# County of Brunswick

3954 Clearwell Dr NE
Leland, NC 28451

## Northwest Plant

Leland, NC
Samples Received: 12-27-18

## Analytical Report
## (1218-719)

## *Isotope Dilution*

PFAS

**Enthalpy Analytical, LLC – Ultratrace**

Phone: (910) 212-5858 / www.enthalpy.com
2714 Exchange Drive, Wilmington, NC 28405

I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains 10 pages.

Bryan Vining

Digitally signed by Bryan Vining
DN: cn=Bryan Vining, o=Enthalpy Analytical, ou=Ultratrace, email=bryan.vining@enthalpy.com, c=US
Date: 2019.01.12 08:34:21 -05'00'

Report Issued Date: 12 JAN 18

ENTHALPY ANALYTICAL

ENTHALPY ANALYTICAL

## Summary of Results

## Enthalpy Ultratrace Batch # 10185

## PFAS

| Analyte | 122718-S01 | 122718-E01 |
|---|---|---|
| **Acids** | | |
| PFBA | 3.42JB | 3.14JB |
| PFPeA | 3.56JB | 3.64JB |
| PFHxA | 3.21JB | 3.38JB |
| PFHpA | 1.98JB | 1.94JB |
| PFOA | 3.22JB | 2.38JB |
| PFNA | 0.794JB | 0.736JB |
| PFDA | ND | 0.157J |
| PFUnA | ND | 0.0621JB |
| PFDoA | ND | ND |
| PFTrA | ND | ND |
| PFTA | ND | ND |
| | | |
| **Sulfonates** | | |
| L-PFBS | 1.43J | 0.951J |
| PFPeS | ND | ND |
| PFHxS | 2.15J | 1.46J |
| PFHpS | ND | 0.320J |
| PFOS | 3.36J | 2.88J |
| PFNS | ND | ND |
| PFDS | 1.08JB | 1.10JB |
| 4:2 FTS | ND | ND |
| 6:2 FTS | 0.532JB | 0.695JB |
| 8:2 FTS | ND | 0.101JB |
| | | |
| **Other** | | |
| PFOSA | 0.169JB | 0.324JB |
| N-MeFOSAA | ND | ND |
| N-EtFOSAA | ND | ND |
| HFPO-DA (Gen-X) | ND | 3.84 |
| **Lab Sample ID** | 1218-719_10185_001 | 1218-719_10185_002 |

# Enthalpy Analytical Narrative Summary

| | | | |
|---|---|---|---|
| **Company** | County of Brunswick | **Client #** | N/A |
| **Analyst** | H. Allen | **Job #** | 1218-719 |
| **Parameters** | PFAS | **# Samples** | 2 |

| | |
|---|---|
| **Custody** | Enthalpy Analytical Wilmington received the samples (via client courier) received by Robin Appelle on 12/27/2018. The samples were received on ice at 2.4°C in good condition.<br><br>Prior to, during, and after analysis, the samples were stored in the laboratory with access only by authorized personnel of Enthalpy Analytical, LLC. |
| **Analysis** | The samples were analyzed by isotope dilution for PFAS via LC/MS/MS. The analysis was completed using the following instrumentation: Waters Acquity UPLC equipped with Xevo TQ MS (Kili).<br><br>The sample is spiked with ES, mixed well and centrifuged. An aliquot of supernatant is added to a measured volume of water and extracted via SPE. The elute is condensed, reconstituted with IS and analyzed. |
| **Calibration** | The labeled standards in the initial calibration met the RSD\ less than 30% for all analytes . All analytes passed the $R^2$>0.99 coefficient correlation criteria.<br><br>The ICV met the ±30% criteria for all analytes. The CCV met the ±30% criteria for analytes and labeled standards, except for M2-6:2 FTS and M2-8:2 FTS, which is because the CS8 was used for the Low analysis, and the native contribution caused a high bias in the result. |
| **QC Notes** | The QC injections passed method criteria.<br><br>The samples were extracted within the 14-day from collection holding time. Extracts were analyzed within the 28-days from extraction to analysis holding time required by the method.<br><br>Some analytes were detected in the method blank. Where those analytes were detected in the samples and were not more than 10 times what was detected in the method blank, a B qualifier was attached to the result. |

| | |
|---|---|
| **Reporting Notes** | The results presented in this report are representative of the samples as provided to the laboratory.<br><br>These analyses met the requirements of the TNI Standard. Any deviations from the requirements of the reference method or TNI Standard have been stated above.<br><br>The samples, calibrations and standards for the data presented in this report were analyzed at 2714 Exchange Drive, Wilmington, NC 28405. |

# General Reporting Notes – Data Qualifiers

The following are general reporting notes that are applicable to all Enthalpy Analytical, Inc.-Wilmington, NC data reports, unless specifically noted otherwise.

**General Data Qualifiers / Data Attributes**

- B – The analyte was found in the method blank, at a concentration that was at least 10% of the concentration in the sample.
- C – Two or more congeners co-elute. In EDDs, C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter**.**
- E – The reported concentration exceeds the calibration range (upper point of the calibration curve).
- EMPC – Represents an estimated maximum possible concentration. EMPCs arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
- J – Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
- ND – Indicates a non-detect.
- NR – Indicates a value that is not reportable.
- PR – Due to interference, the associated congener is poorly resolved.
- DI – Indicates the presence of a quantitative interference.
- SI – Denotes "Single Ion Mode" and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.
- U – The analyte was not detected. The Estimated Detection Limit (EDL) may be reported for this analyte.
- V – The labeled standard recovery was found to be outside of the method control limits.

