ANALYTICAL QUALITY ASSOCIATES, INC.
102 Gold Ave SW
Albuquerque, NM 87102
888-678-5447
www.aqainc.net

Technical Report for the Review of the Joint Base Pearl Harbor-Hickam (JBPHH) Interagency Team's Technical Memorandum on the Lines of Evidence Evaluation of TPH Detections Observed During Long-Term Monitoring

Prepared for the Honolulu Board of Water Supply (BWS)

Technical Review By: _____ **Date: 07/05/2024**

Jeanne Peterson
Project Manager/Sr. Data Validator

Technical Review By: _____ **Date: 07/05/2024**

Allison Felix
Sr. Data Validator

ACRONYMS

AQA	Analytical Quality Associates, Inc.
BWS	Honolulu Board of Water Supply
EAL	Environmental Action Limit
EDWM	Extended Drinking Water Monitoring
GAC	granular activated carbon
GCMS	gas chromatograph/mass spectrometer
GRO	gasoline range organics
HCL	hydrochloric acid
JBPHH	Joint Base Pearl Harbor-Hickam
LOE	line of evidence
LTM	long-term monitoring
MEQ	micro-extraction quench
ppm	parts per million
SDG	sample delivery group
SF	separatory funnel
SVOC	semi-volatile organic compounds
TPH	total petroleum hydrocarbons

ABBREVIATIONS

Memorandum	Pearl Harbor Technical Memorandum "Lines of Evidence of TPH Detections Observed During Long-Term Monitoring" (JBPHH 2024)
Memorandum Authors	Joint Base Pearl Harbor-Hickam (JBPHH) Interagency Team

Date: July 5, 2024

To: Mr. Erwin Kawata
Deputy Manager, Honolulu Board of Water Supply

Subject: Review of the Pearl Harbor Technical Memorandum: Lines of Evidence of TPH Detections Observed During Long-Term Monitoring, Joint Base Pearl Harbor-Hickam (JBPHH) Water Distribution System

Review Performed by:
Jeanne Peterson, Project Manager/Sr. Data Validator
Allison Felix, Sr. Data Validator

Executive Summary

Analytical Quality Associates, Inc. (AQA) was tasked with reviewing the Pearl Harbor Technical Memorandum "Lines of Evidence of TPH Detections Observed During Long-Term Monitoring" (JBPHH 2024) (Memorandum) to determine if the correct procedures were used and followed, and if the conclusions put forth in the Memorandum were supported by the evidence. The Memorandum was reviewed in conjunction with *Drinking Water Sampling Plan* (IDWST 2022a), *Drinking Water Long-Term Monitoring Plan* (IDWST 2022b), the analytical methods used by the laboratory, and several of the laboratory data packages (with particular attention to the total petroleum hydrocarbons [TPH] sections). Each line of evidence (LOE) was reviewed and determined to be inconclusive. Flaws in the sampling process and, most notably, in the analytical system and assumptions made by the Memorandum authors were instrumental in causing a significant degree of uncertainty in the conclusions drawn, and the data did not fully support the conclusions of the Memorandum. The spatial and temporal data present in the Memorandum did not support the conclusions. Zones that received no water from the contaminated well showed similar numbers of detections as zones that received water from the contaminated well. In addition, the investigation did not account for timing of water use during sample collection, although the Memorandum cited sample collection times as a possible contributing factor. Sample collection methods were not followed. The samples were not properly preserved to remove chlorine upon collection per the guiding methodology and were not checked for residual chlorine upon receipt at the laboratory, and the facility's sampling plan itself called for the addition of hydrochloric acid to the samples leading to the potential for false positives (i.e., 'ghost peaks'). Peaks attributed to chlorination by-products were present even for samples collected in zones that employed filters to remove chlorine and in several method blanks, which should have been comprised of deionized water. The investigators also concluded that the high concentration of the surrogate compound required by the method caused a positive interference; however, the laboratory employed practices such as chromatogram "clipping" that precluded full evaluation of

the data and did not modify the method for low-level analysis. Although conclusions drawn from the side-by-side comparison of extraction methods were confounded by changes to multiple experimental parameters, the changes to the analytical system that the investigation recommended would result in more definitive data, thus minimizing doubts about the efficacy of the cleanup or providing data to support additional cleanup.

Although the LOEs were deemed to be inconclusive and not fully supported, the collection of data employing proper sampling techniques and method modifications to allow low-level analysis would significantly improve confidence in the quality of the drinking water. The conclusions from the LOEs in the Memorandum and AQA's perspective are discussed in more detail below.

LOE: Spatial and Temporal Distribution of TPH Results

Memorandum Conclusion: The temporal variation and spatial distribution of TPH levels in the JBPHH System (and evaluation of sampling data in zones with inline GAC treatment) supports the hypothesis that TPH detections are not associated with the November 2021 JP-5 release and/or another release from Red Hill in the JBPHH System.

AQA's Findings:

The key findings that lead to this conclusion were 1) the detections appear to be randomly distributed throughout all Zones, 2) temporal changes in TPH levels from one long-term monitoring (LTM) period to the next were consistent across all Zones, and 3) granular activated carbon (GAC) absorbers, which remove TPH, treat drinking water in Zones H1, H2, H3, and I1 prior to distribution to residences. The circumstances involving this leak indicate that while the overall pattern may be similar (i.e., an increase in detections during LTM period 6), the evidence provided does not support the conclusion.

1) The Exposure Assessment from the State of Hawai'i Department of Health (Brewer 2023) notes that "the intrusion of fuel-contaminated water into homes and buildings appears to have been in part dependent on the timing of water use." This was attributed to isolated pockets of contaminated water that could have been trapped and then released at a later time. If occurrences similar to this are still happening, it would lead one to expect random detections in the samples that are collected, especially since sampling cannot occur at the exact same day of the week and time of day for every sampling location.

2) Figure 2 in the Memorandum shows that temporal changes were not consistent across all Zones. Zone F2, which received 75-100% of its water from the Red Hill Shaft well, had numerous detects in January of 2024 while Zone F1, which also received 75-100% of its water from the Red Hill Shaft well, did not. Zones A1 and A2, which should not have received any of their water from the Red Hill Shaft well, had similar numbers of detects spread throughout the LTM periods, and those numbers were greater than the numbers for Zones C2, C3, D4, and E1, all if which had blended water from the Red Hill Shaft and Waiawa Shaft wells. In addition, Zones C2 and C3 had fewer detects during the periods when the other Zones had more. These

facts suggest possible deficiencies in sample acquisition, handling, and/or analysis, which preclude definitive conclusions being drawn. In addition, the Memorandum relies heavily upon SW-846 Method 8015 data, while there were no data for matrix-matched (i.e., hydrochloric acid added) field blanks analyzed by SW-846 Method 8015 in the data packages we reviewed. This is a serious deficiency in these and all SW-846 Method 8015 data we reviewed.

3) Although the drinking water in Zones H1, H2, H3, and I1 are treated with GAC prior to distribution to residences, there was no evidence provided to show that the GAC absorbers were checked for saturation and replaced as needed. If saturation occurred, the relatively small number of detects shown in Figure 2 could be from the collected samples. According to the Exposure Assessment from the State of Hawai'i Department of Health (Brewer 2023), there are data from samples collected at the Red Hill Shaft well that show the groundwater was contaminated with a significant amount of JP-5 jet fuel at the time the well was shut down. After a leak of this size, it is expected that the GAC absorbers might no longer be working appropriately and would need to be replaced.

AQA's Conclusion: The evidence provided does not support the conclusion in the Memorandum. Figure 2 of the Memorandum does not support the findings outlined in the Memorandum given the occurrences that happened from the first leak and throughout the cleanup. The signs of contamination were random to begin with depending on when the water was accessed, the detects at the different Zones were not consistent with the known contributing sources, and there was no evidence provided to show that the GAC absorbers were working adequately after such a large amount of contaminated water had passed through them.

LOE: Hydraulic Modeling of the JBPHH System Following the November 2021 Release

Memorandum Conclusion: The spatial pattern of TPH detections is not consistent with a JP-5 release from Red Hill because Zones that would not have been impacted by the November 2021 JP-5 release exhibit similar patterns to Zones that were likely impacted by the JP-5 release.

AQA's Findings:

Although TPH was detected in Zones that should not have been impacted by the release of JP-5 into the Red Hill Shaft well water, the Memorandum did not take other factors into account, assumed that the flush of the Red Hill Shaft was 100% effective, and based the conclusion on modeling rather than empirical evidence. The Memorandum did not discuss whether the well was inspected or if the recharged water was evaluated after the flush to determine the success of the cleanup. The Memorandum did not suggest or indicate that water was sampled at intermediate points (i.e., storage tanks) in the distribution system and did not address the potential for lingering contamination in the distribution system. The Memorandum proceeded from the assumption that the inconsistencies were analytical in nature (i.e., laboratory contamination and disinfection by-products).

According to the Exposure Assessment from the State of Hawai'i Department of Health (Brewer 2023), "up to 40 million gallons of contaminated groundwater could therefore have been drawn into the JBPPH drinking water system over the eight days that the well operated following the initial release." In addition, "water in neighborhoods reporting strong fuel odors and sheens was initially discharged into the open, grassy areas untreated, impacting the soil and shallow groundwater and emitting vapors into the ambient air." The contamination pathway for the fuel spill was noted as being "through fractured basalt," which also underlies the open grassy areas, suggesting a further pathway for contamination yet there was no indication that this pathway was inspected for contamination.

The Memorandum ignored the findings noted in the *NEIC Civil Investigation Report: Joint Base Pearl Harbor-Hickam Public Water System, Pearl Harbor, Hawaii 96860* (NEIC 2022), which included Red Hill Shaft and Aiea Halawa Shaft distribution lines that were not labeled as distribution lines or with the direction of flow; lack of yearly service for the Red Hill Shaft and Aiea Halawa Shaft pumps; large-diameter pipes containing JP-5 directly across the Red Hill Shaft water development tunnel from potable water transmission lines; significant exterior rust and pitting of the potable water storage tanks for the Red Hill Shaft and the tanks for the potable water blended from the Red Hill Shaft and Aiea Halawa Shaft wells; ill-fitting or leaking roofs for the Red Hill and Red Hill/Halawa blended tanks; significant sediment in the Red Hill Shaft lower storage tank; and even geckos nesting in the storage tanks. Each finding increases the probability of cross-contamination and/or lingering contamination from the fuel spill.

AQA found no evidence that the well was inspected or tested post-flush; no evidence of samples being collected and analyzed from the soil or surrounding areas after discharge; and no evidence of inspection or sampling at intermediate points in the distribution system. In addition, AQA noted multiple potential pathways for contamination or cross-contamination of the water system even in Zones that should have shown minimal to no impact from the spill.

AQA's Conclusion: The evidence provided does not support the conclusion in the Memorandum. No empirical data were provided that indicated lingering contamination is not an ongoing issue. The Memorandum proceeded from the assumption that the inconsistencies were a function of the sampling and analytical system and did not address other potential contamination or cross contamination pathways.

LOE: Detailed Review of the Analytical Methods Used to Identify and Quantify TPH

Memorandum Conclusion: Free chlorine in the drinking water samples can react with organic precursors and the surrogate compound used during sample analysis, resulting in ghost peaks that appear as TPH detections. In addition to the ghost peaks, laboratory method blank/cross-contamination issues were frequently observed and impacted sample analysis and quantitation. This was observed in drinking samples collected from all Zones (spatial) and LTM Periods (temporal). These observations strongly indicate there is a systemic "treatment" (sample handling and analysis) effect occurring that is not associated with JP-5 (or other fuel-related TPHs). This

treatment effect is consistent with spatial and temporal observations of TPH and explains why TPH was detected in Zones that were not impacted by the November 2021 release of JP-5 from Red Hill (see LOE: Spatial and Temporal Trends of TPH Results and Hydraulic Modelling of the JBPHH System Following the November 2021 Release).

AQA's Findings:

While it is agreed that laboratory method blank/cross-contamination issues were frequently observed and impacted sample analysis and quantitation, the free-chlorine reacting with organic pre-cursors would not have been an issue if the method had been followed. While the Memorandum notes that SW-846 Method 8015 was developed for non-drinking water aqueous samples, SW-846 Chapter 4, Table 4-1 (EPA 2018), recommends that aqueous samples with residual chlorine present be preserved with a 10% sodium thiosulfate solution either at the time of collection or in the laboratory. Chapter 4 does not recommend further chemical preservation for semi-volatile components; however, the *Drinking Water Sampling Plan* (IDWST 2022a, 2022b) Table 1 (Table 4 of the *Drinking Water Long-Term Monitoring Plan* [IDWST 2022b]) directs the addition of 0.5 milliliters (mL) of hydrochloric acid (HCL) to the samples. Thus, even samples collected from the Zones with GAC treatment contained chlorine that was added at the time of sampling. There was no indication in the data packages reviewed that the samples were checked for free chlorine or that the samples were preserved with sodium thiosulfate. In fact, Figure C-1 in the Memorandum indicates that the procedure used for most of the LTM periods did not use the method-specified preservative. Because the samples were not properly preserved and were further chlorinated upon collection, it could not be determined where the ghost peaks attributed to the free chlorine came from because those peaks (along with several other peaks that were found in the samples) were also found in the method blanks (see Attachments 1 through 4 for analytical result examples). Figure C-1 of the Memorandum shows the effect of preservation with sodium thiosulfate. Several peaks that the Memorandum stated resulted from potential chlorination by-products were not present when the sample was analyzed after the addition of sodium thiosulfate. However, the Memorandum does not address the presence of the ghost peaks in method blanks, which should be comprised of deionized (i.e., no chlorine present) water, and the Memorandum did not evaluate the presence or absence of the ghost peaks in a blank-chlorinated matrix. Those peaks, and the laboratory's practice of "clipping" peaks that are attributed to "noise," interfered with the determination of which peaks were actually present in the sample matrix and what those peaks might indicate.

The example taken from the data package for sample delivery group (SDG) DA58996 (Attachment 1) shows the results for two samples, the method blank, the TPH standard, and the JP-5 standard. The chromatograms for each of these standards and samples were not "clipped." The example taken from the data package for SDG DA58265 (Attachment 2) shows chromatograms that have been "clipped." It is clear that either there was a serious contamination problem, or peaks that weren't "noise" were cut off, because there is a definite pattern to the peaks that were not "clipped" in Attachment 1.

Attachment 3 includes sample data from SDG DA43252. Both the sample and method blank chromatograms have been "clipped," so the method blank appears to have no extraneous or "ghost" peaks; however, the chromatogram for the sample shows peaks that have been detected in other method blanks.

Attachment 4 from SDG DA61100 shows the same TPH peaks in the method blank as in the sample. The method blank result was a non-detect while the sample result was "J" flagged because it was greater than the method detection limit but less than the method reporting limit.

AQA's Conclusion: The evidence provided does not support the conclusion in the Memorandum. The sampling plan, and thus the sample collection team, did not follow the method and preserve the samples with sodium thiosulfate for the majority of the long-term monitoring. Added to the issue of frequent but inconsistent cross contamination in the laboratory, the lack of preservation interfered with the ability to accurately assess the data; therefore, the data are inconclusive. The detection of peaks in the method blank proves that there is contamination; it does not prove that JP-5 is not in the sample.

LOE: Side-By-Side Comparison of Laboratory Results using Sample Preparation using Separatory Funnels Without Dechlorination Versus Micro-Extraction with Quenching

Memorandum Conclusion: TPH was detected in 31 of 658 samples (4.7%) using the SF Method (i.e., separatory funnel extraction without quenching [SW-846 Method 3510]). TPH was not detected using the MEQ Method (i.e., micro-extraction with quenching [SW-846 Method 3511]) in any of these 31 samples where TPHs were detected using the SF Method.

In addition, 30 matrix spike samples were collected in the field, spiked with 70 µg/L of JP-5 in the lab prior to preparation. The matrix spike results demonstrate that the MEQ method does not prevent accurate and precise determination of TPH in field samples that contain JP-5, and by extension, other fuels.

Based on the recommendations of the interagency team, the Extended Drinking Water Monitoring (EDWM) Plan, which is currently being developed, will use sodium thiosulfate (quenching) to remove residual chlorine, micro-extraction via EPA Method 3511, and analysis via SW-846 Method 8015.

AQA Findings:

The micro-extraction quench (MEQ) extraction method includes the advantages of using less sample and solvent volume and having the extraction occur in the sample collection vial, thus minimizing the potential for solvent contamination and contamination from laboratory glassware. The samples selected for separatory funnel (SF) versus MEQ evaluation were re-collected on the same days and times. The matrix spike analyses support the conclusion that the MEQ method is an appropriate extraction.

The results of the side-by- side comparisons between the methods showed fewer detections when the MEQ method was used versus the SF method; however, sodium thiosulfate was added to the samples prior to the MEQ extractions but was not added to the SF extractions. Up to 2.5 years elapsed between the original analyses and the re-analyses by both extraction methods, rendering comparison to the original results for the sake of choosing sampling locations invalid. The laboratory reduced the concentration of the surrogate added from 2000 parts per million (ppm) for the original analyses to 10 ppm for the re-analyses, which the Memorandum stated would result in less ghost peaks from chlorinated by-products of the surrogate. The laboratory analyzed the SF and MEQ extracts on different instruments, complicating comparison of the chromatograms, both of which showed potential ghost peaks. The raw data for the MEQ extracts indicated that the data was "clipped" while there was no notation of clipping for the SF extracts.

AQA's Conclusion:

While the changes to multiple experimental parameters confounded any conclusions drawn from the data, the recommendation to use the MEQ method with the addition of sodium thiosulfate as a de-chlorination agent would reduce the potential for both ghost peaks associated with residual chlorine and contamination from laboratory glassware. Use of the MEQ extraction method combined with the use of sodium thiosulfate as a de-chlorination agent should result in more definitive data.

LOE: Absence of Indicator Compounds Associated with JP-5

Memorandum Conclusion: The absence of frequent detections of JP-5-associated compounds throughout the JBPHH System supports the hypothesis that the TPH detections are not associated with the November 2021 release of JP-5 from Red Hill and are likely associated with other non-petrogenic causes.

AQA Findings:

The conclusion in the Memorandum is based on previous Memorandum findings that JP-5 associated compounds were not detected in the samples; however, review of the sample chromatograms showed that either there was too much interference to detect low-level peaks or peaks that might have been important to the assessment were "clipped." Other issues that prevent an accurate assessment are:

1) The method was not modified to account for low level detects; therefore, the chromatograms have a large solvent peak at the front and a large surrogate peak in the middle, making the small peaks appear to be "noise" due to the scale of the chromatograms when they might not be noise (see Attachments 1 through 4 for examples). These small peaks were "clipped" by the laboratory. The recorder should have been turned on after most of the solvent peak had passed, the surrogate spike concentrations should have been adjusted for low-level analysis, and peaks should never be "clipped." The scale of the chromatograms due to the large peak for the surrogate compound precluded evaluation of the shapes and overall pattern of peaks

for comparison to TPH and JP-5 standards. In addition, there were no retention times for the individual peaks on the sample and standard chromatograms and no individual peak data provided on the sample quantitation reports to help determine whether or not the peaks were TPH markers.

2) According to the Memorandum, ion profile screening was performed on historical samples analyzed for semi-volatile organic compounds (SVOCs) by EPA Method 525.2. TPH detects had been reported for the samples that had been chosen for ion profile screening. According to the Memorandum, key components of JP-5 jet fuel (i.e., naphthalenes) were not detected in the SVOC samples; however, the SVOC analyses were performed on separate sample fractions than the TPH analyses. Per the sampling plan (IDWST 2022a), the sample fractions analyzed for volatile organic compounds by EPA Method 524.2 and gasoline range organics (GRO) by SW-846 Method 8015 were to be collected first. If the sample was then consistently collected for TPH prior to being collected for SVOCs, the system would have been purged more when the SVOC fraction was collected than when the TPH fraction was collected, possibly resulting in the SVOC fraction having non-detects when the TPH fraction had detects. The more accurate way to compare analyses would be to analyze the original TPH extracts (including the method blank) on the gas chromatograph/mass spectrometer (GCMS) to ensure that the sample results are similar and allow for the identification of the compound peaks detected in the TPH fraction.

3) There were many peaks in the GCMS analysis of the samples that could also have come from contamination or could have been important in determining if any TPH markers were present at low levels. Again, frequent method blank contamination precluded definitive assessment of the data.

AQA's Conclusion:

The evidence provided does not support the conclusion in the Memorandum. The absence of JP-5 markers could not be confirmed in most of the samples reviewed by AQA and, therefore, could not be used to verify the presence or absence of JP-5 in the samples. The apparent quantitation method employed by the laboratory could miss peaks within the diesel or oil retention time range. The detection of peaks in the method blank proves that there is contamination, but it does not prove that the JP-5 is not in the sample.

LOE: Statistical Analysis of TPH Data, Chlorine Residuals, and Surrogate Doses

Memorandum Conclusion: Analysis of TPH and chlorine data collected over two years strongly supports the hypothesis that halogenated byproducts, not JP-5, are causing the TPH detections.

AQA's Conclusion: While some good points were made in the Memorandum and a path forward was provided, there was not enough evidence provided to determine that the only detects in the samples collected were due to laboratory and/or procedural issues. There are several other issues resulting from the leak that could conflict with the Memorandum findings and nullify the

conclusions presented. The Memorandum did not address these issues; however, they should be addressed in order to accurately determine the level of contamination that still exists (if any) and the safety of those affected by the leak of JP-5. The flaws in the sampling process, the flaws in the analytical system, and the assumptions made by the authors of the Memorandum prevent the data from being conclusive. Therefore, the conclusions drawn were not fully supported by the data.

Data Usability

Due to the uncertainty caused by flaws in the sampling process and, most notably, in the analytical system and assumptions made by the Memorandum authors for long-term monitoring, which were acknowledged by the Memorandum authors, AQA found the existing data to be very suspect and, thus, would qualify it as unusable for the purpose of proving the absence of jet fuel in the drinking water system. Any future data produced should definitively prove the absence of any lingering fuel above the Environmental Action Limit (EAL) in the drinking water system.

REFERENCES

Brewer, R, PhD (2023). *Exposure Assessment: November 2021 Release of JP-5 Jet Fuel into the Joint Base Pearl Harbor Hickam and Connected Drinking Water Systems*. August 2023.

EPA (2018). Chapter 4, Revision 6, December 2018, Final Update VI to the Third Edition of the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846.

Interagency Drinking Water System Team (IDWST) (2022a). *Drinking Water Sampling Plan JBPHH, O'ahu, Hawai'i, Addendum 1*. January 2022.

IDWST (2022b). *Drinking Water Long-Term Monitoring Plan JBPHH, Joint Base Pearl Harbor-Hickam Public Water System #HI0000360 and Aliamanu Military Reservation PWS #HI0000337 O'ahu, Hawai'i*. June 2022.

JBPHH Interagency Team (JBPHH) (2024). Lines of Evidence of TPH Detections Observed During Long-Term Monitoring. April 2024.

National Enforcement Investigations Center (NEIC) (2022). *NEIC Civil Investigation Report: Joint Base Pearl Harbor-Hickam Public Water System (Redacted)*. April 2022.

Attachment 1

Sample Data from SDG DA58996

Attachment 2

Sample Data from SDG DA58265

Attachment 3

Sample Data from SDG DA43252

Attachment 4

Sample Data from SDG DA6110

Attachment 1

Sample Data from SDG DA58996

SGS North America Inc.

Report of Analysis

Client Sample ID: A1-TW-0000439-23139-N
Lab Sample ID: DA58996-2
Matrix: DW - Drinking Water
Method: SW846-8015D SW846 3510C
Project: CV CTO 22F0122

Date Sampled: 09/29/23
Date Received: 09/30/23
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH068231.D	1	10/02/23 14:01	JB	09/30/23 17:35	OP24420	GFH23725
Run #2							

	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
	TPH-DRO (C10-C24)	0.100		0.078	0.050	mg/l	
	TPH-ORO (> C24-C40)	0.050 U		0.078	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		10-131%

U = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Quantitation Report (QT Reviewed)

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Signal(s) : FID1A.ch
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Operator : jackb
Sample : da58996-2
Misc : OP24420,GFH23725,1030,,,1,1
ALS Vial : 24 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:33:12 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
1) S	o-Terphenyl	2.244	809570628	1565.431	ug/ml
	Target Compounds				
2) H	TPH-DRO (C10-C28)	2.060	42193930	113.597	ug/ml
3) H	TPH-DRO (C10-C24)	1.840	38019587	103.204	ug/ml
4) H	TPH-ORO (>C28-C40)	3.880	7603193	43.496	ug/ml
5) H	TPH-ORO (>C24-C40)	3.660	12955611	41.701	ug/ml

(f)=RT Delta > 1/2 Window (m)=manual int.

