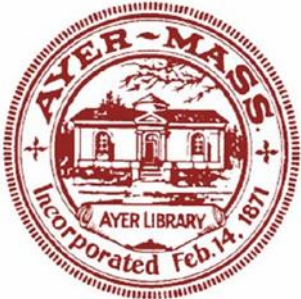


Re-Evaluation of Local Limits Town of Ayer, MA Department of Public Works

Project No. 21.073668.02



DRAFT

October 2023

Prepared for:
Town of Ayer, Massachusetts



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List of Acronyms

ADF	Average daily flow
AHL	Allowable headworks loading
BOD ₅	Biological oxygen demand
DMRs	Daily monitoring reports
FOG	Fats, oil, and grease
gpd	gallons per day
IDP	Industrial Discharge Permit
I/I	Infiltration and inflow
IPP	Industrial Pretreatment Program
IWS	Industrial Waste Survey
LEL	Lower explosive limit
lbs./day	pounds per day
MAHL	Maximum allowable headworks loading
MAIL	Maximum allowable industrial loading
MDL	Method Detection Level
MGD	million gallons per day
Mg/L	milligrams per liter
MRE	Mean Removal Efficiency
PCI	Pretreatment Compliance Inspection
POC	Pollutants of concern
POTW	Publicly owned treatment works
NPDES	National Pollution Discharge Elimination System
SIC	Standard Industrial Classification
SIUs	Significant Industrial User
s.u.	standard unit
SRR	Sewer Rules & Regulations
TTOS	Total toxic organics
TSS	Total suspended solids
TBLL	Technically based local limits
UCLL	Uniform Concentration local limits
USEPA	United States Environmental Protection Agency
WWTF	Wastewater treatment facility
WQS	Water Quality Standards

Executive Summary

This report presents the reevaluation of local limits in accordance with the Town's National Pollutant Discharge Elimination System (NPDES) permit and as part of the Town of Ayer's Industrial Pretreatment Program (IPP). The Town's original local limits were approved in June 1993 when the IPP was developed.

The Town's wastewater treatment facility (WWTF) was regulated by a previous NPDES permit issued in 2006 and modified in December 2014 (Permit #MA0100013). The NPDES permit is enforced jointly by the U.S. Environmental Protection Agency (USEPA) and the Massachusetts Department of Environmental Protection (MassDEP). This permit included more stringent regulation of phosphorus as well as interim limits for copper, aluminum and lead. The NPDES permit required the Town to complete a reassessment of its Technically Based local limits (TBLLs). The TBLL reassessment recommended a complete reassessment of the Town's local limits and was submitted to USEPA in June 2015. Prior to the 2015 reassessment, there had not been a need to revise the Town's local limits, since the MAHLs were protecting the WWTF, the receiving waters, sludge disposal practices, the collection system, and worker's health and safety.

The 2015 TBLL reassessment concluded that the Maximum Allowable Headworks Loading (MAHL) and subsequent local limits should be recalculated to reflect the NPDES permit, several revisions to the Federal water quality criteria and biosolids standards, WWTF conditions including a planned upgrade and to allow for industrial growth within the Town and add flexibility to respond to changes in existing industrial user loadings. In September 2018, a USEPA Pretreatment Compliance (PCI) audit of the Town's IPP was conducted and the USEPA agreed with the June 2015 reassessment recommendation to *reevaluate* the existing MAHLs and subsequent Maximum Allowable *Industrial* Loads (MAIL)s.

Concurrently, the Town contracted with CDM Smith to develop a capital improvements plan (CIP) for the WWTF. In the first phase of the CIP, CDM Smith recommended additional studies be conducted as required by the NPDES permit or would impact the improvements at the WWTF to be implemented in later CIP phases. The studies included:

- Perform a sampling study of the Nashua River to re-evaluate the NPDES metals limits;
- Review other coagulants to identify whether alternatives to aluminum sulfate would help the Town to meet the phosphorus and metals limits;
- Perform engineering analysis (WWTF sampling and Bio Win modeling) of the biological treatment system to determine if the system can handle future loads and then assess process improvements based on these results.

In March 2017, the Town submitted the CDM-Smith *River Sampling and WWTF Permit Compliance Report*, which provided the following proposal to revise the NPDES Permit limits as below:

Effluent Characteristic	Final Average Monthly Limit in the NPDES Permit (µg/l)	Proposed Average Monthly Limit (µg/l)
Total Recoverable Copper	4.1	18-20
Total Recoverable Aluminum	87	634-675

The Town waited for a response from USEPA on the 2017 proposed average monthly limit for copper and aluminum but did not receive any correspondence from USEPA or MADEP regarding their acceptance.

In the Fall of 2019, a planned sampling and analysis program to reevaluate the MAHLs was developed and conducted during low flow conditions at the WWTF and in the collection system. The USEPA approved sampling program supplemented the Town's existing database of known or suspected Pollutants of Concern (POC). The sampling was conducted at the WWTF influent, effluent, uncontrollable sources, and the sludge processing area. Additional POCs emerged during this study. The work was expected to be completed during 2020, however, the reevaluation was delayed due to competing resources as a result of the Covid-19 pandemic.

The Town then reapplied for a new NPDES permit in 2020 and is now regulated under the 2022 Medium WWTF General Permit (MAG590031) with an effective date of April 1, 2023 with stringent copper and lead effluent limits and a new dilution factor. The limits proposed by the Town were not included in the most recent NPDES permit.

In addition, the Town renegotiated and finalized the Wastewater Treatment and Disposal Services Agreement with the Massachusetts Development Finance Agency (known as Devens) on August 30, 2022. The reevaluation of local limits was delayed due to the critical role the use of the Devens WWTF plays in the MAHL that is available to the Town. By diverting wastewater through the Town's Main Pumping Station to the Devens WWTF for treatment and disposal, the Town is able to increase the loading available for each POC. The Town now had in place all the necessary information to develop revised Technically based Local Limits.

A description of the methodology used to develop the new MAHLs and MAILs is included in Section 6. Initial trials of the MAHL calculation indicated there was no loading remaining to be allocated to the SIUs for copper and lead given the very stringent NPDES effluent permit limits. Therefore, the Town conducted additional monitoring of copper which indicated higher removal rates of copper. If the most recent copper data is used, the average removal efficiency is 91 % which is greater than the total study period data set of 78 % which has been used conservatively in the MAHL calculation. The Town also implemented a system wide-corrosion control program and monitors the influent copper loads monthly to monitor progress. This monitoring will also provide more data points to assess the reliability of the removal efficiencies of copper to meet the stringent final effluent limits.

As part of the Town's IPP annual Priority Pollutant Scan the WWTF influent loads are compared to the newly calculated MAHLs to be sure the MAHL is not exceeded or increased more than 20 % over a given year. For the POCs with an average WWTF influent loading greater than 60 % of the newly calculated

MAHL, a local limit, in the form of a Maximum Allowable *Industrial* Load (MAIL), is necessary to control these POC loads from reaching the WWTF. This is further explained in Section 5. The following MAILs have been calculated from the TBLL reassessment:

Proposed MAILs to be published in the Sewer Rules & Regulations (SRR)	
Pollutant	MAIL
Aluminum	1.41 (lbs./day)
Arsenic	0.17 (lbs./day)
Copper	0.03 mg/L
Lead	0.004 mg/L
Mercury	0.001 mg/L
BOD ₅	2,469 (lbs./day)
TSS	4,072 (lbs./day)
Phosphorus	3.6 (mg/L)
Oil and grease	100 (mg/L)
pH (s.u.)	6.5-9.0
Temperature °F	140

The proposed revisions to the Town's existing local limits are considered a "substantial" modification to the Town's IPP as described in 40 CFR Part 403.18 (b)(2) since the proposed MAHLs have been revised and the number of POCs reduced. The MAIL for each POC should be published as soon as they are approved by USEPA and should then be adopted by the Town and incorporated into the Sewer Rules and Regulations SRR. The Town needs only to adopt the MAIL and then it will have the discretion to allocate the MAILs to SIUs that require the loading either uniformly or by the Industrial User (IU) contributory method. The Town should include regulatory review time to account for public notice and the opportunity for public comment relative to the new MAILs. The allocated MAILs will then be added to the SIU and IU's Industrial Discharge permits (IDP) as necessary.

Recommendations as a result of the re-evaluation of local limits include:

- Continue to monitor the WWTF influent, effluent and sludge loads for POCs with a newly calculated MAHL annually.
- Monitor the WWTF influent on a bi-annual basis for those POCs with a MAIL:
- Monitor the WWTF influent on a bi-monthly basis for copper in order to adjust corrosion control chemicals at the Town's Water Treatment plants
- Issue new SIU permits with permit limits base on the reallocated MAIL

1. Background

1.1. Introduction

The Town of Ayer owns, operates, and maintains a Wastewater Treatment Facility (WWTF) with a design capacity of 1.79 MGD average daily flow located off of Brook Street in Ayer, Massachusetts. Through a renegotiated wastewater treatment and disposal service agreement, the Town of Ayer has the ability to divert up to 350,000 gallons per day (gpd) of influent flow from the Main Pumping Station to the Massachusetts Development Finance Agency (Devens) WWTF. The Town is currently discharging an average of 0.10 MGD per day to the Devens WWTF between the hours of 7a.m. – 1p.m.

The Town's new Medium Wastewater General NPDES Permit no. MAG590031, effective April 1, 2023 establishes the discharge limitations to the Nashua River under the Federal Clean Water Act. The dilution factor at the WWTF's outfall is 12.05 as per the NPDES permit fact sheet. The NPDES permit and Fact Sheet are included in Appendix A.



Town of Ayer, Massachusetts
Middlesex County

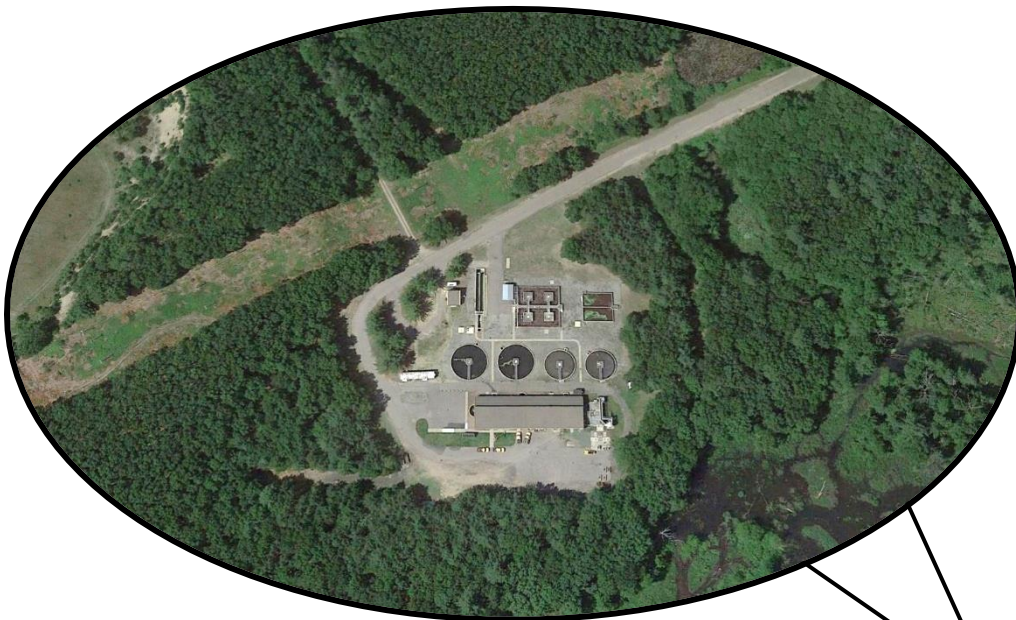
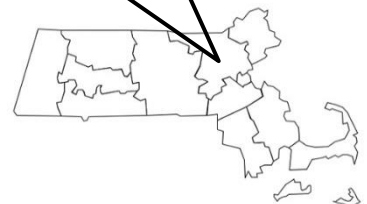


Image Source: Google Earth, 2018



The WWTF is an advanced WWTF that serves approximately 7,500 people as well as commercial and industrial users. The collection system consists of entirely separated sewers, there are no known storm sewers connected to the sanitary sewers. The WWTF was originally built in 1982 (See Appendix B- WWTF Schematic). The following is a brief description of the upgraded treatment process: wastewater first passes through a cyclone grit removal system, followed by an influent chamber. Wastewater then flows to a clari-thickener, where primary solids settle and are removed, followed by anoxic and aerobic basins, where biological treatment takes place. Following the aeration basins, alum is added for phosphorus removal and wastewater then flows to the secondary sedimentation tank where biological solids are removed. Secondary sedimentation tank effluent is then pumped to tertiary cloth filters. Biosolids are currently trucked off-site by an outside contractor for disposal at the Cranston or Woonsocket, Rhode Island WWTF incinerators, the Upper Blackstone WWTF incinerator, or the City of Lowell's WWTF if the other disposal options are not available. Lowell has the option of disposing of sludge at a Maine composting facility. The Town no longer accepts septage or other hauled wastes. Recent upgrades included flow pacing of alum, solids handling and SCADA improvements.

The WWTF is designed to achieve BOD₅ and TSS removal of approximately 90 % and phosphorus removal to 0.2 mg/L, however, the WWTF is able to achieve much greater removal efficiencies for BOD₅ and TSS, in the 95 - 98 %, range on a consistent basis. The Town is in compliance with the current NPDES permit with the exception of effluent copper. The Town has not had WET exceedances during the study period, except for one in June 2018 and December 2022, the Q1 2023 toxicity test was in compliance. The Town has been able to meet the current sludge disposal standards.

There are currently three (3) industrial users that are considered Significant Industrial Users (SIUs) that discharge industrial wastewater to the WWTF as presented in Table 1-1:

Table 1-1 Existing Permitted SIUs		
SIU	SIC Code	Permitted Max. Daily Flow (gpd)
CPF, Inc.	2086	180,000
EPIC Enterprises, Inc.	2086	100,000
Nasoya Foods	2099	170,000
Total		450,000

Box Mill Farms, a company that washes and prepares apples for making apple cider, has been added as a permitted IU in 2017. This IU has a permit with the Town for flow of 10,000 gpd, BOD₅, TSS and pH. All of the SIUs are currently in compliance with their IDPs. By petition of the SIUs, the Town revised and adopted a mass-based MAIL for BOD₅ and TSS in 2014.

The existing published and technically based local limits are shown in the following Table 1-2:

Table 1-2 Existing Local Limits	
Pollutant	Existing local limit (mg/L)
Antimony	10.0
Arsenic	0.30
Cadmium	0.038
Chromium	2.0
Copper	1.0
Cyanide	0.30
Lead	0.250
Mercury	0.001
Nickel	1.0
Selenium	2.50
Silver	0.0146
Zinc	0.75
BOD ₅ ¹ Revised in 2014	2,400 (lbs./day)
TSS ¹ Revised in 2014	5,455 (lbs./day)
Oil and grease	100
pH (s.u.)	6.5-11.5
Temp. (°F)	140

1.2. Purpose and Need

The purpose of this study is to update the MAHLs and the existing local limits to meet the following criteria:

- NPDES permit limits;
- Water quality of the receiving waters of the Nashua River;
- Prevention of inhibition;
- Prevention of pass through or interference;
- Prevention of biosolids contamination;
- Protection of the collection system; AND
- Worker health and safety.

1.3. Scope

The procedures for reevaluating local limits are described in the USEPA's July 2004 *Local Limits Development Guidance* (Guidance Manual) and includes the following general steps:

Step 1 - Assess current conditions to determine whether MAHLs should be recalculated or reallocated or additional Local Limits should be developed. Also, determine which

pollutants need to be further evaluated and for which criteria.

Step 2- Based on the pollutants and criteria in Step 1, determine whether existing data is sufficient.

Step 3- Re-calculate the MAHLs for which local limits have been developed and determine new MAHLs and MAIL.

Step 4- Implement the local limits.

The Guidance Manual is a valuable reference and has been used extensively for this local limits reevaluation. Hoyle, Tanner's scope of work for this study specifically includes the following:

- Review of existing data including WWTF data, Annual reports, SIU permits, SIU self-monitoring data and Sewer Rules and Regulations information.
- Interview Town staff regarding site specific O & M concerns.
- Develop and conduct a sampling plan.
- Analyze Sampling plan data.
- Develop an updated list of POCs.
- Calculate MAHL/MAIL.
- Make recommendations on final local limits and the impact on SIUs.
- Assist the Town with implementing the local limits.

2. Review of the Existing Treatment Plant & Uncontrolled Source Data

To gain an understanding of the pollutant loads reaching the WWTF, Hoyle, Tanner reviewed the WWTF data for the period July 2015 – December 2022, hereafter referred to as the study period, as well as the Daily Monitoring Reports (DMRs) and whole effluent toxicity tests. The data was reviewed to determine if supplemental data would be necessary to determine the average daily pollutant loads reaching the WWTF and if the loadings were causing pass-through, interference, sludge disposal issues, collection system or health and safety concerns of the WWTF operators.

2.1. Influent Data

Influent to the WWTF is comprised of several different sources including domestic wastewater, industrial wastewater, and infiltration and inflow. A review of the influent flow data indicates that the WWTF experiences conservatively approximately 27 % of the ADF as I/I, or near 0.40 MGD according to the report Infiltration/Infiltration Analysis Program-Phase B, Arcadis July 2017. The WWTF rolling average monthly flow is 1.46 MGD.

The Town conducts an annual priority pollutant scan as part of its IPP. After reviewing the database, there was little to no existing influent and effluent data for antimony, beryllium, chromium hexavalent, and molybdenum. The database indicated that the lowest possible method detection levels (MDLs) were being used, however, pollutants such as cadmium, lead and silver have had recent update to the MDLs. Using the lowest possible MDL for these parameters was necessary to see if a removal efficiency can be calculated as further explained in Section 6.

Historically, the influent POC loads have not been exceeding the existing MAHLs, however, this may not be the case once the MAHLs are recalculated based on new NPDES permit limits, a revised dilution factor, revised environmental criteria and updated removal efficiencies.

2.2. Effluent Data

The WWTF effluent database and quarterly toxicity tests was reviewed to see if the effluent from the WWTF meets water quality standards. It was determined that the pollutants tested annually are in compliance with the water quality standards and passed all the whole effluent toxicity tests for the study period with the exception of June 2018 and December 2022 and with the exception of effluent copper. The new dilution factor of 12.05 was used to determine recent compliance by multiplying the established water quality and human health criteria by this factor and then comparing each pollutant's effluent concentration to the product.

The Town has not consistently been able to meet the average or maximum daily effluent copper NPDES permit limit since the final limit of 4.1 (µg/L) went into effect September 1, 2020. The Town is now splitting effluent samples between two laboratories to verify the accuracy of the tests, is looking at the possibility of year-round chemical addition to meet the NPDES copper limit and is conducting collection system monitoring to determine if there are any unidentified contributors of copper to the WWTF.

2.3. Sludge Data

The Town disposed on average 2,500 lbs./day of sludge during the study period to the Cranston, Rhode Island WWTF incinerator. The sludge hauled was approximately 2-3 % solids. The Town also wishes to also have the option to dispose of sludge at the Upper Blackstone Water Pollution Abatement's incinerator and the City of Lowell's WWTF, which has the option to send sludge to a compost facility in Maine. The most stringent sludge standards are used in the MAHL. Annual sludge sampling data is maintained as part of the IPP. The Town has been able to meet the current sludge disposal criteria for its various sludge disposal options.

2.4. SIU Data

The Town maintains self-monitoring data from the SIUs in Excel[®] spreadsheet form. The SIUs are required to sample the effluent from their facility at least once per month. Data reviewed included self-monitoring reports and the Town's compliance monitoring data. The total permitted flow from the three existing SIUs and Box Mill Farms is 0.460 MGD and the average daily flow is 0.388 MGD. For the most part the SIUs are complying with their existing Industrial Discharge Permits except for BOD₅ and TSS slug loads which historically have been caused by mechanical malfunction or operator error.

2.5. Domestic/Uncontrollable Data

The domestic or uncontrollable flow was determined to be:

WWTF ADF	1.46 MGD
SIU average flow	0.38
I/I (27% of ADF)	0.39
Domestic/uncontrollable	0.69 MGD

The SIU and Infiltration and Inflow (I/I) are subtracted from the influent ADF to yield the domestic/uncontrollable flow. Conservatively, the *Infiltration/Infiltration Analysis Program-Phase B, Arcadis July 2017* has determined, that the WWTF sees 27 % of its ADF as I/I. The I/I does not have the same pollutant loading as typical domestic wastewater and therefore is separated from the domestic flows. The remaining flow will be categorized as domestic flow of 0.69 MGD. Most of the influent flow is from domestic or uncontrollable sources, not regulated by the Town's IPP.

The Town does not regularly sample domestic sources or uncontrollable sources. Some historic data was reviewed from the 2015 Technical Evaluation, but it became apparent that additional data would need to be collected to properly quantify the pollutant loads to the WWTF from these sources.

3. Identification of Pollutants of Concern

The USEPA defines pollutants of concern (POC)s as any pollutant that might reasonably be expected to be discharged to the POTW in sufficient amounts to cause pass-through, interference or cause problems in the collection system or jeopardize the worker's health and safety.

The USEPA identifies 15 national POCs that are found in POTW's effluent and biosolids. These POCs include metals and conventional pollutants such as: arsenic, cadmium, chromium, copper, cyanide, lead, mercury, molybdenum, nickel, silver, selenium, zinc, BOD₅, and TSS. The initial 1993 development of local limits included: antimony, beryllium, and thallium in the MAHL analysis but did not include molybdenum.

A summary list of typical POCs is presented in Table 3-1.

Table 3-1 Typical Pollutants of Concern					
Pollutant	NPDES Permit	Fed. WQ Standard	National POCs	Treatment Process Inhibition	Bio Solids Restrictions
Aluminum	X	X			X
Antimony		X			
Arsenic		X	X	X	X
Beryllium					X
Cadmium		X	X	X	X
Chromium ⁺⁶				X	
Chromium		X	X	X	X
Copper	X	X	X	X	X
Cyanide		X	X	X	
Lead	X	X	X	X	X
Mercury		X	X	X	X
Molybdenum			X		X
Nickel		X	X	X	X
Selenium		X	X		X
Silver		X	X	X	
Thallium		X			
Zinc		X	X	X	X
Oil and grease					
BOD ₅	X		X	X	
TSS	X		X	X	
Phosphorus	X			X	
Ammonia as N	X		X	X	
Sulfide as S		X		X	
TTOs		X		X	X

The 2015 TBLL reassessment included a recommendation to add aluminum, molybdenum and phosphorus and TTOS as new POCs for the reevaluation of local limits. Aluminum has a new Federal water quality standard (2018), molybdenum has been added as a POC due to sludge land application criteria and phosphorus has been added as a POC as it now has a NPDES permit limit. Total Toxic Organics (TTO) also need to be added to the POC list as several constituents were present in the study period sludge data.

The study period data and the recent 2020-2022 Priority Pollutant Scan data indicated that the influent, effluent and the sludge were all non-detectable for antimony, beryllium, hexavalent chromium, and thallium and, therefore these pollutants were eliminated from the list of POCs. In addition, in general, if any of the following criteria are met from the Screening Plan data, the pollutant will remain as a POC for the next phase full Sampling Plan:

- The maximum pollutant concentration in the WWTF effluent is more than $\frac{1}{2}$ the allowable effluent concentration required to meet water quality criteria or permit discharge limits;
- The maximum pollutant concentration in the sludge is more than $\frac{1}{2}$ the applicable residual disposal standards;
- The maximum pollutant concentration in the WWTF influent 24 -hour composite sample is more than $\frac{1}{4}$ the inhibition threshold; or
- The concentration in the WWTF influent, adjusted through simple dilution analysis, exceeds water quality criteria or permit discharge limits by any amounts.

The final list of POCs for this local limit reevaluation are presented in Table 3-2:

Table 3-2 Final List of Pollutants of Concern
Aluminum
Arsenic
Cadmium
Chromium
Copper
Cyanide
Lead
Mercury
Molybdenum
Nickel
Selenium
Silver
Zinc
Oil and grease
BOD ₅
TSS
Phosphorus
Ammonia
TTOs

The Town then developed a sampling plan to enhance the database for the final list of POCs. The sampling data will be used to calculate removal efficiencies across the WWTF.

4. Sampling Program

In order to supplement the Town's existing priority pollutant annual data base, with representative samples from the influent, effluent, domestic locations and sludge processing locations, a sampling plan was prepared and approved by the USEPA Region 1 and is included in Appendix C. The plan allowed for a sufficient number of samples to be collected at each location to determine a site-specific removal efficiency for each POC across the WWTF and to determine the loadings contributed from the domestic users. The sampling plan specified the number and type of samples that would be collected for up to three days at the following locations:

- Sewer Manhole upstream of the Main Pumping station (out of the influence of recycle streams).
- Effluent- using a 7 - hr. detention time at the final discharge point following disinfection.
- Domestic source- two (2) sanitary sewer system manholes with little to no infiltration/inflow.
- Sludge - collected from sludge processing area.

Although the Town has done extensive river sampling as part of the *March 2017 Draft River Sampling and WWTF Permit Compliance Report, prepared by CDM- Smith*, the USEPA has not approved this report or the recommendations therein to date. The background Nashua River concentrations for the POCs for this study therefore will be set to 0 mg/L.

If there was no available data for a pollutant in the database or the detection level was not low enough, three consecutive days of samples were collected. If a POC had adequate information and "hits", one sample was collected to verify the influent and effluent concentrations were within typical ranges. Sampling after the primary sedimentation basins was not conducted and the Town relied on the Guidance Manual Literature values for primary removal efficiencies which were used to determine inhibition. The samples were collected beginning Tuesday September 17, 2019 to obtain representative samples.

The specific sample type for each sample location is shown in the plan. Composite and grab samples were collected by EST of Needham, Massachusetts and sent to Alphas Analytical laboratory in Westborough, Massachusetts for analysis. Composite samples were 24-hr. timed composite samples. The laboratory provided its own samplers at each location using clean composite containers with tubing large enough to prevent clogging of the sample. Grab samples were collected in clean containers and then composited, where appropriate, into one sample for analysis for the given day. All the sampling and analysis techniques performed for the evaluation were conducted in accordance with 40 CFR Part 136 and the lowest MDL was used for each parameter and is indicated in the sampling plan.

A quality control report was provided with the sample report indicating the quality control sample results appropriate for comparison to the analytical sample results. The quality control report includes results of method blanks, surrogates, matrix spikes and duplicates for the analytical samples. Statistical calculations provide accuracy (% recovery) and precision (relative percent difference) to determine the quality of the analyses provided. QA/QC analyses were conducted to ensure analytical data quality. Field controls included: field log, clean sampling and handling techniques, and field blanks. The summarized data lists the dates the samples were collected, the concentration at which each pollutant was detected, minimum and maximum detected results, the average contaminant concentration and the loading in lbs./day. Data reported as "non-detect" in the analysis is given a value of one-half the reported detection limit for the data point.

4.1. WWTF Flows During the Sampling Program

The WWTF average daily flows during the sampling program September 17 – September 19, 2019 were 1.30 mgd, lower than the rolling average of 1.46 mgd. This period was chosen to avoid influence of groundwater infiltration and the absence of a rain event. It is typically useful to match the influent and effluent pairs to calculate the removal efficiencies of each POC as it travels through the WWTF. The detention time across the plant was calculated by Town personnel as approximately 7 hrs. Therefore, the effluent samples were collected 7 hrs. following the influent sample.

4.2. Domestic/Background

Domestic background samples were collected from two locations, as shown in the photos. The locations chosen were known to have a new sewer void of I/I and were accessible to set up and leave the sampler for several days. The two domestic samples were analyzed separately.



**Figure 1- Domestic Source 1
Sandy Pond Road**



**Figure 2- Domestic Source 2
Angard Lane**

The data that was collected indicated that the domestic sources pollutant concentrations were less than USEPAs published literature values. See Table 4-1:

Table 4-1 Domestic Sources vs. Literature Values		
POC	Domestic Wastewater (mg/L)	Typical Literature (mg/L)
Arsenic	0.001	0.007
Cadmium	0.0002	0.008
Chromium	0.001	0.006
Copper	0.07	0.14
Cyanide	0.01	0.082
Lead	0.003	0.058
Mercury	0.0001	0.002
Nickel	0.01	0.047
Silver	0.0002	0.19
Zinc	0.16	0.231
BOD ₅	200	200 ¹
TSS	88	200 ¹
Oil & grease	40.0	-
Phosphorus	6.2	0.70

1 Water Supply and Sewerage, Fifth Edition Steel/McGhee, 1979.

4.3. Hauled Waste

The WWTF does not accept hauled waste and does not intend to accept hauled waste during the next NPDES permit period.

4.4. Sludge

A sludge sample was collected over three days by taking a grab sample from the sludge processing location to verify the existing database. The Town disposes an average of 2,500 lbs./day of sludge. The sludge is approximately 2- 3 % solids.



Figure 3 – Sludge sampling location

A summary of the data at each sampling location is shown in Appendix [D](#) and the raw data for each sampling location is included in Appendix [E](#).

5. Criteria for Evaluation

There are some major factors that serve as the basis for the MAHL calculation. The factors include:

- NPDES discharge limits;
- Water quality of the receiving stream;
- Protection of the WWTF;
- Prevention of inhibition;
- Prevention of pass through or interference ;
- Prevention of sludge contamination;
- Protection of the collection system; AND
- Worker health and safety.

5.1. NPDES Permit limits

The NPDES permit establishes the objectives that the Publicly Owned Treatment Works (POTW) must meet to prevent pass-through and interference. POTWs are required to prohibit discharges from SIUs in amounts that result in or cause a violation of any requirement of the POTW's NPDES permit. If pass-through or interference is the result of inadequately pretreated industrial discharges, the POTW must develop local limits for the pollutants responsible for the pass-through or interference. In accordance with the Guidance Manual, the MAHL is set to the POTWs average design capacity for pollutants with NPDES permit limits. These POCs are BOD₅, TSS and phosphorus. The *March 2017 Draft River Sampling and WWTF Permit Compliance Report, prepared by CDM-Smith* included a BioWin™ model analysis of the WWTF design capacity for BOD₅ and TSS at 2,860 and 3,660 lbs./day, respectively. The design capacity for phosphorus is 250 lbs./day based on the cloth disc filter design capacity.

Hoyle Tanner considered various scenarios for the quantity of wastewater that could be diverted to the Devens WWTF. The proposed maximum renegotiated amount of 0.35 mgd was used to determine the MAHL at the Main Pumping station prior to discharge to the DCC.

Ayer allowable influent loading

BioWin™ (no recycle streams) (lbs./day)	Loading Scenario to DCC (lbs./day) (0.35mgd)	Total (@ Main PS) (lbs./day) (0.35mgd)
BOD ₅ 2,860	753	3,613
TSS 3,660	914	4,574

The WWTF average influent concentrations for BOD₅ and TSS of 258 and 313 mg/L respectively from the Town's DMRs 2015-2022 were used to determine the organic loading that may be diverted to Devens. Approximately 753 lbs./day for BOD₅ and 914 lbs./day of TSS can be pumped to Devens if the full 0.35 mgd is pumped, therefore the total BOD₅ loading available to the Town is 3,613 lbs./day and 4,574lbs./day for TSS for this scenario. This total available BOD₅ and TSS loading is used in the MAHL calculations in Section 6.

5.2. Water Quality Criteria

In general, POTWs do not have NPDES permit limits for all the POCs established during the local limits analysis, therefore, USEPA recommends a POTW base its effluent-quality-based AHL on Federal Water Quality Criteria (WQC) and State Water Quality Standards (WQS).

In the absence of any site specific WQS, the Town's water quality AHLs are based on the Federal national recommended water quality Criteria for aquatic life and the human health criteria. The criteria continuous concentration (CCC) is the concentration as a four-day average not to be exceeded more often than once in three years. This is to protect from the effects of chronic toxicity. The criteria maximum concentration (CMC) is the concentration not to be exceeded more than once in three years. This is to protect against acute toxicity. Water quality-based concerns also include human health concerns (dermal contact and fish ingestion). As recently as December 2018, the Federal aluminum criteria for fresh water was updated using the USEPA Aluminum Criteria calculator. Table 5-1 presents the water quality criteria used in the AHL calculation.

Table 5-1 Federal Water Quality Criteria				
	NPDES Permit	Fresh Water	Fresh Water	
Pollutant	Limits	CMC	CCC	Human Consumption
	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Aluminum	0.0925	2.2	1.1	-
Arsenic	-	0.3400	0.1500	0.00014
Cadmium	-	0.0105	0.0017	-
Chromium	-	0.1830	0.0630	-
Copper	0.0041	0.00563	0.00408	-
Cyanide	-	0.022	0.0052	0.4
Lead	0.001	0.02382	0.0005	-
Mercury	-	0.0014	0.0008	0.000051
Molybdenum	-	-	-	-
Nickel	-	0.206	0.0230	4.6
Selenium	-	-	0.005	4.2
Silver	-	0.0027	-	-
Zinc	-	0.053	0.0530	26
BOD ₅	30	-	-	-
TSS	30	-	-	-
Oil and grease	-	-	-	-
pH	-	-	-	-
Temp.	-	-	-	-
Phosphorus (seasonal)	0.2	-	-	-

5.3. WWTF Inhibition

Inhibition occurs when pollutant levels in a POTW's wastewater or sludge cause operational problems for the biological treatment processes involving secondary or tertiary wastewater treatment and alter the POTW's ability to adequately remove BOD₅, TSS, and other pollutants. Town personnel indicated there has been no recent documented reports of pass-through or interference for any of the POCs. Since site specific inhibition criteria for the WWTF could not be determined with the available data, this analysis relied on Guidance Manual *Appendix G* page *G-1* for activated sludge WWTFs. The lowest end of the inhibition ranges, which are the most conservative values, have been used for this analysis with the exception of lead and zinc. Since two studies are referenced, the upper level from one study and the lower end from the other study were used for both lead and zinc.

Table 5-2 WWTF Inhibition	
POC	Min. Threshold Levels (mg/L)
Aluminum	-
Arsenic	0.10
Cadmium	1.00
Chromium	1.00
Chromium ⁺⁶	1.00
Copper	1.00
Cyanide	0.10
Lead	5.0
Mercury	0.10
Molybdenum	-
Nickel	1.00
Selenium	-
Silver	0.25
Zinc	5.0
Ammonia	480
Sulfide	25.0
Phenol part of TTO list	200
Toluene part of TTO list	200

5.4. Sludge Disposal

In February 1993, the USEPA issued the Part 503 Biosolids regulations governing the use or disposal of sewage sludge. Pollutant levels were established for three disposal alternatives: land application to condition the soil or fertilize crops grown in the soil, surface disposal for final disposal, and incineration. The pollutant levels, however, are different for each method of disposal. Use of the criteria can improve a POTW's beneficial use options for disposal of sludge.

The Town currently has been hauling sludge to Cranston, Rhode Island WWTF for incineration during this

evaluation but would like the option to haul sludge to the UBWPAD incinerator and the Lowell WWTF, which has the option to compost sludge in Maine. The biosolids criteria for each disposal option considered feasible for final disposal are presented in Table 5-3:

Table 5-3 Sludge Disposal Criteria					
Pollutant	Federal 503 Land Application mg/kg	Lowell, MA (ME Land Application) mg/kg	Lowell, MA ME (Composting) mg/kg	Woonsocket/Cranston RI (Incineration) mg/kg	UBWPAD WWTF (Incinerator) mg/kg
Aluminum				17,500	-
Arsenic	41	41	-	497	12,000
Beryllium	-	-	-	10.50	
Cadmium	39	39	10	1,231	-
Chromium	1,200	3,000	1,000	3,874	390,000
Copper	1,500	1,500	1,000	-	1,000,000
Lead	300	300	700	2,211	140,000
Mercury	17	10	10	55	-
Molybdenum	-	75	-	-	-
Nickel	420	420	200	43,179	1,000,00
Selenium	36	100	-	-	-
Zinc	2,800	2,800	2,000	-	-

The most stringent criterion for each pollutant is shown in bold and will be used in the MAHL calculation.

5.5. Worker Health and Safety

Pollutants which are volatile or potentially explosive were evaluated to protect the health and safety of the POTW personnel. Fume toxicity screening concentrations are presented in the Guidance Manual. None of the POCs had identified discharge screening levels for either explosivity or fume toxicity listed in Appendix I of the Guidance Manual nor for Worker Exposure Listing in Appendix J.

Discharge screening levels related to the toxicity of volatile compounds are calculated based on the vapor concentrations of volatile organic compounds to which workers may be repeatedly exposed without adverse effect over an eight-hour workday and a 40-hour work week. These screening levels address the risk of a potentially explosive environment developing in the WWTF, pumping station and the collection system. The lower explosivity limit (LEL) is defined as the minimum vapor phase concentration of a substance which will explode or burn in the presence of an ignition source.

The influent and collection system toxic pollutant scan did not identify significant levels of volatile or semi-volatile compounds of concern. TTOs in the sludge were elevated on September 18, 2019 in the sludge, but this was only one datapoint in the database. Based on the influent data indicating no significant

hazardous or toxic gas emission and a lack of health and safety problems for the Town staff a TTO limit will not be set but rather, these concerns will be addressed in the SRR through Best Management Practices for TTOs.

Wastewater collection and treatment facilities do have the potential to generate certain toxic compounds such as methane and sulfide and oxygen depletion. The Town has a confined space safety program in place to protect the employees from the risks of poor ventilation and odor control systems. The Town uses gas detectors, which monitor H₂S and LEL and O₂ levels to prevent the employees from exposure to unsafe levels of hazardous or toxic gases associated with wastewater.

6. Maximum Allowable Headworks Loading

An AHL is the estimated maximum loading of a pollutant that can be received at a POTW's headworks that should not cause a POTW to violate a particular treatment plant limit or environmental criteria. Each of the criteria is then converted into an AHL using a mass balance approach. AHL is calculated based on the treatment process influent flow, the concentration of the most stringent criteria, and the removal efficiency of the treatment process for each pollutant. The calculation is shown in the following subsections for each criterion. Next, for each POC, the most stringent of the AHL is selected as the POC's MAHL.

Hoyle, Tanner has taken the approach to be reasonably conservative in the MAHL calculations in terms of environmental criteria used, removal efficiencies chosen, and safety factors used. A meeting was held with Town personnel on April 3, 2020 to explain the MAHL calculation and the subsequent calculation of a MAIL and local and permit limits. Following the meeting, some revisions were made to the MAHL spreadsheet based on the newly issued NPDES permit and the resultant MAHL spreadsheet is presented in Appendix G.

6.1. Removal Efficiencies

To determine removal efficiencies, the Town used the Mean Removal Efficiency (MRE) calculation.

$$\text{Removal efficiency} = (\text{INF Concentration} - \text{EFF Concentration}) / \text{INF Concentration}$$

Table 6-1 depicts the calculated removal efficiencies and median literature values. The removal efficiency spreadsheet is shown in Appendix F and indicates the average of each POC's influent and effluent concentration used to determine the removal efficiencies. The average concentration of each POC's effluent database (shown at the bottom of both sampling location summary table) was subtracted from the average influent concentration database divided by the average influent concentration to calculate a percentage of the removal efficiency across the entire WWTF.

The paired removal efficiency for each POC was also calculated. This method accounted for the detention time across the WWTF and calculated a removal efficiency for each day and then the median of the removal efficiencies for the POC is calculated. The paired removal efficiencies were less conservative than using the database average influent and effluent concentration values, therefore, the Town has used the Mean Removal Efficiency (MRE) to be more conservative for all POCs. The same removal efficiency is used for evaluating both water quality and biosolids disposal concerns and used in the AHL and MAHL calculations as shown in bold in the following Table.

The Town resampled influent and effluent to get more updated removal efficiency data for copper since initial MAIL calculations indicated there was a negative MAIL loading. This was done during the period of 2020-2022.

Table 6-1 Removal Efficiencies		
POC	Rem. Efficiencies (%) ¹	Literature Removal Efficiencies
Aluminum	48%	-
Arsenic	86%	45
Cadmium	0%	67
Chromium	21%	82
Copper	90%	86
Cyanide	0%	69
Lead	27%	61
Mercury	0%	60
Molybdenum	31%	-
Nickel	23%	42
Selenium	0%	50
Silver	-	75
Zinc	44%	79
BOD ₅ ²	98 %	-
TSS ²	97%	-
Ammonia	99 %	-
Phosphorus	95%	-
TTO	32%	-

¹ Rounded in some instances

² 2020-2022 DMR data used

6.2. NPDES Permit

The BioWin™ MAHL loading for BOD₅ is 2,860 lbs./day and 3,660 lbs./day for TSS. The MAHL for phosphorus is 250 lbs./day based on the design of the cloth disc filters.

6.3. Water Quality Criteria

Allowable headworks loadings to meet each of the three water quality concerns (acute toxicity, chronic toxicity, and human health) were calculated based on the water quality criteria, dilution factors and removal rates stated herein. The USEPA has advised that background concentrations of pollutants in the receiving waters is negligible and the background concentration will be set to 0 mg/L. Example calculations used in the MAHL spreadsheet in Appendix G are shown in Sections 6.3 -6.5:

$$L_{IN}=8.34(C_{WQ})(Q_{POTW} \cdot D.F.) - (C_{STR} \cdot Q_{STR}) / (1-R_{POTW})$$

Where:

AHL_{IN} = Water Quality Allowable Headworks Loading, lbs./day

C_{WQ}= Water Quality Standard, mg/L

C_{Stream}= Background of River (set as 0 mg/L)

Q_{STR}= Flow of the River, mgd

Q_{POTW}= Average Daily flow of POTW, mgd

R_{POTW} = WWTF removal efficiency, expressed as a decimal

Freshwater (CMC) acute

$$AHL_{\text{arsenic}} = 8.34 * (0.34) * (1.46 * 12.05) / (1-86\%)$$

$$AHL = 347.46 \text{ lbs./day}$$

Freshwater (CCC) Chronic

$$AHL_{\text{arsenic}} = 8.34 * (0.15) * (1.46 * 12.05) / (1-86\%)$$

$$AHL = 153.29 \text{ lbs./day}$$

Fish Consumption

$$AHL_{\text{arsenic}} = 8.34 * (0.00014) * (1.46 * 12.05) / (1-86\%)$$

$$AHL = 0.15 \text{ lbs./day} - \text{overly stringent} - \text{do not use}$$

Table 6-2 presents the AHL to meet the most stringent water quality criteria. The Town's influent sampling data indicates that the AHL for the water quality criteria is not being exceeded with the exception of aluminum, copper and lead due to the stringent NPDES permit limits. For all other POCs the data indicates that the influent loading is a very small percentage of the Water Quality AHL for each POC.

Table 6-2
Allowable Headworks Loading - Water Quality

POC	NPDES Permit limit (mg/L)	Fresh Water Criteria (w/o dilution)		Human Health Criteria (mg/L)	Removal Rate (%)	Fresh Water AHL		NPDES Permit Allowable Headworks Load (lbs./day)	Governing Allowable Headworks Load (lbs./day)	Observed Max. influent Load (lbs./day)
		CMC (mg/L)	CCC (mg/L)			CMC (lbs./day)	CCC (lbs./day)			
Aluminum	0.0925	2.2	1.1	-	48%	620.76	310.38	2.17	2.17	3.93
Arsenic	-	0.34	0.15	0.00014	87%	347.46	153.29	-	153.29	0.50
Cadmium	-	0.0105	0.0017	-	0%	4.67	0.76	-	0.76	0.03
Chromium	-	0.183	0.063	-	22%	34.55	11.90	-	11.90	0.06
Cyanide	-	0.022	0.0052	0.40	69%	10.41	2.46	-	2.46	0.06
Copper	0.0041	0.00563	0.00408	-	90%	8.26	5.99	0.50	0.50	0.94
Lead	0.001	0.02382	0.0009	-	28%	4.88	0.19	0.02	0.02	0.06
Mercury	-	0.0014	0.0008	0.000051	0%	.21	0.11	-	0.11	0.0012
Molybdenum	-	-	-	-	31%	-	-	-	-	0.065
Nickel	-	0.206	0.023	4.6	15%	35.72	3.99	-	3.99	0.15
Selenium	-	-	0.005	4.2	0%	-	1.47	-	1.47	0.06
Silver	-	0.0027	-	-	-	1.58	-	-	1.58	0.04
Zinc	-	0.053	0.053	26	44%	13.89	13.89	-	13.89	2.77

6.4. WWTF Inhibition

Although no POCs were identified as POCs for inhibition, AHL for treatment plant inhibition are calculated to determine the MAHL.

The allowable headworks loading for treatment plant inhibition is:

$$AHL_{IN} = (C_{INHIB})(Q_{POTW}) * 8.34 / (1 - R_{PRIM})$$

Where:

L_{IN} = Allowable Headworks Loading, lbs./day

C_{INHIB} = Inhibition Threshold, mg/L

Q_{POTW} = Average Daily flow of POTW, mgd

R_{PRIM} = WWTF primary removal efficiency, expressed as a decimal

$$AHL_{cadmium} = (1.0) * (1.46) * 8.34 / (1 - 15\%)$$

$$AHL_{cadmium} = 14.33 \text{ lbs./day}$$

Table 6-3 presents the numeric evaluation of AHL to meet inhibition concerns. The values of the threshold inhibition are listed and the AHL is calculated using the formula above. The value is then compared to the maximum observed influent loading:

Table 6-3 Allowable Headworks Loading – Inhibition				
POC	Threshold of Inhibition (mg/L)	Lit. Prim. Rem. Rate (%)	Allowable Headworks Loading (lbs./day)	Observed Max. influent Load (lbs./day)
Aluminum	-	-	-	3.93
Arsenic	0.10	-	-	0.50
Cadmium	1.00	15	14.33	0.03
Chromium	1.00	27	16.68	0.06
Copper	1.00	22	15.61	0.94
Cyanide	0.10	27	1.67	0.06
Lead	5.00	57	141.59	0.06
Mercury	0.10	10	1.35	0.0012
Molybdenum	-	-	-	0.065
Nickel	1.00	14	14.16	0.15
Selenium	-	-	-	0.06
Silver	0.25	20	3.81	0.04
Zinc	5.00	27	83.40	2.77
Ammonia	480	Use 99 %	584,467	150.61
Sulfide	25.0	-	-	-

Based on the data, the AHL for inhibition is not exceeded by the maximum influent loads.

6.5. Biosolids

The AHL for sludge to meet both the Federal and State standards for the sludge disposal options the Town may want to explore is calculated as below:

$$AHL_{IN} = (C_{CRIT})(Q_{SLDGE}) / (1,000,000 * R_{POTW}) \text{ (lbs./day)}$$

Where: L_{IN} = Allowable headworks loading, lbs./day

C_{CRIT} = Sludge criteria, mg/kg dry sludge

Q_{SLDGE} = Total sludge flow to disposal, lbs./day

R_{POTW} = Removal efficiency across POTW (as decimal)

$$AHL_{arsenic} = (41.0 * 2,500) / 1,000,000 * (1-87\%)$$

$$AHL_{arsenic} = 0.12 \text{ lbs./day}$$

Table 6-4 presents the numeric evaluation of allowable headworks loading to meet the Town's intended sludge disposal options. Secondary removal rates are listed as well as the Federal and most restrictive State standard where the Town may want to dispose of sludge.

Table 6-4 Allowable Headworks Loading – Sludge Quality				
POC	Removal Rate (%)	Most Stringent Biosolids Standard (mg/kg)	Allowable Headworks Load (lbs./day)	Observed Max. Sludge Load (lbs./day)
Aluminum	48%	17,500	90.95	3.93
Arsenic	87%	41	0.12	0.50
Cadmium	67%	10	0.04	0.03
Chromium	22%	1,000	11.19	0.06
Copper	90%	1,000	2.77	0.62
Cyanide	69%	-	-	0.04
Lead	28%	300	2.64	0.06
Mercury	0%	10	-	0.0012
Molybdenum	31%	75	0.60	0.06
Nickel	15%	200	3.25	0.12
Selenium	50%	36	0.18	0.06
Silver	75%	-	-	0.04
Zinc	44%	2,000	11.34	2.78

6.6. Summary

Table 6-5 summarizes the AHL for each POC for each criterion and then selects the most restrictive criteria as the MAHL for that POC.

**Table 6-5
Allowable Headworks Loading**

POC	Governing AHL Water Quality (lbs./day)	AHL Inhibition (lbs./day)	AHL Sludge (lbs./day)	Governing MAHL (lbs./day)	Diverted to Devens at 0.35MGD (lbs./day)	Proposed TOTAL MAHL (lbs./day)	Governing Criteria
Aluminum	2.17	-	90.95	2.17	0.41	2.58	NPDES Permit
Arsenic	153.29	-	0.12	0.12	0.07	0.19	Sludge
Cadmium	0.76	14.33	0.04	0.04	0.002	0.04	Sludge
Chromium	11.90	16.68	11.19	11.19	0.007	11.20	Sludge
Copper	0.50	15.61	2.77	0.50	0.11	0.61	NPDES Permit
Cyanide	2.46	1.67	-	1.67	0.01	1.68	Inhibition
Lead	0.02	141.59	2.64	0.02	0.01	0.02	NDPES Permit
Mercury	0.11	1.35	-	0.11	0.0003	0.11	WQ
Molybdenum	-	-	0.60	0.60	0.01	0.61	Sludge
Nickel	3.99	14.16	3.25	3.25	0.02	3.27	Sludge
Selenium	1.47	-	0.18	0.18	0.01	0.19	Sludge
Silver	1.58	3.81	-	1.58	0.00	1.59	WQ
Zinc	13.89	83.40	11.34	11.34	0.24	11.58	Sludge
Ammonia	-	584,467	-	-	-	584,467	Inhibition
Phosphorus	-	-	-	50.24	6.87	57.11	NPDES Permit
BOD ₅	-	-	-	2,860	753.10	3,613	Based on BioWin Model and sending (0.35 mgd at influent conc. to DCC)
TSS	-	-	-	3,660	913.65	4,573	Based on BioWin Model and sending (0.35 mgd at influent conc. to DCC)

The observed maximum influent load during the study period for each POC was compared to the newly calculated MAHLs to see if a local limit would be needed to control the discharges to the WWTF. If the average influent load is greater than 60 % of the new MAHL the value is highlighted in bold in Table 6-6 and indicates a local limit is necessary to control the influent loading.

