

Westford Outfall Inventory and Dry Weather Screening Field Effort - FY2021 Summary

TO: Paul Starratt, P.E., Town Engineer
COPY: Jeremy Downs, P.E., Assistant Town Engineer
Stephen Cronin, Director of Public Works
DATE: June 30, 2021

Per *Section 2.3.4.7.b Dry Weather Outfall and Interconnection Screening and Sampling* of the 2016 Small Municipal Separate Storm Sewer Systems (MS4) General Permit, “**all outfalls/interconnections ... shall be inspected for the presence of dry weather flow within three (3) years of the permit effective date.**”

1 Background

Tighe & Bond and the Town of Westford staff have previously completed two rounds of outfall investigations during Fiscal Year 2018 (FY18) and Fiscal Year 2020 (FY20). Results from those field efforts were delivered under separate covers, titled *Westford Outfall Inventory and Dry Weather Screening Field Effort Summary - June 2018* and *November 2020*. Please refer to each document for further information about field work preparation, methods of data collection, and background about water quality standards and sampling requirements for stormwater pollutants.

2 Fall 2020 and Spring 2021 Field Work Overview

This memorandum presents a summary of Tighe & Bond’s outfall investigation field work during Fiscal Year 2021 (FY21) and findings for Westford’s remaining outfalls. During the Fall 2020 and Spring 2021 field efforts, Tighe & Bond and Westford staff completed 246 outfall investigations and sampled at 27 outfalls or upstream drainage structures with dry weather flow¹. This value does not include two (2) additional samples that were taken during the interconnection investigations. **None of the outfalls investigated met EPA’s criteria for a likely sewer input.** At the conclusion of this work, all known outfalls and interconnections have been inspected for dry weather flow.

Tighe & Bond along with Westford staff completed outfall investigations over ten (10) days in December 2020 and January, March, and April 2021, including gathering outfall inventory² data and sampling at outfalls if dry weather flow was present. Additionally, Tighe & Bond completed interconnection investigations in one day in June 2021. The *Dry Weather Sampling Procedure*, developed as part of the town IDDE program, was followed for each outfall investigation and may be used for future outfall investigations. In total, Tighe & Bond visited

¹ **Dry Weather Flow:** This term refers to when there is flow present at an outfall/ interconnection and there has been less than 0.10 inches of rainfall in the previous 24 hours and no significant snow melt is occurring.

² **Inventory:** This term refers to the General Permit requirement in *Section 2.3.4.7.a* to visually inspect each outfall during dry weather conditions and collect prescribed data such as location, size, and visual and olfactory evidence of an illicit discharge.

246 outfalls and **5** interconnections per the General Permit *Section 2.3.4.7*. Please see Section 3 of this memorandum for results from the field effort.

Tighe & Bond will deliver an updated outfall inventory and GIS maps to the Town with the results of the outfall investigation and dry weather sampling, including photographs of the outfalls investigated, additional outfall attributes, and water quality screening and laboratory results. This information is included in the following Attachments.

The map in **Attachment 1** shows the final results of the Town's dry weather screening efforts, including the locations of all mapped outfalls and interconnections. Each outfall is denoted as to whether it was visited during the PY3 field effort or during previous efforts, and whether it was confirmed to be an accurately mapped outfall.

The map in **Attachment 2** shows the updated outfall priority ranking based on this and previous dry weather screening field efforts for all of Westford's known MS4 outfalls. See Section 4.1 for additional information.

Attachment 3 includes an Excel spreadsheet with two separate tabs of data:

1. The Town's outfall inventory (filtered to hide non-MS4 outfalls), including receiving water, priority ranking, updated priority ranking, and screening status.
2. Inspection and in-situ sampling data collected during the PY3 field effort.

This data, along with the entire outfall inventory, is also available in the Town's stormwater geodatabase.

A summary of the dry weather sampling results are included in **Attachment 4**, and the full laboratory-provided sampling results are included in **Attachment 5**.

3 Outfall Investigation Results

Section 3 of this memorandum presents the results of the outfall investigations and dry weather flow sampling.

3.1 Fall 2020 and Spring 2021 Outfall Investigation Results

The following is a summary of the Fall 2020 and Spring 2021 field work results:

- **246** outfalls were visited during the Fall 2020 and Spring 2021 field effort. Of those visited:
 - **149** outfalls were successfully screened for dry weather flow. These outfalls are denoted with green triangles in Attachment 1.
 - **27** of these outfalls had dry weather flow and were sampled. If the outfall was submerged in a water body, samples were taken from the upstream catch basin or drain manhole. These outfalls are denoted with purple circles in Attachment 1. See Section 3.4 for more information.
 - **4** of these outfalls were newly discovered, mapped in GIS, added to the MS4 inventory, and successfully screened. These outfalls are denoted with green circles in Attachment 1.
 - **2** outfalls (OF-418 and OF-22) were screened and incorrectly reclassified prior to PY3 but were reinvestigated in PY3 as outfalls and are marked as screening complete.

- **97** outfalls were visited and should be removed from the outfall inventory because they did not exist, are another stormwater asset (i.e., catch basin) or they were determined to be owned and operated by another entity (i.e., Private). These outfalls are denoted as blue triangles in Attachment 1. See Section 3.6 for additional information.
- **5** interconnections were successfully screened for dry weather flow. These interconnections are denoted as a circled 'X' in Attachment 1. Tighe & Bond visited 7 potential interconnections during the field effort in June 2021. As a result of the field work, potential interconnections IC-1 and IC-2 were deemed to not fall under the Town's General Permit requirements as the drainage network at these two locations flow from the DOT's stormwater network into the Town's. These two locations were not included in the interconnection inventory.

3.2 Outfall Investigations Completed from Previous Field Efforts

Prior to the PY3 field efforts, **363** outfalls were successfully screened in Fall 2017 and Fall 2019. These outfalls are denoted with orange triangles in Attachment 1.

For more detail on the previous field efforts refer to the Town's IDDE Plan and the FY18 and FY20 outfall memorandums.

3.3 Outfall Inventory Summary to Date

A summary of the Town's final outfall inventory at the conclusion of this field effort is provided in Table 3-1 below.

TABLE 3-1
Outfall Inventory Summary – Fall 2020 and Spring 2021

	Change	Subtotal
Outfalls in Original Inventory		688
Outfalls Removed prior to NOI	-75	
Outfall Inventory in NOI		613
Mapped Outfalls Removed Prior to PY3	-52	
Outfalls Added Prior to PY3	+44	
Total Mapped Outfalls at Beginning of PY3 Effort		605
Outfalls Discovered during Investigations	+ 4	
Mapped Outfalls Removed from Inventory	- 97	
Revised Total Number of Outfalls in Inventory		512**
Interconnections	+5	
Updated Outfall/Interconnection Inventory		517

**Total does not include five (5) interconnections inspected.

3.4 Dry Weather Flow Sampling Results

The Town and Tighe & Bond completed dry weather sampling at 27 outfalls, upstream drainage structures, or interconnections with dry weather flow during the Fall 2020 and Spring 2021 field efforts which are listed in Table 3-2 below. Sampling was completed when flow was present at outfalls which had rainfall totals less than 0.10-inches in the previous 24 hours.

TABLE 3-2
Outfalls & Interconnections Where Dry Weather Sampling was Conducted (PY3)

Outfall ID	Sampling Location	Street	Illicit Connection	Date
OF-251	Outfall	North Street	None	12/2/2020
OF-5	Outfall	Pond Road	None	12/2/2020
OF-372	Upstream Catch Basin	Bridge Street	None	12/4/2020
OF-302A*	Upstream Manhole	Pierce Avenue	None	12/4/2020
OF-302B*	Upstream Manhole	Pierce Avenue	None	12/4/2020
OF-308A*	Upstream Catch Basin	Fletcher Road	None	12/4/2020
OF-308B*	Upstream Catch Basin	Fletcher Road	None	12/4/2020
OF-308C*	Upstream Manhole	Fletcher Road	None	12/4/2020
OF-306	Upstream Catch Basin	Fletcher Road	None	12/4/2020
OF-317B	Outfall	Abbott School	None	12/4/2020
OF-291	Upstream Catch Basin	Kirsi Circle	None	12/4/2020
OF-320	Upstream Manhole	Crown Road	None	12/16/2020
OF-321	Outfall	Court Road	None	12/16/2021
OF-269	Outfall	Forge Village Road	None	1/28/2021
OF-1053	Outfall	Stony Brook Road	None	1/28/2021
OF-449	Outfall	Swedes Crossing	None	3/10/2021
OF-176	Outfall	Wagon Trail Road	None	3/10/2021
OF-326	Outfall	Drawbridge Road	None	3/10/2021
OF-324	Outfall	Drawbridge Road	None	3/10/2021
OF-1090	Outfall	Rome Drive	None	3/11/2021
OF-284	Outfall	Boston Road	None	3/11/2021
OF-266	Outfall	Main Street	None	3/11/2021
OF-409	Outfall	Alcorn Crossing	None	3/11/2021
OF-406	Outfall	Starr Circle	None	3/11/2021
OF-10	Outfall	Main Street	None	3/11/2021
OF-1047	Upstream Catch Basin	Brookside Road	None	3/17/2021
OF-1059	Outfall	Lowell Road	None	3/17/2021
OF-455	Upstream Manhole	Sinbad Lane	None	3/17/2021
OF-375	Outfall	Overlook Circle	None	3/30/2021
OF-451	Outfall	Deer Run Drive	None	3/30/2021
IC-4	Interconnection	Boston Road	None	6/2/2021
IC-6	Interconnection	Chandler Road	None	6/2/2021

*Multiple samples were collected from upstream structures for two outfalls.

Sampling results are included in the Outfall Sampling Results Summary in Attachment 4 and the Town's GIS data. The summary has a color-coded ranking system for the results of the outfall monitoring, which demonstrates the severity of the sampling results (i.e., a red result denotes a higher, potentially problematic concentration of a stormwater pollutant). The ranking system uses known EPA benchmarks for each pollutant analyzed. This system was used to clearly understand the water quality at each outfall and will be used to determine the follow-up outfall prioritization required by *Section 2.3.4.7.c* of the General Permit. At the

conclusion of all the outfall investigation field work, a priority ranking of "low" or "high" will be updated for each outfall depending on sampling results and its potential for the presence of an illicit discharge. Samples were sent to Alpha Analytical Laboratories of Westborough, Massachusetts and laboratory data is available in Attachment 5.

Per *Section 2.3.4.7.a* of the General Permit, all outfalls within the MS4 must be priority ranked based on their illicit discharge potential. As described in Section 1.3 of this memorandum, outfalls should be considered high priority if there is dry weather flow with pollutant concentrations or visual observations that meet the criteria for a likely sewer input. The General Permit also requires that discharges that may cause or contribute to an in-stream exceedance of surface water quality standards should be considered a high priority for catchment investigations.

Characteristics of Likely Sewer Input: No location met EPA's criteria for a likely sewer input. A number of outfalls had various exceedances of benchmark levels. In order to be considered a potential source of illicit discharge, it would be expected that flow from a single outfall would surpass multiple benchmarks as described in Section 1.3. A single benchmark exceedance is not alone indicative of an illicit discharge.

- None of the 27 sampled outfalls had elevated levels of surfactants or ammonia.
- Bacteria (*E. coli*, *Enterococcus*, or *Fecal Coliform*) was detected above EPA benchmarks at outfalls OF-1053, OF-5, OF-308, OF-320, and OF-321. However, it is unlikely that there is a sewer input to these outfalls, as ammonia and surfactants were detected below EPA benchmarks. These outfalls should be ranked as high priority for catchment investigations and implementation of the IDDE Program.
- Outfalls OF-176, OF-1090, and OF-375 had total phosphorus levels detected above the 0.024 mg/L benchmark. This could be due to decaying organic matter or runoff from residential lawn watering with recent fertilizer applications. Elevated phosphorus levels alone are not indicative of an illicit sewer discharge, without any exceedances of other benchmarks. It is unlikely that a sewer input exists at these outfalls, as surfactants, *E. coli*, and ammonia (lab analysis) levels were all below EPA benchmarks. These outfalls were ranked as high priority for catchment investigations.
- Outfalls OF-317B, OF-266, and OF-10 had levels of salinity and/or conductivity that were at or above EPA benchmarks. These outfalls were ranked as high priority for catchment investigations. However, it is unlikely that there is a sewer input to these outfalls since *E. coli*, surfactants, and ammonia (lab analysis) were non-detect or below the EPA benchmarks. Winter deicing on public roads and private property may be contributing to widespread elevated salinity.
- The majority of the sampled outfalls and one of the interconnections had chlorine levels greater than the EPA benchmark of 0.02 mg/L, which may indicate potable water source inputs. However, none of these outfalls met the criteria for likely sewer input as levels of ammonia, surfactants, and *E. coli* (except for OF-5, OF-308, OF-320, OF-321) were non-detect or below EPA benchmarks for each of these outfalls. Sources of chlorine may include water main leaks or breaks, hydrant flushing, or chlorinated pool water discharges to the storm drain. These outfalls should be ranked as high priority for catchment investigations and implementation of the IDDE Program.

3.5 Outfalls That Could Not Be Located or Accessed

There were no outfalls during the Fall 2020 and Spring 2021 investigations that were unable to be located or accessed.

