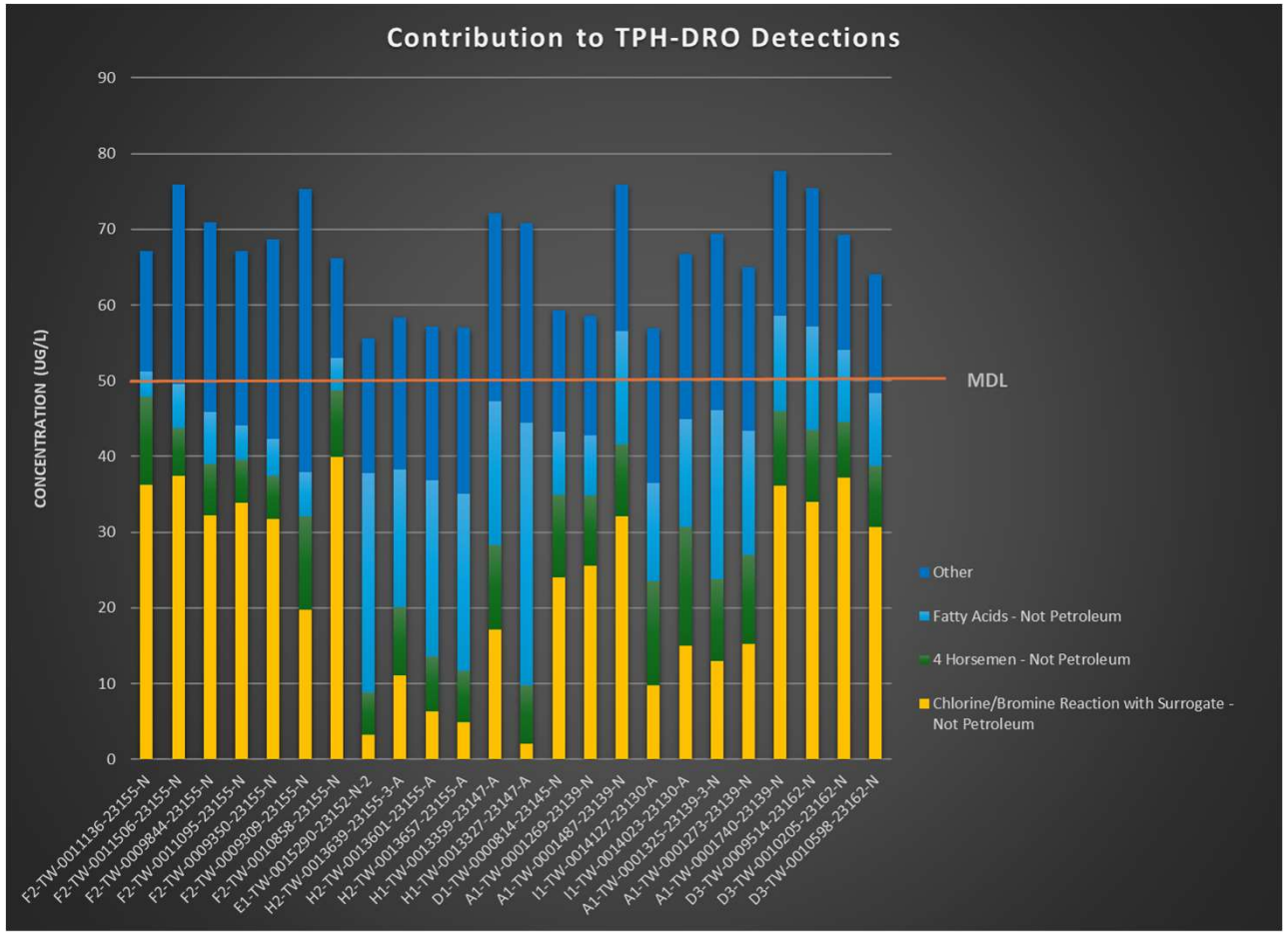
Facts:



The TPH signal from the chlorinated surrogate is not constant.

Point #5 (Cont.)