Table 6-6 Maximum Allowable Headworks Loading vs. Max. Observed Influent Loads				
POC	Proposed MAHL (lbs./day)	Max. Observed Influent Load (lbs./day)	% of MAHL	Local limit required
Aluminum	2.58	3.93	152%	yes
Arsenic	0.19	0.50	255%	yes
Cadmium	0.04	0.03	77%	no
Chromium	11.20	0.06	0.5%	no
Copper	0.61	0.94	154%	yes
Cyanide	1.68	0.06	3.7%	no
Lead	0.02	0.06	250%	yes
Mercury	0.11	0.001	1%	yes¹
Molybdenum	0.61	0.065	11%	no
Nickel	3.27	0.15	5%	no
Selenium	0.19	0.06	32%	no
Silver	1.59	0.04	3%	no
Zinc	11.58	2.77	24%	yes
BOD ₅	3,613	6,283	174%	yes
TSS	4,573	14,353	314%	yes
Ammonia	584,467	317	0.1%	no
Phosphorus	57.11	59.13	104%	yes

¹ Massachusetts limit

For all the POCs where the maximum observed influent load is less than 80 % of the new MAHL a local limit does not need to be calculated and therefore, are eliminated from the evaluation shown in Section 7. It is recommended that the Town monitor the influent loadings for all these POCs and compare them to the MAHLs during the annual priority pollutant sampling as part of the IPP. This will allow Town personnel to annually track changes that may require the development of a local limit in the future and to be sure the MAHL is not exceeded or that the influent percentage of the MAHL does not increase significantly.

The maximum influent loads to the WWTF for aluminum, arsenic, copper, lead and phosphorus for the study period are greater than 60 % of the newly calculated MAHL for these POCs. Therefore, a local limit should be developed. In addition, since there is an NPDES permit limit for BOD₅ and TSS and maximum loads exceed the MAHL, it is recommended that a local limit be developed. Massachusetts has a mercury limit of 0.001 mg/L for all discharges to POTWs so the mercury local limit will be maintained. The Town intends to continue to use zinc orthophosphate for water system corrosion control, so it is important to monitor the zinc MAHL closely against influent increases.

The newly calculated MAHLs compared to the existing 1993 MAHLs are shown in the following table:

Table 6-7 Existing and Proposed MAHLs			
Pollutant	Existing MAHL (lbs./day)	Proposed MAHL (lbs./day)	Description
Aluminum	-	2.58	New POC
Antimony	268.97	-	Removed as a POC
Arsenic	13.20	0.19	Reduction due to sludge AHL
Beryllium	1.20	-	Removed as a POC
Cadmium	0.05	0.04	Reduction due to sludge AHL
Chromium	1.26	11.20	Increase due to sludge AHL
Chromium ⁺⁶	-	-	Removed as a POC
Copper	0.67	0.61	Based on final NPDES permit limit (0.0041mg/L)
Cyanide	0.94	1.68	Increase due to inhibition AHL
Lead	0.46	0.02	Based on final NPDES permit limit (0.001mg/L)
Mercury	0.0054	0.11	Increase due to water quality AHL
Molybdenum	-	0.61	New POC
Nickel	3.53	3.27	Reduction due to sludge AHL
Selenium	7.68	0.19	Reduction due to sludge AHL
Silver	0.03	1.59	Increase due to water quality AHL
Thallium	9.04	0.01	Removed as a POC
Zinc	1.01	11.58	Increase due to sludge AHL
BOD ₅	3,585	3,613	Based on Bio Win TM Model and discharging (0.35 mgd at influent concs. to DCC)
TSS	7,777	4,573	Based on BioWin TM and discharging (0.35 mgd at influent concs. to DCC)
Phosphorus	-	57.11	New POC

A 10% safety factor to account for analytical errors is deemed acceptable and subtracted from the MAHL for all POCs with the exception of BOD₅ and TSS. The Town maintains weekly monitoring data for these parameters and is able to account for sampling and analysis errors in the extensive database. The domestic/uncontrollable source loading is then subtracted from each POCs MAHL less 10% and the remaining loading is considered the *MAIL* as further explained in Section 7.

6.7. Collection System

Collection system based numeric limits which are intended to address explosivity, corrosivity, flow obstruction, temperature and headspace toxicity apply directly to industrial users and do not involve calculations of MAHLs. The General Pretreatment Regulations given at 40 CFR Part 403.5 prohibit the discharge of pollutants that will cause fire or explosion hazard in the POTW. It is recommended that the Town prohibit the discharge of pollutants that have a closed cup flashpoint of 140 ° F to protect against fires and explosions. The Town prohibits discharge of industrial wastewater with a temperature higher than 140° F (60 C) into the collection system. This temperature will likely prevent the

wastewater temperature at the WWTF from being higher than 104 °F which can inhibit the biological process.

The Town intends to make the pH local limits consistent in its SRR and in the SIU permits. A reasonable pH is 6.0 -11.5 s.u. This allowable range appears to provide sufficient protection to the WWTF. The WWTF has been in compliance with the NPDES permit allowable range of 6.5-8.5 s.u.

The existing fats oil and grease local limit in the SU) is 100 mg/L. The WWTF's current NPDES does not contain any limits or screening requirements for oil and grease. During the local limits sampling program, the maximum influent concentration for oil and grease was 26 mg/L and the WWTF demonstrated an 88% removal efficiency for oil and grease. The domestic concentration averaged 40.0 mg/L which is below the current local limit. It is recommended that the local limit remain at 100 mg/L.

6.8. Worker Health and Safety

No volatile organics were identified as pollutants of concern for worker health and safety at the WWTF, with the exception of toluene and 3-methlyphenol found in the sludge on September 18, 2019. AHLs for worker health and safety have not been developed rather, these concerns will be addressed in the SRR through Best Management Practices for toxic organic pollutants.

7. Allocation of Loadings and Local Limits

7.1. Introduction

Once the MAHL is calculated, the local limits analysis includes calculating the pollutant loadings from uncontrolled sources (domestic users and commercial users) and hauled waste sources and subtracting these loads from the MAHL to obtain the MAIL. The MAIL is then allocated to the industrial users. A safety factor is applied to the calculated MAHLs for all POCs. The USEPA recommends a 10 % safety factor be used to account for sampling errors and slug loads from industrial users.

In this section recommendations for local industrial discharge limits are developed. Several different methods may be used to allocate the MAHL loading as local limits including:

- Uniform local limits
- IU contributory method
- Industry specific local limits by mass proportion
- Creative Allocation

After reviewing each method, the most applicable allocation methods for the Town are the Uniform local limits and the IU contributory method. The simplest method of allocating and regulating the local limits is the uniform concentration method. In this manner all the industrial users will be allowed the same concentration of pollutants regardless of the types of pollutants typically discharged by an industry. The total projected industrial flow is used to derive concentration limits given the MAIL for each POC. The determination of local limits by the uniform concentration method results in a single concentration limit for each pollutant of concern for all industrial users. However, the resulting limits may be overly stringent because some of the SIUs will receive an allocation but do not actually discharge the pollutant above background levels.

An alternative to uniform limits is the industry specific local limits by the IU contributory method which set individual local limits to those SIUs needing the POC loading. This approach allows the MAIL to be allocated to those SIUs with the greatest need of the POC. All other IUs will be held to background concentrations. Industrial discharge limits can be expressed either in terms of mass limits (pounds per day) or concentration limits (mg/L). Enforcement of IU contributory limits are more difficult since both the flow and the concentration must be accurately determined. The Town believes it has an accurate means of checking wastewater discharge flow data from the SIUs. The distribution of the MAILs for SIU Industrial Discharge permit limits using the uniform concentration method and the IU contributory method is further evaluated herein.

7.2. Maximum Allowable Industrial Headworks Loading (MAIL)

As recommended by USEPA, a 10 % safety factor has been applied to the MAHL to account for analytical errors or slug loads from industrial users. A factor of safety has not been used for BOD₅ and TSS since the Town maintains daily monitoring data for these pollutants. To determine the MAIL, the loadings from the domestic sources and hauled waste are subtracted from the MAHL (less 10 %). The total pollutant loads from the domestic sources are listed and subtracted from the MAHL to leave the total pollutant load available for industrial users remaining, the MAIL.

Table 7-1 presents the MAIL.

Table 7-1 Maximum Allowable Industrial Loadings (MAILs)				
POC	Proposed Total MAHL (lbs./day)	MAHL Less Safety Factor (10%)	Domestic Loading (lbs./day)	MAIL (lbs./day)
Aluminum	2.58	2.32	0.91	1.41
Arsenic	0.19	0.17	0.01	0.17
Copper	0.61	0.55	0.38	0.17
Lead	0.02	0.02	0.02	0.004
BOD ₅	3,613	3,613	1,144	2,469
TSS	4,573	4,573	501	4,072
Phosphorus	57.11	51.4	36.38	15.02

Table 7-2 presents the MAIL allocated uniformly as concentration-based limits. The SIUs and Box Mill Farm are currently permitted for 0.46 mgd of flow and currently discharge on average 0.388 mgd. The MAIL is allocated uniformly based on an increased permitted flow from the SIUs of 10 % or a total of 0.50 mgd.

Table 7-2 Uniform Concentration Limits				
Parameter	MAIL (lbs./day)	Existing local limit (mg/L)	Prop. Uniform Conc. Limit Allocated evenly to all existing SIUs (mg/L)	Notes
Aluminum	1.41	-	0.3	Contributing IUs should be able to meet
Arsenic	0.17	0.3	0.04	Contributing IUs should be able to meet
Copper	0.17	1.0	0.04	Uniform conc. local limit- may be difficult to meet
Lead	0.004	0.25	0.001	Uniform conc. local limit- may be difficult to meet
Mercury	0.10	0.0009	0.001	Maintain existing limit
BOD ₅	2,469	-	592	Use IU contributory method
TSS	4,072	-	976	Use IU contributory method
Phosphorus	15.02	-	3.6	Uniform conc. local limit- may be difficult to meet

While local limits are recommended for all of these POCs, the Town is not required to impose limits and monitoring requirements for all POCs on all SIUs. Only the parameters that exceed the normal domestic/uncontrollable levels may need to be regulated in the individual SIU discharge permits.

Each SIUs self-monitoring and the Town's compliance monitoring data base was reviewed to determine if the SIU would be able to meet the proposed uniform concentrations. The SIUs do not monitor for aluminum, arsenic, cadmium, copper, lead, mercury, zinc, and phosphorus nor do the SIUs contribute these POCs based on the nature of their manufacturing processes. The Town may want to impose screening levels for some POCs which will allow the Town to monitor pollutant levels without concern for industrial discharge permit noncompliance.

The existing SIUs have adequate flow monitoring devices to accurately determine a discharge loading for BOD₅ and TSS from their facilities. As requested by the SIUs, BOD₅ and TSS will be allocated to those industries known to contribute the loading using the IU contributory method.

7.3. Industrial User contributory Method

An alternative to uniform concentration permit limits is the IU contributory method which allocates MAILs to each IU that contributes the POC at the discretion of the Town. The existing permitted organic loadings and the actual organic loadings for each SIU is shown in Table 7-3:

Table 7-3 Existing Permitted Organic Loadings				
SIU	Permitted Max. (lbs./day)		Actual average day discharged (lbs./day)	
	BOD₅	TSS	BOD₅	TSS
CPF, Inc.	750	400	426	50
Epic Enterprises	400	334	65	32
Nasoya Foods, LLC	750	1,700	247	174
Box Mill Farms (non-SIU)	150	200	113	15
Total	2,050	2,634	851	271
MAIL	2,469	4,072		

If the Town were to divide the BOD₅ MAIL available, after subtracting Box Mill Farms permitted loading of 150 lbs./day, to each SIU evenly, each would receive a BOD₅ permit limit of approximately 773 lbs./day. Since CPF, Inc. and EPIC haul high strength waste to other area POTWs, the Town may want to discuss these issues with these SIUs.

The Town has approximately 419 lbs./day of BOD₅ and 1,438 lbs./day of TSS remaining at the 0.35 mgd diverted flow scenario to DCC to allocate to a new SIU or to the existing SIUs at its discretion.

8. Recommendations and Implementation

8.1. Implementation of Local Limits

The proposed revisions to the Town's existing local limits are considered a "substantial" modification to the Town's IPP by USEPA as described in 40 CFR Part 403.18 (b)(2) since the proposed MAHLs for chromium, cyanide, mercury, silver, and zinc are proposed to increase and there are several new MAHLs. The Town should submit the local limits reevaluation to the USEPA for review and approval. Once these local limits are approved by the USEPA and accepted by Town, the SRR will need to be updated to incorporate the MAILs. The Town must then adopt the local limits and a copy of the revised SRR will be sent to the USEPA for review and approval.

The Town needs only to adopt the MAIL and then it will have the discretion to allocate the MAILs to SIUs that require the loading either uniformly or by the mass proportion method. The Town should include regulatory review time to account for public notice and the opportunity for public comment relative to the new MAILs.

The General Pretreatment Regulations encourage public participation by requiring public notices or hearings for substantial pretreatment program changes. Federal regulations 40 CFR 403.5 (c) (3) require the Town to notify the industrial users and other affected parties and provide them with an opportunity to respond to changes in local limits. The USEPA recommends that POTWs notify affected parties when the new limits are drafted. While the USEPA is reviewing the reevaluation study, the Town should also meet with the SIUs to explain the local limits and the potential for revised permit limits. This would allow any industry to make known their concern with the proposed limits and any plans they may have in the near future that would affect their ability to meet the new local limits. The allocated MAILs should then be incorporated into the SIU and newly identified IU permits, as appropriate.

8.2. Impacts to Industries

The local limits have been developed to minimize the impacts to the existing industries while at the same time meeting the proper environmental criteria. To determine the impact the new revised local limits will have on industry, the proposed local limits were evaluated against the Town's IPP compliance database. Not all the local limits need to be included in the SIU's permits if in fact the SIU does not discharge or have the potential to discharge the POC.

8.3. Recommendations

Recommendations as a result of the re-evaluation of local limits include:

- Continue to annually monitor the WWTF influent, effluent and sludge loads for POCs with a newly calculated MAHL
- Monitor the WWTF influent on a semi-annual basis for those POCs with a MAIL: aluminum, arsenic, lead, and phosphorus to identify any changes in the influent loadings of these POCs.
- Monitor the WWTF influent on at least a monthly basis for copper.

- Conduct an updated Industrial Waste Survey to update the information maintained for IUs that are not currently regulated as part of the IPP.

8.4. Next steps

The recommended next steps include:

- ✓ Town DPW review of the Draft Local Limits report.
- Revise the local limits report to a Draft Report for Select Board approval
- Submit the Draft Local Limits report to the USEPA and MADEP for review and approval.
- Meet with the existing/potential SIUs to inform them of new local limits.
- Public comment on the Draft LL report
- USEPA issues approval of the LL report
- Issue a Final LL Report to all interested parties
- Revise the SRR to include the new MAILs and Local limits
- Revise and issue new industrial discharge permits, as necessary

APPENDIX A



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

VIA EMAIL - READ RECEIPT REQUESTED

February 7, 2023

RE: Authorization to discharge under the Medium Wastewater Treatment Facilities General Permit (Medium WWTF GP) MAG590000

To Whom it May Concern:

Enclosed is your Facility's authorization to discharge under the Medium WWTF GP. Your Facility's authorization number and the authorization effective date are included in the authorization. Authorization to discharge under your individual permit shall terminate on the effective date of this authorization, which is **April 1, 2023**.

Operators must comply with all applicable requirements of the Medium WWTF GP as specified in this authorization, including all record-keeping, standard conditions, state permit conditions, and reporting requirements. For the complete General Permit, see EPA's Medium WWTF GP website, currently available at: <https://www.epa.gov/npdes-permits/region-1-final-medium-wastewater-treatment-facilities-general-permit-massachusetts>.

Please note that as your facility was not previously covered under a General Permit, a new permit authorization number has been assigned to your facility. With the establishment of this new permit authorization number, your facility will need to create an account with the Central Data Exchange (CDX), if you do not already have an account, and have the signatory for the facility request access to the new permit authorization number through NetDMR and receive approval from EPA to report each month. Attached to this letter are the instructions for creating a CDX account (if needed), adding NetDMR Program Service to your account (if needed), and associating your NetDMR account with your new NPDES permit authorization number. Please note that the Medium WWTF GP authorizations are still in the process of being added to NetDMR, therefore, many of the new authorization numbers may not be available in the system until the authorization effective date. If you still have questions or need assistance with NetDMR please send an email to R1.NetDMR@epa.gov.

Please contact Michele Duspiva at Duspiva.Michele@epa.gov or (617) 918-1682 if you have any other questions.

Sincerely,

ELLEN
WEITZLER

Ellen Weitzler, Supervisor
Industrial and Municipal Permits Section, Water Division

Digitally signed by ELLEN
WEITZLER
Date: 2023.02.07 08:24:29
-05'00'

Enclosures: Authorization, CDX Instructions, NetDMR Instructions

Cc: Claire Golden, MassDEP, via email

**AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM MEDIUM
WASTEWATER TREATMENT FACILITY GENERAL PERMIT**

In compliance with the provisions of the Federal Clean Water Act, as amended, (33 U.S.C. §§ 1251 et seq.; the "CWA"),

Town of Ayer, Massachusetts

is authorized to discharge from the facility located at

**Ayer Wastewater Treatment Facility
Brook Street
Ayer, MA 01432**

to receiving water named

**Nashua River
Merrimack River Watershed**

in accordance with effluent limitations, monitoring requirements and other conditions set forth in this authorization and the Medium WWTF GP (General Permit No. MAG590000).

This authorization shall become effective on April 1, 2023.

For applicable attachments see the complete version of the Medium WWTF General Permit:

Part VII – Standard Conditions

Attachment A – Freshwater Acute Toxicity Test Procedure and Protocol, February 2011

Attachment B – Freshwater Chronic Toxicity Test Procedure and Protocol, March 2013

Attachment C – Marine Acute Toxicity Test Procedure and Protocol, July 2012

Attachment D – Marine Chronic Toxicity Test Procedure and Protocol, November 2013

Attachment E – List of Eligible Facilities

Attachment F – Reassessment of Technically Based Industrial Discharge Limits

Attachment G – NPDES Permit Requirement for Industrial Pretreatment Annual Report

Attachment H – PFAS Analyte List

Attachment I – Facility-Specific Permit Terms

Attachment J – Pretreatment Program Development Requirements

I. Applicability and Coverage of the WWTF GP

Supplementary information provided in the complete version of the Medium WWTF GP.

II. General Permit Requirements

A. Effluent Limitations and Monitoring Requirements

During the period beginning on the effective date and lasting through the expiration date, the Permittee is authorized to discharge treated effluent through Outfall Serial Number 001 to the Nashua River. The discharge shall be limited and monitored as specified below at the end of all treatment processes, including disinfection or dechlorination, or at an alternative representative location approved by EPA and the Massachusetts Department of Environmental Protection (MassDEP), that provides a representative sample of the effluent. The receiving water and the influent shall be monitored as specified below.

Table 1. Effluent Limitations and Monitoring Requirements

Effluent Characteristic	Discharge Limitation			Monitoring Requirement ^{1,2}	
Parameter	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type ³
Rolling Average Effluent Flow ⁴	1.79 MGD	---	---	Continuous	Recorder
Effluent Flow ⁴	Report MGD	---	Report MGD	Continuous	Recorder
BOD ₅	30 mg/L 448 lb/day	45 mg/L 672 lb/day	Report mg/L	1/Week	Composite
BOD ₅ Removal	≥ 85 %	---	---	1/Month	Calculation
TSS	30 mg/L 448 lb/day	45 mg/L 672 lb/day	Report mg/L	1/Week	Composite
TSS Removal	≥ 85 %	---	---	1/Month	Calculation
pH Range ⁷	6.5 – 8.3 S.U.			5/Week	Grab
<i>Escherichia coli</i> ⁸	126 colonies/ 100 mL	---	409 colonies/100 mL	1/Week	Grab
Total Residual Chlorine ⁹	124 µg/L	---	222 µg/L	5/Week	Grab
Total Recoverable Aluminum	92.5 µg/L	---	---	1/Month	Composite
Total Recoverable Copper	4.1 µg/L	---	5.6 µg/L	1/Month	Composite
Total Recoverable Lead	1.0 µg/L	---	---	1/Month	Composite
Total Phosphorus (April 1 – October 31)	0.2 mg/L	---	---	1/Week	Composite

Effluent Characteristic Parameter	Discharge Limitation			Monitoring Requirement ^{1,2}	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type ³
Total Phosphorus (November 1 – March 31)	1.0 mg/L	---	---	2/Month	Composite
Dissolved Oxygen	≥ 6.0 mg/L			1/Day	Grab
Total Kjeldahl Nitrogen ¹¹ (April 1 – October 31) (November 1 – March 31)	Report mg/L Report mg/L	---	Report mg/L Report mg/L	1/Week 1/Month	Composite Composite
Nitrate + Nitrite ¹¹ (April 1 – October 31) (November 1 – March 31)	Report mg/L Report mg/L	---	Report mg/L Report mg/L	1/Week 1/Month	Composite Composite
Total Nitrogen ¹¹	Report mg/L Report lb/day	---	Report mg/L	1/Month	Calculation
PFAS Analytes ¹²	---	---	Report ng/L	1/Quarter	Composite
Whole Effluent Toxicity (WET) Testing^{14,15}					
Acute (LC ₅₀) (Test Species: <i>Ceriodaphnia dubia</i>)	---	---	$\geq 100\%$	4/Year	Composite
Chronic (C-NOEC) (Test Species: <i>Ceriodaphnia dubia</i>)	---	---	$\geq 8.3\%$	4/Year	Composite
Hardness (as CaCO ₃)	---	---	Report mg/L	Same as WET Measurement Frequency and Sample Type	
Ammonia Nitrogen	---	---	Report mg/L		
Total Aluminum	---	---	Report mg/L		
Total Cadmium	---	---	Report mg/L		
Total Copper	---	---	Report mg/L		
Total Lead	---	---	Report mg/L		
Total Nickel	---	---	Report mg/L		
Total Zinc	---	---	Report mg/L		
Total Organic Carbon	---	---	Report mg/L		

Ambient Characteristic ¹⁶	Reporting Requirements		Monitoring Requirements ^{1,2,3}		
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type ⁴
Hardness	---	---	Report mg/L	Same as WET Monitoring Frequency	Grab
Ammonia Nitrogen	---	---	Report mg/L		Grab
Total Aluminum	---	---	Report mg/L		Grab
Total Cadmium	---	---	Report mg/L		Grab
Total Copper	---	---	Report mg/L		Grab
Total Nickel	---	---	Report mg/L		Grab
Total Lead	---	---	Report mg/L		Grab
Total Zinc	---	---	Report mg/L		Grab
Total Organic Carbon	---	---	Report mg/L		Grab
Dissolved Organic Carbon ¹⁷	---	---	Report mg/L		Grab
pH ¹⁸	---	---	Report S.U.		Grab
Temperature ¹⁸	---	---	Report °C		Grab
Total Phosphorus ¹⁹	---	---	Report mg/L	See Footnote 19	Grab

Influent Characteristic	Reporting Requirements			Monitoring Requirements ^{1,2,3}	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type ⁴
BOD ₅	Report mg/L	---	---	2/Month	Composite
TSS	Report mg/L	---	---	2/Month	Composite
PFAS Analytes ¹²	---	---	Report ng/L	1/Quarter	Composite

Sludge Characteristic	Reporting Requirements			Monitoring Requirements ^{1,2,3}	
	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type ⁴
PFAS Analytes ²⁰	---	---	Report ng/g	1/Quarter	Composite ²¹

Footnotes to Part II.A. Table 1:

1. All samples shall be collected in a manner to yield representative data. A routine sampling program shall be developed in which samples are taken at the same location, same time and same days of the week each month. Occasional deviations from the routine sampling program are allowed, but the reason for the deviation shall be documented as an electronic attachment to the applicable discharge monitoring report. The Permittee shall report the results to the Environmental Protection Agency Region 1 (EPA) and MassDEP of any additional testing above that required herein, if testing is in accordance with 40 CFR Part 136.
2. In accordance with 40 CFR § 122.44(i)(1)(iv), the Permittee shall monitor according to sufficiently sensitive test procedures (i.e., methods) approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O, for the analysis of pollutants or pollutant parameters (except WET). A method is “sufficiently sensitive” when: 1) The method minimum level (ML) is at or below the level of the effluent limitation established in the permit for the measured pollutant or pollutant parameter; or 2) The method has the lowest ML of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR chapter I, subchapter N or O for the measured pollutant or pollutant parameter. The term “minimum level” refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (MDL), whichever is higher. Minimum levels may be obtained in several ways: they may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a laboratory, by a factor.

When a parameter is not detected above the ML, the Permittee must report the data qualifier signifying less than the ML for that parameter (e.g., < 50 µg/L, if the ML for a parameter is 50 µg/L). For reporting an average based on a mix of values detected and not detected, assign a value of “0” to all non-detects for that reporting period and report the average of all the results.

3. A “grab” sample is an individual sample collected in a period of less than 15 minutes.

A “composite” sample is a composite of at least twenty-four (24) grab samples taken during one consecutive 24-hour period, either collected at equal intervals and combined proportional to flow or continuously collected proportional to flow.
4. The limit is a rolling annual average, reported in million gallons per day (MGD), which will be calculated as the arithmetic mean of the monthly average flow for the reporting month and the monthly average flows of the previous eleven months. Also report monthly average and maximum daily flow in MGD.
5. N/A
6. N/A

7. The pH shall be within the specified range at all times. The minimum and maximum pH sample measurement values for the month shall be reported in standard units (S.U.). Continuous monitoring also fulfills the 5/week monitoring frequency.

8. The monthly average limits for bacteria are expressed as a geometric mean.

Bacteria monitoring shall be conducted concurrently with TRC monitoring, if TRC monitoring is required.

For samples tested using the Most Probable Number (MPN) method, the units may be expressed as MPN. The units may be expressed as colony forming units (cfu) when using the Membrane Filtration method.

9. For total residual chlorine (TRC) limitations and other related requirements, see Part II.B.9 of this permit.

10. N/A

11. Total Kjeldahl nitrogen and nitrate + nitrite samples shall be collected concurrently. The results of these analyses shall be used to calculate both the concentration and mass loadings of total nitrogen, as follows.

$$\text{Total Nitrogen (mg/L)} = \text{Total Kjeldahl Nitrogen (mg/L)} + \text{Nitrate} + \text{Nitrite (mg/L)}$$

$$\text{Total Nitrogen (lbs/day)} = [(\text{average monthly Total Nitrogen (mg/L)} * \text{total monthly effluent flow (Millions of Gallons (MG))} / \# \text{ of days in the month}] * 8.34$$

12. Report in nanograms per liter (ng/L). This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter after the effective date of the authorization to discharge under the General Permit. Until there is an analytical method approved in 40 CFR Part 136 for PFAS in wastewater, monitoring shall be conducted using Draft Method 1633.

Additionally, report in NetDMR the results of all other PFAS analytes required to be tested as part of the method as shown in Attachment H. Any parameters that are removed from the method based on multi-lab validation of the method will not be required for reporting and the Permittee may report "NODI: 9" for any such parameters.

13. N/A

14. The Permittee shall conduct acute toxicity tests (LC50) and chronic toxicity tests (C-NOEC) in accordance with test procedures and protocols specified in **Attachments A and B** of this permit. LC50 and C-NOEC are defined in Part VII.E. of this permit. The Permittee shall test the daphnid (*Ceriodaphnia dubia*). Toxicity test samples shall be collected during the same weeks each time of calendar quarters ending March 31st, June 30th, September 30th, and December 31st. The complete report for each toxicity test shall be submitted as an attachment to the DMR submittal which includes the results for that toxicity test.

15. For Part I.A.1., Whole Effluent Toxicity Testing, the Permittee shall conduct the analyses specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS for the effluent sample. If toxicity test(s) using the receiving water as diluent show the receiving water to be toxic or unreliable, the Permittee shall follow procedures outlined in **Attachments A and B**, Section IV., DILUTION WATER. Minimum levels and test methods are specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS.
16. For Part I.A.1., Ambient Characteristic, the Permittee shall conduct the analyses specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS for the receiving water sample collected as part of the WET testing requirements. Such samples shall be taken from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location, as specified in **Attachments A and B**. Minimum levels and test methods are specified in **Attachments A and B**, Part VI. CHEMICAL ANALYSIS.
17. Monitoring and reporting for dissolved organic carbon (DOC) are not requirements of the Whole Effluent Toxicity (WET) tests but are additional requirements. The Permittee may analyze the WET samples for DOC or may collect separate samples for DOC concurrently with WET sampling.
18. A pH and temperature measurement shall be taken of each receiving water sample at the time of collection and the results reported on the appropriate DMR. These pH and temperature measurements are independent from any pH and temperature measurements required by the WET testing protocols.
19. The Permittee shall develop and implement a sampling and analysis plan for biannually collecting monthly samples at a location upstream of the facility. Samples shall be collected once per month, from May through September, every even calendar year. The Permittee may enter "NODI" code 9 (*i.e.*, conditional monitoring) in the relevant discharge monitoring report during years when monitoring is not required. Sampling shall be conducted on any calendar day that is preceded by at least 72 hours without rainfall, following the last rainfall of 0.1 inches of rainfall or greater. A sampling plan shall be submitted to EPA and the State at least three months prior to the first planned sampling date as part of a Quality Assurance Project Plan for review and State approval.
20. Report in nanograms per gram (ng/g). This reporting requirement for the listed PFAS parameters takes effect the first full calendar quarter after the effective date of the authorization to discharge under the General Permit. Until there is an analytical method approved in 40 CFR Part 136 for PFAS in sludge, monitoring shall be conducted using Draft Method 1633.

Additionally, report in NetDMR the results of all other PFAS analytes required to be tested as part of the method, as shown in Attachment H. Any parameters that are removed from the method based on multi-lab validation of the method will not be required for reporting and the Permittee may report "NODI: 9" for any such parameters.

21. Sludge sampling shall be as representative as possible based on guidance found at <https://www.epa.gov/sites/production/files/2018-11/documents/potw-sludge-sampling-guidance-document.pdf>.

B. Other Requirements

1. The discharge shall not cause a violation of the water quality standards of the receiving water.
2. The discharge shall be free from pollutants in concentrations or combinations that, in the receiving water, settle to form objectionable deposits; float as debris, scum or other matter to form nuisances; produce objectionable odor, color, taste or turbidity; or produce undesirable or nuisance species of aquatic life.
3. The discharge shall be free from pollutants in concentrations or combinations that adversely affect the physical or chemical nature of the bottom, interfere with the propagation of fish or shellfish, or adversely affect populations of non-mobile or sessile benthic organisms.
4. The discharge shall not result in pollutants in concentrations or combinations in the receiving water that are toxic to humans, aquatic life or wildlife.
5. The discharge shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to the receiving water.
6. The discharge shall be free from oil, grease and petrochemicals that produce a visible film on the surface of the water, impart an oily taste to the water or an oily or other undesirable taste to the edible portions of aquatic life, coat the banks or bottom of the water course, or are deleterious or become toxic to aquatic life.
7. The Permittee must provide adequate notice to EPA-Region 1 and MassDEP of the following:
 - a. Any new introduction of pollutants into the facility from an indirect discharger which would be subject to Part 301 or Part 306 of the Clean Water Act if it were directly discharging those pollutants or in a primary industry category (see 40 CFR Part 122 Appendix A as amended) discharging process water; and
 - b. Any substantial change in the volume or character of pollutants being introduced into that facility by a source introducing pollutants into the facility at the time of issuance of the permit.
 - c. For purposes of this paragraph, adequate notice shall include information on:
 - (1) The quantity and quality of effluent introduced into the facility; and
 - (2) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from the facility.
8. Pollutants introduced into the facility by a non-domestic source (user) shall not pass through the POTW or facility or interfere with the operation or performance of the works.
9. Total Residual Chlorine (TRC) limitations and related requirements are specified below:

- a. N/A
- b. The Permittee shall minimize the use of chlorine while maintaining adequate bacterial control. TRC monitoring and limitations only apply to discharges which have been previously chlorinated or which contain residual chlorine. If bacteria limits do not apply during a particular monitoring period and, therefore, chlorine is not utilized, TRC monitoring is not necessary and the Permittee may enter “NODI” code 9 (*i.e.*, conditional monitoring) in the relevant discharge monitoring report.
- c. Additionally, Permittees authorized to conduct disinfection using an alternative to chlorine as the disinfectant are only subject to the TRC limitations and monitoring requirements whenever chlorine is added to the treatment process for disinfection or for other purpose. For the months in which chlorine is not added to the treatment process and the Permittee may enter “NODI” code 9 (*i.e.*, conditional monitoring) in the relevant discharge monitoring report.
- d. Chlorination and dechlorination systems shall include an alarm system for indicating system interruptions or malfunctions. Any interruption or malfunction of the chlorine dosing system that may have resulted in levels of chlorine that were inadequate for achieving effective disinfection, or interruptions or malfunctions of the dechlorination system that may have resulted in excessive levels of chlorine in the final effluent shall be reported with the monthly DMRs. The report shall include the date and time of the interruption or malfunction, the nature of the problem, and the estimated amount of time that the reduced levels of chlorine or dechlorination chemicals occurred.
- e. The Permittee may request authorization to conduct disinfection of the discharge on a seasonal basis. If approved, upon receipt of written authorization from EPA and MassDEP to conduct seasonal disinfection, TRC limitations, monitoring, and reporting requirements apply only during the specified disinfection period and whenever chlorine is added to the treatment process outside of the specified disinfection period.

C. Unauthorized Discharges

1. This permit authorizes discharges only from the outfall(s) listed in the authorization to discharge from EPA in accordance with the terms and conditions of this permit. Discharges of wastewater from any other point sources, including sanitary sewer overflows (SSOs), are not authorized by this permit. The Permittee must provide verbal notification to EPA within 24 hours of becoming aware of any unauthorized discharge and a report within 5 days, in accordance with Part VII.D.1.e (24-hour reporting). Providing that it contains the information required in Part VII.D.1.e, submission of the MassDEP SSO Reporting Form (described in Part II.C.3 below) may satisfy the requirement for a written report. See Part V below for reporting requirements.
2. The Permittee must provide notification to the public within 24 hours of becoming aware of any unauthorized discharge, except SSOs that do not impact a surface water or the public, on a publicly available website, and it shall remain on the website for a minimum of 12 months. Such notification shall include the location and description of the discharge; estimated

volume; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue.

3. Notification of SSOs to MassDEP shall be made on its SSO Reporting Form (which includes MassDEP Regional Office telephone numbers). The reporting form and instruction for its completion may be found on-line at <https://www.mass.gov/how-to/sanitary-sewer-overflowbypassbackup-notification>.

D. Notification Requirements

The Permittee shall notify all downstream community water systems (if any) of any emergency condition, plant upset, bypass, or other system failure which has the potential to impact the quality of the water to be withdrawn by that community for drinking water purposes. This notification should be made as soon as possible but within four (4) hours, and in the anticipation of such an event, if feasible, without taking away from any response time necessary to alleviate the situation. The Permittee shall follow up with written notification within five (5) days. This notification shall include the reason for the emergency, any sampling information, any visual data recorded, a description of how the situation was handled, and when it would be considered to no longer be an emergency.

III. Additional Limitations, Conditions, and Requirements

A. Operation and Maintenance of the Sewer System

Operation and maintenance (O&M) of the sewer system shall be in compliance with the Standard Conditions of Part VII and the following terms and conditions. The Permittee shall complete the following activities for the collection system which it owns:

1. Maintenance Staff

The Permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. Provisions to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section III.A.5. below.

2. Preventive Maintenance Program

The Permittee shall maintain an ongoing preventive maintenance program to prevent overflows and bypasses caused by malfunctions or failures of the sewer system infrastructure. The program shall include an inspection program designed to identify all potential and actual unauthorized discharges. Plans and programs to meet this requirement shall be described in the Collection System O&M Plan required pursuant to Section III.A.5. below.

3. Infiltration/Inflow

The Permittee shall control infiltration and inflow (I/I) into the sewer system as necessary to prevent high flow related unauthorized discharges from their collection systems and high flow related violations of the wastewater treatment plant's effluent limitations. Plans and programs

to control I/I shall be described in the Collection System O&M Plan required pursuant to Section III.A.5. below.

4. Collection System Mapping

The Permittee shall continue to maintain a map of the sewer collection system it owns. The map shall be on a street map of the community, with sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by federal, state, or local agencies. Such map(s) shall include, but not be limited to the following:

- a. All sanitary sewer lines and related manholes;
- b. All combined sewer lines, related manholes, and catch basins;
- c. All combined sewer regulators and any known or suspected connections between the sanitary sewer and storm drain systems (e.g. combination manholes);
- d. All outfalls, including the treatment plant outfall(s), CSOs, and any known or suspected SSOs, including stormwater outfalls that are connected to combination manholes;
- e. All pump stations and force mains;
- f. The wastewater treatment facility(ies);
- g. All surface waters (labeled);
- h. Other major appurtenances such as inverted siphons and air release valves;
- i. A numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;
- j. The scale and a north arrow; and
- k. The pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow.

5. Collection System O&M Plan

- a. N/A
- b. N/A

The Permittee shall update and implement the Collection System O&M Plan they have previously submitted to EPA and the State in accordance with Part (c) below. The plan shall be available for review by federal, state, and local agencies upon request.

c. The Plan shall include:

- (1) A description of the collection system management goals, staffing, information management, and legal authorities;
- (2) A description of the collection system and the overall condition of the collection system including a list of all pump stations and a description of recent studies and construction activities;
- (3) A preventive maintenance and monitoring program for the collection system;
- (4) Description of sufficient staffing necessary to properly operate and maintain the sanitary sewer collection system and how the operation and maintenance program is staffed;
- (5) Description of funding, the source(s) of funding and provisions for funding sufficient for implementing the plan;
- (6) Identification of known and suspected overflows and back-ups, including manholes. A description of the cause of the identified overflows and back-ups, corrective actions taken, and a plan for addressing the overflows and back-ups consistent with the requirements of this permit;
- (7) A description of the Permittee's programs for preventing I/I related effluent violations and all unauthorized discharges of wastewater, including overflows and by-passes and the ongoing program to identify and remove sources of I/I. The program shall include an inflow identification and control program that focuses on the disconnection and redirection of illegal sump pumps and roof down spouts;
- (8) An educational public outreach program for all aspects of I/I control, particularly private inflow; and
- (9) An Overflow Emergency Response Plan to protect public health from overflows and unanticipated bypasses or upsets that exceed any effluent limitation in the permit.

6. Annual Reporting Requirement

The Permittee shall submit a summary report of activities related to the implementation of its Collection System O&M Plan during the previous calendar year. The report shall be submitted to EPA and the State annually by March 31st. The summary report shall, at a minimum, include:

- a. A description of the staffing levels maintained during the year;
- b. A map and a description of inspection and maintenance activities conducted and corrective actions taken during the previous year;
- c. Expenditures for any collection system maintenance activities and corrective actions taken during the previous year;
- d. A map with areas identified for investigation/action in the coming year;
- e. A summary of unauthorized discharges during the past year and their causes and a report of any corrective actions taken as a result of the unauthorized discharges reported pursuant to the Unauthorized Discharges section of this permit; and

- f. If the average annual flow in the previous calendar year exceeded 80 percent of the facility's design flow, or there have been capacity-related overflows, the report shall include items in (1) and (2) below.

- (1) Plans for further potential flow increases describing how the Permittee will maintain compliance with the flow limit and all other effluent limitations and conditions; and
- (2) A calculation of the maximum daily, weekly, and monthly infiltration and the maximum daily, weekly, and monthly inflow for the reporting year.

B. Alternate Power Source

In order to maintain compliance with the terms and conditions of this permit, the Permittee shall provide an alternative power source(s) sufficient to operate the portion of the publicly owned treatment works it owns and operates, as defined in Part VII.E.1 of this permit.

C. Industrial Users

N/A

D. Industrial Pretreatment Programs

1. The Permittee shall develop and enforce specific effluent limits (local limits) for Industrial User(s), and all other users, as appropriate, which together with appropriate changes in the POTW Treatment Plant's Facilities or operation, are necessary to ensure continued compliance with the POTW's NPDES permit or sludge use or disposal practices. Specific local limits shall not be developed and enforced without individual notice to persons or groups who have requested such notice and an opportunity to respond. Within 90 days of the effective date of the authorization to discharge under the General Permit, the Permittee shall prepare and submit a written technical evaluation to EPA analyzing the need to revise local limits. As part of this evaluation, the Permittee shall assess how the POTW performs with respect to influent and effluent of pollutants, water quality concerns, sludge quality, sludge processing concerns/inhibition, biomonitoring results, activated sludge inhibition, worker health and safety and collection system concerns. In preparing this evaluation, the Permittee shall complete and submit the attached form (see **Attachment F – Reassessment of Technically Based Industrial Discharge Limits**) with the technical evaluation to assist in determining whether existing local limits need to be revised. Justifications and conclusions should be based on actual plant data if available and should be included in the report. Should the evaluation reveal the need to revise local limits, the Permittee shall complete the revisions within 120 days of notification by EPA and submit the revisions to EPA for approval. The Permittee shall carry out the local limits revisions in accordance with EPA's Local Limit Development Guidance (July 2004).
2. The Permittee shall implement the Industrial Pretreatment Program in accordance with the legal authorities, policies, procedures, and financial provisions described in the Permittee's approved Pretreatment Program, and the General Pretreatment Regulations, 40 CFR Part 403.

At a minimum, the Permittee must perform the following duties to properly implement the Industrial Pretreatment Program (IPP):

- a. Carry out inspection, surveillance, and monitoring procedures which will determine independent of information supplied by the industrial user, whether the industrial user is in compliance with the Pretreatment Standards. At a minimum, all significant industrial users shall be sampled and inspected at the frequency established in the approved IPP but in no case less than once per year and maintain adequate records.
 - b. Issue or renew all necessary industrial user control mechanisms within 90 days of their expiration date or within 180 days after the industry has been determined to be a significant industrial user.
 - c. Obtain appropriate remedies for noncompliance by any industrial user with any pretreatment standard and/or requirement.
 - d. Maintain an adequate revenue structure for continued implementation of the Pretreatment Program.
3. The Permittee shall provide EPA and MassDEP with an annual report describing the Permittee's pretreatment program activities for the twelve (12) month period ending 60 days prior to the due date in accordance with 40 CFR § 403.12(i). The annual report shall be consistent with the format described in **Attachment G** (*NPDES Permit Requirement for Industrial Pretreatment Annual Report*) of this permit and shall be submitted by **March 1** of each year.
4. The Permittee must obtain approval from EPA prior to making any significant changes to the industrial pretreatment program in accordance with 40 CFR § 403.18(c).
5. The Permittee must assure that applicable National Categorical Pretreatment Standards are met by all categorical industrial users of the POTW. These standards are published in the Federal Regulations at 40 CFR § 405 et seq.
6. The Permittee must modify its pretreatment program, if necessary, to conform to all changes in the Federal Regulations that pertain to the implementation and enforcement of the industrial pretreatment program. Within 180 days of the effective date of the authorization to discharge under the General Permit the Permittee must provide EPA in writing, proposed changes, if applicable, to the Permittee's pretreatment program deemed necessary to assure conformity with current Federal Regulations. At a minimum, the Permittee must address in its written submission the following areas: (1) Enforcement response plan; (2) revised sewer use ordinances; and (3) slug control evaluations. The Permittee will implement these proposed changes pending EPA Region 1's approval under 40 CFR § 403.18. This submission is separate and distinct from any local limits analysis submission described in Part III.D.1.
7. Beginning the first full calendar year after the effective date of the authorization to discharge under the General Permit, the Permittee shall commence annual sampling of the following types of industrial discharges into the POTW:

- Commercial Car Washes
- Platers/Metal Finishers
- Paper and Packaging Manufacturers
- Tanneries and Leather/Fabric/Carpet Treaters
- Manufacturers of Parts with Polytetrafluoroethylene (PTFE) or teflon type coatings (i.e. bearings)
- Landfill Leachate
- Centralized Waste Treaters
- Known or Suspected PFAS Contaminated Sites
- Fire Fighting Training Facilities
- Airports
- Any Other Known or Expected Sources of PFAS

Until there is an analytical method approved in 40 CFR Part 136 for PFAS, monitoring shall be conducted using Draft Method 1633. Sampling shall be for the PFAS analytes required to be tested in Method 1633, as shown in Attachment H.

The industrial discharges sampled and the sampling results (including the full lab report) shall be summarized and included in the annual report (see Part III.D.3).

E. Sludge Conditions

1. The Permittee shall comply with all existing federal and state laws and regulations that apply to sewage sludge use and disposal practices, including EPA regulations promulgated at 40 CFR Part 503, which prescribe “Standards for the Use or Disposal of Sewage Sludge” pursuant to § 405(d) of the CWA, 33 U.S.C. § 1345(d).
2. If both state and federal requirements apply to the Permittee’s sludge use and/or disposal practices, the Permittee shall comply with the more stringent of the applicable requirements.
3. The requirements and technical standards of 40 CFR Part 503 apply to the following sludge use or disposal practices:
 - a. Land application - the use of sewage sludge to condition or fertilize the soil
 - b. Surface disposal - the placement of sewage sludge in a sludge only landfill
 - c. Sewage sludge incineration in a sludge only incinerator
4. The requirements of 40 CFR Part 503 do not apply to facilities which dispose of sludge in a municipal solid waste landfill. 40 CFR § 503.4. These requirements also do not apply to facilities which do not use or dispose of sewage sludge during the life of the permit but rather treat the sludge (e.g., lagoons, reed beds), or are otherwise excluded under 40 CFR § 503.6.
5. The 40 CFR Part 503 requirements include the following elements:
 - General requirements
 - Pollutant limitations

- Operational Standards (pathogen reduction requirements and vector attraction reduction requirements)
- Management practices
- Record keeping
- Monitoring
- Reporting

Which of the 40 CFR Part 503 requirements apply to the Permittee will depend upon the use or disposal practice followed and upon the quality of material produced by a facility. The EPA Region 1 Guidance document, “EPA Region 1 - NPDES Permit Sludge Compliance Guidance” (November 4, 1999), may be used by the Permittee to assist it in determining the applicable requirements.¹

6. The sludge shall be monitored for pollutant concentrations (all Part 503 methods) and pathogen reduction and vector attraction reduction (land application and surface disposal) at the following frequency. This frequency is based upon the volume of sewage sludge generated at the facility in dry metric tons per year, as follows:

less than 290	1/ year
290 to less than 1,500	1 /quarter
1,500 to less than 15,000	6 /year
15,000 +	1 /month

Sampling of the sewage sludge shall use the procedures detailed in 40 CFR § 503.8.

7. Under 40 CFR § 503.9(r), the Permittee is a “person who prepares sewage sludge” because it “is ... the person who generates sewage sludge during the treatment of domestic sewage in a treatment works” If the Permittee contracts with *another* “person who prepares sewage sludge” under 40 CFR § 503.9(r) – i.e., with “a person who derives a material from sewage sludge” – for use or disposal of the sludge, then compliance with Part 503 requirements is the responsibility of the contractor engaged for that purpose. If the Permittee does not engage a “person who prepares sewage sludge,” as defined in 40 CFR § 503.9(r), for use or disposal, then the Permittee remains responsible to ensure that the applicable requirements in Part 503 are met. 40 CFR § 503.7. If the ultimate use or disposal method is land application, the Permittee is responsible for providing the person receiving the sludge with notice and necessary information to comply with the requirements of 40 CFR § 503 Subpart B.
8. The Permittee shall submit an annual report containing the information specified in the 40 CFR Part 503 requirements (§ 503.18 (land application), § 503.28 (surface disposal), or § 503.48

¹ This guidance document is available upon request from EPA Region 1 and may also be found at:
<http://www3.epa.gov/region1/npdes/permits/generic/sludgeguidance.pdf>

(incineration)) by February 19 (see also “EPA Region 1 - NPDES Permit Sludge Compliance Guidance”). Reports shall be submitted electronically using EPA’s Electronic Reporting tool (“NeT”) (see “Reporting Requirements” section below).

F. Schedules of Compliance

N/A

G. Additional Requirements for Facilities Discharging to the Long Island Sound Watershed, the Blackstone River Watershed, the Taunton River Watershed, as well as the Plymouth WWTP and Fairhaven WPCF

N/A

H. Submittal of Facility-Specific Information

Each permittee shall perform three full pollutant scans consistent with the requirements of NPDES Form 2A, Tables B and C, using a representative composite sample once per quarter in the final 3 full calendar quarters of the 5-year permit term. The results for all three scans shall be summarized and submitted as a single electronic attachment to the DMR for the final full calendar quarter before the expiration date of the General Permit (in accordance with Part V.2 below). This submittal shall also include the following information that EPA has deemed necessary for development of the next reissuance of this General Permit:

- Provide the current average daily volume of inflow and infiltration (I/I)
- Provide an updated Flow Diagram or Schematic for the WWTF
- Provide a summary and schedule for any ongoing or planned facility upgrades
- Provide a list of Significant Industrial Users and Categorical Industrial Users contributing flow to the system (including average volume contributed from each)
- Provide a summary of sewage sludge treatment and disposal practices (including disposal method, disposal amount in dry metric tons, name and address of any third-party contractor, etc.).

I. State 401 Certification Conditions

This Permit has received state water quality certification issued by the State under § 401(a) of the CWA and 40 CFR § 124.53. EPA incorporates the following state water quality certification requirements into the Final Permit:

1. Notwithstanding any other provision of the 2022 Federal NPDES Permit to the contrary, monitoring results of the influent, effluent, and sludge for PFAS compounds shall be reported to MassDEP electronically, at massdep.npdes@mass.gov, or as otherwise specified, within 30 days after they are received.
2. Pursuant to M.G.L. c. 21, §§ 26-53, and 314 CMR 3.00 and 4.00, including 314 CMR 3.11(2)(a)6., and in order to ensure the maintenance of surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, in accordance with 314 CMR 4.05(5)(e), MassDEP has determined that it is necessary that the

permittee commence annual monitoring of all Significant Industrial Users^{2,3} discharging into the POTW consistent with the 2022 NPDES General Permit in accordance with the table below. Notwithstanding any other provision of the 2022 NPDES General Permit to the contrary, monitoring results shall be reported to MassDEP electronically at massdep.npdes@mass.gov within 30 days after they are received.

Parameter	Units	Measurement Frequency	Sample Type
Perfluorohexanesulfonic acid (PFHxS)	ng/L	Annual	24-hour Composite
Perfluoroheptanoic acid (PFHpA)	ng/L	Annual	24-hour Composite
Perfluorononanoic acid (PFNA)	ng/L	Annual	24-hour Composite
Perfluorooctanesulfonic acid (PFOS)	ng/L	Annual	24-hour Composite
Perfluorooctanoic acid (PFOA)	ng/L	Annual	24-hour Composite
Perfluorodecanoic acid (PFDA)	ng/L	Annual	24-hour Composite

IV. Obtaining Authorization to Discharge

N/A

V. Monitoring, Record-Keeping, and Reporting Requirements

Unless otherwise specified in this permit, the Permittee shall submit reports, requests, and information and provide notices in the manner described in this section.

1. Submittal of DMRs Using NetDMR

The Permittee shall continue to submit its monthly monitoring data in discharge monitoring reports (DMRs) to EPA and MassDEP no later than the 15th day of the month electronically using NetDMR. When the Permittee submits DMRs using NetDMR, it is not required to submit hard copies of DMRs to EPA or MassDEP. NetDMR is accessible through EPA's Central Data Exchange at <https://cdx.epa.gov/>.