3.6 Outfalls to Reclassify

There were 97 mapped outfalls investigated in the Fall 2020 and Spring 2021 field work that were determined to be other drainage structures (i.e., leaching catch basin), inlets or outlets to a culvert or BMP, to not exist, or private outfalls. An additional 16 points were identified on the GIS mapping to be duplicate points and were therefore removed. Note that while the General Permit does not require culverts to be investigated, **culverts “longer than a simple road crossing” must be included in the outfall inventory** unless it can be confirmed that the culvert is free of any connections. MS4 discharges to any culvert should be evaluated for illicit discharge potential.

Outfalls owned and operated by private entities (e.g., MassDOT) should be removed from the Town’s MS4 outfall inventory. Private outfalls and outfalls regulated under a separate NPDES permit are not regulated under the Town’s MS4 permit and do not need to be included in the IDDE program. Discharges from Westford’s MS4 that enter another regulated storm sewer system (i.e. MassDOT or a neighboring town) should be mapped as an interconnection.

Table 3-3 contains a list of outfalls Tighe & Bond recommends reclassifying and removing from the Town’s outfall inventory. These structures should be reviewed and confirmed by the Town before final removal from the outfall inventory. These “outfalls” are noted as “Remove” in Attachment 1 and Attachment 2 and additional notes are provided in Attachment 3.

TABLE 3-3

Outfalls to be Removed from the Outfall Inventory (Fall 2020 & Spring 2021)

Outfall ID	Street	Reason
OF-198	Carlisle Road	Does Not Exist
OF-121	Dunstable Road	Does Not Exist
OF-250	River Street	Does Not Exist
OF-49	Old Homestead Road	Does Not Exist
OF-94	Stone Ridge Road	Private
OF-95	Stone Ridge Road	Private
OF-345	Groton Road	Culvert out. Not an outfall
OF-347	Groton Road	Culvert out. Not an outfall
OF-305	Sawmill Drive	Culvert out. Not an outfall
OF-8	Fisher Way	Does not exist
OF-470	Joyce Circle	BMP structure. Not an outfall
OF-467	Hyacinth Drive	BMP structure. Not an outfall
OF-468	Hyacinth Drive	BMP structure. Not an outfall
UNK-40	Stony Brook Road	Private
OF-1060	Gifford Drive	Private
OF-1061	Gifford Drive	Private
OF-1057	Lowell Road	Private
OF-245	Patriot Lane	Does Not Exist
OF-246	Patriot Lane	Does Not Exist
OF-371	Patriot Lane	Does Not Exist
OF-370	Patriot Lane	Does Not Exist
OF-87	Lincoln Street	Does Not Exist
OF-9	Main Street	Does Not Exist
OF-902	Main Street	Does Not Exist
OF-379	Hutchins Way	Does Not Exist

Outfall ID	Street	Reason
OF-462	Randolph Circle	BMP structure. Not an outfall
OF-463	Randolph Circle	BMP structure. Not an outfall
OF-96	Hartford Road	BMP structure. Not an outfall
OF-404	Starr Circle	BMP structure. Not an outfall
OF-405	Starr Circle	BMP structure. Not an outfall
OF-408	Alcorn Crossing	BMP structure. Not an outfall
OF-409A	Alcorn Crossing	BMP structure. Not an outfall
OF-410	Alcorn Crossing	BMP structure. Not an outfall
OF-554	Butterfield Lane	BMP structure. Not an outfall
OF-556	Butterfield Lane	BMP structure. Not an outfall
OF-2	Boston Road	Culvert out. Not an outfall
OF-65	Bixby Lane	Private
OF-66	Bixby Lane	Private
OF-67	Bixby Lane	Private
OF-68	Bixby Lane	Private
OF-106	Bixby Lane	Private
OF-582	Woolsack Drive	Private
OF-583	Woolsack Drive	Private
OF-584	Woolsack Drive	Private
OF-585	Woolsack Drive	Private
OF-586	Woolsack Drive	Private
OF-587	Woolsack Drive	Private
OF-588	Woolsack Drive	Private
OF-54	Coldspring Road	Does Not Exist
OF-494	Chamberlain Road	Does Not Exist
OF-82	Fisher Way	Does Not Exist
OF-81	Fisher Way	Does Not Exist
OF-529	Butterfield Lane	Catch Basin drainage trench. Not an outfall.
OF-1058	Lowell road	BMP structure. Not an outfall
OF-176A	Wayne Road	Culvert out. Not an outfall
OF-177	Wayne Road	Inlet. Not an outfall
OF-330	Palace Road	BMP structure. Not an outfall
UNK-7	Steeple Chase Circle	BMP structure. Not an outfall.
OF-1088	Rome Drive	Culvert out. Not an outfall.
OF-361	Meadow Lane	BMP structure. Not an outfall.
OF-100	Hutchins Way	BMP structure. Not an outfall.
OF-101	Hutchins Way	BMP structure. Not an outfall.
OF-102	Hutchins Way	Does Not Exist
OF-906	Fisher Way	Does Not Exist
OF-907	Fisher Way	Does Not Exist
OF-279	Phillips Drive	Does Not Exist
OF-381	Village View Road	Does Not Exist
OF-1073	Poplar Road	Does Not Exist
OF-1063	Sherwood Drive	Does Not Exist
OF-1054	Polley Road	Does Not Exist

Outfall ID	Street	Reason
OF-39	Mitchell Way	BMP structure. Not an outfall.
OF-428	Magnolia Drive	BMP structure. Not an outfall.
OF-429	Magnolia Drive	BMP structure. Not an outfall.
OF-3	Pershing Street	Does Not Exist
OF-23	Tadmuck Road	Does Not Exist
OF-1069	Groton Road	Does Not Exist
OF-432	Dempsey Way	Private
OF-270	Flagg Road	Leaching Catch Basin. Not an outfall.
OF-543	Lakeside Terrace	Does Not Exist
OF-572	Southwick Circle	Does Not Exist
OF-573	Loon Way	Does Not Exist
OF-97	Hartford Road	Does Not Exist
OF-84	Fisher Way	Does Not Exist
OF-1	Main Street	Duplicate point
OF-1058	Lowell Road	Duplicate point
OF-161	Oak Hill Road	Duplicate point
OF-260	North Main Street	Duplicate point
OF-260	North Main Street	Does Not Exist
OF-301	Pierce Avenue	Duplicate point
OF-4	Bridge Street	Duplicate point
OF-449	Swedes Crossing	Duplicate point
OF-493	Chamberlain Road	BMP structure. Not an outfall.
OF-493	Chamberlain Road	Duplicate point
OF-96	Hartford Road	Duplicate point
UNK-13	Vose Hill Road	Duplicate point
OF-388	Village View Road	Duplicate point
OF-350	West Street	Duplicate point

3.7 Outfalls Not Previously Mapped

Although system mapping was excluded from the scope of work, four (4) additional outfalls, which are listed in Table 3-4, were mapped and inventoried while completing outfall investigations in Fall 2020 and Spring 2021. The location and inventory for these outfalls are included in the GIS mapping to be delivered to the Town.

TABLE 3-4

Outfalls Located and Mapped (Fall 2020 & Spring 2021)

Outfall ID	Street	Notes
OF12.16.20	Hildreth Street	Previously unmapped outfall.
New12.3.20	Lowell Road	New drainage installed.
OF-451	Deer Run Drive	Previously unmapped outfall.
OF-455	Sinbad Lane	Previously unmapped outfall.

3.8 Outfalls Requiring Maintenance

Some of the outfalls visited during Tighe & Bond's field efforts were partially or completely full of sediment, leaves, or debris. Tighe & Bond recommends that the outfall pipes and

discharge areas of all outfalls are maintained on a regular basis for proper function of the drainage system. There are **28 outfalls** noted to have maintenance issues during the field efforts and should be evaluated by Town staff for cleaning and/or repair as needed. In addition, **39 outfalls** during the field effort were noted to be partially or completely submerged in water and should also be visited by Town staff to ensure the outfalls are functioning properly. All these outfalls are listed in Attachment 3.

3.9 Interconnection Investigations

Per General Permit *Section 2.3.4.7*, the Town must locate, inventory, and prioritize all interconnections and investigate them for dry weather flow by Permit Year 3. Tighe & Bond visited 7 potential interconnections during the field effort in June 2021. As a result of the field work, potential interconnections IC-1 and IC-2 were deemed to not fall under the Town's General Permit requirements as the drainage network at these two locations flow from the DOT's stormwater network into the Town's. Table 3-5 below lists the 5 interconnections that were successfully screened and two interconnections that were sampled for dry weather flow. Sampling results are included in the Outfall Sampling Results Summary in Attachment 4 and laboratory data is available in Attachment 5.

TABLE 3-5

Interconnections Located and Mapped (Spring 2021)

Connection ID	Street	Notes
IC-3	Boston Road	No dry weather flow; connection surveyed.
IC-4	Boston Road	Dry weather flow was sampled; connection surveyed.
IC-5	Concord Road	No dry weather flow; connection surveyed.
IC-6	Chandler Road	Dry weather flow was sampled; connection surveyed.
IC-7	Nabnasset Street	No dry weather flow; connection surveyed.

4 Conclusions & Recommendations

This outfall inventory and dry weather monitoring effort was completed as part of the Town's IDDE Program and begins to satisfy the requirements of General Permit *Section 2.3.4.7 Outfall/Interconnection Inventory and Initial Ranking and Dry Weather Outfall and Interconnection Screening and Sampling*. The results of this sampling effort indicated that none of the **outfalls and upstream structures had any evidence of a direct or indirect sanitary wastewater connection**. This memorandum will be appended to the Town's written IDDE Plan.

4.1 Updated Outfall Ranking and Prioritization

Information gathered from all outfall investigations and dry weather screening was used to update the outfall priority ranking which will advise the catchment investigations prioritization.

Per Section 2.3.4.7.c.ii of the General Permit, all outfalls within the MS4 must be re-ranked based on their illicit discharge potential. Outfalls should be considered top of the high priority list for catchment investigation if there is dry weather flow with pollutant concentrations of visual observations that meet criteria for a likely sewer input. The General Permit also requires that discharges that may cause or contribute to an in-stream exceedance of surface water quality standards should be considered a high priority for catchment investigations. Any outfall with dry weather screening results that meet these criteria in addition to any dry weather flow parameter exceedances were ranked as High priority in the updated outfall inventory in Attachment 3.

In Westford, since none of the 517 MS4 outfalls and interconnections had any evidence of a direct or indirect illicit discharge connection, all will be recategorized as Low Priority except for ones that had parameter exceedances based on EPA benchmarks. Those outfalls will be recategorized as High Priority and included first in catchment investigations. Based on this assessment the updated outfall rankings include 25 High Priority and 124 Low Priority outfalls. The 363 outfalls investigated prior to the PY3 field effort were ranked as Low priority. See Attachment 2 for a map of the updated ranking.

4.2 Recommendations

The following recommendations can be completed by the Town or a Contractor in subsequent Permit Years:

- **Public education and outreach.** A number of outfalls throughout Town were found to be either completely or partially buried by yard waste (i.e., grass clippings, leaves, branches). It is recommended that targeted public education and outreach pertaining to the proper disposal of yard waste be performed throughout the Town of Westford. Consider referencing Westford's yard waste collection program in the education materials.
- **Continue to improve drainage mapping.** Westford should continue to improve drainage system mapping by digitizing record plans and/or GPS-locating structures, outfalls, and other drainage infrastructure. Connectivity between structures and outfalls must be investigated and confirmed, and the GIS mapping updated accordingly. Outfalls that were newly discovered with 'New' labels should be formatted and integrated into the existing outfall inventory. Culvert outlets and BMP inlets that are currently marked as outfalls in GIS should be resolved and updated. As part of fieldwork identification, multiple outfall locations were identified as having duplicate points. These duplicate points have been identified and should be removed.
- **Continue to implement drainage system operation and maintenance (O&M) plan.** The Town should continue to implement the drainage system maintenance program, which includes cleaning drain pipes and outfalls as necessary to keep the drainage system functional. Refer to the *Stormwater Management Master Plan Volume 3: Town-wide Operation & Maintenance Plan*. It is recommended that the Town revisit locations listed in this memorandum, determine maintenance requirements, and record any action(s) taken. Priority should be given to outfalls fully submerged in sediment and completely clogged lines.
- **Conduct ongoing outfall screening.** Per *Section 2.3.4.10. Ongoing Screening* of the General Permit, "...each outfall or interconnection shall be reprioritized for screening once every five years." Ongoing screening consists of dry weather screening and sampling at all outfalls and interconnections and wet weather sampling at outfalls and interconnections required due to system vulnerability factors (SVFs). The Town should plan and budget for ongoing screening accordingly.