11.1.18 11

Quantitation Report (QT Reviewed)

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Misc : OP24420,GFH23725,1030,,,1,1
ALS Vial : 24 Sample Multiplier: 1

Integration File: autoint1.e
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Quant Title : DRO-ORO FRONT
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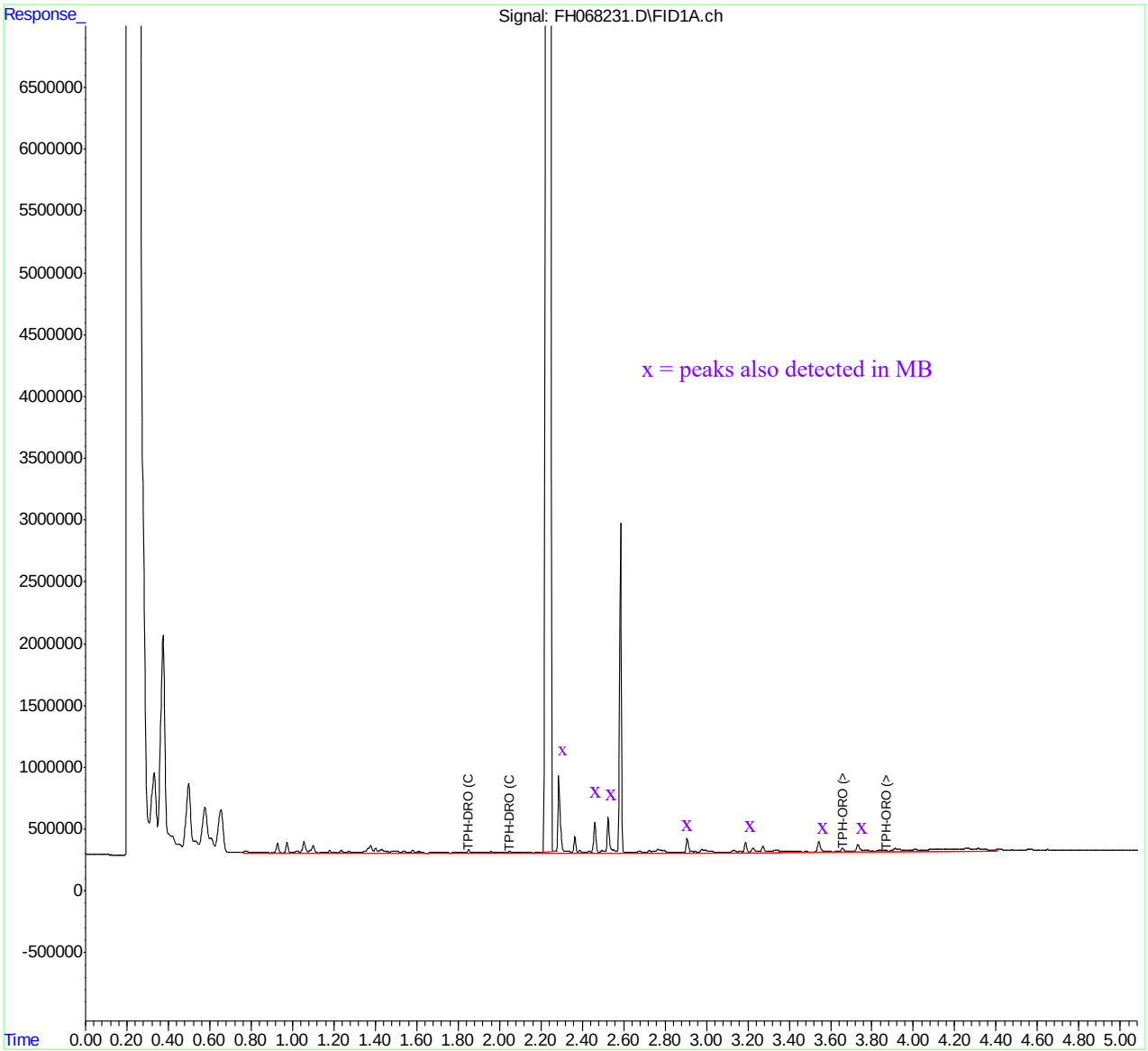
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

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Sample : da58996-2
Misc : OP24420,GFH23725,1030,,,1,1
ALS Vial : 24 Sample Multiplier: 1

Integration File: autoint1.e
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Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
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Response via : Initial Calibration
Integrator: ChemStation

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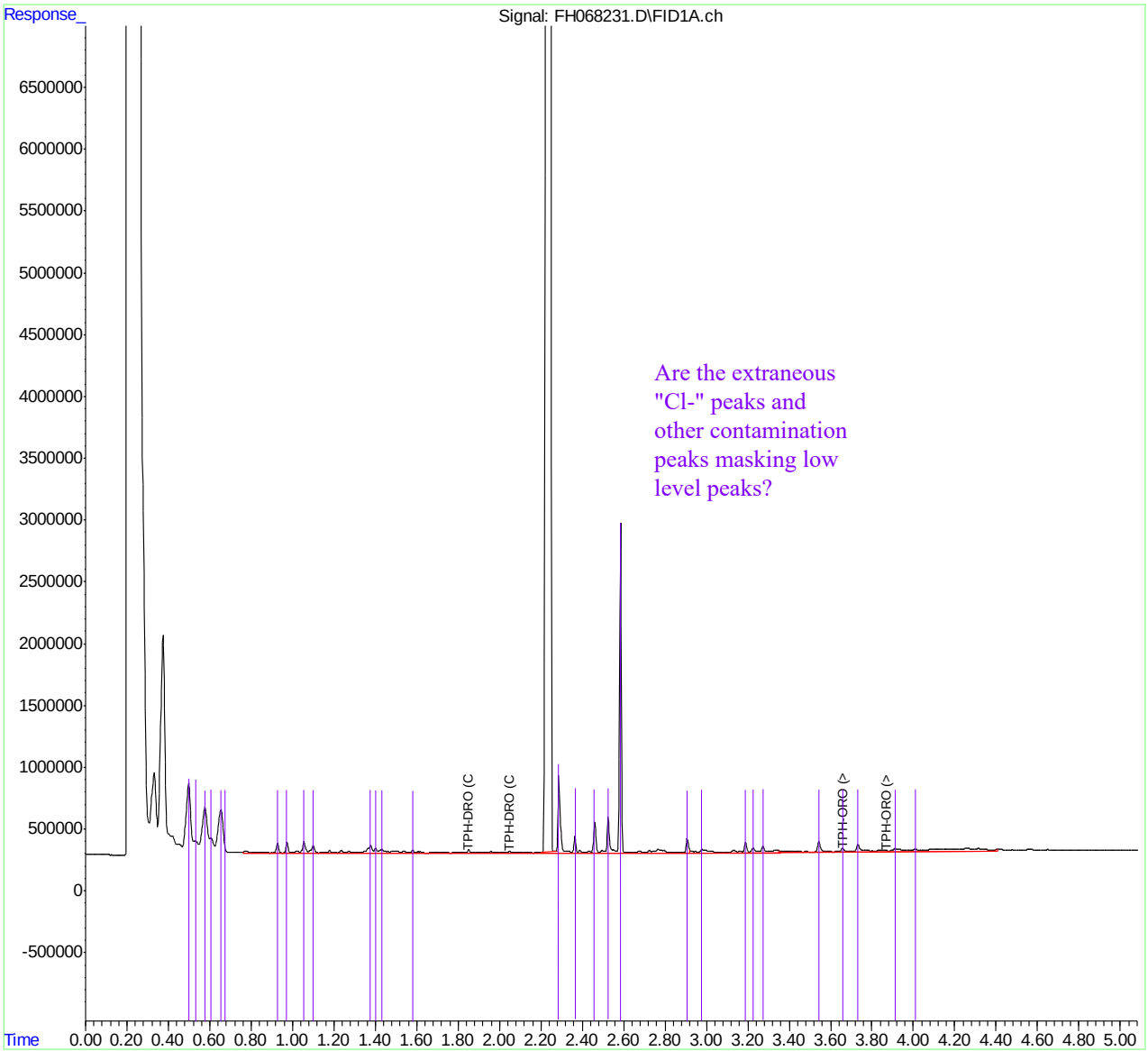
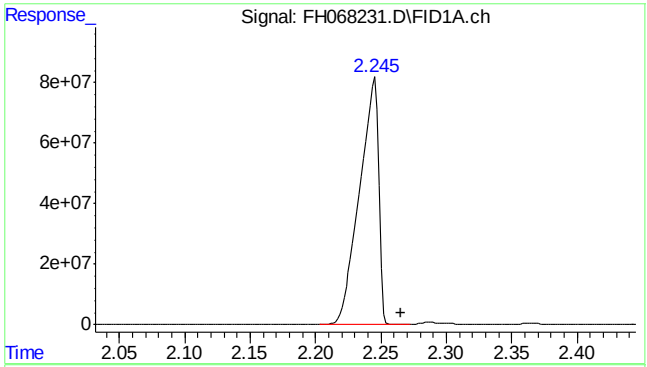
Signal Phase :
Signal Info :



11.1.18 11



#1 o-Terphenyl

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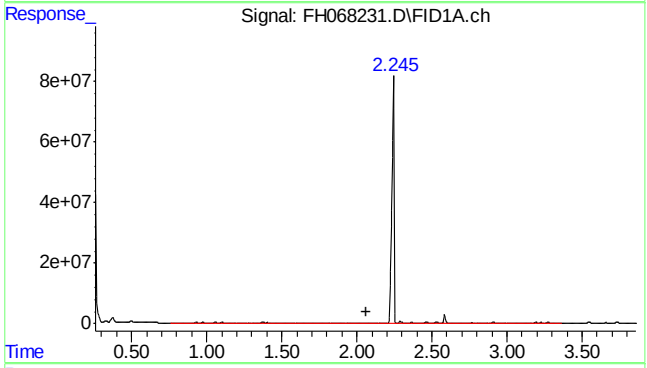
Delta R.T.: -0.021 min
Response: 809570628
Conc: 1565.43 ug/ml



#2 TPH-DRO (C10-C28)

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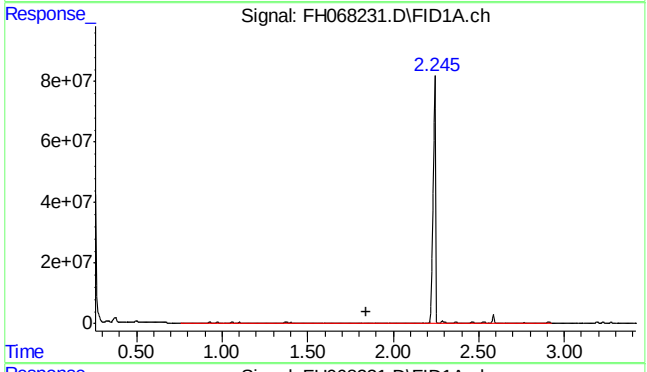
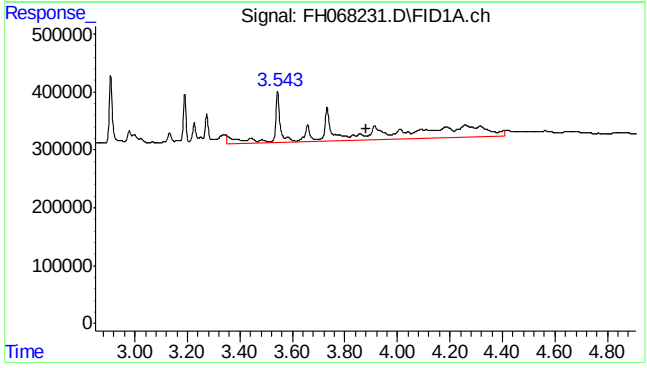
Delta R.T.: 0.000 min
Response: 42193930
Conc: 113.60 ug/ml



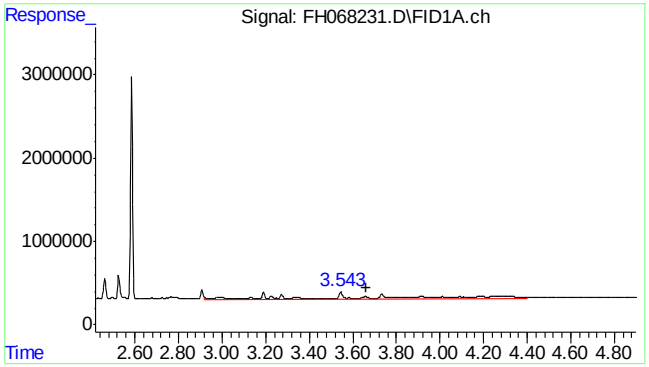
#3 TPH-DRO (C10-C24)

R.T.: 1.840 min
Delta R.T.: 0.000 min
Response: 38019587
Conc: 103.20 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.880 min
Delta R.T.: 0.000 min
Response: 7603193
Conc: 43.50 ug/ml



#5 TPH-ORO (>C24-C40)

R.T.:	3.660 min
Delta R.T.:	0.000 min
Response:	12955611
Conc:	41.70 ug/ml

SGS North America Inc.

Report of Analysis

Client Sample ID:	A1-TW-0001673-23139-N		
Lab Sample ID:	DA58996-6	**Date Sampled:**	09/29/23
Matrix:	DW - Drinking Water	**Date Received:**	09/30/23
Method:	SW846-8015D SW846 3510C	**Percent Solids:**	n/a
Project:	CV CTO 22F0122		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH068235.D	1	10/02/23 14:34	JB	09/30/23 17:35	OP24420	GFH23725
Run #2							

	Initial Volume	Final Volume
Run #1	1030 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
	TPH-DRO (C10-C24)	0.153		0.078	0.050	mg/l	
	TPH-ORO (> C24-C40)	0.0954		0.078	0.050	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	40%		10-131%

U = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068235.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 2:34 pm
Operator : jackb
Sample : da58996-6
Misc : OP24420,GFH23725,1030,,,1,1
ALS Vial : 28 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:55:41 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
1) S	o-Terphenyl	2.236f	411827619	796.333	ug/ml
	Target Compounds				
2) H	TPH-DRO (C10-C28)	2.060	74711898	201.144	ug/ml
3) H	TPH-DRO (C10-C24)	1.840	58014974	157.481	ug/ml
4) H	TPH-ORO (>C28-C40)	3.880	18617544	106.507	ug/mlm
5) H	TPH-ORO (>C24-C40)	3.660	30542683	98.311	ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

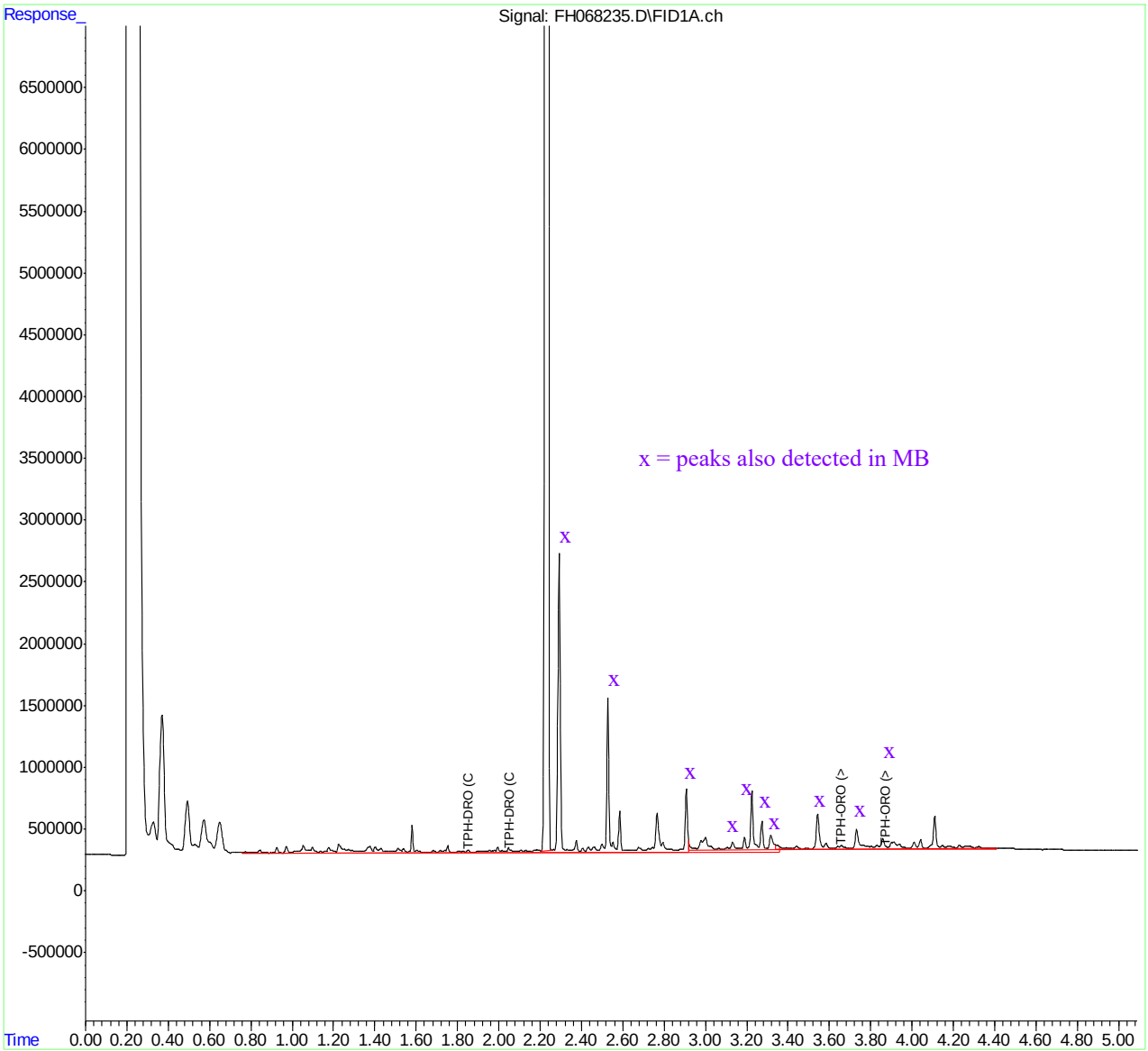
11.1.22
11

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068235.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 2:34 pm
Operator : jackb
Sample : da58996-6
Misc : OP24420,GFH23725,1030,,,1,1
ALS Vial : 28 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:55:41 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

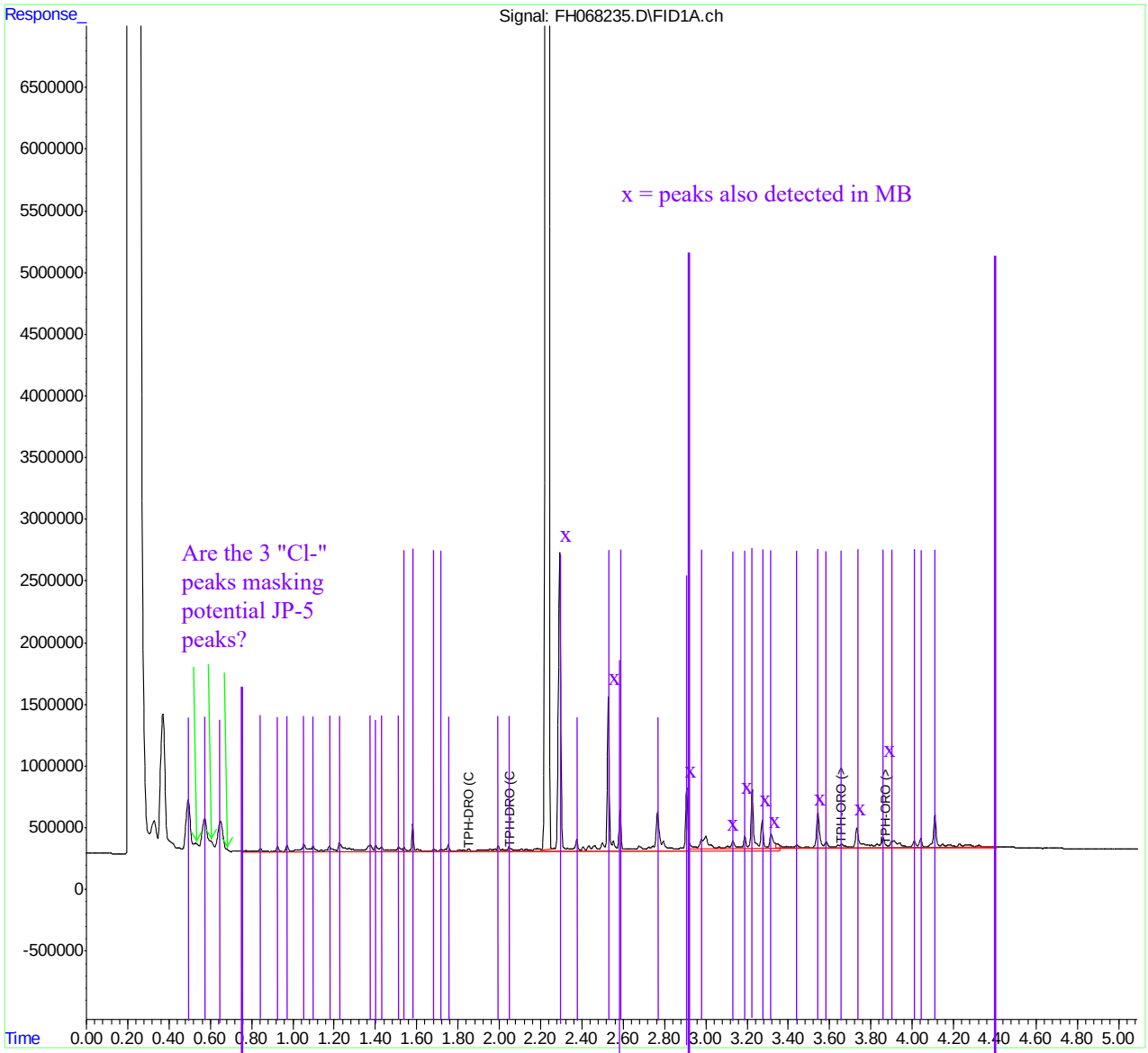
Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068235.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 2:34 pm
Operator : jackb
Sample : da58996-6
Misc : OP24420,GFH23725,1030,,,1,1
ALS Vial : 28 Sample Multiplier: 1

A1-TW-0001673-23139-N
DRO 153 J
ORO 95.4 J
Total TPH 248.4

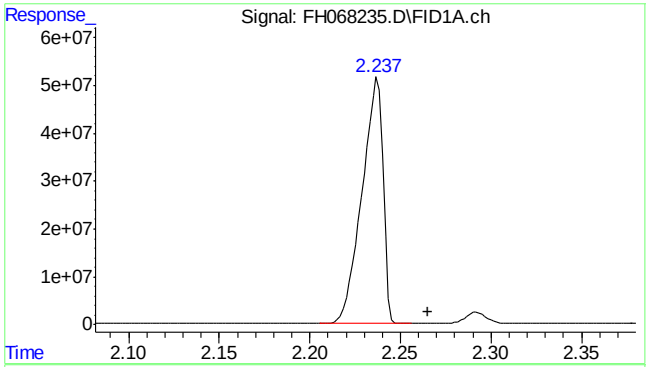
Integration File: autoint1.e
Quant Time: Oct 02 15:55:41 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

Need peak RTs to compare to the standard.

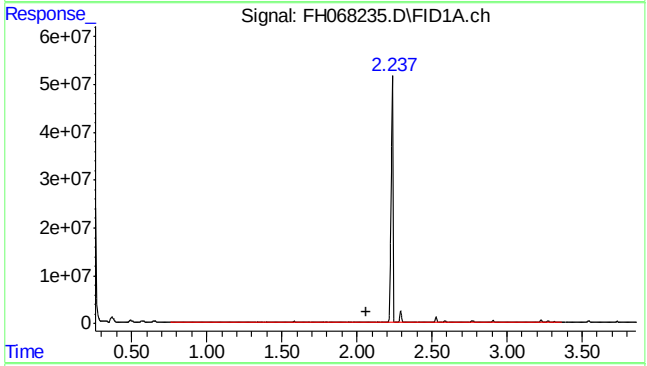


11.1.22 11



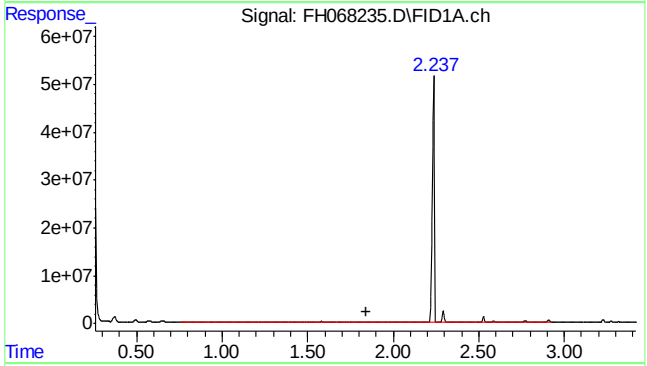
#1 o-Terphenyl

R.T.: 2.236 min
Delta R.T.: -0.029 min
Response: 411827619
Conc: 796.33 ug/ml



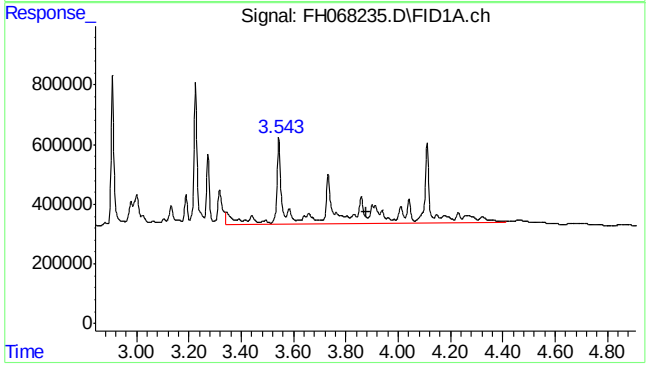
#2 TPH-DRO (C10-C28)

R.T.: 2.060 min
Delta R.T.: 0.000 min
Response: 74711898
Conc: 201.14 ug/ml



#3 TPH-DRO (C10-C24)

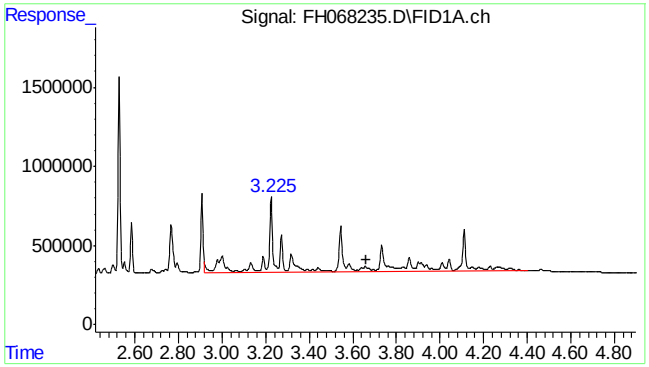
R.T.: 1.840 min
Delta R.T.: 0.000 min
Response: 58014974
Conc: 157.48 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.880 min
Delta R.T.: 0.000 min
Response: 18617544
Conc: 106.51 ug/ml m

11.1.22
11



#5 TPH-ORO (>C24-C40)

R.T.:	3.660 min
Delta R.T.:	0.000 min
Response:	30542683
Conc:	98.31 ug/ml m

Method Blank Summary

Job Number: DA58996
Account: AECOMHIH AECOM
Project: CV CTO 22F0122

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP24420-MB	FH068207.D	1	10/02/23	JB	09/30/23	OP24420	GFH23725

The QC reported here applies to the following samples: **Method:** SW846-8015D

DA58996-1, DA58996-2, DA58996-3, DA58996-4, DA58996-5, DA58996-6, DA58996-7, DA58996-8

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C24)	ND	0.080	0.052	mg/l	
	TPH-ORO (> C24-C40)	ND	0.080	0.052	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	67%	10-131%

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068207.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:47 am
Operator : jackb
Sample : op24420-mb
Misc : OP24420,GFH23725,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:38:04 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
System Monitoring Compounds					
1) S	o-Terphenyl	2.243	693086577	1340.191	ug/ml
Target Compounds					
2) H	TPH-DRO (C10-C28)	2.060	23328096	62.806	ug/ml
3) H	TPH-DRO (C10-C24)	1.840	18044027	48.980	ug/mlm
4) H	TPH-ORO (>C28-C40)	3.880	7742171	44.291	ug/mlm
5) H	TPH-ORO (>C24-C40)	3.660	14161079	45.582	ug/ml

(f)=RT Delta > 1/2 Window (m)=manual int.