2. Submittal of Reports as NetDMR Attachments

² Significant Industrial User (SIU) is defined at 40 CFR part 403: All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR chapter I, subpart N; **and** any other industrial user that: discharges an average of 25,000 GPD or more of process wastewater to the POTW, contributes a process wastestream that makes up 5% or more of the average dry weather hydraulic or organic capacity of the POTW, or designated as such by the POTW on the basis that the industrial users has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standards or requirement.

³ This requirement applies to all Significant Industrial Users and not just those within the sectors identified by EPA in the NPDES permit.

Unless otherwise specified in this permit, the Permittee shall electronically submit all reports to EPA and MassDEP as NetDMR attachments rather than as hard copies. See Part V.5 for more information on State reporting. Because the due dates for reports described in this permit may not coincide with the due date for submitting DMRs (which is no later than the 15th day of the month), a report submitted electronically as a NetDMR attachment shall be considered timely if it is electronically submitted to EPA using NetDMR with the next DMR due following the report due date specified in this permit.

3. Submittal of Industrial User and Pretreatment Related Reports

- a. Prior to 21 December 2025, all reports and information required of the Permittee in the Industrial Users and Pretreatment Program section of this permit shall be submitted to the Pretreatment Coordinator in EPA Region 1 Water Division (WD). Starting on 21 December 2025, these submittals must be done electronically as NetDMR attachments and/or using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which will be accessible through EPA's Central Data Exchange at <https://cdx.epa.gov/>. These requests, reports and notices include:

- (1) Annual Pretreatment Reports,
- (2) Pretreatment Reports Reassessment of Technically Based Industrial Discharge Limits Form,
- (3) Revisions to Industrial Discharge Limits,
- (4) Report describing Pretreatment Program activities, and
- (5) Proposed changes to a Pretreatment Program

- b. This information shall be submitted to EPA WD as a hard copy at the following address:

**U.S. Environmental Protection Agency
Water Division
Regional Pretreatment Coordinator
5 Post Office Square - Suite 100 (06-03)
Boston, MA 02109-3912**

4. Submittal of Biosolids/Sewage Sludge Reports

By February 19 of each year, the Permittee must electronically report their annual Biosolids/Sewage Sludge Report for the previous calendar year using EPA's NPDES Electronic Reporting Tool ("NeT"), or another approved EPA system, which is accessible through EPA's Central Data Exchange at <https://cdx.epa.gov/>.

5. Submittal of Requests and Reports to EPA Water Division (WD)

- a. The following requests, reports, and information described in this permit shall be submitted to the NPDES Applications Coordinator in EPA Water Division (WD):

- (1) Transfer of permit notice;
- (2) Request for changes in sampling location;
- (3) Request for reduction in testing frequency;
- (4) Request for change in WET testing requirement; and
- (5) Report on unacceptable dilution water / request for alternative dilution water for WET testing.
- (6) Report of new industrial user commencing discharge
- (7) Report received from existing industrial user
- (8) Request for extension of compliance schedule

- b. These reports, information, and requests shall be submitted to EPA WD electronically at R1NPDESReporting@epa.gov.

6. Submittal of Sewer Overflow and Bypass Reports and Notices

The Permittee shall submit required reports and notices under Part VII.B.4.c, for bypasses, and Part VII.D.1.e, for sanitary sewer overflows (SSOs) electronically using EPA's NPDES Electronic Reporting Tool ("NeT"), which will be accessible through EPA's Central Data Exchange at <https://cdx.epa.gov/>.

7. State Reporting

Duplicate signed copies of all WET test reports shall be submitted to the Massachusetts Department of Environmental Protection, Division of Watershed Management, at the following address:

Massachusetts Department of Environmental Protection
Bureau of Water Resources
Division of Watershed Management
8 New Bond Street
Worcester, Massachusetts 01606

8. Verbal Reports and Verbal Notifications

- a. Any verbal reports or verbal notifications, if required in Parts I through VII of this General Permit, shall be made to both EPA and to MassDEP. This includes verbal reports and notifications which require reporting within 24 hours (e.g., Part VII.B.4.c.(2), Part VII.B.5.c.(3), and Part VII.D.1.e).
- b. Verbal reports and verbal notifications shall be made to:

EPA ECAD at 617-918-1510
and
MassDEP's Emergency Response at 888-304-1133

VI. Administrative Requirements

A. Notice of Termination (NOT) of Discharge or Change of Owner/Operator

Permittees shall notify EPA and the appropriate State agency in writing upon the termination of any discharge(s) authorized by this General Permit. The NOT shall include the name, mailing address, phone number, and the location of the facility for which the notification is being submitted, the NPDES permit number of the discharge identified by the notice, and an indication of whether the discharge has been eliminated or if the owner/operator of the discharge has changed. The NOT shall be signed in accordance with the signatory requirements of 40 CFR § 122.22. Completed and signed NOTs shall be submitted to EPA at R1NPDESReporting@epa.gov and to MassDEP at MassDEP.NPDES@mass.gov.

B. Continuation of this General Permit After Expiration

If this General Permit is not reissued prior to its expiration date, it will be administratively continued in accordance with the Administrative Procedures Act (5 U.S.C. 558(c)) and 40 CFR § 122.6 and remain in full force and in effect for discharges covered prior to its expiration.

Coverage under this permit will not be available to any facility that is not authorized to discharge under the General Permit before the expiration date.

Any Permittee whose authorization to discharge under this General Permit was administratively continued will automatically remain covered by the continued General Permit until the earlier of:

1. Authorization to discharge under a reissued permit or a replacement of this permit; or
2. The Permittee's submittal of a Notice of Termination; or
3. Issuance of an individual permit for the Permittee's discharge; or
4. A formal permit decision by EPA not to reissue this General Permit, at which time EPA will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease at the end of this time period.

Attachment E - List of Eligible Facilities
MAG590000

Facility Name	Current Permit Number	Watershed	Class	Expiration Date	Address	City or Town	Co-permittee(s)	Ambient TP Monitoring (see Part II.A footnote 19)	Collection System Mapping Due Date (Part III.A.4)	Collection System O&M Plan Due Date (Parts III.A.5.a & b)	Pretreatment Program (Parts III.C & D)	Design Flow (MGD)	Upstream 7Q10 Flow (cfs)	Dilution Factor
Northbridge WTP	MA0100722	Blackstone (Unnamed tributary)	B	8/31/2018	644 Providence Road	Whitinsville	None	No	Done	Done	Yes, effective after IPP developed based on Attachment J	2	0.557	1.2
Grafton WWTP	MA0101311	Blackstone River	B	7/31/2018	9 Depot Street	Grafton	None	Yes	Done	Done	No	2.4	68	19
Uxbridge WWTF	MA0102440	Blackstone River	B	8/31/2018	80 River Road	Uxbridge	None	Yes	Done	Done	No	1.25	51.3	27.58
Dartmouth WPCF	MA0101605	Buzzards Bay	SA	8/31/2014	759 Russells Mills Road	Dartmouth	None	No	30 months from effective date	6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	No	4.2	N/A (tidal)	8.5
Wareham WPCF	MA0101893	Buzzards Bay (Agawam River)	SB	6/30/2013	6 Tony's Lane	Wareham	None	No	30 months from effective date	6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	No	1.56	10.8	5.48
Fairhaven WPCF	MA0100765	Buzzards Bay (Acushnet River)	SB	12/31/2022	Arsene Street	Fairhaven	None	No	30 months from effective date	6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	No	5	N/A (tidal)	8.20
Milford WWTF	MA0100579	Charles River	B	10/31/2024	230 South Main Street, Route 140	Hopedale	None	No	Done	Done	No	4.3	0	1
Medfield WWTF	MA0100978	Charles River	B	2/28/2017	101 West Street	Medfield	None	No	Done	Done	No	1.52	4.95	3.1
Adams WWTP	MA0100315	Hudson (Hoosic River)	B	7/31/2022	273 Columbia Street	Adams	None	Yes	Done	Done	Yes	4.6 & 3.5	16.87	3.37 & 4.11
Spencer WWTP	MA0100919	Long Island Sound - Chicopee (Cranberry River)	B	4/30/2024	Route 9	Spencer	None	No	Done	Done	No	1.08	0.122	1.07
Warren WWTF	MA0101567	Long Island Sound - Chicopee (Quaboag River)	B	11/30/2021	2527 Main Street	West Warren	None	Yes	Done	Done	No	1.5	10.71	5.62
Ware WWTP	MA0100889	Long Island Sound - Chicopee (Ware River)	B	11/30/2018	30 Robbins Road	Ware	None	Yes	Done	Done	Yes	1	14.31	10.23
Gardner WWTF	MA0100994	Long Island Sound - Connecticut (Otter River)	B	3/31/2026	52 Plant Road	East Templeton	Ashburnham	Yes	October 2023	Done (for Part III.A.5.a) and April 2023 (for Part III.A.5.b)	Yes	5	2.25	1.29
Greenfield WPCP	MA0101214	Long Island Sound - Connecticut (Deerfield River)	B	11/30/2016	384 Deerfield Street	Greenfield	None	Yes	30 months from effective date	6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	No	3.4	232.4	45.18
Belchertown WWTP	MA0102148	Long Island Sound - Connecticut (Lampson Brook)	B	9/30/2019	175 George Hannum Road	Belchertown	None	No	Done	Done	No	1	0.1	1.1
Athol WWTP	MA0100005	Long Island Sound - Connecticut (Millers River)	B	3/31/2026	Jones Street	Athol	None	Yes	October 2023	Done (for Part III.A.5.a) and April 2023 (for Part III.A.5.b)	No	1.75	31.7	12.7
Winchendon WPCF	MA0100862	Long Island Sound - Connecticut (Millers River)	B	10/31/2026	637 River Street	Winchendon	None	Yes	May 2024	Done (for Part III.A.5.a) and November 2023 (for Part III.A.5.b)	No	1.1	4.3	3.55
Orange WWTF	MA0101257	Long Island Sound - Connecticut (Millers River)	B	3/31/2026	295 West Main Street	Orange	None	Yes	October 2023	Done (for Part III.A.5.a) and April 2023 (for Part III.A.5.b)	No	1.1	36.4	22.4
Erving POTW 1	MA0101516	Long Island Sound - Connecticut (Millers River)	B	11/30/2026	16 Public Works Boulevard	Erving	None	Yes	June 2024	Done (for Part III.A.5.a) and December 2024 (for Part III.A.5.b)	No	1.02	43.7	28.7
South Hadley WWTP	MA0100455	Long Island Sound - Connecticut River	B	9/30/2017	2 James Street	Chicopee	Granby	No	Done	Done	Yes	4.2	2077.1	320.55
Easthampton WWTF	MA0101478	Long Island Sound - Connecticut River and Manhan River	B	10/31/2018	10 Gosselin Drive	Easthampton	None	No	Easthampton: Done Southampton: 30 months from effective date	Easthampton: Done Southampton: 6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	Yes	3.8	2177.6	371.34
Lee WWTF	MA0100153	Long Island Sound - Housatonic River	B	11/30/2024	379 Pleasant Street	Lee	None	Yes	Done	Done	No	1.25	38.8	21.1
Lenox WWTP	MA0100935	Long Island Sound - Housatonic River	B	11/30/2024	239 Crystal Street	Lenox Dale	None	Yes	Done	Done	No	1.19	40	22.7
Great Barrington WWTF	MA0101524	Long Island Sound - Housatonic River	B	11/30/2024	100 Bentley Street	Great Barrington	None	Yes	Done	Done	Yes	3.2	78.9	16.9
Sturbridge WPCF	MA0100421	Long Island Sound - Thames (Quinebaug River)	B	11/30/2019	1 New Boston Road Extension	Sturbridge	None	Yes	Done	Done	No	1.3	7.78	4.87
Southbridge WWTP	MA0100901	Long Island Sound - Thames (Quinebaug River)	B	2/28/2020	83 Dresser Hill Road	Southbridge	None	Yes	Done	Done	Yes	3.77	11.07	2.9
Maynard WWTF	MA0101001	Merrimack (Assabet River to Concord River)	B	9/30/2024	18 Pine Hill Road	Maynard	None	No	Done	Done	No	1.45	12.67	6.64
Hudson WWTF	MA0101788	Merrimack (Assabet River to Concord River)	B	4/30/2024	One Municipal Drive	Hudson	None	No	Done	Done	Yes	3	12	3.4
Concord WWTF	MA0100668	Merrimack (Concord River)	B	9/30/2018	509 Bedford Street	Concord	None	Yes	30 months from effective date	6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	No	1.2	25.02	14
Ayer WWTP	MA0100013	Merrimack (Nashua River)	B	2/29/2020	Brook Street	Ayer	None	Yes	Done	Done	Yes	1.79	30.6	12.05
Pepperell WWTP	MA0100064	Merrimack (Nashua River)	B	11/30/2021	47 Nashua Road, Route 111	Pepperell	Groton	Yes	Done	Done	No	1.1	44.7	27.31
MWRA-Clinton STP	MA0100404	Merrimack (South Branch Nashua River)	B	2/28/2022	677 High Street	Clinton	Clinton, Lancaster	Yes	Done	Done	Yes	3.01	2.63	1.56
Amesbury WPAF	MA0101745	Merrimack River	SB	10/31/2015	19 Merrimack Street	Amesbury	None	No	30 months from effective date	6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	Yes	2.4	896	242.51
Newburyport	MA0101427	Merrimack River	SB	6/30/2025	115B Water Street	Newburyport	None	No	Done	Done	Yes	3.4	N/A	30
Ipswich WWTF	MA0100609	North Coastal (Greenwood Creek)	SA	9/30/2021	20 Fowlers Lane Street	Ipswich	None	No	Done	Done	No	1.8	0	1
Hull WPCF	MA0101231	South Coastal (Boston Harbor)	SB	8/31/2014	1111 Nantasket Avenue	Hull	Hingham	No	30 months from effective date	6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	No	3.07	N/A (tidal)	94
Rockland WWTP	MA0101923	South Coastal (French Stream)	B	1/31/2027	587R Summer Street	Rockland	None	No	August 2024	Done	Yes	2.5	0.18	1.05
Marshfield WWTF	MA0101737	South Coastal (Massachusetts Bay)	SA	2/28/2020	200 Joseph Driebek Way	Marshfield	Duxbury (new)	No	Marshfield: Done Duxbury: 30 months from effective date	Marshfield: Done Duxbury: 6 months (for Part III.A.5.a) & 24 months (for Part III.A.5.b) from effective date	No	2.1	N/A (tidal)	45
Plymouth WWTP	MA0100587	South Coastal (Plymouth Harbor)	SA	8/31/2021	131 Camelot Street	Plymouth	None	No	Done	Done	Yes	1.75	N/A (tidal)	10
Scituate WWTP	MA0102695	South Coastal (Tidal Creek to Herring River)	SA	11/30/2017	161 Driftway	Scituate	None	No	Done	Done	No	1.6	0	1
Middleborough STP	MA0101591	Taunton (Nemasket River)	B	7/31/2019	Joe Ciaglo Way	Middleborough	None	Yes	Done	Done	Yes	2.16	5.4	2.62
MFN Regional WPCF	MA0101702	Taunton (Three Mile River)	B	11/30/2019	Hill Street and Crane Street	Norton	Mansfield, Norton, Foxboro	Yes	Done	Done	Yes	3.14	3.68	1.76
Bridgewater WWTF	MA0100641	Taunton (Town River)	B	4/30/2022	100 Morris Avenue	Bridgewater	None	Yes	Done	Done	No	1.44	2.22	2

Attachment E - List of Eligible Facilities
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Facility Name	Modified Limit(s)	New Limit(s)
Northbridge WTP	Ammonia: 5.1 mg/L (monthly ave, November 1 - April 30), 1.6 mg/L (monthly ave, May 1 - October 31); Al: 161 µg/L (monthly ave), 593 µg/L (daily max); Cd: 0.9 µg/L (daily max); C-NOEC ≥ 100%	None
Grafton WWTP	None	C-NOEC ≥ 5%
Uxbridge WWTF	Al: 243 µg/L (monthly ave)	None
Dartmouth WPCF	None	None
Wareham WPCF	None	None
Fairhaven WPCF	None	Ammonia: 11 mg/L (monthly ave, April 1 - October 31); Cu: 30.6 µg/L (monthly ave); Cu: 47.4 µg/L (daily max)
Milford WWTF	Al: 173 µg/L (monthly ave)	None
Medfield WWTF	C-NOEC ≥ 32%; Ammonia: 5.1 mg/L (monthly ave, June 1 - October 31); Al: 1.05 mg/L (monthly ave)	Ammonia: 16.2 mg/L (monthly ave, November 1 - May 31)
Adams WWTP	TP: 0.36 mg/L (monthly ave, April 1 - October 31); C-NOEC ≥ 29%; TRC: 37 µg/L (monthly average), 64 µg/L (daily max); Al: 890 µg/L (monthly ave)	None
Spencer WWTP	None	TN: 90 lb/day
Warren WWTF	C-NOEC ≥ 17.8%; TRC: 62 µg/L (monthly average), 107 µg/L (daily max)	TN: 125 lb/day
Ware WWTP	TRC: 113 µg/L (monthly average), 195 µg/L (daily max); Al: 318 µg/L (monthly ave)	TN: 83 lb/day
Gardner WWTF	Al: 91 µg/L (monthly ave)	None
Greenfield WPCP	None	TN: 283 lb/day; TP: 3.7 mg/L (monthly ave, April 1 - October 31)
Belchertown WWTP	Ammonia: 4.2 mg/L (daily max, May), 0.8 mg/L (monthly ave, May), 14.3 mg/L (daily max, November 1 - April 30), 2.6 mg/L (monthly ave, November 1 - April 30), 0.8 mg/L (monthly ave, June 1 - October 31); Al: 0.634 mg/L (daily max); C-NOEC ≥ 99%	TN: 83 lb/day
Athol WWTP	None	None
Winchendon WPCF	None	None
Orange WWTF	None	None
Erving POTW 1	None	None
South Hadley WWTP	None	TN: 350 lb/day
Easthampton WWTF	None	TN: 317 lb/day
Lee WWTF	None	None
Lenox WWTP	None	None
Great Barrington WWTF	None	None
Sturbridge WPCF	None	TN: 108 lb/day
Southbridge WWTP	C-NOEC ≥ 34.5%; TRC: 33 µg/L (monthly average), 56 µg/L (daily max)	TN: 314 lb/day
Maynard WWTF	None	None
Hudson WWTF	None	None
Concord WWTF	None	C-NOEC ≥ 7.3%
Ayer WWTP	C-NOEC ≥ 8.3%; TRC: 124 µg/L (monthly average), 222 µg/L (daily max); Al: 92.5 µg/L (monthly ave)	None
Pepperell WWTP	Cu: 3.4 µg/L (monthly ave), 4.6 µg/L (daily max); Al: 73.6 µg/L (daily max) and 40.6 µg/L (monthly ave)	None
MWRA-Clinton STP	Ammonia: 3.9 mg/L (monthly ave, April), 2.1 mg/L (monthly ave, May), 6.6 mg/L (monthly ave, November 1 - March 31), 35 mg/L (daily max, November 1 - March 31)	None
Amesbury WPAF	None	None
Newburyport	None	None
Ipswich WWTF	Cu: 18 µg/L (monthly ave); Cu: 26 µg/L (daily max)	Zn: 85.6 µg/L (monthly ave); Zn: 95.1 µg/L (daily max)
Hull WPCF	None	None
Rockland WWTP	None	None
Marshfield WWTF	None	None
Plymouth WWTP	Cu: 22 µg/L (monthly ave); Cu: 43 µg/L (daily max)	None
Scituate WWTP	None	None
Middleborough STP	None	None
MFN Regional WPCF	TP: 0.16 mg/L (monthly ave, April 1 - October 31); Ammonia: 18.1 mg/L (monthly ave, November 1 - March 31), 4.9 mg/L (monthly ave, April 1 - April 30), 2.6 mg/L (monthly ave, May 1 - May 31); C-NOEC ≥ 57%	None
Bridgewater WWTF	Cu: 34 µg/L (monthly ave); TP: 0.12 mg/L (monthly ave, April 1 - October 31); C-NOEC ≥ 50%	None

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PART II. A. GENERAL REQUIREMENTS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

- a. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirements.
- b. The CWA provides that any person who violates Section 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any of such sections in a permit issued under Section 402, or any requirement imposed in a pretreatment program approved under Section 402 (a)(3) or 402 (b)(8) of the CWA is subject to a civil penalty not to exceed \$25,000 per day for each violation. Any person who negligently violates such requirements is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both. Any person who knowingly violates such requirements is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than 3 years, or both.
- c. Any person may be assessed an administrative penalty by the Administrator for violating Section 301, 302, 306, 307, 308, 318, or 405 of the CWA, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the CWA. Administrative penalties for Class I violations are not to exceed \$10,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$25,000. Penalties for Class II violations are not to exceed \$10,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$125,000.

Note: See 40 CFR §122.41(a)(2) for complete “Duty to Comply” regulations.

2. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or notifications of planned changes or anticipated noncompliance does not stay any permit condition.

3. Duty to Provide Information

The permittee shall furnish to the Regional Administrator, within a reasonable time, any information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Regional Administrator, upon request, copies of records required to be kept by this permit.

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4. Reopener Clause

The Regional Administrator reserves the right to make appropriate revisions to this permit in order to establish any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA in order to bring all discharges into compliance with the CWA.

For any permit issued to a treatment works treating domestic sewage (including “sludge-only facilities”), the Regional Administrator or Director shall include a reopener clause to incorporate any applicable standard for sewage sludge use or disposal promulgated under Section 405 (d) of the CWA. The Regional Administrator or Director may promptly modify or revoke and reissue any permit containing the reopener clause required by this paragraph if the standard for sewage sludge use or disposal is more stringent than any requirements for sludge use or disposal in the permit, or contains a pollutant or practice not limited in the permit.

Federal regulations pertaining to permit modification, revocation and reissuance, and termination are found at 40 CFR §122.62, 122.63, 122.64, and 124.5.

5. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the CWA, or Section 106 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA).

6. Property Rights

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges.

7. Confidentiality of Information

- a. In accordance with 40 CFR Part 2, any information submitted to EPA pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words “confidential business information” on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information).
- b. Claims of confidentiality for the following information will be denied:
 - (1) The name and address of any permit applicant or permittee;
 - (2) Permit applications, permits, and effluent data as defined in 40 CFR §2.302(a)(2).
- c. Information required by NPDES application forms provided by the Regional Administrator under 40 CFR §122.21 may not be claimed confidential. This includes information submitted on the forms themselves and any attachments used to supply information required by the forms.

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8. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after its expiration date, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Regional Administrator. (The Regional Administrator shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

9. State Authorities

Nothing in Part 122, 123, or 124 precludes more stringent State regulation of any activity covered by these regulations, whether or not under an approved State program.

10. Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, or local laws and regulations.

PART II. B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Bypass

a. Definitions

- (1) *Bypass* means the intentional diversion of waste streams from any portion of a treatment facility.

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- (2) *Severe property damage* means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can be reasonably expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provision of Paragraphs B.4.c. and 4.d. of this section.

c. Notice

- (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
- (2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in paragraph D.1.e. of this part (Twenty-four hour reporting).

d. Prohibition of bypass

Bypass is prohibited, and the Regional Administrator may take enforcement action against a permittee for bypass, unless:

- (1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
- (2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and
- (3) i) The permittee submitted notices as required under Paragraph 4.c. of this section.
ii) The Regional Administrator may approve an anticipated bypass, after considering its adverse effects, if the Regional Administrator determines that it will meet the three conditions listed above in paragraph 4.d. of this section.

5. Upset

- a. Definition. *Upset* means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
- b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph B.5.c. of this section are met. No determination made during

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administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

- c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - (2) The permitted facility was at the time being properly operated;
 - (3) The permittee submitted notice of the upset as required in paragraphs D.1.a. and 1.e. (Twenty-four hour notice); and
 - (4) The permittee complied with any remedial measures required under B.3. above.
- d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

PART II. C. MONITORING REQUIREMENTS

1. Monitoring and Records

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
- b. Except for records for monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by 40 CFR Part 503), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application except for the information concerning storm water discharges which must be retained for a total of 6 years. This retention period may be extended by request of the Regional Administrator at any time.
- c. Records of monitoring information shall include:
 - (1) The date, exact place, and time of sampling or measurements;
 - (2) The individual(s) who performed the sampling or measurements;
 - (3) The date(s) analyses were performed;
 - (4) The individual(s) who performed the analyses;
 - (5) The analytical techniques or methods used; and
 - (6) The results of such analyses.
- d. Monitoring results must be conducted according to test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, unless other test procedures have been specified in the permit.
- e. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000, or by

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imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

2. Inspection and Entry

The permittee shall allow the Regional Administrator or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

- a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

PART II. D. REPORTING REQUIREMENTS

1. Reporting Requirements

- a. **Planned Changes.** The permittee shall give notice to the Regional Administrator as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is only required when:
 - (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR§122.29(b); or
 - (2) The alteration or addition could significantly change the nature or increase the quantities of the pollutants discharged. This notification applies to pollutants which are subject neither to the effluent limitations in the permit, nor to the notification requirements at 40 CFR§122.42(a)(1).
 - (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition or change may justify the application of permit conditions different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.
- b. **Anticipated noncompliance.** The permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- c. **Transfers.** This permit is not transferable to any person except after notice to the Regional Administrator. The Regional Administrator may require modification or revocation and reissuance of the permit to change the name of the permittee and

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incorporate such other requirements as may be necessary under the CWA. (See 40 CFR Part 122.61; in some cases, modification or revocation and reissuance is mandatory.)

- d. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
 - (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.
 - (2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of the monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.
 - (3) Calculations for all limitations which require averaging or measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.
- e. Twenty-four hour reporting.
 - (1) The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances.

A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.
 - (2) The following shall be included as information which must be reported within 24 hours under this paragraph.
 - (a) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR §122.41(g).)
 - (b) Any upset which exceeds any effluent limitation in the permit.
 - (c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Regional Administrator in the permit to be reported within 24 hours. (See 40 CFR §122.44(g).)
 - (3) The Regional Administrator may waive the written report on a case-by-case basis for reports under Paragraph D.1.e. if the oral report has been received within 24 hours.

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- f. Compliance Schedules. Reports of compliance or noncompliance with, any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.
- g. Other noncompliance. The permittee shall report all instances of noncompliance not reported under Paragraphs D.1.d., D.1.e., and D.1.f. of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D.1.e. of this section.
- h. Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, it shall promptly submit such facts or information.

2. Signatory Requirement

- a. All applications, reports, or information submitted to the Regional Administrator shall be signed and certified. (See 40 CFR §122.22)
- b. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than 2 years per violation, or by both.

3. Availability of Reports.

Except for data determined to be confidential under Paragraph A.8. above, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the State water pollution control agency and the Regional Administrator. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

PART II. E. DEFINITIONS AND ABBREVIATIONS

1. Definitions for Individual NPDES Permits including Storm Water Requirements

Administrator means the Administrator of the United States Environmental Protection Agency, or an authorized representative.

Applicable standards and limitations means all, State, interstate, and Federal standards and limitations to which a “discharge”, a “sewage sludge use or disposal practice”, or a related activity is subject to, including “effluent limitations”, water quality standards, standards of performance, toxic effluent standards or prohibitions, “best management practices”, pretreatment standards, and “standards for sewage sludge use and disposal” under Sections 301, 302, 303, 304, 306, 307, 308, 403, and 405 of the CWA.

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Application means the EPA standard national forms for applying for a permit, including any additions, revisions, or modifications to the forms; or forms approved by EPA for use in “approved States”, including any approved modifications or revisions.

Average means the arithmetic mean of values taken at the frequency required for each parameter over the specified period. For total and/or fecal coliforms and Escherichia coli, the average shall be the geometric mean.

Average monthly discharge limitation means the highest allowable average of “daily discharges” over a calendar month calculated as the sum of all “daily discharges” measured during a calendar month divided by the number of “daily discharges” measured during that month.

Average weekly discharge limitation means the highest allowable average of “daily discharges” measured during the calendar week divided by the number of “daily discharges” measured during the week.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of “waters of the United States.” BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Best Professional Judgment (BPJ) means a case-by-case determination of Best Practicable Treatment (BPT), Best Available Treatment (BAT), or other appropriate technology-based standard based on an evaluation of the available technology to achieve a particular pollutant reduction and other factors set forth in 40 CFR §125.3 (d).

Coal Pile Runoff means the rainfall runoff from or through any coal storage pile.

Composite Sample means a sample consisting of a minimum of eight grab samples of equal volume collected at equal intervals during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportional to flow, or a sample consisting of the same number of grab samples, or greater, collected proportionally to flow over that same time period.

Construction Activities - The following definitions apply to construction activities:

- (a) Commencement of Construction is the initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.
- (b) Dedicated portable asphalt plant is a portable asphalt plant located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR Part 443.
- (c) Dedicated portable concrete plant is a portable concrete plant located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

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- (d) Final Stabilization means that all soil disturbing activities at the site have been complete, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed.
- (e) Runoff coefficient means the fraction of total rainfall that will appear at the conveyance as runoff.

Contiguous zone means the entire zone established by the United States under Article 24 of the Convention on the Territorial Sea and the Contiguous Zone.

Continuous discharge means a “discharge” which occurs without interruption throughout the operating hours of the facility except for infrequent shutdowns for maintenance, process changes, or similar activities.

CWA means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, and Pub. L. 97-117; 33 USC §§1251 et seq.

Daily Discharge means the discharge of a pollutant measured during the calendar day or any other 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the “daily discharge” is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurements, the “daily discharge” is calculated as the average measurement of the pollutant over the day.

Director normally means the person authorized to sign NPDES permits by EPA or the State or an authorized representative. Conversely, it also could mean the Regional Administrator or the State Director as the context requires.

Discharge Monitoring Report Form (DMR) means the EPA standard national form, including any subsequent additions, revisions, or modifications for the reporting of self-monitoring results by permittees. DMRs must be used by “approved States” as well as by EPA. EPA will supply DMRs to any approved State upon request. The EPA national forms may be modified to substitute the State Agency name, address, logo, and other similar information, as appropriate, in place of EPA’s.

Discharge of a pollutant means:

- (a) Any addition of any “pollutant” or combination of pollutants to “waters of the United States” from any “point source”, or
- (b) Any addition of any pollutant or combination of pollutants to the waters of the “contiguous zone” or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation (See “Point Source” definition).

This definition includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead

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to a treatment works; and discharges through pipes, sewers, or other conveyances leading into privately owned treatment works.

This term does not include an addition of pollutants by any “indirect discharger.”

Effluent limitation means any restriction imposed by the Regional Administrator on quantities, discharge rates, and concentrations of “pollutants” which are “discharged” from “point sources” into “waters of the United States”, the waters of the “contiguous zone”, or the ocean.

Effluent limitation guidelines means a regulation published by the Administrator under Section 304(b) of CWA to adopt or revise “effluent limitations”.

EPA means the United States “Environmental Protection Agency”.

Flow-weighted composite sample means a composite sample consisting of a mixture of aliquots where the volume of each aliquot is proportional to the flow rate of the discharge.

Grab Sample – An individual sample collected in a period of less than 15 minutes.

Hazardous Substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the CWA.

Indirect Discharger means a non-domestic discharger introducing pollutants to a publicly owned treatment works.

Interference means a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

- (a) Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
- (b) Therefore is a cause of a violation of any requirement of the POTW’s NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act (CWA), the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resources Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to Subtitle D of the SDWA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection Research and Sanctuaries Act.

Landfill means an area of land or an excavation in which wastes are placed for permanent disposal, and which is not a land application unit, surface impoundment, injection well, or waste pile.

Land application unit means an area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for treatment or disposal.

Large and Medium municipal separate storm sewer system means all municipal separate storm sewers that are either: (i) located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and 40 CFR Part 122); or (ii) located in the counties with unincorporated urbanized

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populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships, or towns within such counties (these counties are listed in Appendices H and I of 40 CFR 122); or (iii) owned or operated by a municipality other than those described in Paragraph (i) or (ii) and that are designated by the Regional Administrator as part of the large or medium municipal separate storm sewer system.

Maximum daily discharge limitation means the highest allowable “daily discharge” concentration that occurs only during a normal day (24-hour duration).

Maximum daily discharge limitation (as defined for the Steam Electric Power Plants only) when applied to Total Residual Chlorine (TRC) or Total Residual Oxidant (TRO) is defined as “maximum concentration” or “Instantaneous Maximum Concentration” during the two hours of a chlorination cycle (or fraction thereof) prescribed in the Steam Electric Guidelines, 40 CFR Part 423. These three synonymous terms all mean “a value that shall not be exceeded” during the two-hour chlorination cycle. This interpretation differs from the specified NPDES Permit requirement, 40 CFR § 122.2, where the two terms of “Maximum Daily Discharge” and “Average Daily Discharge” concentrations are specifically limited to the daily (24-hour duration) values.

Municipality means a city, town, borough, county, parish, district, association, or other public body created by or under State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or an Indian tribe or an authorized Indian tribe organization, or a designated and approved management agency under Section 208 of the CWA.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the CWA. The term includes an “approved program”.

New Discharger means any building, structure, facility, or installation:

- (a) From which there is or may be a “discharge of pollutants”;
- (b) That did not commence the “discharge of pollutants” at a particular “site” prior to August 13, 1979;
- (c) Which is not a “new source”; and
- (d) Which has never received a finally effective NPDES permit for discharges at that “site”.

This definition includes an “indirect discharger” which commences discharging into “waters of the United States” after August 13, 1979. It also includes any existing mobile point source (other than an offshore or coastal oil and gas exploratory drilling rig or a coastal oil and gas exploratory drilling rig or a coastal oil and gas developmental drilling rig) such as a seafood processing rig, seafood processing vessel, or aggregate plant, that begins discharging at a “site” for which it does not have a permit; and any offshore rig or coastal mobile oil and gas exploratory drilling rig or coastal mobile oil and gas developmental drilling rig that commences the discharge of pollutants after August 13, 1979, at a “site” under EPA’s permitting jurisdiction for which it is not covered by an individual or general permit and which is located in an area determined by the Regional Administrator in the issuance of a final permit to be in an area of biological concern. In determining whether an area is an area of biological concern, the Regional Administrator shall consider the factors specified in 40 CFR §§125.122 (a) (1) through (10).

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An offshore or coastal mobile exploratory drilling rig or coastal mobile developmental drilling rig will be considered a “new discharger” only for the duration of its discharge in an area of biological concern.

New source means any building, structure, facility, or installation from which there is or may be a “discharge of pollutants”, the construction of which commenced:

- (a) After promulgation of standards of performance under Section 306 of CWA which are applicable to such source, or
- (b) After proposal of standards of performance in accordance with Section 306 of CWA which are applicable to such source, but only if the standards are promulgated in accordance with Section 306 within 120 days of their proposal.

NPDES means “National Pollutant Discharge Elimination System”.

Owner or operator means the owner or operator of any “facility or activity” subject to regulation under the NPDES programs.

Pass through means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW’s NPDES permit (including an increase in the magnitude or duration of a violation).

Permit means an authorization, license, or equivalent control document issued by EPA or an “approved” State.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff (see 40 CFR §122.2).

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. §§2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. It does not mean:

- (a) Sewage from vessels; or
- (b) Water, gas, or other material which is injected into a well to facilitate production of oil or gas, or water derived in association with oil and gas production and disposed of in a well, if the well is used either to facilitate production or for disposal purposes is approved by the authority of the State in which the well is located, and if the State determines that the injection or disposal will not result in the degradation of ground or surface water resources.

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Primary industry category means any industry category listed in the NRDC settlement agreement (Natural Resources Defense Council et al. v. Train, 8 E.R.C. 2120 (D.D.C. 1976), modified 12 E.R.C. 1833 (D. D.C. 1979)); also listed in Appendix A of 40 CFR Part 122.

Privately owned treatment works means any device or system which is (a) used to treat wastes from any facility whose operation is not the operator of the treatment works or (b) not a “POTW”.

Process wastewater means any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

Publicly Owned Treatment Works (POTW) means any facility or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a “State” or “municipality”.

This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Regional Administrator means the Regional Administrator, EPA, Region I, Boston, Massachusetts.

Secondary Industry Category means any industry which is not a “primary industry category”.

Section 313 water priority chemical means a chemical or chemical category which:

- (1) is listed at 40 CFR §372.65 pursuant to Section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986);
- (2) is present at or above threshold levels at a facility subject to EPCRA Section 313 reporting requirements; and
- (3) satisfies at least one of the following criteria:
 - (i) are listed in Appendix D of 40 CFR Part 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols), or Table V (certain toxic pollutants and hazardous substances);
 - (ii) are listed as a hazardous substance pursuant to Section 311(b)(2)(A) of the CWA at 40 CFR §116.4; or
 - (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

Septage means the liquid and solid material pumped from a septic tank, cesspool, or similar domestic sewage treatment system, or a holding tank when the system is cleaned or maintained.

Sewage Sludge means any solid, semisolid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. Sewage sludge includes, but is not limited to, solids removed during primary, secondary, or advanced wastewater treatment, scum, septage, portable toilet pumpings, Type III Marine Sanitation Device pumpings (33 CFR Part 159), and sewage sludge products. Sewage sludge does not include grit or screenings, or ash generated during the incineration of sewage sludge.

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Sewage sludge use or disposal practice means the collection, storage, treatment, transportation, processing, monitoring, use, or disposal of sewage sludge.

Significant materials includes, but is not limited to: raw materials, fuels, materials such as solvents, detergents, and plastic pellets, raw materials used in food processing or production, hazardous substance designated under section 101(14) of CERCLA, any chemical the facility is required to report pursuant to EPCRA Section 313, fertilizers, pesticides, and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills includes, but is not limited to, releases of oil or hazardous substances in excess of reportable quantities under Section 311 of the CWA (see 40 CFR §110.10 and §117.21) or Section 102 of CERCLA (see 40 CFR § 302.4).

Sludge-only facility means any “treatment works treating domestic sewage” whose methods of sewage sludge use or disposal are subject to regulations promulgated pursuant to Section 405(d) of the CWA, and is required to obtain a permit under 40 CFR §122.1(b)(3).

State means any of the 50 States, the District of Columbia, Guam, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Trust Territory of the Pacific Islands.

Storm Water means storm water runoff, snow melt runoff, and surface runoff and drainage.

Storm water discharge associated with industrial activity means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. (See 40 CFR §122.26 (b)(14) for specifics of this definition.

Time-weighted composite means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

Toxic pollutants means any pollutant listed as toxic under Section 307 (a)(1) or, in the case of “sludge use or disposal practices” any pollutant identified in regulations implementing Section 405(d) of the CWA.

Treatment works treating domestic sewage means a POTW or any other sewage sludge or wastewater treatment devices or systems, regardless of ownership (including federal facilities), used in the storage, treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated for the disposal of sewage sludge. This definition does not include septic tanks or similar devices.

For purposes of this definition, “domestic sewage” includes waste and wastewater from humans or household operations that are discharged to or otherwise enter a treatment works. In States where there is no approved State sludge management program under Section 405(f) of the CWA, the Regional Administrator may designate any person subject to the standards for sewage sludge use and disposal in 40 CFR Part 503 as a “treatment works treating domestic sewage”, where he or she finds that there is a potential for adverse effects on public health and the environment from poor sludge quality or poor sludge handling, use or disposal practices, or where he or she finds that such designation is necessary to ensure that such person is in compliance with 40 CFR Part 503.

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Waste Pile means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

Waters of the United States means:

- (a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of tide;
- (b) All interstate waters, including interstate “wetlands”;
- (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, “wetlands”, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - (1) Which are or could be used by interstate or foreign travelers for recreational or other purpose;
 - (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (3) Which are used or could be used for industrial purposes by industries in interstate commerce;
- (d) All impoundments of waters otherwise defined as waters of the United States under this definition;
- (e) Tributaries of waters identified in Paragraphs (a) through (d) of this definition;
- (f) The territorial sea; and
- (g) “Wetlands” adjacent to waters (other than waters that are themselves wetlands) identified in Paragraphs (a) through (f) of this definition.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR §423.11(m) which also meet the criteria of this definition) are not waters of the United States.

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Whole Effluent Toxicity (WET) means the aggregate toxic effect of an effluent measured directly by a toxicity test. (See Abbreviations Section, following, for additional information.)

2. Definitions for NPDES Permit Sludge Use and Disposal Requirements.

Active sewage sludge unit is a sewage sludge unit that has not closed.

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Aerobic Digestion is the biochemical decomposition of organic matter in sewage sludge into carbon dioxide and water by microorganisms in the presence of air.

Agricultural Land is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture.

Agronomic rate is the whole sludge application rate (dry weight basis) designed:

- (1) To provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop, or vegetation grown on the land; and
- (2) To minimize the amount of nitrogen in the sewage sludge that passes below the root zone of the crop or vegetation grown on the land to the ground water.

Air pollution control device is one or more processes used to treat the exit gas from a sewage sludge incinerator stack.

Anaerobic digestion is the biochemical decomposition of organic matter in sewage sludge into methane gas and carbon dioxide by microorganisms in the absence of air.

Annual pollutant loading rate is the maximum amount of a pollutant that can be applied to a unit area of land during a 365 day period.

Annual whole sludge application rate is the maximum amount of sewage sludge (dry weight basis) that can be applied to a unit area of land during a 365 day period.

Apply sewage sludge or sewage sludge applied to the land means land application of sewage sludge.

Aquifer is a geologic formation, group of geologic formations, or a portion of a geologic formation capable of yielding ground water to wells or springs.

Auxiliary fuel is fuel used to augment the fuel value of sewage sludge. This includes, but is not limited to, natural gas, fuel oil, coal, gas generated during anaerobic digestion of sewage sludge, and municipal solid waste (not to exceed 30 percent of the dry weight of the sewage sludge and auxiliary fuel together). Hazardous wastes are not auxiliary fuel.

Base flood is a flood that has a one percent chance of occurring in any given year (i.e. a flood with a magnitude equaled once in 100 years).

Bulk sewage sludge is sewage sludge that is not sold or given away in a bag or other container for application to the land.

Contaminate an aquifer means to introduce a substance that causes the maximum contaminant level for nitrate in 40 CFR §141.11 to be exceeded in ground water or that causes the existing concentration of nitrate in the ground water to increase when the existing concentration of nitrate in the ground water exceeds the maximum contaminant level for nitrate in 40 CFR §141.11.

Class I sludge management facility is any publicly owned treatment works (POTW), as defined in 40 CFR §501.2, required to have an approved pretreatment program under 40 CFR §403.8 (a) (including any POTW located in a state that has elected to assume local program responsibilities pursuant to 40 CFR §403.10 (e) and any treatment works treating domestic sewage, as defined in 40 CFR § 122.2,

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classified as a Class I sludge management facility by the EPA Regional Administrator, or, in the case of approved state programs, the Regional Administrator in conjunction with the State Director, because of the potential for sewage sludge use or disposal practice to affect public health and the environment adversely.

Control efficiency is the mass of a pollutant in the sewage sludge fed to an incinerator minus the mass of that pollutant in the exit gas from the incinerator stack divided by the mass of the pollutant in the sewage sludge fed to the incinerator.

Cover is soil or other material used to cover sewage sludge placed on an active sewage sludge unit.

Cover crop is a small grain crop, such as oats, wheat, or barley, not grown for harvest.

Cumulative pollutant loading rate is the maximum amount of inorganic pollutant that can be applied to an area of land.

Density of microorganisms is the number of microorganisms per unit mass of total solids (dry weight) in the sewage sludge.

Dispersion factor is the ratio of the increase in the ground level ambient air concentration for a pollutant at or beyond the property line of the site where the sewage sludge incinerator is located to the mass emission rate for the pollutant from the incinerator stack.

Displacement is the relative movement of any two sides of a fault measured in any direction.

Domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.

Domestic sewage is waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works.

Dry weight basis means calculated on the basis of having been dried at 105 degrees Celsius (°C) until reaching a constant mass (i.e. essentially 100 percent solids content).

Fault is a fracture or zone of fractures in any materials along which strata on one side are displaced with respect to the strata on the other side.

Feed crops are crops produced primarily for consumption by animals.

Fiber crops are crops such as flax and cotton.

Final cover is the last layer of soil or other material placed on a sewage sludge unit at closure.

Fluidized bed incinerator is an enclosed device in which organic matter and inorganic matter in sewage sludge are combusted in a bed of particles suspended in the combustion chamber gas.

Food crops are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco.

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Forest is a tract of land thick with trees and underbrush.

Ground water is water below the land surface in the saturated zone.

Holocene time is the most recent epoch of the Quaternary period, extending from the end of the Pleistocene epoch to the present.

Hourly average is the arithmetic mean of all the measurements taken during an hour. At least two measurements must be taken during the hour.

Incineration is the combustion of organic matter and inorganic matter in sewage sludge by high temperatures in an enclosed device.

Industrial wastewater is wastewater generated in a commercial or industrial process.

Land application is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil.

Land with a high potential for public exposure is land that the public uses frequently. This includes, but is not limited to, a public contact site and reclamation site located in a populated area (e.g., a construction site located in a city).

Land with low potential for public exposure is land that the public uses infrequently. This includes, but is not limited to, agricultural land, forest and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area).

Leachate collection system is a system or device installed immediately above a liner that is designed, constructed, maintained, and operated to collect and remove leachate from a sewage sludge unit.

Liner is soil or synthetic material that has a hydraulic conductivity of 1×10^{-7} centimeters per second or less.

Lower explosive limit for methane gas is the lowest percentage of methane gas in air, by volume, that propagates a flame at 25 degrees Celsius and atmospheric pressure.

Monthly average (Incineration) is the arithmetic mean of the hourly averages for the hours a sewage sludge incinerator operates during the month.

Monthly average (Land Application) is the arithmetic mean of all measurements taken during the month.

Municipality means a city, town, borough, county, parish, district, association, or other public body (including an intermunicipal agency of two or more of the foregoing entities) created by or under State law; an Indian tribe or an authorized Indian tribal organization having jurisdiction over sewage sludge management; or a designated and approved management agency under section 208 of the CWA, as amended. The definition includes a special district created under state law, such as a water district, sewer district, sanitary district, utility district, drainage district, or similar entity, or an integrated waste management facility as defined in section 201 (e) of the CWA, as amended, that has as one of its principal responsibilities the treatment, transport, use or disposal of sewage sludge.

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Other container is either an open or closed receptacle. This includes, but is not limited to, a bucket, a box, a carton, and a vehicle or trailer with a load capacity of one metric ton or less.

Pasture is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover.

Pathogenic organisms are disease-causing organisms. These include, but are not limited to, certain bacteria, protozoa, viruses, and viable helminth ova.

Permitting authority is either EPA or a State with an EPA-approved sludge management program.

Person is an individual, association, partnership, corporation, municipality, State or Federal Agency, or an agent or employee thereof.

Person who prepares sewage sludge is either the person who generates sewage sludge during the treatment of domestic sewage in a treatment works or the person who derives a material from sewage sludge.

pH means the logarithm of the reciprocal of the hydrogen ion concentration; a measure of the acidity or alkalinity of a liquid or solid material.

Place sewage sludge or sewage sludge placed means disposal of sewage sludge on a surface disposal site.

Pollutant (as defined in sludge disposal requirements) is an organic substance, an inorganic substance, a combination of organic and inorganic substances, or pathogenic organism that, after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism either directly from the environment or indirectly by ingestion through the food chain, could on the basis of information available to the Administrator of EPA, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunction in reproduction) or physical deformations in either organisms or offspring of the organisms.

Pollutant limit (for sludge disposal requirements) is a numerical value that describes the amount of a pollutant allowed per unit amount of sewage sludge (e.g., milligrams per kilogram of total solids); the amount of pollutant that can be applied to a unit of land (e.g., kilograms per hectare); or the volume of the material that can be applied to the land (e.g., gallons per acre).

Public contact site is a land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses.

Qualified ground water scientist is an individual with a baccalaureate or post-graduate degree in the natural sciences or engineering who has sufficient training and experience in ground water hydrology and related fields, as may be demonstrated by State registration, professional certification, or completion of accredited university programs, to make sound professional judgments regarding ground water monitoring, pollutant fate and transport, and corrective action.

Range land is open land with indigenous vegetation.

Reclamation site is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to, strip mines and construction sites.

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Risk specific concentration is the allowable increase in the average daily ground level ambient air concentration for a pollutant from the incineration of sewage sludge at or beyond the property line of a site where the sewage sludge incinerator is located.

Runoff is rainwater, leachate, or other liquid that drains overland on any part of a land surface and runs off the land surface.

Seismic impact zone is an area that has 10 percent or greater probability that the horizontal ground level acceleration to the rock in the area exceeds 0.10 gravity once in 250 years.

Sewage sludge is a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to: domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screening generated during preliminary treatment of domestic sewage in treatment works.

Sewage sludge feed rate is either the average daily amount of sewage sludge fired in all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located for the number of days in a 365 day period that each sewage sludge incinerator operates, or the average daily design capacity for all sewage sludge incinerators within the property line of the site where the sewage sludge incinerators are located.

Sewage sludge incinerator is an enclosed device in which only sewage sludge and auxiliary fuel are fired.

Sewage sludge unit is land on which only sewage sludge is placed for final disposal. This does not include land on which sewage sludge is either stored or treated. Land does not include waters of the United States, as defined in 40 CFR §122.2.

Sewage sludge unit boundary is the outermost perimeter of an active sewage sludge unit.

Specific oxygen uptake rate (SOUR) is the mass of oxygen consumed per unit time per unit mass of total solids (dry weight basis) in sewage sludge.

Stack height is the difference between the elevation of the top of a sewage sludge incinerator stack and the elevation of the ground at the base of the stack when the difference is equal to or less than 65 meters. When the difference is greater than 65 meters, stack height is the creditable stack height determined in accordance with 40 CFR §51.100 (ii).

State is one of the United States of America, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, and an Indian tribe eligible for treatment as a State pursuant to regulations promulgated under the authority of section 518(e) of the CWA.

Store or storage of sewage sludge is the placement of sewage sludge on land on which the sewage sludge remains for two years or less. This does not include the placement of sewage sludge on land for treatment.

Surface disposal site is an area of land that contains one or more active sewage sludge units.

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Total hydrocarbons means the organic compounds in the exit gas from a sewage sludge incinerator stack measured using a flame ionization detection instrument referenced to propane.

Total solids are the materials in sewage sludge that remain as residue when the sewage sludge is dried at 103 to 105 degrees Celsius.

Treat or treatment of sewage sludge is the preparation of sewage sludge for final use or disposal. This includes, but is not limited to, thickening, stabilization, and dewatering of sewage sludge. This does not include storage of sewage sludge.

Treatment works is either a federally owned, publicly owned, or privately owned device or system used to treat (including recycle and reclaim) either domestic sewage or a combination of domestic sewage and industrial waste of a liquid nature.