**DRBC/TMDL Specific Data Qualifiers / Data Attributes**

- J – The reported result is an estimate. The value is less than the minimum calibration level but greater than the Estimated Detection Limit (EDL).
- U – The analyte was not detected in the sample at the Estimated Detection Limit (EDL).
- E – The reported concentration is an estimate. The value exceeds the upper calibration range (upper point of the calibration curve).

- D – Dilution Data. Result was obtained from the analysis of a dilution.
- B – Analyte found in the sample and associated method blank.
- Cxx – Co-elutes with the indicated congener, data is reported under the lowest IUPAC congener. 'xx' denotes the IUPAC number with the lowest numerical designated congener.
- NR – Analyte is not reportable because of problems in sample preparation or analysis.
- V – Labeled standard recovery is not within method control limits.
- X – Results from re-injection/repeat/second-column analysis.
- EMPC – Estimated Maximum Possible Concentration. Indicates that a peak is identified but did not meet the method specified ion-abundance ratio.

**Lab Identifiers**

- AR – Indicates use of the archived portion of the sample extract.
- CU – Indicates a sample that required additional clean-up prior to HRMS injection/processing.
- D – Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
- DE – Indicates a dilution performed with the addition of ES (Extraction Standard) solution.
- DUP – Designation for a duplicate sample.
- MS – Designation for a matrix spike.
- MSD – Designation for a matrix spike duplicate.
- RJ – Indicates a reinjection of the sample extract.
- S – Indicates a sample split. The number that follows the "S" indicates the split factor.

# Job 1218-719 report due Friday Jan 11 2019

ENTHALPY ANALYTICAL

| | | | |
|---|---|---|---|
| To | Glenn Walker | From | Lindsay Boone |
| Company | County of Brunswick | Customer PO | |
| Site | | Sales Order | SO1032859 |
| Customer Phone | 910-612-5618 | Date Due QA | Wednesday, January 09, 2019 |
| Customer Email | glenn.walker@brunswickcountync.gov | Results Due | Friday, January 11, 2019 |
| Customer Project | | Report Due | Friday, January 11, 2019 |

| Line | Method | Analytes | Quant | Dept | Objective | Status |
|---|---|---|---|---|---|---|
| 1 | WM-026<br>PFAS by Isotope Dilution (non-potable water)<br>report: | Legacy 24 plus Gen X | 2 | Wilmington | | Sampled 12-27-18 10:05 (local time)<br>Received 12-27-18 15:55<br>ReceivedTemp 2.4<br>StorageTemp 4<br>StorageLocation R1 |

1218-719

# Chain of Custody Record

ENTHALPY analytical

Enthalpy Ultratrace Job#: _____ COC Page_____of_____

**Special Handling:**

☑ Standard Turn Around Time

☐ Rush Turn Around Time -- Date Needed_____

• All Fast TATs Subject to Approval by Enthalpy Analytical, Inc.

• All Samples Disposed of After 6 months Unless Otherwise Instructed.

Enthalpy Analytical-Wilmington, NC has added enhancements to standard methods to improve accuracy, precision and permit an assessment of laboratory performance in the context of your specific data needs. For more information email Cindy.James@enthalpy.com.

Client Name: Brunswick County Water

Project Manager: Glenn Walker

Report To: Same

Project Number: _____

Site Name: North West Plant

Location: Same

PO#: _____

Telephone#: 910-371-3490

Email: glenn.walker@brunswickcountync.gov

This Chain of Custody is applicable to Non-Air samples. Standard TAT differ per analysis and are provided by request.

**Client Special Instructions:**

Matrix: GW-Groundwater, WW-Wastewater, NW-Non-Potable Water, DW-Drinking Water, S-Soil, SL-Sludge, BT-Biological Tissue, O-Other

Type: G=Grab C=Composite Q=Quality Control

| Sample ID | Date | Time | Sample Volume | Type | Matrix | Sample Containers: # of Bottles | # of Jars | # of Bags | # Other | | | | Analyses: Method 1613 | Method 8290 | Method 1668A/B/C PCB | PFAS by LC/MS/MS | PAHs by HRGC/HRMS | Sample on Hold | EPA 537 + GEN | | Notes: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 122718 - S01 | 12-27-18 | 1005 | 30 mL | G | NW | 2 | | | | | | | | | | | | | ✓ | | |
| 122718 - E01 | 12-27-18 | 1005 | 30 mL | G | DW | 2 | | | | | | | | | | | | | ✓ | | |

| Relinquished By: | Date: | Received By: | Date: | Time: | Sample Temperature Upon Receipt: |
|---|---|---|---|---|---|
| * Glenn A. Comfetter | 12-27-18 | | 12/27/18 | 1555 | ☒ Iced ☐ Ambient °C 2.4° |
| | | | | | ☐ Iced ☐ Ambient °C_____ |
| | | | | | ☐ Iced ☐ Ambient °C_____ |



Enthalpy Courier, No seals, On Ice, Good Condition. NA 12/27/18

# This Is The Last Page Of This Report.

ENTHALPY ANALYTICAL