Surrogate Concentration Reduction

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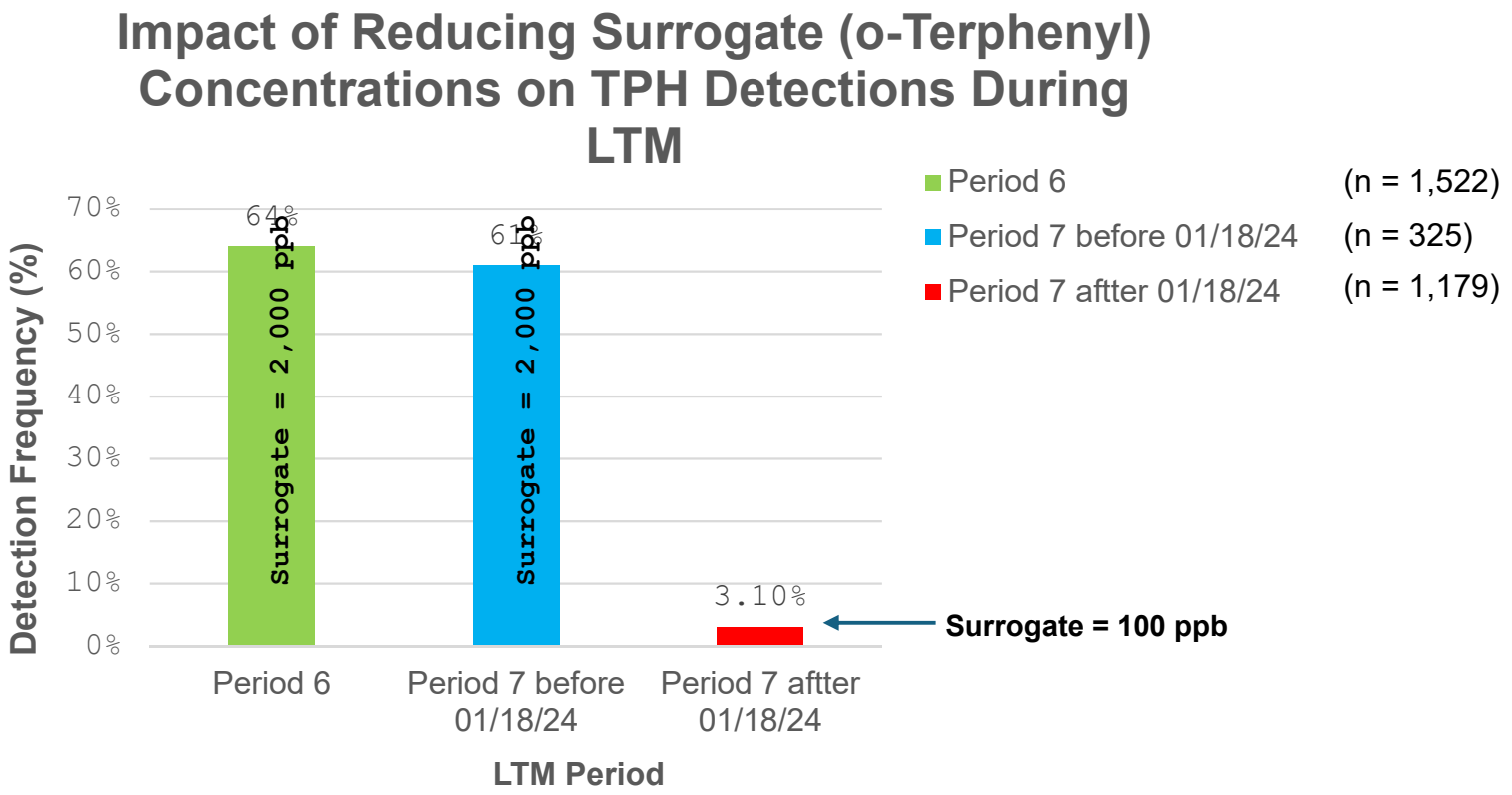
Facts:



On January 18, 2024 the laboratory reduced the Surrogate concentration from 2,000 ppb to 100 ppb in all samples analyzed under LTM via EPA Method 8015/Method 3510 (Separatory Funnel).

Significant Reduction in TPH Detections in LTM 7 When the Surrogate Concentration was Reduced. All Other Parameters Remained Unchanged.

Point #6

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BWS Consultants' Claim:
The Lab clipped chromatograms or otherwise manipulated information.

Facts:

- This is 100% FALSE. The clipping process does not affect the integration, peak signal, or quantitation, but simply scales the signal to be processed correctly in Chemstation (i.e., the software used by the laboratory) – More on Next Slide.
- The Swarm Team Tech Memo did resize Chromatograms smaller to fit the page size used; full data set available on SafeWaters with Validation (Level 2 and Level 4)
- The majority of integrations of were automatically performed by the Chemstation software. If the laboratory/analyst performed a manual integration, then it is clearly identified, as required, on the chromatogram.
  - TPH Peak Integration starts a C10 and ends at C40. All peaks between the C10 Retention Time and C40 Retention Time are integrated, as appropriate.
- Lab uploads data into the EDMS/SafeWaters not the Navy

The TPH Chromatograms <u>were not</u> Manipulated in to Alter the Detected TPH Concentration.

Point #6 Peak clipping, cont.-

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```
Data Path : C:\Users\Jason Savoie\Desktop\AECOM\AECOM Screens\Navy Reques
Data File : LW16505.d
Signal(s) : FID1B.CH
Acq On    : 09 Sep 2023  19:49 pm
Operator  : jackb
Sample    : da58316-7
Misc      : OP24284,GLW553,1000,,,1,1
ALS Vial  : 0   Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 10 17:49:30 2023
Quant Method : C:\msdchem\1\methods\DRO090923.M
Quant Title  : Diesel range organics by method 8015.