Unstable area is land subject to natural or human-induced forces that may damage the structural components of an active sewage sludge unit. This includes, but is not limited to, land on which the soils are subject to mass movement.

Unstabilized solids are organic materials in sewage sludge that have not been treated in either an aerobic or anaerobic treatment process.

Vector attraction is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents.

Volatile solids is the amount of the total solids in sewage sludge lost when the sewage sludge is combusted at 550 degrees Celsius in the presence of excess air.

Wet electrostatic precipitator is an air pollution control device that uses both electrical forces and water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

Wet scrubber is an air pollution control device that uses water to remove pollutants in the exit gas from a sewage sludge incinerator stack.

3. Commonly Used Abbreviations

BOD	Five-day biochemical oxygen demand unless otherwise specified
CBOD	Carbonaceous BOD
CFS	Cubic feet per second
COD	Chemical oxygen demand
Chlorine	
Cl ₂	Total residual chlorine
TRC	Total residual chlorine which is a combination of free available chlorine (FAC, see below) and combined chlorine (chloramines, etc.)

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TRO	Total residual chlorine in marine waters where halogen compounds are present
FAC	Free available chlorine (aqueous molecular chlorine, hypochlorous acid, and hypochlorite ion)
Coliform	
Coliform, Fecal	Total fecal coliform bacteria
Coliform, Total	Total coliform bacteria
Cont. (Continuous)	Continuous recording of the parameter being monitored, i.e. flow, temperature, pH, etc.
Cu. M/day or M ³ /day	Cubic meters per day
DO	Dissolved oxygen
kg/day	Kilograms per day
lbs/day	Pounds per day
mg/l	Milligram(s) per liter
ml/l	Milliliters per liter
MGD	Million gallons per day
Nitrogen	
Total N	Total nitrogen
NH ₃ -N	Ammonia nitrogen as nitrogen
NO ₃ -N	Nitrate as nitrogen
NO ₂ -N	Nitrite as nitrogen
NO ₃ -NO ₂	Combined nitrate and nitrite nitrogen as nitrogen
TKN	Total Kjeldahl nitrogen as nitrogen
Oil & Grease	Freon extractable material
PCB	Polychlorinated biphenyl
pH	A measure of the hydrogen ion concentration. A measure of the acidity or alkalinity of a liquid or material
Surfactant	Surface-active agent

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Temp. °C	Temperature in degrees Centigrade
Temp. °F	Temperature in degrees Fahrenheit
TOC	Total organic carbon
Total P	Total phosphorus
TSS or NFR	Total suspended solids or total nonfilterable residue
Turb. or Turbidity	Turbidity measured by the Nephelometric Method (NTU)
ug/l	Microgram(s) per liter
WET	“Whole effluent toxicity” is the total effect of an effluent measured directly with a toxicity test.
C-NOEC	“Chronic (Long-term Exposure Test) – No Observed Effect Concentration”. The highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specified time of observation.
A-NOEC	“Acute (Short-term Exposure Test) – No Observed Effect Concentration” (see C-NOEC definition).
LC ₅₀	LC ₅₀ is the concentration of a sample that causes mortality of 50% of the test population at a specific time of observation. The LC ₅₀ = 100% is defined as a sample of undiluted effluent.
ZID	Zone of Initial Dilution means the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports.

Permit Attachment A
FRESHWATER CHRONIC
TOXICITY TEST PROCEDURE AND PROTOCOL
USEPA Region 1

I. GENERAL REQUIREMENTS

The permittee shall be responsible for the conduct of acceptable chronic toxicity tests using three fresh samples collected during each test period. The following tests shall be performed as prescribed in Part 1 of the NPDES discharge permit in accordance with the appropriate test protocols described below. (Note: the permittee and testing laboratory should review the applicable permit to determine whether testing of one or both species is required).

- **Daphnid (Ceriodaphnia dubia) Survival and Reproduction Test.**
- **Fathead Minnow (Pimephales promelas) Larval Growth and Survival Test.**

Chronic toxicity data shall be reported as outlined in Section VIII.

II. METHODS

Methods to follow are those recommended by EPA in: Short Term Methods For Estimating The Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms, Fourth Edition, October 2002. United States Environmental Protection Agency. Office of Water, Washington, D.C., EPA 821-R-02-013. The methods are available on-line at <http://www.epa.gov/waterscience/WET/> . Exceptions and clarification are stated herein.

III. SAMPLE COLLECTION AND USE

A total of three fresh samples of effluent and receiving water are required for initiation and subsequent renewals of a freshwater, chronic, toxicity test. The receiving water control sample must be collected immediately upstream of the permitted discharge's zone of influence. Fresh samples are recommended for use on test days 1, 3, and 5. However, provided a total of three samples are used for testing over the test period, an alternate sampling schedule is acceptable. The acceptable holding times until initial use of a sample are 24 and 36 hours for on-site and off-site testing, respectively. A written waiver is required from the regulating authority for any hold time extension. All test samples collected may be used for 24, 48 and 72 hour renewals after initial use. All samples held for use beyond the day of sampling shall be refrigerated and maintained at a temperature range of 0-6° C.

All samples submitted for chemical and physical analyses will be analyzed according to Section VI of this protocol.

Sampling guidance dictates that, where appropriate, aliquots for the analysis required in this protocol shall be split from the samples, containerized and immediately preserved, or analyzed as per 40 CFR Part 136. EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection. Testing for the presence of total residual chlorine (TRC) must be analyzed immediately or as soon as possible, for all effluent samples, prior to WET testing. TRC analysis may be performed on-site or by the toxicity testing laboratory and the samples must be dechlorinated, as necessary, using sodium thiosulfate prior to sample use for toxicity testing.

If any of the renewal samples are of sufficient potency to cause lethality to 50 percent or more of the test organisms in any of the test treatments for either species or, if the test fails to meet its permit limits, then chemical analysis for total metals (originally required for the initial sample only in Section VI) will be required on the renewal sample(s) as well.

IV. DILUTION WATER

Samples of receiving water must be collected from a location in the receiving water body immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. EPA strongly urges that screening for toxicity be performed prior to the set up of a full, definitive toxicity test any time there is a question about the test dilution water's ability to achieve test acceptability criteria (TAC) as indicated in Section V of this protocol. The test dilution water control response will be used in the statistical analysis of the toxicity test data. All other control(s) required to be run in the test will be reported as specified in the Discharge Monitoring Report (DMR) Instructions, Attachment F, page 2, Test Results & Permit Limits.

The test dilution water must be used to determine whether the test met the applicable TAC. When receiving water is used for test dilution, an additional control made up of standard laboratory water (0% effluent) is required. This control will be used to verify the health of the test organisms and evaluate to what extent, if any, the receiving water itself is responsible for any toxic response observed.

If dechlorination of a sample by the toxicity testing laboratory is necessary a "sodium thiosulfate" control, representing the concentration of sodium thiosulfate used to adequately dechlorinate the sample prior to toxicity testing, must be included in the test.

If the use of an alternate dilution water (ADW) is authorized, in addition to the ADW test control, the testing laboratory must, for the purpose of monitoring the receiving water, also run a receiving water control.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable an ADW of known quality with hardness similar to that of the receiving water may be substituted. Substitution is species specific meaning that the decision to use ADW is made for each species and is based on the toxic response of that particular species. Substitution to an ADW is authorized in two cases. The first is the case where repeating a test due to toxicity in the site dilution water requires an **immediate decision** for ADW use be made by the permittee and toxicity testing laboratory. The second is in the case where two of the most recent documented incidents of unacceptable site dilution water toxicity requires ADW use in future WET testing.

For the second case, written notification from the permittee requesting ADW use **and** written authorization from the permit issuing agency(s) is required **prior to** switching to a long-term use of ADW for the duration of the permit.

Written requests for use of ADW must be mailed with supporting documentation to the following addresses:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
One Congress St., Suite 1100
Boston, MA 02114-2023

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
One Congress Street, Suite 1100
Boston, MA 02114-2023

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at <http://www.epa.gov/region1/enforcementandassistance/dmr.html> for further important details on alternate dilution water substitution requests.

V. TEST CONDITIONS AND TEST ACCEPTABILITY CRITERIA

Method specific test conditions and TAC are to be followed and adhered to as specified in the method guidance document, EPA 821-R-02-013. If a test does not meet TAC the test must be repeated with fresh samples within 30 days of the initial test completion date.

V.1. Use of Reference Toxicity Testing

Reference toxicity test results and applicable control charts must be included in the toxicity testing report.

If reference toxicity test results fall outside the control limits established by the laboratory for a specific test endpoint, a reason or reasons for this excursion must be evaluated, correction made and reference toxicity tests rerun as necessary.

If a test endpoint value exceeds the control limits at a frequency of more than one out of twenty then causes for the reference toxicity test failure must be examined and if problems are identified corrective action taken. The reference toxicity test must be repeated during the same month in which the exceedance occurred.

If two consecutive reference toxicity tests fall outside control limits, the possible cause(s) for the exceedance must be examined, corrective actions taken and a repeat of the reference toxicity test must take place immediately. Actions taken to resolve the problem must be reported.

V.1.a. Use of Concurrent Reference Toxicity Testing

In the case where concurrent reference toxicity testing is required due to a low frequency of testing with a particular method, if the reference toxicity test results fall slightly outside of laboratory established control limits, but the primary test met the TAC, the results of the primary test will be considered acceptable. However, if the results of the concurrent test fall well outside the established **upper** control limits i.e. ≥ 3 standard deviations for IC25 values and $\geq$ two concentration intervals for NOECs, and even though the primary test meets TAC, the primary test will be considered unacceptable and must be repeated.

V.2. For the *C. dubia* test, the determination of TAC and formal statistical analyses must be performed using only the first three broods produced.

V.3. Test treatments must include 5 effluent concentrations and a dilution water control. An additional test treatment, at the permitted effluent concentration (% effluent), is required if it is not included in the dilution series.

VI. CHEMICAL ANALYSIS

As part of each toxicity test's daily renewal procedure, pH, specific conductance, dissolved oxygen (DO) and temperature must be measured at the beginning and end of each 24-hour period in each test treatment and the control(s).

The additional analysis that must be performed under this protocol is as specified and noted in the table below.

<u>Parameter</u>	Effluent	Receiving Water	ML (mg/l)
Hardness ^{1, 4}	x	x	0.5
Total Residual Chlorine (TRC) ^{2, 3, 4}	x		0.02
Alkalinity ⁴	x	x	2.0
pH ⁴	x	x	--
Specific Conductance ⁴	x	x	--
Total Solids ⁶	x		--
Total Dissolved Solids ⁶	x		--
Ammonia ⁴	x	x	0.1
Total Organic Carbon ⁶	x	x	0.5
Total Metals ⁵			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02

Other as permit requires

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 2340B (hardness by calculation)
 - Method 2340C (titration)
2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.
- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 4500-CL E Low Level Amperometric Titration
 - Method 4500-CL G DPD Colorimetric Method
 - USEPA 1983. Manual of Methods Analysis of Water and Wastes
 - Method 330.5
3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing
4. Analysis is to be performed on samples and/or receiving water, as designated in the table above, from all three sampling events.
5. Analysis is to be performed on the initial sample(s) only unless the situation arises as stated in Section III, paragraph 4
6. Analysis to be performed on initial samples only

VII. TOXICITY TEST DATA ANALYSIS AND REVIEW

A. Test Review

1. Concentration / Response Relationship

A concentration/response relationship evaluation is required for test endpoint determinations from both Hypothesis Testing and Point Estimate techniques. The test report is to include documentation of this evaluation in support of the endpoint values reported. The dose-response review must be performed as required in Section 10.2.6 of EPA-821-R-02-013.

Guidance for this review can be found at

<http://water.epa.gov/scitech/methods/cwa/> . In most cases, the review will result in one of the following three conclusions: (1) Results are reliable and reportable; (2) Results are anomalous and require explanation; or (3) Results are inconclusive and a retest with fresh samples is required.

2. Test Variability (Test Sensitivity)

This review step is separate from the determination of whether a test meets or does not meet TAC. Within test variability is to be examined for the purpose of evaluating test sensitivity. This evaluation is to be performed for the sub-lethal hypothesis testing endpoints reproduction and growth as required by the permit. The test report is to include documentation of this evaluation to support that the endpoint values reported resulted from a toxicity test of adequate sensitivity. This evaluation must be performed as required in Section 10.2.8 of EPA-821-R-02-013.

To determine the adequacy of test sensitivity, USEPA requires the calculation of test percent minimum significant difference (PMSD) values. In cases where NOEC determinations are made based on a non-parametric technique, calculation of a test PMSD value, for the sole purpose of assessing test sensitivity, shall be calculated using a comparable parametric statistical analysis technique. The calculated test PMSD is then compared to the upper and lower PMSD bounds shown for freshwater tests in Section 10.2.8.3, p. 52, Table 6 of EPA-821-R-02-013. The comparison will yield one of the following determinations.

- The test PMSD exceeds the PMSD upper bound test variability criterion in Table 6, the test results are considered highly variable and the test may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC). If the test results indicate that the discharge is not toxic at the PLC, then the test is considered insufficiently sensitive and must be repeated within 30 days of the initial test completion using fresh samples. If the test results indicate that the discharge is toxic at the PLC, the test is considered acceptable and does not have to be repeated.
- The test PMSD falls below the PMSD lower bound test variability criterion in Table 6, the test is determined to be very sensitive. In order to determine which treatment(s) are statistically significant and which are not, for the purpose of reporting a NOEC, the relative percent difference (RPD) between the control and each treatment must be calculated and compared to the lower PMSD boundary. See *Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program*, EPA 833-R-00-003, June 2002, Section 6.4.2. The following link: [Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the NPDES Program](#) can be used to locate the USEPA website containing this document. If the RPD for a treatment falls below the PMSD lower bound, the difference is considered statistically insignificant. If the RPD for a treatment is greater than the PMSD lower bound, then the treatment is considered statistically significant.
- The test PMSD falls within the PMSD upper and lower bounds in Table 6, the sub-lethal test endpoint values shall be reported as is.

B. Statistical Analysis

1. General - Recommended Statistical Analysis Method

Refer to general data analysis flowchart, EPA 821-R-02-013, page 43

For discussion on Hypothesis Testing, refer to EPA 821-R-02-013, Section 9.6

For discussion on Point Estimation Techniques, refer to EPA 821-R-02-013, Section 9.7

2. *Pimephales promelas*

Refer to survival hypothesis testing analysis flowchart, EPA 821-R-02-013, page 79

Refer to survival point estimate techniques flowchart, EPA 821-R-02-013, page 80

Refer to growth data statistical analysis flowchart, EPA 821-R-02-013, page 92

3. *Ceriodaphnia dubia*

Refer to survival data testing flowchart, EPA 821-R-02-013, page 168

Refer to reproduction data testing flowchart, EPA 821-R-02-013, page 173

VIII. TOXICITY TEST REPORTING

A report of results must include the following:

- Test summary sheets (2007 DMR Attachment F) which includes:
 - Facility name
 - NPDES permit number
 - Outfall number
 - Sample type
 - Sampling method
 - Effluent TRC concentration
 - Dilution water used
 - Receiving water name and sampling location
 - Test type and species
 - Test start date
 - Effluent concentrations tested (%) and permit limit concentration
 - Applicable reference toxicity test date and whether acceptable or not
 - Age, age range and source of test organisms used for testing
 - Results of TAC review for all applicable controls
 - Test sensitivity evaluation results (test PMSD for growth and reproduction)
 - Permit limit and toxicity test results
 - Summary of test sensitivity and concentration response evaluation

In addition to the summary sheets the report must include:

- A brief description of sample collection procedures
- Chain of custody documentation including names of individuals collecting samples, times and dates of sample collection, sample locations, requested analysis and lab receipt with time and date received, lab receipt personnel and condition of samples upon receipt at the lab(s)
- Reference toxicity test control charts
- All sample chemical/physical data generated, including minimum limits (MLs) and analytical methods used
- All toxicity test raw data including daily ambient test conditions, toxicity test chemistry, sample dechlorination details as necessary, bench sheets and statistical analysis
- A discussion of any deviations from test conditions
- Any further discussion of reported test results, statistical analysis and concentration-response relationship and test sensitivity review per species per endpoint

USEPA REGION 1 FRESHWATER ACUTE TOXICITY TEST PROCEDURE AND PROTOCOL

I. GENERAL REQUIREMENTS

The permittee shall conduct acceptable acute toxicity tests in accordance with the appropriate test protocols described below:

- **Daphnid (Ceriodaphnia dubia) definitive 48 hour test.**
- **Fathead Minnow (Pimephales promelas) definitive 48 hour test.**

Acute toxicity test data shall be reported as outlined in Section VIII.

II. METHODS

The permittee shall use 40 CFR Part 136 methods. Methods and guidance may be found at:

<http://water.epa.gov/scitech/swguidance/methods/wet/index.cfm#methods>

The permittee shall also meet the sampling, analysis and reporting requirements included in this protocol. This protocol defines more specific requirements while still being consistent with the Part 136 methods. If, due to modifications of Part 136, there are conflicting requirements between the Part 136 method and this protocol, the permittee shall comply with the requirements of the Part 136 method.

III. SAMPLE COLLECTION

A discharge sample shall be collected. Aliquots shall be split from the sample, containerized and preserved (as per 40 CFR Part 136) for chemical and physical analyses required. The remaining sample shall be measured for total residual chlorine and dechlorinated (if detected) in the laboratory using sodium thiosulfate for subsequent toxicity testing. (Note that EPA approved test methods require that samples collected for metals analyses be preserved immediately after collection.) Grab samples must be used for pH, temperature, and total residual chlorine (as per 40 CFR Part 122.21).

Standard Methods for the Examination of Water and Wastewater describes dechlorination of samples (APHA, 1992). Dechlorination can be achieved using a ratio of 6.7 mg/L anhydrous sodium thiosulfate to reduce 1.0 mg/L chlorine. If dechlorination is necessary, a thiosulfate control (maximum amount of thiosulfate in lab control or receiving water) must also be run in the WET test.

All samples held overnight shall be refrigerated at 1- 6°C.

IV. DILUTION WATER

A grab sample of dilution water used for acute toxicity testing shall be collected from the receiving water at a point immediately upstream of the permitted discharge's zone of influence at a reasonably accessible location. Avoid collection near areas of obvious road or agricultural runoff, storm sewers or other point source discharges and areas where stagnant conditions exist. In the case where an alternate dilution water has been agreed upon an additional receiving water control (0% effluent) must also be tested.

If the receiving water diluent is found to be, or suspected to be toxic or unreliable, an alternate standard dilution water of known quality with a hardness, pH, conductivity, alkalinity, organic carbon, and total suspended solids similar to that of the receiving water may be substituted **AFTER RECEIVING WRITTEN APPROVAL FROM THE PERMIT ISSUING AGENCY(S)**. Written requests for use of an alternate dilution water should be mailed with supporting documentation to the following address:

Director
Office of Ecosystem Protection (CAA)
U.S. Environmental Protection Agency-New England
5 Post Office Sq., Suite 100 (OEP06-5)
Boston, MA 02109-3912

and

Manager
Water Technical Unit (SEW)
U.S. Environmental Protection Agency
5 Post Office Sq., Suite 100 (OES04-4)
Boston, MA 02109-3912

Note: USEPA Region 1 retains the right to modify any part of the alternate dilution water policy stated in this protocol at any time. Any changes to this policy will be documented in the annual DMR posting.

See the most current annual DMR instructions which can be found on the EPA Region 1 website at <http://www.epa.gov/region1/enforcementandassistance/dmr.html> for further important details on alternate dilution water substitution requests.

It may prove beneficial to have the proposed dilution water source screened for suitability prior to toxicity testing. EPA strongly urges that screening be done prior to set up of a full definitive toxicity test any time there is question about the dilution water's ability to support acceptable performance as outlined in the 'test acceptability' section of the protocol.

V. TEST CONDITIONS

The following tables summarize the accepted daphnid and fathead minnow toxicity test conditions and test acceptability criteria:

EPA NEW ENGLAND EFFLUENT TOXICITY TEST CONDITIONS FOR THE DAPHNID, CERIODAPHNIA DUBIA 48 HOUR ACUTE TESTS¹

1.	Test type	Static, non-renewal
2.	Temperature (°C)	20 ± 1° C or 25 ± 1°C
3.	Light quality	Ambient laboratory illumination
4.	Photoperiod	16 hour light, 8 hour dark
5.	Test chamber size	Minimum 30 ml
6.	Test solution volume	Minimum 15 ml
7.	Age of test organisms	1-24 hours (neonates)
8.	No. of daphnids per test chamber	5
9.	No. of replicate test chambers per treatment	4
10.	Total no. daphnids per test concentration	20
11.	Feeding regime	As per manual, lightly feed YCT and <u>Selenastrum</u> to newly released organisms while holding prior to initiating test
12.	Aeration	None
13.	Dilution water ²	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q ^R or equivalent deionized water and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14.	Dilution series	≥ 0.5, must bracket the permitted RWC

15. Number of dilutions ³	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16. Effect measured	Mortality-no movement of body or appendages on gentle prodding
17. Test acceptability	90% or greater survival of test organisms in dilution water control solution
18. Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples must first be used within 36 hours of collection.
19. Sample volume required	Minimum 1 liter

Footnotes:

1. Adapted from EPA-821-R-02-012.
2. Standard prepared dilution water must have hardness requirements to generally reflect the characteristics of the receiving water.

**EPA NEW ENGLAND TEST CONDITIONS FOR THE FATHEAD MINNOW
(PIMEPHALES PROMELAS) 48 HOUR ACUTE TEST¹**

1. Test Type	Static, non-renewal
2. Temperature (°C):	20 ± 1 °C or 25 ± 1 °C
3. Light quality:	Ambient laboratory illumination
4. Photoperiod:	16 hr light, 8 hr dark
5. Size of test vessels:	250 mL minimum
6. Volume of test solution:	Minimum 200 mL/replicate
7. Age of fish:	1-14 days old and age within 24 hrs of each the others
8. No. of fish per chamber	10
9. No. of replicate test vessels per treatment	4
10. Total no. organisms per concentration:	40
11. Feeding regime:	As per manual, lightly feed test age larvae using concentrated brine shrimp nauplii while holding prior to initiating test
12. Aeration:	None, unless dissolved oxygen (D.O.) concentration falls below 4.0 mg/L, at which time gentle single bubble aeration should be started at a rate of less than 100 bubbles/min. (Routine D.O. check is recommended.)
13. dilution water: ²	Receiving water, other surface water, synthetic water adjusted to the hardness and alkalinity of the receiving water (prepared using either Millipore Milli-Q ^R or equivalent deionized and reagent grade chemicals according to EPA acute toxicity test manual) or deionized water combined with mineral water to appropriate hardness.
14. Dilution series	≥ 0.5 , must bracket the permitted RWC

15. Number of dilutions ³	5 plus receiving water and laboratory water control and thiosulfate control, as necessary. An additional dilution at the permitted effluent concentration (% effluent) is required if it is not included in the dilution series.
16. Effect measured	Mortality-no movement on gentle prodding
17. Test acceptability	90% or greater survival of test organisms in dilution water control solution
18. Sampling requirements	For on-site tests, samples must be used within 24 hours of the time that they are removed from the sampling device. For off-site tests, samples are used within 36 hours of collection.
19. Sample volume required	Minimum 2 liters

Footnotes:

1. Adapted from EPA-821-R-02-012
2. Standard dilution water must have hardness requirements to generally reflect characteristics of the receiving water.

VI. CHEMICAL ANALYSIS

At the beginning of a static acute toxicity test, pH, conductivity, total residual chlorine, oxygen, hardness, alkalinity and temperature must be measured in the highest effluent concentration and the dilution water. Dissolved oxygen, pH and temperature are also measured at 24 and 48 hour

intervals in all dilutions. The following chemical analyses shall be performed on the 100 percent effluent sample and the upstream water sample for each sampling event.

<u>Parameter</u>	Effluent	Receiving Water	ML (mg/l)
Hardness ¹ ,	x	x	0.5
Total Residual Chlorine (TRC) ^{2, 3} ,	x		0.02
Alkalinity	x	x	2.0
pH ⁴	x	x	--
Specific Conductance	x	x	--
Total Solids	x		--
Total Dissolved Solids	x		--
Ammonia	x	x	0.1
Total Organic Carbon	x	x	0.5
Total Metals			
Cd	x	x	0.0005
Pb	x	x	0.0005
Cu	x	x	0.003
Zn	x	x	0.005
Ni	x	x	0.005
Al	x	x	0.02
Other as permit requires			

Notes:

1. Hardness may be determined by:

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 2340B (hardness by calculation)
 - Method 2340C (titration)

2. Total Residual Chlorine may be performed using any of the following methods provided the required minimum limit (ML) is met.

- APHA Standard Methods for the Examination of Water and Wastewater , 21st Edition
 - Method 4500-CL E Low Level Amperometric Titration
 - Method 4500-CL G DPD Colorimetric Method

3. Required to be performed on the sample used for WET testing prior to its use for toxicity testing

VII. TOXICITY TEST DATA ANALYSIS

LC50 Median Lethal Concentration (Determined at 48 Hours)

Methods of Estimation:

- Probit Method
- Spearman-Kärber
- Trimmed Spearman-Kärber
- Graphical

See the flow chart in Figure 6 on p. 73 of EPA-821-R-02-012 for appropriate method to use on a given data set.

No Observed Acute Effect Level (NOAEL)

See the flow chart in Figure 13 on p. 87 of EPA-821-R-02-012 .

VIII. TOXICITY TEST REPORTING

A report of the results will include the following:

- Description of sample collection procedures, site description
- Names of individuals collecting and transporting samples, times and dates of sample collection and analysis on chain-of-custody
- General description of tests: age of test organisms, origin, dates and results of standard toxicant tests; light and temperature regime; other information on test conditions if different than procedures recommended. Reference toxicant test data should be included.
- All chemical/physical data generated. (Include minimum detection levels and minimum quantification levels.)
- Raw data and bench sheets.
- Provide a description of dechlorination procedures (as applicable).
- Any other observations or test conditions affecting test outcome.

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

Under 40 CFR §122.21(j)(4), all Publicly Owned Treatment Works (POTWs) with approved Industrial Pretreatment Programs (IPPs) shall provide the following information to the Director: a written evaluation of the need to revise local industrial discharge limits under 40 CFR §403.5(c)(1).

Below is a form designed by the U.S. Environmental Protection Agency (EPA - New England) to assist POTWs with approved IPPs in evaluating whether their existing Technically Based Local Limits (TBLLs) need to be recalculated. The form allows the permittee and EPA to evaluate and compare pertinent information used in previous TBLLs calculations against present conditions at the POTW.

Please read direction below before filling out form.

ITEM I.

- * In Column (1), list what your POTW's influent flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present influent flow rate. Your current flow rate should be calculated using the POTW's average daily flow rate from the previous 12 months.
- * In Column (1) list what your POTW's SIU flow rate was when your existing TBLLs were calculated. In Column (2), list your POTW's present SIU flow rate.
- * In Column (1), list what dilution ratio and/or 7Q10 value was used in your old/expired NPDES permit. In Column (2), list what dilution ratio and/or 7Q10 value is presently being used in your new/reissued NPDES permit.

The 7Q10 value is the lowest seven day average flow rate, in the river, over a ten year period. The 7Q10 value and/or dilution ratio used by EPA in your new NPDES permit can be found in your NPDES permit "Fact Sheet."

- * In Column (1), list the safety factor, if any, that was used when your existing TBLLs were calculated.
- * In Column (1), note how your bio-solids were managed when your existing TBLLs were calculated. In Column (2), note how your POTW is presently disposing of its biosolids and how your POTW will be disposing of its biosolids in the future.

ITEM II.

- * List what your existing TBLLs are - as they appear in your current Sewer Use Ordinance (SUO).

EPA - New England

Reassessment of Technically Based Industrial Discharge Limits

Under 40 CFR §122.21(j)(4), all Publicly Owned Treatment Works (POTWs) with approved Industrial Pretreatment Programs (IPPs) shall provide the following information to the Director: a written evaluation of the need to revise local industrial discharge limits under 40 CFR §403.5(c)(1).

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Please read direction below before filling out form.

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- * In Column (1), note how your bio-solids were managed when your existing TBLLs were calculated. In Column (2), note how your POTW is presently disposing of its biosolids and how your POTW will be disposing of its biosolids in the future.

ITEM II.

- * List what your existing TBLLs are - as they appear in your current Sewer Use Ordinance (SUO).

ITEM III.

- * Identify how your existing TBLLs are allocated out to your industrial community. Some pollutants may be allocated differently than others, if so please explain.

ITEM IV.

- * Since your existing TBLLs were calculated, identify the following in detail:
 - (1) if your POTW has experienced any upsets, inhibition, interference or pass-through as a result of an industrial discharge.
 - (2) if your POTW is presently violating any of its current NPDES permit limitations - include toxicity.

ITEM V.

- * Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in pounds per day) received in the POTW's influent. Current sampling data is defined as data obtained over the last 24 month period.

All influent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

- * Based on your existing TBLLs, as presented in Item II., list in Column (2), for each pollutant the Maximum Allowable Headwork Loading (MAHL) values derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For more information, please see p.,3-28 in EPA's Guidance Manual on the Development and Implementation of Local Limits Under the Pretreatment Program, 12/87.

Item VI.

- * Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period. All effluent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.
- * List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLLs were calculated, please note what hardness value was used at that

time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

List in Column (2B) the current WQSS or "Chronic Gold Book" values for each pollutant multiplied by the dilution ratio used in your new/reissued NPDES permit. For example, with a dilution ratio of 25:1 at a hardness of 25 mg/l - Calcium Carbonate (copper's chronic WQS equals 6.54 ug/l) the chronic NPDES permit limit for copper would equal 156.25 ug/l.

ITEM VII.

- * In Column (1), list all pollutants (in micrograms per liter) limited in your new/reissued NPDES permit. In Column (2), list all pollutants limited in your old/expired NPDES permit.

ITEM VIII.

- * Using current sampling data, list in Column (1) the average and maximum amount of pollutants in your POTW's biosolids. Current data is defined as data obtained during the last 24 month period. Results are to be expressed as total dry weight.

All biosolids data collected and analyzed must be in accordance with 40 CFR §136.

In Column (2A), list current State and/or Federal sludge standards that your facility's biosolids must comply with. Also note how your POTW currently manages the disposal of its biosolids. If your POTW is planning on managing its biosolids differently, list in Column (2B) what your new biosolids criteria will be and method of disposal.

In general, please be sure the units reported are correct and all pertinent information is included in your evaluation. If you have any questions, please contact your pretreatment representative at EPA - New England.

**REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS
(TBLLs)**

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

In Column (1) list the conditions that existed when your current TBLLs were calculated. In Column (2), list current conditions or expected conditions at your POTW.		
	Column (1) EXISTING TBLLs	Column (2) PRESENT CONDITIONS
POTW Flow (MGD)		
Dilution Ratio or 7Q10 (from NPDES Permit)		
SIU Flow (MGD)		
Safety Factor		N/A
Biosolids Disposal Method(s)		

ITEM II.

EXISTING TBLLs			
POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)	POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)

ITEM III.

Note how your existing TBLLs, listed in Item II., are allocated to your Significant Industrial Users (SIUs), i.e. uniform concentration, contributory flow, mass proportioning, other. Please specify by circling.

ITEM IV.

Has your POTW experienced any upsets, inhibition, interference or pass-through from industrial sources since your existing TBLLs were calculated?

If yes, explain.

Has your POTW violated any of its NPDES permit limits and/or toxicity test requirements?

If yes, explain.

ITEM V.

Using current POTW influent sampling data fill in Column (1). In Column (2), list your Maximum Allowable Headwork Loading (MAHL) values used to derive your TBLLs listed in Item II. In addition, please note the Environmental Criteria for which each MAHL value was established, i.e. water quality, sludge, NPDES etc.

Pollutant	Column (1) Influent Data Analyses		Column (2)	Criteria
	Maximum (lb/day)	Average (lb/day)	MAHL Values (lb/day)	
Arsenic				
Cadmium				
Chromium				
Copper				
Cyanide				
Lead				
Mercury				
Nickel				
Silver				
Zinc				
Other (List)				

ITEM VI.

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.				
Pollutant	Column (1)		Columns (2A) (2B)	
	Effluent Data Analyses Maximum Average (ug/l) (ug/l)		Water Quality Criteria (Gold Book) From TBLLs Today (ug/l) (ug/l)	
Arsenic				
*Cadmium				
*Chromium				
*Copper				
Cyanide				
*Lead				
Mercury				
*Nickel				
Silver				
*Zinc				
Other (List)				

*Hardness Dependent (mg/l - CaCO3)

ITEM VII.

In Column (1), identify all pollutants limited in your new/reissued NPDES permit. In Column (2), identify all pollutants that were limited in your old/expired NPDES permit.

[illegible]

ITEM VIII.

Using current POTW biosolids data, fill in Column (1). In Column (2A), list the biosolids criteria that was used at the time your existing TBLLs were calculated. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria would be and method of disposal.			
Pollutant	Column (1) Biosolids Data Analyses Average (mg/kg)	Columns (2A) Biosolids Criteria From TBLLs (mg/kg)	(2B) New (mg/kg)
Arsenic			
Cadmium			
Chromium			
Copper			
Cyanide			
Lead			
Mercury			
Nickel			
Silver			
Zinc			
Molybdenum			
Selenium			
Other (List)			

ITEM III.

- * Identify how your existing TBLLs are allocated out to your industrial community. Some pollutants may be allocated differently than others, if so please explain.

ITEM IV.

- * Since your existing TBLLs were calculated, identify the following in detail:
 - (1) if your POTW has experienced any upsets, inhibition, interference or pass-through as a result of an industrial discharge.
 - (2) if your POTW is presently violating any of its current NPDES permit limitations - include toxicity.

ITEM V.

- * Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in pounds per day) received in the POTW's influent. Current sampling data is defined as data obtained over the last 24 month period.

All influent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.

- * Based on your existing TBLLs, as presented in Item II., list in Column (2), for each pollutant the Maximum Allowable Headwork Loading (MAHL) values derived from an applicable environmental criteria or standard, e.g. water quality, sludge, NPDES, inhibition, etc. For more information, please see p.,3-28 in EPA's Guidance Manual on the Development and Implementation of Local Limits Under the Pretreatment Program, 12/87.

Item VI.

- * Using current sampling data, list in Column (1) the average and maximum amount of pollutants (in micrograms per liter) present your POTW's effluent. Current sampling data is defined as data obtained during the last 24 month period. All effluent data collected and analyzed must be in accordance with 40 CFR §136. Sampling data collected should be analyzed using the lowest possible detection method(s), e.g. graphite furnace.
- * List in Column (2A) what the Water Quality Standards (WQS) were (in micrograms per liter) when your TBLLs were calculated, please note what hardness value was used at that

time. Hardness should be expressed in milligram per liter of Calcium Carbonate.

List in Column (2B) the current WQSS or "Chronic Gold Book" values for each pollutant multiplied by the dilution ratio used in your new/reissued NPDES permit. For example, with a dilution ratio of 25:1 at a hardness of 25 mg/l - Calcium Carbonate (copper's chronic WQS equals 6.54 ug/l) the chronic NPDES permit limit for copper would equal 156.25 ug/l.

ITEM VII.

- * In Column (1), list all pollutants (in micrograms per liter) limited in your new/reissued NPDES permit. In Column (2), list all pollutants limited in your old/expired NPDES permit.

ITEM VIII.

- * Using current sampling data, list in Column (1) the average and maximum amount of pollutants in your POTW's biosolids. Current data is defined as data obtained during the last 24 month period. Results are to be expressed as total dry weight.

All biosolids data collected and analyzed must be in accordance with 40 CFR §136.

In Column (2A), list current State and/or Federal sludge standards that your facility's biosolids must comply with. Also note how your POTW currently manages the disposal of its biosolids. If your POTW is planning on managing its biosolids differently, list in Column (2B) what your new biosolids criteria will be and method of disposal.

In general, please be sure the units reported are correct and all pertinent information is included in your evaluation. If you have any questions, please contact your pretreatment representative at EPA - New England.

**REASSESSMENT OF TECHNICALLY BASED LOCAL LIMITS
(TBLLs)**

POTW Name & Address : _____

NPDES PERMIT # : _____

Date EPA approved current TBLLs : _____

Date EPA approved current Sewer Use Ordinance : _____

ITEM I.

In Column (1) list the conditions that existed when your current TBLLs were calculated. In Column (2), list current conditions or expected conditions at your POTW.		
	Column (1) EXISTING TBLLs	Column (2) PRESENT CONDITIONS
POTW Flow (MGD)		
Dilution Ratio or 7Q10 (from NPDES Permit)		
SIU Flow (MGD)		
Safety Factor		N/A
Biosolids Disposal Method(s)		

ITEM II.

EXISTING TBLLs			
POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)	POLLUTANT	NUMERICAL LIMIT (mg/l) or (lb/day)

ITEM III.

Note how your existing TBLLs, listed in Item II., are allocated to your Significant Industrial Users (SIUs), i.e. uniform concentration, contributory flow, mass proportioning, other. Please specify by circling.

ITEM IV.

Has your POTW experienced any upsets, inhibition, interference or pass-through from industrial sources since your existing TBLLs were calculated?

If yes, explain.

Has your POTW violated any of its NPDES permit limits and/or toxicity test requirements?

If yes, explain.

ITEM V.

Using current POTW influent sampling data fill in Column (1). In Column (2), list your Maximum Allowable Headwork Loading (MAHL) values used to derive your TBLLs listed in Item II. In addition, please note the Environmental Criteria for which each MAHL value was established, i.e. water quality, sludge, NPDES etc.

Pollutant	Column (1) Influent Data Analyses		Column (2)	Criteria
	Maximum (lb/day)	Average (lb/day)	MAHL Values (lb/day)	
Arsenic				
Cadmium				
Chromium				
Copper				
Cyanide				
Lead				
Mercury				
Nickel				
Silver				
Zinc				
Other (List)				

ITEM VI.

Using current POTW effluent sampling data, fill in Column (1). In Column (2A) list what the Water Quality Standards (Gold Book Criteria) were at the time your existing TBLLs were developed. List in Column (2B) current Gold Book values multiplied by the dilution ratio used in your new/reissued NPDES permit.				
Pollutant	Column (1)		Columns (2A) (2B)	
	Effluent Data Analyses Maximum Average (ug/l) (ug/l)		Water Quality Criteria (Gold Book) From TBLLs Today (ug/l) (ug/l)	
Arsenic				
*Cadmium				
*Chromium				
*Copper				
Cyanide				
*Lead				
Mercury				
*Nickel				
Silver				
*Zinc				
Other (List)				

*Hardness Dependent (mg/l - CaCO3)

ITEM VII.

In Column (1), identify all pollutants limited in your new/reissued NPDES permit. In Column (2), identify all pollutants that were limited in your old/expired NPDES permit.

[illegible]

ITEM VIII.

Using current POTW biosolids data, fill in Column (1). In Column (2A), list the biosolids criteria that was used at the time your existing TBLLs were calculated. If your POTW is planing on managing its biosolids differently, list in Column (2B) what your new biosolids criteria would be and method of disposal.			
Pollutant	Column (1) Biosolids Data Analyses Average (mg/kg)	Columns (2A) Biosolids Criteria From TBLLs (mg/kg)	(2B) New (mg/kg)
Arsenic			
Cadmium			
Chromium			
Copper			
Cyanide			
Lead			
Mercury			
Nickel			
Silver			
Zinc			
Molybdenum			
Selenium			
Other (List)			

NPDES PERMIT REQUIREMENT
FOR
INDUSTRIAL PRETREATMENT ANNUAL REPORT

The information described below shall be included in the pretreatment program annual reports:

1. An updated list of all industrial users by category, as set forth in 40 C.F.R. 403.8(f)(2)(i), indicating compliance or noncompliance with the following:
 - baseline monitoring reporting requirements for newly promulgated industries
 - compliance status reporting requirements for newly promulgated industries
 - periodic (semi-annual) monitoring reporting requirements,
 - categorical standards, and
 - local limits;
2. A summary of compliance and enforcement activities during the preceding year, including the number of:
 - significant industrial users inspected by POTW (include inspection dates for each industrial user),
 - significant industrial users sampled by POTW (include sampling dates for each industrial user),
 - compliance schedules issued (include list of subject users),
 - written notices of violations issued (include list of subject users),
 - administrative orders issued (include list of subject users),
 - criminal or civil suits filed (include list of subject users) and,
 - penalties obtained (include list of subject users and penalty amounts);
3. A list of significantly violating industries required to be published in a local newspaper in accordance with 40 C.F.R. 403.8(f)(2)(vii);
4. A narrative description of program effectiveness including present and proposed changes to the program, such as funding, staffing, ordinances, regulations, rules and/or statutory authority;
5. A summary of all pollutant analytical results for influent, effluent, sludge and any toxicity or bioassay data from the wastewater treatment facility. The summary shall include a comparison of influent sampling results versus threshold inhibitory concentrations for the Wastewater Treatment System and effluent sampling results versus water quality standards. Such a comparison shall be based on the sampling program described in the paragraph below or any similar sampling program described in this Permit.

At a minimum, annual sampling and analysis of the influent and effluent of the Wastewater Treatment Plant shall be conducted for the following pollutants:

- | | |
|--------------------|-------------------|
| a.) Total Cadmium | f.) Total Nickel |
| b.) Total Chromium | g.) Total Silver |
| c.) Total Copper | h.) Total Zinc |
| d.) Total Lead | i.) Total Cyanide |
| e.) Total Mercury | j.) Total Arsenic |

The sampling program shall consist of one 24-hour flow-proportioned composite and at least one grab sample that is representative of the flows received by the POTW. The composite shall consist of hourly flow-proportioned grab samples taken over a 24-hour period if the sample is collected manually or shall consist of a minimum of 48 samples collected at 30 minute intervals if an automated sampler is used. Cyanide shall be taken as a grab sample during the same period as the composite sample. Sampling and preservation shall be consistent with 40 CFR Part 136.

6. A detailed description of all interference and pass-through that occurred during the past year;
7. A thorough description of all investigations into interference and pass-through during the past year;
8. A description of monitoring, sewer inspections and evaluations which were done during the past year to detect interference and pass-through, specifying parameters and frequencies;
9. A description of actions being taken to reduce the incidence of significant violations by significant industrial users; and,
10. The date of the latest adoption of local limits and an indication as to whether or not the permittee is under a State or Federal compliance schedule that includes steps to be taken to revise local limits.

Permit Attachment E

Summary of Required Report Submittals

This table is a summary of the reports required to be submitted under this NPDES permit as an aid to the permittee(s). If there are any discrepancies between the permit and this summary, the permittee(s) shall follow the permit requirements. The addresses are for the submittal of hard copies.

When the permittee begins reporting using NetDMR, submittal of hard copies of many of the required reports will not be necessary. See permit conditions for details.

1 U.S. Environmental Protection Agency Water Technical Unit (OES04-SMR) 5 Post Office Square - Suite 100 Boston, MA 02109-3912	2 MassDEP Surface Water Discharge Permit Program 627 Main Street, 2nd Floor Worcester, Massachusetts 01608
3 MassDEP Central Regional Office- Bureau of Resource Protection 627 Main Street Worcester, MA 01608	

Requirement	Due Date	Addressees
Toxicity test samples shall be collected during the months of; March, June, September, and December [Part I.A Footnote 9]	Results shall be submitted by April 30, July 31, October 31, and January 31 of each year	1 and 2
If the average annual flow in any calendar year exceeds 80% of the facility's design flow, the permittee shall submit a report to MassDEP. [Part I.A.2.i.]	By March 31 of the following calendar year	1, 2 and 3
Notification of Sanitary Sewer Overflows [Part I.B]	Within 24 hours of SSO event.	1 and 3
The permittee shall prepare a map of the sewer collection system it owns. [Part I.C.4.a]	Within 30 months of the effective date of this permit	1, 2, and 3
The permittee shall develop and implement a Collection System Operation and Maintenance Plan. [Part I.C.4]	Within six (6) months of the effective date of the permit, the permittee shall submit to EPA and MassDEP	1, 2, and 3

The full Collection System O & M Plan shall be completed, implemented and submitted to EPA and MassDEP. [Part I.C.5.b]	Within twenty four (24) months of the effective date of the permit, the permittee shall submit to EPA and MassDEP	1, 2, and 3
The permittee shall submit a summary report of activities related to the implementation of its Collection System O & M Plan during the previous calendar year. [I.C.6]	The report shall be submitted to EPA and MassDEP annually by March 31	1, 2, and 3
Annual Sludge Report [Part I.D.8]	Annually by February 19	1, 2, and 3
The permittee shall prepare and submit a written technical evaluation to the EPA analyzing the need to revise local limits. [Part I.E.]	Within 120 days of the effective date of this permit the report shall be submitted to EPA and MassDEP	1, 2, and 3
Annual report describing the permittee's pretreatment program activities. [Part I.E.3]	The report shall be submitted to EPA and MassDEP annually no later than November 30 of each year	1, 2, and 3
Monitoring results obtained during each calendar month shall be summarized and reported via NET DMR [Part I.F]	No later than the 15th day of the following month.	

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND
5 POST OFFICE SQUARE – SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

FACT SHEET

DRAFT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES.

NPDES PERMIT NO.: MA0100013

NAME AND ADDRESS OF APPLICANT:

**Board of Selectmen
Town of Ayer
Brook Street
Ayer, MA 01432**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**Ayer Wastewater Treatment Facility
Brook Street
Ayer, MA 01432**

RECEIVING WATER: **Nashua River (Segment MA81-05)**

CLASSIFICATION: **Class B, Warm Water Fishery**

I. Proposed Action, Type of Facility, and Discharge Location

The Town of Ayer has requested that the U.S. Environmental Protection Agency (EPA) reissue its NPDES permit to discharge into the Nashua River. The Ayer Wastewater Treatment Facility (WWTF) is engaged in the collection and treatment of municipal and industrial wastewater.

The existing NPDES permit was signed on February 28, 2006, became effective on April 25, 2006 and expired on April 25, 2011. The applicant filed a complete application as required by 40 Code of Federal Regulations (CFR) Part 122.6 so the existing permit has been administratively extended and will remain in effect until a renewed permit has been issued. The existing permit and Draft Permit authorize a discharge only from Outfall 001, at the facility. The Draft Permit has been written to reflect the current operations and conditions at the facility. Attachments; Figure 1 – Location Map, Figure 2, Photo of Facility, A – Discharge Monitoring Report Data, B – Metals Data and Attachment C- Nashua River Schematic .

II. Quantitative Data

A quantitative description of the treatment plant's discharge in terms of significant effluent parameters based on recent monitoring data is shown in Attachment A.

III. Limitations and Conditions

The proposed effluent limitations and monitoring requirements may be found in the draft NPDES permit.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

The facility is a 1.79 million gallon per day (mgd) advanced wastewater treatment facility that serves 7,500 people and discharges to the Nashua River. The collection system discharging to the facility consists of separate sewers. The facility is designed to achieve BOD and TSS removal of approximately 90%, total phosphorus removal to 0.2 mg/l, and ammonia removal to between 1-2 mg/l. Significant upgrades to the facility were completed in March 2005.

The following is a brief description of the upgraded plant's treatment process: wastewater first passes through a cyclone grit removal system, followed by an influent chamber. Wastewater then flows to a clari-thickener, where primary solids are settled and removed, followed by anoxic and aerobic basins, where biological treatment takes place. Following the aeration basins, alum is added for phosphorus removal and wastewater then flows to secondary sedimentation tanks, where biological solids are removed. Secondary sedimentation tank effluent is then pumped to tertiary filters, for further solids removal. The final effluent is disinfected using ultraviolet light (UV). The facility has maintained the ability to use chlorine for disinfection in the case where the tertiary filter/UV system is offline. Chlorine may also be used for odor control.

Residential septage (pumped septic tank contents) is accepted from Ayer and surrounding towns. Septage is ground and then added to the wastewater flow upstream of the grit removal system. Sludge is stored in sludge holding tanks and periodically hauled to the Fitchburg Easterly facility for incineration and final disposal.

Overview of Federal and State Regulations

General Requirements

The Clean Water Act (CWA or the Act) prohibits the discharge of pollutants to waters of the United States without an NPDES permit unless such a discharge is otherwise authorized by the Act. NPDES permits are used to implement technology-based and water quality-based effluent limitations, as well as other requirements, including monitoring and reporting. This draft NPDES permit was developed in accordance with statutory and regulatory authorities established pursuant to the Act. The regulations governing the NPDES program are found in 40 CFR Parts 122, 124, and 125.

EPA is required to consider technology-based and water quality-based requirements when developing permit effluent limits. Technology-based treatment requirements represent the minimum level of control that must be imposed under Sections 402 and 301(b) of the Act. Under Section 301(b)(1)(B) of the CWA, publicly owned treatment works (POTWs) must have achieved effluent limitations based upon secondary treatment by July 1, 1977. The secondary treatment requirements are set forth at 49 CFR Part 133.

Under Section 301(b)(1)(C) of the CWA, discharges are subject to limits more stringent than technology-based limits where necessary to meet water quality standards. The Massachusetts Surface Water Quality Standards (MA SWQS) include requirements for the regulation and control of toxic constituents and also require that EPA criteria, established pursuant to Section 304(a) of the CWA, be used unless a site specific criterion is established.

Massachusetts Surface Water Quality Standards also require that discharges of pollutants to surface waters be limited or prohibited to assure that surface water quality standards of the receiving waters are protected and maintained or attained. See 314 CMR 4.03(1)(a).

EPA regulations at 40 CFR 122.44(d)(1)(i), require that the permit limit any pollutant or pollutant parameter (conventional, non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. An excursion occurs if the projected or actual in-stream concentrations exceed the applicable criterion. In determining reasonable potential, EPA considers existing controls on point and non-point sources of pollution, variability of the pollutant in the effluent, sensitivity of the species to toxicity and, where appropriate, the dilution of the effluent in the receiving water.

A permit may not be renewed, reissued, or modified with less stringent limitations or conditions than those contained in the previous permit unless in compliance with the anti-backsliding requirement of the CWA. EPA's anti-backsliding provisions, found in Sections 402(o) and 303(d)(4) of the CWA and at 40 CFR 122.44(l), prohibit the relaxation of permit limits, standards, and conditions, except under certain, limited conditions. Therefore, the effluent limits in the reissued permit must be at least as stringent as those in the previous permit, unless a relaxation is allowed under the provisions of the law and regulations.

Waterbody Classification and Usage

The Ayer WWTF discharges to segment MA81-05 of the Nashua River. The Massachusetts Department of Environmental Protection (MassDEP) lists this segment of the river as a Class B Warm Water Fishery.

Class B waters are designated as habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment ("Treated Water Supply"). Class B waters shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.

