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DEPARTMENT OF ECOLOGY

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To: Will Hobbs, Project Officer, TSU
From: John Weakland, Data Validation Chemist, MEL *JW*
Project: NWTPH-Dx Silica Gel Cleanup
Subject: Validation of NWTPH-Dx in water

Work Orders: 2302038

Forty subsamples were taken from the study site by the Department of Ecology, Toxics Studies Unit. Four replicates were shipped to seven commercial laboratories, and ten replicates were shipped to MEL for semivolatile petroleum hydrocarbon analysis following modifications to the Ecology method *NWTPH-Dx*. The analytical results for these samples were validated in this report.

Summary of Samples Validated

Client ID	MEL ID	Lab ID	Collection Date	Extraction Date	Analysis Date
Lab 1					
DW3-A	2302038-01	EV23020012-01	2/1/2023	2/7/2023	2/8/2023
DW3-B	2302038-02	EV23020012-02	2/1/2023	2/7/2023	2/8/2023
DW3-C	2302038-03	EV23020012-03	2/1/2023	2/7/2023	2/8/2023
--	MB	MB-020723W	--	2/7/2023	2/8/2023
--	BS	BS	--	2/7/2023	2/8/2023
--	BSD	BSD	--	2/7/2023	2/8/2023
DW3-A (SGT)	2302038-01 (SGT)	EV23020012-01 (SGT)	2/1/2023	2/7/2023	2/14/2023
DW3-B (SGT)	2302038-02 (SGT)	EV23020012-02 (SGT)	2/1/2023	2/7/2023	2/14/2023
DW3-C (SGT)	2302038-03 (SGT)	EV23020012-03 (SGT)	2/1/2023	2/7/2023	2/14/2023
--	MB (SGT)	MB-020723W (SGT)	--	2/7/2023	2/14/2023
--	LCS (SGT)	BS (SGT)	--	2/7/2023	2/14/2023
--	LCSD (SGT)	BSD (SGT)	--	2/7/2023	2/14/2023
Lab 2					
DW3-A	2302038-05	MDB0094-01	2/1/2023	2/15/2023	3/14/2023
DW3-B	2302038-06	MDB0094-02	2/1/2023	2/15/202	3/14/2023
DW3-C	2302038-07	MDB0094-03	2/1/2023	2/15/202	3/14/2023
--	MB	BDB0485-BLK1	--	2/15/202	3/14/2023
--	LCS	BDB0485-BS1	--	2/15/202	3/14/2023
--	LCSD	BDB0485-BSD1	--	2/15/202	3/14/2023