QLast Update : Sat Sep 09 15:29:59 2023
Response via : Initial Calibration

Integrator: ChemStation   6890 Scale Mode: Small noise peaks clipped
Volume Inj.  : 1 ul
Signal Phase : MXT-5 5% Diphenyl / 95% Dimethyl Polysiloxane
Signal Info  : 15M , 0.25 mmID, 0.25 um df
```

The TPH Chromatograms <u>were not</u> Manipulated in to Alter the Detected TPH Concentration.

Point #6 (Cont.)

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Facts:

The “clipping” technique was for older versions of Chemstation running on 6890s and is no longer applicable to the newer versions we are using.

A bit more information on the “Clipping” (from the software user manual)…

“Clipping is a scaling feature in older versions of Chemstation and must be used for 6890s to scale the small vs large peaks so chemists are able to properly integrate the peaks in the software. This does not affect the integration, peak signal, or quantitation, but simply scales the signal to be processed correctly in Chemstation. This does not apply to 5890s or 7890s where some of the discrepancies were identified. Of course, as demonstrated in recent data packages, the scale can be adjusted at the client’s request to focus on the smaller peaks along the baseline to assist with identifying patterns. “Clipping” does not suppress or raise the baseline to exclude peaks from quantitation and all Calibration, QC, and samples are processed under the same conditions.”

*Older version of Chemstation program showed “clipped” during scaling process to integrate signals. No longer used in newer version of program.

Point #7

SAFE. DELIBERATE. ENGAGED. COMMITTED.

BWS Consultants' Claim:

"The method blanks show that laboratory contamination does not appear to be a major cause for the increased frequency of TPH detections."

Facts:

- This is not correct. The impact of low-level method blank contamination was significant during specific timeframes
  - Example – September 2023
- Glove and Skin Chromatogram

At Such Low Levels, Every Small Contribution Results in an Increased Probability of a "False Positive" TPH Detection Above the MDL.

Point #7 (Cont.)
Method Blank Impact on TPH Detections

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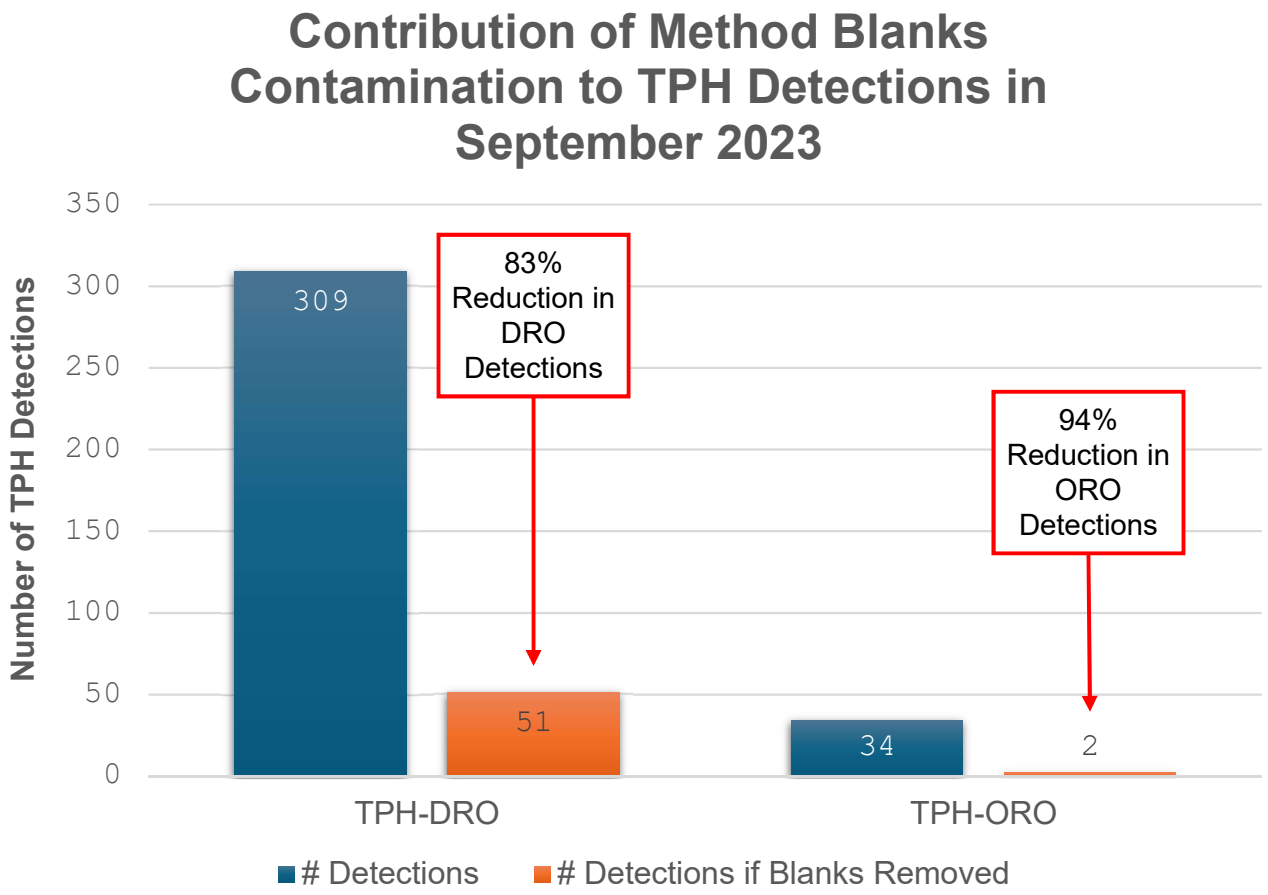
Facts:



Method Blank Contamination Contributed Significantly to the Number # of TPH Detections During September 2023.