The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To meet this goal, the CWA requires states to develop information on the quality of their water resources and report this information to the EPA, the U.S. Congress, and the public. To this end, the EPA released guidance on November 19, 2001, for the preparation of an integrated "List of Waters" that could combine reporting elements of both §305(b) and §303(d) of the CWA. The integrated list allows the Massachusetts to provide the status of all their assessed waters in one list. Each water body or segment is listed in one of the following five categories:

1) Unimpaired and not threatened for all designated uses; 2) Unimpaired waters for some uses and not assessed for others; 3) Insufficient information to make assessments for any uses; 4) Impaired or threatened for one or more uses but not requiring the calculation of a Total Maximum Daily Load (TMDL); and 5) Impaired or threatened for one or more uses and requiring a TMDL. Section 303(d) of the CWA requires states to identify and list those water bodies that are not expected to meet surface water quality standards after the implementation of technology based controls and, as such, require the development of Total Maximum Daily Load.

The most recent water quality assessment report prepared by the Massachusetts Department of Environmental Protection (MassDEP) is the Nashua River Watershed 2003 Water Quality Assessment Report¹, published in August 2008. A copy of the Assessment Report can be reviewed at: <http://www.mass.gov/eea/agencies/massdep/water/watersheds/nashua-river-basin-2003.html>.

The Final Massachusetts Year 2012 Integrated Lists of Waters, prepared in part using information from the assessment report is available on the MassDEP website at: <http://www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf>. Segment MA81-05 of the Nashua River is listed as not being in attainment of state water quality standards and is listed as a Category 5 Water, “Waters requiring a TMDL”, with specific impairment causes listed as: *Aquatic Macroinvertebrate Bioassessments, Escherichia coli, Phosphorus (Total), Sediment Bioassays--Acute Toxicity Freshwater*. See page 160 of the report.

River Flow and Available Dilution

Water quality-based limits are established with the use of a calculated available dilution. 314 CMR 4.03(3)(a) of the MA SWQS requires that effluent dilution be calculated based on the receiving water 7Q10. The 7Q10 is the lowest observed mean river flow for 7 consecutive days, occurring over a 10-year recurrence interval. Additionally, the facility design flow is used to calculate available effluent dilution, see 40 CFR §122.45(b)(1). The facility design flow is 1.79 million gallons per day or 2.8 cubic feet per second (cfs).

The Nashua River begins at the confluence of the North and South Nashua Rivers. The Fitchburg East and Leominster POTWs are located upstream of Ayer on the North Nashua River. Water quality-based permit limits for total phosphorus found later in this fact sheet are part of a wasteload allocation that includes the upstream POTWs. To be consistent throughout the shared watershed and shared dilution, the 7Q10 upstream of the Ayer discharge was calculated using the same general methodology that was used to establish the 7Q10 flows at Leominster and East Fitchburg. This methodology used updated 7Q10 flows for the USGS gage on the North Nashua River at Leominster [Gage number 01094500] and the main stem of the Nashua River Pepperell [Gage number 01096500], dry weather flows from the wastewater treatment plants between the gages, the dry weather release from the Wachusett Reservoir and the upstream watershed areas associated with pertinent locations in the watershed.

The specific information is as follows:

	7Q10 flow cfs	Watershed Area, mi ²	
Pepperell gage	40.1	435	flow based on the period from 1992-2012
Leominster gage	25.3	110	flow based on the period from 1992-2012
Wachusett Reservoir Outlet	2.8	119	flow from MWRA Clinton fact sheet
Ayer		326	

¹ MassDEP. 2008.. *Nashua River Watershed 2003 Water Quality Assessment Report*, CN 360.0 Massachusetts Department of Environmental Protection, Division of Watershed Management, Worcester, MA.

Dry Weather Monthly Average Flow
cfs mgd

MWRA Clinton	4.13	2.67	Lowest monthly average during June–Sept, 2010-2012
Ayer	1.47	0.95	Lowest monthly average during June–Sept, 2010-2012

EPA first subtracted the Leominster gage 7Q10 from the Pepperell gage 7Q10, which yields 14.8 cfs. Then, the regulated portion of this flow (the combined MWRA Clinton and Ayer dry weather flows and the Wachusett Reservoir release – 8.4 cfs) was subtracted to determine the unregulated flows entering the watershed between the gages. This value is 6.4 cfs.

Next, the tributary watershed area generating this flow was calculated by subtracting the combined watershed area upstream of the Wachusett Reservoir and the Leominster gage (229 mi²) from the area at the Pepperell gage (435 mi²), yielding 206 mi².

The unregulated flow of 6.4 cfs was then divided by the calculated watershed area of 206 mi² to calculate a flow factor of 0.031 cfs/mi². This is the unregulated flow per square mile generated by the portion of the watershed downstream of the Wachusett Reservoir and Leominster gage, and upstream of the Pepperell gage.

The watershed area downstream of the Wachusett Reservoir outlet and the Leominster gage and upstream of the Ayer discharge was calculated by subtracting the watershed areas at the Wachusett Reservoir (119 mi²) and the Leominster gage (110 mi²) from the area at Ayer (326 mi²), yielding a watershed area of 97 mi². The total unregulated flow from this portion of the watershed was then calculated by multiplying the flow factor of 0.031 cfs/mi² by the watershed area of 97 mi², yielding a flow of 3.0 cfs.

Finally, the 7Q10 at Ayer was calculated by adding the unregulated flow calculated above (3.0 cfs), the regulated flows from the MWRA Clinton treatment plant (4.13 cfs) and the Wachusett Reservoir release (2.8 cfs), and the 7Q10 flow measured at the Leominster gage (25.3 cfs), yielding a flow of 35.24 cfs.

$$\text{Dilution Factor (7Q10)} = \frac{(35.24 \text{ cfs} + 2.8 \text{ cfs})}{2.8 \text{ cfs}} = 13.6$$

The 7Q10 dilution factor of 13.6 above differs minimally from the dilution factor of 13 for the previous Ayer permit.

Permit Limits and Effluent Data

Effluent Flow

The annual rolling average flow limit in the Draft Permit is the same as in the existing permit, 1.79 mgd (2.8 cfs). The 12-month average flow for 2012 was 1.3 mgd. The maximum daily flow rate for 2012 was 3.0 mgd.

Federal regulations found at 40 CFR §122.45(b)(i) require that effluent limitations for POTWs be calculated based on design flow, which is found in the Permit Application Form 2A, Part A, Section a.6. Flow is to be measured continuously. The permittee shall report the annual average monthly flow using the annual rolling average method (See Permit Footnote 2). The maximum, minimum and total flow for each operating date shall also be reported.

Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS), Dissolved Oxygen (DO), BOD₅ and TSS

The Draft Permit proposes the same BOD₅ and TSS limitations as in the existing permit. The average monthly and average weekly limits are based on the secondary treatment requirements set forth at 40 CFR 133.102 (a)(1), (2), 40 CFR 133.102 (b)(1), (2) and 40 CFR 122.45 (f) and are a monthly average BOD₅ and TSS concentration of 30 mg/l, and a weekly average concentration of 45 mg/l. The Draft Permit requires the permittee to report the maximum BOD₅ and TSS values each month, but does not establish a maximum daily effluent limit. The monitoring frequency continues to be once per week.

The Draft Permit also contains 85% BOD₅ and TSS removal limitations based on the requirements of 40 CFR 133.102(3). These limitations are the same as in the existing permit. A review of DMR data for January 2011 through December 2012 shows compliance with all BOD₅ and TSS limits.

BOD₅ and TSS Mass Loading Calculations:

Calculations of maximum allowable loads for average monthly and average weekly BOD₅ and TSS are based on the following equation:

$L = C \times DF \times 8.34$ where:

L = Maximum allowable load in lbs/day (or kg/day).

C = Maximum allowable effluent concentration for reporting period in mg/l.

Reporting periods are average monthly and weekly and daily maximum.

DF = Facility design flow in MGD.

8.34 = Factor to convert effluent concentration in mg/l and design flow in MGD to lbs/day.

3.79 = Factor to convert effluent concentration in mg/l and design flow in MGD to kg/day.

(Concentration limit) [30] X 8.34 (Constant) X 1.79 (Design flow) = 448 lb/day

(Concentration limit) [45] X 8.34 (Constant) X 1.79 (Design flow) = 672 lb/day

(Concentration limit) [30] X 3.79 (Constant) X 1.79 (Design flow) = 204 kg/day

(Concentration limit) [45] X 3.79 (Constant) X 1.79 (Design flow) = 305 kg/day

DO and pH

The dissolved oxygen limit, “no less than 6.0 mg/l”, is based on water quality considerations for this segment of the river and is the same as the limit in the existing permit. The state Class B in-stream water quality standard for “warm water fisheries” is 5.0 mg/l as found at 314CMR 4.05(3)(b)1. The effluent DO requirement, which is 1.0 mg/l higher than the in-stream criteria, will reduce the DO “sag” caused by the introduction of BOD in the effluent. There have been two low DO concentrations reported in the past two years; August of 2011 (5.8 mg/l) and December 2012 (4.6 mg/l).

The Draft Permit has pH limits that are at least as stringent as the requirements set forth at 40 CFR 133.102(c) and the MA SWQS at 314 CMR 4.05(3)(b)3. The State’s water quality standards require Class B waters maintain a pH range of 6.5 through 8.3 standard units with not more than 0.5 standard units outside of the receiving water background range.

The water quality standards also require there be no change from background conditions that would impair any use assigned to this class. There was one low pH (6.4 September 2012) reported during the past two years.

Fecal coliform bacteria and *Escherichia coli* (*E. coli*) bacteria

On December 29, 2006, the State revised the bacteria criteria in its water quality standards for Class B waters, changing the criteria from fecal coliform bacteria to *Escherichia coli* (*E. coli*) bacteria. EPA approved this revision on September 19, 2007.

The permittee shall transition from fecal coliform limits to *E. coli* with this permit reissuance. The permittee is in the process of replacing the existing UV disinfection system with more efficient UV units.

The *E. coli* bacteria limitations are a monthly average geometric mean of 126 colony forming units per 100 ml (cfu/ml) and a maximum daily value of 409 cfu/100 ml. The maximum daily value is the 90% distribution of the geometric mean of 126 cfu/100 ml. The monitoring frequency remains once per week.

The Massachusetts Water Quality Standards (WQS) Implementation Policy allows for seasonal disinfection. The Nashua River flows into New Hampshire where WQS do not allow for seasonal disinfection, therefore, the permit requires year-round disinfection of the effluent.

Total Residual Chlorine (TRC)

The Draft Permit includes total residual chlorine limitations that are based on state water quality standards. The permittee must test daily for TRC when it is in use. Chlorine compounds produced by the chlorination of wastewater can be extremely toxic to aquatic life. The water quality criteria established for chlorine are 19 ug/l daily maximum (Criterion Maximum Concentration) and 11ug/l (Criterion Continuous Concentration) monthly average in the receiving water. Given a dilution factor of 13.6, water quality-based total residual chlorine limitations may be calculated as follows:

Total Residual Chlorine (TRC) Limitations based on criteria:

(Acute criteria x dilution factor) = Acute (Maximum Daily Limit)
 $(19 \text{ ug/l} \times 13.6) = 258 \text{ ug/l} = 0.26 \text{ mg/l}$

(Chronic criteria x dilution) = Chronic (Monthly Average Limit)
 $(11 \text{ ug/l} \times 13.6) = 150 \text{ ug/l} = 0.15 \text{ mg/l}$

These limits are essentially the same as the limits in the current permit. The Draft Permit carries forward the TRC limits from the current permit consistent with anti-backsliding provisions found in 40 CFR §122.44 and CWA Section 402(o). The Draft Permit therefore includes a monthly average limit of 0.14 mg/l and a daily maximum limit of 0.25 mg/l. The sampling frequency remains at once per day when in use.

Metals

Hardness Dependent Metals

Certain metals in water can be toxic to aquatic life. There is a need to limit toxic metal concentrations in the effluent where aquatic life may be impacted. An evaluation of the concentration of metals in the facility's effluent from Whole Effluent Toxicity (WET) reports submitted between June 2010 and December of 2012 was used to determine reasonable potential for toxicity caused by aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Metals may be present in both dissolved and particulate forms in the water column. However, extensive studies suggest that it is the dissolved fraction that is biologically available, and therefore, presents the greatest risk of toxicity to aquatic life inhabiting the water column.

This conclusion is widely accepted by the scientific community both within and outside of EPA (Water Quality Standards Handbook: Second Edition, Chapter 3.6 and Appendix J, EPA 1994 [EPA 823-B-94-005a]. Also see <http://www.epa.gov/waterscience/standards/handbook/chapter03.html#section6>. As a result, water quality criteria are established in terms of dissolved metals.

However, many inorganic components of domestic wastewater, including metals, are in the particulate form, and differences in the chemical composition between the effluent and the receiving water affects the partitioning of metals between the particulate and dissolved fractions as the effluent mixes with the receiving water, often resulting in a transition from the particulate to dissolved form (*The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* (USEPA 1996 [EPA-823-B96-007])). Consequently, quantifying only the dissolved fraction of metals in the effluent prior to discharge may not accurately reflect the biologically-available portion of metals in the receiving water. Regulations at 40 CFR 122.45(c) require, with limited exceptions, that metals limits in NPDES permits be expressed as total recoverable metals.

EPA's Office of Water - Office of Science and Water Technology stated in a letter dated July 7, 2000 that "[t]he hardness of water containing the discharged toxic metal should be used for determining the applicable criterion. Thus the downstream hardness should be used." The theoretical hardness of the Nashua River downstream of the treatment plant under 7Q10 low flow conditions were calculated based on ambient and effluent hardness data reported in the recent toxicity tests conducted in 2010 and 2011 in Table 2, Nashua River Hardness. The hardness is reported as an equivalent concentration of calcium carbonate.

Table 2. Nashua River Hardness

WET Test Date	Effluent Hardness, mg/l	Ambient Hardness, mg/l
12/11	100	24
9/11	140	26
6/11	130	33
3/11	110	22
12/10	140	39
9/10	150	34
6/10	150	34
3/10	120	25
Median	135	30

Calculation of hardness in the receiving water downstream of the WWTF:

In order to determine the hardness downstream of the treatment plant during the 7Q10 low flow periods, the effluent and ambient hardness values from whole effluent toxicity tests conducted in July and October were used in the mass balance equations:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

Where:

Q_s 7Q10 river flow upstream of plant is 35.24 cfs

Q_d , Discharge flow from plant is 1.79 MGD (2.8 cfs)

Q_r , Combined river flow (7Q10 + plant flow) is 2.8 cfs + 35.24 = 38.04cfs

C_s , Upstream hardness concentration is 30

C_d Effluent hardness is 135

C_r Receiving water hardness downstream

Calculation:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r} = \frac{(2.8)(135 \text{ mg/l}) + (35.24 \text{ cfs})(30 \text{ mg/l})}{(38.04 \text{ cfs})} = 38 \text{ mg/l}$$

For metals with hardness-based water quality criteria, the criteria were determined using the equations in *National Recommended Water Quality Criteria: 2002*, using the appropriate factors for the individual metals found in the MA SWQS (see table below). As described above, the downstream hardness was calculated to be 38 mg/l as CaCO_3 , using a mass balance equation with the design flow, and receiving water 7Q10. The downstream hardness was used to determine the total recoverable metals criteria. The following table presents the factors used to determine the acute and chronic total recoverable criteria for each metal:

Metal	Parameters				Total Recoverable Criteria	
	Ma	ba	mc	bc	Acute Criteria (CMC)* (ug/L)	Chronic Criteria (CCC)** (ug/L)
Aluminum	—	—	—	—	750	87
Cadmium	1.0166	-3.9240	0.7409	-4.7190	0.80	0.13
Copper	0.9422	-1.7000	0.8545	-1.7020	5.63	4.08
Lead	1.2730	-1.4600	1.2730	-4.7050	23.82	0.93
Nickel	0.8460	2.2550	0.8460	0.0584	206.93	23.01
Zinc	0.8473	0.8840	0.8473	0.8840	52.78	52.78

*Acute Criteria (CMC) = $\exp\{ma \cdot \ln(\text{hardness}) + ba\}$

**Chronic Criteria (CCC) = $\exp\{mc \cdot \ln(\text{hardness}) + bc\}$

In order to determine whether the effluent has the reasonable potential to cause or contribute to an exceedence above the in-stream water quality criteria for each metal, the following mass balance is used to project in-stream metal concentrations downstream from the discharge.

$$Q_d C_d + Q_s C_s = Q_r C_r$$

rewritten as:

$$C_r = \frac{Q_d C_d + Q_s C_s}{Q_r}$$

where:

Q_d = effluent flow (design flow = 1.79 mgd = 2.8 cfs)

C_d = effluent metals concentration in ug/L (95th percentile)

Q_s = stream flow upstream (7Q10 upstream = 35.24 cfs)

C_s = background in-stream metals concentration in ug/L (median)

Q_r = resultant in-stream flow, after discharge ($Q_s + Q_d = 35.24 + 2.8$ cfs = 38.04 cfs)

C_r = resultant in-stream concentration in ug/L

EPA bases its determination of “reasonable potential” on a characterization of the upper bound of expected effluent concentrations based on a statistical analysis of the available monitoring data. As noted in the *Technical Support Document for Water Quality Based Toxics Control* (EPA 1991) (“TSD”), “[a]ll monitoring data, including results for concentrations of individual chemicals, have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty.” Thus with a limited data set, the maximum concentration that has been found in the samples may not reflect the full range of effluent concentration.

To account for this, EPA has developed a statistical approach to characterizing effluent variability when the monitoring dataset includes 10 or more samples.² As “experience has shown that daily pollutant discharges are generally lognormally distributed,” TSD at App. E, EPA uses a lognormal distribution to model the shape of the observed data, unless analysis indicates a different distributional model provides a better fit to the data. The model parameters (mean and variance) are derived from the monitoring data. The model parameter μ is the mean of the natural logs of the monitoring data values, while σ is the standard deviation of the natural logs of the monitoring data values.

The lognormal distribution generally provides a good fit to environmental data because it is bounded on the lower end (i.e. you cannot have pollutant concentrations less than zero) and is positively skewed. It also has the practical benefit that if an original lognormal data set X is logarithmically transformed (i.e. $Y = \ln[X]$) the resulting variable Y will be normally distributed. Then the upper percentile expected values of X can be calculated using the z-score of the standardized normal distribution (i.e. the normal distribution with mean = 0 and variance = 1), a common and relatively simple statistical calculation. The p^{th} percentile of X is estimated by

$$X_p = \exp(\mu_y + z_p \times \sigma_y), \quad \text{where } \begin{aligned} \mu_y &= \text{mean of } Y \\ \sigma_y &= \text{standard deviation of } Y \\ Y &= \ln[X] \\ z_p &= \text{the z-score for percentile “p”} \end{aligned}$$

² A different statistical approach is applied where the monitoring data set includes less than 10 samples.

For the 95th percentile, $z_{95} = 1.645$, so that

$$X_{95} = \exp(\mu_y + 1.645 \times \sigma_y)$$

The 95th percentile value is used to determine whether a discharge has a reasonable potential to cause or contribute to an exceedance of a water quality standard. The combination of the upper bound effluent concentration with dilution in the receiving water is calculated to determine whether the water quality criteria will be exceeded.

If there is reasonable potential (for either acute or chronic conditions), the appropriate limit is then calculated by rearranging the previous mass balance equation to solve for the effluent concentration (C_d) using the criterion as the resultant in-stream concentration (C_r). See the table on the next page for the results of this analysis with respect to aluminum, cadmium, chromium, copper, lead, nickel and zinc.

Metal	Qd	Cd ¹ (95th Percentile)	Qs	Cs ² (Median)	Qr = Qs + Qd	Cr = (QdCd+QsCs)/Q _r	Criteria		Reasonable Potential?	Limit = (Qr*Criteria-QsCs)/Qd	
	cfs	ug/l	cfs	ug/l	cfs	ug/l	Acute (ug/l)	Chronic (ug/l)	Cr > Criteria	Acute (ug/l)	Chronic (ug/l)
Aluminum	2.77	1227	35.24	75	36.6	166.1	750	87	Y (chronic only)	N/A	87
Cadmium		0		0		0	10.5	1.7	N	N/A	N/A
Copper		23.3		6		7.6	5.63	4.08	Y	5.63*	4.08*
Lead		1.8		2		2.1	23.82	0.93	Y (chronic only)	N/A	1
Nickel		5.2		0		0.4	206.93	23.01	N	N/A	N/A
Zinc		42		7		9.9	52.78	52.78	N	N/A	N/A

¹ Values calculated using data from the 2008-2012 WET testing (see Attachment B).

² Median upstream data taken from Whole Effluent Toxicity (WET) testing on the Nashua River just upstream of the Ayer WWTF (see Attachment B).

- The calculated limits are below the criteria. The permit limits will be equivalent to the criteria.

As indicated in the table above, there is reasonable potential (for either acute or chronic conditions) that the discharge of aluminum, copper, and lead will cause or contribute to an exceedance of applicable water quality criteria. Hence, metals limits are included in the Draft Permit.

Reasonable potential is then determined by comparing this resultant in-stream concentration (for both acute and chronic conditions) with the criteria for each metal. In EPA's TSD, box 3-2 describes the statistical approach in determining if there is reasonable potential for an excursion

Alum ($\text{Al}_2(\text{SO}_4)_3$) is added in the treatment process to reduce effluent total phosphorus. Alum contributes to high total aluminum in the effluent. Similar treatment facilities have switched to non-aluminum additives such as ferrous chloride (FeCl_2) and ferric chloride (FeCl_3) to control phosphorus and still meet phosphorus effluent limits. If the permittee discontinues the use of aluminum containing treatment additives and can demonstrate that effluent total aluminum concentrations are below 87 ug/l, EPA and MassDEP will consider this new information to be a basis for removing the aluminum limits from the permit.

The median effluent concentration of total aluminum exceeds the state water quality chronic. The permit shall include an average monthly limit of 87 ug/l.

Phosphorus

The Draft Permit continues the existing effluent limits and monitoring requirements for total phosphorus of 0.2 mg/l monthly average (April to October) and 1.0 mg/l monthly average (November to March), and the existing monitoring requirements for orthophosphorus (report only, November to March).

Phosphorus is an essential nutrient for plant growth, but excessive amounts of phosphorus in a water body have the potential to accelerate stream eutrophication, characterized by excessive plant growth, low dissolved oxygen, and large diurnal swings in dissolved oxygen in the water body.

Regulatory Background

The MA SWQS do not include numeric criteria for phosphorus. The Standards do include narrative criteria, including, in 314 CMR 4.05(5)(c) that states "unless naturally occurring, all surface waters shall be free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses and shall not exceed the site specific criteria developed in a TMDL or as otherwise established by the Department pursuant to 314 CMR 4.00. Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and BAT for non POTWs, to remove such nutrients to ensure protection of existing and designated uses."

The existing permit has a 0.2 mg/l monthly average limit for total phosphorus from April 1 through October 31, which is based on Highest and Best Practical Treatment (HBPT) pursuant to 314 CMR 4.05(5)(c) of the MA SWQS, and a 1.0 mg/l monthly average limit from November 1 through March 31. The monthly average phosphorus data from the facility's DMRs averaged 0.14 mg/l during the warm weather seasons, from June 2009 through October 2012. See Table below.

Total Phosphorus (June 1 2009 through October 31, 2012)

Limits	0.2 mg/l	Report mg/l
MP Date	MONTHLY AVERAGE	DAILY MAXIMUM
06/30/2009	.08	.1
07/31/2009	.05	.1
08/31/2009	.06	.1
09/30/2009	.11	.2
10/31/2009	.11	.22
04/30/2010	.1	.14
05/31/2010	.35	.98
06/30/2010	.08	.14
07/31/2010	.11	.15
08/31/2010	.08	.22
09/30/2010	.14	.17
10/31/2010	.16	.65
04/30/2011	.06	.09
05/31/2011	.05	.07
06/30/2011	.05	.07
07/31/2011	.07	.12
08/31/2011	.06	.08
09/30/2011	.16	.26
10/31/2011	.12	.17
04/30/2012	.1	.14
05/31/2012	.23	.68
06/30/2012	.09	.16
07/31/2012	.14	.2
08/31/2012	.17	.28
09/30/2012	.74	.16
10/31/2012	.22	.42
Average	0.14	0.23
Median	0.11	0.17

The Massachusetts Year 2012 Integrated List of Waters, Listing of the Condition of Massachusetts' Waters Pursuant to Sections 305(b), 314 and 303(d) of the Clean Water Act, list the Nashua River, Segment, MA81-05 [into which Ayer discharges] as a Category 5 Waters, "Waters requiring a TMDL" for the Impairments; *Aquatic Macroinvertebrate Bioassessments*, *Escherichia coli*, *Phosphorus (Total)*, *Sediment Bioassays--Acute Toxicity (Freshwater)*. See page 160 of the report.

MassDEP has prepared a draft TMDL for the Nashua River [see Draft Nashua River, Massachusetts Total Maximum Daily Load for the Nutrient Phosphorus, MassDEP DWM TMDL, (Report # 81-TMDL-2007-2)]. The final TMDL has not been completed or submitted to EPA for approval. Accordingly, while the draft TMDL does provide useful information in establishing an appropriate water quality-based phosphorus limit (Draft TMDL recommends 0.2 mg/l TP), the permit is not required to be consistent with the TMDL pursuant to 40 CFR 122.44(d)(1)(vii)(B), and so EPA has undertaken an analysis to independently assess the adequacy of the current phosphorus limits

In the absence of numeric criteria, EPA interprets the narrative criteria using the procedures found at 40 CFR Part 122.44(d)(1)(vi), including the use of available guidance and other relevant information.

In its development of the East Fitchburg NPDES permit, issued on June 22, 2010, EPA used a methodology that ensured attainment of Gold Book –recommended total phosphorus criteria of 100 ug/l at the confluence of the North and South Branches of the Nashua River, upstream of the Ayer discharge. This methodology considered treatment plant loads from the East Fitchburg, Leominster, and MWRA Clinton POTWs (all located upstream of the confluence of the North and South Branches) as well as an estimate of the background concentration in the receiving water. The East Fitchburg limit was intended to be protective of water quality in segment MA81-05, including Pepperell Pond. The Fact Sheet (7/16/2009) that accompanied the East Fitchburg Draft Permit and the Response to Comments issued with the final permit detail the methodology. . See <http://www.epa.gov/region1/npdes/permits/2010/finalma0100986permit.pdf>

EPA decided to use this same methodology and assumptions to check that the 0.2 mg/l limit on total phosphorus in the current permit (and recommended in the draft TMDL) is sufficiently stringent to attain water quality standards downstream of the Ayer discharge, about 11.6 river miles downstream of the confluence of the North and South Branches. See Attachment C-Nashua River Schematic.

EPA used the following information/assumptions, in addition to information used in calculating the Ayer 7Q10:

- The in-stream total phosphorus concentration at the confluence of the North and South Branches of the river is 0.1 mg/l (Gold Book Criteria). This was the target threshold on which the limits for East Fitchburg, Leominster and MWRA Clinton limits were established.
- The watershed area at the confluence of the North and South Branches of the Nashua is 265 mi².
- The total phosphorus concentration of flow entering the river between the North/South confluence and the Ayer discharge is 0.024 mg/l. (There are no wastewater treatment plant discharges into this segment.) The total phosphorus concentration from non-point sources was determined by looking at 2003 data collected by the MassDEP for nearby brooks without point source phosphorus contributions. The non-point source contribution is calculated as follows:

Catacoonamug Brook

4/9/2003	0.01
5/7/2003	0.02
6/11/2003	0.022
8/13/2003	0.026
10/8/2003	0.016

Nonacoicus Brook

4/9/2003	0.011
5/7/2003	0.024
6/11/2003	0.032
7/16/2003	0.051
8/13/2003	0.044
10/8/2003	0.022

Mulpus Brook

4/9/2003	0.01	
5/7/2003	0.018	
6/11/2003	0.026	
7/16/2003	0.023	
8/13/2003	0.032	average of duplicates
10/8/2003	0.015	
average	0.024	
median	0.022	

First, the 7Q10 flow at the North/South confluence is calculated. This is done by adding the flow at the Leominster gage (25.3 cfs) to the flows from the regulated sources, the MWRA Clinton treatment plant (4.13 cfs) and the release from the Wachusett Reservoir (2.8 cfs to the flow generated by the watershed area downstream of the Wachusett Reservoir dam and the Leominster gage. This flow can be estimated by calculating the watershed area of this segment ($265-110-119 = 36 \text{ mi}^2$) and multiplying it by the flow factor of 0.031 (see Ayer flow calculation) resulting in a flow of 1.12 cfs, yielding a total flow of 33.35 cfs ($25.3+4.13+2.8+1.12$).

Next, the flow entering the watershed between the confluence of the North and South Branches and the Ayer discharge can be calculated by subtracting the flow at the North/South confluence (33.35 cfs) from the flow at Ayer (35.24 cfs). This yields a flow of 1.89 cfs.

Finally the in-stream total phosphorus concentration downstream of Ayer was calculated using a mass balance equation. The calculation was done assuming Ayer discharging total phosphorus at its permitted concentration of 0.2 mg/l. The calculation was done with Ayer at its current dry weather flow as well as at design flow. If the calculated downstream concentration is equal to or less than 0.1 mg/l (the Gold Book criteria), the limit is protective of water quality standards.

The basic mass balance equation is:

$$Q_r C_r = Q_s C_s + Q_d C_d$$

Q_r	=	Streamflow below outfall
C_r	=	Concentration below outfall
Q_s	=	Upstream flow
C_s	=	Upstream concentration
Q_d	=	Discharge flow
C_d	=	Discharge concentration

Solving for C_r yields:

$$C_r = \frac{Q_s C_s + Q_d C_d}{Q_r}$$

In this case the upstream load ($C_s Q_s$) is the sum of the load at the North/South confluence (at a concentration of 0.1 mg/l) plus the load entering between that location and the Ayer discharge (at a concentration of 0.024 mg/l).

Therefore, the total phosphorus concentration downstream of Ayer with Ayer discharging at summer low flow is:

$$\frac{(33.35)(0.1) + (1.89)(0.024) + (1.47)(0.2)}{33.35 + 0.189 + 1.47} = 0.1 \text{ mg/l}$$

The total phosphorus concentration downstream of Ayer with Ayer discharging at design flow is:

$$\frac{(33.35)(0.1) + (1.89)(0.024) + (2.77)(0.2)}{33.35 + 0.189 + 2.77} = 0.107 \text{ mg/l}$$

These calculations show that the current monthly average total phosphorus limit of 0.2 mg/l for the months of April through October will result in attainment of the Gold Book-recommended criterion of 100 ug/l downstream of the discharge under typical summer flow conditions, and there will be only a very small exceedance under design flow conditions. Accordingly, EPA has determined that the 0.2 mg/l limit is protective of water quality standards and has retained this limit in the Draft Permit.

The current permit also has a monthly average total phosphorus limit of 1.0 mg/l for the months of November through March 31, to reduce deposition and storage of phosphorus in sediment during the non-growing season. Additionally, the current permit requires monitoring of dissolved ortho-phosphorus to measure the immediately bioavailable portion of the effluent total phosphorus. These requirements are carried over into the Draft Permit.

Whole Effluent Toxicity Testing

Under Section 301(b)(1) of the CWA, discharges are subject to effluent limitations based on water quality standards. The MA SWQS at 314 CMR 4.05(5)(e), include the following narrative statements and require that EPA criteria established pursuant to Section 304(a)(1) of the CWA be used as guidance for interpretation of the following narrative criteria:

All surface waters shall be free from pollutants in concentrations or combinations that are toxic to humans, aquatic life or wildlife. For pollutants not otherwise listed in 314 CMR 4.00, the National Recommended Water Quality Criteria: 2002, EPA 822-R-02-047, November 2002 published by EPA pursuant to Section 304(a) of the Federal Water Pollution Control Act, are the allowable receiving water concentrations for the affected waters, unless the Department either establishes a site specific criterion or determines that naturally occurring background concentrations are higher.

Where the Department determines that naturally occurring background concentrations are higher, those concentrations shall be the allowable receiving water concentrations... Site specific limits, human health risk levels and permit limits will be established in accordance with... 314 CMR 4.05(5)(e)1, 2, 3, and 4.

National studies conducted by the EPA have demonstrated that industrial and domestic sources contribute toxic constituents, such as metals, chlorinated solvents aromatic hydrocarbons, and other pollutants to POTWs. The impact of such complex mixtures is often difficult to assess. Therefore, the toxicity of several constituents in a single effluent can only be accurately examined by whole effluent toxicity testing. In addition, 40 CFR 122.44 (d) requires whole effluent toxicity limits in NPDES permits when the effluent has a reasonable potential to cause toxicity.

The principal advantages of biological techniques are: (1) the effects of complex discharges of many known and unknown constituents can be measured only by biological analysis; (2) bioavailability of pollutants after discharge is measured by toxicity testing including any synergistic effect of pollutants; and (3) pollutants for which there are inadequate analytical methods or criteria can be addressed. Therefore, toxicity testing is used in connection with pollutant-specific control procedures to control the discharge of toxic pollutants.

Therefore, the Draft Permit includes acute and chronic whole effluent toxicity limitations and monitoring requirements. (See, e.g., “Policy for the Development of Water quality based Permit Limitations for Toxic Pollutants”, 50 Fed. Reg. 30,784-July 24, 1985. See also EPA’s Technical Support Document for Water Quality Based Toxics Control, EPA/505-90-001). The LC₅₀ limitation prohibits acute effects, lethality, to more than 50% of the test organisms when exposed to POTW undiluted effluent for 48 hours.

The chronic-no observed effect concentration (C-NOEC) limitation in the Draft Permit prohibits chronic adverse effects such as survival, growth, and reproduction when aquatic organisms are exposed to the POTW discharges at the calculated available dilution.

The LC₅₀ limitation in the Draft Permit is 100%, consistent with MassDEP’s “Implementation Policy for the Control of Toxic Pollutants in Surface Waters”, February 23, 1990, which requires an effluent limitation of 1 toxic unit (LC₅₀ = 100%) for discharges with dilution factors less than 100.

The Chronic - No Observed Effect Concentration (C-NOEC) limitation in the Draft Permit prohibits chronic adverse effects that adversely affect survival, growth, or reproduction when aquatic organisms are exposed to the POTW effluent at the available dilution. The C-NOEC is established equal to the receiving water concentration, (the inverse of the dilution factor) consistent with MassDEP's "Implementation Policy for the Control of Toxic Pollutants in Surface Waters", February 23, 1990. The C-NOEC is the existing permit is 7.7%.

C-NOEC = Inverse of the receiving water concentration = $(1/13.6)(100) = 7.3\%$

The Draft Permit carries forward the chronic WET limit from the previous permit based on anti-backsliding provisions found in 40 CFR §122.44. The reissued permit must include limits which are at least as stringent as those in the current permit. The chronic limit remains at $\geq 7.7\%$.

Chronic Modified Acute Ceriodaphnia WET test Results		
MP Date	DAILY MN Acute LC50 100%	DAILY MN Chronic NOEC $\geq 7.7\%$
03/31/2011	100	100
06/30/2011	100	100
09/30/2011	100	100
12/31/2011	100	25
03/31/2012	100	100
06/30/2012	100	100
09/30/2012	100	100
12/31/2012	100	50

This Draft Permit continues to require four toxicity tests per year for the daphnid (*Ceriodaphnia dubia*) only. Tests are to be conducted in March, June, September, and December using the protocols in Permit Attachments A and B, Freshwater Chronic Toxicity Test Procedure and Protocol and Freshwater Acute Toxicity Test Procedure and Protocol to the Draft Permit.

Please note that the previous permit had one protocol that combined both the acute and chronic tests. However, the requirements for WET testing recently changed. It has come to EPA Region 1's attention that the modified acute toxicity test in the current permit, which is conducted as part of the chronic toxicity test, is not an approved method under 40 CFR Part 136. As of March 2013 the modified acute testing requirement is being replaced by a standalone acute toxicity test. The acute toxicity testing protocol is Attachment A to the Draft Permit.

INDUSTRIAL PRETREATMENT PROGRAM

The permittee is required to administer a pretreatment program based on the authority granted under 40 CFR §122.44(j), 40 CFR Part 403 and Section 307 of the Act. The permittee's pretreatment program received EPA approval on September 24, 1984 and, as a result, appropriate pretreatment program requirements were incorporated into the 2007 permit which was consistent with that approval and federal pretreatment regulations in effect when the permit was issued.

Ayer has 4 Significant Industrial Users (SIUs)³. These are:

- 1) Cains Foods –Hauls all industrial wastewater offsite for disposal. There is an onsite industrial pre-treatment system connected to the sewer system that is currently unused. All sanitary wastewater goes to the POTW.
- 2) CPF - Pepsi Bottler – Segregates high strength organic waste and hauls this to other POTWs. The average daily flow from CPF is about 120,000 gpd, subject to BOD₅ and TSS limits of 400 mg/L. CPF neutralizes pH of this wastewater before discharge to the POTW.
- 3) EPIC- Pepsi Canner- Pepsi segregates its high strength organic waste and hauls this to other POTWs. The average daily industrial flow from EPIC is about 30,000 gpd subject to BOD₅ and TSS limits of 400 mg/L.
- 4) Vitasoy – Tofu manufacturer - Has an onsite biological pretreatment system and discharges approximately 100,000 gpd, subject to BOD₅ and TSS limits of 400 mg/L. Due to recent violations of flow, BOD₅ and TSS limitations, Vitasoy is under an order from the Town to update its slug control plan as well as to evaluate the pretreatment system's ability to consistently meet the local limits. Vitasoy has recently been intermittently hauling high strength waste to other disposers in order to meet the flow, BOD₅ and TSS limits.

There are 161 other small industrial and commercial users tied to the collection system that do not meet the definition of significant industrial user and do not appear to have the capability to cause pass-through or interference at the POTW. These industries are subject to the Town's sewer use ordinance.

The Federal Pretreatment Regulations in 40 CFR Part 403 require the permittee to: (1) develop and enforce EPA approved specific effluent limits (technically-based local limits); (2) revise the local sewer-use ordinance or regulation, as appropriate, to be consistent with Federal Regulations; (3) develop an enforcement response plan; (4) implement a slug control evaluation program; (5) track significant noncompliance for industrial users; and (6) establish a definition of and track significant industrial users.

These requirements are necessary to ensure continued compliance with the POTW's NPDES permit and its sludge use or disposal practices. In addition to the requirements described above, the Draft Permit requires the permittee to submit to EPA in writing, within 180 days of the permit's effective date, a description of proposed changes, if applicable, to the permittee's pretreatment program deemed necessary to assure conformity with current federal pretreatment regulations. These requirements are included in the Draft Permit to ensure that the pretreatment program is consistent and up-to-date with all pretreatment requirements in effect.

The permittee must also continue to submit, by November 1st each year, an annual pretreatment report detailing the activities of the program for the previous year.

³ November 2011 Ayer Annual Industrial Pretreatment Report

VI. OPERATION AND MAINTENANCE OF THE SEWER SYSTEM

The permit standard conditions for "Proper Operation and Maintenance" are found at 40 CFR §122.41(e). These require proper operation and maintenance (O & M) of permitted wastewater systems and related facilities to achieve permit conditions. Similarly, permittees have a "duty to mitigate" as stated in 40 CFR §122.41(d). This requires permittees to take all reasonable steps to minimize or prevent any discharge in violation of the permit which has the reasonable likelihood of adversely affecting human health or the environment.

In order to ensure proper O & M of the collection system, the Draft Permit includes requirements for the permittees to control infiltration and inflow (I/I). Infiltration is groundwater that enters the collection system through physical defects such as cracked pipes, or deteriorated joints. Inflow is extraneous flow entering the collection system through point sources such as roof leaders, yard and area drains, sump pumps, manhole covers, tide gates, and cross connections from storm water systems. Significant I/I in a collection system may displace sanitary flow reducing the capacity and the efficiency of the treatment works and may cause bypasses of secondary treatment. It greatly increases the potential for sanitary sewer overflows (SSO) in separate systems. Infiltration and inflow (I/I) is approximately 250,000 gpd⁴. I/I is being addressed by the Town through manhole and sewer line repair.

The proposed permit includes several additional O & M requirements. The permittee is required to prepare a map of the sewer collection system within 30 months of the effective of the permit. The permittee is also required to complete and implement collection system operation and maintenance plans within 24 months of the effective date of the permit. Details regarding these requirements can be found in the Section C.4 and C.5 of the Draft Permit.

MassDEP has stated that inclusion of the I/I conditions in the NPDES permits is a standard State Certification requirement under Section 401 of the Clean Water Act and 40 CFR §124.55(b).

VII. Sludge Information and Requirements

Sludge generated at the Ayer WTTF is incinerated at the East Fitchburg WWTP. In 2009, 2,918,900 gallons of sludge was sent for incineration.

Section 405(d) of the CWA requires that sludge conditions be included in all municipal permits. The sludge conditions in the Draft Permit satisfy this requirement and are taken from EPA's Standards for the Disposal of Sewage Sludge codified at 40 CFR Part 503 (February 6, 1989-54 FR 5746). The pollutants listed are those which are to be limited by 40 CFR Part 503.

VIII. Unauthorized Discharges

This permit only authorizes the discharge or treated wastewater from wastewater treatment plant outfall 001. Other discharges of wastewater, such as pump station emergency overflows or sanitary sewer overflows are not authorized by this permit and must be reported in accordance with reporting requirements found in Section D.1.e of Part II of the permit (24 hour reporting), including requirements for both oral notice within 24 hours and written notice within 5 days.

⁴ Source - August 2010 Permit Application, Page 7 Form 2S

VII. Anti-Backsliding

Federal anti-backsliding provisions are found in Section 402(o) of the Clean Water Act and at 40 CFR §122.44(l) and generally prohibit the relaxation of permit limits, standards, and conditions. Anti-backsliding provisions apply to effluent limits based on technology, water quality, Best Professional Judgment and State Certification requirements. All limitations in the Draft Permit are as or more stringent than those in the current permit.

VIII. Anti-Degradation Review

The Massachusetts anti-degradation regulations (314 CMR 4.04) require that all existing uses of the Nashua River must be protected. MassDEP has indicated that it believes there will be no lowering of water quality and/or no loss of existing water uses for this segment of the river as a result of the Draft Permit and that no additional anti-degradation review is warranted.

IX. Essential Fish Habitat Determination

Under the 1996 Amendments (PL 104-267) to the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C § 1801 et seq.(1998)), EPA is required to consult with the National Marine Fisheries Service (NMFS) if EPA's action or proposed actions that it funds, permits, or undertakes, "may adversely impact any essential fish habitat," 16 U.S.C. § 1855(b).

The Amendments broadly define "essential fish habitat" (EFH) as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," 16 U.S.C. § 1802(10). "Adverse impact" means any impact which reduces the quality and/or quantity of EFH, 50 C.F.R. § 600.910(a). Adverse effects may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. Id.

Essential fish habitat is only designated for fish species for which federal Fisheries Management Plans exist. 16 U.S.C. § 1855 (b)(1)(A). EFH designations for New England were approved by the U.S. Department of Commerce on March 3, 1999.

There is no "habitat of particular concern," as defined under § 600.815 (a)(9) of the Magnuson-Stevens Act, designated for this site.

EPA and MassDEP have determined that a formal EFH consultation with NMFS for this discharge is not required. The proposed discharge permit is developed to meet MA SWQS and will not adversely impact EFH.

X. Endangered Species Act

Section 7(a) of the Endangered Species Act of 1973, as amended (ESA) grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that have been designated as critical (a "critical habitat").

The ESA requires every Federal agency, in consultation with and with the assistance of the Secretary of Interior, to insure that any action it authorizes, funds, or carries out, in the United States or upon the high seas, is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. The United States Fish and Wildlife Service (USFWS) administer Section 7 consultations for freshwater species. The National Marine Fisheries Service (NOAA Fisheries) administers Section 7 consultations for marine species and anadromous fish.

EPA and the MassDEP have determined that an ESA consultation is not required for this discharge, since no listed species or critical habitats are located in an area that could be affected by the facility's discharge.

XI. Monitoring and Reporting

The effluent monitoring requirements have been established to yield data representative of the discharge under authority of Section 308 (a) of the CWA in accordance with 40 CFR §§122.41 (j), 122.44 (l), and 122.48.

The Draft Permit requires that the permittee submit all monitoring data and other reports required by the permit to EPA using NetDMR. NetDMR is a national web-based tool for regulated CWA permittees to submit DMRs electronically via a secure Internet application to U.S. EPA through the Environmental Information Exchange Network. NetDMR allows participants to discontinue mailing in hard copy forms under 40 CFR § 122.41 and § 403.12. NetDMR is accessed from the following url:

<http://www.epa.gov/netdmr>. Further information about NetDMR, including contacts for EPA Region 1, is provided on this website.

The Draft Permit requires the permittee to report monitoring results obtained during each calendar month using NetDMR, no later than the 15th day of the month following the completed reporting period. All reports required under the permit shall be submitted to EPA as an electronic attachment to the DMR. Permittees must continue to send hard copies of reports other than DMRs to MassDEP until further notice from MassDEP.

XII. State Certification Requirements

EPA may not issue a permit unless MassDEP with jurisdiction over the receiving water certifies that the effluent limitations contained in the permit are stringent enough to assure that the discharge will not cause the receiving water to violate State Water Quality Standards. The staff of MassDEP have reviewed the Draft Permit and advised EPA that the limitations are adequate to protect water quality. EPA has requested permit certification by the State pursuant to 40 CFR 124.53 and expects that the Draft Permit will be certified.

XIII. Public Comment Period and, Procedures for Final Decision

All persons, including applicants, who believe any condition of the Draft Permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the United States Environmental Protection Agency, 5 Post Office Square-Suite 100, Mailcode OEP06-1, Boston, Massachusetts 02109-3912.

Any person, prior to such date, may submit a request in writing for a public hearing to consider the Draft Permit to EPA and the State Agency. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty days public notice whenever the Regional Administrator finds that response to this notice indicates significant public interest. In reaching a final decision on the Draft Permit the Regional Administrator will respond to all significant comments and make these responses available to the public at EPA's Boston office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Regional Administrator will issue a Final Permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice.