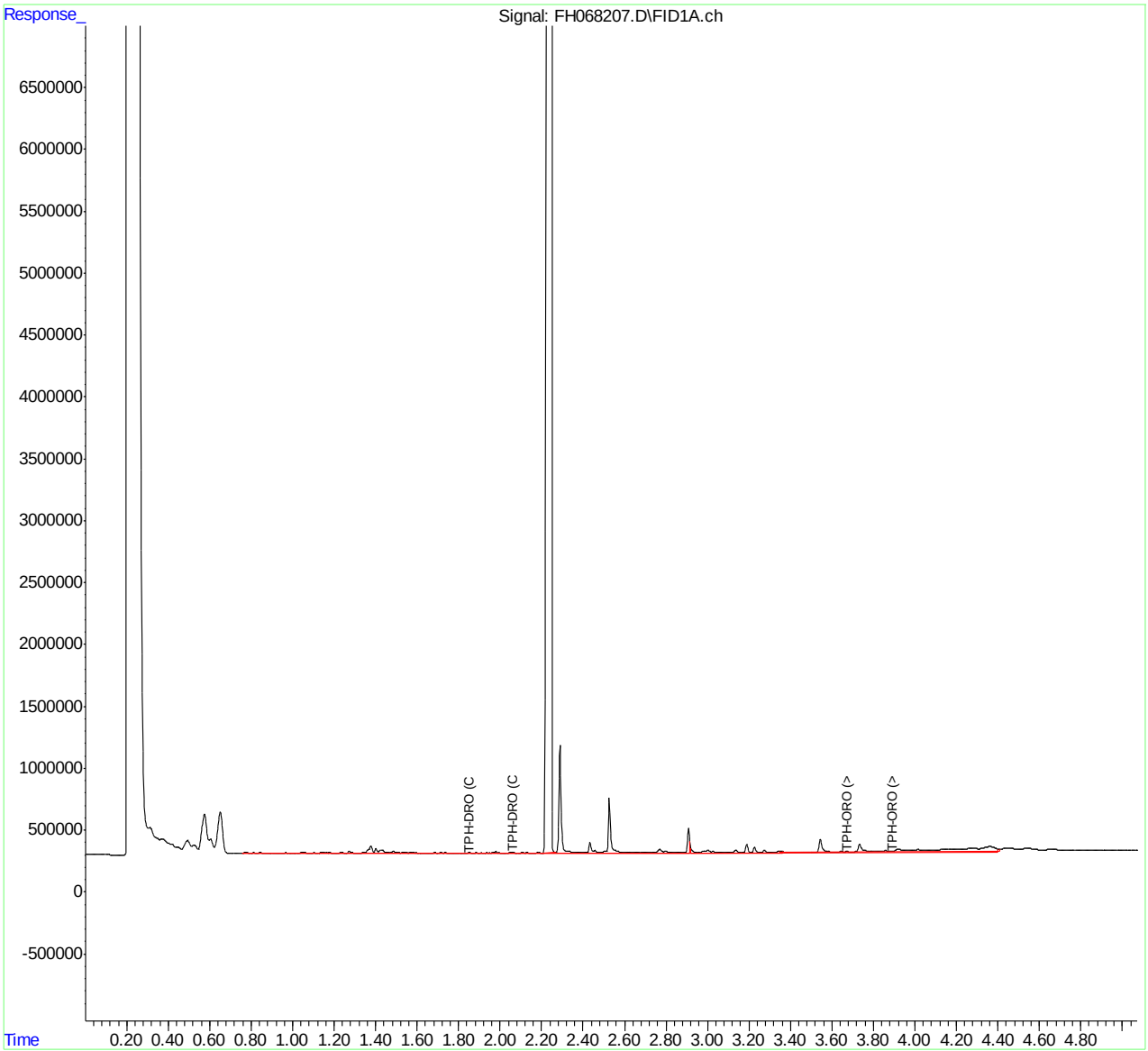
11.2.2 11

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068207.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:47 am
Operator : jackb
Sample : op24420-mb
Misc : OP24420,GFH23725,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:38:04 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

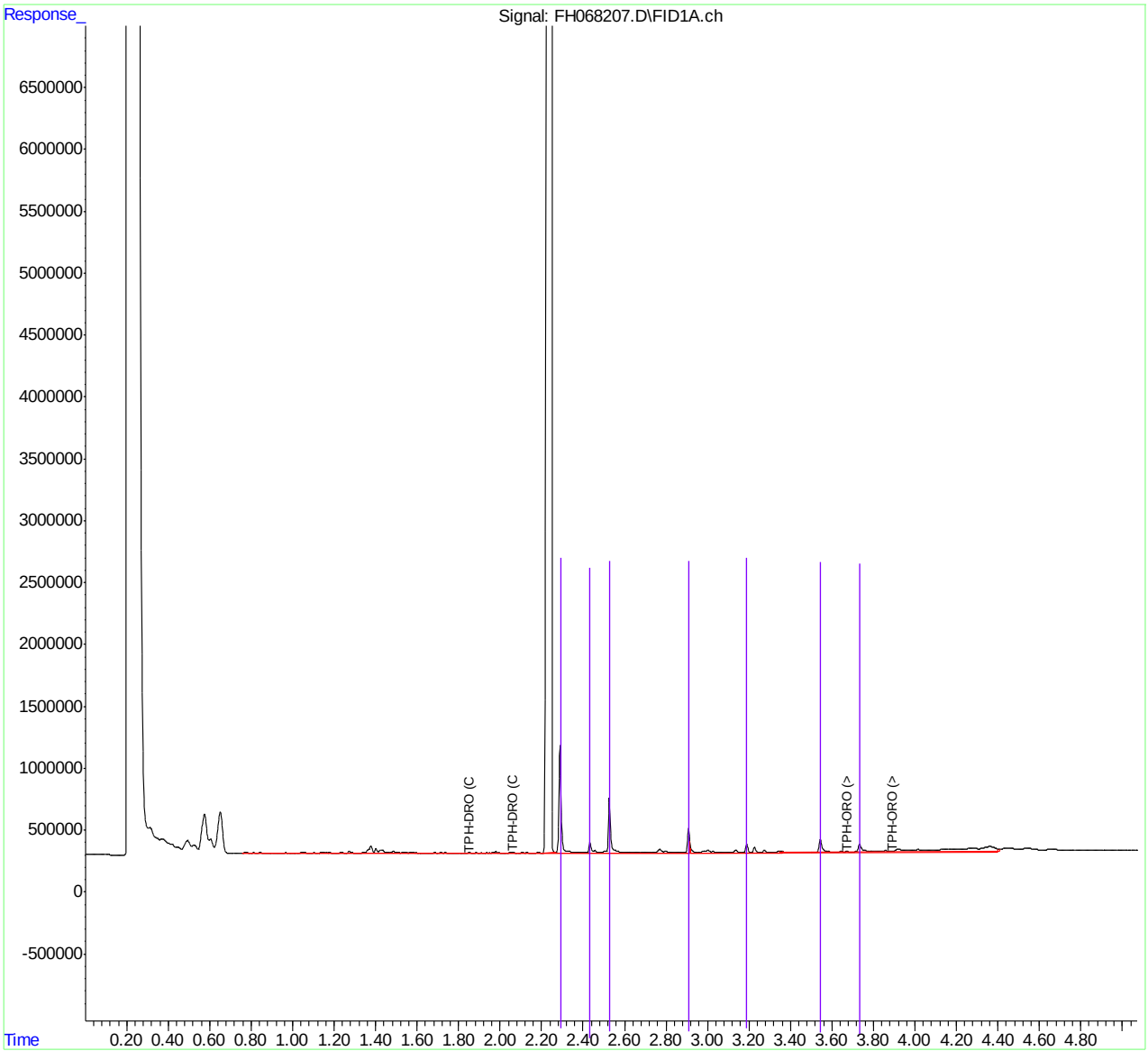


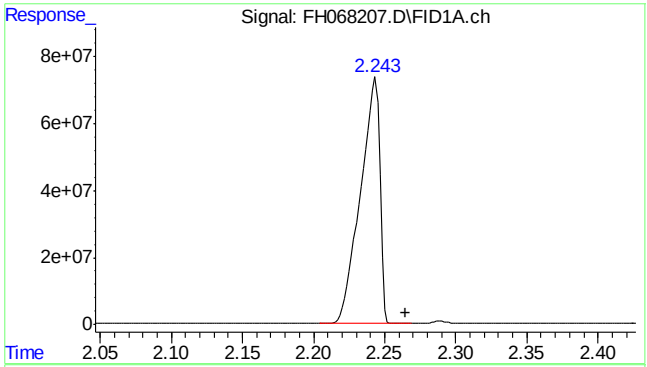
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068207.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:47 am
Operator : jackb
Sample : op24420-mb
Misc : OP24420,GFH23725,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:38:04 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

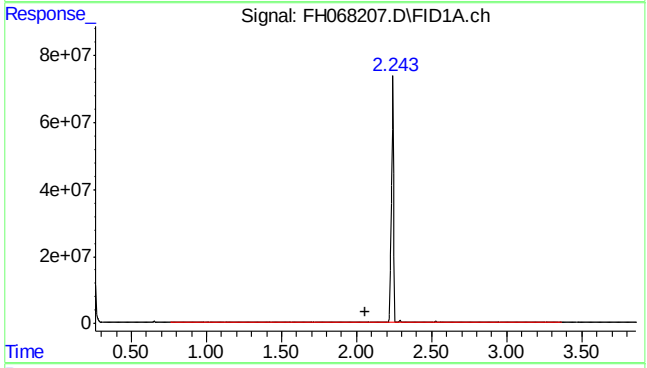
Volume Inj. :
Signal Phase :
Signal Info :





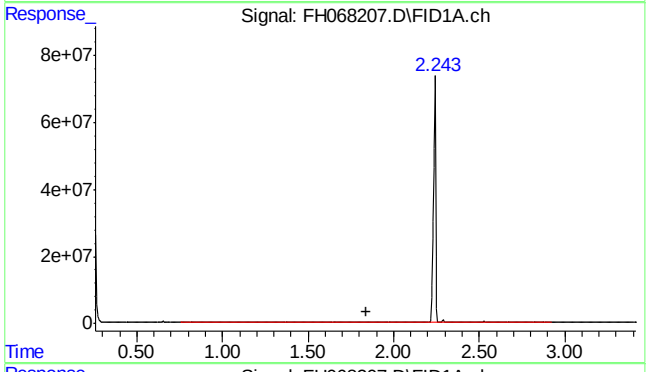
#1 o-Terphenyl

R.T.: 2.243 min
Delta R.T.: -0.022 min
Response: 693086577
Conc: 1340.19 ug/ml



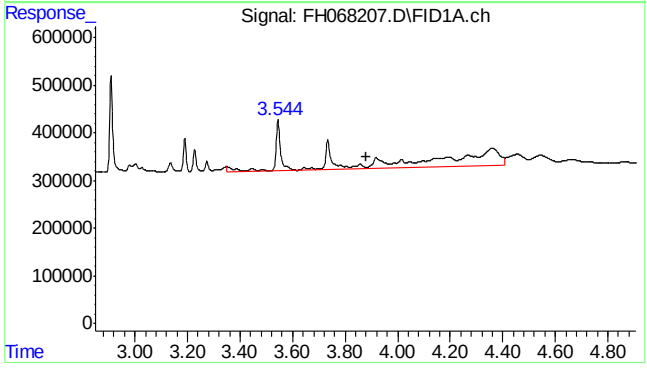
#2 TPH-DRO (C10-C28)

R.T.: 2.060 min
Delta R.T.: 0.000 min
Response: 23328096
Conc: 62.81 ug/ml



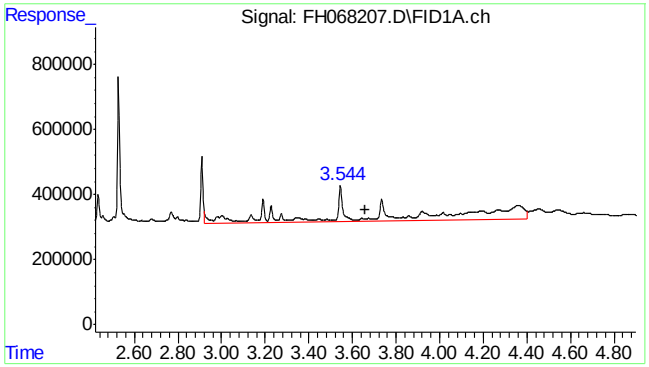
#3 TPH-DRO (C10-C24)

R.T.: 1.840 min
Delta R.T.: 0.000 min
Response: 18044027
Conc: 48.98 ug/ml m



#4 TPH-ORO (>C28-C40)

R.T.: 3.880 min
Delta R.T.: 0.000 min
Response: 7742171
Conc: 44.29 ug/ml m



#5 TPH-ORO (>C24-C40)

R.T.:	3.660 min
Delta R.T.:	0.000 min
Response:	14161079
Conc:	45.58 ug/ml

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068203.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:15 am
Operator : jackb
Sample : RT C10-C40
Misc : OP20000,GFH23725,,,,,1
ALS Vial : 2 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:32:16 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
System Monitoring Compounds					
1) S	o-Terphenyl	0.000	0	N.D.	ug/ml
Target Compounds					
2) H	TPH-DRO (C10-C28)	2.060	524728711	1412.711	ug/ml
3) H	TPH-DRO (C10-C24)	1.840	405115731	1099.685	ug/ml
4) H	TPH-ORO (>C28-C40)	3.880	363906419	2081.832	ug/ml
5) H	TPH-ORO (>C24-C40)	3.660	483522967	1556.361	ug/ml

(f)=RT Delta > 1/2 Window (m)=manual int.

11.5.2 11

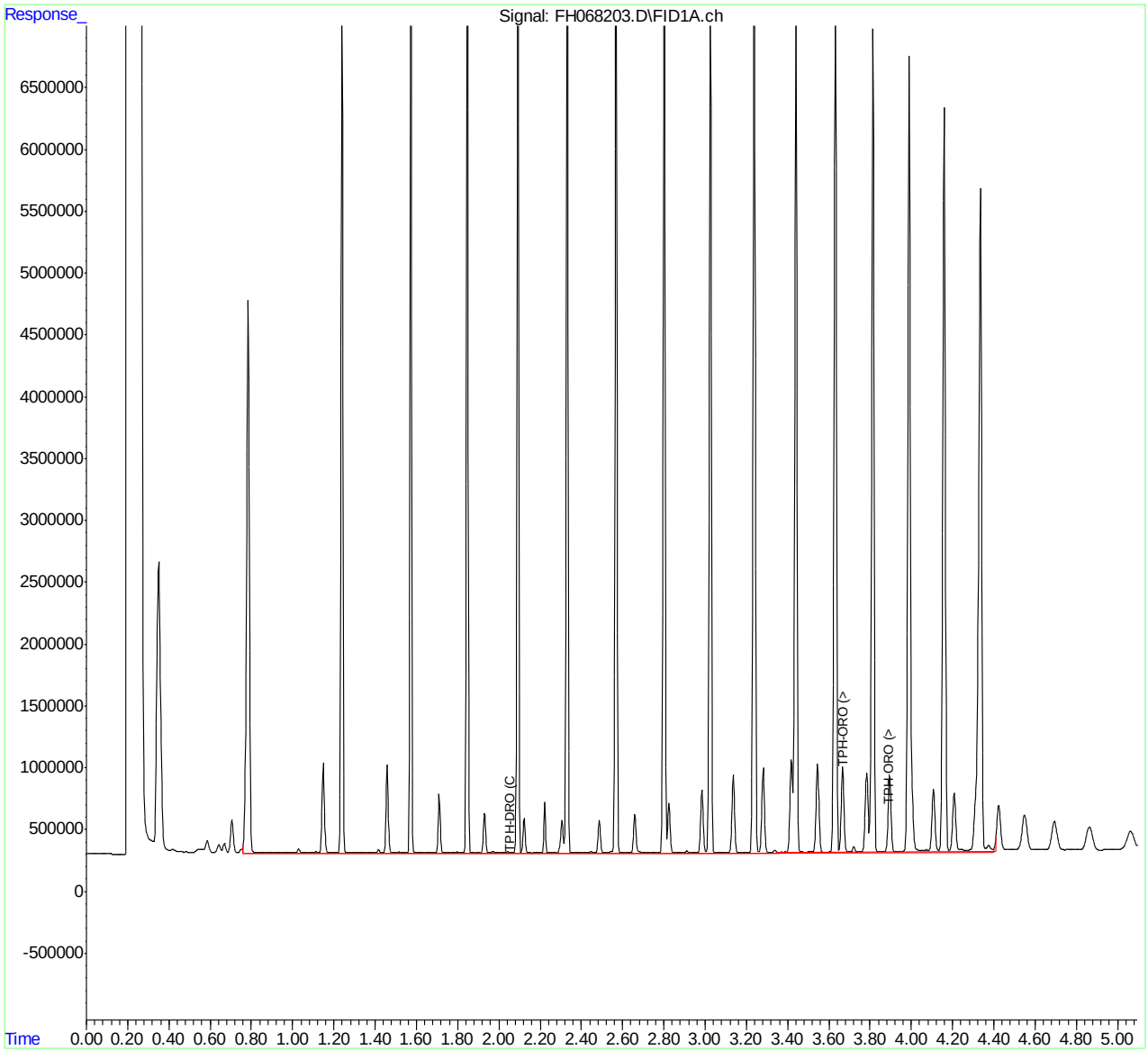
Quantitation Report (QT Reviewed)

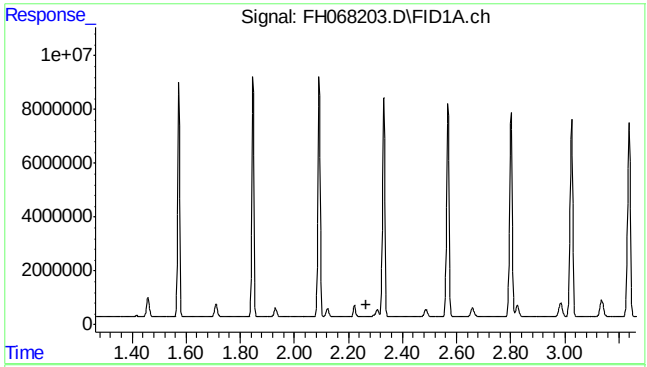
Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068203.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:15 am
Operator : jackb
Sample : RT C10-C40
Misc : OP20000,GFH23725,,,,,1
ALS Vial : 2 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:32:16 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

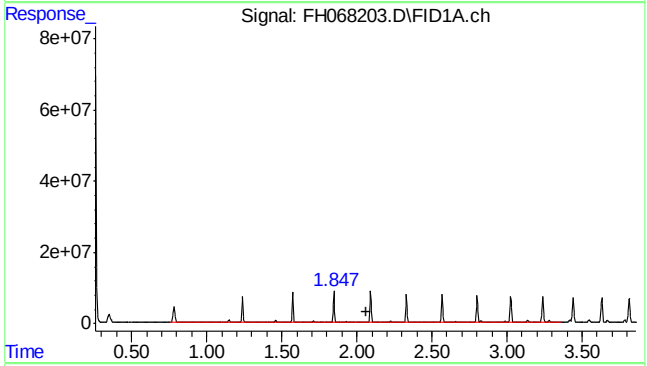
No RTs? Need a c-gram that has marker compounds as well as all peaks with RTs to compare to samples.





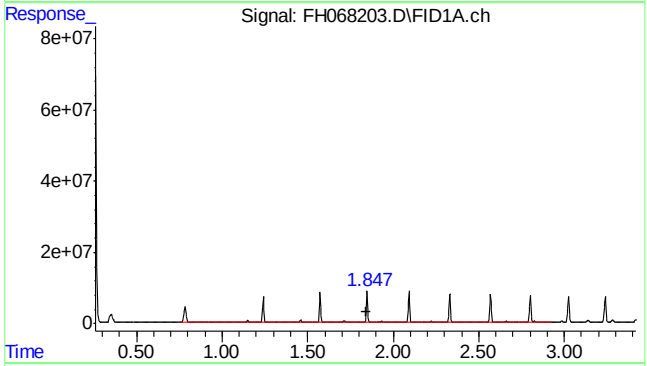
#1 o-Terphenyl

R.T.: 0.000 min
Exp R.T. : 2.265 min
Response: 0
Conc: N.D.



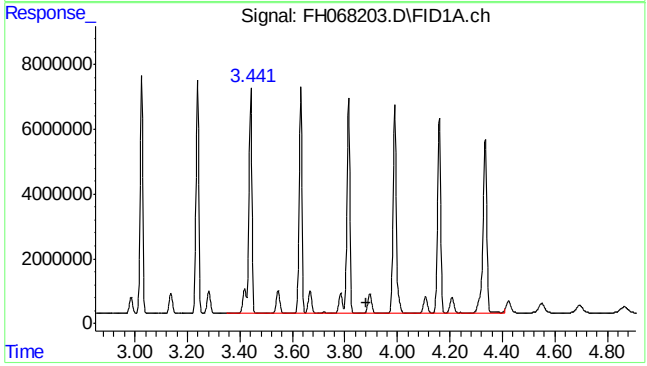
#2 TPH-DRO (C10-C28)

R.T.: 2.060 min
Delta R.T.: 0.000 min
Response: 524728711
Conc: 1412.71 ug/ml



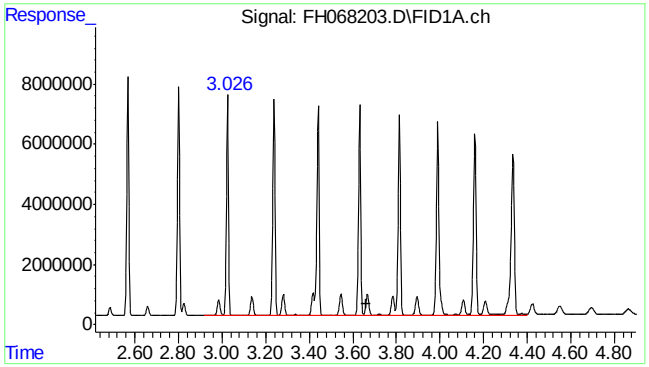
#3 TPH-DRO (C10-C24)

R.T.: 1.840 min
Delta R.T.: 0.000 min
Response: 405115731
Conc: 1099.69 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.880 min
Delta R.T.: 0.000 min
Response: 363906419
Conc: 2081.83 ug/ml



#5 TPH-ORO (>C24-C40)

R.T.: 3.660 min
Delta R.T.: 0.000 min
Response: 483522967
Conc: 1556.36 ug/ml

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068204.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:23 am
Operator : jackb
Sample : RT JP-05
Misc : OP20000,GFH23725,,,,,1
ALS Vial : 3 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:32:18 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
System Monitoring Compounds					
1) S	o-Terphenyl	0.000	0	N.D.	ug/ml
Target Compounds					
2) H	TPH-DRO (C10-C28)	2.060	268735700	723.509	ug/ml
3) H	TPH-DRO (C10-C24)	1.840	263338830	714.832	ug/ml
4) H	TPH-ORO (>C28-C40)	3.880	20691103	118.369	ug/ml
5) H	TPH-ORO (>C24-C40)	3.660	26841384	86.397	ug/ml

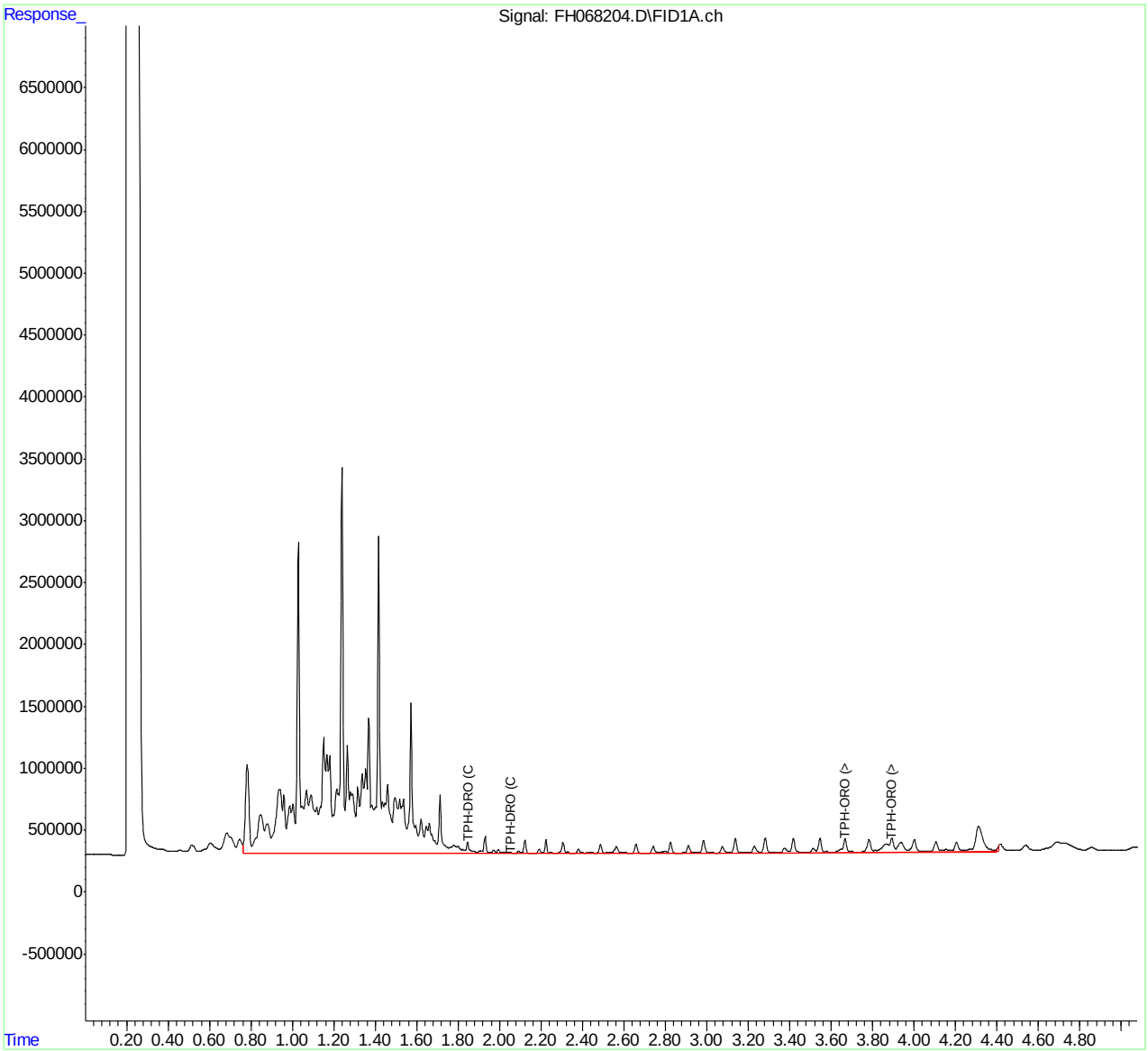
(f)=RT Delta > 1/2 Window (m)=manual int.