Client ID	MEL ID	Lab ID	Collection Date	Extraction Date	Analysis Date
DW3-A (SGT)	2302038-05 (SGT)	MDB0094-01 (SGT)	2/1/2023	2/15/2023	3/15/2023
DW3-B (SGT)	2302038-06 (SGT)	MDB0094-02 (SGT)	2/1/2023	2/15/2023	3/15/2023
DW3-C (SGT)	2302038-07 (SGT)	MDB0094-03 (SGT)	2/1/2023	2/15/2023	3/15/2023
--	MB (SGT)	BDB0486-BLK1 (SGT)	--	2/15/2023	3/15/2023
--	LCS (SGT)	BDB0486-BS1 (SGT)	--	2/15/2023	3/15/2023
--	LCSD (SGT)	BDB0486-BSD1 (SGT)	--	2/15/2023	3/15/2023
Lab 3					
DW3-A	2302038-09	A3B0052-01	2/1/2023	2/8/2023	2/14/2023
DW3-B	2302038-10	A3B0052-02	2/1/2023	2/8/2023	2/14/2023
DW3-C	2302038-11	A3B0052-03	2/1/2023	2/8/2023	2/14/2023
--	MB1	23B0280-BLK1	--	2/8/2023	2/14/2023
--	MB2	23B0280-BLK2	--	2/8/2023	2/13/2023
--	LCS1	23B0280-BS1	--	2/8/2023	2/14/2023
--	LCS2	23B0280-BS2	--	2/8/2023	2/13/2023
--	LCSD1	23B0280-BSD1	--	2/8/2023	2/14/2023
--	LCSD2	23B0280-BSD2	--	2/8/2023	2/13/2023
DW3-A (SGT)	2302038-09 (SGT)	MDB0094-01 (SGT)	2/1/2023	2/8/2023	2/14/2023
DW3-B (SGT)	2302038-10 (SGT)	MDB0094-02 (SGT)	2/1/2023	2/8/2023	2/14/2023
DW3-C (SGT)	2302038-11 (SGT)	MDB0094-03 (SGT)	2/1/2023	2/8/2023	2/14/2023
--	MB (SGT)	23B0361-BLK1 (SGT)	--	2/8/2023	2/14/2023
--	LCS (SGT)	23B0361-BS1 (SGT)	--	2/8/2023	2/14/2023
--	LCSD (SGT)	23B0361-BSD1 (SGT)	--	2/8/2023	2/14/2023
Lab 4					
DW3-A	2302038-13	07110	2/1/2023	--	2/27/2023
DW3-B	2302038-14	07111	2/1/2023	--	2/27/2023
DW3-C	2302038-15	07112	2/1/2023	--	2/27/2023
--	MB	MB	--	--	2/27/2023
--	LCS	LCS	--	--	2/27/2023
--	LCS Dup	LCS Dup	--	--	2/27/2023
DW3-A (SGT)	2302038-13 (SGT)	07110 (SGT)	2/1/2023	--	2/27/2023
DW3-B (SGT)	2302038-14 (SGT)	07111 (SGT)	2/1/2023	--	2/27/2023
DW3-C (SGT)	2302038-15 (SGT)	07112 (SGT)	2/1/2023	--	2/27/2023
Lab 5					
DW3-A	2302038-17	302020-01	2/1/2023	2/15/2023	2/27/2023
DW3-B	2302038-18	302020-02	2/1/2023	2/15/2023	2/27/2023
DW3-C	2302038-19	302020-03	2/1/2023	2/15/2023	2/27/2023
--	MB	03-430 MB	--	2/15/2023	2/27/2023
--	LCS	LCS-20891	--	2/15/2023	2/27/2023
DW3-A (SGT)	2302038-17 (SGT)	2302008-01 (SGT)	2/1/2023	2/6/2023	2/27/2023
DW3-B (SGT)	2302038-18 (SGT)	2302008-02 (SGT)	2/1/2023	2/6/2023	2/27/2023
DW3-C (SGT)	2302038-19 (SGT)	2302008-03 (SGT)	2/1/2023	2/6/2023	2/27/2023
--	MB (SGT)	03-430 MB (SGT)	--	2/6/2023	2/27/2023
--	LCS (SGT)	LCS-20897 (SGT)	--	2/6/2023	2/27/2023
Lab 6					
DW3-A	2302038-21	02-031-01	2/1/2023	2/6/2023	3/3/2023
DW3-B	2302038-22	02-031-02	2/1/2023	2/6/2023	3/3/2023
DW3-C	2302038-23	02-031-03	2/1/2023	2/6/2023	3/3/2023
--	MB	MB0215W2	--	2/6/2023	3/2/2023
--	LCS	SB0215W2	--	2/6/2023	3/3/2023