Attachments

- Attachment 1: Final Outfall Screening Status Map
- Attachment 2: Updated Outfall Ranking Map
- Attachment 3: Updated Outfall Inventory and Inspection Data (*delivered electronically*)
- Attachment 4: Outfall & Interconnection Sampling Summary Results
- Attachment 5: Outfall & Interconnection Laboratory Analytical Results

Attachment 1
Updated Screening Status

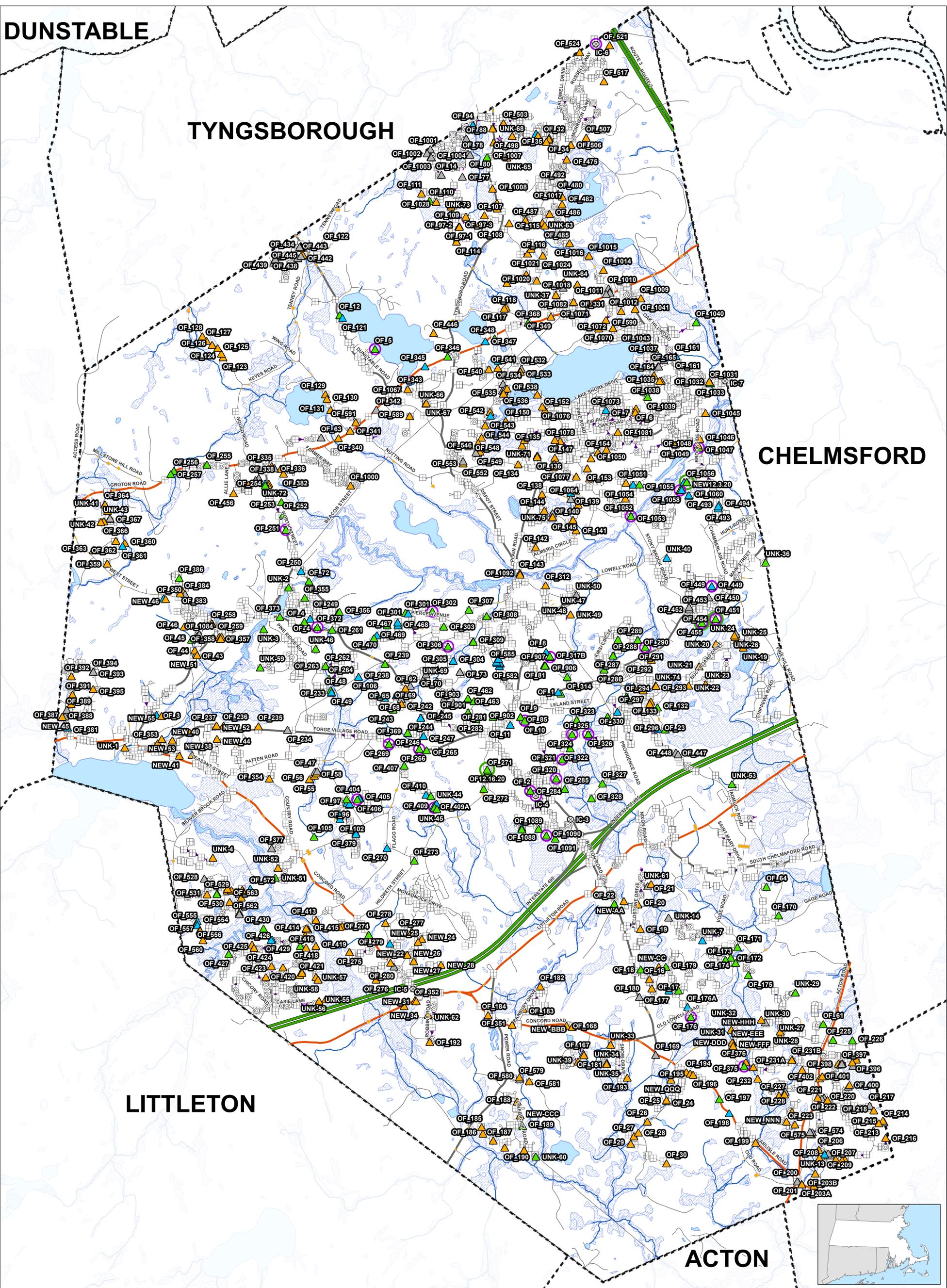
DUNSTABLE

TYNGSBOROUGH

CHELMSFORD

LITTLETON

ACTON



Legend			
Final Screening Status	<ul style="list-style-type: none"> ● 2021 - Complete ▲ Before 2021 - Complete ▲ 2021 - Remove ▲ Before 2021 - Remove ● Interconnection 	<ul style="list-style-type: none"> ○ Newly Mapped Outfall in 2021 Catch Basin ● Manhole ★ Water Quality Inlet — Culverts — Drain Pipes 	<ul style="list-style-type: none"> Limited Access Highway Multi-Lane Highway, NOT Limited Access Other Numbered Highway Major Road - Collector Minor Street or Road Town Boundary MassDEP Inland Wetlands MassDEP Coastal Wetlands Public Surface Water Supply (PSWS) Water Bodies Stream/Intermittent Stream

Notes

1. MassGIS
2. Town of Westford: Stormwater Infrastructure

1:18,000

0 1,500 3,000

Feet

ATTACHMENT 1

FINAL SCREENING STATUS

Illicit Discharge Detection and Elimination Plan

Westford, Massachusetts

September 2021

Attachment 2
Updated Outfall Ranking

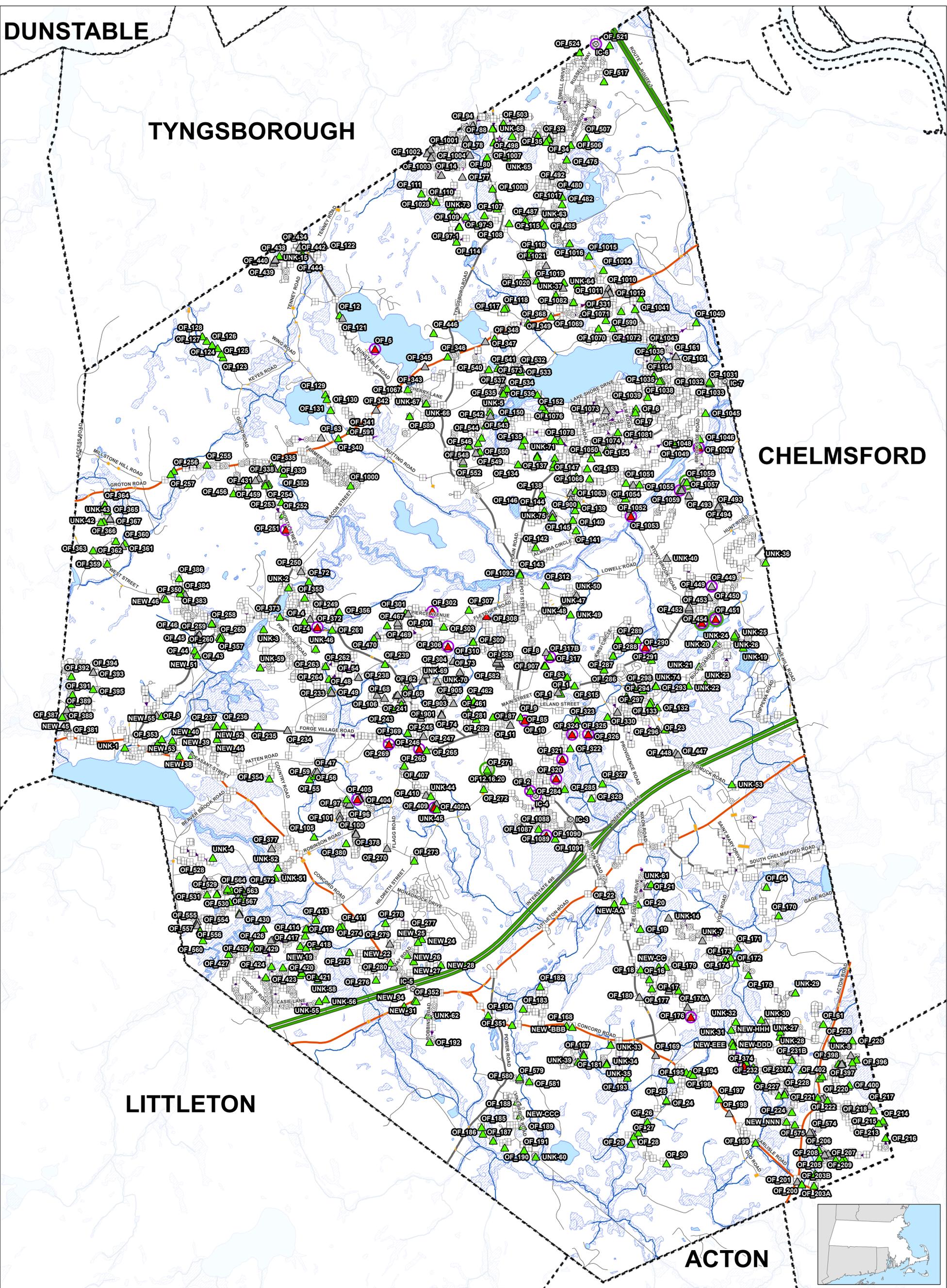
DUNSTABLE

TYNGSBOROUGH

CHELMSFORD

LITTLETON

ACTON



Legend			
UpdatedPriority	<ul style="list-style-type: none"> ○ Outfall Sampled in 2021 ○ Newly Mapped Outfall in 2021 	<ul style="list-style-type: none"> — Limited Access Highway — Multi-Lane Highway, NOT Limited Access — Other Numbered Highway — Major Road - Collector — Minor Street or Road 	<ul style="list-style-type: none"> - - - Town Boundary ▨ MassDEP Inland Wetlands ▨ MassDEP Coastal Wetlands ■ Public Surface Water Supply (PSWS) ■ Water Bodies — Stream/Intermittent Stream
<ul style="list-style-type: none"> ▲ High ▲ Low ▲ Remove ○ Interconnection — Culverts — DrainPipes 	<ul style="list-style-type: none"> ○ Manhole ★ Water Quality Inlet 		

Notes

1. MassGIS

2. Town of Westford: Stormwater Infrastructure

1:18,000

0 1,500 3,000

Feet

ATTACHMENT 2

UPDATED OUTFALL RANKING

Illicit Discharge Detection and Elimination Plan

Westford, Massachusetts

September 2021



Attachment 3

Updated Inventory and Inspection Data
(delivered electronically)

Attachment 4
Outfall Sampling Results Summary

Outfall & Interconnections Sampling Results Summary - Westford, MA

Location				Laboratory Analysis ⁽¹⁾							Water Quality Meter/Test Kit ⁽¹⁾				
Date	Outfall ID	Street	Sample Location	Ammonia	Surfactants	E. coli ⁽⁵⁾	Fecal Coliform	TSS	Turbidity	Total Phosphorus	Temperature	Salinity ⁽³⁾	Conductivity	Chlorine	Ammonia
				mg/L	mg/L	CFU/100mL or MPN/100mL	CFU/100mL			mg/L	°F	ppt	µS/cm ⁽²⁾	mg/L	mg/L
12/2/2020	OF_251	North Street	Outfall Flow	0.080	ND	195.59 ⁽⁴⁾	-	-	-	-	42.7	0.20	258	0.1	0.10
12/2/2020	OF_5	Pond Road	Outfall Flow	0.250	ND	4,314 ⁽⁴⁾	-	-	-	-	48.2	0.34	478	0.25	0.25
12/4/2020	OF_372	Bridge Street	Upstream CB	0.151	ND	ND	-	-	-	-	47.5	0.17	349	0.08	0.25
12/4/2020	OF_302A ⁽⁶⁾	Pierce Ave	Upstream MH	0.243	ND	7	-	-	-	-	47.3	0.13	282	0.08	0.25
12/4/2020	OF_302B ⁽⁶⁾	Pierce Ave	Upstream MH	0.093	ND	ND	-	-	-	-	49.8	0.25	509	0.08	0.25
12/4/2020	OF_308A ⁽⁶⁾	Fletcher Road	Upstream CB	ND	ND	6.32 ⁽⁴⁾	-	-	-	-	52.5	0.25	516	0.07	0.00
12/4/2020	OF_308B ⁽⁶⁾	Fletcher Road	Upstream CB	ND	ND	770.1 ⁽⁴⁾	-	-	-	-	49.5	0.22	455	0.10	0.00
12/4/2020	OF_308C ⁽⁶⁾	Fletcher Road	Upstream MH	0.120	ND	2,672 ⁽⁴⁾	-	-	-	-	50.0	0.30	621	0.07	0.25
12/4/2020	OF_306	Fletcher Road	Upstream CB	ND	ND	5.21 ⁽⁴⁾	-	-	-	-	52.5	0.14	293	0.07	0.00
12/4/2020	OF_317B	Abbott School	Outfall Flow	ND	ND	<1 ⁽⁴⁾	-	-	-	-	58.1	0.72	1425	0.07	0.00
12/4/2020	OF_291	Kirsi Circle	Upstream CB	0.093	ND	<1 ⁽⁴⁾	-	-	-	-	51.4	0.13	274	0.08	0.00
12/16/2020	OF_320	Crown Road	Upstream MH	0.218	ND	1,500	-	-	-	-	43.0	0.46	934	0.07	0.25
12/16/2020	OF_321	Court Road	Outfall Flow	0.169	ND	3,700	-	-	-	-	42.4	0.25	507	0.09	0.25
1/28/2021	OF_269	Forge Village Road	Outfall Flow	ND	ND	ND	-	-	-	-	40.8	0.00	0	0.11	0.00
1/28/2021	OF_1053	Stony Brook Road	Outfall Flow	ND	ND	1400	3,000	ND	0.26	-	42.1	0.30	362	0.00	0.00
1/28/2021	OF_449	Swedes Crossing	Outfall Flow	ND	ND	11.0	-	-	-	-	42.4	0.20	269	0.04	0.00
3/10/2021	OF_176	Wagon Trail Road	Outfall Flow	0.149	ND	8.0	-	-	-	0.024	42.8	0.30	399	0.1	0.10
3/10/2021	OF_326	Drawbridge Road	Outfall Flow	0.150	ND	ND	-	-	-	-	46.4	0.20	225	0.04	0.25
3/10/2021	OF_324	Drawbridge Road	Outfall Flow	ND	ND	ND	-	-	-	-	46.2	0.20	321	0.06	0.00
3/11/2021	OF_1090	Rome Drive	Outfall Flow	0.094	ND	ND	-	-	-	0.043	43.5	0.30	380	0.06	0.25
3/11/2021	OF_284	Boston Road	Outfall Flow	0.081	ND	ND	-	-	-	-	41.0	0.20	293	0.00	0.10
3/11/2021	OF_266	Main Street	Outfall Flow	ND	ND	130	-	-	-	-	46.9	0.50	678	0.00	0.00
3/11/2021	OF_409	Alcorn Crossing	Outfall Flow	ND	ND	ND	-	-	-	0.021	39.2	0.20	272	0.06	0.25
3/11/2021	OF_406	Starr Circle	Outfall Flow	0.164	ND	ND	-	-	-	-	46.2	0.30	405	0.09	0.10
3/11/2021	OF_10	Main Street	Outfall Flow	ND	ND	2.0	-	-	-	-	46.2	0.90	1200	0.11	0.10
3/17/2021	OF_1047	Brook Side Road	Ustream CB Flow	0.095	ND	3.0	-	-	-	-	42.8	0.30	453	0.14	0.25
3/17/2021	OF_1059	Lowell Road	Outfall Flow	ND	ND	3.0	-	-	-	-	40.5	0.10	189	0.00	0.00
3/17/2021	OF_455	Sinbad Lane	Upstream MH	ND	ND	23.0	-	-	-	-	41.0	0.30	373	0.04	0.00
3/30/2021	OF_375	Overlook Circle	Outfall Flow	ND	ND	ND	-	-	-	0.105	40.5	0.10	121	0.00	0.00
3/30/2021	OF_451	Deer Run Drive	Outfall Flow	ND	ND	ND	-	-	-	-	46.4	0.30	349	0.18	0.00
6/2/2021	IC-4	Boston Road	Interconnection Flow	ND	ND	3.06 ⁽⁴⁾	-	-	-	-	56.0	0.08	160	0.09	0.00
6/2/2021	IC-6	Chandler Road	Interconnection Flow	0.081	ND	2.02 ⁽⁴⁾	-	-	-	-	55.5	0.10	218	0.00	0.00