Point #7 (Cont.)- Blank Contamination Experimental analysis with Glove w/ Skin Contact

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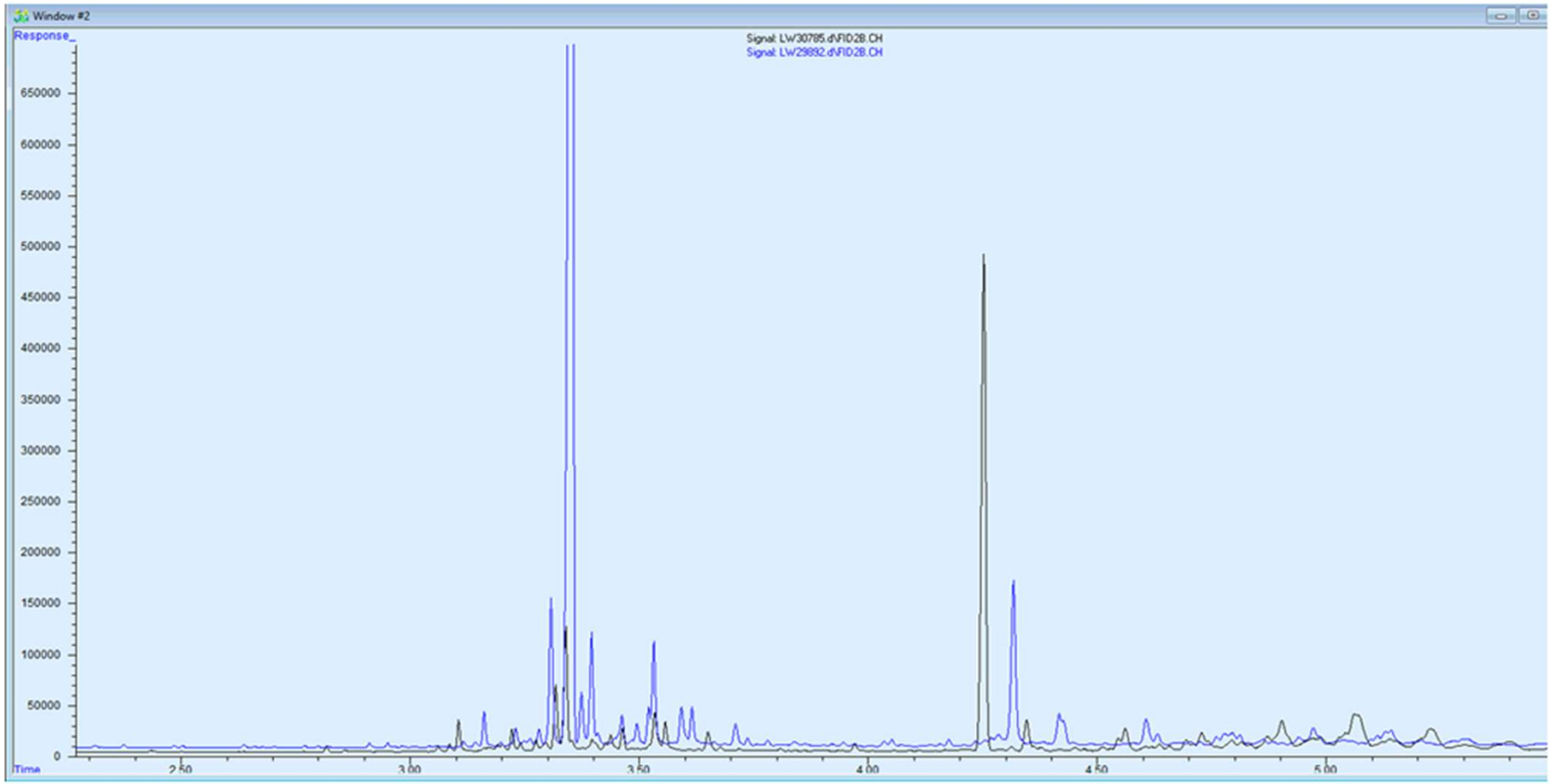

Point #4

SAFE. DELIBERATE. ENGAGED. COMMITTED.