11.5.3 11

Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068204.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:23 am
Operator : jackb
Sample : RT JP-05
Misc : OP20000,GFH23725,,,,,1
ALS Vial : 3 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:32:18 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

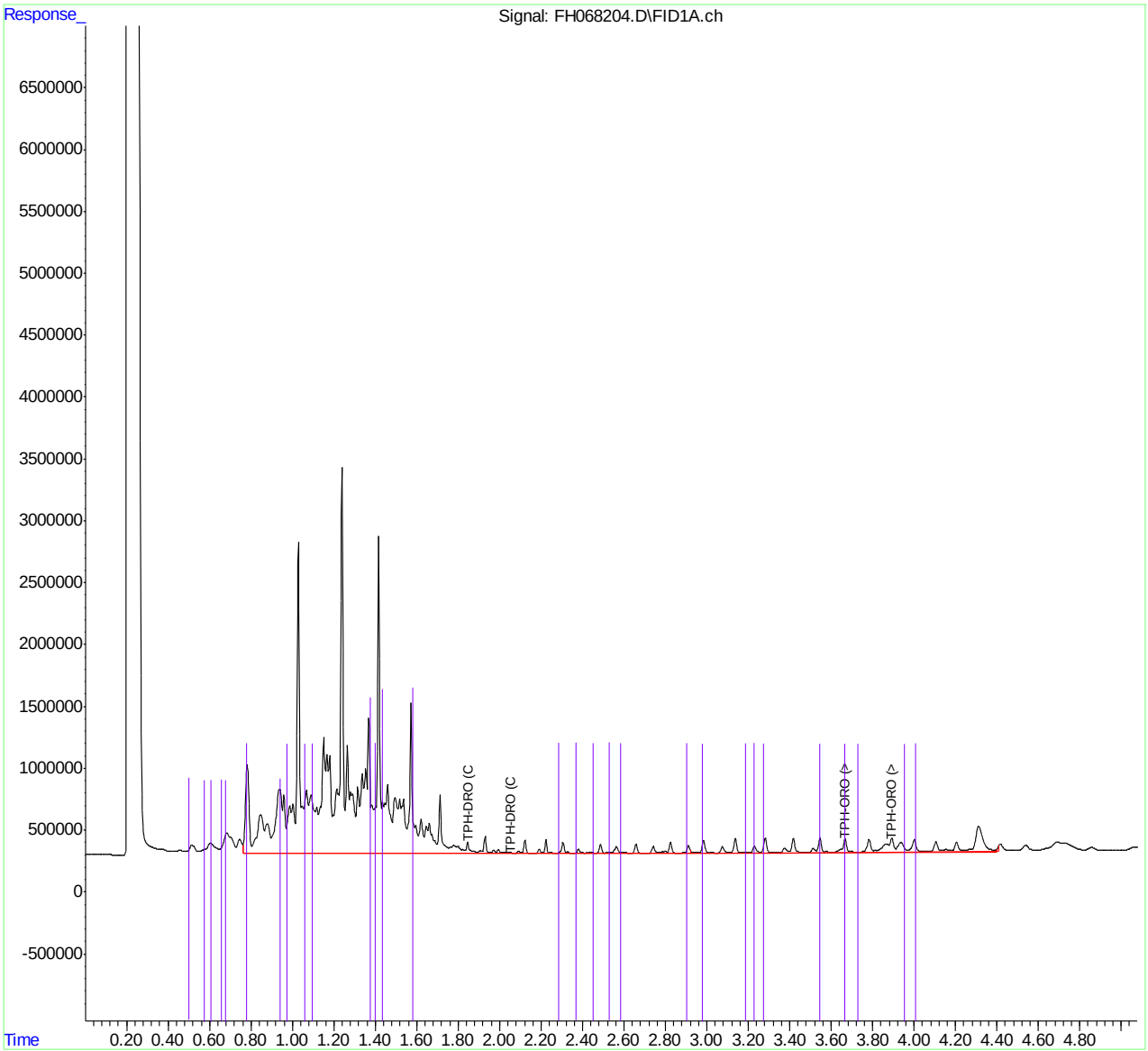
Volume Inj. :
Signal Phase :
Signal Info :



Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068204.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:23 am
Operator : jackb
Sample : RT JP-05
Misc : OP20000,GFH23725,,,,,1
ALS Vial : 3 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:32:18 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



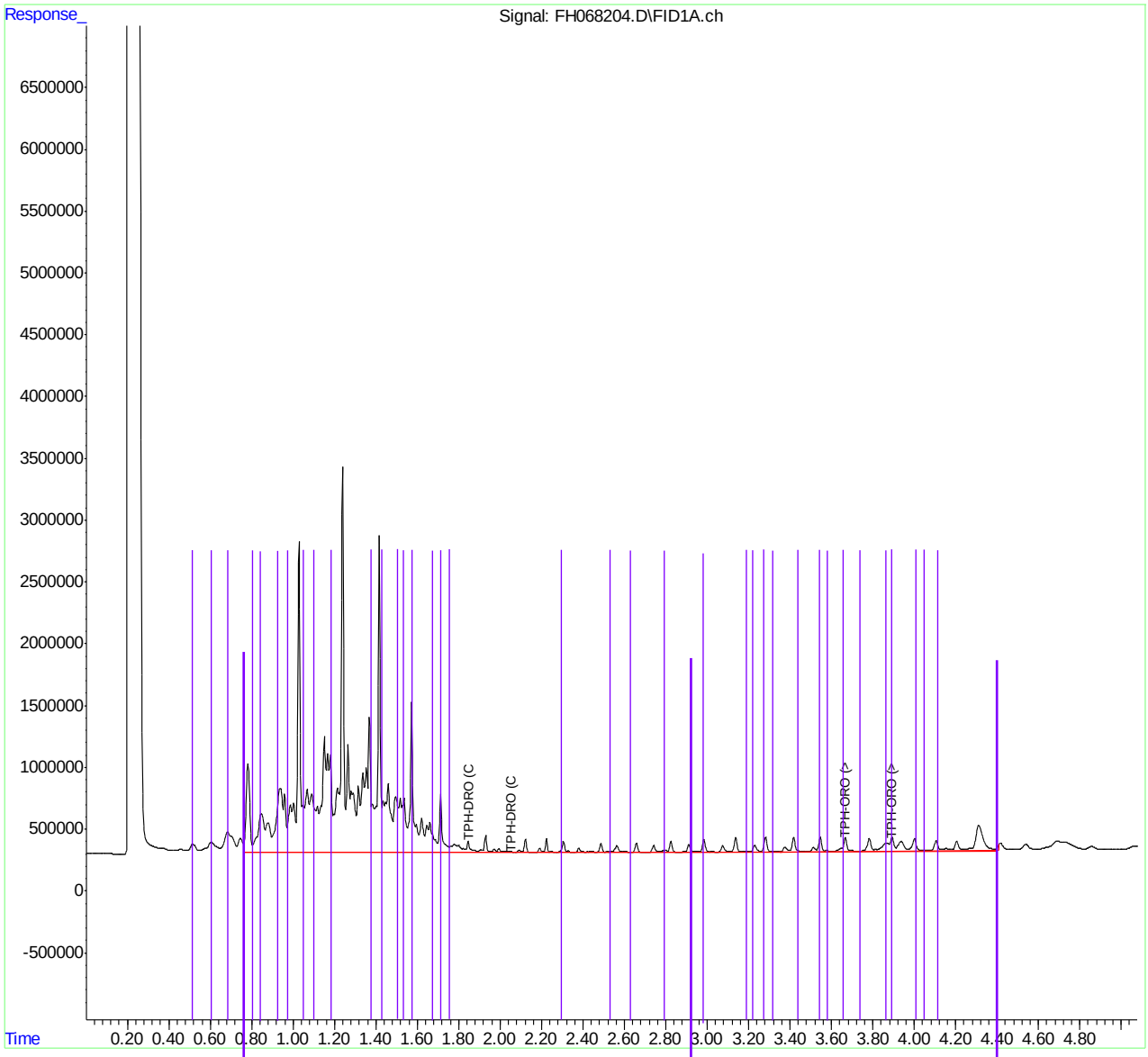
Quantitation Report (QT Reviewed)

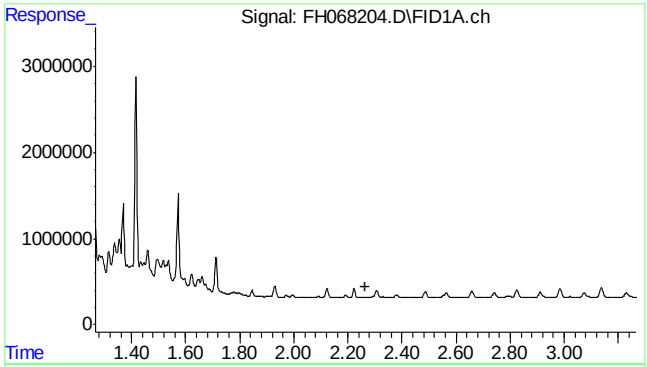
Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068204.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:23 am
Operator : jackb
Sample : RT JP-05
Misc : OP20000,GFH23725,,,,,1
ALS Vial : 3 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Oct 02 15:32:18 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

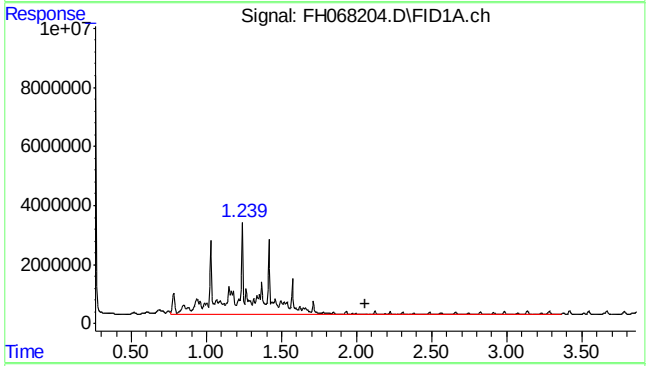
No RTs? Need a c-gram that has marker compounds as well as all peaks with RTs to compare to samples. Also, no surrogate to base accuracy of RTs on.





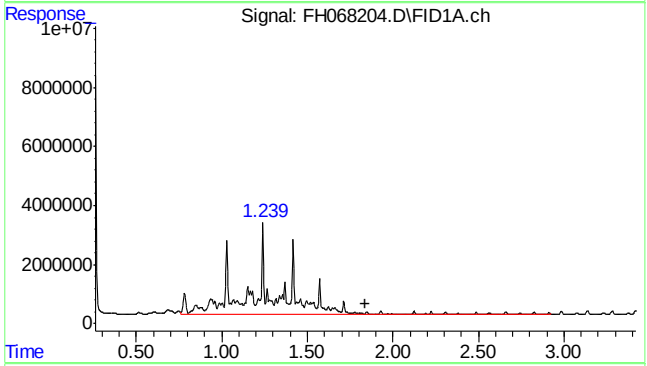
#1 o-Terphenyl

R.T.: 0.000 min
Exp R.T. : 2.265 min
Response: 0
Conc: N.D.



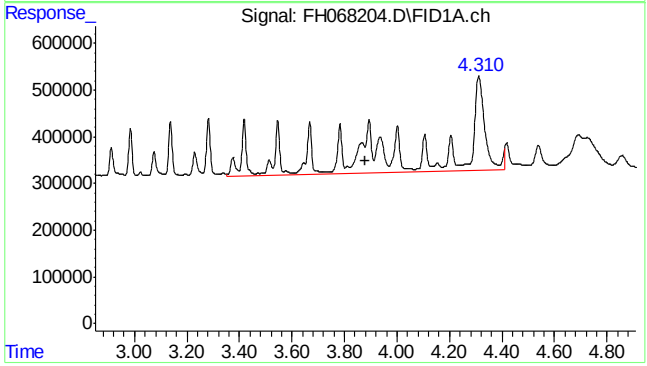
#2 TPH-DRO (C10-C28)

R.T.: 2.060 min
Delta R.T.: 0.000 min
Response: 268735700
Conc: 723.51 ug/ml



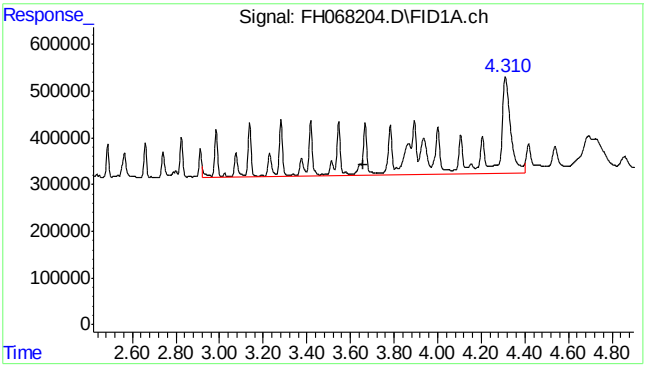
#3 TPH-DRO (C10-C24)

R.T.: 1.840 min
Delta R.T.: 0.000 min
Response: 263338830
Conc: 714.83 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.880 min
Delta R.T.: 0.000 min
Response: 20691103
Conc: 118.37 ug/ml



#5 TPH-ORO (>C24-C40)

R.T.:	3.660 min
Delta R.T.:	0.000 min
Response:	26841384
Conc:	86.40 ug/ml

Attachment 2

Sample Data from SDG DA58265

SGS North America Inc.

Report of Analysis

Client Sample ID:	F2-TW-0010437-23155-N		
Lab Sample ID:	DA58265-13	**Date Sampled:**	08/31/23
Matrix:	DW - Drinking Water	**Date Received:**	09/01/23
Method:	SW846-8015D SW846 3510C	**Percent Solids:**	n/a
Project:	CV CTO 22F0122		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	LW16112.D	1	09/02/23 20:16	JB	09/02/23 06:50	OP24267	GLW544
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
	TPH-DRO (C10-C24) [a]	0.0904		0.080	0.052	mg/l	
	TPH-ORO (> C24-C40)	0.0705		0.080	0.052	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	57%		10-131%

(a) Associated CCV outside of control limits high.

U = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16112.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 20:16:28
Operator : jackb
Sample : da58265-13
Misc : OP24267,GLW544,1000,,,1,1
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 03 16:15:15 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 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

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
5) S O-TERPHENYL	2.342	24611153	1137.728 ppm
Spiked Amount 2000.000	Range 10 - 130	Recovery =	56.89%
Target Compounds			
1) H TPH-DRO (C10-C28)	2.140	1892351	115.068 ppm
2) H TPH-ORO (>C28-C40)	3.970	635645	69.957 ppm
3) H TPH-DRO (C10-C24)	1.920	1423186	90.369 ppm
4) H TPH-ORO (>C24-C40)	3.750	1090268	70.497 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

11.1.26 11

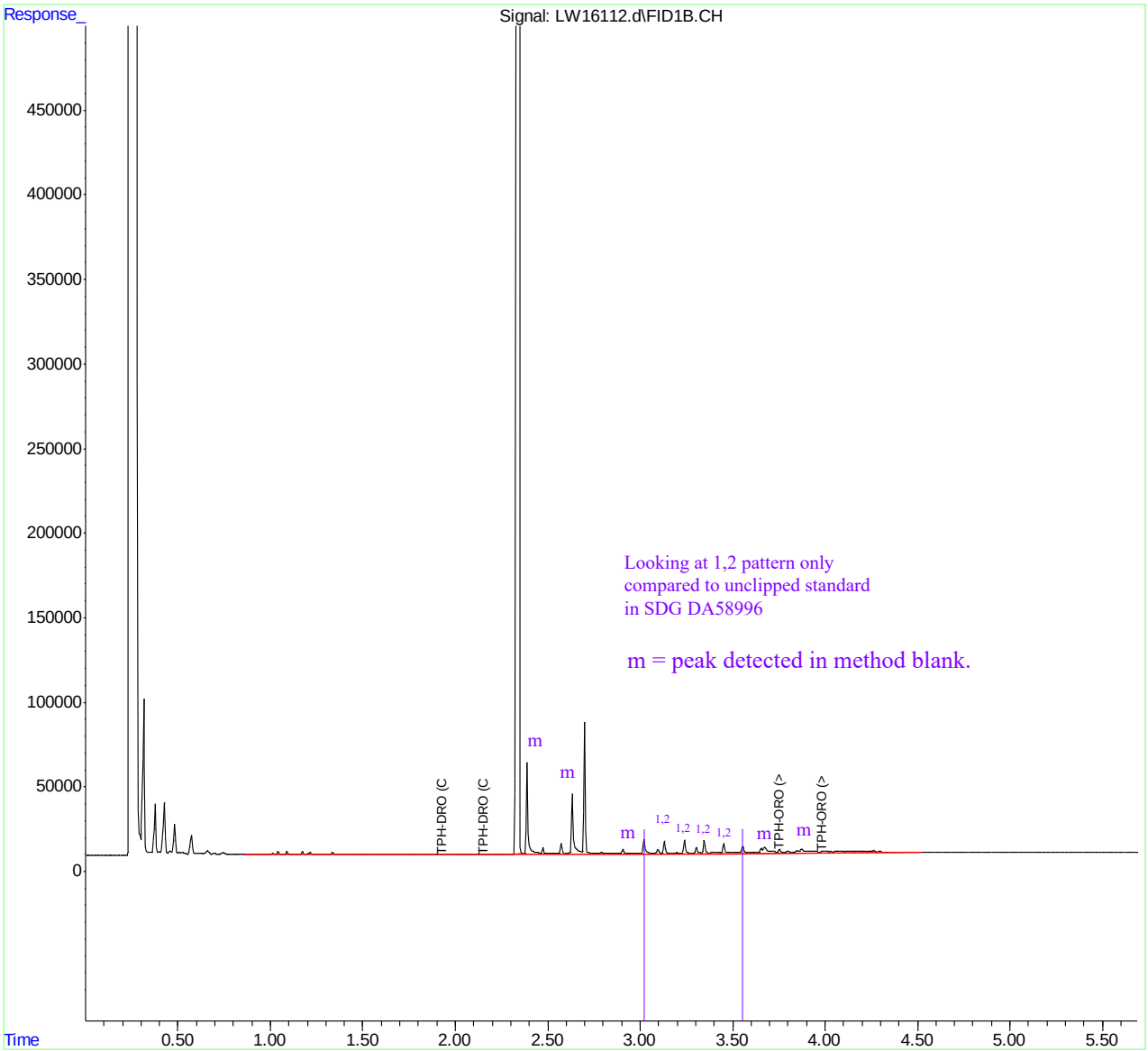
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16112.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 20:16:28
Operator : jackb
Sample : da58265-13
Misc : OP24267,GLW544,1000,,,1,1
ALS Vial : 0 Sample Multiplier: 1

F2-TW-0010437-23155-N
DRO 90.4
ORO 70.5 J
Total TPH 160.9

Integration File: autoint1.e
Quant Time: Sep 03 16:15:15 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 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



11.1.26 11

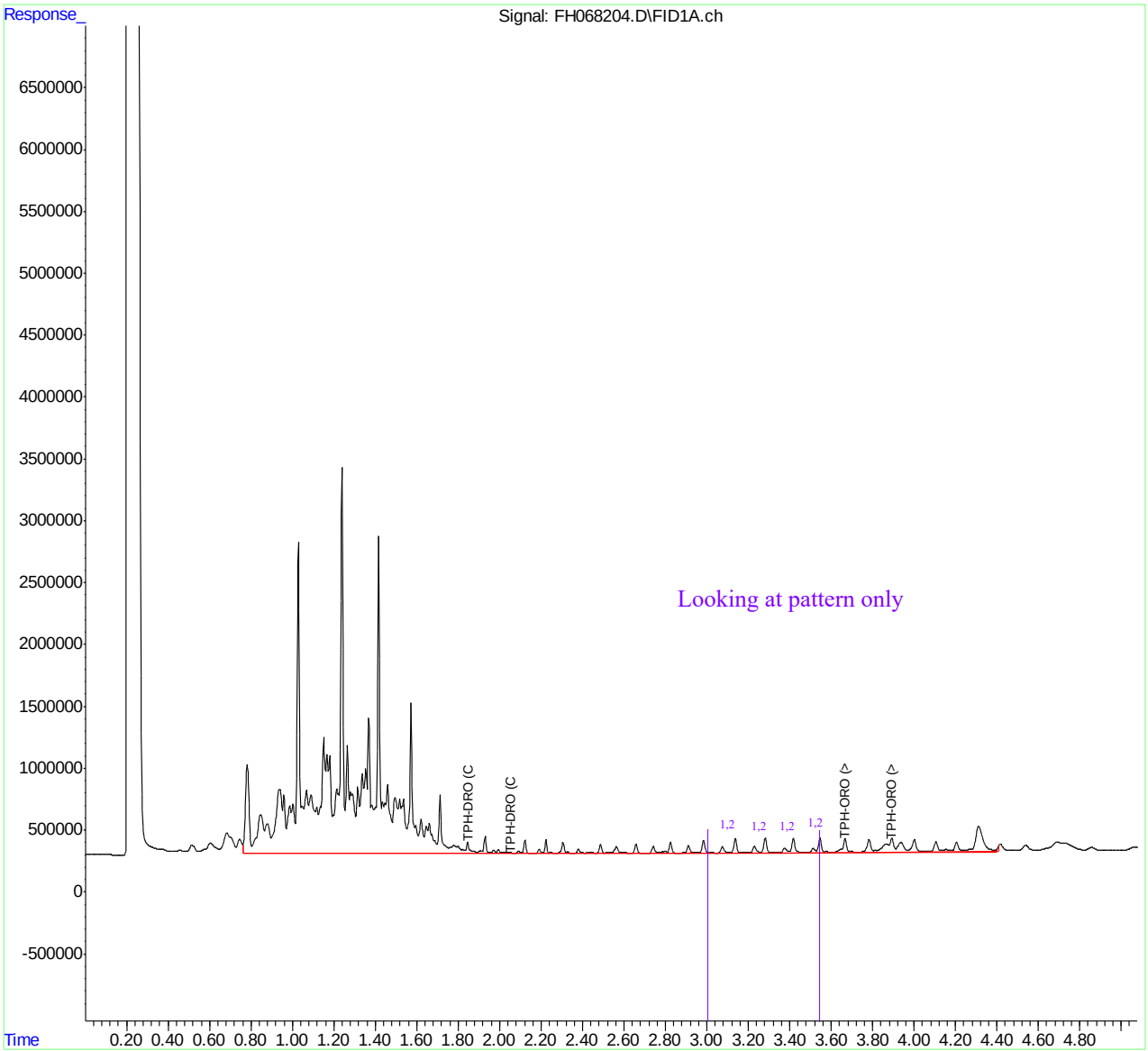
Quantitation Report (QT Reviewed)

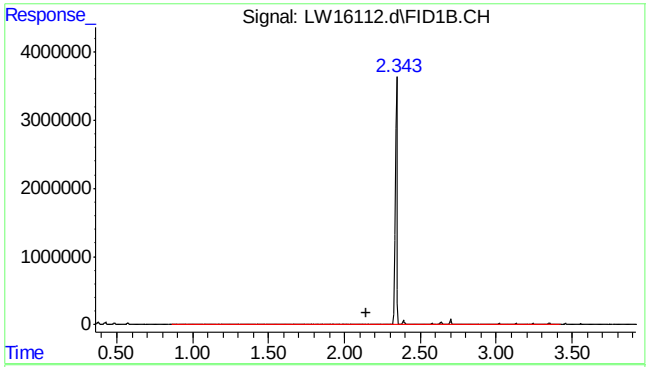
Data Path : C:\msdchem\1\DATA\2023\August\FH100223\
Data File : FH068204.D
Signal(s) : FID1A.ch
Acq On : 2 Oct 2023 10:23 am
Operator : jackb
Sample : RT JP-05
Misc : OP20000,GFH23725,,,,,1
ALS Vial : 3 Sample Multiplier: 1

This c-gram was taken from SDG DA58996.