REPORTING LIMITS

Ammonia = 0.075 mg/L
 Surfactants = 0.050 mg/L
 E. coli = 2 CFU/100mL
 Fecal Coliform = 2 CFU/100mL
 BOD₅ = 2 mg/L
 Total Phosphorus = 0.01 mg/L
 "ND" = none detected

COLOR KEY
(benchmarks are bold)

	Ammonia	Surfactants	E. coli	Fecal Coliform			Total Phosphorus	Temperature	Salinity	Conductivity	Chlorine	Ammonia
	mg/L	mg/L	CFU/100 mL	CFU/100 mL			mg/L	°F	ppt	µS/cm	mg/L	mg/L
	≥ 6.00	≥ 1.00	≥ 10,000	≥ 10,000			≥ 0.908		≥ 1.0	≥ 2,000	≥ 1.00	≥ 6.0
	≥ 1.00	≥ 0.50	≥ 1,260	≥ 1,000			≥ 0.466		≥ 0.75	≥ 1,500	≥ 0.30	≥ 1.0
	≥ 0.50	≥ 0.25	≥ 235	≥ 200			≥ 0.024	≥ 83.0	≥ 0.5	≥ 1,000	≥ 0.02	≥ 0.5
	< 0.50	< 0.25	< 235	< 200			< 0.024	< 83	< 0.5	< 1,000	< 0.02	< 0.5

Notes for Results Summary:

- (1) "-" means no analysis was completed
- (2) µS/cm is equivalent to µmhos/cm
- (3) Salinity was measured in µS/cm units on the YSI Met and then converted to ppt
- (4) Analytical method used was 9223B rather than the typical 9213D, so units are MPN/100mL.
- (5) Refer to analytical data for units of E. coli that apply.
- (6) Multiple samples were collected at upstream structures for OF302 & 308

Benchmark Sources:

- Ammonia, Surfactants, and Chlorine - EPA General Permit for Stormwater Discharges from Small MS4 in Massachusetts
- E. coli, Temperature, and Dissolved Oxygen - 314 CMR 4.00: Massachusetts Surface Water Quality Standards
- Fecal coliform - MWRA Water Quality Standards for Class B and Class SB Waters
- Total Phosphorus - EPA Ambient Water Quality Criteria Recommendations for Rivers and Streams in Nutrient Ecoregion XIV
- Salinity - EPA Volunteer Estuary Monitoring: A Methods Manual
- Conductivity - Center for Watershed Protection Illicit discharge Detection and Elimination Guidance Manual
- Total Suspended Solids and Turbidity do not have quantitative benchmarks.

Attachment 5
Laboratory Sampling Results



ANALYTICAL REPORT

Lab Number:	L2053392
Client:	Tighe & Bond, Inc. 120 Front Street Suite 7 Worcester, MA 01608
ATTN:	Kayla Larson-Dubois
Phone:	(508) 754-2201
Project Name:	WESTFORD OUTFALLS
Project Number:	W-2047-005
Report Date:	12/11/20

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2053392-01	OF-251	WATER	WESTFORD, MA	12/02/20 08:50	12/02/20
L2053392-02	OF-5	WATER	WESTFORD, MA	12/02/20 09:00	12/02/20

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

Case Narrative (continued)

Sample Receipt

L2053392-02: The collection date and time on the chain of custody was 02-DEC-20 09:30; however, the collection date/time on the container label was 02-DEC-20 09:00. At the client's request, the collection date/time is reported as 02-DEC-20 09:00.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 12/11/20

INORGANICS & MISCELLANEOUS

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

SAMPLE RESULTS

Lab ID: L2053392-01
Client ID: OF-251
Sample Location: WESTFORD, MA

Date Collected: 12/02/20 08:50
Date Received: 12/02/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	195.59		MPN/100ml	1	NA	1	-	12/02/20 15:42	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.080		mg/l	0.075	--	1	12/09/20 04:49	12/10/20 19:22	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/03/20 04:00	12/03/20 07:31	121,5540C	JA



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

SAMPLE RESULTS

Lab ID: L2053392-02
Client ID: OF-5
Sample Location: WESTFORD, MA

Date Collected: 12/02/20 09:00
Date Received: 12/02/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	4314		MPN/100ml	200	NA	200	-	12/02/20 15:42	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.250		mg/l	0.075	--	1	12/09/20 04:49	12/10/20 19:23	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/03/20 04:00	12/03/20 07:31	121,5540C	JA



Project Name: WESTFORD OUTFALLS

Lab Number: L2053392

Project Number: W-2047-005

Report Date: 12/11/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1440331-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	12/02/20 15:42	121,9223B	CM
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1440539-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/03/20 04:00	12/03/20 07:29	121,5540C	JA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1442549-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/09/20 04:49	12/10/20 19:19	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Lab Number: L2053392

Report Date: 12/11/20

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1440539-2								
Surfactants, MBAS	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1442549-2								
Nitrogen, Ammonia	110		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: WESTFORD OUTFALLS

Lab Number: L2053392

Project Number: W-2047-005

Report Date: 12/11/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1440539-4 QC Sample: L2053392-01 Client ID: OF-251												
Surfactants, MBAS	ND	0.4	0.430	108		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1442549-4 QC Sample: L2053532-01 Client ID: MS Sample												
Nitrogen, Ammonia	2.21	4	5.75	88	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Lab Number: L2053392

Report Date: 12/11/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1440539-3 QC Sample: L2053392-01 Client ID: OF-251						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1442549-3 QC Sample: L2053532-01 Client ID: DUP Sample						
Nitrogen, Ammonia	2.21	2.32	mg/l	5		20

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2053392-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.9	Y	Absent		E-COLI-QT(.33)
L2053392-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	3.9	Y	Absent		NH3-350(28)
L2053392-01C	Plastic 950ml unpreserved	A	7	7	3.9	Y	Absent		MBAS-5540(2)
L2053392-02A	Bacteria Cup Na2S2O3 preserved	A	NA		3.9	Y	Absent		E-COLI-QT(.33)
L2053392-02B	Plastic 500ml H2SO4 preserved	A	<2	<2	3.9	Y	Absent		NH3-350(28)
L2053392-02C	Plastic 950ml unpreserved	A	7	7	3.9	Y	Absent		MBAS-5540(2)

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2053392
Report Date: 12/11/20

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2053981
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	12/14/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2053981
Report Date: 12/14/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2053981-01	OF-372	WATER	WESTFORD, MA	12/04/20 08:00	12/04/20
L2053981-02	OF-302A	WATER	WESTFORD, MA	12/04/20 08:55	12/04/20
L2053981-03	OF-302B	WATER	WESTFORD, MA	12/04/20 09:12	12/04/20

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2053981
Report Date: 12/14/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2053981
Report Date: 12/14/20

Case Narrative (continued)

Sample Receipt

L2053981-02: The sample identified as "OF-302A" on the chain of custody was identified as "OF-302" on the container label. At the client's request, the sample is reported as "OF-302A".

E. Coli (MF)

L2053981-01 through -03 were analyzed with the method required holding time exceeded.

L2053981-01 and -03: The sample has an elevated detection limit due to the dilution required by the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Tiffani Morrissey

Title: Technical Director/Representative

Date: 12/14/20

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2053981

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2053981-01

Client ID: OF-372

Sample Location: WESTFORD, MA

Date Collected: 12/04/20 08:00

Date Received: 12/04/20

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	12/04/20 17:17	121,9213D	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.151		mg/l	0.075	--	1	12/12/20 09:00	12/14/20 18:57	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:05	121,5540C	MR



Project Name: OUTFALL SAMPLING

Lab Number: L2053981

Project Number: W-5005-023-01-02

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2053981-02

Date Collected: 12/04/20 08:55

Client ID: OF-302A

Date Received: 12/04/20

Sample Location: WESTFORD, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	7.0		col/100ml	2.0	NA	2	-	12/04/20 17:17	121,9213D	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.243		mg/l	0.075	--	1	12/12/20 09:00	12/14/20 18:58	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:05	121,5540C	MR



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2053981

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2053981-03

Client ID: OF-302B

Sample Location: WESTFORD, MA

Date Collected: 12/04/20 09:12

Date Received: 12/04/20

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	12/04/20 17:17	121,9213D	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.093		mg/l	0.075	--	1	12/12/20 09:00	12/14/20 18:59	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:06	121,5540C	MR



Project Name: OUTFALL SAMPLING

Lab Number: L2053981

Project Number: W-5005-023-01-02

Report Date: 12/14/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-03 Batch: WG1441362-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	12/04/20 17:17	121,9213D	CM
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1441426-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:03	121,5540C	MR
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1444365-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/12/20 09:00	12/14/20 19:03	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2053981

Report Date: 12/14/20

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1441426-2								
Surfactants, MBAS	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1444365-2								
Nitrogen, Ammonia	97		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2053981

Project Number: W-5005-023-01-02

Report Date: 12/14/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1441426-4 QC Sample: L2054084-07 Client ID: MS Sample												
Surfactants, MBAS	0.070	0.4	0.420	88		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1444365-4 QC Sample: L2053228-84 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.46	86	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2053981

Report Date: 12/14/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1441426-3 QC Sample: L2054084-07 Client ID: DUP Sample						
Surfactants, MBAS	0.070	0.060	mg/l	15		32
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1444365-3 QC Sample: L2053228-84 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20

Project Name: OUTFALL SAMPLING**Lab Number:** L2053981**Project Number:** W-5005-023-01-02**Report Date:** 12/14/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2053981-01A	Bacteria Cup Na2S2O3 preserved	A	NA		2.9	Y	Absent		E-COLI-MF(.33)
L2053981-01B	Bacteria Cup Na2S2O3 preserved	A	NA		2.9	Y	Absent		E-COLI-MF(.33)
L2053981-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.9	Y	Absent		NH3-350(28)
L2053981-01D	Plastic 950ml unpreserved	A	7	7	2.9	Y	Absent		MBAS-5540(2)
L2053981-02A	Bacteria Cup Na2S2O3 preserved	A	NA		2.9	Y	Absent		E-COLI-MF(.33)
L2053981-02B	Bacteria Cup Na2S2O3 preserved	A	NA		2.9	Y	Absent		E-COLI-MF(.33)
L2053981-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.9	Y	Absent		NH3-350(28)
L2053981-02D	Plastic 950ml unpreserved	A	7	7	2.9	Y	Absent		MBAS-5540(2)
L2053981-03A	Bacteria Cup Na2S2O3 preserved	A	NA		2.9	Y	Absent		E-COLI-MF(.33)
L2053981-03B	Bacteria Cup Na2S2O3 preserved	A	NA		2.9	Y	Absent		E-COLI-MF(.33)
L2053981-03C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.9	Y	Absent		NH3-350(28)
L2053981-03D	Plastic 950ml unpreserved	A	7	7	2.9	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2053981
Report Date: 12/14/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2053981
Report Date: 12/14/20

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2053981
Report Date: 12/14/20

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2053981
Report Date: 12/14/20

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE OF

Project Information

Project Name: Outfall Sampling

Project Location: Westford, MA

Project #: W-5005-023-01-02

Project Manager: Emily Scerbo

ALPHA Quote #: 7901

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: Tighe & Bond, Attn: Evelyn Ramos

Address: 1 University Ave #100

Westwood, MA 02090

Phone: 781-375-2576

Fax: Email: ERamos@TigheBond.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

Send Results to Evelyn Ramos, Tighe & Bond at ERamos@TigheBond.com

Date Rec'd in Lab: 12/4/20

ALPHA Job #: L258981

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program

Criteria

Small MS4 Permit Massachusetts

Dry Weather Outfall Screening

ANALYSIS

Surfactants (5540C)	Ammonia (350.1)	E. Coll (9213D)	Fecal Coliform (9222D)	BOD5 (5210B)	Total Phosphorus (4500P-E)	Total Suspended Solids (2540D)	Turbidity (180.1)								
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SAMPLE HANDLING
 Filtration
 Done
 Not Needed
 Lab to do
 Preservation
 Lab to do
 (Please specify below)

TOTAL # BOTTLES

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials
		Date	Time		
53981-01	OF-372	12/4/20	8:00		EB
-02	OF-302A	12/4/20	8:55		EB
-03	OF-302 B	12/4/20	9:12		EB

Container Type

Preservative

P	P	B	-	B	P	P	P	P	-	-	-
A	D	H	-	H	A	D	-	-	-	-	-

Relinquished By:

Date/Time

Received By:

Date/Time

Kenneth P. [Signature]
12/4/20 12:42

12/4/20 11:30
12/4/20 12:42

[Signature]
12/4/20

12/4/20 11:30
12/4/20 12:42

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.