XIV. EPA and MassDEP Contacts

Additional information concerning the Draft Permit may be obtained between the hours of 9:00 a.m. and 5:00 p.m., Monday through Friday, excluding holidays from:

Doug Corb
US Environmental Protection Agency
5 Post Office Square – Suite 100
Mailcode: OEP06-1
Boston, Massachusetts 02109-3912
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or Claire Golden
Massachusetts Department of Environmental Protection
Division of Watershed Management
205B Lowell Street
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claire.golden@state.ma.us

Date: August 29, 2013

Ken Moraff, Acting Director
Office of Ecosystems Protection
U.S. Environmental Protection Agency

Fact Sheet Parameter Limits	BOD 448 lb/d	BOD Mon. lb/d	BOD 30 mg/L	BOD 45 mg/L	BOD Mon. mg/L	TSS 448 lb/d	TSS Mon. lb/d	TSS 30 mg/L	TSS 45 mg/L	TSS Mon. mg/L	BOD 85 %	TSS 85 %
MP Date	MO AVG	DAILY MX	MO AVG	WKLY AVG	DAILY MX	MO AVG	DAILY MX	MO AVG	WKLY AVG	DAILY MX	MO AV MN	MO AV MN
01/31/2011	46.3	100.6	5.2	9.5	10.7	18.	52.5	1.9	3.2	4.6	98.4	99.3
02/28/2011	21.7	44.4	2.3	3.2	4.3	15.3	32.	1.6	2.6	2.8	99.3	99.2
03/31/2011	110.	182.	6.5	8.8	10.8	58.	106.2	3.3	4.8	5.7	94.3	99.
04/30/2011	79.2	105.9	5.7	6.3	7.	23.8	29.9	1.7	1.9	2.1	99.6	98.7
05/31/2011	71.5	168.5	5.7	9.8	11.9	25.4	36.4	2.	2.6	2.8	94.7	98.4
06/30/2011	69.4	101.9	6.2	6.5	8.5	27.	53.9	2.4	3.2	5.1	96.4	98.9
07/31/2011	57.7	101.7	5.7	7.2	9.2	34.9	54.3	3.5	5.2	6.5	96.6	98.8
08/31/2011	87.9	153.3	8.3	5.3	11.1	41.	69.	4.3	6.8	11.8	94.8	97.6
09/30/2011	104.	177.7	8.6	12.8	13.	62.4	159.7	5.2	8.9	12.6	92.8	97.6
10/31/2011	92.3	165.	6.6	10.7	11.7	50.5	73.2	3.5	3.6	5.4	94.8	98.6
11/30/2011	121.6	195.1	8.1	14.5	16.7	65.4	129.3	5.	8.	9.6	92.6	97.8
12/31/2011	107.7	143.2	8.1	11.05	1.5	23.7	48.1	1.8	3.	3.6	91.9	98.7
01/31/2012	114.5	164.7	10.4	12.3	14.	75.3	111.6	6.9	10.	10.4	93.7	96.5
02/29/2012	270.	332.5	21.7	30.9	37.3	125.5	252.7	12.	21.4	23.4	90.2	96.3
03/31/2012	109.7	178.8	10.4	14.4	17.5	44.1	101.5	4.3	7.5	9.6	96.7	98.7
04/30/2012	116.8	180.5	12.9	16.5	20.4	19.5	40.2	2.	3.5	4.2	91.5	99.4
05/31/2012	58.	179.8	5.3	12.	15.4	18.9	31.4	1.7	3.	2.7	96.4	99.6
06/30/2012	46.4	131.3	4.5	8.7	14.	23.5	40.	2.2	3.	3.8	98.2	99.3
07/31/2012	28.6	43.7	3.2	4.7	5.3	8.2	22.3	1.1	2.3	2.4	98.	99.6
08/31/2012	55.4	141.5	6.1	9.4	14.9	25.1	75.	2.7	4.8	14.9	96.1	99.2
09/30/2012	141.6	203.4	14.6	19.1	19.6	148.6	397.2	15.9	30.9	45.3	93.3	97.
10/31/2012	53.	113.	5.8	11.7	13.6	32.8	52.7	3.6	4.8	5.8	97.1	99.2
11/30/2012	141.3	406.9	13.2	19.4	38.3	24.	37.4	2.3	3.	3.9	95.3	99.5
12/31/2012	111.1	132.8		19.4	19.4	95.6	129.4	12.	22.	22.	96.9	96.9

Parameter Limits	TRC .14 mg/L	TRC .25 mg/L	Fecal 200 #/100mL	Fecal 400 #/100mL	Flow 1.79 MGD	Flow Req. Mon. MGD	DO 6 mg/L	pH 6.5 SU	pH 8.3 SU
MP Date	MO AVG	DAILY MX	MO GEO	DAILY MX	12MO AVG	DAILY MX	DAILY MN	MINIMUM	MAXIMUM
01/31/2011			13.3	44.	1.264	4.049	8.7	7.1	7.5
02/28/2011			20.2	866.	1.17	4.039	9.1	7.03	7.51
03/31/2011			22.	267.	1.218	4.039	9.	7.	7.4
04/30/2011			13.8	53.	1.194	3.033	9.1	7.1	7.4
05/31/2011			16.3	96.	1.209	3.033	7.8	6.9	7.4
06/30/2011			11.1	100.	1.226	3.033	7.9	6.96	7.3
07/31/2011			15.	79.	1.128	3.033	6.9	7.1	7.5
08/31/2011	.2	.7	84.2	520.	1.241	3.033	5.8	7.	7.8
09/30/2011	.2	.46	117.5	1220.	1.287	3.033	7.2	6.8	7.3
10/31/2011	.09	.13	71.6	316.	1.337	3.033	7.8	6.8	7.2
11/30/2011	.07	.5	43.9	800.	1.379	3.033	7.	6.7	7.2
12/31/2011	.	.	112.	1000.	1.415	3.033	8.1	7.	7.5
01/31/2012	.05	.37	972.	1585.	1.404	3.033	9.1	7.2	7.6
02/29/2012	.11	.25	200.	400.	1.413	3.033	8.5	7.	7.45
03/31/2012	.14	.29	295.1	498.	1.352	2.077	8.5	6.9	7.5
04/30/2012	.09	.25	219.3	1350.	1.335	2.077	8.6	7.	7.6
05/31/2012	.09	.54	30.7	317.	1.339	2.154	8.	7.1	7.6
06/30/2012			75.7	498.	1.334	2.154	8.3	7.1	7.5
07/31/2012			305.7	1000.	1.013	1.202	7.1	6.9	7.6
08/31/2012	.21	.26	250.7	1180.	1.336	2.154	6.	6.5	7.5
09/30/2012	.14	.23	229.3	1000.	1.3	2.077	6.3	6.4	7.6
10/31/2012	.12	.22	242.6	1000.	1.304	2.077	7.2	7.	7.4
11/30/2012	.07	.22	199.1	1325.	1.252	2.077	6.6	6.8	7.3
12/31/2012	.11	.19	20.8	48.	1.246	1.884	4.6	6.6	7.3

Fact Sheet Attachment B

Effluent	ug/L						Ambient	ug/L				
Pram	Al	Cd	Cu	pb	Ni	Zn	Al	Cd	Cu	pb	Ni	Zn
12-Dec	330	<.5	15	<.5	4	16	53	<0.5	6	1	<2	7
12-Sep	380	<.5	8	<.5	4	7	53	<0.5	8	2	<2	5
12-Jun	82	<.5	18	<.5	3	23	110	<0.5	6	3	<2	6
12-Mar	240	<.5	9	<.5	4	9	54	<0.5	6	0.9	<2	5
11-Dec	1300	<.5	18	1	6	33	75	<0.5	2	1	<2	6
11-Sep	1100	<.5	10	<.5	4	16	120	<0.5	12	3	<2	8
11-Jun	210	<.5	10	<.5	4	25	83	<0.5	3	3	<2	5
11-Mar	85	<.5	9	<.5	4	13	140	<0.5	2	2	<2	10
10-Dec	60	<.5	12	0.7	4	28	61	<0.5	3	1	<2	8
10-Sep	88	<.5	19	2	4	18	54	<0.5	5	2	<2	7
10-Jun	61	<.5	22	<.5	4	33	89	<0.5	6	3	<2	8
Ave	360.6	Non-D	13.5	1.35	4.1	20.5	83.9	Non-D	5.3	2.09	Non-D	6.8
Max	1300	Non-D	22	2	6	33	140	Non-D	12	3	Non-D	10

Ambient median value

Al	Cu	Pb	Zn
53	2	0.9	5
53	2	1	5
54	3	1	5
54	3	1	6
61	5	2	6
75	6	2	7
83	6	2	7
89	6	3	8
110	6	3	8
120	8	3	8
140	12	3	10

Effluent		Ambient	
NH3	pH	NHS	pH
<0.1	7.41	<0.1	7.05
3.4	7.54	<0.1	7.11
<0.1	7.5	<0.1	7.5
8.5	7.58	<0.1	6.64
7.4	7.52	<0.1	6.67
1	7.46	<0.1	6.58
1.6	7.54	0.12	6.88
6.7	7.14	<0.1	6.39
0.16	7.56	<0.1	6.81
<0.1	7.8	<0.1	6.98
<0.1	7.72	N/A	7.02
3.372	7.536	Non-D	6.858
8.5	7.8	Non-D	7.5
	7.14		6.39

Attachment C

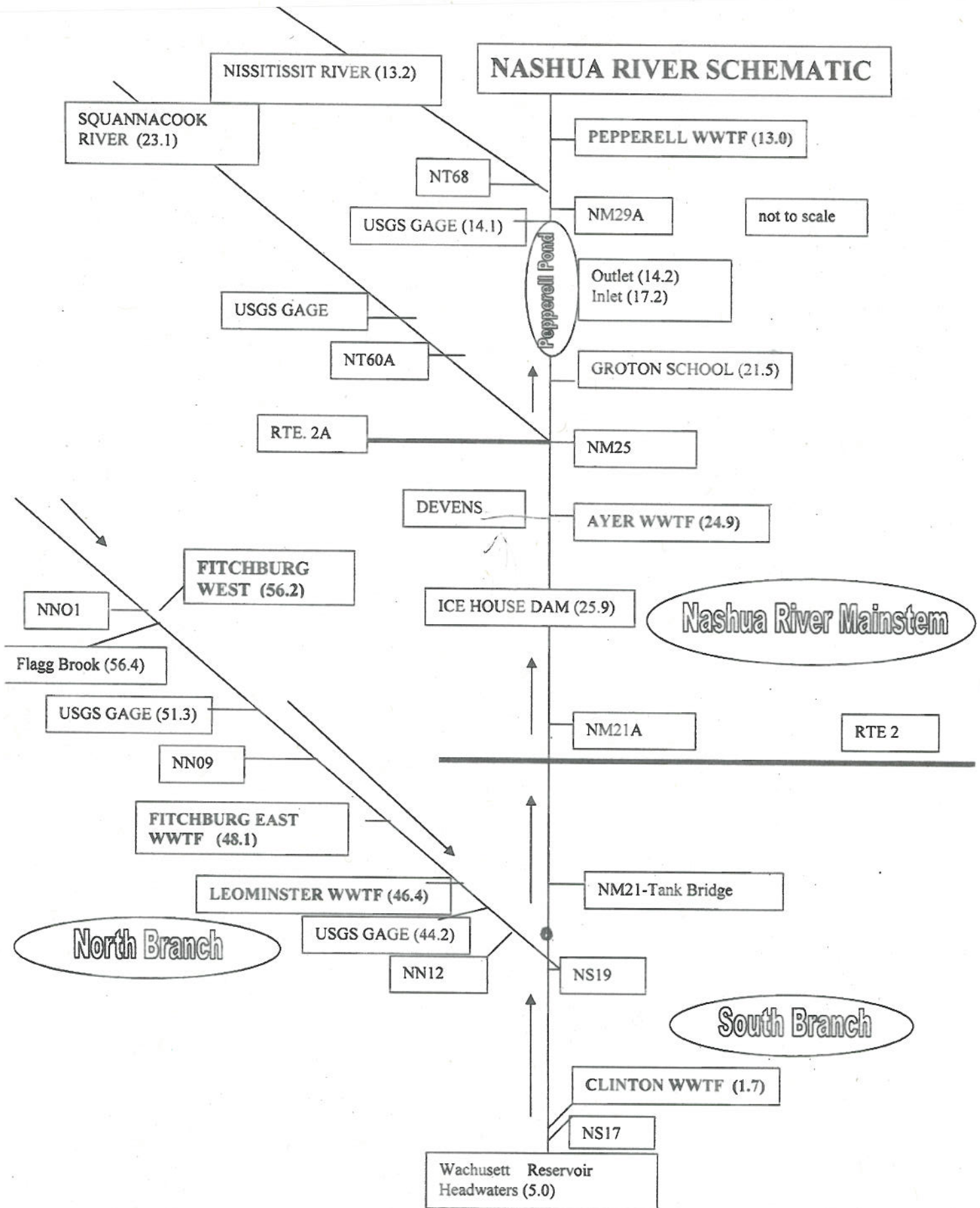


Figure 2: Nashua River Schematic

Not to Scale River milepoint listed in parentheses

Figure 1 Facility Location Map

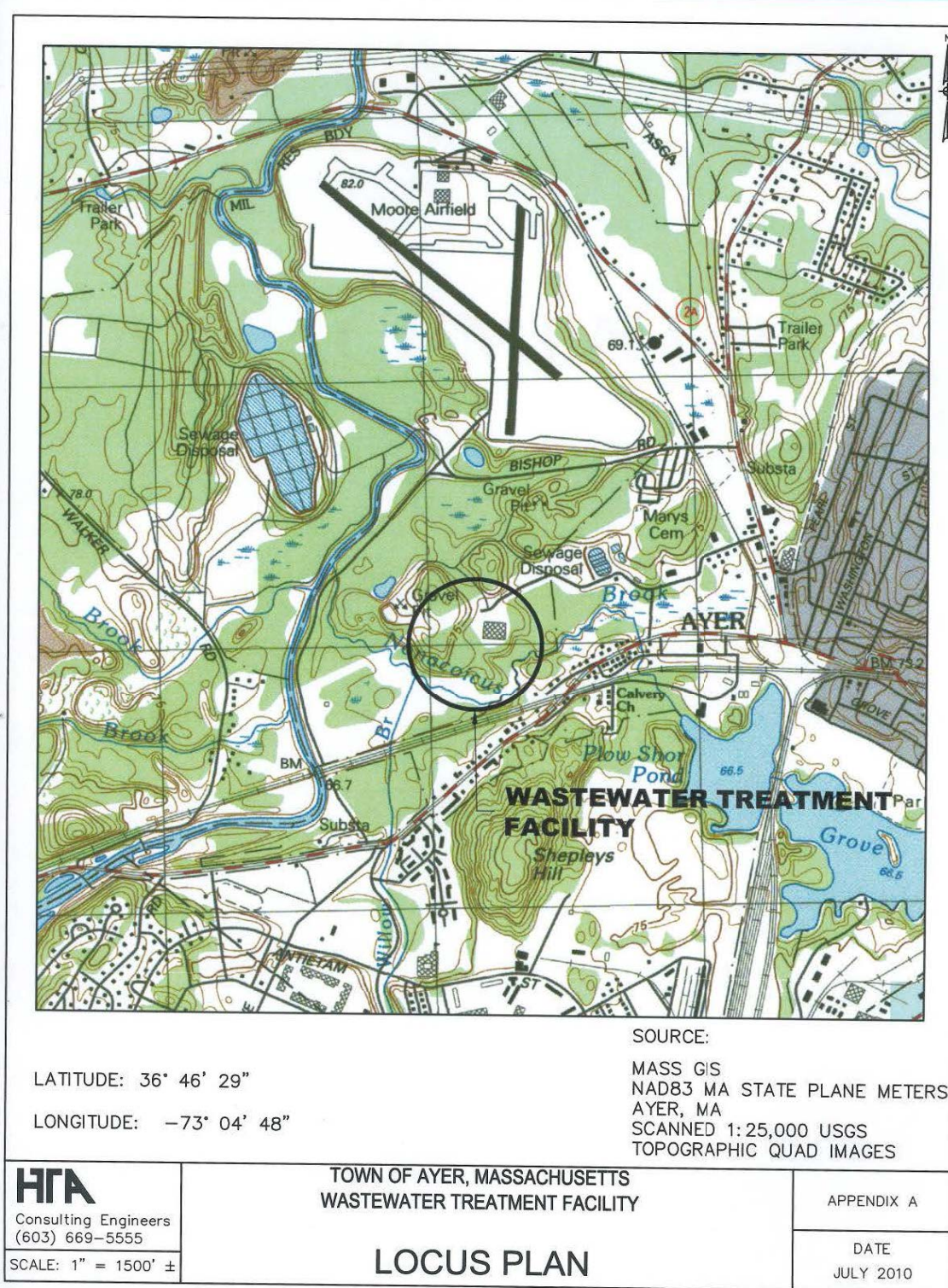


Figure 2. Satellite Photo of Ayer Wastewater Treatment Facility



Response to Public Comments

Public notice period: **09/13/13 - 10/27/13 (Extended to 11/27/13 at the request of the permittee)**

In accordance with the provisions of 40 C.F.R. §124.17, this document presents EPA's responses to comments received on the draft NPDES Permit, MA0100013. The response to comments explains and supports the EPA determinations that form the basis of the final permit. From September 13, 2013 through November 27, 2013, the United States Environmental Protection Agency ("EPA") and the Massachusetts Department of Environmental Protection ("MassDEP") (together, the "Agencies") solicited public comments on a draft NPDES permit, MA0100013, developed pursuant to a permit application from Ayer Wastewater Treatment Facility (WWTF), for the reissuance of a National Pollutant Discharge Elimination System ("NPDES") permit to discharge treated municipal and industrial effluent from outfall number 001 to the Nashua River in Ayer, Massachusetts.

After a review of the comments received, EPA and MassDEP have made a final decision to issue this permit authorizing these discharges. The permit includes substantially more stringent limits for total recoverable copper, new limits for total recoverable lead and total recoverable aluminum. The final permit includes compliance schedules to allow the permittee additional time to meet each of the metal limits.

Copies of the final permit may be obtained by writing or calling Doug Corb of EPA's NPDES Municipal Permits Branch (OEP 06-1), Office of Ecosystem Protection, 5 Post Office Square, Suite 100, Boston, MA 02109-3912; Telephone: (617) 918-1565 or email: corb.doug@epa.gov.

Comments (1-8) submitted by: Mark Wetzel, P.E., Superintendent Ayer Department of Public Works (Letter dated November 26, 2013) and **(Comments 9 and 10)** submitted by Martha S. Morgan Water Programs Director Nashua River Watershed Association (NRWA) (letter dated November 23, 2013).

Comment No. 1 (Part I-A.1 Effluent Characteristic Parameter): Fecal Coliform to Escherichia Coli

The Town acknowledges this permit revision.

Response No. 1:

The permittee's comment does not request a change or question the contents of the draft permit and therefore, a further response from EPA and MassDEP is not required.

Comment No. 2 (Part I-A.1 Effluent Characteristic Parameter): Total Phosphorus

Seasonal Phosphorus limits are no longer “report only”, there is now a permit limit included in the Draft Permit. The report used to establish the phosphorus limits are from *Draft Nashua River Massachusetts Total Maximum Daily Load for the Nutrient Phosphorus* (2007) (“Draft TMDL Report”). The Draft TMDL Report indicates that the worst eutrophic conditions are encountered in the Pepperell Pond Impoundment, located in segment MA81-06. According to the Draft Fact Sheet attached to the permit, the water quality condition that EPA seeks to address with the proposed 0.2 mg/l limit is the listed impairment for nutrients in the Nashua River downstream of its confluence with the North Nashua River and eutrophication in the Pepperell Impoundment.

2a) According to the MADEP, the Final TMDL of the Nashua River is due within weeks of the comment period end date. As such, the Town requests that the “report only” requirement for phosphorus remain in place until such time that the EPA reviews and approves the TMDL. Although the Town’s effluent data from June 1, 2009 – October 31, 2012 (summer months only) averages 0.14 mg/l, which is below the 0.2 mg/l summer discharge limit, the Town has only been able to meet the summer limit by adding aluminum bisulfate to its process. Since there is now a proposed aluminum limit of 0.087 mg/l included in the Draft permit, other alternatives for meeting the phosphorus limit must be evaluated.

2b) The Town also understands that the EPA and the MADEP may be able to remove the effluent permit limit for aluminum if other non-aluminum additives such as ferric chloride are used. This may be problematic due to the use of cloth disc filters which are marginally sized to handle the existing solids loading. The additional solids load associated with increased phosphorous precipitation may also negatively impact the filtering operation.

2c) EPA’s *Phosphorous Removal Design Manual*, (EPA/625/1-87/001) indicates that the lower limit of phosphorous removal with the use of metal salts is approximately 0.5 mg/l. Given the capacity constraints of the existing filtration process and limitations of the chemical addition process, it is not realistic to expect that the existing facility can achieve 0.2 mg/l simply by adding more alum or ferric chloride. Also, according to WWTF operators the use of ferric chloride will impede the ultra violet disinfection system as well as the cloth disc filters. The Town is committed to optimize the phosphorus removal by evaluating other coagulants or enhancing the anoxic tanks.

2d) While this evaluation is ongoing, the Town requests a rolling average permit limits to meet the new phosphorus limits. Water quality-based limits that are developed to protect against chronic impacts such as eutrophication are typically established as monthly average limits.

For the phosphorus limit in this permit, the 60-day rolling average limit has advantages over a monthly average limit: it provides the permittee with flexibility to deal with occasional, perhaps unavoidable, excursions above limits, while at the same time necessitating that such excursions are short-term and that optimum removal efficiencies are maintained overall. Short-term exceedences of the phosphorus limit are unlikely to result in a significant response in the receiving water relative to aquatic plant growth. Longer term exceedences capable of eliciting a response in plant growth would likely result in a violation of the rolling average limit.

The 60-day rolling average will enable the best possible performance on any given day since the results for that day will be averaged with the other data points to determine compliance. The uncertainty of future results that will be used for determining compliance dictates the best possible performance on any given day. Short-term excursions will have to be responded to quickly in order to ensure compliance. In contrast, a 30-day (monthly) average limit can result in relaxed performance towards the end of the 30-day period if performance early on in the period exceeded what was necessary to meet the permit limits. EPA has already set precedence by allowing rolling averages in other WWTF NPDES permits in New England (e.g. 60-day rolling average for phosphorus – Winchendon MA NPDES #MA0100862; 214-day seasonal rolling average for total nitrogen – Exeter, NH NPDES #NH0100871. The Town of Ayer requests that the phosphorus limits be based on a 60-day rolling average.

Response No. 2:

Ayer's discharge is approximately 7 river miles above the Pepperell Impoundment. In river Segment MA81-05, there is currently an excess of available phosphorus with little expectation of attenuation prior to reaching the impoundment. Therefore, the draft TMDL and Final Permit limit total phosphorus from Ayer and other discharges further upstream of the impoundment.

Response No. 2a:

The Permittee has stated that *According to the MADEP, the Final TMDL of the Nashua River is due within weeks of the comment period end date.* EPA Region I's Water Quality Branch reports that the MassDEP has withdrawn the 2013 draft TMDL and has not yet set a date for resubmission for EPA concurrence.

EPA may not wait for the TMDL to become final to place Water Quality Based Effluent Limitations (WQBELs) in the final permit. Water quality based effluent limitations in NPDES permits must be "consistent with the assumptions and requirements of any *available* [emphasis added] wasteload allocation." 40 C.F.R. § 122.44(d)(1)(vii)(B). Thus, an approved TMDL is not a precondition to the issuance of an NPDES permit for discharges to an impaired waterway.

This interpretation is consistent with the preamble to 40 C.F.R. § 122.44(d)(1), which expressly outlines the relationship between subsections 122.44(d)(1)(vi) (i.e., procedures for implementing narrative criteria), and (d)(1)(vii). The draft TMDL remains the best available science to produce limits for phosphorus.

The WQBEL for total *phosphorus* is in the final permit as required by regulation, accompanied by a compliance schedule which establishes an achievable interim aluminum limit.

The interim limit for total recoverable aluminum allows the permittee to use aluminum based salts to achieve the total phosphorus limit. The compliance schedules found in the final permit are based on planning done by the Town and their consultants as result of the draft permit.

Response No. 2b:

In order for EPA and MassDEP to modify and/or remove the total recoverable aluminum limit from the permit, the permittee must demonstrate that there is no reasonable potential for aluminum in the discharge to cause or contribute to an exceedance of the aluminum criteria in the Nashua River.

Response No. 2c:

The compliance schedule for total recoverable aluminum (see comment and response 5) in the final permit recognizes the need for additional time to meet the new WQBEL for total recoverable aluminum. The Town has said that it is *committed to optimize the phosphorus removal by evaluating other coagulants or enhancing the anoxic tanks*, as well as other steps to meet the new limits.

EPA will retain the current 200 ug/l total phosphorus limit found in the previous (February 2006) permit. Compliance schedules in permits may be used exclusively for new permit limits.

Response No. 2d:

EPA and MassDEP may not establish an interim limit or schedule of compliance for total phosphorus to comply with a limit that has been in effect since the issuance of the last permit.

Further, EPA Region I has moved away from phosphorus limits with averaging periods longer than 30 days to be consistent with regulations found at;

40 CFR §122.45 *Calculating NPDES permit conditions d) Continuous discharges. For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as: ...2) Average weekly and average monthly discharge limitations for POTWs.* Therefore, the total phosphorus limit in the final permit remains an average monthly requirement.

Comment No. 3 (Part I-A.1 Effluent Characteristic Parameter): Total Recoverable Copper

We request that EPA acknowledge that the proposed copper limit is extremely stringent at 4.1 ug/l average monthly limit and a 5.6 ug/l maximum daily limit. Although the Town has had an effluent permit limit for copper, the new permit limits are ten (10) times more stringent.

The Commonwealth of Massachusetts's Water Quality Standards require that effluent limitations for metals be based upon the criteria published in the National Recommended Water Quality Criteria: 2002 (USEPA 2002 [EPA-822-R-02-047]), unless site-specific criteria are established or MADEP determines that natural background concentrations are higher than the criteria (314 CMR § 4.05(5)(e)). Recognizing that EPA's 2002 Recommended Water Quality Criteria for copper may be inappropriate, MADEP has developed site specific copper water quality criteria for many receiving streams in Massachusetts. These site specific criteria have typically resulted in significantly higher copper concentration limits for discharges to these receiving streams. MADEP has developed site specific criteria for the North Nashua River and the branch known as the South Branch but not segment MA81-05. The Town wishes to encourage Massachusetts to develop new site-specific copper criteria for this section of the Nashua River. The Town also requests the Draft Permit be reopened to address the copper limits if the site specific copper criteria in the Massachusetts Surface Water Quality Standards are updated to include segment MA81-05 of the Nashua River. The EPA has long recognized metal bioavailability and toxicity to be a function of water chemistry. The Biotic Ligand Model was developed to incorporate metal speciation and the protective effects of competing cat ions into predictions of metal bioavailability and toxicity. EPA currently recommends the use of this model for determining copper water quality criteria.

Given the inherent difficulty of complying with such a low copper limit, the Town requests that the limit be changed to "Report Maximum Daily" or that a much higher interim limit be established in order to give the Town time to evaluate sources of influent copper such as and the effects of implementing system wide corrosion control, septage sources and contributions from the SIUs and to evaluate various treatment alternatives to meet the limit. The treatment required to meet such a low copper limit would most likely involve chemical precipitation, ion exchange or reverse osmosis. The extensive modifications required to facilitate chemical precipitation at this scale and to this degree may make this option unfeasible.

The options of ion exchange and reverse osmosis are extremely expensive both in terms of capital cost as well as ongoing operation and maintenance costs. The Town will need time to evaluate potential options and run pilot scale testing in order to determine the most technically feasible and cost-effective option.

Response No. 3:

EPA and MassDEP included a schedule for achieving compliance with the new WQBEL for total recoverable copper in the Final Permit in recognition of the significant lowering of the limit. The more stringent Cu limits are a result of high background (upstream) concentrations of copper found in upstream Whole Effluent Toxicity (WET) testing dilution water samples provided by the permittee.

If the water quality standards for copper are changed by the State of Massachusetts, EPA will consider a request for a change in permitted total recoverable copper limits subject to anti-backsliding provisions found in Section 402(o) of the Clean Water Act and at 40 CFR §122.44(l) as well as an anti-degradation review (see 314 CMR 4.04). The MassDEP has no current plan to revise the copper criteria for Segment MA81-05 of the Nashua River.

The permittee has committed to take additional upstream copper samples using sufficiently sensitive methods and clean techniques to establish clear picture of the instream contribution of copper in the river.

A review of recent effluent data demonstrates low total recoverable copper concentrations compared to most similar POTWs. The one exception, January 2014, occurred during a plant upset caused by a surge in filamentous bacteria.

Total Copper		
	47 ug/L	64 ug/L
MP Date	MO AVG	DAILY MX
09/30/2013	5.	5.
10/31/2013	5.	5.
11/30/2013	5.	7.
12/31/2013	5.5	8.
01/31/2014	33.5	60.
02/28/2014	3.	3.
03/31/2014	3.	4.
04/30/2014	4.	5.
05/31/2014	3.	4.
06/30/2014	6.	3.
07/31/2014	10.	10.

The compliance schedule for total recoverable copper sets an interim average monthly limit of 10 ug/l based on currently achievable copper concentrations, rather than “report only” as requested by the permittee. The maximum daily limit shall be report only as requested. The interim limits require the permittee to take reasonable measures to consistently meet the lowest possible copper discharge using the available treatment process.

Comment No. 4 (Part I-A.1 Effluent Characteristic Parameter): Total Recoverable Lead

Although the Town is frequently able to meet the average monthly limit for lead of 1.0 ug/l strict sampling and analysis procedures must be adhered to assure consistent compliance with this permit limit. The ability to meet this limit will be evaluated through a system wide source identification program as indicated in Comment 3 above and the effects of implementing corrosion control throughout the water system scheduled to come online in June 2014.

Response No. 4:

The following effluent data for total recoverable lead is the basis for an interim limit. The final permit includes a schedule of compliance for total recoverable lead. The interim limit is an average monthly concentration of 2 ug/l. The WQBEL for total recoverable lead is 1.0 ug/l.

Total Lead Data from Whole Effluent Toxicity Tests

Pb ug/l	Effluent	Upstream
12-Dec	<.5	1
12-Sep	<.5	2
12-Jun	<.5	3
12-Mar	<.5	0.9
11-Dec	1	1
11-Sep	<.5	3
11-Jun	<.5	3
11-Mar	<.5	2
10-Dec	0.7	1
10-Sep	2	2
10-Jun	<.5	3
Ave	1.35	2.09
Max	2	3

Comment No. 5 (Part I-A.1 Effluent Characteristic Parameter): Total Recoverable Aluminum

5.1) The Draft Permit proposes an effluent average monthly limit of 87 μ g/l for aluminum. From the WET data, the average in-stream aluminum concentration upstream of the WWTF is 0.084 mg/l, with a maximum of 0.140 mg/l.

The Town intends to sample instream just upstream of the Ayer discharge to gather more data points in the hope of proving that the aluminum water quality criteria is not being exceeded before it reaches the Ayer discharge and thus the limit might be revised, as necessary.

5.2) The Ayer WWTF consistently shows no acute toxicity but has noticed in the months of December 2011 and September 2012 a failed chronic toxicity test. Aluminum bisulfate is not added during December. It is also our understanding that there may have been problems or “issues of concern” relative to the sampling and testing to determine ambient metals concentrations in the river. If the ambient data is suspect, it cannot be reasonably used to establish such stringent limits for the permit. We request the opportunity to have the ambient metals concentrations in the river re-evaluated and further request that the metals limits be changed to “Report Maximum Daily” until data with a higher confidence level can be obtained.

5.3) MADEP has informed EPA that it is considering developing site-specific criteria for aluminum that reflect specific factors affecting aluminum toxicity. The development of site-specific criteria must meet the procedural requirements for changes to water quality standards, as well as receive EPA approval. As this is a lengthy process, and formal proceedings to change the standard have not commenced, EPA has decided to issue this Final Permit based on the existing criterion. If a site-specific criterion is adopted and approved during this permit term, the permittee may request modification of the permit. We request that the MADEP undertake such a study. If adopted by MADEP and approved by EPA, they may be used as the basis for a permit modification or during subsequent reissuance of the permit.

5.4) Furthermore, the addition of an aluminum limit will severely limit the Town's options for removing phosphorus and may result in increased operating cost to remove phosphorus in other manners since it will require the Town to use alternative chemicals, potentially produce more sludge, utilize more electricity, and increase its “carbon footprint”. The proposed phosphorus limit (0.20 mg/l) cannot be achieved consistently without chemical addition as noted in Comment 2 above. Aluminum based metal salts have generally proven to be most effective and most cost-effective. The Town's options for achieving low level phosphorous limits should not be contravened by other aspects of the permit such as the proposed limit on aluminum since it could create an untenable situation for the Town.

We request that the limit on total recoverable aluminum be changed to “Report Maximum Daily” until such time that site-specific criteria are developed for segment MA81-05 of the Nashua River.

Response No. 5.1:

The more stringent total recoverable aluminum limits are a result of high background (upstream) concentrations of aluminum found in Whole Effluent Toxicity (WET) testing dilution water samples provided by the permittee. The permittee has committed to take additional upstream aluminum samples using sufficiently sensitive methods to establish a clear picture of the instream contribution of aluminum in the river. If conclusive data shows that the upstream aluminum concentration is consistently lower than previously reported, EPA and MassDEP may consider modifying the permit to adjust the WQBEL limitation subject to anti-backsliding provisions found in Section 402(o) of the Clean Water Act and at 40 CFR §122.44(l) as well as an anti-degradation review (see 314 CMR 4.04). The MassDEP has no current plan to revise the aluminum criteria for Segment MA81-05 of the Nashua River.

Response No. 5.2:

With the advent of different ways (chemical specific, bio-monitoring, and whole effluent toxicity) of assessing the health of aquatic systems comes the possibility of conflicting results. To address such conflicts, EPA developed the policy of independent application. Independent application states that where different types of monitoring data are available for assessment of whether a water body is attaining aquatic life uses or for identifying the potential of pollution sources to cause or contribute to nonattainment of aquatic life uses, any one assessment is sufficient to identify an existing or potential impact/impairment, and no one assessment can be used to override a finding of existing or potential impact or impairment based on another assessment.

The independent application policy takes into account that each assessment provides unique insights into the integrity and health of an aquatic system. In addition, each assessment approach has differing strengths and limitations, and assesses different stressors and their effects, or potential effects, on aquatic systems... EPA's policy on independent application is based on the premise that any valid, representative data indicating an actual or projected water quality impairment must not be ignored when determining the appropriate action to be taken. Independent application recognizes the strengths and limitations of all three assessment approaches.¹

Following the policy of “independent application” EPA has set chemical specific limits for total recoverable aluminum despite the permittee’s assertion that WET tests demonstrate no apparent toxicity. Further, the permit must include numeric limits for total recoverable aluminum, rather than a monitor only condition based on 40 CFR §122.44(d)(1)(i) which reads;

¹ Federal Register: July 7, 1998 (Volume 63, Number 129) - Advance notice of proposed rulemaking

Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.

Response No. 5.3:

Both EPA and MassDEP do not currently have the resources to study site specific aluminum criteria for Nashua River in Ayer. As noted in response 5.2, EPA and MassDEP must include WQBELs to protect current water quality criteria.

If the water quality standards for aluminum are eventually changed by the State of Massachusetts, EPA will consider a request for a modification of the permitted total recoverable aluminum limits subject to anti-backsliding provisions found in Section 402(o) of the Clean Water Act and at 40 CFR §122.44(l) as well as an anti-degradation review (see 314 CMR 4.04). The MassDEP has no current plan to revise the aluminum criteria for Segment MA81-05 of the Nashua River.

Response No. 5.4:

A review of quarterly effluent total recoverable aluminum concentrations for the years 2010 through 2012 show a maximum effluent concentration 1.3 mg/l with an average concentration of 0.3 mg/l. To reduce the impacts of eutrophication from too much phosphorus in the Nashua River and Pepperell Impoundment, EPA and MassDEP recognize the benefits of the continued control of phosphorus in the POTW effluent, therefore, EPA and MassDEP shall include a compliance schedule for total recoverable aluminum with an interim limit of 1.3 mg/l. The permit will retain the WQBELs on the limits page with a footnote containing a reference to the interim limit and schedule.

Comment No. 6 (Part I-A.1 Effluent Characteristic Parameter): WET

The Town notes that the previous permit had one protocol that combined both the acute and the chronic tests. We understand that the requirements for WET changed in March 2013 to a standalone test. There is an increase in cost to do this test four times per year. The Town understands should the results of the WET show no indication [of toxicity], the frequency of this test from 4/YEAR may be reduced without modification of the permit.

Response No. 6:

The number of WET test species were previously reduced from 2 to 1 during the July 28, 2000, permit reissuance, based on demonstrated compliance with the WET limits. The compliance schedules for three metals run the duration of this permit term. EPA looks to WET testing to protect the receiving waters during this period of significant

process change at the treatment plant. WET testing frequency will be reviewed again at the next permit reissuance.

Comment No. 7 Part I-C. OPERATION OF THE SEWER SYSTEM

The Town is in the process of implementing the requirements of the CMOM and believes these will be beneficial to the long term operation and maintenance of the Town of Ayer collection system.

Response No. 7:

The permittee's comment does not request a change or question the contents of the draft permit and therefore, a further response from EPA and MassDEP is not required.

Comment No. 8 Part I-E. INDUSTRIAL PRETREATMENT PROGRAM (Fact Sheet) page 20 of 24

The DRAFT permit annual Industrial Pretreatment Program report submittal date as November 30th.. The November 30th submittal date is best suited for the timing of the fourth quarter significant non-compliance evaluation and the compilation of the necessary data for the report submittal. The date for submittal should be revised in the Fact sheet to reflect the November 30th date not November 1.

Response No. 8:

The November 30th submittal date found in the permit is correct. This response to the comment serves to correct the fact sheet.

Comment No. 9

The spikes in Total Residual Chlorine and fecal coliform bacteria are troublesome. We trust the new UV disinfection system to be installed by the plant will alleviate the spikes in bacteria, and will also eliminate the use of chlorine for disinfection.

Response No. 9:

The ultraviolet disinfection replaced chlorine in April of 2013. The Town has reported compliance with the bacteria limits with the exception of the period, January through March of 2014, during a plant upset caused by a surge in filamentous bacteria. See the following Discharge Monitoring Report data.

Effluent Fecal Coliform Results

200 400
#/100mL #/100mL

MP Date	MO GEO	DAILY MX
04/30/2013	5.8	26.5
05/31/2013	7.1	49.5
06/30/2013	8.2	62.
07/31/2013	1.9	5.3
08/31/2013	3.6	18.
09/30/2013	3.1	34.
10/31/2013	1.2	2.
11/30/2013	6.5	99.
12/31/2013	6.	82.
01/31/2014	7.8	725.
02/28/2014	--	--
03/31/2014	16.4	491.
04/30/2014	7.3	80.
05/31/2014	1.	1.
06/30/2014	4.6	65.
07/31/2014	5.2	147.

Comment No. 10:

The NRWA questions if the approach to calculating the total phosphorus (TP) limit is sufficiently protective. Equal weight was given to all of the tributaries downstream of the North/South Nashua confluence. A tributary with higher in stream concentration may also have a larger average flow and P load. Averaging the load may under estimate the TP contribution from other sources.

Response No. 10:

MassDEP conducts watershed assessments on a 5 year revolving cycle. *The intensive [monitoring] program, carried out in 1998 was augmented by data collected in 2003 and 2008 with expansion into the un-assessed tributaries for non-point source monitoring. Quality Assurance Project Plans developed for the monitoring programs are available on the MassDEP website.* The ongoing watershed assessments will allow better calibration of the TMDL and validation of the waste load model.

Data collected in 2003 was used in the August 29, 2013 Fact Sheet as it had undergone rigorous quality assurance before release. Aggregate data from 3 tributaries was combined and averaged to establish a TP concentration of 0.024 mg/l to be used in calculating the non-point source load.

The following data table provides separate TP average concentrations for each of the 3 tributaries previously aggregated as 1.

Stream	Catacoonamug Brook	Nonacoicus Brook	Catacoonamug Brook
Drainage area In Square Miles	20	18.9	15.6
4/9/2003	0.01	0.011	0.01
5/7/2003	0.02	0.024	0.018
6/11/2003	0.022	0.032	0.026
8/13/2003	0.026	0.044	0.032
10/8/2003	0.016	0.022	0.015
Average	0.019	0.027	0.020

The range of TP average concentrations for the 3 brooks is from 0.019 mg/l to 0.027 mg/l. All 3 brook TP concentrations are within 21% of the 0.024 mg/l concentration established in the Fact Sheet. When each of the individual brook average TP concentrations are placed in the mass balance equation from the fact sheet that projects total phosphorus concentration downstream of WWTP, the results are within a range of 1%.

$$\frac{(33.35)(0.1)+(1.89)(0.019)+(2.77)(0.2)}{33.35+1.89+2.77} = 0.103 \text{ mg/l}$$

$$\frac{(33.35)(0.1)+(1.89)(0.020)+(2.77)(0.2)}{33.35+01.89+2.77} = 0.103 \text{ mg/l}$$

$$\frac{(33.35)(0.1)+(1.89)(0.024)+(2.77)(0.2)}{33.35+01.89+2.77} = 0.104 \text{ mg/l}^*$$

$$\frac{(33.35)(0.1)+(1.89)(0.027)+(2.77)(0.2)}{33.35+1.89+2.77} = 0.104 \text{ mg/l}$$

*Note that 0.104 mg/l is a corrected value. The 0.107 mg/l value in the Fact Sheet was an error.

The calculated total phosphorus limit of 0.2 mg/l in the permit is consistent with the proposed average monthly limit in the most recent (2013) Draft Nashua River Total Maximum Daily Load for the Nutrient Phosphorus which includes data from a *MassDEP and USEPA sampling program in 2003 and 2004 to update water quality data and provide assessment of tributaries*²

The Draft TMDL notes that tributaries without point source discharges may have larger quantities of phosphorus, but in a much less reactive form, less readily available for uptake by algae than the dissolved phosphorus from the WWTFs. This is consistent with EPA's focus on the total phosphorus in the upstream effluent dominated North and Main Stem Nashua Rivers.

² Draft Nashua River, Massachusetts -Total Maximum Daily Load for the Nutrient Phosphorus, MassDEP DWM (Report # 81-TMDL-2007-2) Page 6

Additionally, the TMDL includes a margin of safety to protect the river from technical errors that might contribute to a permit limit that may be too great.

EPA and MassDEP are confident that the TP concentration used in the Fact Sheet is appropriate and will not lead to a significant under estimate of the TP contribution from non-point (other) sources.

Address Change:

Please note that the address for the MassDEP Central Office has changed since the end of the public notice. The final permit reflects the new address. See Page 17 of 18.

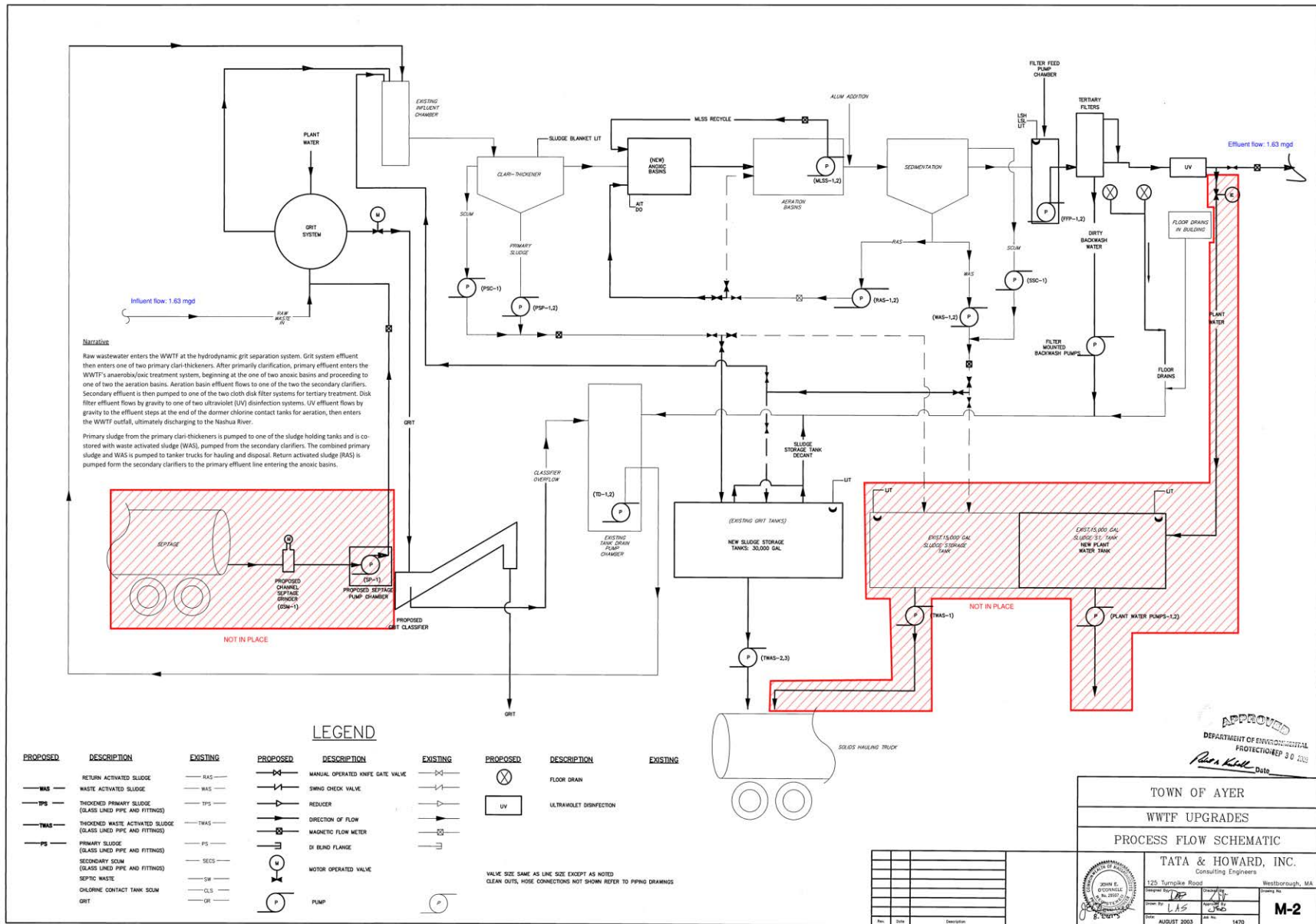
Duplicate signed copies of all reports or notifications required above shall be submitted to the State at the following address:

MassDEP – Central Region
Bureau of Resource Protection
8 New Bond Street
Worcester, Massachusetts 01606

Toxicity test reports only shall also be submitted to the State at the following address:

Massachusetts Department of Environmental Protection
Watershed Planning Program
8 New Bond Street
Worcester, Massachusetts 01606

APPENDIX B



APPENDIX C

DEPARTMENT OF PUBLIC WORKS

Water, Wastewater, Highway, Solid Waste & Stormwater Divisions

Mark L. Wetzel, P.E., Superintendent
Pamela J. Martin, Business Manager

25 BROOK STREET
AYER, MASSACHUSETTS 01432
T: (978) 772-8240
F: (978) 772-8244

September 6, 2018

US Environmental Protection Agency
Office of Ecosystem Protection
Regional Pretreatment Coordinator
5 Post Office Square – Suite 100 (OEP06-03)
Boston, MA 02109-3912

Attn: Mr. Justin Pimpare, Regional Pretreatment Coordinator

Re: Town of Ayer, MA – Reevaluation of Local Limits- Proposed Sampling Plan

Dear Mr. Pimpare:

Attached, please find the proposed Sampling and Analysis Plan for the reevaluation of Local limits for the Town of Ayer, Massachusetts. In September 2018, the Town underwent a USEPA audit which required the Town to reevaluate its current local limits as part of its Industrial Pretreatment Program. The Town requested that the reevaluation be conducted in September 2019 when the flows to the WWTF are typically very low.

After reviewing the Town's existing pollutant database for a period 2015-2018, we propose the attached **Table 1 -Sampling and Analysis Plan** to reevaluate and update, as necessary, the Town's current local limits. The Sampling and Analysis Plan is designed to collect the data necessary to evaluate and quantify pollutant loadings at the WWTF and to determine if the existing local limits need to be revised. The evaluation will be conducted in accordance with USEPA's Guidance Manual for the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program, July 2004. The components of the Sampling and Analysis Plan are summarized below:

SAMPLING LOCATIONS

The wastewater sampling locations will include:

- Influent - at the headworks of the WWTF
- Effluent – at the final discharge point following disinfection
- Two (2) -Domestic sources from two different drinking water sources AND
- Sludge

POLLUTANT PARAMETERS

The pollutant parameters to be sampled for at each location are identified in **Table 1 (attached)**. The Town collects annual influent and effluent samples as part of its IPP for most of the listed parameters. The last three years of the Town's data has been evaluated to see if any data gaps needed to be filled in. **Table 1** presents the number of days to collect additional data at each location to complete the database

for those parameters where there was not sufficient historical data or there is a lower detection level that may now be used.

IDENTIFICATION OF ANALYTICAL METHODS

The methods to be used for the analysis are approved by USEPA in accordance with 40 CFR Part 136. The lowest possible detection levels will be used for each parameter. In addition, all samples will be preserved using proper current sampling preservation methods. Where applicable, clean sampling techniques will be used.

SAMPLE TYPE

Table 1 provides a listing of the specific sample type for each sample location. Composite samples will be 24 hr. timed composite samples. Grab samples will also be collected in clean containers in the manner indicated in **Table 1**. The detention time (7 hrs.) through the WWTF will be taken into consideration for the collection of influent and effluent samples.

The Town looks forward to conducting the Sampling and Analysis Plan and we respectfully request your review and approval of the Plan so that we begin the work the week of September 9 2018. Should you have any questions or comments at all, please do not hesitate to contact me or Ms. Paula M. Boyle at pboyle@hoyletanner.com.

Very truly yours,

Mark Wetzel

Mark L. Wetzel, P.E.
Superintendent

Copy: Ms. Paula M. Boyle, Senior Engineer, Hoyle, Tanner & Associates, Inc.