Client ID	MEL ID	Lab ID	Collection Date	Extraction Date	Analysis Date
DW3-A (SGT)	2302038-21 (SGT)	02-031-01 (SGT)	2/1/2023	2/6/2023	3/2/2023
DW3-B (SGT)	2302038-22 (SGT)	02-031-02 (SGT)	2/1/2023	2/6/2023	3/2/2023
DW3-C (SGT)	2302038-23 (SGT)	02-031-03 (SGT)	2/1/2023	2/6/2023	3/2/2023
--	MB (SGT)	MB0215W2 (SGT)	--	2/6/2023	3/2/2023
--	LCS (SGT)	SB0215W2 (SGT)	--	2/6/2023	3/2/2023
Lab 7					
DW3-A	2302038-25	2302008-01	2/1/2023	2/6/2023	2/10/2023
DW3-B	2302038-26	2302008-02	2/1/2023	2/6/2023	2/10/2023
DW3-C	2302038-27	2302008-03	2/1/2023	2/6/2023	2/10/2023
--	MB	MB-20891	--	2/6/2023	2/10/2023
--	LCS	LCS-20891	--	2/6/2023	2/10/2023
--	LCSD	LCSD-20891	--	2/6/2023	2/10/2023
DW3-A (SGT)	2302038-25 (SGT)	2302008-01 (SGT)	2/1/2023	2/6/2023	2/10/2023
DW3-B (SGT)	2302038-26 (SGT)	2302008-02 (SGT)	2/1/2023	2/6/2023	2/10/2023
DW3-C (SGT)	2302038-27 (SGT)	2302008-03 (SGT)	2/1/2023	2/6/2023	2/10/2023
--	MB (SGT)	MB-20897 (SGT)	--	2/6/2023	2/10/2023
--	LCS (SGT)	LCS-20897 (SGT)	--	2/6/2023	2/10/2023
--	LCSD (SGT)	LCSD-20897 (SGT)	--	2/6/2023	2/10/2023
MEL					
DW3-A	2302038-29	--	2/1/2023	2/9/2023	2/17/2023
DW3-B	2302038-30	--	2/1/2023	2/9/2023	2/17/2023
DW3-C	2302038-31	--	2/1/2023	2/9/2023	2/17/2023
DW3-D	2302038-32	--	2/1/2023	2/9/2023	2/17/2023
DW3-E	2302038-33	--	2/1/2023	2/9/2023	2/17/2023
DW3-F	2302038-34	--	2/1/2023	2/9/2023	2/17/2023
DW3-G	2302038-35	--	2/1/2023	2/9/2023	2/17/2023
DW3-H	2302038-36	--	2/1/2023	2/9/2023	2/18/2023
DW3-I	2302038-37	--	2/1/2023	2/9/2023	2/18/2023
DW3-J	2302038-38	--	2/1/2023	2/9/2023	2/18/2023
MB	B23B056-BLK1	--	--	2/9/2023	2/17/2023
LCS	B23B056-BS1	--	--	2/9/2023	2/17/2023
LCSD	B23B056-BSD1	--	--	2/9/2023	2/17/2023
DW3-A (SGT)	2302038-29 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-B (SGT)	2302038-30 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-C (SGT)	2302038-31 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-D (SGT)	2302038-32 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-E (SGT)	2302038-33 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-F (SGT)	2302038-34 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-G (SGT)	2302038-35 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-H (SGT)	2302038-36 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-I (SGT)	2302038-37 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
DW3-J (SGT)	2302038-38 (SGT)	--	2/1/2023	2/9/2023	2/18/2023
MB (SGT)	B23B056-BLK1 (SGT)	--	--	2/9/2023	2/18/2023
LCS (SGT)	B23B056-BS1 (SGT)	--	--	2/9/2023	2/18/2023
LCSD (SGT)	B23B056-BSD1 (SGT)	--	--	2/9/2023	2/18/2023

SGT = Identifies the analyzed sample extract underwent silica gel cleanup.

QUALIFICATIONS

Stage 2B data validation was completed using manual review and verification of reported results per the technical specifications of the following:

- Analytical Methods for Petroleum Hydrocarbons, ECY 97-602, June 1997.
- Quality Assurance Project Plan: Guidance for the WDOE NWTPH-Dx Method for Testing Groundwater, January 2022.
- National Functional Guidelines for Organic Superfund Methods Data Review, US EPA, November 2020.

OVERALL ASSESSMENT OF THE DATA

As determined by this evaluation, the laboratory followed the specified analytical methods. Reported results were qualified as:

- rejected based on serious deficiencies with QC and data package.
- not detected or estimated based on method blank contamination.
- not detected or estimated based on reverse surrogate outliers.
- not detected or estimated based on reported diesel and oil ranges.

Note that laboratory-generated data flags for detected and not detected results *below* the reporting limit were changed into qualifiers in the EDDs without a reason code entered. All other data qualifiers added during validation have an associated reason code.

Data recommended for rejection should not be used for any purpose; all other data, as qualified, are acceptable for use. Refer to the Qualified Data Summary Table at the end of this report listing all qualified results. The conclusions presented in this report are based on the information available during the review.

For questions, contact John Weakland at jwea461@ecy.wa.gov or call 360-480-7515.