ANALYTICAL REPORT

Lab Number:	L2054180
Client:	Tighe & Bond, Inc. 120 Front Street Suite 7 Worcester, MA 01608
ATTN:	Kayla Larson-Dubois
Phone:	(508) 754-2201
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	12/14/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2054180
Report Date: 12/14/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2054180-01	OF-308A	WATER	WESTFORD, MA	12/04/20 13:05	12/04/20
L2054180-02	OF-308B	WATER	WESTFORD, MA	12/04/20 12:50	12/04/20
L2054180-03	OF-308C	WATER	WESTFORD, MA	12/04/20 12:15	12/04/20
L2054180-04	OF-306	WATER	WESTFORD, MA	12/04/20 13:40	12/04/20
L2054180-05	OF-317B	WATER	WESTFORD, MA	12/04/20 14:25	12/04/20
L2054180-06	OF-291	WATER	WESTFORD, MA	12/04/20 15:05	12/04/20

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2054180
Report Date: 12/14/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 12/14/20

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING

Lab Number: L2054180

Project Number: W-5005-023-01-02

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2054180-01

Date Collected: 12/04/20 13:05

Client ID: OF-308A

Date Received: 12/04/20

Sample Location: WESTFORD, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	6.32		MPN/100ml	1	NA	1	-	12/04/20 19:02	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/12/20 04:58	12/14/20 18:22	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:09	121,5540C	MR



Project Name: OUTFALL SAMPLING

Lab Number: L2054180

Project Number: W-5005-023-01-02

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2054180-02

Date Collected: 12/04/20 12:50

Client ID: OF-308B

Date Received: 12/04/20

Sample Location: WESTFORD, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	770.1		MPN/100ml	1	NA	1	-	12/04/20 19:02	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/12/20 04:58	12/14/20 18:23	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:09	121,5540C	MR



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2054180

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2054180-03

Client ID: OF-308C

Sample Location: WESTFORD, MA

Date Collected: 12/04/20 12:15

Date Received: 12/04/20

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	2672		MPN/100ml	200	NA	200	-	12/04/20 19:02	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.120		mg/l	0.075	--	1	12/12/20 04:58	12/14/20 18:24	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:10	121,5540C	MR



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2054180
Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2054180-04
Client ID: OF-306
Sample Location: WESTFORD, MA

Date Collected: 12/04/20 13:40
Date Received: 12/04/20
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	5.21		MPN/100ml	1	NA	1	-	12/04/20 19:02	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/12/20 04:58	12/14/20 18:25	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:11	121,5540C	MR



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2054180

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2054180-05

Client ID: OF-317B

Sample Location: WESTFORD, MA

Date Collected: 12/04/20 14:25

Date Received: 12/04/20

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	12/04/20 19:02	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/12/20 04:58	12/14/20 18:25	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:11	121,5540C	MR



Project Name: OUTFALL SAMPLING

Lab Number: L2054180

Project Number: W-5005-023-01-02

Report Date: 12/14/20

SAMPLE RESULTS

Lab ID: L2054180-06

Date Collected: 12/04/20 15:05

Client ID: OF-291

Date Received: 12/04/20

Sample Location: WESTFORD, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	12/04/20 19:02	121,9223B	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.093		mg/l	0.075	--	1	12/12/20 04:58	12/14/20 18:26	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:11	121,5540C	MR



Project Name: OUTFALL SAMPLING

Lab Number: L2054180

Project Number: W-5005-023-01-02

Report Date: 12/14/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-06 Batch: WG1441387-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	12/04/20 19:02	121,9223B	CM
General Chemistry - Westborough Lab for sample(s): 01-06 Batch: WG1441426-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/04/20 23:51	12/05/20 06:03	121,5540C	MR
General Chemistry - Westborough Lab for sample(s): 01-06 Batch: WG1444172-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/12/20 04:58	12/14/20 17:46	44,350.1	AT

Lab Control Sample Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2054180

Report Date: 12/14/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-06 Batch: WG1441426-2								
Surfactants, MBAS	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-06 Batch: WG1444172-2								
Nitrogen, Ammonia	100		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2054180

Project Number: W-5005-023-01-02

Report Date: 12/14/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG1441426-4 QC Sample: L2054084-07 Client ID: MS Sample												
Surfactants, MBAS	0.070	0.4	0.420	88		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG1444172-4 QC Sample: L2053567-04 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.48	87	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2054180

Report Date: 12/14/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG1441426-3 QC Sample: L2054084-07 Client ID: DUP Sample						
Surfactants, MBAS	0.070	0.060	mg/l	15		32
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG1444172-3 QC Sample: L2053567-04 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20

Project Name: OUTFALL SAMPLING**Lab Number:** L2054180**Project Number:** W-5005-023-01-02**Report Date:** 12/14/20**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2054180-01A	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-01B	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.8	Y	Absent		NH3-350(28)
L2054180-01D	Plastic 950ml unpreserved	A	7	7	2.8	Y	Absent		MBAS-5540(2)
L2054180-02A	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-02B	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.8	Y	Absent		NH3-350(28)
L2054180-02D	Plastic 950ml unpreserved	A	7	7	2.8	Y	Absent		MBAS-5540(2)
L2054180-03A	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-03B	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-03C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.8	Y	Absent		NH3-350(28)
L2054180-03D	Plastic 950ml unpreserved	A	7	7	2.8	Y	Absent		MBAS-5540(2)
L2054180-04A	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-04B	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-04C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.8	Y	Absent		NH3-350(28)
L2054180-04D	Plastic 950ml unpreserved	A	7	7	2.8	Y	Absent		MBAS-5540(2)
L2054180-05A	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-05B	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-05C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.8	Y	Absent		NH3-350(28)
L2054180-05D	Plastic 950ml unpreserved	A	7	7	2.8	Y	Absent		MBAS-5540(2)
L2054180-06A	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-06B	Bacteria Cup Na2S2O3 preserved	A	NA		2.8	Y	Absent		E-COLI-QT(.33)
L2054180-06C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.8	Y	Absent		NH3-350(28)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Serial_No:12142019:04
Lab Number: L2054180
Report Date: 12/14/20

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2054180-06D	Plastic 950ml unpreserved	A	7	7	2.8	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2054180
Report Date: 12/14/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2054180
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2054180
Report Date: 12/14/20

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2054180
Report Date: 12/14/20

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE OF

Project Information

Project Name: Outfall Sampling

Project Location: Westford, MA

Project #: W-5005-023-01-02

Project Manager: Emily Scerbo

ALPHA Quote #: 7901

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: Tighe & Bond, Attn: Evelyn Ramos

Address: 1 University Ave #100

Westwood, MA 02090

Phone: 781-375-2576

Fax:

Email: ERamos@TigheBond.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

Send Results to Evelyn Ramos, Tighe & Bond at ERamos@TigheBond.com

Date Rec'd in Lab: 12/4/20

ALPHA Job #: L205410

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program

Criteria

Small MS4 Permit Massachusetts

Dry Weather Outfall Screening

ANALYSIS

Surfactants (5540C)	Ammonia (350.1)	E. Coli (9213D)	Fecal Coliform (9222D)	BOD5 (5210B)	Total Phosphorus (4500P-E)	Total Suspended Solids (2540D)	Turbidity (180.1)								
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SAMPLE HANDLING
 Filtration
 Done
 Not Needed
 Lab to do
 Preservation
 Lab to do
 (Please specify below)

Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials
		Date	Time		
54180-01	OF-308 A	12/4/20	13:05		
02	OF-308 B	12/4/20	12:50		
03	OF-308 C	12/4/20	12:15		
04	OF-306	12/4/20	13:40		
05	OF-317B	12/4/20	14:25		
06	OF-291	12/4/20	15:05		

Container Type
 Preservative

P	P	B	-	B	P	P	P	P	-	-	-
A	D	H	-	H	A	D	-	-	-	-	-

Relinquished By:	Date/Time	Received By:	Date/Time
<i>Sandy Pella</i>	12/4/20 15:30	<i>Steve White</i>	12/4/20 15:30
<i>Emily Scerbo</i>	12/4/20 16:20	<i>Emily Scerbo</i>	12/4/20 16:20

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.



ANALYTICAL REPORT

Lab Number:	L2056282
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	12/27/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2056282
Report Date: 12/27/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2056282-01	OF-320	WATER	WESTFORD, MA	12/16/20 10:30	12/16/20
L2056282-02	OF-321	WATER	WESTFORD, MA	12/16/20 10:45	12/16/20

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2056282
Report Date: 12/27/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 12/27/20

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING

Lab Number: L2056282

Project Number: W-5005-023-01-02

Report Date: 12/27/20

SAMPLE RESULTS

Lab ID: L2056282-01

Date Collected: 12/16/20 10:30

Client ID: OF-320

Date Received: 12/16/20

Sample Location: WESTFORD, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	1500		col/100ml	10	NA	10	-	12/16/20 18:13	121,9213D	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.218		mg/l	0.075	--	1	12/23/20 10:30	12/23/20 19:49	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/18/20 04:00	12/18/20 08:13	121,5540C	JA



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2056282

Report Date: 12/27/20

SAMPLE RESULTS

Lab ID: L2056282-02

Client ID: OF-321

Sample Location: WESTFORD, MA

Date Collected: 12/16/20 10:45

Date Received: 12/16/20

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	3700		col/100ml	100	NA	100	-	12/16/20 18:13	121,9213D	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.169		mg/l	0.075	--	1	12/23/20 10:30	12/23/20 19:53	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/18/20 04:00	12/18/20 08:14	121,5540C	JA



Project Name: OUTFALL SAMPLING

Lab Number: L2056282

Project Number: W-5005-023-01-02

Report Date: 12/27/20

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1446146-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	12/16/20 18:13	121,9213D	CM
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1446503-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	12/18/20 04:00	12/18/20 08:08	121,5540C	JA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1448545-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	12/23/20 10:30	12/23/20 19:41	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2056282

Report Date: 12/27/20

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1446503-2								
Surfactants, MBAS	102		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1448545-2								
Nitrogen, Ammonia	98		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2056282

Project Number: W-5005-023-01-02

Report Date: 12/27/20

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MS Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1446503-4 QC Sample: L2056248-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.380	95		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1448545-4 QC Sample: L2056230-02 Client ID: MS Sample												
Nitrogen, Ammonia	0.162	4	3.57	85	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2056282

Report Date: 12/27/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1446503-3 QC Sample: L2056248-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1448545-3 QC Sample: L2056230-02 Client ID: DUP Sample						
Nitrogen, Ammonia	0.162	0.190	mg/l	16		20

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2056282-01A	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-MF(.33)
L2056282-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	2.3	Y	Absent		NH3-350(28)
L2056282-01C	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		MBAS-5540(2)
L2056282-02A	Bacteria Cup Na2S2O3 preserved	A	NA		2.3	Y	Absent		E-COLI-MF(.33)
L2056282-02B	Plastic 500ml H2SO4 preserved	A	<2	<2	2.3	Y	Absent		NH3-350(28)
L2056282-02C	Plastic 950ml unpreserved	A	7	7	2.3	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2056282
Report Date: 12/27/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
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Lab Number: L2056282
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
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Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2056282
Report Date: 12/27/20

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2104397
Client:	Tighe & Bond, Inc. 120 Front Street Suite 7 Worcester, MA 01608
ATTN:	Kayla Larson-Dubois
Phone:	(508) 754-2201
Project Name:	WESTFORD OUTFALLS
Project Number:	W-2047-005
Report Date:	02/04/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2104397-01	OF-269	WATER	WESTFORD, MA	01/28/21 10:15	01/28/21

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

Case Narrative (continued)

E. Coli (MF)

L2104397-01: The sample has an elevated detection limit due to the dilution required by the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 02/04/21

INORGANICS & MISCELLANEOUS

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

SAMPLE RESULTS

Lab ID: L2104397-01
Client ID: OF-269
Sample Location: WESTFORD, MA

Date Collected: 01/28/21 10:15
Date Received: 01/28/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	01/28/21 15:28	121,9213D	CM
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	01/29/21 11:00	01/29/21 20:27	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	01/29/21 03:00	01/29/21 06:11	121,5540C	JA



Project Name: WESTFORD OUTFALLS

Lab Number: L2104397

Project Number: W-2047-005

Report Date: 02/04/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1459730-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	01/28/21 15:28	121,9213D	CM
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1459905-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	01/29/21 03:00	01/29/21 06:09	121,5540C	JA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1460036-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	01/29/21 11:00	01/29/21 20:22	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Lab Number: L2104397