BWS Consultants' Claim:

"Significant method modification could result in datasets that are not comparable. Significant differences in sample preparation should not result in comparable MDLs."

Facts:

- Method improvement (MEQ) used in follow-on EDWM
  - None of MEQ test data collected during LTM/Swarm was used for decision-making purposes. MEQ data were only used in EDWM.
- Deliberate, data-driven evaluation of MEQ prior to adoption
  - Identified need for large-volume injection to achieve MDL
  - Extraction 55mil sample (2mil Hexane, no concentration) & concentration process
- MDL Study – Results comparable/better than LTM
- Additional QA/QC – Excellent Results.
  - Matrix Spike samples collected/analyzed at high frequency – spiked at MRL.
  - Performance samples (JP-5) shipped to lab ("double blind") with regular samples – spiked at MRL (80 ug/L) and at 266 ug/L.

LTM and EDWM Datasets are Comparable.

Point #4 (Cont.)
EDWM MEQ MDL Study Summary

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Facts:

MEQ MDL Study Results:

- Run 10/27-11/1/2023
- DRO (C_{10}-C_{24}) MDL = 10.5 ug/L
- ORO (C_{24}-C_{40}) MDL = 17.7 ug/L

Statistically Derived; MDL for EDWM Remained 50 ppb (Consistent with LTM).

Point #4 (Cont.)
EDWM MEQ Matrix Spike Sample Results

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Measure	Matrix Spike Sample Results (MEQ)
Number of Samples	85
Percent Recovery	67 - 166%
Average % Recovery	105.3%
Standard Deviation	17.9%
QSM Limits (DRO)	36 – 132%

A total of 85 Matrix Spike samples were collected, spiked with 80 ug/L JP-5, and analyzed for TPH via the MEQ method between 04 April 2024 and 28 June 2024. Matrix spike samples will be collected throughout EDWM.

Consistent, Excellent Spike Recoveries Indicate the EDWM TPH Are of Good Quality.

Point #4 (Cont.)
Double Blind Performance Evaluation Samples

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Sampling Date	Sample ID	Lab Sample ID	Sample Type	Spiked Concentration (ug/L)	Detected Concentration (ug/L)	% Rec
5/29/2024 12:00:00 PM	I1-TW-0016032-24122-N-1	DA64690-2	PT	80	90.5	113%
5/29/2024 12:00:00 PM	I1-TW-0016032-24122-N-2	DA64690-1	PT	266	226	85%
6/11/2024 4:00:00 PM	I1-TW-0016032-24122-N-1-R1	DA64954-2	PT	80	68.8	86%
6/11/2024 4:00:00 PM	I1-TW-0016032-24122-N-2-R1	DA64954-1	PT	266	193	73%
7/10/2024 4:00:00 PM	I1-TW-0016032-24122-N-1-R2	DA65646-1	PT	80	52.9	66%
7/10/2024 4:00:00 PM	I1-TW-0016032-24122-N-2-R2	DA65646-2	PT	266	215	81%
8/6/2024 7:53:00 AM	I1-TW-0016032-24122-N-1-R3	DA66245-1	PT	80	26.3	33%
8/6/2024 8:01:00 AM	I1-TW-0016032-24122-N-2-R3	DA66245-2	PT	266	231	87%
9/11/2024 8:10:00 AM	I1-TW-0016032-24122-N-1-R4	DA67219-1	PT	80	63.3	79%
9/11/2024 8:15:00 AM	I1-TW-0016032-24122-N-2-R4	DA67219-2	PT	266	178	67%
10/9/2024 8:18:00 AM	I1-TW-0016032-24122-N-1-R5	DA67973-2	PT	266	157	59%
10/9/2024 8:23:00 AM	I1-TW-0016032-24122-N-2-R5	DA67973-1	PT	80	56.0	70%

- Performance samples are obtained from ERA. ERA ships “PT” samples to AECOM overnight to Honolulu for inclusion in JBPHH EDWM sample shipments. No more than 2 days between prep and shipment to SGS laboratory.
- Performance samples will be collected monthly throughout EDWM.

If JP-5/Fuel were Present in Drinking Water Samples
They Would be Detected by the Laboratory (Excellent Accuracy and Precision).