Table 1

Parameter	Min. Detection Level (mg/L)	Influent (at MH outside of Main P.S.)	Effluent	Domestic Sampling	Sludge Sample
Type of Sample		Time weighted composite or grab	Time weighted composite or grab	Time weighted composite or grab	grab
Number of locations		1	1	2	1
		Number of days	Number of days	Number of days	Number of days
Aluminum	0.05	3	3	3	1
Antimony	-	3	3	3	1
Arsenic	0.0005	1	1	3	1
Beryllium	-	3	3	3	1
Cadmium	0.005	3	3	3	1
Chromium (Total)	0.0005	3	3	3	1
Chromium ⁺⁶ (grab)	0.005	3	3	3	1
Copper	0.001	1	1	3	1
Cyanide (grab)	0.005	1	1	3	1
Lead	0.0005	3	3	3	1
Mercury (Method 1631)	1ng/L	3	3	3	1
Molybdenum	0.0005	3	3	3	1
Nickel	0.0005	3	3	3	1
Selenium	0.0005	3	3	3	1
Silver	0.0005	3	3	3	1
Thallium	0.001	3	3	3	1
Zinc		3	3	3	1
Phosphorus		1	1	3	1
Oil & Grease (4 grabs then composited for analysis)		1	1	3	
Temperature (grab)		1	1	3	
pH (Min.) (grab)		1	1	3	
pH (Max.) (grab)		1	1	3	
BOD ₅		1	1	3	1
TSS		1	1	3	1
Ammonia (NH ₃)		1	1	3	1
USEPA Method Vocs (Method 624) (grab)		1	1	1 location only – 1 day	1
USEPA Method Semi-VOCs (Method 625) (grab)		1	1	1 location only-1 day	1

APPENDIX D

Local Limits Plant Influent Sampling - AYER, MA

Sample Date	mg/L																							
	Flow	Aluminum	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Chromium VI	Copper	Cyanide	Lead	Mercury	Molybdenum	Nickel	Oil/Grease	Total P	Selenium	Silver	Thallium	Ammonia	Zinc	TTO (ug/L)	TSS	BOD
19-Sep-19	1.24	0.109	0.002		0.0005	0.0001	0.00126	0.005			0.002	0.00010	0.003	0.006			0.00250	0.0002	0.0005		0.100			
18-Sep-19	1.28	0.120	0.002		0.0005	0.0001	0.0023	0.005			0.003	0.00010	0.004	0.008			0.00250	0.0002	0.0005		0.226			
17-Sep-19	1.40	0.213	0.005	0.024	0.0005	0.00010	0.0012	0.005	0.017	0.0025	0.0005	0.00010	0.005	0.005	17.00	3.06	0.00250	0.0002	0.0005	7.58	0.070	23.500	120.00	180.00
27-Jul-18	2.26	0.075		0.028		0.00010	0.0005		0.012		0.0005	0.00010		0.003	6.90	1.49	0.00250	0.0002	0.0005	6.28	0.030	26.00	24.00	160.00
20-Jul-17	1.50	0.168		0.040		0.00010	0.00125		0.051	0.0025	0.001	0.00010		0.005	4.40	2.90	0.003	0.0002	0.00025	7.05	0.068		100.00	150.00
10-Mar-16	1.55	0.050		0.027		0.00250	0.005		0.031	0.0025	0.005	0.00010		0.010	26.00	1.88	0.005	0.0035	0.010	11.20	0.025		48.00	100.00
15-Jul-15	1.09	0.320		0.035		0.00250	0.005		0.028	0.0025	0.005	0.00010		0.010	13.00	2.34	0.005	0.0035	0.010	12.60	0.025	500.00	81.00	92.00
Minimum	1.09	0.05	0.00	0.02	0.001	0.000	0.00	0.01	0.01	0.00	0.00	0.00	0.003	0.00	4.40	1.49	0.003	0.0002	0.00025	6.28	0.03	23.50	24.00	92.00
90 PERCENTILE	1.83	0.26	0.00	0.04	0.001	0.003	0.01	0.01	0.04	0.00	0.01	0.00	0.005	0.01	22.40	3.00	0.005	0.004	0.010	12.04	0.15	405.20	112.00	172.00
Maximum	2.26	0.32	0.00	0.04	0.001	0.003	0.01	0.01	0.05	0.00	0.01	0.00	0.005	0.01	26.00	3.06	0.005	0.004	0.010	12.60	0.23	500.00	120.00	180.00
Average (mg/L)	1.474	0.151	0.00	0.03	0.001	0.001	0.002	0.01	0.028	0.003	0.002	0.0001	0.004	0.007	13.46	2.33	0.003	0.0011	0.003	8.94	0.08	183.17	74.60	136.40
Max. (#/day)		3.93	0.06	0.50	0.01	0.03	0.06	0.06	0.62	0.03	0.06	0.00123	0.06	0.12	319.68	37.62	0.06	0.0430	0.12	154.92	2.78	6.15	1,475.47	2,213.20
Avg. (#/day)		1.85	0.04	0.38	0.01	0.01	0.03	0.06	0.34	0.03	0.03	0.001	0.05	0.08	165.50	28.70	0.04	0.0141	0.04	109.95	0.95	2.25	917.25	1,677.11

Local Limits Effluent Sampling - AYER, MA

Sample Date	mg/L																						
	Aluminum	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Chromium V	Copper	Cyanide	Lead	Mercury	Molybdenum	Nickel	Oil & Grease	Phosphorus (T)	Selenium	Silver	Thallium	Ammonia	Zinc	TTO (ug/L)	TSS	BOD
19-Sep-19	0.084	0.002		0.0005	0.0001	0.0005	0.0050			0.0005	0.0001	0.002	0.0029			0.0025	0.0002	0.0005		0.023	0.00		
18-Sep-19	0.041	0.002		0.0005	0.0001	0.0005	0.0050			0.0005	0.0001	0.003	0.0029			0.0025	0.0002	0.0005		0.022			
17-Sep-19	0.058	0.002	0.002	0.0005	0.0001	0.0005	0.0050	0.002	0.0025	0.0005	0.0001	0.002	0.0035	0.00	0.119	0.0025	0.0002	0.0005	0.106	0.026	0.00	0.00	2.20
27-Sep-18	0.041		0.003		0.0001	0.0005		0.002		0.0005	0.0001		0.002		0.086	0.0025	0.0002	0.00025	0.087	0.018	1.20		
20-Jul-17	0.032		0.005		0.0001	0.001		0.008	0.0025	0.0005	0.0001		0.005	2.00	0.167	0.003	0.0015	0.003	0.095	0.040		2.50	1.00
10-Mar-16	0.050		0.003		0.0025	0.0050		0.005		0.005	0.0001		0.010		0.043	0.005	0.0035	0.010	0.084	0.025		2.50	9.00
15-Jul-15	0.160		0.007		0.0025	0.0050		0.012	0.0025	0.005	0.0001		0.010	2.00	0.195	0.005	0.0035	0.010	0.088	0.025	500.00	2.50	1.00
Minimum	0.032	0.002	0.002	0.001	0.000	0.001	0.0050	0.002	0.0025	0.001	0.000	0.002	0.002	0.000	0.043	0.003	0.00020	0.000	0.084	0.018	0.000	0.000	1.00
Maximum	0.160	0.002	0.007	0.001	0.003	0.005	0.0050	0.012	0.0025	0.005	0.000	0.003	0.010	2.000	0.195	0.005	0.00350	0.010	0.106	0.040	500.00	2.500	9.00
Average	0.067	0.002	0.004	0.001	0.001	0.002	0.0050	0.006	0.0025	0.0018	0.0001	0.002	0.005	1.333	0.122	0.003	0.00133	0.003	0.092	0.026	125.30	1.875	3.30

Local Limits Plant Sludge Sampling - AYER, MA																										
Sample Date	Waste Parameter (mg/L)																									
	pH	Temp.	Aluminum	Arsenic	Cadmium	Chromium	Chromium VI	Copper	Cyanide	Lead	Mercury	Molybdenum	Nickel	Nitrate	Ammonia	Oil & Grease	Phenol	Phosphorus (T)	Selenium	Silver	Sulfide	% Solids	TTO (ug/kg)	Zinc	TSS	BOD
18-Sep-19	-	-	0.00	0.00	0.000	0.00	0.005	0.00	0.039	0.00	0.0000	0.00	0.00	-	9.6100	-	0.00	275	0.00	0.00	-	3.0	7,700.00	0.00	30,000.0	12,000.00
Minimum																										
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00	9.61	0.00	0.00	275.00	0.00	0.00	0.00	3.00	7,700.00	0.00	30,000.00	12,000.00
Average	-	-	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.00	-	9.61	-	0.00	275.00	0.00	0.00	-	3.00	7,700.00	-	30,000.00	12,000.00

Local Limits Domestic Sampling - AYER, MA																												
Sample Date	Sample Location	Waste Parameter (mg/L)																										
		pH	Temp.	Aluminum	Arsenic	Cadmium	Chromium	Chromium	Copper	Cyanide	Lead	Mercury	Molybdenum	Nickel	Nitrate	N (Ammonia)	Oil & Grease	Phenol (ug/L)	Phosphorus (T)	Selenium	Silver	Sulfide	% Solids	TKN	Zinc	TTO (ug/L)	BOD	TSS
19-Sep-19	Angard Lane	7.91	17.60	0.138	0.0017	0.0001	0.0005	0.0050	0.067	0.0025	0.003	0.00010	0.0010	0.0044		34.20			5.4	0.0025	0.0002				0.108		210	74.0
18-Sep-19	Angard Lane			0.200	0.0017	0.0001	0.0022	0.0050	0.109	0.046	0.005	0.00010	0.0010	0.0058		53.20	43.0		8.2	0.0025	0.0002				0.201		270	89.0
17-Sep-19	Angard Lane	7.61	17.1	0.247	0.0019	0.0001	0.0011	0.0050	0.049	0.0025	0.0040	0.00010	0.0010	0.0083		33.20	50.0	80.00	5.9	0.0025	0.0002				0.187	221.20	240	130.0
19-Sep-19	Sandy Pond	8.58	15.40	0.057	0.0005	0.0005	0.0005		0.057		0.002	0.00010	0.0010	0.004		45.70	42.0		5.1	0.0025	0.0002				0.084		130	45.0
18-Sep-19	Sandy Pond			0.179	0.0005	0.0001	0.0023		0.076		0.003	0.00010	0.0010	0.008		44.20	39.0		6.0	0.0025	0.0002				0.260		180	78.0
17-Sep-19	Sandy Pond	7.84	17.10	0.131	0.0005	0.0001	0.0005	0.0050	0.036	0.0025	0.001	0.00010	0.0010	0.003		52.40	28.0	26.00	7.6	0.0025	0.0002				0.129	1035.00	170	110.0
Minimum		7.61	15.40	0.06	0.00	0.00	0.00	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	33.20	28.00	26.00	5.12	0.00	0.00	0.00	0.00	0.00	0.08	221.20	130.00	45.00
Maximum		8.58	17.60	0.00	0.00	0.00	0.00	0.00	0.11	0.05	0.00	0.00	0.00	0.01	0.00	53.20	50.00	80.00	8.21	0.00	0.00	0.00	0.00	0.00	0.26	1035.00	270.00	130.00
Average		7.99	16.80	0.16	0.001	0.0002	0.001	0.01	0.07	0.01	0.003	0.0001	0.00	0.01	-	43.82	40.40	53.00	6.36	0.00	0.0002	-	-	-	0.16	628.10	200.00	87.67

APPENDIX E



ANALYTICAL REPORT

Lab Number:	L1942754
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	BROOK STREET WWTF DAY 1
Project Number:	BROOK STREET WWTF
Report Date:	09/24/19

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: BROOK STREET WWTF DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1942754
Report Date: 09/24/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1942754-01	INFLUENT COMPOSITE	WATER	BROOK STREET	09/17/19 07:30	09/17/19
L1942754-02	INFLUENT GRAB	WATER	BROOK STREET	09/17/19 07:30	09/17/19

Project Name: BROOK STREET WWTF DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1942754
Report Date: 09/24/19

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: BROOK STREET WWTF DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1942754
Report Date: 09/24/19

Case Narrative (continued)

Semivolatile Organics by Method 625

L1942754-01: The sample has elevated detection limits 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:

 Kelly Stenstrom

Title: Technical Director/Representative

Date: 09/24/19

ORGANICS

VOLATILES

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS**

Lab ID: L1942754-02
 Client ID: INFLUENT GRAB
 Sample Location: BROOK STREET

Date Collected: 09/17/19 07:30
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 09/18/19 21:16
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Chloroform	4.5		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS**

Lab ID: L1942754-02
 Client ID: INFLUENT GRAB
 Sample Location: BROOK STREET

Date Collected: 09/17/19 07:30
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Acetone	19		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
Vinyl acetate	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrolein	ND		ug/l	8.0	--	1
Acrylonitrile	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	93		60-140
Fluorobenzene	80		60-140
4-Bromofluorobenzene	103		60-140

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1

Analytical Date: 09/18/19 13:05

Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1285721-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 09/18/19 13:05
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1285721-4					
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
Vinyl acetate	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrolein	ND		ug/l	8.0	--
Acrylonitrile	ND		ug/l	10	--
n-Hexane ¹	ND		ug/l	20	--
Methyl tert butyl ether	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--
1,4-Dioxane ¹	ND		ug/l	2000	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	90		60-140
Fluorobenzene	109		60-140
4-Bromofluorobenzene	100		60-140



Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Methylene chloride	95		-		60-140	-		28
1,1-Dichloroethane	90		-		50-150	-		49
Chloroform	95		-		70-135	-		54
Carbon tetrachloride	115		-		70-130	-		41
1,2-Dichloropropane	90		-		35-165	-		55
Dibromochloromethane	100		-		70-135	-		50
1,1,2-Trichloroethane	100		-		70-130	-		45
2-Chloroethylvinyl ether	100		-		1-225	-		71
Tetrachloroethene	105		-		70-130	-		39
Chlorobenzene	95		-		65-135	-		53
Trichlorofluoromethane	95		-		50-150	-		84
1,2-Dichloroethane	120		-		70-130	-		49
1,1,1-Trichloroethane	115		-		70-130	-		36
Bromodichloromethane	100		-		65-135	-		56
trans-1,3-Dichloropropene	95		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	95		-		70-130	-		42
1,1,2,2-Tetrachloroethane	110		-		60-140	-		61
Benzene	120		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Chloromethane	80		-		1-205	-		60
Bromomethane	75		-		15-185	-		61

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Vinyl chloride	85		-		5-195	-		66
Chloroethane	100		-		40-160	-		78
1,1-Dichloroethene	95		-		50-150	-		32
trans-1,2-Dichloroethene	105		-		70-130	-		45
cis-1,2-Dichloroethene	100		-		60-140	-		30
Trichloroethene	130		-		65-135	-		48
1,2-Dichlorobenzene	105		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	105		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Styrene	100		-		60-140	-		30
Acetone	92		-		40-160	-		30
Carbon disulfide	85		-		60-140	-		30
2-Butanone	102		-		60-140	-		30
Vinyl acetate	80		-		60-140	-		30
4-Methyl-2-pentanone	114		-		60-140	-		30
2-Hexanone	104		-		60-140	-		30
Acrolein	82		-		60-140	-		30
Acrylonitrile	95		-		60-140	-		60
Methyl tert butyl ether	95		-		60-140	-		30
Dibromomethane	95		-		70-130	-		30
1,4-Dioxane ¹	110		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Tert-Butyl Alcohol	100		-		60-140	-		30
Tertiary-Amyl Methyl Ether	110		-		60-140	-		30
Dichlorodifluoromethane ¹	85		-		70-130	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	92				60-140
Fluorobenzene	114				60-140
4-Bromofluorobenzene	101				60-140

SEMIVOLATILES

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS**

Lab ID: L1942754-01 D
 Client ID: INFLUENT COMPOSITE
 Sample Location: BROOK STREET

Date Collected: 09/17/19 07:30
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 09/23/19 19:20
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/22/19 12:12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	20	--	10
Benzidine ¹	ND		ug/l	200	--	10
1,2,4-Trichlorobenzene	ND		ug/l	50	--	10
Hexachlorobenzene	ND		ug/l	20	--	10
Bis(2-chloroethyl)ether	ND		ug/l	20	--	10
2-Chloronaphthalene	ND		ug/l	20	--	10
3,3'-Dichlorobenzidine	ND		ug/l	50	--	10
2,4-Dinitrotoluene	ND		ug/l	50	--	10
2,6-Dinitrotoluene	ND		ug/l	50	--	10
Azobenzene ¹	ND		ug/l	20	--	10
Fluoranthene	ND		ug/l	20	--	10
4-Chlorophenyl phenyl ether	ND		ug/l	20	--	10
4-Bromophenyl phenyl ether	ND		ug/l	20	--	10
Bis(2-chloroisopropyl)ether	ND		ug/l	20	--	10
Bis(2-chloroethoxy)methane	ND		ug/l	50	--	10
Hexachlorobutadiene	ND		ug/l	20	--	10
Hexachlorocyclopentadiene ¹	ND		ug/l	100	--	10
Hexachloroethane	ND		ug/l	20	--	10
Isophorone	ND		ug/l	50	--	10
Naphthalene	ND		ug/l	20	--	10
Nitrobenzene	ND		ug/l	20	--	10
NDPA/DPA ¹	ND		ug/l	20	--	10
n-Nitrosodi-n-propylamine	ND		ug/l	50	--	10
Bis(2-ethylhexyl)phthalate	ND		ug/l	22	--	10
Butyl benzyl phthalate	ND		ug/l	50	--	10
Di-n-butylphthalate	ND		ug/l	50	--	10
Di-n-octylphthalate	ND		ug/l	50	--	10
Diethyl phthalate	ND		ug/l	50	--	10

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS**

Lab ID: L1942754-01 D
 Client ID: INFLUENT COMPOSITE
 Sample Location: BROOK STREET

Date Collected: 09/17/19 07:30
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	50	--	10
Benzo(a)anthracene	ND		ug/l	20	--	10
Benzo(a)pyrene	ND		ug/l	20	--	10
Benzo(b)fluoranthene	ND		ug/l	20	--	10
Benzo(k)fluoranthene	ND		ug/l	20	--	10
Chrysene	ND		ug/l	20	--	10
Acenaphthylene	ND		ug/l	20	--	10
Anthracene	ND		ug/l	20	--	10
Benzo(ghi)perylene	ND		ug/l	20	--	10
Fluorene	ND		ug/l	20	--	10
Phenanthrene	ND		ug/l	20	--	10
Dibenzo(a,h)anthracene	ND		ug/l	20	--	10
Indeno(1,2,3-cd)pyrene	ND		ug/l	20	--	10
Pyrene	ND		ug/l	20	--	10
4-Chloroaniline ¹	ND		ug/l	50	--	10
Dibenzofuran ¹	ND		ug/l	20	--	10
2-Methylnaphthalene ¹	ND		ug/l	20	--	10
n-Nitrosodimethylamine ¹	ND		ug/l	20	--	10
2,4,6-Trichlorophenol	ND		ug/l	50	--	10
p-Chloro-m-cresol ¹	ND		ug/l	20	--	10
2-Chlorophenol	ND		ug/l	20	--	10
2,4-Dichlorophenol	ND		ug/l	50	--	10
2,4-Dimethylphenol	ND		ug/l	50	--	10
2-Nitrophenol	ND		ug/l	50	--	10
4-Nitrophenol	ND		ug/l	100	--	10
2,4-Dinitrophenol	ND		ug/l	200	--	10
4,6-Dinitro-o-cresol	ND		ug/l	100	--	10
Pentachlorophenol	ND		ug/l	50	--	10
Phenol	ND		ug/l	50	--	10
2-Methylphenol ¹	ND		ug/l	50	--	10
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	50	--	10
2,4,5-Trichlorophenol ¹	ND		ug/l	50	--	10
Benzoic Acid ¹	ND		ug/l	500	--	10
Benzyl Alcohol ¹	ND		ug/l	20	--	10

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS**

Lab ID: L1942754-01 D

Date Collected: 09/17/19 07:30

Client ID: INFLUENT COMPOSITE

Date Received: 09/17/19

Sample Location: BROOK STREET

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	36		25-87
Phenol-d6	26		16-65
Nitrobenzene-d5	52		42-122
2-Fluorobiphenyl	64		46-121
2,4,6-Tribromophenol	90		45-128
4-Terphenyl-d14	71		47-138

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 11:37
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/22/19 12:12

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1287148-1					
Acenaphthene	ND		ug/l	2.0	--
Benzidine ¹	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene ¹	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA ¹	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 11:37
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/22/19 12:12

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1287148-1					
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
4-Chloroaniline ¹	ND		ug/l	5.0	--
Dibenzofuran ¹	ND		ug/l	2.0	--
2-Methylnaphthalene ¹	ND		ug/l	2.0	--
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	5.0	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Pentachlorophenol	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol ¹	ND		ug/l	5.0	--

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 11:37
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/22/19 12:12

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1287148-1					
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--
Benzoic Acid ¹	ND		ug/l	50	--
Benzyl Alcohol ¹	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	40		25-87
Phenol-d6	25		16-65
Nitrobenzene-d5	53		42-122
2-Fluorobiphenyl	62		46-121
2,4,6-Tribromophenol	58		45-128
4-Terphenyl-d14	64		47-138

Lab Control Sample Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287148-3								
Acenaphthene	84		-		60-132	-		48
Benzidine ¹	53		-		0-70	-		30
1,2,4-Trichlorobenzene	76		-		57-130	-		50
Hexachlorobenzene	93		-		8-142	-		55
Bis(2-chloroethyl)ether	72		-		43-126	-		108
2-Chloronaphthalene	86		-		65-120	-		24
3,3'-Dichlorobenzidine	38		-		8-213	-		108
2,4-Dinitrotoluene	107		-		48-127	-		42
2,6-Dinitrotoluene	105		-		68-137	-		48
Azobenzene ¹	89		-		44-115	-		23
Fluoranthene	101		-		43-121	-		66
4-Chlorophenyl phenyl ether	92		-		38-145	-		61
4-Bromophenyl phenyl ether	97		-		65-120	-		43
Bis(2-chloroisopropyl)ether	67		-		63-139	-		76
Bis(2-chloroethoxy)methane	77		-		49-165	-		54
Hexachlorobutadiene	83		-		38-120	-		62
Hexachlorocyclopentadiene ¹	79		-		7-118	-		35
Hexachloroethane	73		-		55-120	-		52
Isophorone	88		-		47-180	-		93
Naphthalene	78		-		36-120	-		65
Nitrobenzene	84		-		54-158	-		62
NDPA/DPA ¹	94		-		45-112	-		36
n-Nitrosodi-n-propylamine	88		-		14-198	-		87

Lab Control Sample Analysis

Batch Quality Control

Project Name: BROOK STREET WWTF DAY 1

Project Number: BROOK STREET WWTF

Lab Number: L1942754

Report Date: 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287148-3								
Bis(2-ethylhexyl)phthalate	92		-		29-137	-		82
Butyl benzyl phthalate	111		-		1-140	-		60
Di-n-butylphthalate	100		-		8-120	-		47
Di-n-octylphthalate	104		-		19-132	-		69
Diethyl phthalate	102		-		1-120	-		100
Dimethyl phthalate	101		-		1-120	-		183
Benzo(a)anthracene	92		-		42-133	-		53
Benzo(a)pyrene	92		-		32-148	-		72
Benzo(b)fluoranthene	94		-		42-140	-		71
Benzo(k)fluoranthene	91		-		25-146	-		63
Chrysene	82		-		44-140	-		87
Acenaphthylene	100		-		54-126	-		74
Anthracene	87		-		43-120	-		66
Benzo(ghi)perylene	95		-		1-195	-		97
Fluorene	93		-		70-120	-		38
Phenanthrene	80		-		65-120	-		39
Dibenzo(a,h)anthracene	106		-		1-200	-		126
Indeno(1,2,3-cd)pyrene	86		-		1-151	-		99
Pyrene	92		-		70-120	-		49
4-Chloroaniline ¹	74		-		10-100	-		53
Dibenzofuran ¹	88		-		23-126	-		22
2-Methylnaphthalene ¹	87		-		40-109	-		18
n-Nitrosodimethylamine ¹	43		-		15-68	-		17

Lab Control Sample Analysis

Batch Quality Control

Project Name: BROOK STREET WWTF DAY 1

Project Number: BROOK STREET WWTF

Lab Number: L1942754

Report Date: 09/24/19

Parameter	LCS %Recovery	Qual	LCS %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287148-3								
2,4,6-Trichlorophenol	105		-		52-129	-		58
p-Chloro-m-cresol ¹	103		-		68-130	-		73
2-Chlorophenol	78		-		36-120	-		61
2,4-Dichlorophenol	94		-		53-122	-		50
2,4-Dimethylphenol	91		-		42-120	-		58
2-Nitrophenol	93		-		45-167	-		55
4-Nitrophenol	66		-		13-129	-		131
2,4-Dinitrophenol	103		-		1-173	-		132
4,6-Dinitro-o-cresol	108		-		56-130	-		203
Pentachlorophenol	88		-		38-152	-		86
Phenol	39		-		17-120	-		64
2-Methylphenol ¹	78		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	78		-		35-103	-		26
2,4,5-Trichlorophenol ¹	108		-		47-126	-		28
Benzoic Acid ¹	23		-		2-55	-		27
Benzyl Alcohol ¹	76		-		31-103	-		23

Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287148-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	53				25-87
Phenol-d6	37				16-65
Nitrobenzene-d5	75				42-122
2-Fluorobiphenyl	81				46-121
2,4,6-Tribromophenol	85				45-128
4-Terphenyl-d14	83				47-138

METALS

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS**

Lab ID: L1942754-01

Date Collected: 09/17/19 07:30

Client ID: INFLUENT COMPOSITE

Date Received: 09/17/19

Sample Location: BROOK STREET

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.2125		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Antimony, Total	0.00478		mg/l	0.00400	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Arsenic, Total	0.02416		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Chromium, Total	0.00121		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Copper, Total	0.01749		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/20/19 12:35	09/20/19 18:58	EPA 245.1	3,245.1	GD
Molybdenum, Total	0.00528		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Nickel, Total	0.00546		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM
Zinc, Total	0.07006		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 10:40	EPA 3005A	3,200.8	AM



Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1285833-1										
Aluminum, Total	ND		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1286661-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/20/19 12:35	09/20/19 18:29	3,245.1	GD

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: BROOK STREET WWTF DAY 1

Project Number: BROOK STREET WWTF

Lab Number: L1942754

Report Date: 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1285833-2								
Aluminum, Total	101		-		85-115	-		
Antimony, Total	93		-		85-115	-		
Arsenic, Total	108		-		85-115	-		
Beryllium, Total	102		-		85-115	-		
Cadmium, Total	110		-		85-115	-		
Chromium, Total	105		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	111		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	104		-		85-115	-		
Selenium, Total	106		-		85-115	-		
Silver, Total	104		-		85-115	-		
Thallium, Total	110		-		85-115	-		
Zinc, Total	110		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1286661-2								
Mercury, Total	98		-		85-115	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1285833-3 QC Sample: L1942996-01 Client ID: MS Sample												
Aluminum, Total	ND	2	1.918	96		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.6106	122		-	-		70-130	-		20
Arsenic, Total	0.00673	0.12	0.1386	110		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05304	106		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05626	110		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2049	102		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2535	101		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5439	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.082	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5283	106		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1216	101		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04979	100		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1291	108		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5656	113		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-3 QC Sample: L1941364-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00487	97		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-5 QC Sample: L1941975-02 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00433	87		-	-		70-130	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: BROOK STREET WWTF DAY 1

Project Number: BROOK STREET WWTF

Lab Number: L1942754

Report Date: 09/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1285833-4 QC Sample: L1942996-01 Client ID: DUP Sample						
Arsenic, Total	0.00673	0.00762	mg/l	12		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	ND	ND	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Molybdenum, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-4 QC Sample: L1941364-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-6 QC Sample: L1941975-02 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

SAMPLE RESULTS

Lab ID: L1942754-01

Date Collected: 09/17/19 07:30

Client ID: INFLUENT COMPOSITE

Date Received: 09/17/19

Sample Location: BROOK STREET

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	120		mg/l	25	NA	5	-	09/18/19 15:15	121,2540D	DR
Nitrogen, Ammonia	7.58		mg/l	0.150	--	2	09/18/19 16:16	09/20/19 22:53	121,4500NH3-BH	AT
Phosphorus, Total	3.06		mg/l	0.125	--	12.5	09/20/19 10:00	09/23/19 13:13	121,4500P-E	SD
BOD, 5 day	180		mg/l	60	NA	30	09/18/19 04:55	09/23/19 10:05	121,5210B	TE



Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS****Lab ID:** L1942754-02**Date Collected:** 09/17/19 07:30**Client ID:** INFLUENT GRAB**Date Received:** 09/17/19**Sample Location:** BROOK STREET**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/18/19 11:40	09/19/19 11:15	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 00:30	09/18/19 01:55	121,3500CR-B	JW



Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285238-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 00:30	09/18/19 01:26	121,3500CR-B	JW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285426-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/18/19 04:55	09/23/19 10:05	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285435-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/18/19 15:15	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285510-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/18/19 11:40	09/19/19 11:00	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285549-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/18/19 16:16	09/20/19 22:51	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286503-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/20/19 10:00	09/23/19 11:47	121,4500P-E	SD



Lab Control Sample Analysis**Batch Quality Control****Project Name:** BROOK STREET WWTF DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1942754**Report Date:** 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285238-2								
Chromium, Hexavalent	100		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285426-2								
BOD, 5 day	86		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285510-2								
Cyanide, Total	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285549-2								
Nitrogen, Ammonia	98		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286503-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: BROOK STREET WWTF DAY 1

Lab Number: L1942754

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285238-4 QC Sample: L1942754-02 Client ID: INFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.100	100		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285426-4 QC Sample: L1942581-01 Client ID: MS Sample												
BOD, 5 day	ND	100	74	74		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285510-4 QC Sample: L1942547-01 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.196	98		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285549-4 QC Sample: L1942710-09 Client ID: MS Sample												
Nitrogen, Ammonia	5.07	4	9.00	98		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-3 QC Sample: L1941364-01 Client ID: MS Sample												
Phosphorus, Total	0.309	0.5	0.790	96		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: BROOK STREET WWTF DAY 1

Project Number: BROOK STREET WWTF

Lab Number: L1942754

Report Date: 09/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285238-3 QC Sample: L1942754-02 Client ID: INFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285426-3 QC Sample: L1942581-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285435-2 QC Sample: L1942573-05 Client ID: DUP Sample						
Solids, Total Suspended	ND	ND	mg/l	NC		29
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285510-3 QC Sample: L1942547-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285549-3 QC Sample: L1942710-09 Client ID: DUP Sample						
Nitrogen, Ammonia	5.07	5.18	mg/l	2		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-4 QC Sample: L1941370-05 Client ID: DUP Sample						
Phosphorus, Total	3.73	3.70	mg/l	1		20

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
---------------	---------------------

A	Absent
---	--------

B	Absent
---	--------

C	Absent
---	--------

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1942754-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.2	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1942754-01B	Plastic 500ml unpreserved	A	NA		4.2	Y	Absent		BOD-5210(2)
L1942754-01C	Plastic 950ml unpreserved	A	NA		4.2	Y	Absent		TSS-2540(7)
L1942754-01D	Plastic 500ml H2SO4 preserved	B	NA		3.9	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1942754-01E	Amber 1000ml Na2S2O3	C	NA		3.8	Y	Absent		625.1(7)
L1942754-01F	Amber 1000ml Na2S2O3	C	NA		3.8	Y	Absent		625.1(7)
L1942754-02A	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942754-02B	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942754-02C	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942754-02D	Plastic 250ml unpreserved	A	NA		4.2	Y	Absent		HEXCR-3500(1)
L1942754-02E	Plastic 250ml NaOH preserved	B	>12	>12	3.9	Y	Absent		TCN-4500(14)

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

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.
LCS D	- 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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: BROOK STREET WWTF DAY 1**Lab Number:** L1942754**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: BROOK STREET WWTF DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1942754
Report Date: 09/24/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Lab Report To:

Hoyle Tanner

L1942754

EST Invoice To: Hoyle Tanner

5555-Q-xx

Q#00978

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

☐ Rush ____ Day Turnaround

Description: Town of Ayer IPP Sampling Day 1 of 3 (Influent)

Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes		
		Size	Type	#	Date	Time					
Influent Composite (Time)	1	250 ml	P	1	9/16/19	0730	HNO3	Total Metals *See Comments*	pH = 7.23		
Influent Composite	1	1 L	P	1	↓	↓	None	TSS	Flow = N/A		
Influent Composite	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 18.1		
Influent Composite	1	500 ml	P	1	↓	↓	None	BOD			
Influent Composite	1	1 L	G	2	↓	↓	Na2S2O3	Semi-VOA (625.1)			
Influent Grab	1	40 ml	V	3	9/17	0730	Na2S2O3	VOA (624.1)			
Influent Grab	1	250 ml	P	1	↓	↓	NaOH	Total CN			
Influent Grab (4x)	1	1 L	G	2	↓	↓	HCl	Oil & Grease	(MB)		
Influent Grab	1	500 ml	P	1	↓	↓	None	CrVI			
Sampler's Name (Print) <i>Signature</i>					DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
Matt Crowell					9/17/19	0730	1	Matt Crowell	Alana Riggins	9/17/19	1545
Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.							2			9/17/19	1650
							3				
							4				
							5				
*All samples chilled to 4 degrees celsius.											



ANALYTICAL REPORT

Lab Number:	L1943025
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 1
Project Number:	BROOK STREET WWTF
Report Date:	09/24/19

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: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943025
Report Date: 09/24/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943025-01	INFLUENT GRAB (4X)	WATER	BROOK STREET, AYER, MA	09/17/19 14:00	09/18/19

Project Name: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943025
Report Date: 09/24/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/24/19

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1943025**Report Date:** 09/24/19**SAMPLE RESULTS****Lab ID:** L1943025-01**Client ID:** INFLUENT GRAB (4X)**Sample Location:** BROOK STREET, AYER, MA**Date Collected:** 09/17/19 14:00**Date Received:** 09/18/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Oil & Grease, Hem-Grav	17.		mg/l	4.0	--	1	09/20/19 17:30	09/20/19 18:00	74,1664A	ML



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943025**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286777-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/20/19 17:30	09/20/19 18:00	74,1664A	ML

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1943025**Report Date:** 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286777-2								
Oil & Grease, Hem-Grav	97		-		78-114	-		18

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1943025

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286777-4 QC Sample: L1943285-02 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	40	37	93		-	-		78-114	-		18

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** AYER IPP SAMPLING DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1943025**Report Date:** 09/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286777-3 QC Sample: L1943285-01 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943025**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

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

B Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943025-01A	Amber 1000ml HCl preserved	B	NA		2.0	Y	Absent		OG-1664(28)
L1943025-01B	Amber 1000ml HCl preserved	B	NA		2.0	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943025**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943025**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943025
Report Date: 09/24/19

REFERENCES

- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

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 its 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Lab Invoice To: Hoyle Tanner

Hoyle Tanner

Lab Report To:

L1943025

EST Invoice To: Hoyle Tanner

5555-Q-xx

Q#00978

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

☐ Rush ____ Day Turnaround

Description: *Ayer IPP Sampling Day 1 - Partial (Influent)*

Fax #: (603) 669-4168

[illegible]



ANALYTICAL REPORT

Lab Number:	L1943027
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	TOWN OF AYER IPP DAY 2
Project Number:	BROOK STREET WWTF
Report Date:	09/25/19

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: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943027
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943027-01	INFLUENT COMPOSITE	WATER	BROOK STREET	09/18/19 07:30	09/18/19
L1943027-02	INFLUENT GRAB	WATER	BROOK STREET	09/18/19 07:30	09/18/19

Project Name: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943027
Report Date: 09/25/19

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: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943027
Report Date: 09/25/19

Case Narrative (continued)

Sample Receipt

The collection dates were specified by the client.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/25/19

METALS

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943027**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1943027-01

Date Collected: 09/18/19 07:30

Client ID: INFLUENT COMPOSITE

Date Received: 09/18/19

Sample Location: BROOK STREET

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.1200		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Chromium, Total	0.00230		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Lead, Total	0.00283		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/20/19 16:39	09/20/19 23:44	EPA 245.1	3,245.1	GD
Molybdenum, Total	0.00373		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Nickel, Total	0.00792		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM
Zinc, Total	0.2258		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 10:21	EPA 3005A	3,200.8	AM



Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943027

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287394-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/20/19 16:39	09/20/19 22:53	3,245.1	GD

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287409-1										
Aluminum, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Project Number: BROOK STREET WWTF

Lab Number: L1943027

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287394-2								
Mercury, Total	94		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287409-2								
Aluminum, Total	102		-		85-115	-		
Antimony, Total	86		-		85-115	-		
Beryllium, Total	98		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Lead, Total	106		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	115		-		85-115	-		
Silver, Total	98		-		85-115	-		
Thallium, Total	107		-		85-115	-		
Zinc, Total	106		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Project Number: BROOK STREET WWTF

Lab Number: L1943027

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287394-3 WG1287394-4 QC Sample: L1900009-144 Client ID: MS Sample												
Mercury, Total	0.00672	0.005	0.01140	94		0.01120	90		70-130	2		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-3 QC Sample: L1942810-01 Client ID: MS Sample												
Aluminum, Total	ND	2	2.127	106		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.3880	78		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05027	100		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05414	106		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1947	97		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5440	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.081	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4867	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1384	115		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04955	99		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1313	109		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5300	106		-	-		70-130	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: TOWN OF AYER IPP DAY 2

Project Number: BROOK STREET WWTF

Lab Number: L1943027

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-5 QC Sample: L1942970-01 Client ID: MS Sample									
Aluminum, Total	2.005	2	4.325	116	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4256	85	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.05117	102	-	-	70-130	-	20
Cadmium, Total	0.00024	0.051	0.05451	106	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2066	103	-	-	70-130	-	20
Lead, Total	0.01672	0.51	0.5937	113	-	-	70-130	-	20
Molybdenum, Total	0.0050	1	1.140	113	-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5351	107	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1311	109	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05210	104	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1360	113	-	-	70-130	-	20
Zinc, Total	0.05371	0.5	0.6190	113	-	-	70-130	-	20

Project Name: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1943027
Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-4 QC Sample: L1942810-01 Client ID: DUP Sample						
Lead, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-6 QC Sample: L1942970-01 Client ID: DUP Sample						
Aluminum, Total	2.005	1.886	mg/l	6		20
Antimony, Total	ND	ND	mg/l	NC		20
Cadmium, Total	0.00024	0.00022	mg/l	8		20
Chromium, Total	ND	ND	mg/l	NC		20
Lead, Total	0.01672	0.01659	mg/l	1		20
Nickel, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.05371	0.05078	mg/l	6		20

INORGANICS & MISCELLANEOUS

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943027**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1943027-02**Date Collected:** 09/18/19 07:30**Client ID:** INFLUENT GRAB**Date Received:** 09/18/19**Sample Location:** BROOK STREET**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:18	121,3500CR-B	MA



Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943027**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285957-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:16	121,3500CR-B	MA



Lab Control Sample Analysis
Batch Quality Control**Project Name:** TOWN OF AYER IPP DAY 2**Project Number:** BROOK STREET WWTF**Lab Number:** L1943027**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285957-2								
Chromium, Hexavalent	96		-		85-115	-		20

Matrix Spike Analysis Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943027

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285957-4 QC Sample: L1943027-02 Client ID: INFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.093	93		-	-		85-115	-		20

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** TOWN OF AYER IPP DAY 2**Project Number:** BROOK STREET WWTF**Lab Number:** L1943027**Report Date:** 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285957-3 QC Sample: L1943027-02 Client ID: INFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943027**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**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(*)
L1943027-01A	Plastic 250ml HNO3 preserved	A	<2	<2	2.1	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),AG-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943027-02A	Plastic 250ml unpreserved	A	7	7	2.1	Y	Absent		HEXCR-3500(1)

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943027**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943027**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943027
Report Date: 09/25/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Hoyle Tanner

Lab Report To:

L1943027

EST Invoice To: Hoyle Tanner

5555-Q-xx

Q#00978

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

☐ Rush ____ Day Turnaround

Description: Town of Ayer IPP Sampling Day 2 of 3 (Influent)

Fax #: (603) 669-4168

[illegible]



ANALYTICAL REPORT

Lab Number:	L1943299
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	TOWN OF AYER IPP DAY 3
Project Number:	BROOK STREET WWTF
Report Date:	09/26/19

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: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943299
Report Date: 09/26/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943299-01	INFLUENT COMPOSITE	WATER	BROOK STREET, AYER, MA	09/19/19 07:30	09/19/19
L1943299-02	INFLUENT GRAB	WATER	BROOK STREET, AYER, MA	09/19/19 07:40	09/19/19

Project Name: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943299
Report Date: 09/26/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/26/19

METALS

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943299**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS**

Lab ID: L1943299-01

Date Collected: 09/19/19 07:30

Client ID: INFLUENT COMPOSITE

Date Received: 09/19/19

Sample Location: BROOK STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.1090		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Chromium, Total	0.00126		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Lead, Total	0.00200		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/24/19 16:07	09/24/19 22:07	EPA 245.1	3,245.1	AL
Molybdenum, Total	0.00266		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Nickel, Total	0.00580		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM
Zinc, Total	0.09971		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:40	EPA 3005A	3,200.8	AM

Project Name: TOWN OF AYER IPP DAY 3

Lab Number: L1943299

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287993-1									
Aluminum, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Antimony, Total	ND	mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Beryllium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Thallium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287997-1									
Mercury, Total	ND	mg/l	0.0002	--	1	09/24/19 16:07	09/24/19 21:30	3,245.1	AL

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943299

Report Date: 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287993-2								
Aluminum, Total	92		-		85-115	-		
Antimony, Total	85		-		85-115	-		
Beryllium, Total	97		-		85-115	-		
Cadmium, Total	100		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Lead, Total	101		-		85-115	-		
Molybdenum, Total	95		-		85-115	-		
Nickel, Total	95		-		85-115	-		
Selenium, Total	98		-		85-115	-		
Silver, Total	95		-		85-115	-		
Thallium, Total	105		-		85-115	-		
Zinc, Total	99		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287997-2								
Mercury, Total	90		-		85-115	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: TOWN OF AYER IPP DAY 3

Lab Number: L1943299

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-3 QC Sample: L1943414-01 Client ID: MS Sample												
Aluminum, Total	0.2622	2	2.125	93		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.4386	88		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.04655	93		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.04919	96		-	-		70-130	-		20
Chromium, Total	0.00166	0.2	0.1914	95		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5026	98		-	-		70-130	-		20
Molybdenum, Total	0.0249	1	0.9951	97		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4850	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1263	105		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04611	92		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1211	101		-	-		70-130	-		20
Zinc, Total	0.01650	0.5	0.5128	99		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943299

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-5 QC Sample: L1943878-01 Client ID: MS Sample									
Aluminum, Total	2.262	2	4.594	117	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4460	89	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.04913	98	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05103	100	-	-	70-130	-	20
Chromium, Total	0.00923	0.2	0.2080	99	-	-	70-130	-	20
Lead, Total	0.00966	0.51	0.5431	104	-	-	70-130	-	20
Molybdenum, Total	0.0469	1	1.023	98	-	-	70-130	-	20
Nickel, Total	0.01493	0.5	0.4985	97	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1348	112	-	-	70-130	-	20
Silver, Total	ND	0.05	0.04851	97	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1258	105	-	-	70-130	-	20
Zinc, Total	0.07696	0.5	0.6009	105	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-3 QC Sample: L1943085-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0049	99	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-5 QC Sample: L1943220-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0039	78	-	-	70-130	-	20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943299

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-4 QC Sample: L1943414-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00166	0.00164	mg/l	1		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	0.00202	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.01650	0.01695	mg/l	3		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-6 QC Sample: L1943878-01 Client ID: DUP Sample						
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00923	0.00899	mg/l	3		20
Lead, Total	0.00966	0.00948	mg/l	2		20
Nickel, Total	0.01493	0.01446	mg/l	3		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.07696	0.07399	mg/l	4		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-4 QC Sample: L1943085-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** TOWN OF AYER IPP DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943299**Report Date:** 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-6 QC Sample: L1943220-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: TOWN OF AYER IPP DAY 3

Lab Number: L1943299

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

SAMPLE RESULTS

Lab ID: L1943299-02

Date Collected: 09/19/19 07:40

Client ID: INFLUENT GRAB

Date Received: 09/19/19

Sample Location: BROOK STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:49	121,3500CR-B	JW



Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943299**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286394-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:45	121,3500CR-B	JW



Lab Control Sample Analysis**Batch Quality Control****Project Name:** TOWN OF AYER IPP DAY 3**Lab Number:** L1943299**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286394-2								
Chromium, Hexavalent	102		-		85-115	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 3

Lab Number: L1943299

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286394-4 QC Sample: L1943299-02 Client ID: INFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.086	86		-	-		85-115	-		20

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** TOWN OF AYER IPP DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943299**Report Date:** 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286394-3 QC Sample: L1943299-02 Client ID: INFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943299**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

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

B Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943299-01A	Plastic 250ml HNO3 preserved	B	<2	<2	4.1	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),AG-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943299-02A	Plastic 250ml unpreserved	B	7	7	4.1	Y	Absent		HEXCR-3500(1)

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943299**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943299**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943299
Report Date: 09/26/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Lab Invoice To: ~~Hoyle-Tanner~~ EST

Hoyle Tanner

Lab Report To:

L1943299

EST Invoice To: Hoyle Tanner

5555-Q-xx 05

Q#00978

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

Description: Town of Ayer IPP Sampling Day 3 of 3 (Influent)

Fax #: (603) 669-4168

☐ Rush ____ Day Turnaround[illegible]



ANALYTICAL REPORT

Lab Number:	L1942811
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY1/3
Project Number:	BROOK STREET WWTF
Report Date:	09/25/19

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: AYER IPP SAMPLING DAY1/3
Project Number: BROOK STREET WWTF

Lab Number: L1942811
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1942811-01	EFFLUENT COMPOSITE	WATER	BROOK STREET, AYER, MA 01432	09/17/19 14:30	09/18/19
L1942811-02	EFFLUENT GRAB	WATER	BROOK STREET, AYER, MA 01432	09/17/19 14:30	09/18/19

Project Name: AYER IPP SAMPLING DAY1/3
Project Number: BROOK STREET WWTF

Lab Number: L1942811
Report Date: 09/25/19

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: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Case Narrative (continued)**

Semivolatile Organics

The WG1286874-2 LCS recovery, associated with L1942811-01, is above the acceptance criteria for 2,4-dinitrotoluene (131%), fluoranthene (125%), nitrosodiphenylamine(ndpa)/dpa (115%), di-n-butylphthalate (123%), diethyl phthalate (124%) and 1,3-dinitrobenzene (131%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/25/19

ORGANICS

VOLATILES

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-02
 Client ID: EFFLUENT GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 128,624.1

Analytical Date: 09/19/19 18:29

Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Volatile Organics by GC/MS - Westborough Lab

Acrolein	ND		ug/l	8.0	--	1
----------	----	--	------	-----	----	---

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	84		60-140
Fluorobenzene	115		60-140
4-Bromofluorobenzene	96		60-140

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-02 R
 Client ID: EFFLUENT GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 09/19/19 18:37
 Analyst: AD/GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1



Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-02 R
 Client ID: EFFLUENT GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
Vinyl acetate	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrylonitrile	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	87		60-140
Fluorobenzene	103		60-140
4-Bromofluorobenzene	103		60-140

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 09/19/19 14:24
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1286626-8					
Acrolein	ND		ug/l	8.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	85		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	96		60-140

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1

Analytical Date: 09/19/19 17:31

Analyst: AD/GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1286651-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1

Analytical Date: 09/19/19 17:31

Analyst: AD/GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1286651-4					
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
Vinyl acetate	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrylonitrile	ND		ug/l	10	--
n-Hexane ¹	ND		ug/l	20	--
Methyl tert butyl ether	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	93		60-140
Fluorobenzene	101		60-140
4-Bromofluorobenzene	99		60-140



Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286626-7								
Acrolein	85		-		60-140	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	92				60-140
Fluorobenzene	107				60-140
4-Bromofluorobenzene	99				60-140

Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286651-3								
Methylene chloride	100		-		60-140	-		28
1,1-Dichloroethane	90		-		50-150	-		49
Chloroform	105		-		70-135	-		54
Carbon tetrachloride	120		-		70-130	-		41
1,2-Dichloropropane	95		-		35-165	-		55
Dibromochloromethane	105		-		70-135	-		50
1,1,2-Trichloroethane	105		-		70-130	-		45
2-Chloroethylvinyl ether	95		-		1-225	-		71
Tetrachloroethene	110		-		70-130	-		39
Chlorobenzene	100		-		65-135	-		53
Trichlorofluoromethane	95		-		50-150	-		84
1,2-Dichloroethane	130		-		70-130	-		49
1,1,1-Trichloroethane	125		-		70-130	-		36
Bromodichloromethane	110		-		65-135	-		56
trans-1,3-Dichloropropene	100		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	100		-		70-130	-		42
1,1,2,2-Tetrachloroethane	120		-		60-140	-		61
Benzene	125		-		65-135	-		61
Toluene	110		-		70-130	-		41
Ethylbenzene	110		-		60-140	-		63
Chloromethane	70		-		1-205	-		60
Bromomethane	55		-		15-185	-		61

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286651-3								
Vinyl chloride	85		-		5-195	-		66
Chloroethane	100		-		40-160	-		78
1,1-Dichloroethene	105		-		50-150	-		32
trans-1,2-Dichloroethene	90		-		70-130	-		45
cis-1,2-Dichloroethene	105		-		60-140	-		30
Trichloroethene	95		-		65-135	-		48
1,2-Dichlorobenzene	110		-		65-135	-		57
1,3-Dichlorobenzene	105		-		70-130	-		43
1,4-Dichlorobenzene	105		-		65-135	-		57
p/m-Xylene	108		-		60-140	-		30
o-xylene	100		-		60-140	-		30
Styrene	105		-		60-140	-		30
Acetone	98		-		40-160	-		30
Carbon disulfide	90		-		60-140	-		30
2-Butanone	96		-		60-140	-		30
Vinyl acetate	85		-		60-140	-		30
4-Methyl-2-pentanone	114		-		60-140	-		30
2-Hexanone	106		-		60-140	-		30
Acrylonitrile	100		-		60-140	-		60
Methyl tert butyl ether	100		-		60-140	-		30
Dibromomethane	95		-		70-130	-		30
Tert-Butyl Alcohol	120		-		60-140	-		30
Tertiary-Amyl Methyl Ether	110		-		60-140	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286651-3								
Dichlorodifluoromethane ¹	80		-		70-130	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	93				60-140
Fluorobenzene	113				60-140
4-Bromofluorobenzene	99				60-140

SEMIVOLATILES

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01
 Client ID: EFFLUENT COMPOSITE
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 09/23/19 18:02
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	2.0	--	1
Benzidine ¹	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Hexachlorobenzene	ND		ug/l	2.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
2-Chloronaphthalene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene ¹	ND		ug/l	2.0	--	1
Fluoranthene	ND		ug/l	2.0	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorobutadiene	ND		ug/l	2.0	--	1
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	2.0	--	1
Isophorone	ND		ug/l	5.0	--	1
Naphthalene	ND		ug/l	2.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA ¹	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01

Date Collected: 09/17/19 14:30

Client ID: EFFLUENT COMPOSITE

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	5.0	--	1
Benzo(a)anthracene	ND		ug/l	2.0	--	1
Benzo(a)pyrene	ND		ug/l	2.0	--	1
Benzo(b)fluoranthene	ND		ug/l	2.0	--	1
Benzo(k)fluoranthene	ND		ug/l	2.0	--	1
Chrysene	ND		ug/l	2.0	--	1
Acenaphthylene	ND		ug/l	2.0	--	1
Anthracene	ND		ug/l	2.0	--	1
Benzo(ghi)perylene	ND		ug/l	2.0	--	1
Fluorene	ND		ug/l	2.0	--	1
Phenanthrene	ND		ug/l	2.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--	1
Pyrene	ND		ug/l	2.0	--	1
4-Chloroaniline ¹	ND		ug/l	5.0	--	1
Dibenzofuran ¹	ND		ug/l	2.0	--	1
2-Methylnaphthalene ¹	ND		ug/l	2.0	--	1
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	5.0	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10	--	1
Pentachlorophenol	ND		ug/l	5.0	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol ¹	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--	1
Benzoic Acid ¹	ND		ug/l	50	--	1
Benzyl Alcohol ¹	ND		ug/l	2.0	--	1

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01

Date Collected: 09/17/19 14:30

Client ID: EFFLUENT COMPOSITE

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	74		25-87
Phenol-d6	56		16-65
Nitrobenzene-d5	91		42-122
2-Fluorobiphenyl	96		46-121
2,4,6-Tribromophenol	113		45-128
4-Terphenyl-d14	120		47-138

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Acenaphthene	ND		ug/l	2.0	--
Benzidine ¹	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene ¹	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA ¹	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
4-Chloroaniline ¹	ND		ug/l	5.0	--
Dibenzofuran ¹	ND		ug/l	2.0	--
2-Methylnaphthalene ¹	ND		ug/l	2.0	--
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	5.0	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Pentachlorophenol	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol ¹	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality ControlAnalytical Method: 129,625.1
Analytical Date: 09/23/19 12:56
Analyst: SZExtraction Method: EPA 625.1
Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--
Benzoic Acid ¹	ND		ug/l	50	--
Benzyl Alcohol ¹	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		25-87
Phenol-d6	44		16-65
Nitrobenzene-d5	73		42-122
2-Fluorobiphenyl	83		46-121
2,4,6-Tribromophenol	84		45-128
4-Terphenyl-d14	104		47-138

Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Acenaphthene	96		-		60-132	-		48
Benzidine ¹	9		-		0-70	-		30
1,2,4-Trichlorobenzene	74		-		57-130	-		50
Hexachlorobenzene	111		-		8-142	-		55
Bis(2-chloroethyl)ether	84		-		43-126	-		108
2-Chloronaphthalene	93		-		65-120	-		24
3,3'-Dichlorobenzidine	49		-		8-213	-		108
2,4-Dinitrotoluene	131	Q	-		48-127	-		42
2,6-Dinitrotoluene	127		-		68-137	-		48
Azobenzene ¹	107		-		44-115	-		23
Fluoranthene	125	Q	-		43-121	-		66
4-Chlorophenyl phenyl ether	110		-		38-145	-		61
4-Bromophenyl phenyl ether	117		-		65-120	-		43
Bis(2-chloroisopropyl)ether	77		-		63-139	-		76
Bis(2-chloroethoxy)methane	90		-		49-165	-		54
Hexachlorobutadiene	76		-		38-120	-		62
Hexachlorocyclopentadiene ¹	72		-		7-118	-		35
Hexachloroethane	66		-		55-120	-		52
Isophorone	104		-		47-180	-		93
Naphthalene	82		-		36-120	-		65
Nitrobenzene	96		-		54-158	-		62
NDPA/DPA ¹	115	Q	-		45-112	-		36
n-Nitrosodi-n-propylamine	103		-		14-198	-		87

Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Bis(2-ethylhexyl)phthalate	118		-		29-137	-		82
Butyl benzyl phthalate	140		-		1-140	-		60
Di-n-butylphthalate	123	Q	-		8-120	-		47
Di-n-octylphthalate	132		-		19-132	-		69
Diethyl phthalate	124	Q	-		1-120	-		100
Dimethyl phthalate	120		-		1-120	-		183
Benzo(a)anthracene	115		-		42-133	-		53
Benzo(a)pyrene	120		-		32-148	-		72
Benzo(b)fluoranthene	119		-		42-140	-		71
Benzo(k)fluoranthene	120		-		25-146	-		63
Chrysene	102		-		44-140	-		87
Acenaphthylene	113		-		54-126	-		74
Anthracene	104		-		43-120	-		66
Benzo(ghi)perylene	119		-		1-195	-		97
Fluorene	111		-		70-120	-		38
Phenanthrene	96		-		65-120	-		39
Dibenzo(a,h)anthracene	133		-		1-200	-		126
Indeno(1,2,3-cd)pyrene	111		-		1-151	-		99
Pyrene	114		-		70-120	-		49
4-Chloroaniline ¹	76		-		10-100	-		53
Dibenzofuran ¹	104		-		23-126	-		22
2-Methylnaphthalene ¹	92		-		40-109	-		18
n-Nitrosodimethylamine ¹	52		-		15-68	-		17