The following QC elements were evaluated in this report:

QC Requirement:	Acceptable	Outlier(s)	Outlier(s) with Qualifiers
1. Sample Preservation & Holding Times	✓		
2. Sample Extraction & Cleanup	✓		
3. Initial Calibration	✓		
4. Continuing Calibration Verification	✓		
5. Laboratory Control Sample (LCS)/LCS Duplicate (LCSD)	✓		
6. Sample Dup	✓		
7. Method Blanks			✓
8. Reverse Surrogate Standard			✓
9. Surrogate Standards	✓		
10. Compound Identification	✓		
11. Target Analyte Quantitation	✓		

COMPLETENESS

The laboratories submitted all the required deliverables, with any exceptions noted below.

Lab 1. The data package did not contain instrument QC summaries or raw data with the submitted data package.

Lab 2. EDD is not in the EIM format. The reported result value for non-detects was <RL instead of the numerical value of the reporting limit.

Lab 4. The laboratory encountered the loss of a critical chemist during the project, and the lab could not fully recover the data for the project. The reported untreated results were well below those of other laboratories, and there were deficiencies with batch QC and instrument calibration. The lab's reported results are unusable, and the samples were qualified as rejected (R-20A).

MEL. The lab did not submit a Level 4 data package. However, all the applicable raw data was reviewable via Element LIMS.

DISCUSSION

1. SAMPLE PRESERVATION & HOLDING TIMES – Acceptable

The subsamples were taken on February 1, 2023, and shipped the same day to seven commercial laboratories, including MEL, for analysis with and without silica gel treatment (SGT). As validation guidance documents indicate, the cooler temperature should be within an advisory temperature range of 0° to 6°C. The samples were stored frozen at 4°C until extraction. All the samples were received within the proper temperature range unless specified below. Data were not qualified on this basis.

The extraction technical holding time is determined from the date of sample collection to the date of extraction. The analytical holding time is calculated from the date of extraction to the date of analysis. The QAPP indicates an extraction holding time of 14 days for acidified samples held at 4°C and an analysis holding time of 40 days for the extracts. All the samples met extraction technical holding times, with any exceptions noted below. Data were not qualified on this basis.

2. SAMPLE EXTRACTION AND CLEANUP - Acceptable

The samples were extracted in batches that included a method blank, Laboratory Control Sample/ Laboratory Control Sample Duplicate, and sample duplicate. All field and batch QC samples were spiked with surrogate standards, extracted, and brought to final volume. An aliquot of the extract was taken and treated using a silica gel column. The treated and untreated samples were then analyzed by gas chromatograph with a flame ionization detector. The laboratories followed the sample extraction and clean-up procedures specified in the SOW with any issues noted below. Data were not qualified on this basis.

Lab 3. Lab extracted two sets of untreated batch QC. Data were not qualified on this basis.

3. INITIAL CALIBRATION (ICAL) - Acceptable

The laboratories analyzed initial calibration curves and analyzed five or more calibration standards. ICALs must have a linear correlation coefficient ≥ 0.990 and ICAL standard recoveries within 85 – 115% of their true values. All associated ICALs met method requirements, with any exceptions noted below. Data were not qualified on this basis.

4. CONTINUING CALIBRATION VERIFICATION (CCV) – Acceptable

CCV standards were analyzed daily prior to the analysis of samples and every ten field samples thereafter. The frequency of CCVs was met. Analyte concentrations must be within 85-115% of their true values. All CCVs met method requirements with any exceptions noted below. Data were not qualified on this basis.

5. LABORATORY CONTROL SAMPLE (LCS) AND LCS DUPLICATE (LCSD) RECOVERIES – Acceptable

One LCS/LCSD pair were extracted and analyzed with each batch of samples. The frequency of LCS/LCSD was met. Analyte concentrations must be within QAPP limits of 70-130% of their true values and the RPD ≤ 40. All associated LCS/LCSDs met the QAPP requirements, with any exceptions noted below. Data were not qualified on this basis.

Lab 3. The recovery of diesel in 23B0280-BSD2 (69%) was slightly below QAPP limits, while the recoveries of the other three LCS/LCSDs were all within QAPP limits. Data were not qualified on this basis.

Lab 5. The lab did not analyze an LCSD sample. Data were not qualified on this basis.

Lab 6. The lab did not analyze an LCSD sample. Data were not qualified on this basis.

6. SAMPLE DUPLICATE (DUP) – Acceptable

Lab DUPs were not extracted and analyzed with each batch because labs were directed to hold onto the additional sample as a backup if needed. The three samples are replicates, so the DUP was not necessary. Data were not qualified on this basis.