Summary

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- LTM completed on schedule; validated DOH system certification and served to demonstrate the JBPHH drinking water system has recovered from the Nov 2021 release
- All LTM data (for over 9,200 samples) is valid - met data quality objectives set forth in inter-agency Sampling and Analysis Plan (SAP)
- LTM informed subsequent monitoring plan, EDWM, implementing an additional level of analysis for fuel-related constituents
- Over 4,000 EDWM results in six months substantiate Swarm conclusions
- BWS report, comments are concerning

Sample results evaluated over multiple lines of evidence demonstrate no presence of fuel.

Discussion

Point #5 (Cont.)
Surrogate Residence Time Study

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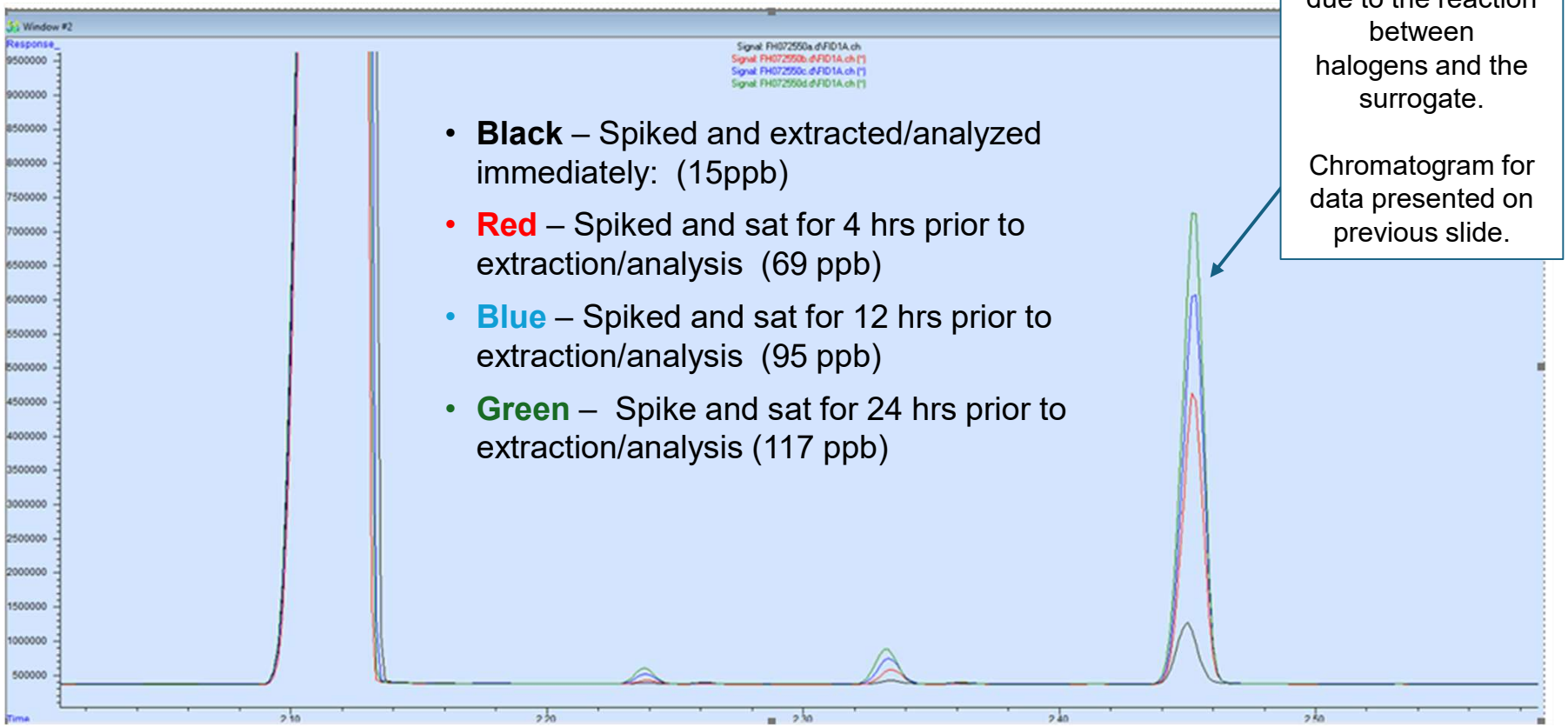

- **Black** – Spiked and extracted/analyzed immediately: (15ppb)
- **Red** – Spiked and sat for 4 hrs prior to extraction/analysis (69 ppb)
- **Blue** – Spiked and sat for 12 hrs prior to extraction/analysis (95 ppb)
- **Green** – Spike and sat for 24 hrs prior to extraction/analysis (117 ppb)

TPH false positives due to the reaction between halogens and the surrogate.

Chromatogram for data presented on previous slide.

Higher TPH concentrations (false positives) were observed as residence time increased, demonstrating that unquenched TPH results are "biased high."