Report Date: 02/04/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1459905-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1460036-2								
Nitrogen, Ammonia	104		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: WESTFORD OUTFALLS

Lab Number: L2104397

Project Number: W-2047-005

Report Date: 02/04/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1459905-4 QC Sample: L2104616-02 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.620	155	-	-	-	-	52-157	-	-	32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1460036-4 QC Sample: L2104137-02 Client ID: MS Sample												
Nitrogen, Ammonia	0.165	4	3.76	90	-	-	-	-	90-110	-	-	20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Lab Number: L2104397

Report Date: 02/04/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1459905-3 QC Sample: L2104616-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1460036-3 QC Sample: L2104137-02 Client ID: DUP Sample						
Nitrogen, Ammonia	0.165	0.214	mg/l	26	Q	20

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2104397-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-MF(.33)
L2104397-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		NH3-350(28)
L2104397-01C	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104397
Report Date: 02/04/21

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2104616
Client:	Tighe & Bond, Inc. 120 Front Street Suite 7 Worcester, MA 01608
ATTN:	Kayla Larson-Dubois
Phone:	(508) 754-2201
Project Name:	WESTFORD OUTFALLS
Project Number:	W-2047-005
Report Date:	02/03/21

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

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Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104616
Report Date: 02/03/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2104616-01	OF-1053	WATER	WESTFORD, MA	01/28/21 13:30	01/28/21
L2104616-02	OF-449	WATER	WESTFORD, MA	01/28/21 14:45	01/28/21

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104616
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Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

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Case Narrative (continued)

Turbidity

The WG1460247-3 Laboratory Duplicate RPD for turbidity (18%), performed on L2104616-01, is above the acceptance criteria; however, the sample and duplicate results are less than five times the reporting limit. Therefore, the RPD is valid.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Kelly Stenstrom

Title: Technical Director/Representative

Date: 02/03/21

INORGANICS & MISCELLANEOUS

Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104616
Report Date: 02/03/21

SAMPLE RESULTS

Lab ID: L2104616-01
Client ID: OF-1053
Sample Location: WESTFORD, MA

Date Collected: 01/28/21 13:30
Date Received: 01/28/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
Coliform, Fecal (MF)	3000		col/100ml	100	NA	100	-	01/28/21 19:59	121,9222D	CC
E. Coli (MF)	1400		col/100ml	10	NA	10	-	01/28/21 19:30	121,9213D	CC
General Chemistry - Westborough Lab										
Turbidity	0.26		NTU	0.20	--	1	-	01/29/21 22:29	44,180.1	JW
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	02/02/21 16:50	121,2540D	AC
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	01/29/21 11:00	01/29/21 20:28	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	01/29/21 03:00	01/29/21 06:17	121,5540C	JA



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104616
Report Date: 02/03/21

SAMPLE RESULTS

Lab ID: L2104616-02
Client ID: OF-449
Sample Location: WESTFORD, MA

Date Collected: 01/28/21 14:45
Date Received: 01/28/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	11		col/100ml	2.0	NA	2	-	01/28/21 19:30	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	01/29/21 11:00	01/29/21 20:29	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	01/29/21 03:00	01/29/21 06:18	121,5540C	JA



Project Name: WESTFORD OUTFALLS
Project Number: W-2047-005

Lab Number: L2104616
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Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1459819-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	01/28/21 19:30	121,9213D	CC
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1459821-1										
Coliform, Fecal (MF)	ND		col/100ml	1.0	NA	1	-	01/28/21 19:59	121,9222D	CC
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1459905-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	01/29/21 03:00	01/29/21 06:09	121,5540C	JA
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1460036-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	01/29/21 11:00	01/29/21 20:22	44,350.1	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1460247-1										
Turbidity	ND		NTU	0.20	--	1	-	01/29/21 22:29	44,180.1	JW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1460910-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	02/02/21 16:50	121,2540D	AC

Lab Control Sample Analysis

Batch Quality Control

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Lab Number: L2104616

Report Date: 02/03/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1459905-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1460036-2								
Nitrogen, Ammonia	104		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1460247-2								
Turbidity	95		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1460910-2								
Solids, Total Suspended	101		-		80-120	-		

Matrix Spike Analysis Batch Quality Control

Project Name: WESTFORD OUTFALLS

Lab Number: L2104616

Project Number: W-2047-005

Report Date: 02/03/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1459905-4 QC Sample: L2104616-02 Client ID: OF-449												
Surfactants, MBAS	ND	0.4	0.620	155	-	-	-	-	52-157	-	-	32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1460036-4 QC Sample: L2104137-02 Client ID: MS Sample												
Nitrogen, Ammonia	0.165	4	3.76	90	-	-	-	-	90-110	-	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: WESTFORD OUTFALLS

Project Number: W-2047-005

Lab Number: L2104616

Report Date: 02/03/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1459905-3 QC Sample: L2104616-01 Client ID: OF-1053						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1460036-3 QC Sample: L2104137-02 Client ID: DUP Sample						
Nitrogen, Ammonia	0.165	0.214	mg/l	26	Q	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1460247-3 QC Sample: L2104616-01 Client ID: OF-1053						
Turbidity	0.26	0.31	NTU	18	Q	13
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1460910-3 QC Sample: L2104671-01 Client ID: DUP Sample						
Solids, Total Suspended	62	60	mg/l	3		29

Project Name: WESTFORD OUTFALLS**Lab Number:** L2104616**Project Number:** W-2047-005**Report Date:** 02/03/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2104616-01A	Bacteria Cup Na2S2O3 preserved	A	NA		2.5	Y	Absent		E-COLI-MF(.33)
L2104616-01B	Bacteria Cup Na2S2O3 preserved	A	NA		2.5	Y	Absent		E-COLI-MF(.33)
L2104616-01C	Bacteria Cup Na2S2O3 preserved	A	NA		2.5	Y	Absent		F-COLI-MF(.33)
L2104616-01D	Bacteria Cup Na2S2O3 preserved	A	NA		2.5	Y	Absent		F-COLI-MF(.33)
L2104616-01E	Plastic 60ml unpreserved	A	7	7	2.5	Y	Absent		TURB-180(2)
L2104616-01F	Plastic 500ml H2SO4 preserved	A	<2	<2	2.5	Y	Absent		NH3-350(28)
L2104616-01G	Plastic 950ml unpreserved	A	7	7	2.5	Y	Absent		MBAS-5540(2)
L2104616-01H	Plastic 950ml unpreserved	A	7	7	2.5	Y	Absent		TSS-2540(7)
L2104616-02A	Bacteria Cup Na2S2O3 preserved	A	NA		2.5	Y	Absent		E-COLI-MF(.33)
L2104616-02B	Bacteria Cup Na2S2O3 preserved	A	NA		2.5	Y	Absent		E-COLI-MF(.33)
L2104616-02F	Plastic 500ml H2SO4 preserved	A	<2	<2	2.5	Y	Absent		NH3-350(28)
L2104616-02G	Plastic 950ml unpreserved	A	7	7	2.5	Y	Absent		MBAS-5540(2)

Project Name: WESTFORD OUTFALLS
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GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



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Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

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REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE _____ OF _____

8 Walkup Drive
Westboro, MA 01581
Tel: 508-896-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Date Rec'd in Lab: 1/28/21

ALPHA Job #: L2104610

Client Information

Client: Tigue & Bond
Address: 1 University Ave
Westwood, MA
Phone: 781-375-2576
Email: ERamos@TigueBond.com

Project Information

Project Name: Westford Outfalls
Project Location: Westford, MA
Project #: W-2047-005
Project Manager: Evelyn Ramos
ALPHA Quote #: 7101

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)
Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program _____ Criteria _____

Additional Project Information:

ANALYSIS	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	Substrates	Ammonia	E-Coli	TSS	Fecal Coliform	Turbidity	SAMPLE INFO	TOTAL # BOTTLES
VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 624 <input type="checkbox"/> 524.2	<input type="checkbox"/> ABN <input type="checkbox"/> PAH	<input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	<input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA8 <input type="checkbox"/> PPI3	<input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input type="checkbox"/> PCB <input type="checkbox"/> PEST	<input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint							Filtration <input type="checkbox"/> Field <input type="checkbox"/> Lab to do Preservation <input type="checkbox"/> Lab to do	

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
04616-01	OF-1053	1/28/21	1:30		SKD
-02	OF-449	" "	2:45		SKD

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₃
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Relinquished By: San Downes AAR	Date/Time 1/28/21 5:00p 1/28/21 17:5 5:00p	Received By: AAR AAR	Date/Time 1/28/21 17:00 1/28/21 17:00
---------------------------------------	--	----------------------------	---

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
FORM NO: 01-01 (rev. 12-Mar-2012)



ANALYTICAL REPORT

Lab Number:	L2111764
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	03/17/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111764
Report Date: 03/17/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2111764-01	OF-176	WATER	WESTFORD, MA	03/10/21 10:15	03/10/21

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111764
Report Date: 03/17/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Michelle M. Morris

Title: Technical Director/Representative

Date: 03/17/21

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING

Lab Number: L2111764

Project Number: W-5005-023-01-02

Report Date: 03/17/21

SAMPLE RESULTS

Lab ID: L2111764-01
 Client ID: OF-176
 Sample Location: WESTFORD, MA

Date Collected: 03/10/21 10:15
 Date Received: 03/10/21
 Field Prep: Not Specified

Sample Depth:
 Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	8.0		col/100ml	2.0	NA	2	-	03/10/21 17:30	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.149		mg/l	0.075	--	1	03/16/21 02:11	03/16/21 19:49	44,350.1	AT
Phosphorus, Total	0.024		mg/l	0.010	--	1	03/15/21 08:00	03/15/21 16:02	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/11/21 02:35	03/11/21 04:41	121,5540C	AW



Project Name: OUTFALL SAMPLING

Lab Number: L2111764

Project Number: W-5005-023-01-02

Report Date: 03/17/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01 Batch: WG1472986-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	03/10/21 17:30	121,9213D	CC
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1473047-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/11/21 02:35	03/11/21 04:36	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1474402-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	03/15/21 08:00	03/15/21 15:38	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1474759-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 02:11	03/16/21 19:45	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2111764

Report Date: 03/17/21

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1473047-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1474402-2								
Phosphorus, Total	102		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1474759-2								
Nitrogen, Ammonia	100		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2111764

Project Number: W-5005-023-01-02

Report Date: 03/17/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1473047-4 QC Sample: L2111764-01 Client ID: OF-176												
Surfactants, MBAS	ND	0.4	0.460	115	-	-	-	-	52-157	-	-	32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1474402-3 QC Sample: L2111444-03 Client ID: MS Sample												
Phosphorus, Total	7.46	2.5	9.90	98	-	-	-	-	75-125	-	-	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1474759-4 QC Sample: L2111950-04 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.47	87	Q	-	-	-	90-110	-	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2111764

Report Date: 03/17/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1473047-3 QC Sample: L2111764-01 Client ID: OF-176						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1474402-4 QC Sample: L2111444-03 Client ID: DUP Sample						
Phosphorus, Total	7.46	7.22	mg/l	3		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1474759-3 QC Sample: L2111950-04 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	0.086	mg/l	NC		20

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2111764-01A	Bacteria Cup Na2S2O3 preserved	A	NA		2.4	Y	Absent		E-COLI-MF(.33)
L2111764-01B	Bacteria Cup Na2S2O3 preserved	A	NA		2.4	Y	Absent		E-COLI-MF(.33)
L2111764-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	2.4	Y	Absent		TPHOS-4500(28),NH3-350(28)
L2111764-01D	Plastic 950ml unpreserved	A	7	7	2.4	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111764
Report Date: 03/17/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111764
Report Date: 03/17/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111764
Report Date: 03/17/21

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111764
Report Date: 03/17/21

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2111887
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	03/17/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111887
Report Date: 03/17/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2111887-01	OF-326	WATER	WESTFORD, MA	03/10/21 13:00	03/10/21
L2111887-02	OF-324	WATER	WESTFORD, MA	03/10/21 13:20	03/10/21

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111887
Report Date: 03/17/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111887
Report Date: 03/17/21

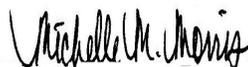
Case Narrative (continued)

E. Coli (MF)

L2111887-01 and -02: The sample has an elevated detection limit due to the dilution required by the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 03/17/21

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING

Lab Number: L2111887

Project Number: W-5005-023-01-02

Report Date: 03/17/21

SAMPLE RESULTS

Lab ID: L2111887-01

Date Collected: 03/10/21 13:00

Client ID: OF-326

Date Received: 03/10/21

Sample Location: WESTFORD, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/10/21 17:30	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.150		mg/l	0.075	--	1	03/16/21 02:11	03/16/21 19:50	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/11/21 02:35	03/11/21 04:42	121,5540C	AW



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111887
Report Date: 03/17/21

SAMPLE RESULTS

Lab ID: L2111887-02
Client ID: OF-324
Sample Location: WESTFORD, MA

Date Collected: 03/10/21 13:20
Date Received: 03/10/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/10/21 17:30	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 02:11	03/16/21 19:51	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/11/21 02:35	03/11/21 04:42	121,5540C	AW



Project Name: OUTFALL SAMPLING

Lab Number: L2111887

Project Number: W-5005-023-01-02

Report Date: 03/17/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1472986-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	03/10/21 17:30	121,9213D	CC
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1473047-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/11/21 02:35	03/11/21 04:36	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1474759-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 02:11	03/16/21 19:45	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2111887