7. METHOD BLANKS (MB) – Qualified Results

One MB was extracted, and the treated and untreated MBs were analyzed with each batch. The frequency of MBs was met. Analyte concentrations must be ≤ Reporting Limit (RL). All MBs met QAPP limits with any exceptions noted below. Data were qualified on this basis.

Lab 1. Target compounds were detected in the treated and untreated MBs. However, the reported results were > 5x the MB. Data were not qualified on this basis.

MEL. The #2 Diesel and lube oil results in the SGT MB were slightly above the RL and did not meet QAPP limits. To assess the impact of contaminants on the reported sample results, action levels (ALs) of 5 times (5x) the concentration reported in the method blank were calculated. The following analytes were reported or detected in the MBs.

MEL B23B056-BLK2 (SGT)		
Analyte	Result (mg/L)	Action Level(AL)
#2 Diesel	0.29	1.45
Lube oil	0.60	3.00

The ALs were sample adjusted and compared to the sample results. Detected sample results less than the AL were qualified as non-detected at the amount found (U-3M). Data were qualified as shown in the table below.

MEL B23B056-BLK2 (SGT)					
Client ID	MEL ID	Analyte	Result (mg/L)	RL	Qualifier
DW3-A (SGT)	2302038-29 (SGT)	#2 Diesel	0.41	0.15	U-3M

MEL B23B056-BLK2 (SGT)					
Client ID	MEL ID	Analyte	Result (mg/L)	RL	Qualifier
DW3-B (SGT)	2302038-30 (SGT)	#2 Diesel	0.40	0.15	U-3M
DW3-C (SGT)	2302038-31 (SGT)		0.40		
DW3-D (SGT)	2302038-32 (SGT)		0.38		
DW3-E (SGT)	2302038-33 (SGT)		0.39		
DW3-F (SGT)	2302038-34 (SGT)		0.36		
DW3-G (SGT)	2302038-35 (SGT)		0.36		
DW3-H (SGT)	2302038-36 (SGT)		0.38		
DW3-I (SGT)	2302038-37 (SGT)		0.38		
DW3-J (SGT)	2302038-38 (SGT)		0.35		

8. REVERSE SURROGATE STANDARD (RSS) – Qualified Results.

The RSS decanoic acid was added to the extract aliquots of all field and batch QC samples before the SGT. The RSS monitors the effectiveness of the SGT because it is removed when the sample is adequately cleaned up. For the SGT samples, the RSS concentrations should be $\leq 10\%$ of their true values. All the samples met QAPP limits, with any exceptions noted below. Data were qualified on this basis.

Lab 2. The lab reportedly used the LC-Si column for cleanups and followed the procedure. However, The RSS recoveries for all client samples and the LCS/LCSD exceeded QC limits indicating a high bias. Samples were qualified as shown below.

Client ID	Lab ID	Surrogate	% Rec	Affected Analyte(s)	Qualifier
DW3-A (SGT)	MDB0094-01 (SGT)	Decanoic acid	93.7	Diesel	J-20B
DW3-B (SGT)	MDB0094-02 (SGT)		92.7		
DW3-C (SGT)	MDB0094-03 (SGT)		86.2		
LCS	BDB0486-BS1		15.1		
LCSD	BDB0486-BSD		17.3		

Lab 3. The lab did not report the RSS in the SGT client samples but did report them in the batch QC. Since the RSS was unreported and small diesel hits were reported, the results were qualified, as shown below.

Client ID	Lab ID	Surrogate	% Rec	Affected Analyte(s)	Qualifier
DW3-A (SGT)	A3B0052-01 (SGT)	Decanoic acid	--	Diesel	J-20B
DW3-B (SGT)	A3B0052-02 (SGT)		--		
DW3-C (SGT)	A3B0052-03 (SGT)		--		

Lab 7. The lab did not report RSS results for the SGT LCS/LCS Dup. Data were not qualified on this basis.

9. SURROGATE STANDARDS – Acceptable

Surrogates were added to all field and batch QC samples prior to extraction. The surrogate analyte concentrations must be within QAPP limits of 50 – 150% of their true values. All surrogate recoveries met QAPP requirements, with any exceptions noted below. Data were not qualified on this basis.

Lab 7. The lab did not report surrogate results for the treated and untreated LCS or LCS Dup. Data were not qualified on this basis.