Break

Extended Drinking Water Monitoring

10 December 2024

Apple Android

Extended Drinking Water Monitoring

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- One-year enhanced drinking water monitoring plan focusing on fuel-related constituents, not just JP-5
- Voluntarily initiated by Navy to deliver on commitment to continue drinking water monitoring; implemented into 2023 ACO as enforceable by agreement
- Continues to demonstrate JBPHH Drinking Water System has recovered from the Nov 2021 release
- Objectives:
  - Sample remaining residences served by JBPHH system
  - Investigatory approach with advanced analysis

EDWM Plan

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- Additional sample zone (+J1 Manana Housing = 20 zones)
- Advanced analysis (forensic methods) to evaluate fuel-related analyte detections, and delineate chemical makeup of petroleum hydrocarbon detections
- Increased sampling frequency of priority areas (source, schools and Child Development Centers/Homes)
- Estimated 6,000 additional drinking water samples
- Refined extraction method prior to analysis by EPA Method 8015 (Non-Halogenated Organics)

LTM and EDWM Analytes

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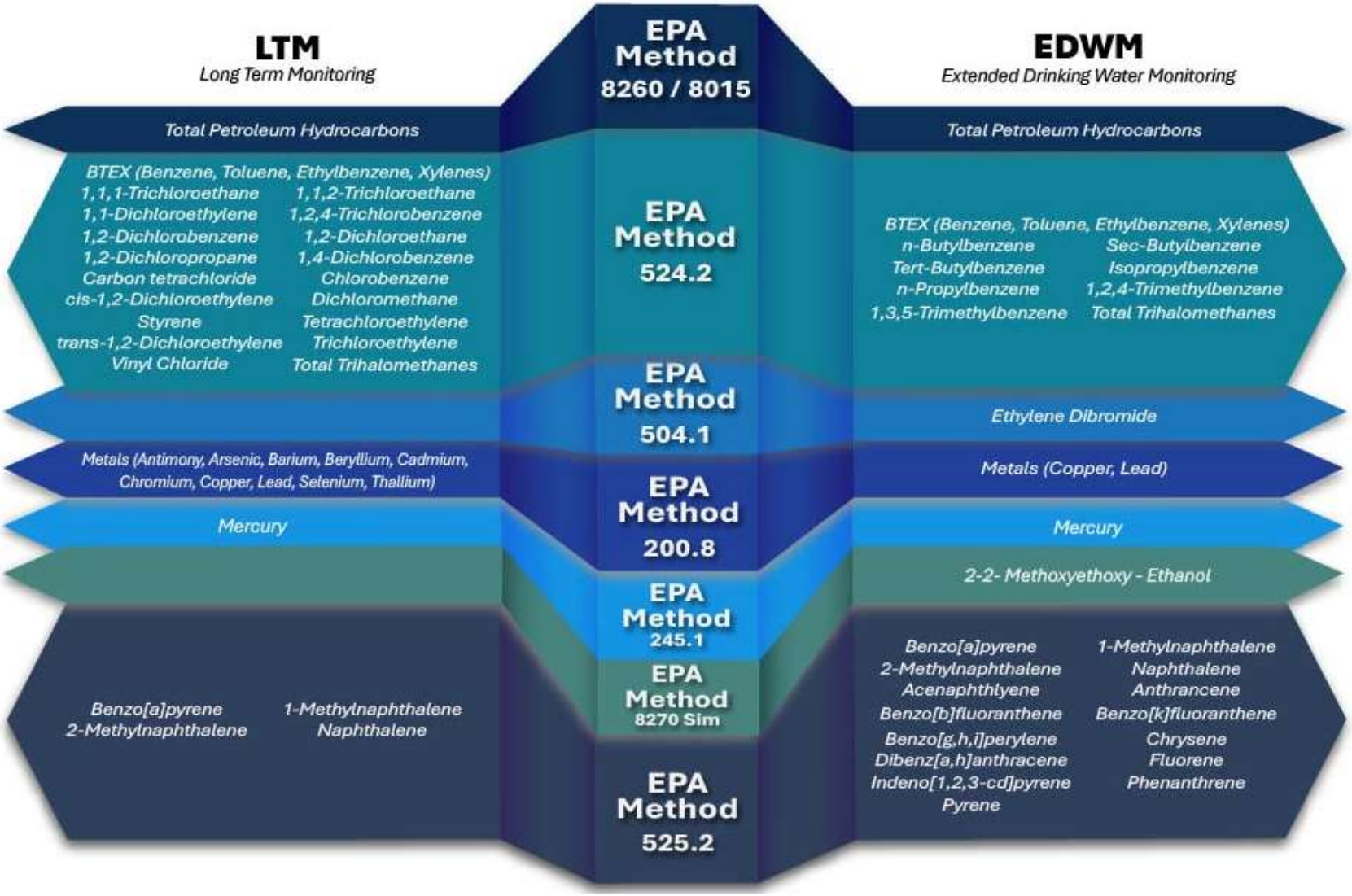

EDWM Results

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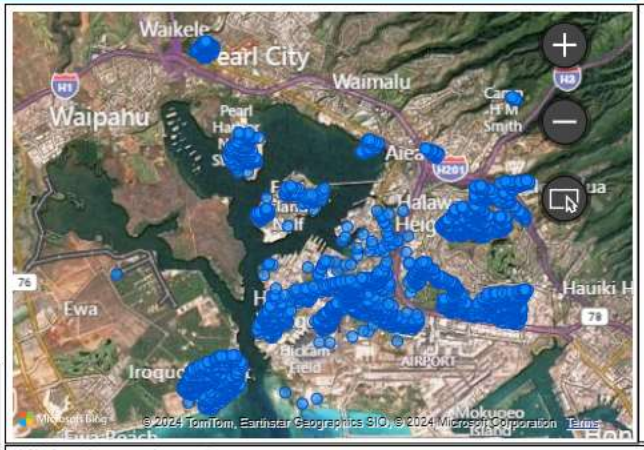
Joint Base Pearl Harbor-Hickam (JBPHH)
Drinking Water Monitoring Dashboard

Locations Sampled	Total Samples	Analytes Tested	Detected Above Screening Level
2259	4063	130.0K	0

Location Sampled by Zone

Zone	Locations
EDWM A1 Zone Residential Sampling	109
EDWM A2 Zone Residential Sampling	74
EDWM A3 Zone Residential Sampling	282
EDWM B1 Zone Residential Sampling	42
EDWM C2 Zone Residential Sampling	7
EDWM C3 Zone Residential Sampling	2
EDWM D1 Zone Residential Sampling	72
EDWM D2 Zone Residential Sampling	347
EDWM D3 Zone Residential Sampling	193
EDWM E1 Zone Residential Sampling	12
EDWM E1 Zone Residential Sampling	142
Total	2259



Analytes Exceeding Screening Level

Analyte Name	Screening Level	Min Exceedance	Max Exceedance	Count of Exceedances

Zone/Area: All

Find Address: All

Analyte Name: All

Screening: All

Date Range: 3/11/2022 – 11/20/2024

EDWM | LTM

All Analytes Tested

Location	Address	Sampling Date	Client Sample ID	Analyte Name	Screening Level	Reported Results	Units	Screening
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	Alkalinity, Total (as CaCO3)	NA	55.6	MG/L	Detection