Integration File: autoint1.e
Quant Time: Oct 02 15:32:18 2023
Quant Method : C:\msdchem\1\METHODS\DRO-092023.M
Quant Title : DRO-ORO FRONT
QLast Update : Wed Sep 20 16:12:50 2023
Response via : Initial Calibration
Integrator: ChemStation

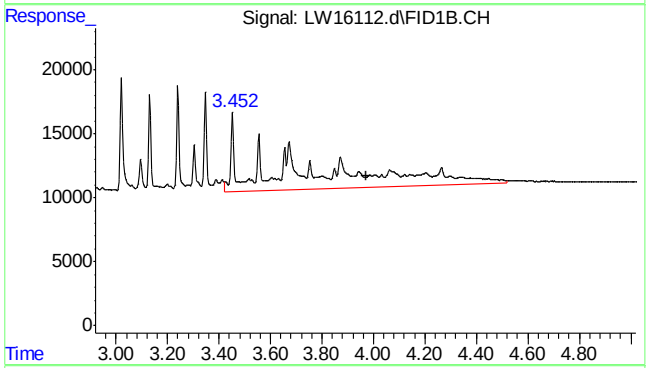
Volume Inj. :
Signal Phase :
Signal Info :





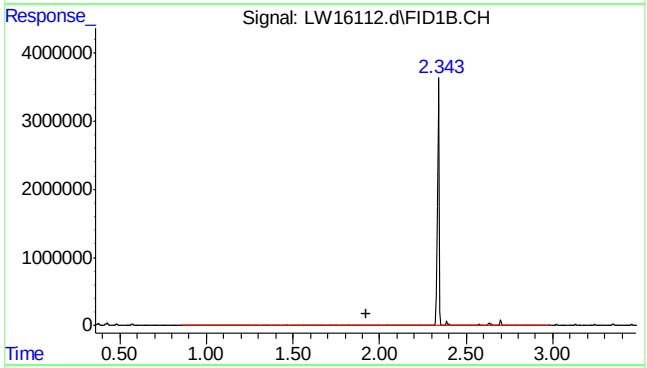
#1 TPH-DRO (C10-C28)

R.T.: 2.140 min
Delta R.T.: 0.000 min
Response: 1892351
Conc: 115.07 ppm



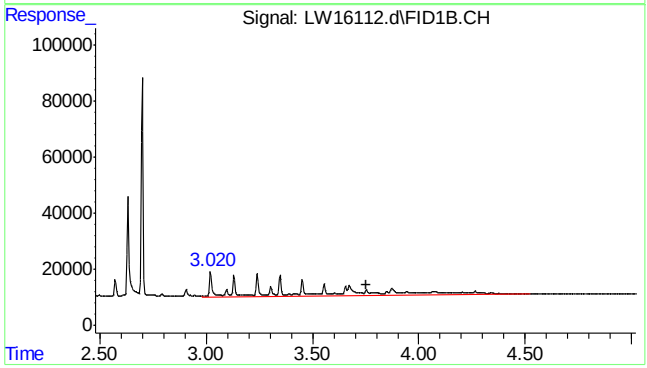
#2 TPH-ORO (>C28-C40)

R.T.: 3.970 min
Delta R.T.: 0.000 min
Response: 635645
Conc: 69.96 ppm



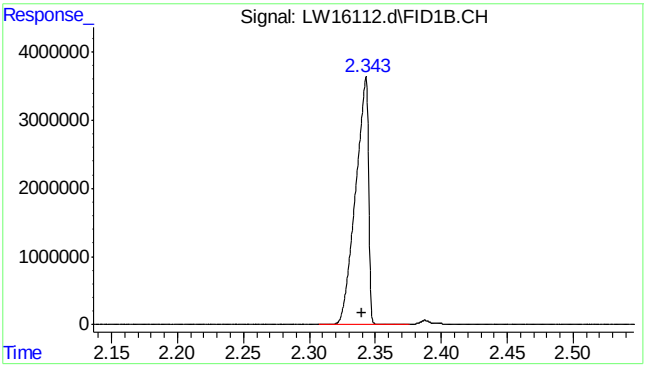
#3 TPH-DRO (C10-C24)

R.T.: 1.920 min
Delta R.T.: 0.000 min
Response: 1423186
Conc: 90.37 ppm



#4 TPH-ORO (>C24-C40)

R.T.: 3.750 min
Delta R.T.: 0.000 min
Response: 1090268
Conc: 70.50 ppm



#5 O-TERPHENYL

R.T.: 2.342 min
Delta R.T.: 0.002 min
Response: 24611153
Conc: 1137.73 ppm

Method Blank Summary

Job Number: DA58265
Account: AECOMHIH AECOM
Project: CV CTO 22F0122

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP24267-MB	LW16097.D	1	09/02/23	JB	09/02/23	OP24267	GLW544

The QC reported here applies to the following samples: **Method:** SW846-8015D

DA58265-13

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C24)	ND	0.080	0.052	mg/l	
	TPH-ORO (> C24-C40)	ND	0.080	0.052	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	94%	10-131%

10.1.3 10

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16097.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 17:45:15
Operator : jackb
Sample : op24267-mb
Misc : OP24267,GLW544,1000,,,1,1
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 03 16:14:44 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 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

	Compound	R.T.	Response	Conc Units
	System Monitoring Compounds			
5) S	O-TERPHENYL	2.349	40537445	1873.971 ppm
Spiked Amount	2000.000	Range 10 - 130	Recovery =	93.70%
	Target Compounds			
1) H	TPH-DRO (C10-C28)	2.140	845060	51.386 ppm
2) H	TPH-ORO (>C28-C40)	3.970	410269	45.153 ppm
3) H	TPH-DRO (C10-C24)	1.920	587779	37.323 ppm
4) H	TPH-ORO (>C24-C40)	3.750	756404	48.910 ppm

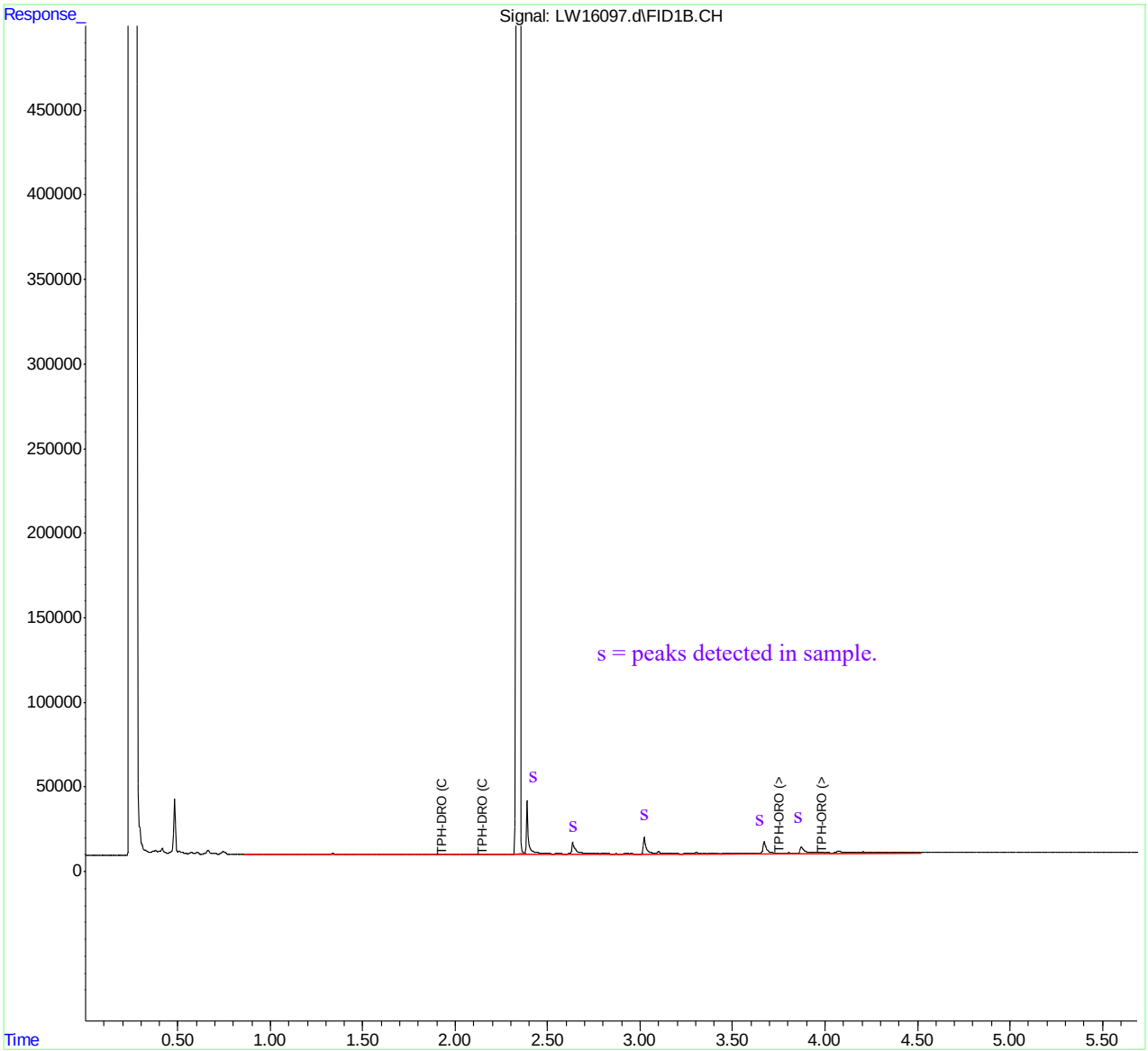
(f)=RT Delta > 1/2 Window (m)=manual int.

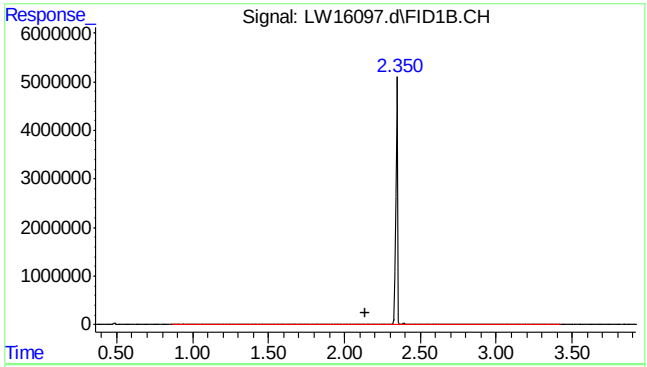
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16097.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 17:45:15
Operator : jackb
Sample : op24267-mb
Misc : OP24267,GLW544,1000,,,1,1
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 03 16:14:44 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 2023
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

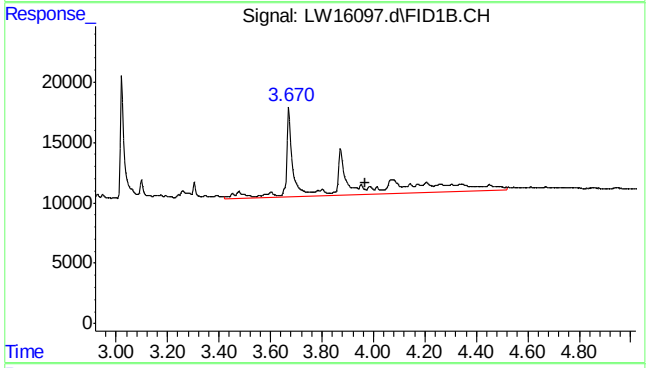
Volume Inj. : 1 ul
Signal Phase : MXT-5 5% Diphenyl / 95% Dimethyl Polysiloxane
Signal Info : 15M , 0.25 mmID, 0.25 um df





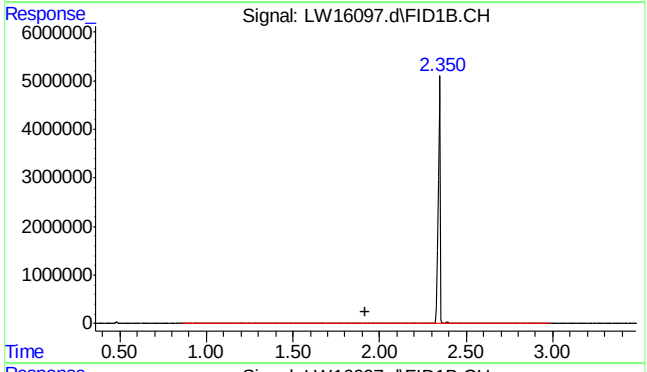
#1 TPH-DRO (C10-C28)

R.T.: 2.140 min
Delta R.T.: 0.000 min
Response: 845060
Conc: 51.39 ppm



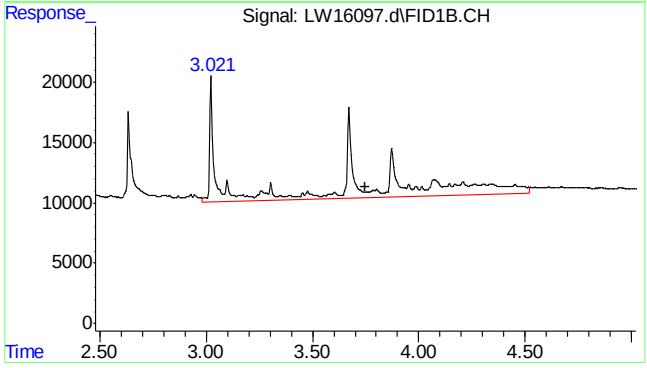
#2 TPH-ORO (>C28-C40)

R.T.: 3.970 min
Delta R.T.: 0.000 min
Response: 410269
Conc: 45.15 ppm



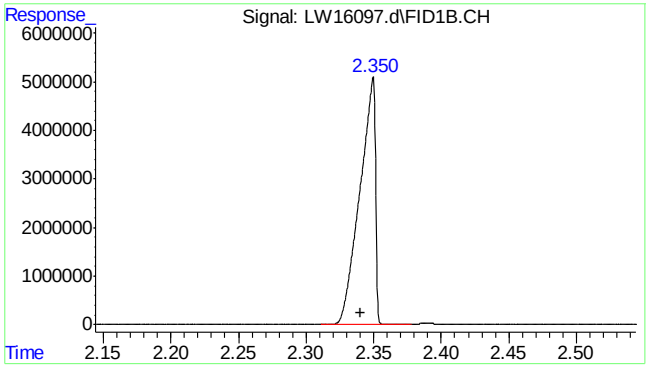
#3 TPH-DRO (C10-C24)

R.T.: 1.920 min
Delta R.T.: 0.000 min
Response: 587779
Conc: 37.32 ppm



#4 TPH-ORO (>C24-C40)

R.T.: 3.750 min
Delta R.T.: 0.000 min
Response: 756404
Conc: 48.91 ppm



#5 O-TERPHENYL

R.T.: 2.349 min
Delta R.T.: 0.009 min
Response: 40537445
Conc: 1873.97 ppm

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16093a.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 17:14:57
Operator : jackb
Sample : RT C10-C40
Misc : OP24267,GLW544,,,,,1
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 03 16:14:35 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 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

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
5) S O-TERPHENYL	0.000	0	N.D. ppm
Spiked Amount 2000.000	Range 10 - 130	Recovery =	0.00%#
Target Compounds			
1) H TPH-DRO (C10-C28)	2.140	17214033	1046.734 ppm
2) H TPH-ORO (>C28-C40)	3.970	12210267	1343.816 ppm
3) H TPH-DRO (C10-C24)	1.920	12985622	824.559 ppm
4) H TPH-ORO (>C24-C40)	3.750	16447158	1063.484 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

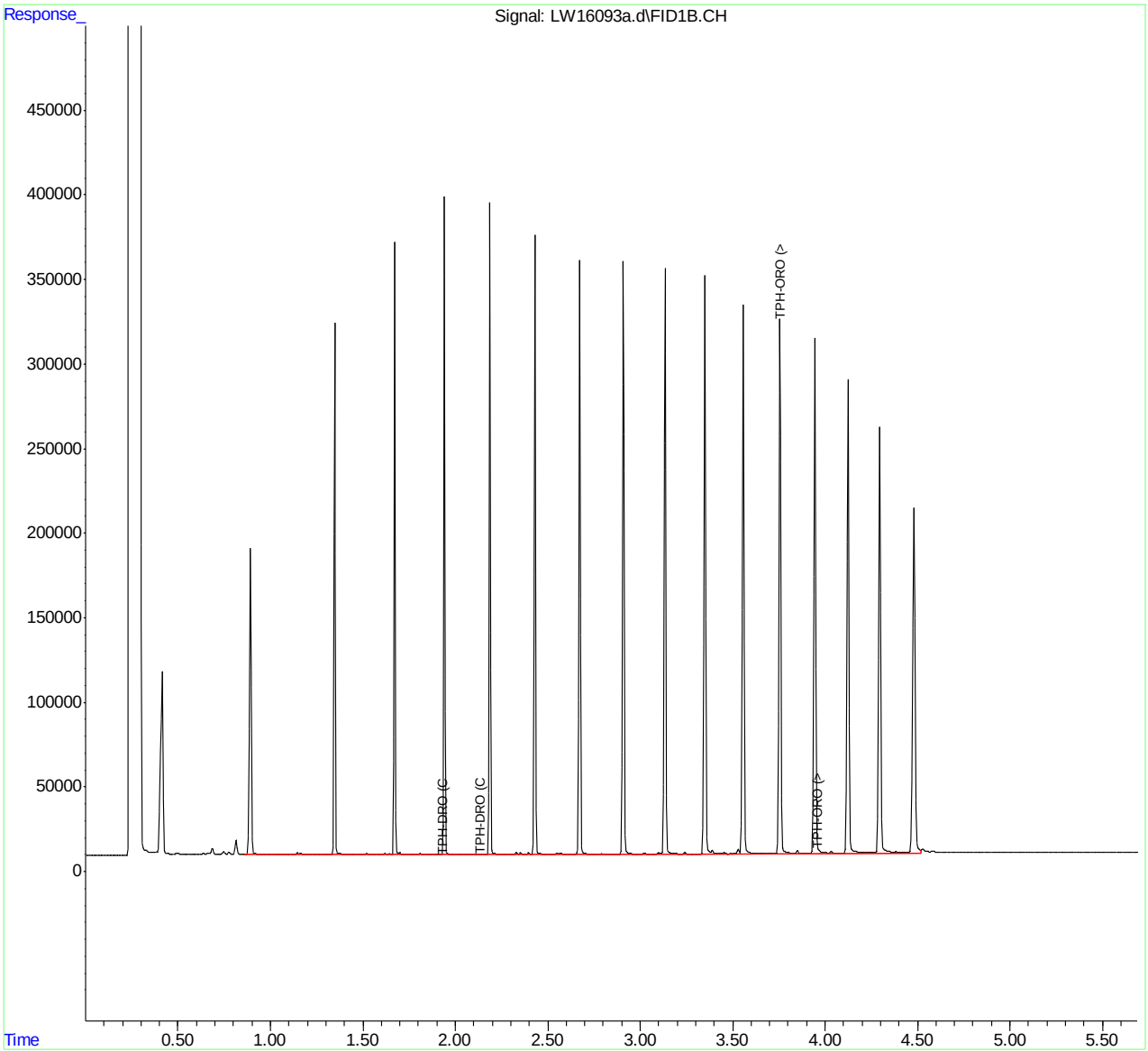
11.5.5 11

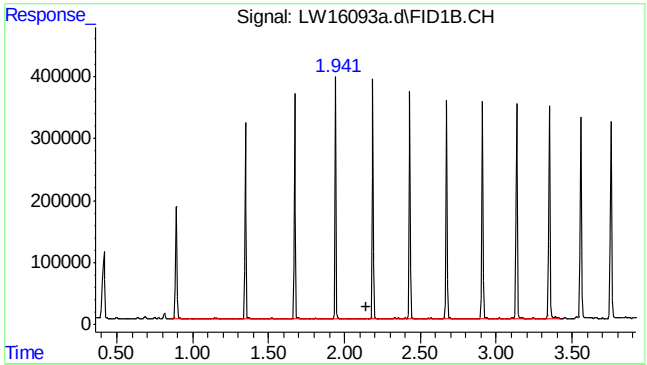
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16093a.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 17:14:57
Operator : jackb
Sample : RT C10-C40
Misc : OP24267,GLW544,,,,,1
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 03 16:14:35 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 2023
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

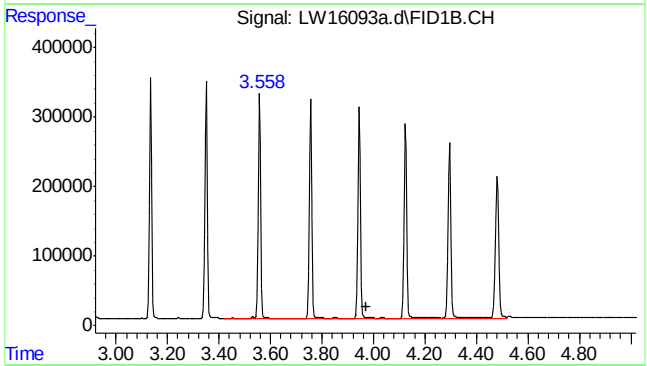
Volume Inj. : 1 ul
Signal Phase : MXT-5 5% Diphenyl / 95% Dimethyl Polysiloxane
Signal Info : 15M , 0.25 mmID, 0.25 um df





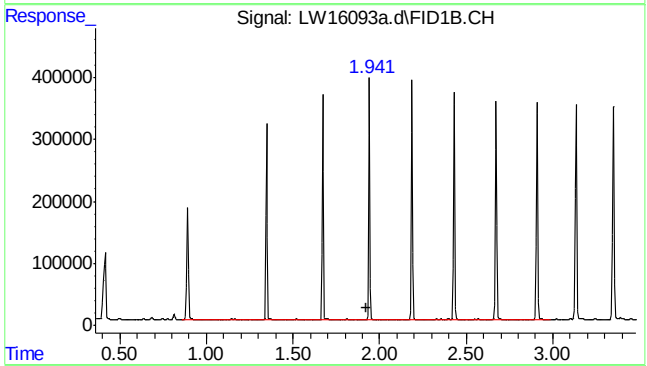
#1 TPH-DRO (C10-C28)

R.T.: 2.140 min
Delta R.T.: 0.000 min
Response: 17214033
Conc: 1046.73 ppm



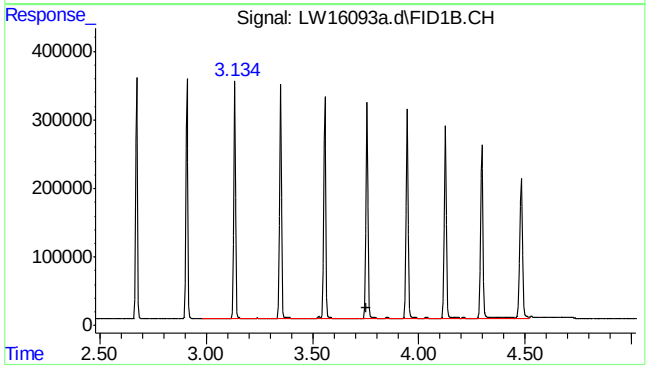
#2 TPH-ORO (>C28-C40)

R.T.: 3.970 min
Delta R.T.: 0.000 min
Response: 12210267
Conc: 1343.82 ppm



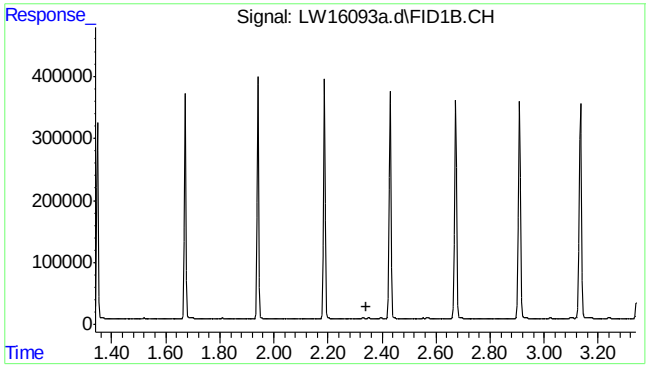
#3 TPH-DRO (C10-C24)

R.T.: 1.920 min
Delta R.T.: 0.000 min
Response: 12985622
Conc: 824.56 ppm



#4 TPH-ORO (>C24-C40)

R.T.: 3.750 min
Delta R.T.: 0.000 min
Response: 16447158
Conc: 1063.48 ppm



#5 O-TERPHENYL

R.T.: 0.000 min
Exp R.T. : 2.340 min
Response: 0
Conc: N.D.

11.5.5 11

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16094.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 17:04:53
Operator : jackb
Sample : RT JP-05
Misc : OP24267,GLW544,,,,,1
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 03 16:14:38 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 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

Compound	R.T.	Response	Conc Units
System Monitoring Compounds			
5) S O-TERPHENYL	0.000	0	N.D. ppm
Spiked Amount 2000.000	Range 10 - 130	Recovery =	0.00%#
Target Compounds			
1) H TPH-DRO (C10-C28)	2.140	9946819	604.836 ppm
2) H TPH-ORO (>C28-C40)	3.970	191593	21.086 ppm
3) H TPH-DRO (C10-C24)	1.920	9886379	627.764 ppm
4) H TPH-ORO (>C24-C40)	3.750	248139	16.045 ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

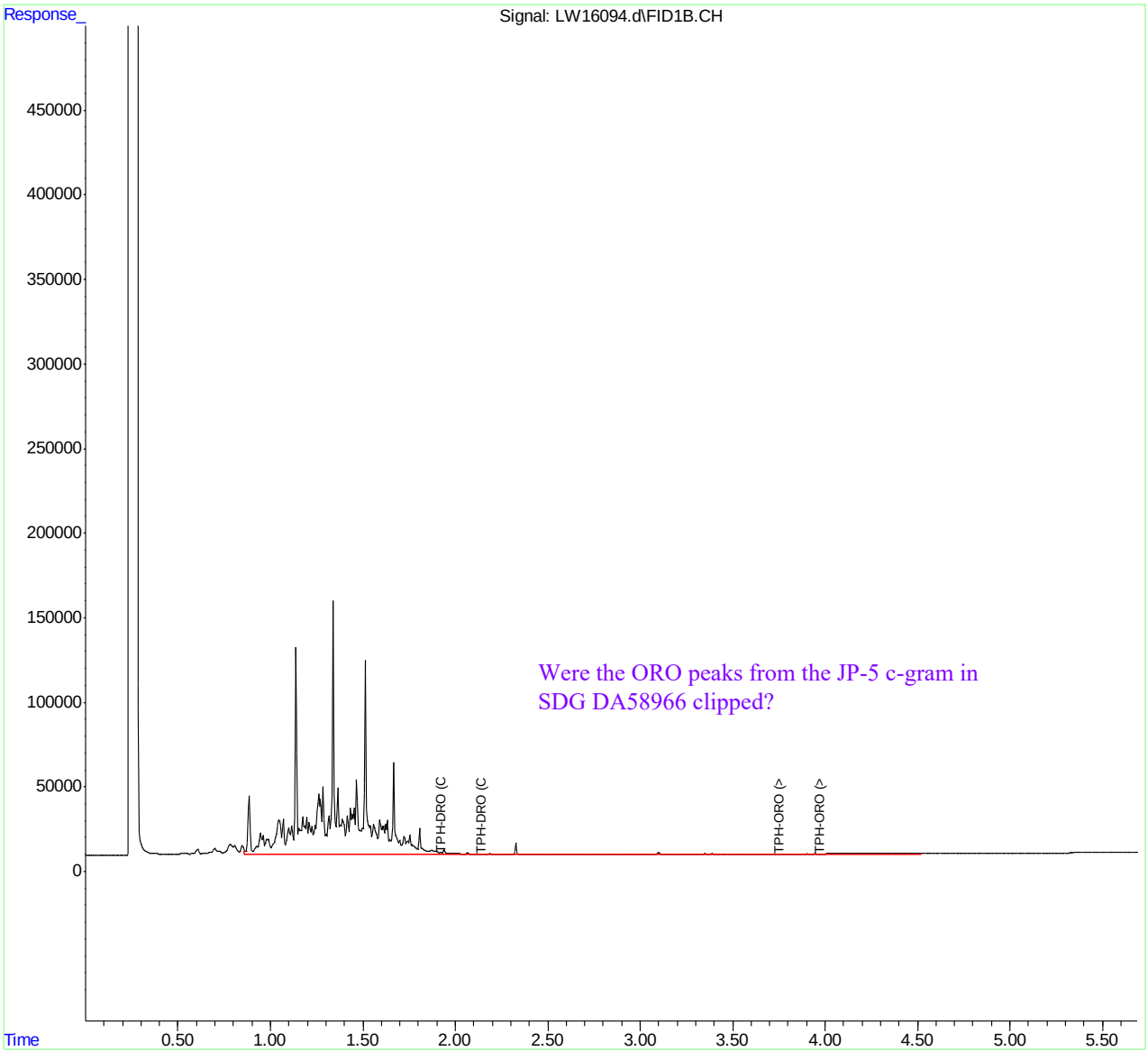
11.5.4 11

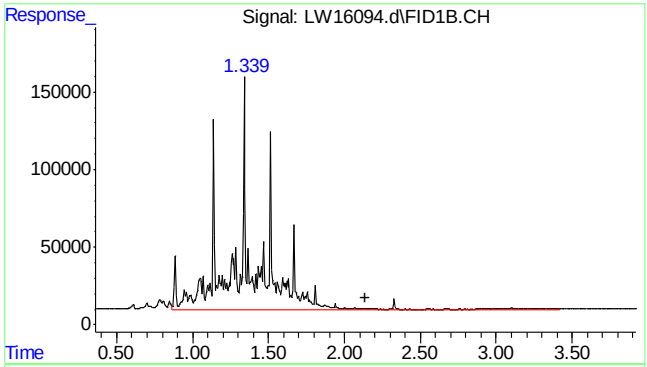
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2023\08.23\090223\
Data File : LW16094.d
Signal(s) : FID1B.CH
Acq On : 02-Sep-23, 17:04:53
Operator : jackb
Sample : RT JP-05
Misc : OP24267,GLW544,,,,,1
ALS Vial : 0 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Sep 03 16:14:38 2023
Quant Method : C:\msdchem\1\methods\DRO082123.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Mon Aug 21 10:56:48 2023
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

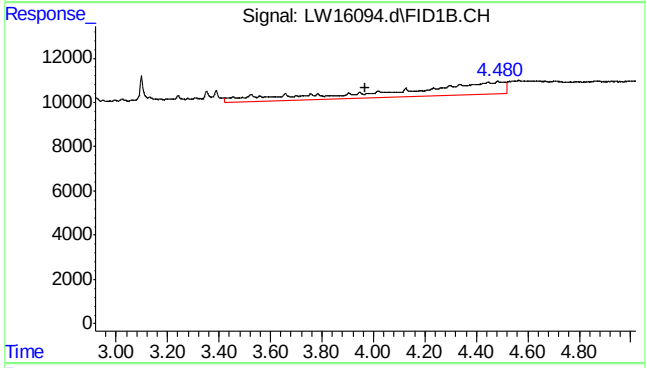
Volume Inj. : 1 ul
Signal Phase : MXT-5 5% Diphenyl / 95% Dimethyl Polysiloxane
Signal Info : 15M , 0.25 mmID, 0.25 um df





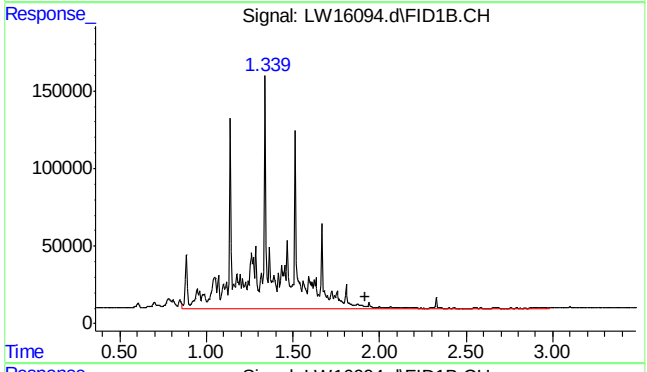
#1 TPH-DRO (C10-C28)

R.T.: 2.140 min
Delta R.T.: 0.000 min
Response: 9946819
Conc: 604.84 ppm



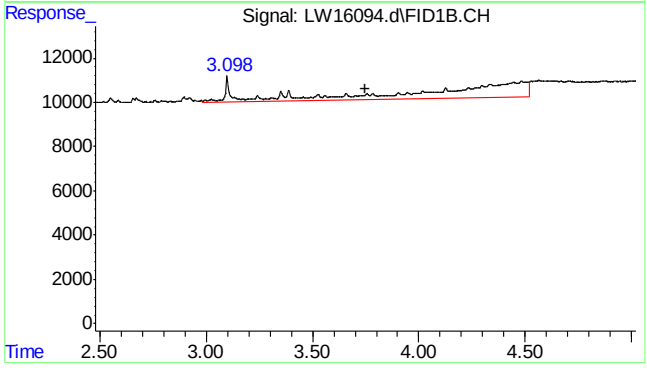
#2 TPH-ORO (>C28-C40)

R.T.: 3.970 min
Delta R.T.: 0.000 min
Response: 191593
Conc: 21.09 ppm



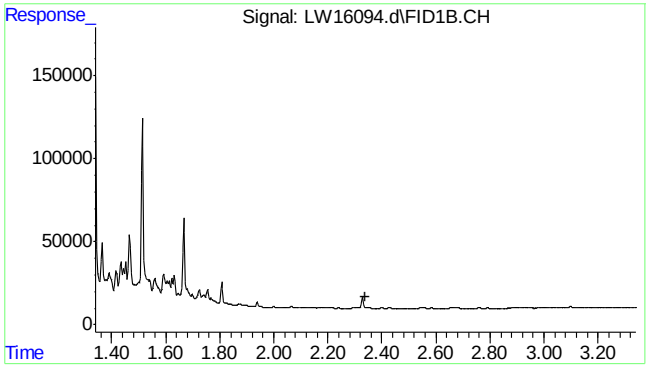
#3 TPH-DRO (C10-C24)

R.T.: 1.920 min
Delta R.T.: 0.000 min
Response: 9886379
Conc: 627.76 ppm



#4 TPH-ORO (>C24-C40)

R.T.: 3.750 min
Delta R.T.: 0.000 min
Response: 248139
Conc: 16.04 ppm



#5 O-TERPHENYL

R.T.: 0.000 min
Exp R.T. : 2.340 min
Response: 0
Conc: N.D.