Report Date: 03/17/21

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1473047-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1474759-2								
Nitrogen, Ammonia	100		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2111887

Project Number: W-5005-023-01-02

Report Date: 03/17/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1473047-4 QC Sample: L2111764-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.460	115		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1474759-4 QC Sample: L2111950-04 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.47	87	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2111887

Report Date: 03/17/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1473047-3 QC Sample: L2111764-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1474759-3 QC Sample: L2111950-04 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	0.086	mg/l	NC		20

Project Name: OUTFALL SAMPLING**Lab Number:** L2111887**Project Number:** W-5005-023-01-02**Report Date:** 03/17/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2111887-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.4	Y	Absent		E-COLI-MF(.33)
L2111887-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.4	Y	Absent		E-COLI-MF(.33)
L2111887-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.4	Y	Absent		NH3-350(28)
L2111887-01D	Plastic 950ml unpreserved	A	6	6	3.4	Y	Absent		MBAS-5540(2)
L2111887-02A	Bacteria Cup Na2S2O3 preserved	A	NA		3.4	Y	Absent		E-COLI-MF(.33)
L2111887-02B	Bacteria Cup Na2S2O3 preserved	A	NA		3.4	Y	Absent		E-COLI-MF(.33)
L2111887-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.4	Y	Absent		NH3-350(28)
L2111887-02D	Plastic 950ml unpreserved	A	6	6	3.4	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111887
Report Date: 03/17/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111887
Report Date: 03/17/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
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Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2111887
Report Date: 03/17/21

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE OF

Project Information

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Project Name: Outfall Sampling

Client Information

Client: Tighe & Bond, Attn: Evelyn Ramos

Project Location: Westford, MA

Address: 1 University Ave #100

Project #: W-5005-023-01-02

Westwood, MA 02090

Project Manager: Emily Scerbo

Phone: 781-375-2576

ALPHA Quote #: 7901

Fax: Standard Rush (ONLY IF PRE-APPROVED)

Email: ERamos@TigheBond.com

Turn-Around Time

These samples have been Previously analyzed by Alpha Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits:

Send Results to Evelyn Ramos, Tighe & Bond at ERamos@TigheBond.com

Date Rec'd in Lab: 3/10/21

ALPHA Job #: L2111887

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program

Criteria

Small MS4 Permit Massachusetts

Dry Weather Outfall Screening

ANALYSIS

Surfactants (5540C)	Ammonia (350.1)	E. Coli (9213D)	Fecal Coliform (9222D)	BOD5 (5210B)	Total Phosphorus (4500P-E)	Total Suspended Solids (2540D)	Turbidity (180.1)
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ANALYTICAL REPORT

Lab Number:	L2112025
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	03/18/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2112025-01	OF-1090	WATER	WESTFORD, MA	03/11/21 10:00	03/11/21
L2112025-02	OF-284	WATER	WESTFORD, MA	03/11/21 11:00	03/11/21

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

Case Narrative (continued)

E. Coli (MF)

L2112025-01 and -02: The sample has an elevated detection limit due to the dilution required by the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 03/18/21

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

SAMPLE RESULTS

Lab ID: L2112025-01
Client ID: OF-1090
Sample Location: WESTFORD, MA

Date Collected: 03/11/21 10:00
Date Received: 03/11/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/11/21 15:10	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.094		mg/l	0.075	--	1	03/16/21 02:15	03/16/21 20:25	44,350.1	AT
Phosphorus, Total	0.043		mg/l	0.010	--	1	03/16/21 12:20	03/17/21 09:10	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:56	121,5540C	AW



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

SAMPLE RESULTS

Lab ID: L2112025-02
Client ID: OF-284
Sample Location: WESTFORD, MA

Date Collected: 03/11/21 11:00
Date Received: 03/11/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/11/21 15:10	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.081		mg/l	0.075	--	1	03/16/21 02:15	03/16/21 20:26	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:57	121,5540C	AW



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1473401-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	03/11/21 15:10	121,9213D	CC
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1473551-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:54	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1474760-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 02:15	03/16/21 20:12	44,350.1	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1474880-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	03/16/21 12:20	03/17/21 08:53	121,4500P-E	SD

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2112025

Report Date: 03/18/21

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1473551-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1474760-2								
Nitrogen, Ammonia	103		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1474880-2								
Phosphorus, Total	109		-		80-120	-		

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1473551-4 QC Sample: L2112025-01 Client ID: OF-1090												
Surfactants, MBAS	ND	0.4	0.400	100		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1474760-4 QC Sample: L2112213-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.114	4	3.55	86	Q	-	-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1474880-3 QC Sample: L2111420-02 Client ID: MS Sample												
Phosphorus, Total	0.176	0.5	0.675	100		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1473551-3 QC Sample: L2112025-01 Client ID: OF-1090						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1474760-3 QC Sample: L2112213-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.114	0.115	mg/l	1		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1474880-4 QC Sample: L2111420-02 Client ID: DUP Sample						
Phosphorus, Total	0.176	0.170	mg/l	3		20

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2112025-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-MF(.33)
L2112025-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-MF(.33)
L2112025-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		TPHOS-4500(28),NH3-350(28)
L2112025-01D	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)
L2112025-02A	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-MF(.33)
L2112025-02B	Bacteria Cup Na2S2O3 preserved	A	NA		3.7	Y	Absent		E-COLI-MF(.33)
L2112025-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.7	Y	Absent		NH3-350(28)
L2112025-02D	Plastic 950ml unpreserved	A	7	7	3.7	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
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Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112025
Report Date: 03/18/21

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2112183
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	03/18/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112183
Report Date: 03/18/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2112183-01	OF-266	WATER	WESTFORD, MA	03/11/21 13:10	03/11/21
L2112183-02	OF-409	WATER	WESTFORD, MA	03/11/21 13:45	03/11/21
L2112183-03	OF-406	WATER	WESTFORD, MA	03/11/21 14:15	03/11/21
L2112183-04	OF-10	WATER	WESTFORD, MA	03/11/21 15:00	03/11/21

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112183
Report Date: 03/18/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112183
Report Date: 03/18/21

Case Narrative (continued)

Sample Receipt

L2112183-04: A sample identified as "OF-10" was received, but not listed on the Chain of Custody. At the client's request, this sample was analyzed according to methods listed on the Chain of Custody for samples L2112183-01 and -03.

E. Coli (MF)

L2112183-02 and -03: The sample has an elevated detection limit due to the dilution required by the method.

Nitrogen, Ammonia

L2112183-04: The sample has an elevated detection limit due to the dilution required by the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 03/18/21

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2112183

Report Date: 03/18/21

SAMPLE RESULTS

Lab ID: L2112183-01

Client ID: OF-266

Sample Location: WESTFORD, MA

Date Collected: 03/11/21 13:10

Date Received: 03/11/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	130		col/100ml	2.0	NA	2	-	03/11/21 18:24	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 02:15	03/16/21 20:18	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:58	121,5540C	AW



Project Name: OUTFALL SAMPLING

Lab Number: L2112183

Project Number: W-5005-023-01-02

Report Date: 03/18/21

SAMPLE RESULTS

Lab ID: L2112183-02

Date Collected: 03/11/21 13:45

Client ID: OF-409

Date Received: 03/11/21

Sample Location: WESTFORD, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/11/21 18:24	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 02:15	03/16/21 20:19	44,350.1	AT
Phosphorus, Total	0.021		mg/l	0.010	--	1	03/17/21 09:00	03/17/21 15:25	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:58	121,5540C	AW



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2112183

Report Date: 03/18/21

SAMPLE RESULTS

Lab ID: L2112183-03

Client ID: OF-406

Sample Location: WESTFORD, MA

Date Collected: 03/11/21 14:15

Date Received: 03/11/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/11/21 18:24	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.164		mg/l	0.150	--	2	03/16/21 18:00	03/16/21 21:59	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:59	121,5540C	AW



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2112183

Report Date: 03/18/21

SAMPLE RESULTS

Lab ID: L2112183-04

Client ID: OF-10

Sample Location: WESTFORD, MA

Date Collected: 03/11/21 15:00

Date Received: 03/11/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	2.0		col/100ml	2.0	NA	2	-	03/11/21 18:24	121,9213D	CC
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.150	--	2	03/16/21 18:00	03/16/21 22:00	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:59	121,5540C	AW



Project Name: OUTFALL SAMPLING

Lab Number: L2112183

Project Number: W-5005-023-01-02

Report Date: 03/18/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-04 Batch: WG1473450-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	03/11/21 18:24	121,9213D	CC
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1473551-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/12/21 01:17	03/12/21 03:54	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1474760-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 02:15	03/16/21 20:12	44,350.1	AT
General Chemistry - Westborough Lab for sample(s): 03-04 Batch: WG1475149-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/16/21 18:00	03/16/21 21:55	44,350.1	AT
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1475350-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	03/17/21 09:00	03/17/21 15:09	121,4500P-E	SD

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2112183

Report Date: 03/18/21

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1473551-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1474760-2								
Nitrogen, Ammonia	103		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 03-04 Batch: WG1475149-2								
Nitrogen, Ammonia	98		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1475350-2								
Phosphorus, Total	103		-		80-120	-		

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2112183

Project Number: W-5005-023-01-02

Report Date: 03/18/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1473551-4 QC Sample: L2112025-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.400	100		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1474760-4 QC Sample: L2112213-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.114	4	3.55	86	Q	-	-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 03-04 QC Batch ID: WG1475149-4 QC Sample: L2109826-106 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.49	87	Q	-	-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1475350-3 QC Sample: L2111363-01 Client ID: MS Sample												
Phosphorus, Total	0.142	0.5	0.589	89		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2112183

Report Date: 03/18/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1473551-3 QC Sample: L2112025-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1474760-3 QC Sample: L2112213-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.114	0.115	mg/l	1		20
General Chemistry - Westborough Lab Associated sample(s): 03-04 QC Batch ID: WG1475149-3 QC Sample: L2109826-106 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1475350-4 QC Sample: L2111363-01 Client ID: DUP Sample						
Phosphorus, Total	0.142	0.133	mg/l	7		20

Project Name: OUTFALL SAMPLING**Lab Number:** L2112183**Project Number:** W-5005-023-01-02**Report Date:** 03/18/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2112183-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.6	Y	Absent		NH3-350(28)
L2112183-01D	Plastic 950ml unpreserved	A	7	7	3.6	Y	Absent		MBAS-5540(2)
L2112183-02A	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-02B	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.6	Y	Absent		NH3-350(28)
L2112183-02D	Plastic 950ml unpreserved	A	7	7	3.6	Y	Absent		MBAS-5540(2)
L2112183-03A	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-03B	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-03C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.6	Y	Absent		NH3-350(28)
L2112183-03D	Plastic 950ml unpreserved	A	7	7	3.6	Y	Absent		MBAS-5540(2)
L2112183-04A	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-04B	Bacteria Cup Na2S2O3 preserved	A	NA		3.6	Y	Absent		E-COLI-MF(.33)
L2112183-04C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.6	Y	Absent		NH3-350(28)
L2112183-04D	Plastic 950ml unpreserved	A	7	7	3.6	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112183
Report Date: 03/18/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112183
Report Date: 03/18/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112183
Report Date: 03/18/21

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2112183
Report Date: 03/18/21

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE OF

Project Information

Project Name: Outfall Sampling

Project Location: Westford, MA

Project #: W-5005-023-01-02

Project Manager: Emily Scerbo

ALPHA Quote #: 7901

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: Tighe & Bond, Attn: Evelyn Ramos

Address: 1 University Ave #100

Westwood, MA 02090

Phone: 781-375-2576

Fax: Email: ERamos@TigheBond.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

Send Results to Evelyn Ramos, Tighe & Bond at ERamos@TigheBond.com

Date Rec'd in Lab: 3/11/21

ALPHA Job #: L2112183

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program

Criteria

Small MS4 Permit Massachusetts

Dry Weather Outfall Screening

ANALYSIS

Surfactants (5540C)	Ammonia (350.1)	E. Coll (9213D)	Fecal Coliform (9222D)	BOD5 (5210B)	Total Phosphorus (4500P-E)	Total Suspended Solids (2540D)	Turbidity (180.1)								
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAMPLE HANDLING

Filtration

Done

Not Needed

Lab to do

Preservation

Lab to do

(Please specify below)

TOTAL # BOTTLES

4

4

4

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials
		Date	Time		
12183-01	OF-266	3/11	1:10		SKD
-02	OF-409	3/11	1:45		SKD
-03	OF-406	3/11	2:15		SKD

Container Type	P	P	B	-	B	P	P	P	P	-	-	-
Preservative	A	D	H	-	H	A	D	-	-	-	-	-

Relinquished By:	Date/Time	Received By:	Date/Time
<i>[Signature]</i>	3/11 3:55 PM	MSM MWR A92	3/11/21 1:15
<i>[Signature]</i>	3/11/21 1:55	MWR W002	3/11/21 1:55

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.