10. COMPOUND IDENTIFICATION – Acceptable

The observed petroleum product is determined by pattern matching with the standards analyzed the same day. The method states that “Diesel range” and “oil range” should only be used if the lab cannot identify the petroleum products present. Petroleum products with an unresolved envelope $>C_{24}$ may be reported by the collective term “lube oil” unless specific identification is possible. The labs flagged or narrated results with unidentifiable petroleum products, shown below. Data were not qualified on this basis.

Lab 1. The lab narrated that the treated and untreated sample results contained “...an unidentified diesel range product and an unidentified oil range product.”

Lab 2. The lab narrated that the treated and untreated samples had “...petroleum contamination that ranged from $C_{10} - C_{28}$.”

Lab 3. The lab narrated that the treated and untreated diesel “... hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.”

Lab 6. The lab narrated that they could not positively identify the products present in the samples and reported the results as Diesel Range Organics and Lube Oil Range Organics.

11. TARGET ANALYTE QUANTITATION - Acceptable

The method uses an external standard technique for quantitation. The reporting limits (RL) were calculated based on the lowest calibration level with adjustments on the sample amount extracted. Samples are quantitated for the diesel range from $C_{12}-C_{24}$ using Diesel #2 and the oil range $>C_{24}$ using motor oil. Any quantitation issues encountered by the laboratories are noted below.

For this project, labs were requested to report to the lab’s MDL. Non-detected results would be flagged with a UJ, not detected at the estimated detection limit, and all detected results less than the RL were qualified J, estimated value without reason codes. Any issues with labs reporting the MDL or quantitating samples are noted below. Data were not qualified on this basis.

Lab 1. The lab narrated that treated and untreated “Oil range product results biased high due to diesel range product overlap.” Data were not qualified on this basis.

Lab 2. The lab reported non-detects to the RL, not to the MDL as requested, and no results were reported below the RL. The lab narrated that for all three untreated samples, they integrated the entire unresolved petroleum envelope from $C_{10} - C_{28}$, calculated it as diesel, and reported the oil results as not detected. Since the lab changed the method’s petroleum ranges, the results were qualified, as shown below, to indicate a high bias for the diesel range results and a low bias for the oil range results.

Client ID	Lab ID	Analyte	Qualifier
DW3-A	MDB0094-01	Diesel	J-20C
		Oil	UJ-20C
DW3-B	MDB0094-02	Diesel	J-20C
		Oil	UJ-20C
DW3-C	MDB0094-03	Diesel	J-20C
		Oil	UJ-20C
DW3-A (SGT)	MDB0094-01	Diesel	J-20C
		Oil	UJ-20C
DW3-B (SGT)	MDB0094-02 (SGT)	Diesel	J-20C
		Oil	UJ-20C

Client ID	Lab ID	Analyte	Qualifier
DW3-C (SGT)	MDB0094-03 (SGT)	Diesel	J-20C
		Oil	UJ-20C

Lab 4. The lab reported non-detects to the MDL but flagged the results U instead of UJ. Data were not qualified on this basis.

Lab 5. The lab flagged the diesel range and motor oil ranges “The sample chromatographic pattern does not resemble the fuel standard used for quantitation.”

Lab 6. The lab reported non-detects to the RL, not to the MDL as requested, and no results were reported below the RL. The lab also narrated the reported diesel and lube oil range organics used petroleum product ranges that did not overlap. Data were not qualified on this basis.

MEL. The lab reported non-detects to the RL, not to the MDL but did report results below the RL. Data were not qualified on this basis.

DATA QUALIFIERS

QUALIFIER	DESCRIPTION
U	The analyte was analyzed for but was not detected at the reported level of quantitation.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of the analyte has been tentatively identified and the associated numerical value represents approximate concentration. Identification needs further confirmation.
UJ	The analyte was not detected at or above the reported quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
NUJ	The analyte was initially identified by the lab as tentatively identified at estimated concentration in both sample and associated method blank. The reported value is quantified as not-detect because the sample value is less than 5x the value in the associated blank.
R	The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet the quality control criteria. The presence or absence of the analyte cannot be verified.