Attachment 3

Sample Data from SDG DA43252

SGS North America Inc.

Report of Analysis

Client Sample ID:	F2-TW-0009957-22070-N		
Lab Sample ID:	DA43252-4	**Date Sampled:**	03/25/22
Matrix:	DW - Drinking Water	**Date Received:**	03/26/22
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	CV CTO 22F0122		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7V77677.D	1	04/02/22 04:02	MB	n/a	n/a	V7V3892
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
	TPH-GRO (C5-C12)	50 U		100	50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	102%		70-130%

U = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\220327\
Data File : LW002770.D
Signal(s) : FID2B.CH
Acq On : 28-Mar-22, 00:02:29
Operator : IANV
Sample : DA43252-4
Misc : OP21424,GLW61,1055,,1.0,1
ALS Vial : 71 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 28 08:56:48 2022
Quant Method : C:\msdchem\1\METHODS\DRO220318.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Sat Mar 19 14:10:31 2022
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

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
5) S	O-TERPHENYL	2.407f	20948398	1429.130	ppm
Spiked Amount	2000.000	Range 10 - 130	Recovery =	71.46%	
	Target Compounds				
1) H	TPH-DRO (C10-C28)	2.179	1393198	126.317	ppm
2) H	TPH-ORO (>C28-C40)	4.066	179032	27.887	ppm
3) H	TPH-DRO (C10-C24)	1.947	1168596	107.369	ppm
4) H	TPH-ORO (>C24-C40)	3.834	295804	25.522	ppm m

(f)=RT Delta > 1/2 Window (m)=manual int.

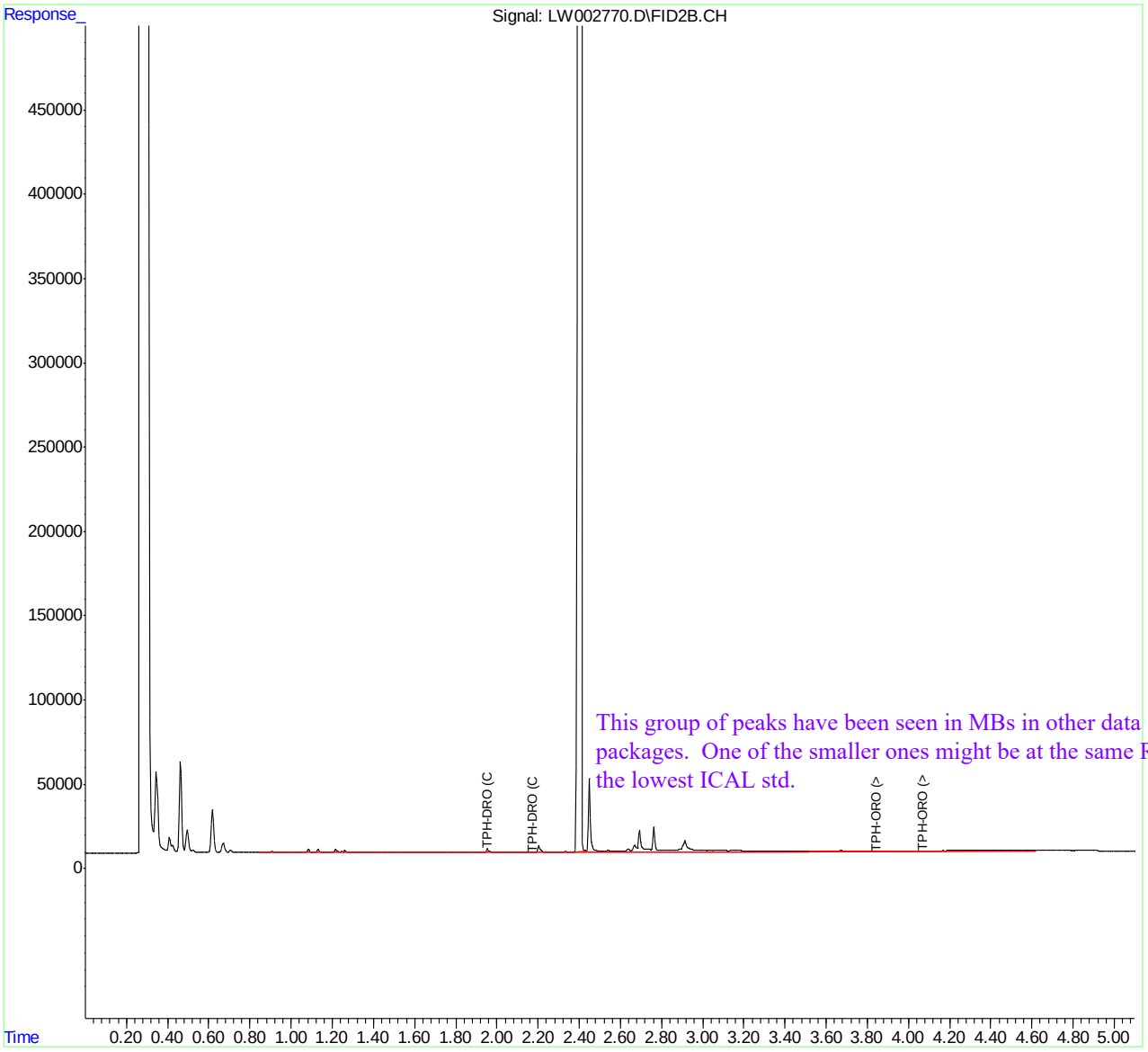
11.1.69 11

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\220327\
Data File : LW002770.D
Signal(s) : FID2B.CH
Acq On : 28-Mar-22, 00:02:29
Operator : IANV
Sample : DA43252-4
Misc : OP21424,GLW61,1055,,1.0,1
ALS Vial : 71 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 28 08:56:48 2022
Quant Method : C:\msdchem\1\METHODS\DRO220318.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Sat Mar 19 14:10:31 2022
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

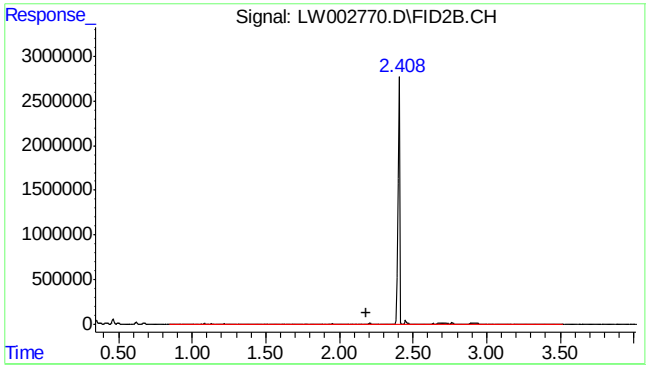
Volume Inj. : 1 ul
Signal Phase : MXT-5 5% Diphenyl / 95% Dimethyl Polysiloxane
Signal Info : 15M , 0.25 mmID, 0.25 um df



This group of peaks have been seen in MBs in other data packages. One of the smaller ones might be at the same RT as the lowest ICAL std.

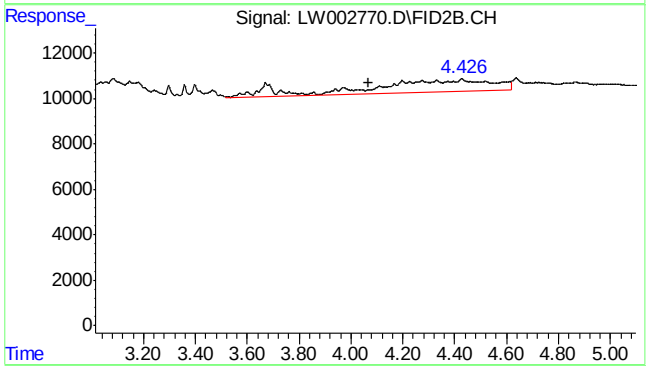
11.1.69

11



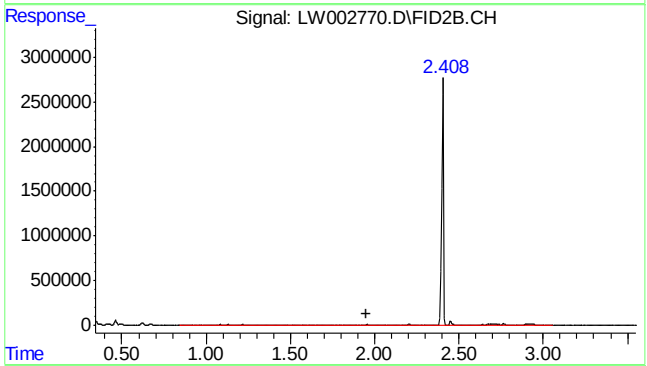
#1 TPH-DRO (C10-C28)

R.T.: 2.179 min
Delta R.T.: 0.000 min
Response: 1393198
Conc: 126.32 ppm



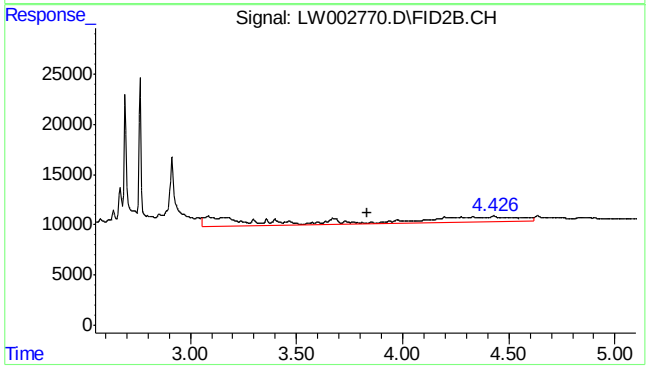
#2 TPH-ORO (>C28-C40)

R.T.: 4.066 min
Delta R.T.: 0.000 min
Response: 179032
Conc: 27.89 ppm



#3 TPH-DRO (C10-C24)

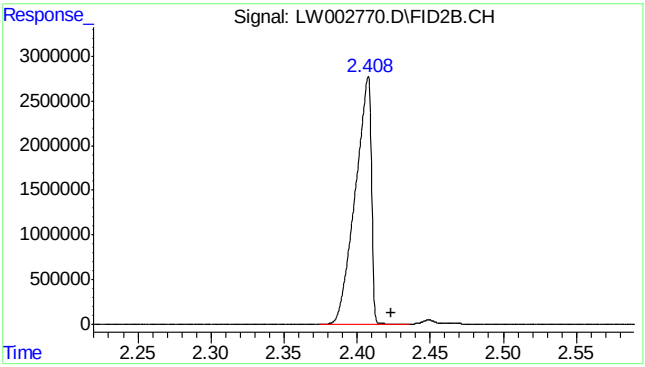
R.T.: 1.947 min
Delta R.T.: 0.000 min
Response: 1168596
Conc: 107.37 ppm



#4 TPH-ORO (>C24-C40)

R.T.: 3.834 min
Delta R.T.: 0.000 min
Response: 295804
Conc: 25.52 ppm m

11.1.69 11



#5 O-TERPHENYL

R.T.: 2.407 min
Delta R.T.: -0.016 min
Response: 20948398
Conc: 1429.13 ppm

11.1.69
11

Method Blank Summary

Job Number: DA43252
Account: AECOMHIH AECOM
Project: CV CTO 22F0122

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP21424-MB	LW002757.D	1	03/27/22	IV	03/26/22	OP21424	GLW61

The QC reported here applies to the following samples: **Method:** SW846-8015D

DA43252-1, DA43252-2, DA43252-3, DA43252-4, DA43252-5, DA43252-6, DA43252-7, DA43252-8, DA43252-9, DA43252-10, DA43252-11, DA43252-12, DA43252-13, DA43252-14, DA43252-15, DA43252-16, DA43252-17, DA43252-18, DA43252-19

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C24)	ND	0.10	0.052	mg/l	
	TPH-ORO (> C24-C40)	ND	0.10	0.052	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	88%	10-131%

Quantitation Report (QT Reviewed)

Data Path : R:\GBSData\DATA\GCSEMI\GLW\220327\
Data File : LW002757.D
Signal(s) : FID2B.CH
Acq On : 27 Mar 2022 22:00 pm
Operator : IANV
Sample : OP21424-MB
Misc : OP21424,GLW61,1000,,,1.0,1
ALS Vial : 60 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 28 10:19:21 2022
Quant Method : R:\GBSData\DATA\GCSEMI\GLW\220327\DRO220318.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Sat Mar 19 14:10:31 2022
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

Compound	R.T.	Response	Conc	Units
System Monitoring Compounds				
5) S O-TERPHENYL	2.408f	25663265	1750.785	ppm
Spiked Amount 2000.000	Range 10 - 130	Recovery = 87.54%		
Target Compounds				
1) H TPH-DRO (C10-C28)	2.179	284764	25.819	ppm
2) H TPH-ORO (>C28-C40)	4.066	310012	48.289	ppm
3) H TPH-DRO (C10-C24)	1.947	257554	23.664	ppm
4) H TPH-ORO (>C24-C40)	3.834	330433	28.510	ppm

(f)=RT Delta > 1/2 Window (m)=manual int.

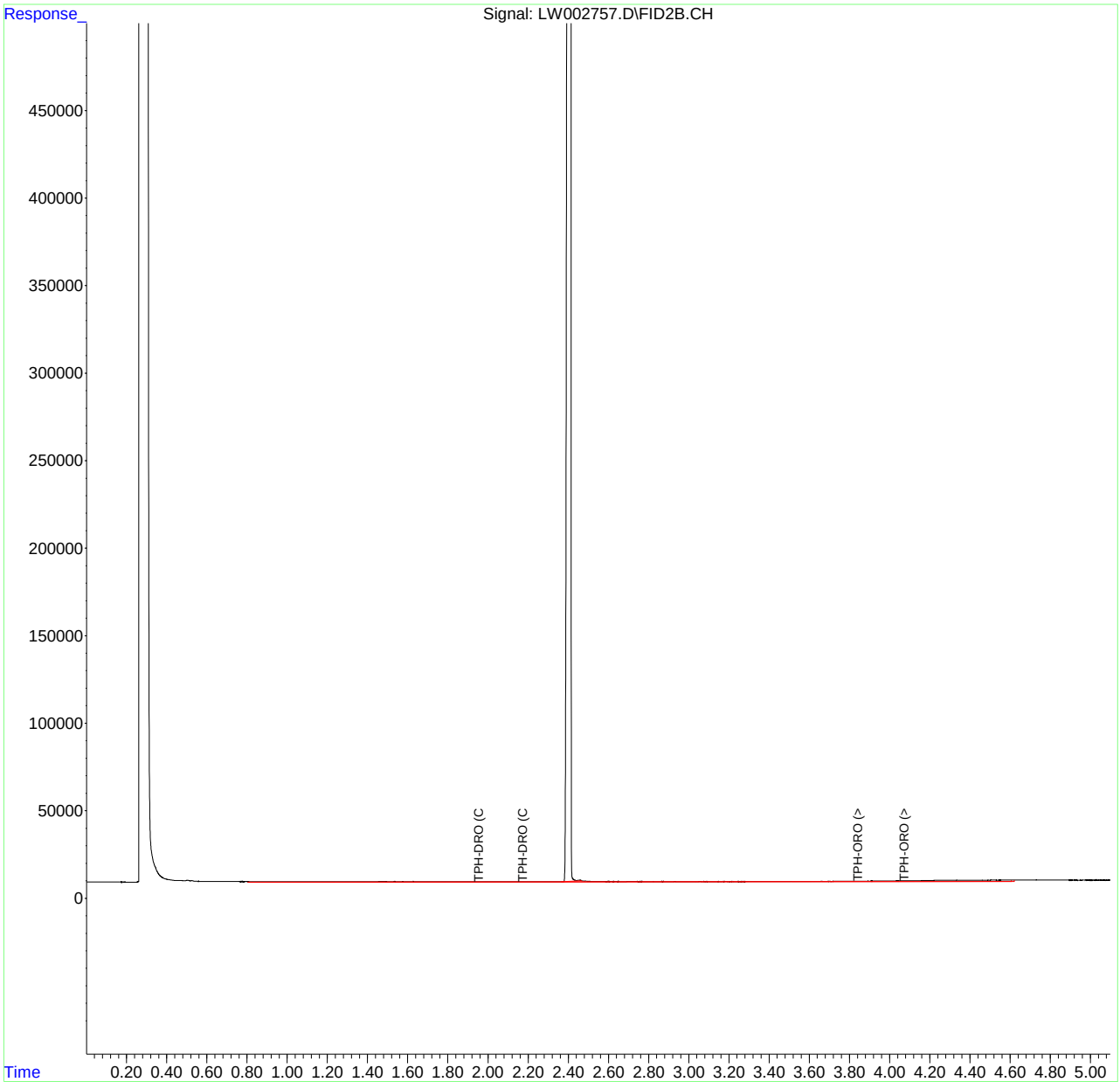
11.2.5 11

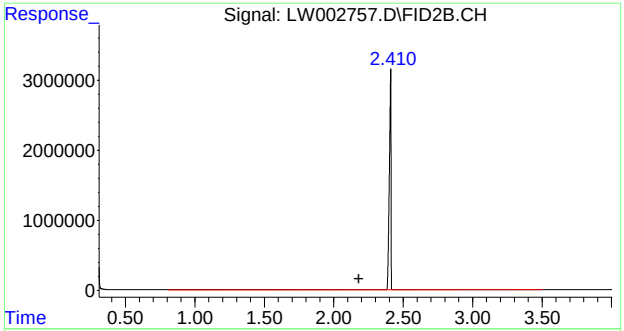
Quantitation Report (QT Reviewed)

Data Path : R:\GBSData\DATA\GCSEMI\GLW\220327\
Data File : LW002757.D
Signal(s) : FID2B.CH
Acq On : 27 Mar 2022 22:00 pm
Operator : IANV
Sample : OP21424-MB
Misc : OP21424,GLW61,1000,,,1.0,1
ALS Vial : 60 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Mar 28 10:19:21 2022
Quant Method : R:\GBSData\DATA\GCSEMI\GLW\220327\DRO220318.M
Quant Title : Diesel range organics by method 8015.
QLast Update : Sat Mar 19 14:10:31 2022
Response via : Initial Calibration
Integrator: ChemStation 6890 Scale Mode: Small noise peaks clipped

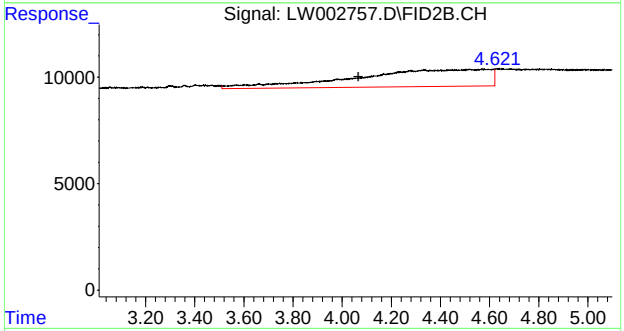
Volume Inj. : 1 ul
Signal Phase : MXT-5 5% Diphenyl / 95% Dimethyl Polysiloxane
Signal Info : 15M , 0.25 mmID, 0.25 um df





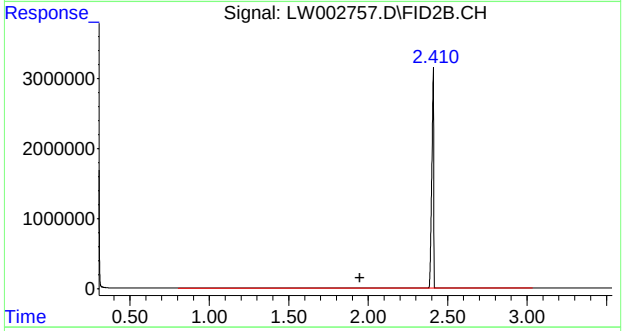
#1 TPH-DRO (C10-C28)

R.T.:	2.179 min
Delta R.T.:	0.000 min
Response:	284764
Conc:	25.82 ppm



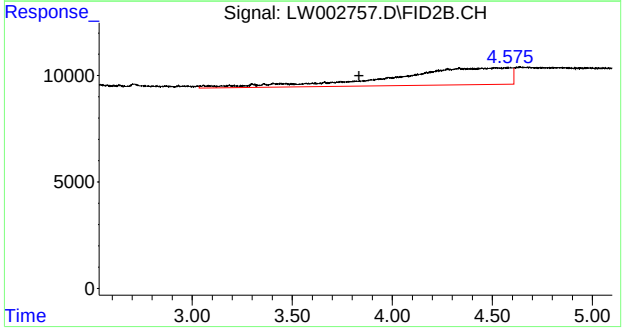
#2 TPH-ORO (>C28-C40)

R.T.:	4.066 min
Delta R.T.:	0.000 min
Response:	310012
Conc:	48.29 ppm



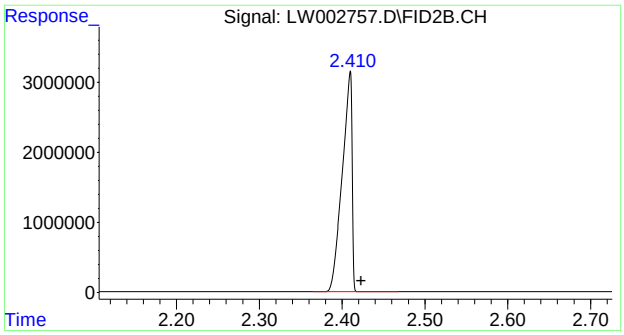
#3 TPH-DRO (C10-C24)

R.T.:	1.947 min
Delta R.T.:	0.000 min
Response:	257554
Conc:	23.66 ppm



#4 TPH-ORO (>C24-C40)

R.T.:	3.834 min
Delta R.T.:	0.000 min
Response:	330433
Conc:	28.51 ppm



#5 O-TERPHENYL

R.T.: 2.408 min
Delta R.T.: -0.015 min
Response: 25663265
Conc: 1750.78 ppm

Attachment 4

Sample Data from SDG DA6110

SGS North America Inc.