ANALYTICAL REPORT

Lab Number:	L2113183
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	03/22/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2113183
Report Date: 03/22/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2113183-01	OF-1047	WATER	WESTFORD, MA	03/17/21 08:45	03/17/21
L2113183-02	OF-1059	WATER	WESTFORD, MA	03/17/21 09:20	03/17/21
L2113183-03	OF-455	WATER	WESTFORD, MA	03/17/21 10:30	03/17/21

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2113183
Report Date: 03/22/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Tiffani Morrissey

Title: Technical Director/Representative

Date: 03/22/21

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2113183
Report Date: 03/22/21

SAMPLE RESULTS

Lab ID: L2113183-01
Client ID: OF-1047
Sample Location: WESTFORD, MA

Date Collected: 03/17/21 08:45
Date Received: 03/17/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	3.0		col/100ml	2.0	NA	2	-	03/17/21 15:15	121,9213D	JT
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.095		mg/l	0.075	--	1	03/19/21 02:50	03/19/21 21:14	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/18/21 04:00	03/18/21 06:52	121,5540C	AW



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2113183

Report Date: 03/22/21

SAMPLE RESULTS

Lab ID: L2113183-02

Client ID: OF-1059

Sample Location: WESTFORD, MA

Date Collected: 03/17/21 09:20

Date Received: 03/17/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	3.0		col/100ml	2.0	NA	2	-	03/17/21 15:15	121,9213D	JT
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/19/21 02:50	03/19/21 21:15	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/18/21 04:00	03/18/21 06:53	121,5540C	AW



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2113183

Report Date: 03/22/21

SAMPLE RESULTS

Lab ID: L2113183-03

Client ID: OF-455

Sample Location: WESTFORD, MA

Date Collected: 03/17/21 10:30

Date Received: 03/17/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	23		col/100ml	2.0	NA	2	-	03/17/21 15:15	121,9213D	JT
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/19/21 02:50	03/19/21 21:16	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/18/21 04:00	03/18/21 06:53	121,5540C	AW



Project Name: OUTFALL SAMPLING

Lab Number: L2113183

Project Number: W-5005-023-01-02

Report Date: 03/22/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-03 Batch: WG1475583-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	03/17/21 15:15	121,9213D	JT
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1475786-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/18/21 04:00	03/18/21 06:50	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-03 Batch: WG1476190-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	03/19/21 02:50	03/19/21 21:08	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2113183

Report Date: 03/22/21

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1475786-2								
Surfactants, MBAS	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1476190-2								
Nitrogen, Ammonia	95		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2113183

Project Number: W-5005-023-01-02

Report Date: 03/22/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1475786-4 QC Sample: L2113291-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.380	95		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1476190-4 QC Sample: L2113176-02 Client ID: MS Sample												
Nitrogen, Ammonia	0.247	4	3.44	80	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2113183

Report Date: 03/22/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1475786-3 QC Sample: L2113291-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-03 QC Batch ID: WG1476190-3 QC Sample: L2113176-02 Client ID: DUP Sample						
Nitrogen, Ammonia	0.247	0.156	mg/l	45	Q	20

Project Name: OUTFALL SAMPLING**Lab Number:** L2113183**Project Number:** W-5005-023-01-02**Report Date:** 03/22/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2113183-01A	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		E-COLI-MF(.33)
L2113183-01B	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		E-COLI-MF(.33)
L2113183-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.2	Y	Absent		NH3-350(28)
L2113183-01D	Plastic 950ml unpreserved	A	7	7	3.2	Y	Absent		MBAS-5540(2)
L2113183-02A	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		E-COLI-MF(.33)
L2113183-02B	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		E-COLI-MF(.33)
L2113183-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.2	Y	Absent		NH3-350(28)
L2113183-02D	Plastic 950ml unpreserved	A	7	7	3.2	Y	Absent		MBAS-5540(2)
L2113183-03A	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		E-COLI-MF(.33)
L2113183-03B	Bacteria Cup Na2S2O3 preserved	A	NA		3.2	Y	Absent		E-COLI-MF(.33)
L2113183-03C	Plastic 500ml H2SO4 preserved	A	<2	<2	3.2	Y	Absent		NH3-350(28)
L2113183-03D	Plastic 950ml unpreserved	A	7	7	3.2	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2113183
Report Date: 03/22/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2113183
Report Date: 03/22/21

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
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Lab Number: L2113183
Report Date: 03/22/21

Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2113183
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REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2115768
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	04/06/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2115768
Report Date: 04/06/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2115768-01	OF-375	WATER	WESTFORD, MA	03/30/21 08:45	03/30/21
L2115768-02	OF-451	WATER	WESTFORD, MA	03/30/21 11:00	03/30/21

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2115768
Report Date: 04/06/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2115768
Report Date: 04/06/21

Case Narrative (continued)

E. Coli (MF)

L2115768-01 and -02: The sample has an elevated detection limit due to the dilution required by the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Michelle M. Morris

Title: Technical Director/Representative

Date: 04/06/21

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2115768
Report Date: 04/06/21

SAMPLE RESULTS

Lab ID: L2115768-01
Client ID: OF-375
Sample Location: WESTFORD, MA

Date Collected: 03/30/21 08:45
Date Received: 03/30/21
Field Prep: Not Specified

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/30/21 15:00	121,9213D	DW
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	04/02/21 17:00	04/02/21 21:14	44,350.1	AT
Phosphorus, Total	0.105		mg/l	0.010	--	1	03/31/21 08:30	04/01/21 10:39	121,4500P-E	SD
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/31/21 04:00	03/31/21 07:47	121,5540C	AW



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2115768

Report Date: 04/06/21

SAMPLE RESULTS

Lab ID: L2115768-02

Client ID: OF-451

Sample Location: WESTFORD, MA

Date Collected: 03/30/21 11:00

Date Received: 03/30/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MF)	ND		col/100ml	2.0	NA	2	-	03/30/21 15:00	121,9213D	DW
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	04/02/21 17:00	04/02/21 21:15	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/31/21 04:00	03/31/21 07:48	121,5540C	AW



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2115768
Report Date: 04/06/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1480547-1										
E. Coli (MF)	ND		col/100ml	1.0	NA	1	-	03/30/21 15:00	121,9213D	DW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1480682-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	03/31/21 04:00	03/31/21 07:44	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1480764-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	03/31/21 08:30	04/01/21 10:13	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1481997-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	04/02/21 17:00	04/02/21 21:01	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2115768

Report Date: 04/06/21

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1480682-2								
Surfactants, MBAS	90		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1480764-2								
Phosphorus, Total	108		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1481997-2								
Nitrogen, Ammonia	95		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2115768

Project Number: W-5005-023-01-02

Report Date: 04/06/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1480682-4 QC Sample: L2115768-02 Client ID: OF-451												
Surfactants, MBAS	ND	0.4	0.420	105		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1480764-3 QC Sample: L2115231-01 Client ID: MS Sample												
Phosphorus, Total	3.29	1.25	4.37	86		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1481997-4 QC Sample: L2115603-04 Client ID: MS Sample												
Nitrogen, Ammonia	0.091	4	3.59	87	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2115768

Report Date: 04/06/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1480682-3 QC Sample: L2115768-02 Client ID: OF-451						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1480764-4 QC Sample: L2115231-01 Client ID: DUP Sample						
Phosphorus, Total	3.29	3.30	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1481997-3 QC Sample: L2115603-04 Client ID: DUP Sample						
Nitrogen, Ammonia	0.091	0.095	mg/l	4		20

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2115768-01A	Bacteria Cup Na2S2O3 preserved	A	NA		4.7	Y	Absent		E-COLI-MF(.33)
L2115768-01B	Bacteria Cup Na2S2O3 preserved	A	NA		4.7	Y	Absent		E-COLI-MF(.33)
L2115768-01C	Plastic 500ml H2SO4 preserved	A	<2	<2	4.7	Y	Absent		TPHOS-4500(28),NH3-350(28)
L2115768-01D	Plastic 950ml unpreserved	A	7	7	4.7	Y	Absent		MBAS-5540(2)
L2115768-02A	Bacteria Cup Na2S2O3 preserved	A	NA		4.7	Y	Absent		E-COLI-MF(.33)
L2115768-02B	Bacteria Cup Na2S2O3 preserved	A	NA		4.7	Y	Absent		E-COLI-MF(.33)
L2115768-02C	Plastic 500ml H2SO4 preserved	A	<2	<2	4.7	Y	Absent		NH3-350(28)
L2115768-02D	Plastic 950ml unpreserved	A	7	7	4.7	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2115768
Report Date: 04/06/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
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Lab Number: L2115768
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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

Report Format: Data Usability Report



Project Name: OUTFALL SAMPLING
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Data Qualifiers

the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2115768
Report Date: 04/06/21

REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



ANALYTICAL REPORT

Lab Number:	L2129241
Client:	Tighe & Bond, Inc. One University Avenue Suite 100 Westwood, MA 02090
ATTN:	Evelyn Ramos
Phone:	(781) 375-2576
Project Name:	OUTFALL SAMPLING
Project Number:	W-5005-023-01-02
Report Date:	06/11/21

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2129241
Report Date: 06/11/21

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2129241-01	IC-6	WATER	WESTFORD, MA	06/02/21 12:00	06/02/21
L2129241-02	IC-4	WATER	WESTFORD, MA	06/02/21 09:40	06/02/21

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2129241
Report Date: 06/11/21

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Sebastian Corbin

Title: Technical Director/Representative

Date: 06/11/21

INORGANICS & MISCELLANEOUS

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2129241

Report Date: 06/11/21

SAMPLE RESULTS

Lab ID: L2129241-01

Client ID: IC-6

Sample Location: WESTFORD, MA

Date Collected: 06/02/21 12:00

Date Received: 06/02/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	2.02		MPN/100ml	1	NA	1	-	06/02/21 16:04	121,9223B	SH
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	0.081		mg/l	0.075	--	1	06/09/21 20:00	06/10/21 20:46	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/03/21 01:00	06/03/21 07:44	121,5540C	AW



Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2129241

Report Date: 06/11/21

SAMPLE RESULTS

Lab ID: L2129241-02

Client ID: IC-4

Sample Location: WESTFORD, MA

Date Collected: 06/02/21 09:40

Date Received: 06/02/21

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab										
E. Coli (MPN)	3.06		MPN/100ml	1	NA	1	-	06/02/21 16:04	121,9223B	SH
General Chemistry - Westborough Lab										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/09/21 20:00	06/10/21 20:47	44,350.1	AT
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/03/21 01:00	06/03/21 07:45	121,5540C	AW



Project Name: OUTFALL SAMPLING

Lab Number: L2129241

Project Number: W-5005-023-01-02

Report Date: 06/11/21

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Microbiological Analysis - Westborough Lab for sample(s): 01-02 Batch: WG1506713-1										
E. Coli (MPN)	<1		MPN/100ml	1	NA	1	-	06/02/21 16:04	121,9223B	SH
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1506847-1										
Surfactants, MBAS	ND		mg/l	0.050	--	1	06/03/21 01:00	06/03/21 07:36	121,5540C	AW
General Chemistry - Westborough Lab for sample(s): 01-02 Batch: WG1510018-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	06/09/21 20:00	06/10/21 20:30	44,350.1	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2129241

Report Date: 06/11/21

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1506847-2								
Surfactants, MBAS	96		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01-02 Batch: WG1510018-2								
Nitrogen, Ammonia	98		-		90-110	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: OUTFALL SAMPLING

Lab Number: L2129241

Project Number: W-5005-023-01-02

Report Date: 06/11/21

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1506847-4 QC Sample: L2129193-01 Client ID: MS Sample												
Surfactants, MBAS	ND	0.4	0.390	98		-	-		52-157	-		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1510018-4 QC Sample: L2129193-03 Client ID: MS Sample												
Nitrogen, Ammonia	0.084	4	3.35	82	Q	-	-		90-110	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: OUTFALL SAMPLING

Project Number: W-5005-023-01-02

Lab Number: L2129241

Report Date: 06/11/21

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1506847-3 QC Sample: L2129193-01 Client ID: DUP Sample						
Surfactants, MBAS	ND	ND	mg/l	NC		32
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1510018-3 QC Sample: L2129193-03 Client ID: DUP Sample						
Nitrogen, Ammonia	0.084	0.099	mg/l	17		20

Project Name: OUTFALL SAMPLING**Lab Number:** L2129241**Project Number:** W-5005-023-01-02**Report Date:** 06/11/21**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2129241-01A	Bacteria Cup Na2S2O3 preserved	A	NA		4.8	Y	Absent		E-COLI-QT(.33)
L2129241-01B	Bacteria Cup Na2S2O3 preserved	A	NA		4.8	Y	Absent		E-COLI-QT(.33)
L2129241-01C	Plastic 250ml H2SO4 preserved	A	<2	<2	4.8	Y	Absent		NH3-350(28)
L2129241-01C1	Plastic 500ml H2SO4 preserved	A	<2	<2	4.8	Y	Absent		NH3-350(28)
L2129241-01D	Plastic 950ml unpreserved	A	7	7	4.8	Y	Absent		MBAS-5540(2)
L2129241-02A	Bacteria Cup Na2S2O3 preserved	A	NA		4.8	Y	Absent		E-COLI-QT(.33)
L2129241-02B	Bacteria Cup Na2S2O3 preserved	A	NA		4.8	Y	Absent		E-COLI-QT(.33)
L2129241-02C	Plastic 250ml H2SO4 preserved	A	<2	<2	4.8	Y	Absent		NH3-350(28)
L2129241-02D	Plastic 950ml unpreserved	A	7	7	4.8	Y	Absent		MBAS-5540(2)

Project Name: OUTFALL SAMPLING
Project Number: W-5005-023-01-02

Lab Number: L2129241
Report Date: 06/11/21

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

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Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. (Note: 'PFAS, Total (6)' is applicable to MassDEP DW compliance analysis only.). If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where

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the identification is based on a mass spectral library search.

- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

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REFERENCES

- 44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