DATA QUALIFIER REASON CODES

GROUP	CODE	REASON for QUALIFIER
Blanks	3M	Method Blank Contamination
Misc.	20A	Deficiencies in reported data and data package
	20B	Cleanup standard recovery
	20C	Method-specific petroleum ranges were not used

Qualified Data Summary Table

Client ID	MEL ID	Lab ID	Method	Analyte	Result	Result Unit	Lab Flag	DV Result Value	DV Qualifier	DV Reason Code
Lab 2										
DW3-A	2302038-05	MDB0094-01	NWTPH-Dx	#2 Diesel	3.81	mg/L	--	3.81	J	20C
DW3-A	2302038-05	MDB0094-01	NWTPH-Dx	Lube Oil	0.205	mg/L	U	0.205	UJ	20C
DW3-B	2302038-06	MDB0094-02	NWTPH-Dx	#2 Diesel	3.54	mg/L	--	3.54	J	20C
DW3-B	2302038-06	MDB0094-02	NWTPH-Dx	Lube Oil	0.197	mg/L	U	0.197	UJ	20C
DW3-C	2302038-07	MDB0094-03	NWTPH-Dx	#2 Diesel	2.27	mg/L	--	2.27	J	20C
DW3-C	2302038-07	MDB0094-03	NWTPH-Dx	Lube Oil	0.199	mg/L	U	0.199	UJ	20C
DW3-A (SGT)	2302038-05 (SGT)	MDB0094-01 (SGT)	NWTPH-Dx	#2 Diesel	1.98	mg/L	--	1.98	J	20B, 20C
DW3-A (SGT)	2302038-05 (SGT)	MDB0094-01 (SGT)	NWTPH-Dx	Lube Oil	0.205	mg/L	U	0.205	UJ	20B, 20C
DW3-B (SGT)	2302038-06 (SGT)	MDB0094-02 (SGT)	NWTPH-Dx	#2 Diesel	1.89	mg/L	--	1.89	J	20B, 20C
DW3-B (SGT)	2302038-06 (SGT)	MDB0094-02 (SGT)	NWTPH-Dx	Lube Oil	0.197	mg/L	U	0.197	UJ	20B, 20C
DW3-C (SGT)	2302038-07 (SGT)	MDB0094-03 (SGT)	NWTPH-Dx	#2 Diesel	1.33	mg/L	--	1.33	J	20B, 20C
DW3-C (SGT)	2302038-07 (SGT)	MDB0094-03 (SGT)	NWTPH-Dx	Lube Oil	0.199	mg/L	U	0.199	UJ	20B, 20C
Lab 3										
DW3-A (SGT)	2302038-09 (SGT)	A3B0052-01 (SGT)	NWTPH-Dx	#2 Diesel	0.131	mg/L	--	0.131	J	20B
DW3-B (SGT)	2302038-10 (SGT)	A3B0052-02 (SGT)	NWTPH-Dx	#2 Diesel	0.116	mg/L	--	0.116	J	20B
DW3-C (SGT)	2302038-11 (SGT)	A3B0052-03 (SGT)	NWTPH-Dx	#2 Diesel	0.147	mg/L	--	0.147	J	20B
Lab 4										
DW3-A	2302038-13	07110	NWTPH-Dx	#2 Diesel	0.30	mg/L			R	20A
DW3-A	2302038-13	07110	NWTPH-Dx	Heavy Fuel Oil	0.40	mg/L	J		R	20A
DW3-B	2302038-14	07111	NWTPH-Dx	#2 Diesel	0.28	mg/L			R	20A
DW3-B	2302038-14	07111	NWTPH-Dx	Heavy Fuel Oil	0.41	mg/L	J		R	20A
DW3-C	2302038-15	07112	NWTPH-Dx	#2 Diesel	0.25	mg/L			R	20A
DW3-C	2302038-15	07112	NWTPH-Dx	Heavy Fuel Oil	0.27	mg/L	J		R	20A
--	MB	MB	NWTPH-Dx	#2 Diesel	0.25	mg/L	U		R	20A
--	MB	MB	NWTPH-Dx	Heavy Fuel Oil	0.50	mg/L	U		R	20A
DW3-A (SGT)	2302038-13 (SGT)	07110 (SGT)	NWTPH-Dx	#2 Diesel	0.15	mg/L	J		R	20A
DW3-A (SGT)	2302038-13 (SGT)	07110 (SGT)	NWTPH-Dx	Heavy Fuel Oil	0.24	mg/L	J		R	20A