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	Total Organic Carbon	NA	ND	MG/L	Not Detected
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	Petroleum Hydrocarbons (Total)		ND	UG/L	Not Detected
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	Benzo(a)pyrene	0.2	ND	UG/L	Not Detected
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	Toluene	1000	ND	UG/L	Not Detected
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	m,p-Xylene	10000	ND	UG/L	Not Detected
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	o-Xylene	10000	ND	UG/L	Not Detected
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	Xylenes, Total	10000	ND	UG/L	Not Detected
A1-ALOH1613	1613 Aloha Avenue	8/16/2024	A1-TW-0001573-24092-N	Copper	1300	24.3	UG/L	Detection

Clear Filters | More Info

Detection Analyte found at concentration below the lowest regulatory screening level

Exceedance Analyte concentration exceeds lowest regulatory screening level

No fuel found; JBPHH drinking water continues to meet state and federal standards.

EDWM: Petroleum Hydrocarbons Results

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	Location	Results	Assessment
1	Hydrant	48.4ppb ORO	Lubricant
2	Hydrant	37ppb GRO	Isopropyl alcohol
3	Hydrant	92.4ppb ORO, 1460ppb DRO	Lubricant
4	Residence	62.4ppb ORO	Lubricant
5	Residence	47.4ppb ORO, 62.3 DRO	Lubricant
6	Hydrant	63.5ppb GRO	Isopropyl alcohol
7	Residence	73ppb ORO	Lubricating oil
8	Residence	246ppb ORO, 145ppb DRO	Skin contact contamination (lab)
9	Residence	165ppb ORO	Lubricant
10	Hydrant	143ppb GRO, (Duplicate 64.5ppb GRO)	Isopropyl alcohol

- Each sample above ran through tiered assessment to evaluate source of detection

0.27% TPH detection rate across 4,300 samples; no fuel detected.

Independent Evaluations

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- Concurrent EPA monitoring
  - Independent analysis of over 300 samples collected to date
  - Sep 2024 EDWM sampling audit:

    “Although there are specific findings, none of the findings are predicted to have a significant effect on sample integrity. Total Petroleum Hydrocarbons, diesel fraction and lead samples have no associate finding.”

- Independent HDOH investigation, Feb-May 2024
  - Analyzed Waiawa source, residences and school/CDC
  - No evidence of petroleum or jet fuel compounds

No results or indication of the presence of fuel in drinking water system.

Discussion