Report of Analysis

Client Sample ID:	D2-TW-0008281-23337-N		
Lab Sample ID:	DA61100-5	**Date Sampled:**	01/04/24
Matrix:	DW - Drinking Water	**Date Received:**	01/05/24
Method:	SW846-8015D SW846 3510C	**Percent Solids:**	n/a
Project:	CV CTO 22F0122		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH070362.D	1	01/05/24 21:50	MB	01/05/24 08:30	OP24817	GFH23788
Run #2							

	Initial Volume	Final Volume
Run #1	1010 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	MCL	RL	MDL	Units	Q
	TPH-DRO (C10-C24)	0.0755		0.079	0.051	mg/l	J
	TPH-ORO (> C24-C40)	0.0752		0.079	0.051	mg/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	76%		10-131%

U = Not detected MDL = Method Detection Limit
MCL = Maximum Contamination Level (40 CFR 141)
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070362.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 9:50 pm
Operator : michaelb
Sample : da61100-5
Misc : OP24817,GFH23788,1010,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 14:05:24 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
1) S	o-Terphenyl	2.171	852767192	1518.665	ug/ml
	Target Compounds				
2) H	TPH-DRO (C10-C28)	1.980	47901347	123.167	ug/ml
3) H	TPH-DRO (C10-C24)	1.760	29276697	76.283	ug/ml
4) H	TPH-ORO (>C28-C40)	3.790	12873860	52.974	ug/mlm
5) H	TPH-ORO (>C24-C40)	3.570	31705691	75.961	ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

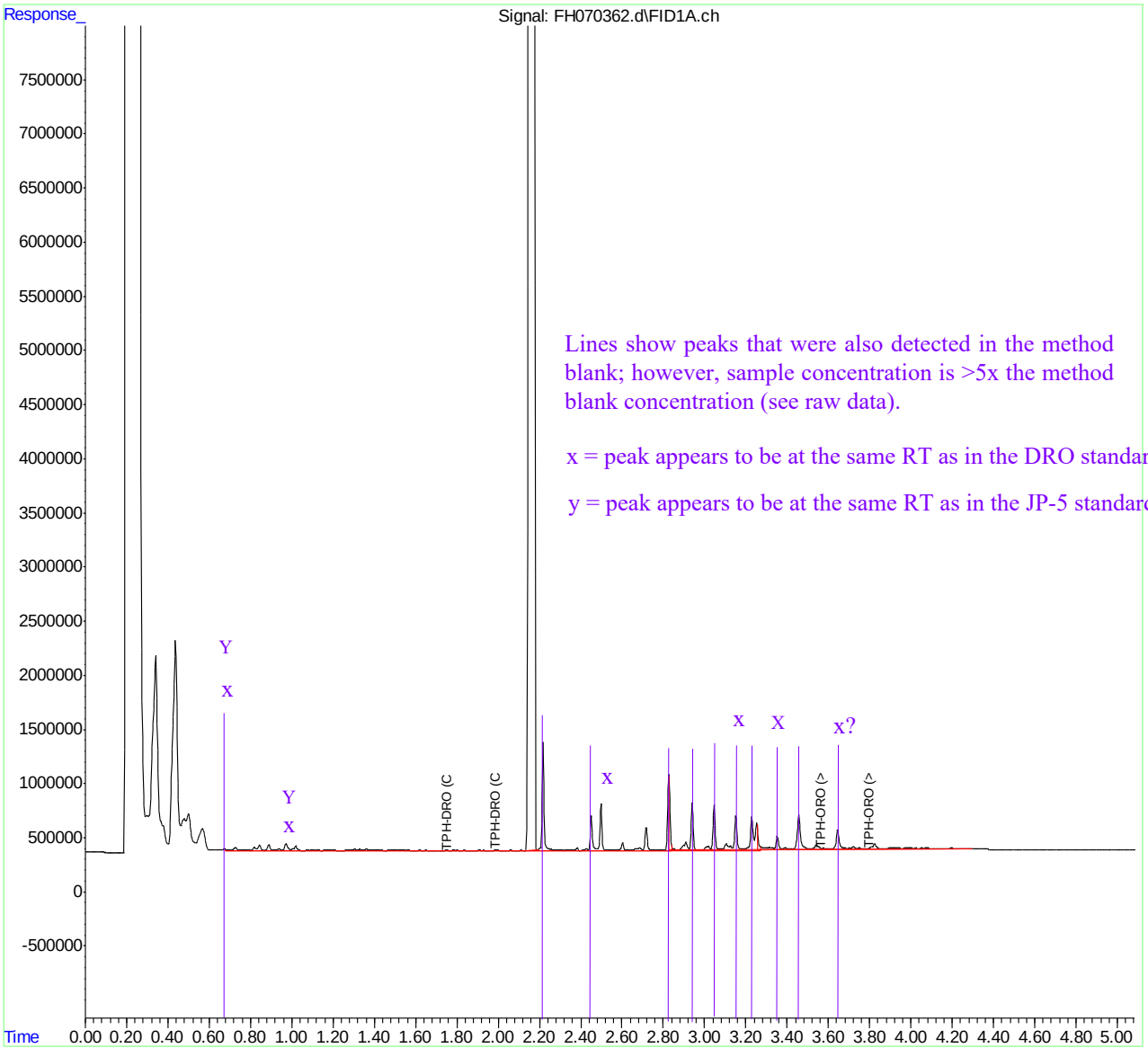
11.1.17 11

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070362.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 9:50 pm
Operator : michaelb
Sample : da61100-5
Misc : OP24817,GFH23788,1010,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 14:05:24 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

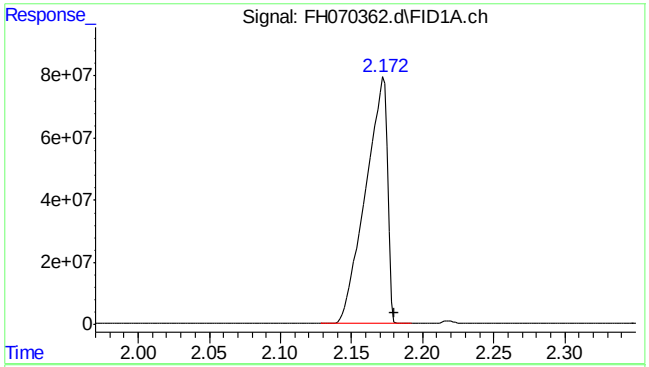
Volume Inj. :
Signal Phase :
Signal Info :



Lines show peaks that were also detected in the method blank; however, sample concentration is >5x the method blank concentration (see raw data).

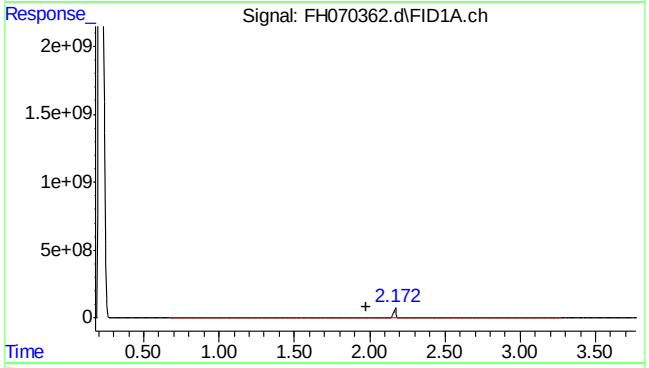
x = peak appears to be at the same RT as in the DRO standard.

y = peak appears to be at the same RT as in the JP-5 standard.



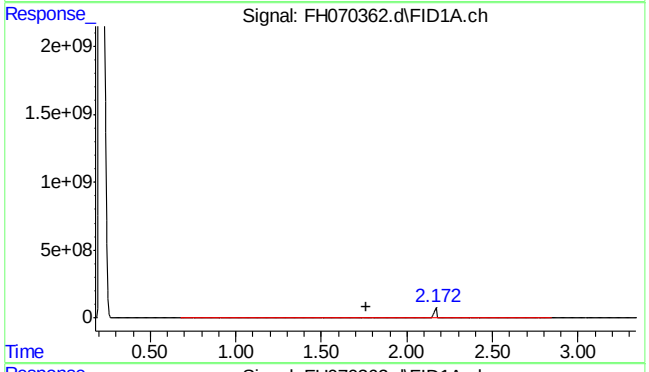
#1 o-Terphenyl

R.T.: 2.171 min
Delta R.T.: -0.009 min
Response: 852767192
Conc: 1518.67 ug/ml



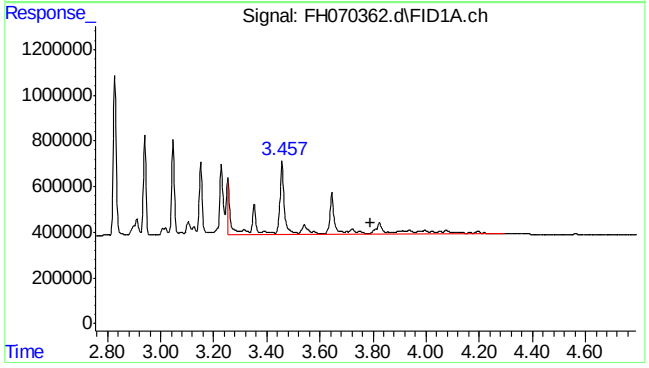
#2 TPH-DRO (C10-C28)

R.T.: 1.980 min
Delta R.T.: 0.000 min
Response: 47901347
Conc: 123.17 ug/ml



#3 TPH-DRO (C10-C24)

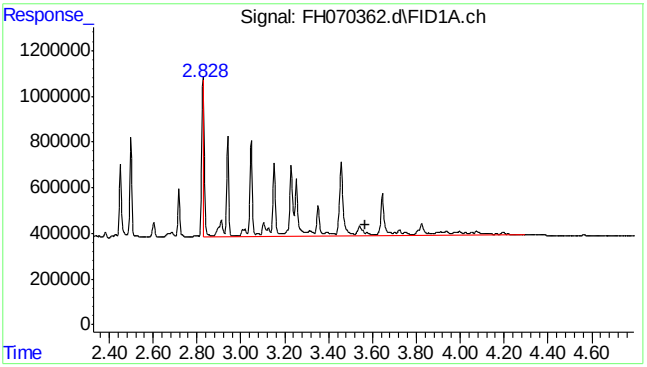
R.T.: 1.760 min
Delta R.T.: 0.000 min
Response: 29276697
Conc: 76.28 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.790 min
Delta R.T.: 0.000 min
Response: 12873860
Conc: 52.97 ug/ml m

11.1.17
11



#5 TPH-ORO (>C24-C40)

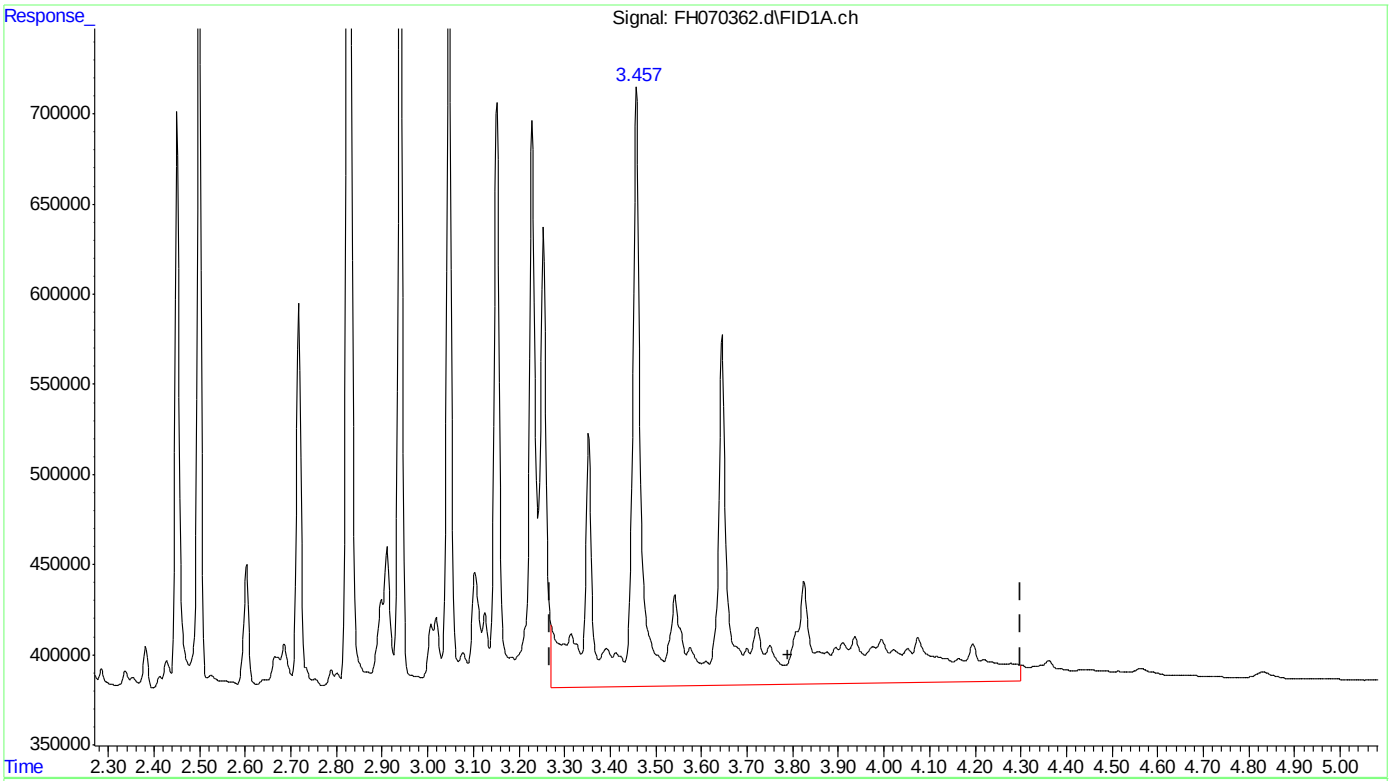
R.T.:	3.570 min
Delta R.T.:	0.000 min
Response:	31705691
Conc:	75.96 ug/ml m

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070362.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 9:50 pm
Operator : michaelb
Sample : da61100-5
Misc : OP24817,GFH23788,1010,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:37 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



QEdit

(4) TPH-ORO (>C28-C40) (H)

3.790min 76.687 ug/ml

response 16967795

(+) = Expected Retention Time

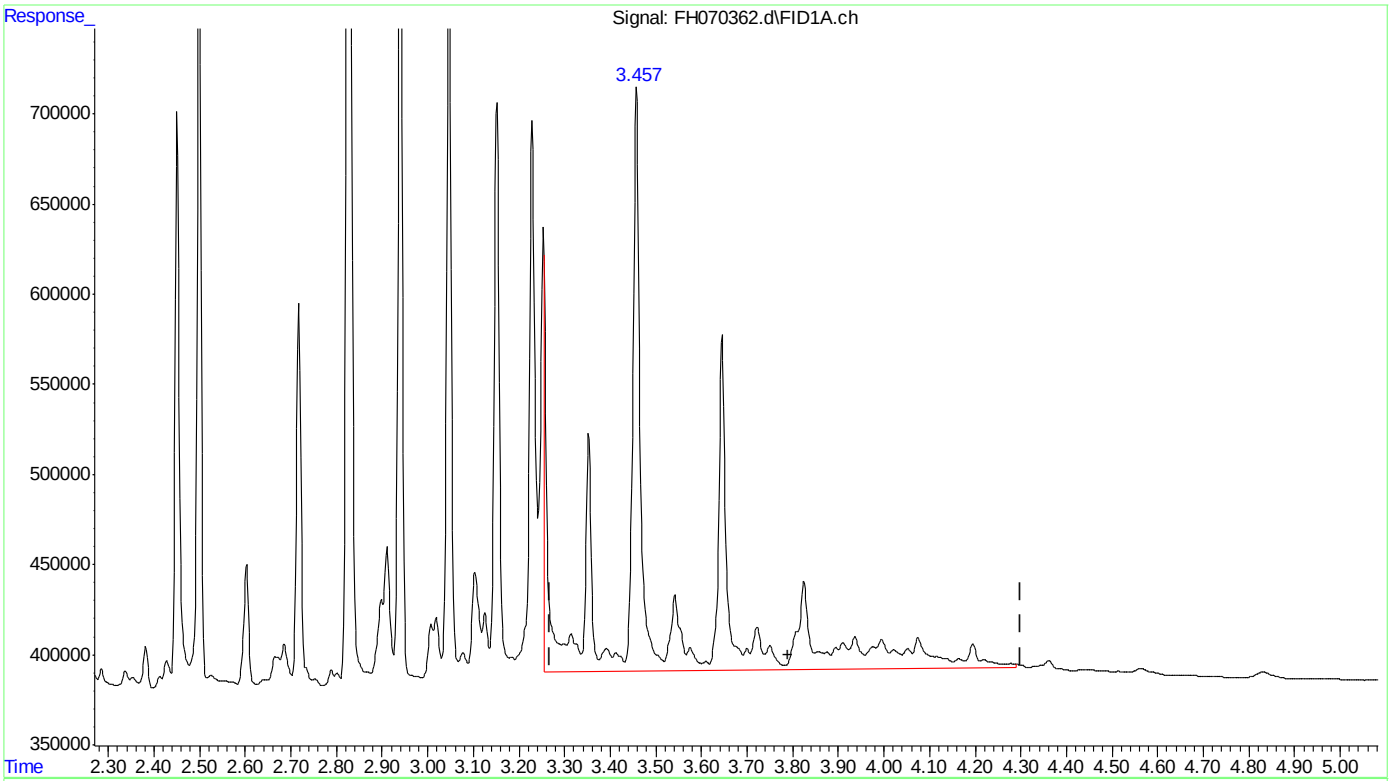
DRO-122823.M Sun Jan 07 14:05:11 2024 Page: 1

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070362.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 9:50 pm
Operator : michaelb
Sample : da61100-5
Misc : OP24817,GFH23788,1010,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:37 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



(4) TPH-ORO (>C28-C40) (H)

3.790min 52.974 ug/ml m

response 12873860

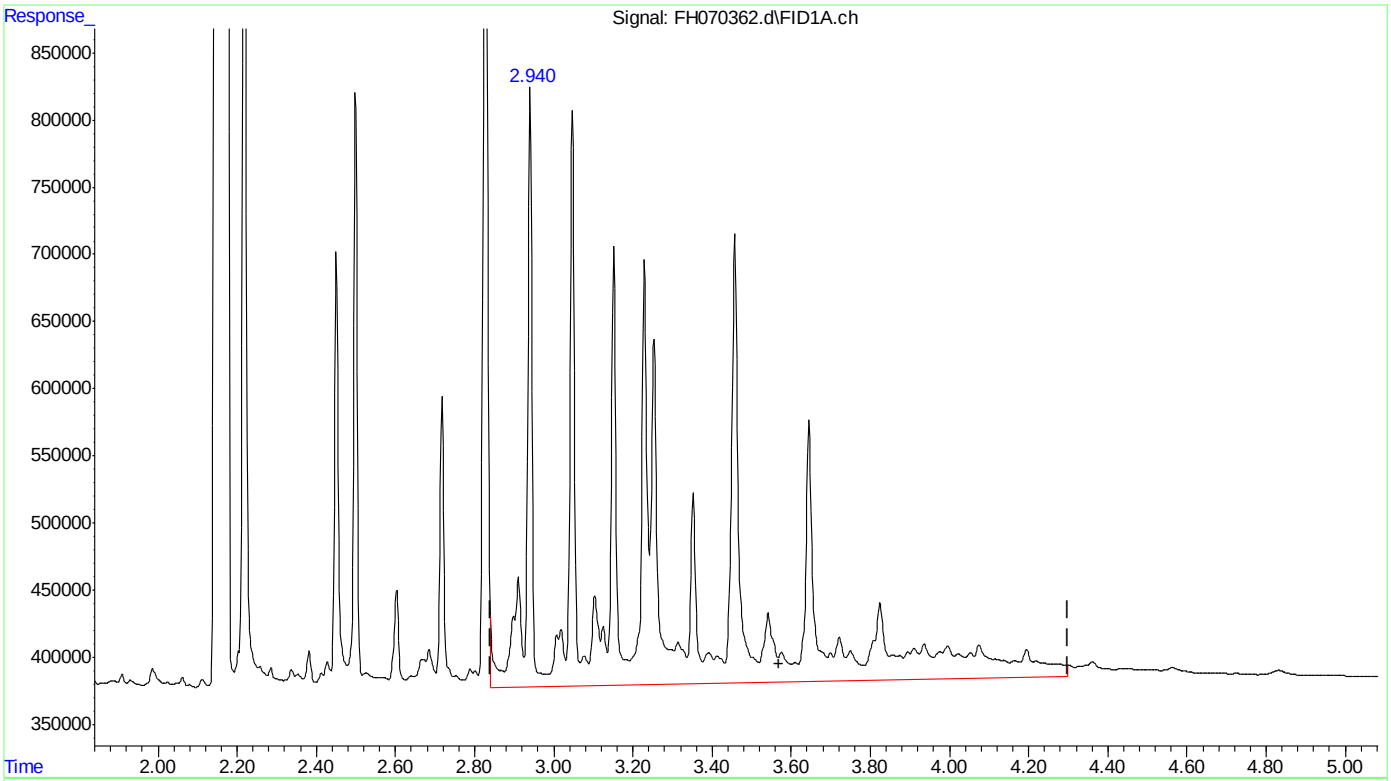
(+) = Expected Retention Time

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070362.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 9:50 pm
Operator : michaelb
Sample : da61100-5
Misc : OP24817,GFH23788,1010,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:37 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



(5) TPH-ORO (>C24-C40) (H)

3.570min 88.889 ug/ml

response 35651254

(+) = Expected Retention Time

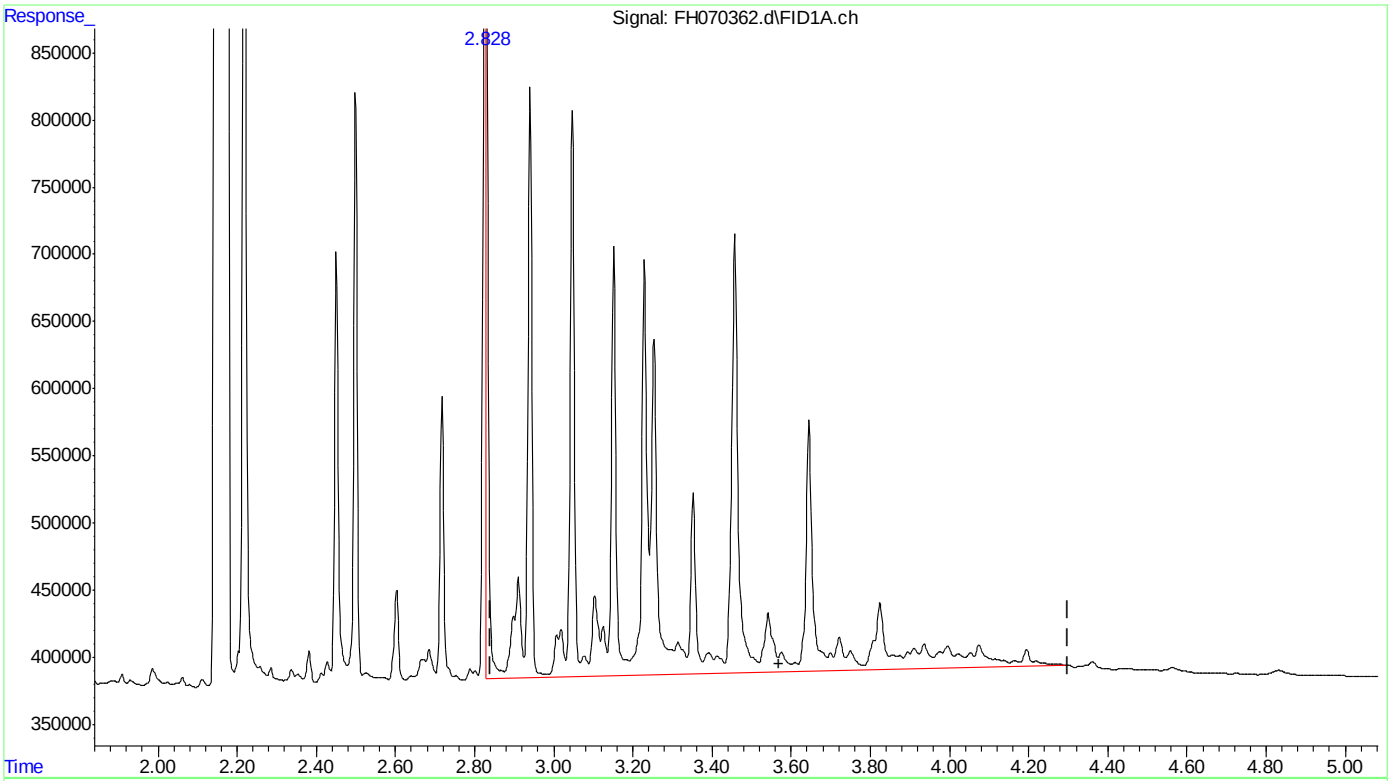
DRO-122823.M Sun Jan 07 14:05:21 2024 Page: 1

Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070362.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 9:50 pm
Operator : michaelb
Sample : da61100-5
Misc : OP24817,GFH23788,1010,,,1,1
ALS Vial : 16 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:37 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :



(5) TPH-ORO (>C24-C40) (H)

3.570min 75.961 ug/ml m

response 31705691

(+) = Expected Retention Time

DRO-122823.M Sun Jan 07 14:05:26 2024 Page: 1

Method Blank Summary

Job Number: DA61100
Account: AECOMHIH AECOM
Project: CV CTO 22F0122

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP24817-MB	FH070348.D	1	01/05/24	MB	01/05/24	OP24817	GFH23788

The QC reported here applies to the following samples: **Method:** SW846-8015D

DA61100-1, DA61100-2, DA61100-3, DA61100-4, DA61100-5, DA61100-6, DA61100-7, DA61100-8, DA61100-9, DA61100-10, DA61100-11, DA61100-12

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C24)	ND	0.080	0.052	mg/l	
	TPH-ORO (> C24-C40)	ND	0.080	0.052	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	79%	10-131%

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070348.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 7:55 pm
Operator : michaelb
Sample : op24817-mb
Misc : OP24817,GFH23788,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:09 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
	System Monitoring Compounds				
1) S	o-Terphenyl	2.173	882020796	1570.813	ug/ml
	Target Compounds				
2) H	TPH-DRO (C10-C28)	1.980	15472790	39.785	ug/ml
3) H	TPH-DRO (C10-C24)	1.760	11128563	28.997	ug/ml
4) H	TPH-ORO (>C28-C40)	3.790	4673922	5.478	ug/ml
5) H	TPH-ORO (>C24-C40)	3.570	9000566	1.566	ug/ml

(f)=RT Delta > 1/2 Window (m)=manual int.

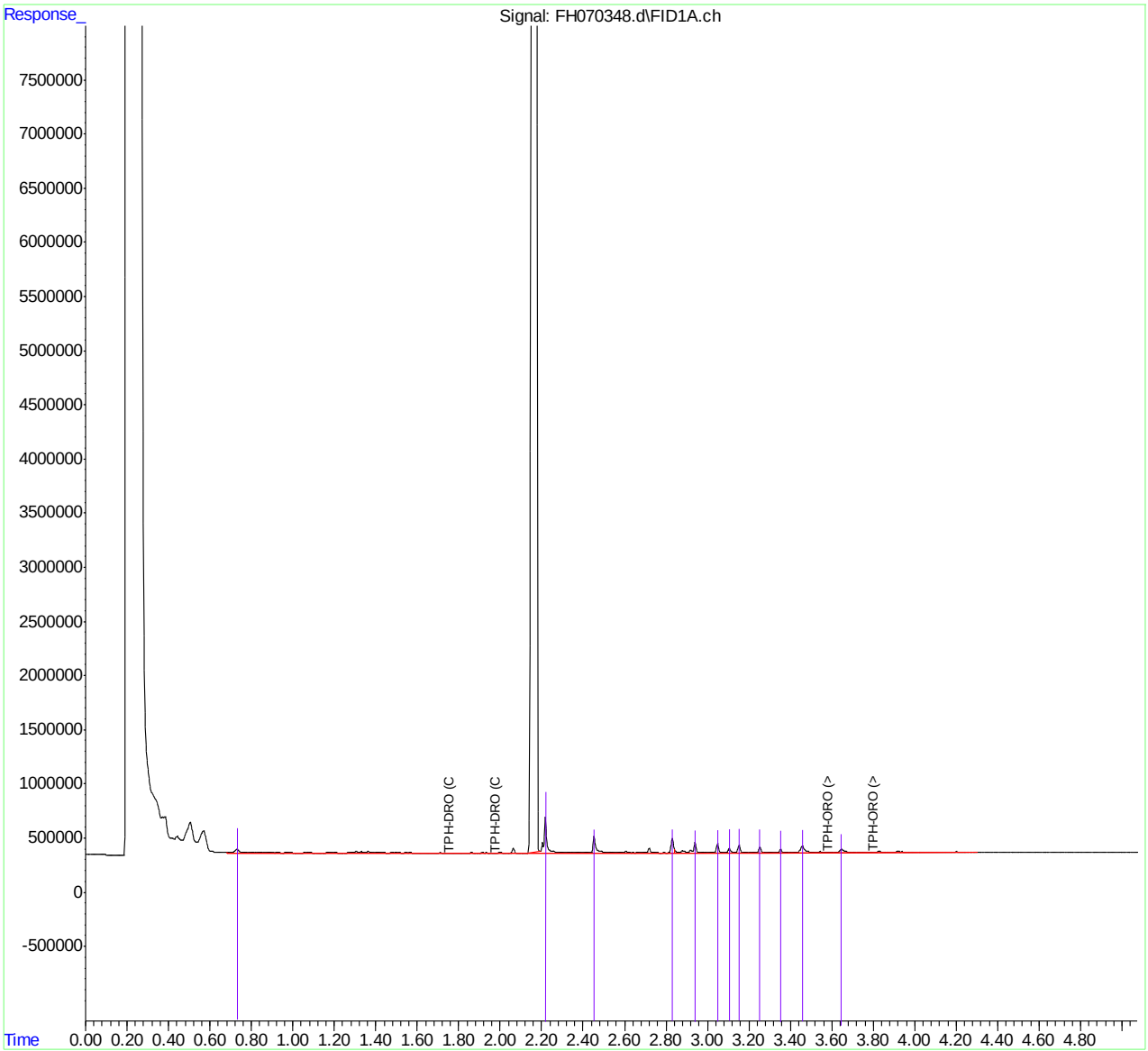
11.2.3 11

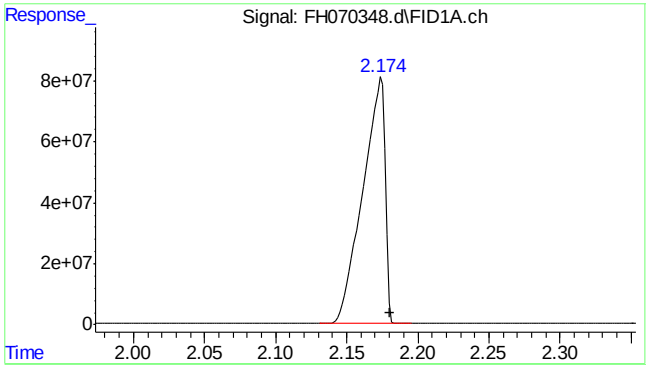
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070348.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 7:55 pm
Operator : michaelb
Sample : op24817-mb
Misc : OP24817,GFH23788,1000,,,1,1
ALS Vial : 4 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:09 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

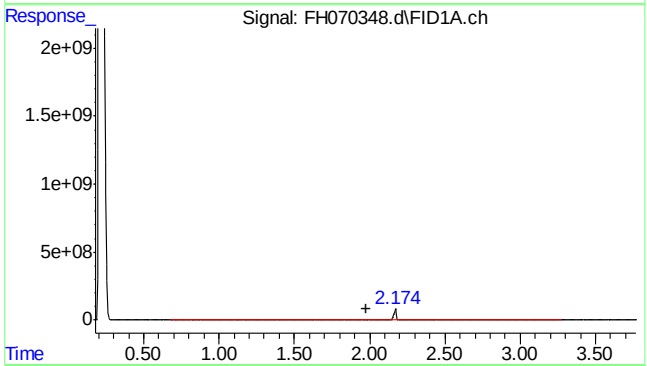
Volume Inj. :
Signal Phase :
Signal Info :





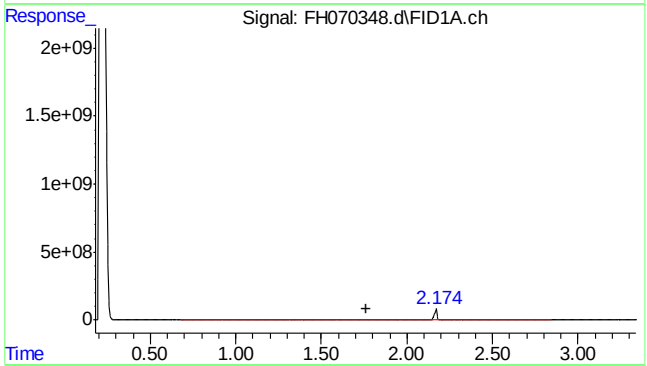
#1 o-Terphenyl

R.T.: 2.173 min
Delta R.T.: -0.007 min
Response: 882020796
Conc: 1570.81 ug/ml



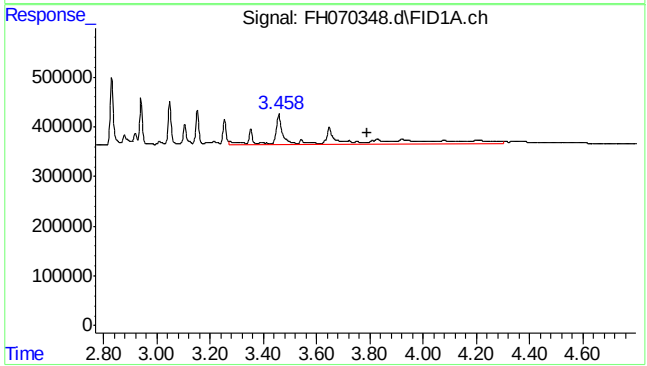
#2 TPH-DRO (C10-C28)

R.T.: 1.980 min
Delta R.T.: 0.000 min
Response: 15472790
Conc: 39.78 ug/ml



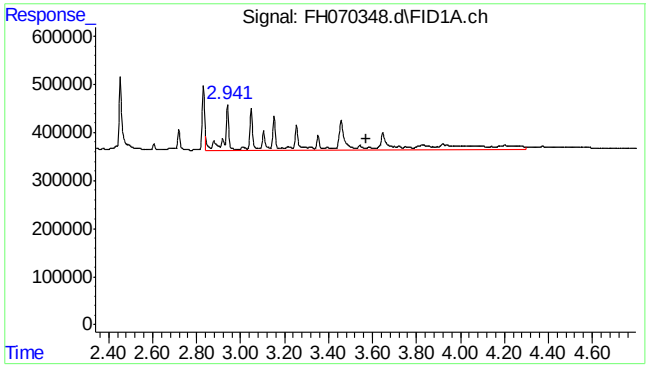
#3 TPH-DRO (C10-C24)

R.T.: 1.760 min
Delta R.T.: 0.000 min
Response: 11128563
Conc: 29.00 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.790 min
Delta R.T.: 0.000 min
Response: 4673922
Conc: 5.48 ug/ml



#5 TPH-ORO (>C24-C40)

R.T.:	3.570 min
Delta R.T.:	0.000 min
Response:	9000566
Conc:	1.57 ug/ml

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070343.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 7:14 pm
Operator : michaelb
Sample : RT C10-C40
Misc : OP20000,GFH23788,,,,,1
ALS Vial : 2 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:45:59 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
System Monitoring Compounds					
1) S	o-Terphenyl	0.000	0	N.D.	ug/ml
Target Compounds					
2) H	TPH-DRO (C10-C28)	1.980	24239372	62.326	ug/ml
3) H	TPH-DRO (C10-C24)	1.760	18933299	49.333	ug/ml
4) H	TPH-ORO (>C28-C40)	3.790	13315262	55.530	ug/ml
5) H	TPH-ORO (>C24-C40)	3.570	18624030	33.098	ug/ml

(f)=RT Delta > 1/2 Window (m)=manual int.

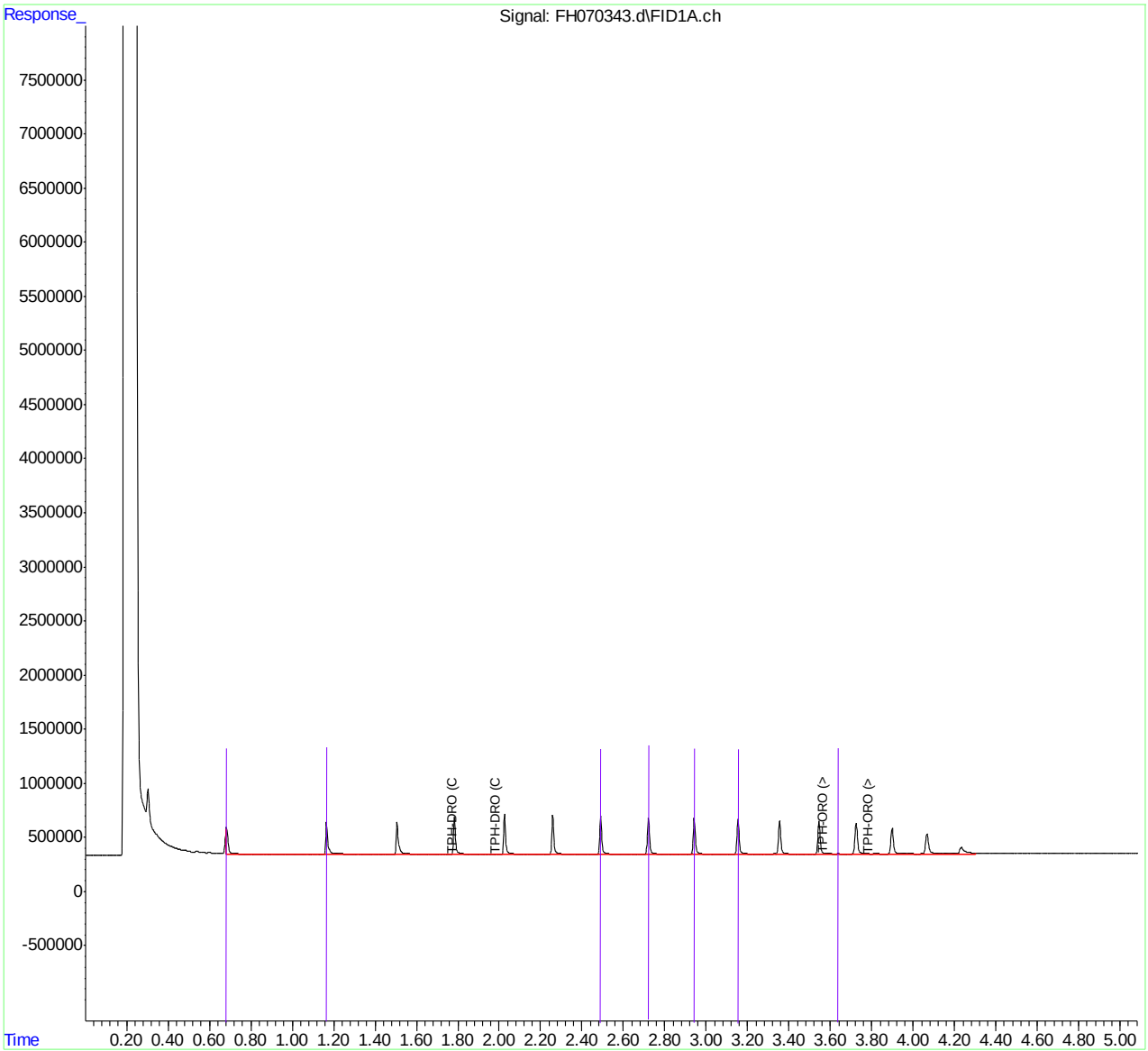
11.5.2 11

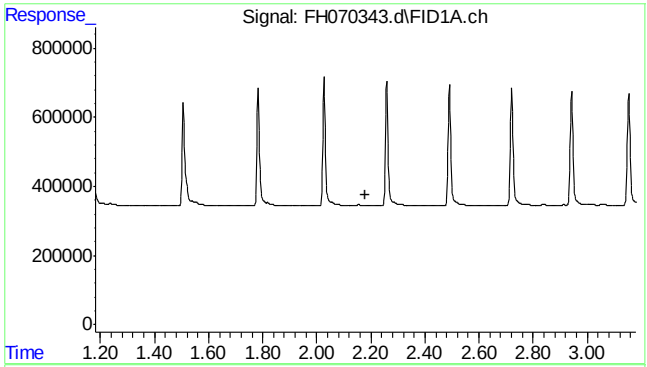
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070343.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 7:14 pm
Operator : michaelb
Sample : RT C10-C40
Misc : OP20000,GFH23788,,,,,1
ALS Vial : 2 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:45:59 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

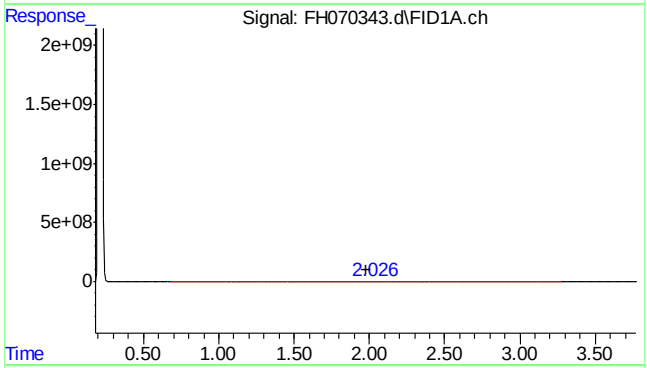
Volume Inj. :
Signal Phase :
Signal Info :





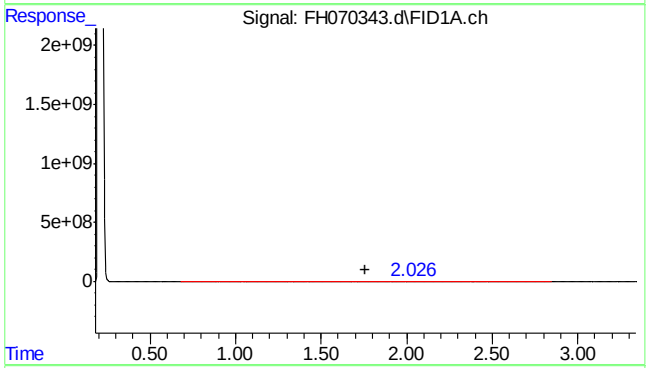
#1 o-Terphenyl

R.T.: 0.000 min
Exp R.T. : 2.180 min
Response: 0
Conc: N.D.



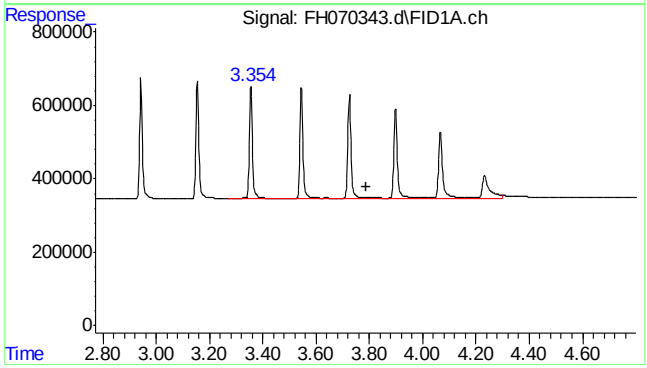
#2 TPH-DRO (C10-C28)

R.T.: 1.980 min
Delta R.T.: 0.000 min
Response: 24239372
Conc: 62.33 ug/ml



#3 TPH-DRO (C10-C24)

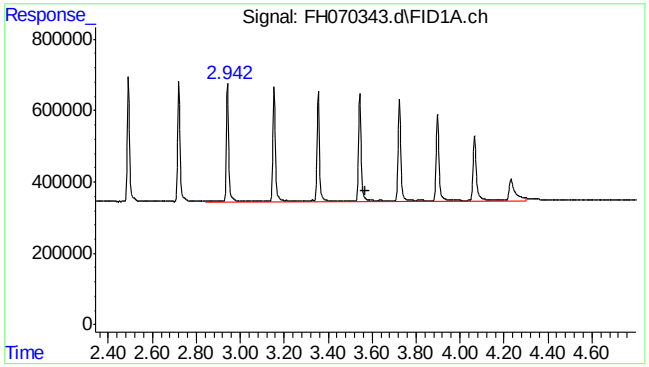
R.T.: 1.760 min
Delta R.T.: 0.000 min
Response: 18933299
Conc: 49.33 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.790 min
Delta R.T.: 0.000 min
Response: 13315262
Conc: 55.53 ug/ml

11.5.2
11



#5 TPH-ORO (>C24-C40)

R.T.:	3.570 min
Delta R.T.:	0.000 min
Response:	18624030
Conc:	33.10 ug/ml

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070344.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 7:22 pm
Operator : michaelb
Sample : RT JP-05
Misc : OP20000,GFH23788,,,,,1
ALS Vial : 3 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:01 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc	Units
System Monitoring Compounds					
1) S	o-Terphenyl	0.000	0	N.D.	ug/ml
Target Compounds					
2) H	TPH-DRO (C10-C28)	1.980	221080354	568.456	ug/ml
3) H	TPH-DRO (C10-C24)	1.760	220947579	575.701	ug/ml
4) H	TPH-ORO (>C28-C40)	3.790	770099	N.D.	ug/ml
5) H	TPH-ORO (>C24-C40)	3.570	910143	N.D.	ug/ml

(f)=RT Delta > 1/2 Window (m)=manual int.

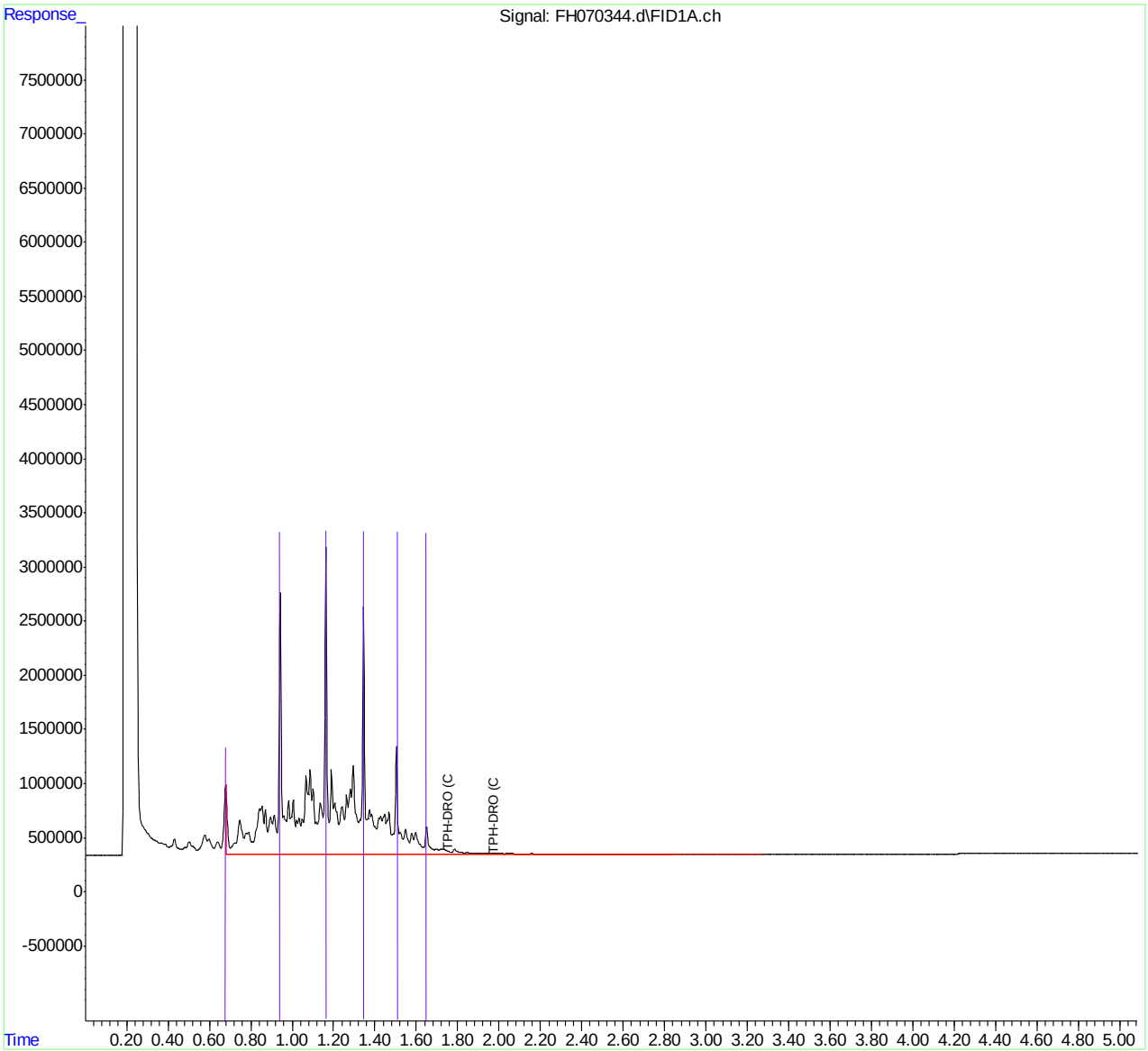
11.5.3 11

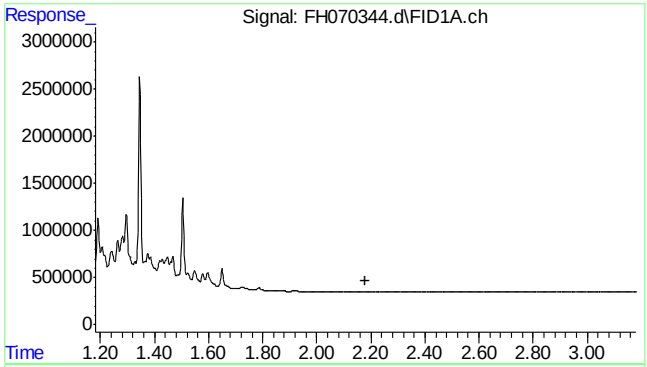
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\2024\01.24\GFH\010524\
Data File : FH070344.d
Signal(s) : FID1A.ch
Acq On : 5 Jan 2024 7:22 pm
Operator : michaelb
Sample : RT JP-05
Misc : OP20000,GFH23788,,,,,1
ALS Vial : 3 Sample Multiplier: 1

Integration File: autoint1.e
Quant Time: Jan 07 13:46:01 2024
Quant Method : C:\msdchem\1\methods\DRO-122823.M
Quant Title : DRO-ORO FRONT
QLast Update : Thu Jan 04 16:49:54 2024
Response via : Initial Calibration
Integrator: ChemStation

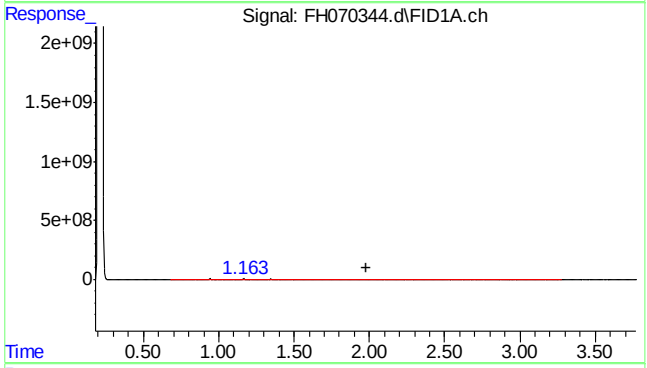
Volume Inj. :
Signal Phase :
Signal Info :





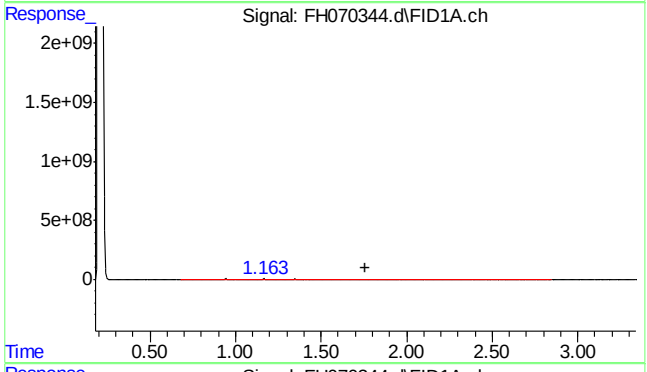
#1 o-Terphenyl

R.T.: 0.000 min
Exp R.T. : 2.180 min
Response: 0
Conc: N.D.



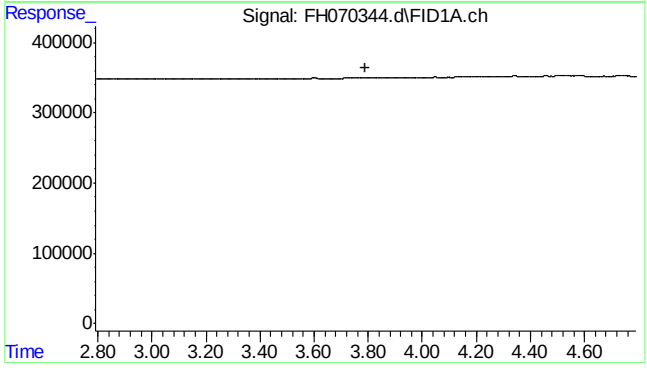
#2 TPH-DRO (C10-C28)

R.T.: 1.980 min
Delta R.T.: 0.000 min
Response: 221080354
Conc: 568.46 ug/ml



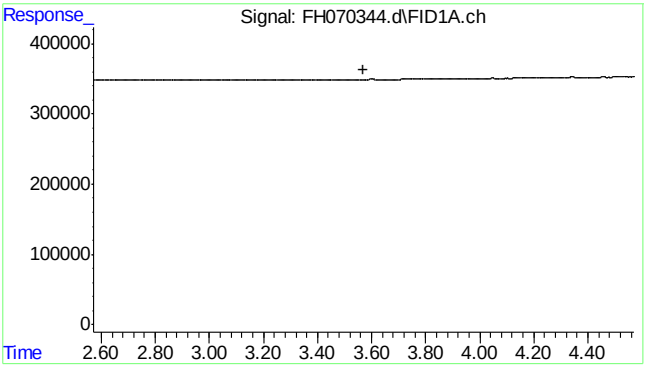
#3 TPH-DRO (C10-C24)

R.T.: 1.760 min
Delta R.T.: 0.000 min
Response: 220947579
Conc: 575.70 ug/ml



#4 TPH-ORO (>C28-C40)

R.T.: 3.790 min
Delta R.T.: 0.000 min
Response: 770099
Conc: N.D.



#5 TPH-ORO (>C24-C40)

R.T.:	3.570 min
Delta R.T.:	0.000 min
Response:	910143
Conc:	N.D.