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCS %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
2,4,6-Trichlorophenol	123		-		52-129	-		58
p-Chloro-m-cresol ¹	124		-		68-130	-		73
2-Chlorophenol	93		-		36-120	-		61
2,4-Dichlorophenol	110		-		53-122	-		50
2,4-Dimethylphenol	97		-		42-120	-		58
2-Nitrophenol	108		-		45-167	-		55
4-Nitrophenol	96		-		13-129	-		131
2,4-Dinitrophenol	129		-		1-173	-		132
4,6-Dinitro-o-cresol	128		-		56-130	-		203
Pentachlorophenol	105		-		38-152	-		86
Phenol	56		-		17-120	-		64
2-Methylphenol ¹	98		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	97		-		35-103	-		26
2,4,5-Trichlorophenol ¹	126		-		47-126	-		28
Benzoic Acid ¹	47		-		2-55	-		27
Benzyl Alcohol ¹	92		-		31-103	-		23

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	73				25-87
Phenol-d6	55				16-65
Nitrobenzene-d5	87				42-122
2-Fluorobiphenyl	93				46-121
2,4,6-Tribromophenol	104				45-128
4-Terphenyl-d14	103				47-138

METALS

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01

Date Collected: 09/17/19 14:30

Client ID: EFFLUENT COMPOSITE

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.05836		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00243		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Copper, Total	0.00235		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 23:11	EPA 245.1	3,245.1	MG
Molybdenum, Total	0.00231		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Nickel, Total	0.00349		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Zinc, Total	0.02622		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM



Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287393-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 22:55	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287409-1										
Aluminum, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287393-2								
Mercury, Total	89		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287409-2								
Aluminum, Total	102		-		85-115	-		
Antimony, Total	86		-		85-115	-		
Arsenic, Total	106		-		85-115	-		
Beryllium, Total	98		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	106		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	115		-		85-115	-		
Silver, Total	98		-		85-115	-		
Thallium, Total	107		-		85-115	-		
Zinc, Total	106		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-3 QC Sample: L1942718-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00451	90		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-5 QC Sample: L1942757-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00438	88		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-3 QC Sample: L1942810-01 Client ID: MS Sample												
Aluminum, Total	ND	2	2.127	106		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.3880	78		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1202	100		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05027	100		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05414	106		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1947	97		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2443	98		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5440	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.081	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4867	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1384	115		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04955	99		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1313	109		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5300	106		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-5 QC Sample: L1942970-01 Client ID: MS Sample									
Aluminum, Total	2.005	2	4.325	116	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4256	85	-	-	70-130	-	20
Arsenic, Total	0.0099	0.12	0.1392	108	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.05117	102	-	-	70-130	-	20
Cadmium, Total	0.00024	0.051	0.05451	106	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2066	103	-	-	70-130	-	20
Copper, Total	0.01225	0.25	0.2686	102	-	-	70-130	-	20
Lead, Total	0.01672	0.51	0.5937	113	-	-	70-130	-	20
Molybdenum, Total	0.0050	1	1.140	113	-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5351	107	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1311	109	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05210	104	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1360	113	-	-	70-130	-	20
Zinc, Total	0.05371	0.5	0.6190	113	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-4 QC Sample: L1942718-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-6 QC Sample: L1942757-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-4 QC Sample: L1942810-01 Client ID: DUP Sample						
Lead, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-6 QC Sample: L1942970-01 Client ID: DUP Sample						
Aluminum, Total	2.005	1.886	mg/l	6		20
Antimony, Total	ND	ND	mg/l	NC		20
Cadmium, Total	0.00024	0.00022	mg/l	8		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.01225	0.01172	mg/l	4		20
Lead, Total	0.01672	0.01659	mg/l	1		20
Nickel, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.05371	0.05078	mg/l	6		20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1942811-01**Date Collected:** 09/17/19 14:30**Client ID:** EFFLUENT COMPOSITE**Date Received:** 09/18/19**Sample Location:** BROOK STREET, AYER, MA 01432**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/19/19 14:40	121,2540D	DR
Nitrogen, Ammonia	0.106		mg/l	0.075	--	1	09/19/19 17:18	09/19/19 23:08	121,4500NH3-BH	AT
Phosphorus, Total	0.119		mg/l	0.010	--	1	09/20/19 10:00	09/23/19 12:12	121,4500P-E	SD
BOD, 5 day	2.2		mg/l	2.0	NA	1	09/19/19 06:50	09/24/19 01:30	121,5210B	TE



Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1942811-02**Date Collected:** 09/17/19 14:30**Client ID:** EFFLUENT GRAB**Date Received:** 09/18/19**Sample Location:** BROOK STREET, AYER, MA 01432**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:44	121,4500CN-CE	LH
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/18/19 16:35	09/18/19 17:15	74,1664A	ML
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 14:15	09/18/19 14:29	121,3500CR-B	JO



Project Name: AYER IPP SAMPLING DAY1/3
Project Number: BROOK STREET WWTF

Lab Number: L1942811
Report Date: 09/25/19

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285691-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 14:15	09/18/19 14:29	121,3500CR-B	JO
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285741-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/18/19 16:35	09/18/19 17:15	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285970-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/19/19 06:50	09/24/19 01:30	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286004-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/19/19 14:40	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286066-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:34	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286156-13										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/19/19 17:18	09/19/19 22:43	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286503-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/20/19 10:00	09/23/19 11:47	121,4500P-E	SD



Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Project Number:** BROOK STREET WWTF**Lab Number:** L1942811**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285691-2								
Chromium, Hexavalent	100		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285741-2								
Oil & Grease, Hem-Grav	93		-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285970-2								
BOD, 5 day	90		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286066-2								
Cyanide, Total	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286156-14								
Nitrogen, Ammonia	95		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286503-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285691-4 QC Sample: L1942811-02 Client ID: EFFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.102	102		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285741-4 QC Sample: L1940432-03 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	80	67	84		-	-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285970-4 QC Sample: L1942883-01 Client ID: MS Sample												
BOD, 5 day	ND	100	71	71		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-4 QC Sample: L1942830-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.194	97		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286156-16 QC Sample: L1942790-05 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.70	92		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-3 QC Sample: L1941364-01 Client ID: MS Sample												
Phosphorus, Total	0.309	0.5	0.790	96		-	-		75-125	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285691-3 QC Sample: L1942811-02 Client ID: EFFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285741-3 QC Sample: L1942285-05 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285970-3 QC Sample: L1942883-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286004-2 QC Sample: L1942590-04 Client ID: DUP Sample						
Solids, Total Suspended	4200	4100	mg/l	2		29
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-3 QC Sample: L1942830-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286156-15 QC Sample: L1942790-05 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-4 QC Sample: L1941370-05 Client ID: DUP Sample						
Phosphorus, Total	3.73	3.70	mg/l	1		20

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**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(*)
L1942811-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.9	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1942811-01B	Plastic 500ml unpreserved	A	7	7	4.9	Y	Absent		BOD-5210(2)
L1942811-01C	Plastic 950ml unpreserved	A	7	7	4.9	Y	Absent		TSS-2540(7)
L1942811-01D	Plastic 500ml H2SO4 preserved	A	<2	<2	4.9	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1942811-01E	Amber 1000ml Na2S2O3	A	7	7	4.9	Y	Absent		625.1(7)
L1942811-01F	Amber 1000ml Na2S2O3	A	7	7	4.9	Y	Absent		625.1(7)
L1942811-02A	Vial Na2S2O3 preserved	A	NA		4.9	Y	Absent		624.1(3)
L1942811-02B	Vial Na2S2O3 preserved	A	NA		4.9	Y	Absent		624.1(3)
L1942811-02C	Vial Na2S2O3 preserved	A	NA		4.9	Y	Absent		624.1(3)
L1942811-02D	Plastic 250ml unpreserved	A	7	7	4.9	Y	Absent		HEXCR-3500(1)
L1942811-02E	Plastic 250ml NaOH preserved	A	>12	>12	4.9	Y	Absent		TCN-4500(14)
L1942811-02F	Amber 1000ml HCl preserved	A	NA		4.9	Y	Absent		OG-1664(28)
L1942811-02G	Amber 1000ml HCl preserved	A	NA		4.9	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY1/3
Project Number: BROOK STREET WWTF

Lab Number: L1942811
Report Date: 09/25/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

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 its 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Lab Report To: Hoyle Tanner

EST Invoice To: Hoyle Tanner

5555-Q-xx
Q#00978

11942811

☐ **Rush** _____ Day Turnaround

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

Description: Town of Ayer IPP Sampling Day 1 of 3 (Effluent)

Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes																																										
		Size	Type	#	Date	Time																																													
Effluent Composite (Time)	1	250 ml	P	1	9/16-17	1430	HNO3	Total Metals *See Comments Below*	pH = 7.99																																										
Effluent Composite	1	1 L	P	1			None	TSS	Flow = N/A																																										
Effluent Composite	1	500 ml	P	1			H2SO4	NH3, T-Phos	Temp = 21.2																																										
Effluent Composite	1	500 ml	P	1			None	BOD																																											
Effluent Composite	1	1 L	G	2	✓	✓	Na2S2O3	Semi-VOA (625.1)																																											
Effluent Grab	1	40 ml	V	3	9/17	1430	Na2S2O3	VOA (624.1)																																											
Effluent Grab	1	250 ml	P	1	✓	✓	NaOH	Total CN																																											
Effluent Grab (4x)	1	1 L	G	2	9/16-17	0745-1430	HCl	Oil & Grease																																											
Effluent Grab	1	500 ml	P	1	9/17	1430	None	CrVI																																											
<table border="1"> <thead> <tr> <th>Sampler's Name (Print)</th> <th>Signature</th> <th>DATE</th> <th>TIME</th> <th>NUMBER</th> <th>TRANSFERS RELINQUISHED BY</th> <th>TRANSFERS ACCEPTED BY</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td>Matt Gould</td> <td><i>[Signature]</i></td> <td>9/17/19</td> <td>1430</td> <td>1</td> <td><i>[Signature]</i></td> <td><i>[Signature]</i></td> <td>9/18/19</td> <td>0935</td> </tr> <tr> <td colspan="4" rowspan="4"> Additional Comments: Total Metals to include: Al, Sb, As, Be, Cd, Cu, Cr, Pb, Hg, Mo, Ni, Se, Ag, Ti, Zn *Please use lowest possible detection limit for each parameter. </td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Sampler's Name (Print)	Signature	DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	Matt Gould	<i>[Signature]</i>	9/17/19	1430	1	<i>[Signature]</i>	<i>[Signature]</i>	9/18/19	0935	Additional Comments: Total Metals to include: Al, Sb, As, Be, Cd, Cu, Cr, Pb, Hg, Mo, Ni, Se, Ag, Ti, Zn *Please use lowest possible detection limit for each parameter.				2					3					4					5				
Sampler's Name (Print)	Signature	DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME																																											
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				3																																															
				4																																															
				5																																															
*All samples chilled to 4 degrees celsius.																																																			



ANALYTICAL REPORT

Lab Number:	L1943085
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	TOWN OF AYER IPP DAY 2
Project Number:	BROOK STREET WWTF
Report Date:	09/26/19

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: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943085
Report Date: 09/26/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943085-01	EFFLUENT COMPOSITE	WATER	BROOK STREET, AYER, MA	09/18/19 14:15	09/19/19
L1943085-02	EFFLUENT GRAB	WATER	BROOK STREET, AYER, MA	09/18/19 14:15	09/19/19

Project Name: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943085
Report Date: 09/26/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/26/19

METALS

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943085**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS**

Lab ID: L1943085-01

Date Collected: 09/18/19 14:15

Client ID: EFFLUENT COMPOSITE

Date Received: 09/19/19

Sample Location: BROOK STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.04135		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/24/19 16:07	09/24/19 21:34	EPA 245.1	3,245.1	AL
Molybdenum, Total	0.00260		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Nickel, Total	0.00292		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM
Zinc, Total	0.02208		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:10	EPA 3005A	3,200.8	AM



Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943085

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287993-1									
Aluminum, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Antimony, Total	ND	mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Beryllium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Thallium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287997-1									
Mercury, Total	ND	mg/l	0.0002	--	1	09/24/19 16:07	09/24/19 21:30	3,245.1	AL

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943085

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287993-2								
Aluminum, Total	92		-		85-115	-		
Antimony, Total	85		-		85-115	-		
Beryllium, Total	97		-		85-115	-		
Cadmium, Total	100		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Lead, Total	101		-		85-115	-		
Molybdenum, Total	95		-		85-115	-		
Nickel, Total	95		-		85-115	-		
Selenium, Total	98		-		85-115	-		
Silver, Total	95		-		85-115	-		
Thallium, Total	105		-		85-115	-		
Zinc, Total	99		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287997-2								
Mercury, Total	90		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943085

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-3 QC Sample: L1943414-01 Client ID: MS Sample												
Aluminum, Total	0.2622	2	2.125	93		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.4386	88		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.04655	93		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.04919	96		-	-		70-130	-		20
Chromium, Total	0.00166	0.2	0.1914	95		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5026	98		-	-		70-130	-		20
Molybdenum, Total	0.0249	1	0.9951	97		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4850	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1263	105		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04611	92		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1211	101		-	-		70-130	-		20
Zinc, Total	0.01650	0.5	0.5128	99		-	-		70-130	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: TOWN OF AYER IPP DAY 2

Project Number: BROOK STREET WWTF

Lab Number: L1943085

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-5 QC Sample: L1943878-01 Client ID: MS Sample									
Aluminum, Total	2.262	2	4.594	117	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4460	89	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.04913	98	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05103	100	-	-	70-130	-	20
Chromium, Total	0.00923	0.2	0.2080	99	-	-	70-130	-	20
Lead, Total	0.00966	0.51	0.5431	104	-	-	70-130	-	20
Molybdenum, Total	0.0469	1	1.023	98	-	-	70-130	-	20
Nickel, Total	0.01493	0.5	0.4985	97	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1348	112	-	-	70-130	-	20
Silver, Total	ND	0.05	0.04851	97	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1258	105	-	-	70-130	-	20
Zinc, Total	0.07696	0.5	0.6009	105	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-3 QC Sample: L1943085-01 Client ID: EFFLUENT COMPOSITE									
Mercury, Total	ND	0.005	0.0049	99	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-5 QC Sample: L1943220-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0039	78	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Project Number: BROOK STREET WWTF

Lab Number: L1943085

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-4 QC Sample: L1943414-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00166	0.00164	mg/l	1		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	0.00202	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.01650	0.01695	mg/l	3		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-6 QC Sample: L1943878-01 Client ID: DUP Sample						
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00923	0.00899	mg/l	3		20
Lead, Total	0.00966	0.00948	mg/l	2		20
Nickel, Total	0.01493	0.01446	mg/l	3		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.07696	0.07399	mg/l	4		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-4 QC Sample: L1943085-01 Client ID: EFFLUENT COMPOSITE						
Mercury, Total	ND	ND	mg/l	NC		20

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** TOWN OF AYER IPP DAY 2**Project Number:** BROOK STREET WWTF**Lab Number:** L1943085**Report Date:** 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-6 QC Sample: L1943220-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943085**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS****Lab ID:** L1943085-02**Date Collected:** 09/18/19 14:15**Client ID:** EFFLUENT GRAB**Date Received:** 09/19/19**Sample Location:** BROOK STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 13:40	09/19/19 13:49	121,3500CR-B	JT



Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943085**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286179-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 13:40	09/19/19 13:48	121,3500CR-B	JT

Lab Control Sample Analysis**Batch Quality Control****Project Name:** TOWN OF AYER IPP DAY 2**Project Number:** BROOK STREET WWTF**Lab Number:** L1943085**Report Date:** 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286179-2								
Chromium, Hexavalent	92		-		85-115	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943085

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286179-4 QC Sample: L1943085-02 Client ID: EFFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.100	100		-	-		85-115	-		20

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** TOWN OF AYER IPP DAY 2**Project Number:** BROOK STREET WWTF**Lab Number:** L1943085**Report Date:** 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286179-3 QC Sample: L1943085-02 Client ID: EFFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Serial_No:09261913:58
Lab Number: L1943085
Report Date: 09/26/19

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(*)
L1943085-01A	Plastic 250ml HNO3 preserved	A	<2	<2	3.4	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),AG-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943085-02A	Plastic 250ml unpreserved	A	7	7	3.4	Y	Absent		HEXCR-3500(1)

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943085**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943085**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: TOWN OF AYER IPP DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943085
Report Date: 09/26/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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,

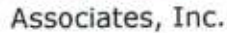
3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

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.****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 Record

Alpha Analytical Labs
(508) 898-9220

Chain of Custody Record

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

by: Hoyle Tanner

Hoyle Tanner

by: Hoyle Tanner

Q#00978

☐ Rush ____ Day Turnaround

Fax #: (603) 669-4168

*All samples chilled to 4 degrees celsius.



ANALYTICAL REPORT

Lab Number:	L1942811
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY1/3
Project Number:	BROOK STREET WWTF
Report Date:	09/25/19

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: AYER IPP SAMPLING DAY1/3**Project Number:** BROOK STREET WWTF**Lab Number:** L1942811**Report Date:** 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1942811-01	EFFLUENT COMPOSITE	WATER	BROOK STREET, AYER, MA 01432	09/17/19 14:30	09/18/19
L1942811-02	EFFLUENT GRAB	WATER	BROOK STREET, AYER, MA 01432	09/17/19 14:30	09/18/19

Project Name: AYER IPP SAMPLING DAY1/3
Project Number: BROOK STREET WWTF

Lab Number: L1942811
Report Date: 09/25/19

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: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Case Narrative (continued)**

Semivolatile Organics

The WG1286874-2 LCS recovery, associated with L1942811-01, is above the acceptance criteria for 2,4-dinitrotoluene (131%), fluoranthene (125%), nitrosodiphenylamine(ndpa)/dpa (115%), di-n-butylphthalate (123%), diethyl phthalate (124%) and 1,3-dinitrobenzene (131%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/25/19

ORGANICS

VOLATILES

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-02
 Client ID: EFFLUENT GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water

Analytical Method: 128,624.1

Analytical Date: 09/19/19 18:29

Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Volatile Organics by GC/MS - Westborough Lab

Acrolein	ND		ug/l	8.0	--	1
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	84		60-140
Fluorobenzene	115		60-140
4-Bromofluorobenzene	96		60-140

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-02 R
 Client ID: EFFLUENT GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 09/19/19 18:37
 Analyst: AD/GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1



Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-02 R
 Client ID: EFFLUENT GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
Vinyl acetate	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrylonitrile	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	87		60-140
Fluorobenzene	103		60-140
4-Bromofluorobenzene	103		60-140

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 09/19/19 14:24
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1286626-8					
Acrolein	ND		ug/l	8.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	85		60-140
Fluorobenzene	111		60-140
4-Bromofluorobenzene	96		60-140

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1

Analytical Date: 09/19/19 17:31

Analyst: AD/GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1286651-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1

Analytical Date: 09/19/19 17:31

Analyst: AD/GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1286651-4					
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
Vinyl acetate	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrylonitrile	ND		ug/l	10	--
n-Hexane ¹	ND		ug/l	20	--
Methyl tert butyl ether	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	93		60-140
Fluorobenzene	101		60-140
4-Bromofluorobenzene	99		60-140



Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286626-7								
Acrolein	85		-		60-140	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	92				60-140
Fluorobenzene	107				60-140
4-Bromofluorobenzene	99				60-140

Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286651-3								
Methylene chloride	100		-		60-140	-		28
1,1-Dichloroethane	90		-		50-150	-		49
Chloroform	105		-		70-135	-		54
Carbon tetrachloride	120		-		70-130	-		41
1,2-Dichloropropane	95		-		35-165	-		55
Dibromochloromethane	105		-		70-135	-		50
1,1,2-Trichloroethane	105		-		70-130	-		45
2-Chloroethylvinyl ether	95		-		1-225	-		71
Tetrachloroethene	110		-		70-130	-		39
Chlorobenzene	100		-		65-135	-		53
Trichlorofluoromethane	95		-		50-150	-		84
1,2-Dichloroethane	130		-		70-130	-		49
1,1,1-Trichloroethane	125		-		70-130	-		36
Bromodichloromethane	110		-		65-135	-		56
trans-1,3-Dichloropropene	100		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	100		-		70-130	-		42
1,1,2,2-Tetrachloroethane	120		-		60-140	-		61
Benzene	125		-		65-135	-		61
Toluene	110		-		70-130	-		41
Ethylbenzene	110		-		60-140	-		63
Chloromethane	70		-		1-205	-		60
Bromomethane	55		-		15-185	-		61

Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286651-3								
Vinyl chloride	85		-		5-195	-		66
Chloroethane	100		-		40-160	-		78
1,1-Dichloroethene	105		-		50-150	-		32
trans-1,2-Dichloroethene	90		-		70-130	-		45
cis-1,2-Dichloroethene	105		-		60-140	-		30
Trichloroethene	95		-		65-135	-		48
1,2-Dichlorobenzene	110		-		65-135	-		57
1,3-Dichlorobenzene	105		-		70-130	-		43
1,4-Dichlorobenzene	105		-		65-135	-		57
p/m-Xylene	108		-		60-140	-		30
o-xylene	100		-		60-140	-		30
Styrene	105		-		60-140	-		30
Acetone	98		-		40-160	-		30
Carbon disulfide	90		-		60-140	-		30
2-Butanone	96		-		60-140	-		30
Vinyl acetate	85		-		60-140	-		30
4-Methyl-2-pentanone	114		-		60-140	-		30
2-Hexanone	106		-		60-140	-		30
Acrylonitrile	100		-		60-140	-		60
Methyl tert butyl ether	100		-		60-140	-		30
Dibromomethane	95		-		70-130	-		30
Tert-Butyl Alcohol	120		-		60-140	-		30
Tertiary-Amyl Methyl Ether	110		-		60-140	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1286651-3								
Dichlorodifluoromethane ¹	80		-		70-130	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	93				60-140
Fluorobenzene	113				60-140
4-Bromofluorobenzene	99				60-140

SEMIVOLATILES

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01
 Client ID: EFFLUENT COMPOSITE
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/17/19 14:30
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 09/23/19 18:02
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	2.0	--	1
Benzidine ¹	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Hexachlorobenzene	ND		ug/l	2.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
2-Chloronaphthalene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene ¹	ND		ug/l	2.0	--	1
Fluoranthene	ND		ug/l	2.0	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorobutadiene	ND		ug/l	2.0	--	1
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--	1
Hexachloroethane	ND		ug/l	2.0	--	1
Isophorone	ND		ug/l	5.0	--	1
Naphthalene	ND		ug/l	2.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA ¹	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01

Date Collected: 09/17/19 14:30

Client ID: EFFLUENT COMPOSITE

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	5.0	--	1
Benzo(a)anthracene	ND		ug/l	2.0	--	1
Benzo(a)pyrene	ND		ug/l	2.0	--	1
Benzo(b)fluoranthene	ND		ug/l	2.0	--	1
Benzo(k)fluoranthene	ND		ug/l	2.0	--	1
Chrysene	ND		ug/l	2.0	--	1
Acenaphthylene	ND		ug/l	2.0	--	1
Anthracene	ND		ug/l	2.0	--	1
Benzo(ghi)perylene	ND		ug/l	2.0	--	1
Fluorene	ND		ug/l	2.0	--	1
Phenanthrene	ND		ug/l	2.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--	1
Pyrene	ND		ug/l	2.0	--	1
4-Chloroaniline ¹	ND		ug/l	5.0	--	1
Dibenzofuran ¹	ND		ug/l	2.0	--	1
2-Methylnaphthalene ¹	ND		ug/l	2.0	--	1
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	5.0	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10	--	1
Pentachlorophenol	ND		ug/l	5.0	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol ¹	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--	1
Benzoic Acid ¹	ND		ug/l	50	--	1
Benzyl Alcohol ¹	ND		ug/l	2.0	--	1

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01

Date Collected: 09/17/19 14:30

Client ID: EFFLUENT COMPOSITE

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	74		25-87
Phenol-d6	56		16-65
Nitrobenzene-d5	91		42-122
2-Fluorobiphenyl	96		46-121
2,4,6-Tribromophenol	113		45-128
4-Terphenyl-d14	120		47-138

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Acenaphthene	ND		ug/l	2.0	--
Benzidine ¹	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene ¹	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA ¹	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--



Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
4-Chloroaniline ¹	ND		ug/l	5.0	--
Dibenzofuran ¹	ND		ug/l	2.0	--
2-Methylnaphthalene ¹	ND		ug/l	2.0	--
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	5.0	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Pentachlorophenol	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol ¹	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--
Benzoic Acid ¹	ND		ug/l	50	--
Benzyl Alcohol ¹	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		25-87
Phenol-d6	44		16-65
Nitrobenzene-d5	73		42-122
2-Fluorobiphenyl	83		46-121
2,4,6-Tribromophenol	84		45-128
4-Terphenyl-d14	104		47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Acenaphthene	96		-		60-132	-		48
Benzidine ¹	9		-		0-70	-		30
1,2,4-Trichlorobenzene	74		-		57-130	-		50
Hexachlorobenzene	111		-		8-142	-		55
Bis(2-chloroethyl)ether	84		-		43-126	-		108
2-Chloronaphthalene	93		-		65-120	-		24
3,3'-Dichlorobenzidine	49		-		8-213	-		108
2,4-Dinitrotoluene	131	Q	-		48-127	-		42
2,6-Dinitrotoluene	127		-		68-137	-		48
Azobenzene ¹	107		-		44-115	-		23
Fluoranthene	125	Q	-		43-121	-		66
4-Chlorophenyl phenyl ether	110		-		38-145	-		61
4-Bromophenyl phenyl ether	117		-		65-120	-		43
Bis(2-chloroisopropyl)ether	77		-		63-139	-		76
Bis(2-chloroethoxy)methane	90		-		49-165	-		54
Hexachlorobutadiene	76		-		38-120	-		62
Hexachlorocyclopentadiene ¹	72		-		7-118	-		35
Hexachloroethane	66		-		55-120	-		52
Isophorone	104		-		47-180	-		93
Naphthalene	82		-		36-120	-		65
Nitrobenzene	96		-		54-158	-		62
NDPA/DPA ¹	115	Q	-		45-112	-		36
n-Nitrosodi-n-propylamine	103		-		14-198	-		87

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Bis(2-ethylhexyl)phthalate	118		-		29-137	-		82
Butyl benzyl phthalate	140		-		1-140	-		60
Di-n-butylphthalate	123	Q	-		8-120	-		47
Di-n-octylphthalate	132		-		19-132	-		69
Diethyl phthalate	124	Q	-		1-120	-		100
Dimethyl phthalate	120		-		1-120	-		183
Benzo(a)anthracene	115		-		42-133	-		53
Benzo(a)pyrene	120		-		32-148	-		72
Benzo(b)fluoranthene	119		-		42-140	-		71
Benzo(k)fluoranthene	120		-		25-146	-		63
Chrysene	102		-		44-140	-		87
Acenaphthylene	113		-		54-126	-		74
Anthracene	104		-		43-120	-		66
Benzo(ghi)perylene	119		-		1-195	-		97
Fluorene	111		-		70-120	-		38
Phenanthrene	96		-		65-120	-		39
Dibenzo(a,h)anthracene	133		-		1-200	-		126
Indeno(1,2,3-cd)pyrene	111		-		1-151	-		99
Pyrene	114		-		70-120	-		49
4-Chloroaniline ¹	76		-		10-100	-		53
Dibenzofuran ¹	104		-		23-126	-		22
2-Methylnaphthalene ¹	92		-		40-109	-		18
n-Nitrosodimethylamine ¹	52		-		15-68	-		17

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCS %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
2,4,6-Trichlorophenol	123		-		52-129	-		58
p-Chloro-m-cresol ¹	124		-		68-130	-		73
2-Chlorophenol	93		-		36-120	-		61
2,4-Dichlorophenol	110		-		53-122	-		50
2,4-Dimethylphenol	97		-		42-120	-		58
2-Nitrophenol	108		-		45-167	-		55
4-Nitrophenol	96		-		13-129	-		131
2,4-Dinitrophenol	129		-		1-173	-		132
4,6-Dinitro-o-cresol	128		-		56-130	-		203
Pentachlorophenol	105		-		38-152	-		86
Phenol	56		-		17-120	-		64
2-Methylphenol ¹	98		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	97		-		35-103	-		26
2,4,5-Trichlorophenol ¹	126		-		47-126	-		28
Benzoic Acid ¹	47		-		2-55	-		27
Benzyl Alcohol ¹	92		-		31-103	-		23

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	73				25-87
Phenol-d6	55				16-65
Nitrobenzene-d5	87				42-122
2-Fluorobiphenyl	93				46-121
2,4,6-Tribromophenol	104				45-128
4-Terphenyl-d14	103				47-138

METALS

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942811-01

Date Collected: 09/17/19 14:30

Client ID: EFFLUENT COMPOSITE

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.05836		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00243		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Copper, Total	0.00235		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 23:11	EPA 245.1	3,245.1	MG
Molybdenum, Total	0.00231		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Nickel, Total	0.00349		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM
Zinc, Total	0.02622		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:41	EPA 3005A	3,200.8	AM



Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287393-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 22:55	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287409-1										
Aluminum, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287393-2								
Mercury, Total	89		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287409-2								
Aluminum, Total	102		-		85-115	-		
Antimony, Total	86		-		85-115	-		
Arsenic, Total	106		-		85-115	-		
Beryllium, Total	98		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	106		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	115		-		85-115	-		
Silver, Total	98		-		85-115	-		
Thallium, Total	107		-		85-115	-		
Zinc, Total	106		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-3 QC Sample: L1942718-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00451	90		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-5 QC Sample: L1942757-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00438	88		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-3 QC Sample: L1942810-01 Client ID: MS Sample												
Aluminum, Total	ND	2	2.127	106		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.3880	78		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1202	100		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05027	100		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05414	106		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1947	97		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2443	98		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5440	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.081	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4867	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1384	115		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04955	99		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1313	109		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5300	106		-	-		70-130	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY1/3

Lab Number: L1942811

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-5 QC Sample: L1942970-01 Client ID: MS Sample									
Aluminum, Total	2.005	2	4.325	116	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4256	85	-	-	70-130	-	20
Arsenic, Total	0.0099	0.12	0.1392	108	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.05117	102	-	-	70-130	-	20
Cadmium, Total	0.00024	0.051	0.05451	106	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2066	103	-	-	70-130	-	20
Copper, Total	0.01225	0.25	0.2686	102	-	-	70-130	-	20
Lead, Total	0.01672	0.51	0.5937	113	-	-	70-130	-	20
Molybdenum, Total	0.0050	1	1.140	113	-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5351	107	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1311	109	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05210	104	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1360	113	-	-	70-130	-	20
Zinc, Total	0.05371	0.5	0.6190	113	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-4 QC Sample: L1942718-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-6 QC Sample: L1942757-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-4 QC Sample: L1942810-01 Client ID: DUP Sample						
Lead, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-6 QC Sample: L1942970-01 Client ID: DUP Sample						
Aluminum, Total	2.005	1.886	mg/l	6		20
Antimony, Total	ND	ND	mg/l	NC		20
Cadmium, Total	0.00024	0.00022	mg/l	8		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.01225	0.01172	mg/l	4		20
Lead, Total	0.01672	0.01659	mg/l	1		20
Nickel, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.05371	0.05078	mg/l	6		20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1942811-01**Date Collected:** 09/17/19 14:30**Client ID:** EFFLUENT COMPOSITE**Date Received:** 09/18/19**Sample Location:** BROOK STREET, AYER, MA 01432**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/19/19 14:40	121,2540D	DR
Nitrogen, Ammonia	0.106		mg/l	0.075	--	1	09/19/19 17:18	09/19/19 23:08	121,4500NH3-BH	AT
Phosphorus, Total	0.119		mg/l	0.010	--	1	09/20/19 10:00	09/23/19 12:12	121,4500P-E	SD
BOD, 5 day	2.2		mg/l	2.0	NA	1	09/19/19 06:50	09/24/19 01:30	121,5210B	TE



Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1942811-02**Date Collected:** 09/17/19 14:30**Client ID:** EFFLUENT GRAB**Date Received:** 09/18/19**Sample Location:** BROOK STREET, AYER, MA 01432**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:44	121,4500CN-CE	LH
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/18/19 16:35	09/18/19 17:15	74,1664A	ML
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 14:15	09/18/19 14:29	121,3500CR-B	JO



Project Name: AYER IPP SAMPLING DAY1/3
Project Number: BROOK STREET WWTF

Lab Number: L1942811
Report Date: 09/25/19

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285691-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 14:15	09/18/19 14:29	121,3500CR-B	JO
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285741-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/18/19 16:35	09/18/19 17:15	74,1664A	ML
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285970-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/19/19 06:50	09/24/19 01:30	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286004-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/19/19 14:40	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286066-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:34	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286156-13										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/19/19 17:18	09/19/19 22:43	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286503-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/20/19 10:00	09/23/19 11:47	121,4500P-E	SD



Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY1/3**Project Number:** BROOK STREET WWTF**Lab Number:** L1942811**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285691-2								
Chromium, Hexavalent	100		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285741-2								
Oil & Grease, Hem-Grav	93		-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285970-2								
BOD, 5 day	90		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286066-2								
Cyanide, Total	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286156-14								
Nitrogen, Ammonia	95		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286503-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285691-4 QC Sample: L1942811-02 Client ID: EFFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.102	102		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285741-4 QC Sample: L1940432-03 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	80	67	84		-	-		78-114	-		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285970-4 QC Sample: L1942883-01 Client ID: MS Sample												
BOD, 5 day	ND	100	71	71		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-4 QC Sample: L1942830-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.194	97		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286156-16 QC Sample: L1942790-05 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.70	92		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-3 QC Sample: L1941364-01 Client ID: MS Sample												
Phosphorus, Total	0.309	0.5	0.790	96		-	-		75-125	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY1/3

Project Number: BROOK STREET WWTF

Lab Number: L1942811

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285691-3 QC Sample: L1942811-02 Client ID: EFFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285741-3 QC Sample: L1942285-05 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285970-3 QC Sample: L1942883-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286004-2 QC Sample: L1942590-04 Client ID: DUP Sample						
Solids, Total Suspended	4200	4100	mg/l	2		29
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-3 QC Sample: L1942830-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286156-15 QC Sample: L1942790-05 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-4 QC Sample: L1941370-05 Client ID: DUP Sample						
Phosphorus, Total	3.73	3.70	mg/l	1		20

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**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(*)
L1942811-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.9	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1942811-01B	Plastic 500ml unpreserved	A	7	7	4.9	Y	Absent		BOD-5210(2)
L1942811-01C	Plastic 950ml unpreserved	A	7	7	4.9	Y	Absent		TSS-2540(7)
L1942811-01D	Plastic 500ml H2SO4 preserved	A	<2	<2	4.9	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1942811-01E	Amber 1000ml Na2S2O3	A	7	7	4.9	Y	Absent		625.1(7)
L1942811-01F	Amber 1000ml Na2S2O3	A	7	7	4.9	Y	Absent		625.1(7)
L1942811-02A	Vial Na2S2O3 preserved	A	NA		4.9	Y	Absent		624.1(3)
L1942811-02B	Vial Na2S2O3 preserved	A	NA		4.9	Y	Absent		624.1(3)
L1942811-02C	Vial Na2S2O3 preserved	A	NA		4.9	Y	Absent		624.1(3)
L1942811-02D	Plastic 250ml unpreserved	A	7	7	4.9	Y	Absent		HEXCR-3500(1)
L1942811-02E	Plastic 250ml NaOH preserved	A	>12	>12	4.9	Y	Absent		TCN-4500(14)
L1942811-02F	Amber 1000ml HCl preserved	A	NA		4.9	Y	Absent		OG-1664(28)
L1942811-02G	Amber 1000ml HCl preserved	A	NA		4.9	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

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.
LCS D	- 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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY1/3**Lab Number:** L1942811**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY1/3
Project Number: BROOK STREET WWTF

Lab Number: L1942811
Report Date: 09/25/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

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 its 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Lab Report To: Hoyle Tanner

EST Invoice To: Hoyle Tanner

5555-Q-xx
Q#00978

11942811

☐ **Rush** _____ Day Turnaround

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

Description: Town of Ayer IPP Sampling Day 1 of 3 (Effluent)

Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes																																										
		Size	Type	#	Date	Time																																													
Effluent Composite (Time)	1	250 ml	P	1	9/16-17	1430	HNO3	Total Metals *See Comments Below*	pH = 7.99																																										
Effluent Composite	1	1 L	P	1			None	TSS	Flow = N/A																																										
Effluent Composite	1	500 ml	P	1			H2SO4	NH3, T-Phos	Temp = 21.2																																										
Effluent Composite	1	500 ml	P	1			None	BOD																																											
Effluent Composite	1	1 L	G	2	✓	✓	Na2S2O3	Semi-VOA (625.1)																																											
Effluent Grab	1	40 ml	V	3	9/17	1430	Na2S2O3	VOA (624.1)																																											
Effluent Grab	1	250 ml	P	1	✓	✓	NaOH	Total CN																																											
Effluent Grab (4x)	1	1 L	G	2	9/16-17	0745-1430	HCl	Oil & Grease																																											
Effluent Grab	1	500 ml	P	1	9/17	1430	None	CrVI																																											
<table border="1"> <thead> <tr> <th>Sampler's Name (Print)</th> <th>Signature</th> <th>DATE</th> <th>TIME</th> <th>NUMBER</th> <th>TRANSFERS RELINQUISHED BY</th> <th>TRANSFERS ACCEPTED BY</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td>Matt Gould</td> <td><i>[Signature]</i></td> <td>9/17/19</td> <td>1430</td> <td>1</td> <td><i>[Signature]</i></td> <td><i>[Signature]</i></td> <td>9/16/19</td> <td>0935</td> </tr> <tr> <td colspan="4" rowspan="4"> Additional Comments: Total Metals to include: Al, Sb, As, Be, Cd, Cu, Cr, Pb, Hg, Mo, Ni, Se, Ag, Ti, Zn *Please use lowest possible detection limit for each parameter. </td> <td>2</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Sampler's Name (Print)	Signature	DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	Matt Gould	<i>[Signature]</i>	9/17/19	1430	1	<i>[Signature]</i>	<i>[Signature]</i>	9/16/19	0935	Additional Comments: Total Metals to include: Al, Sb, As, Be, Cd, Cu, Cr, Pb, Hg, Mo, Ni, Se, Ag, Ti, Zn *Please use lowest possible detection limit for each parameter.				2					3					4					5				
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				3																																															
				4																																															
				5																																															
*All samples chilled to 4 degrees celsius.																																																			



ANALYTICAL REPORT

Lab Number:	L1943395
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 3
Project Number:	BROOK STREET WWTF
Report Date:	09/27/19

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: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943395
Report Date: 09/27/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943395-01	EFFLUENT COMPOSITE	WATER	BROOK STREET, AYER, MA 01432	09/19/19 14:15	09/20/19
L1943395-02	EFFLUENT GRAB	WATER	BROOK STREET, AYER, MA 01432	09/19/19 14:15	09/20/19

Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943395
Report Date: 09/27/19

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: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943395
Report Date: 09/27/19

Case Narrative (continued)

Total Metals

The WG1288893-4 Laboratory Duplicate RPD for molybdenum (49%), performed on L1943395-01, 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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/27/19

METALS

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943395**Project Number:** BROOK STREET WWTF**Report Date:** 09/27/19**SAMPLE RESULTS**

Lab ID: L1943395-01

Date Collected: 09/19/19 14:15

Client ID: EFFLUENT COMPOSITE

Date Received: 09/20/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.08438		mg/l	0.01000	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/26/19 12:37	09/26/19 20:13	EPA 245.1	3,245.1	AL
Molybdenum, Total	0.00249		mg/l	0.00200	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Nickel, Total	0.00289		mg/l	0.00200	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM
Zinc, Total	0.02339		mg/l	0.01000	--	1	09/26/19 09:53	09/26/19 16:02	EPA 3005A	3,200.8	AM

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943395

Project Number: BROOK STREET WWTF

Report Date: 09/27/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1288893-1									
Aluminum, Total	ND	mg/l	0.01000	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Antimony, Total	ND	mg/l	0.00400	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Beryllium, Total	ND	mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.00200	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Thallium, Total	ND	mg/l	0.00100	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	09/26/19 09:53	09/26/19 15:45	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1288987-1									
Mercury, Total	ND	mg/l	0.00020	--	1	09/26/19 12:37	09/26/19 19:19	3,245.1	AL

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943395

Report Date: 09/27/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1288893-2								
Aluminum, Total	113		-		85-115	-		
Antimony, Total	88		-		85-115	-		
Beryllium, Total	106		-		85-115	-		
Cadmium, Total	112		-		85-115	-		
Chromium, Total	110		-		85-115	-		
Lead, Total	108		-		85-115	-		
Molybdenum, Total	102		-		85-115	-		
Nickel, Total	111		-		85-115	-		
Selenium, Total	102		-		85-115	-		
Silver, Total	91		-		85-115	-		
Thallium, Total	109		-		85-115	-		
Zinc, Total	115		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1288987-2								
Mercury, Total	86		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943395

Report Date: 09/27/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1288893-3 QC Sample: L1943395-01 Client ID: EFFLUENT COMPOSITE												
Aluminum, Total	0.08438	2	2.473	119		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.4954	99		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05798	116		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05836	114		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2222	111		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5631	110		-	-		70-130	-		20
Molybdenum, Total	0.00249	1	1.081	108		-	-		70-130	-		20
Nickel, Total	0.00289	0.5	0.5602	111		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1465	122		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04727	94		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1358	113		-	-		70-130	-		20
Zinc, Total	0.02339	0.5	0.5873	113		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1288987-3 QC Sample: L1942499-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00279	56	Q	-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1288987-5 QC Sample: L1942499-02 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00417	83		-	-		70-130	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943395

Report Date: 09/27/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1288893-4 QC Sample: L1943395-01 Client ID: EFFLUENT COMPOSITE						
Aluminum, Total	0.08438	0.07903	mg/l	7		20
Antimony, Total	ND	ND	mg/l	NC		20
Beryllium, Total	ND	ND	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Molybdenum, Total	0.00249	0.00411	mg/l	49	Q	20
Nickel, Total	0.00289	0.00301	mg/l	4		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Thallium, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.02339	0.02176	mg/l	7		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1288987-4 QC Sample: L1942499-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1288987-6 QC Sample: L1942499-02 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943395**Report Date:** 09/27/19**SAMPLE RESULTS****Lab ID:** L1943395-02**Client ID:** EFFLUENT GRAB**Sample Location:** BROOK STREET, AYER, MA 01432**Date Collected:** 09/19/19 14:15**Date Received:** 09/20/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 12:58	09/20/19 13:05	121,3500CR-B	MR



Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943395**Project Number:** BROOK STREET WWTF**Report Date:** 09/27/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286685-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 12:58	09/20/19 13:04	121,3500CR-B	MR

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943395**Report Date:** 09/27/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286685-2								
Chromium, Hexavalent	106		-		85-115	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943395

Project Number: BROOK STREET WWTF

Report Date: 09/27/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286685-4 QC Sample: L1943395-02 Client ID: EFFLUENT GRAB												
Chromium, Hexavalent	ND	0.1	0.104	104		-	-		85-115	-		20

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943395**Report Date:** 09/27/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286685-3 QC Sample: L1943395-02 Client ID: EFFLUENT GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943395**Project Number:** BROOK STREET WWTF**Report Date:** 09/27/19**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**

L1943395-01A Plastic 250ml HNO3 preserved

L1943395-02A Plastic 250ml unpreserved

Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
A	<2	<2	2.0	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),AG-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
A	7	7	2.0	Y	Absent		HEXCR-3500(1)

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943395**Project Number:** BROOK STREET WWTF**Report Date:** 09/27/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943395**Project Number:** BROOK STREET WWTF**Report Date:** 09/27/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943395
Report Date: 09/27/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.

EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

P - Plastic
G - Glass
V - VOA
B - Bacteria

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Alpha Analytical Labs
(508) 898-9220

Lab Report To:

5555-Q-xx
Q#00978

Fax #: (603) 669-4168

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ANALYTICAL REPORT

Lab Number:	L1943012
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING SLUDGE
Project Number:	BROOK STREET WWTF
Report Date:	09/30/19

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: AYER IPP SAMPLING SLUDGE
Project Number: BROOK STREET WWTF

Lab Number: L1943012
Report Date: 09/30/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943012-01	SLUDGE GRAB	LIQUID	BROOK STREET, AYER, MA 01432	09/18/19 08:25	09/18/19
L1943012-02	SLUDGE GRAB	SLUDGE	BROOK STREET, AYER, MA 01432	09/18/19 08:25	09/18/19

Project Name: AYER IPP SAMPLING SLUDGE
Project Number: BROOK STREET WWTF

Lab Number: L1943012
Report Date: 09/30/19

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: AYER IPP SAMPLING SLUDGE
Project Number: BROOK STREET WWTF

Lab Number: L1943012
Report Date: 09/30/19

Case Narrative (continued)

Sample Receipt

L1943012-01: The sample was received above the appropriate pH for the Total Phosphorus analysis. The pH was not adjusted due to the matrix of the sample.

L1943012-01: The analysis of Volatile Organics by 624 could not be performed due to the sample matrix.

L1943012-02: The sample was received in an inappropriate container for the Volatile Organics analysis. An aliquot was taken from an unpreserved container and preserved appropriately.

Volatile Organics

L1943012-02: The analysis of Volatile Organics by EPA Method 5035/8260 Low Level could not be performed due to the elevated concentrations of non-target compounds in the sample.

Semivolatile Organics by Method 625

L1943012-01: The sample has elevated detection limits due to the limited sample volume utilized during extraction, as required by the sample matrix. The container was not rinsed as prescribed by the method.

L1943012-01: The sample has elevated detection limits due to the dilution required by the sample matrix.

L1943012-01: The surrogate recoveries are below the acceptance criteria for 2-fluorophenol (0%), phenol-d6 (0%), nitrobenzene-d5 (0%), 2-fluorobiphenyl (0%), 2,4,6-tribromophenol (0%) and 4-terphenyl-d14 (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/30/19

ORGANICS

VOLATILES

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS**

Lab ID: L1943012-02
 Client ID: SLUDGE GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/18/19 08:25
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Sludge
 Analytical Method: 1,8260C
 Analytical Date: 09/29/19 16:24
 Analyst: NLK
 Percent Solids: 3%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/kg	18000	--	1
1,1-Dichloroethane	ND		ug/kg	3600	--	1
Chloroform	ND		ug/kg	5400	--	1
Carbon tetrachloride	ND		ug/kg	3600	--	1
1,2-Dichloropropane	ND		ug/kg	3600	--	1
Dibromochloromethane	ND		ug/kg	3600	--	1
1,1,2-Trichloroethane	ND		ug/kg	3600	--	1
Tetrachloroethene	ND		ug/kg	1800	--	1
Chlorobenzene	ND		ug/kg	1800	--	1
Trichlorofluoromethane	ND		ug/kg	14000	--	1
1,2-Dichloroethane	ND		ug/kg	3600	--	1
1,1,1-Trichloroethane	ND		ug/kg	1800	--	1
Bromodichloromethane	ND		ug/kg	1800	--	1
trans-1,3-Dichloropropene	ND		ug/kg	3600	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1800	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1800	--	1
1,1-Dichloropropene	ND		ug/kg	1800	--	1
Bromoform	ND		ug/kg	14000	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1800	--	1
Benzene	ND		ug/kg	1800	--	1
Toluene	5400		ug/kg	3600	--	1
Ethylbenzene	ND		ug/kg	3600	--	1
Chloromethane	ND		ug/kg	14000	--	1
Bromomethane	ND		ug/kg	7200	--	1
Vinyl chloride	ND		ug/kg	3600	--	1
Chloroethane	ND		ug/kg	7200	--	1
1,1-Dichloroethene	ND		ug/kg	3600	--	1
trans-1,2-Dichloroethene	ND		ug/kg	5400	--	1

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS**

Lab ID: L1943012-02
 Client ID: SLUDGE GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/18/19 08:25
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/kg	1800	--	1
1,2-Dichlorobenzene	ND		ug/kg	7200	--	1
1,3-Dichlorobenzene	ND		ug/kg	7200	--	1
1,4-Dichlorobenzene	ND		ug/kg	7200	--	1
Methyl tert butyl ether	ND		ug/kg	7200	--	1
p/m-Xylene	ND		ug/kg	7200	--	1
o-Xylene	ND		ug/kg	3600	--	1
Xylenes, Total	ND		ug/kg	3600	--	1
cis-1,2-Dichloroethene	ND		ug/kg	3600	--	1
1,2-Dichloroethene, Total	ND		ug/kg	3600	--	1
Dibromomethane	ND		ug/kg	7200	--	1
1,4-Dichlorobutane	ND		ug/kg	36000	--	1
1,2,3-Trichloropropane	ND		ug/kg	7200	--	1
Styrene	ND		ug/kg	3600	--	1
Dichlorodifluoromethane	ND		ug/kg	36000	--	1
Acetone	ND		ug/kg	36000	--	1
Carbon disulfide	ND		ug/kg	36000	--	1
2-Butanone	ND		ug/kg	36000	--	1
Vinyl acetate	ND		ug/kg	36000	--	1
4-Methyl-2-pentanone	ND		ug/kg	36000	--	1
2-Hexanone	ND		ug/kg	36000	--	1
Ethyl methacrylate	ND		ug/kg	36000	--	1
Acrylonitrile	ND		ug/kg	14000	--	1
Bromochloromethane	ND		ug/kg	7200	--	1
Tetrahydrofuran	ND		ug/kg	14000	--	1
2,2-Dichloropropane	ND		ug/kg	7200	--	1
1,2-Dibromoethane	ND		ug/kg	3600	--	1
1,3-Dichloropropane	ND		ug/kg	7200	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1800	--	1
Bromobenzene	ND		ug/kg	7200	--	1
n-Butylbenzene	ND		ug/kg	3600	--	1
sec-Butylbenzene	ND		ug/kg	3600	--	1
tert-Butylbenzene	ND		ug/kg	7200	--	1
o-Chlorotoluene	ND		ug/kg	7200	--	1
p-Chlorotoluene	ND		ug/kg	7200	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	11000	--	1
Hexachlorobutadiene	ND		ug/kg	14000	--	1



Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS****Lab ID:** L1943012-02**Date Collected:** 09/18/19 08:25**Client ID:** SLUDGE GRAB**Date Received:** 09/18/19**Sample Location:** BROOK STREET, AYER, MA 01432**Field Prep:** Not Specified**Sample Depth:**

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Isopropylbenzene	ND		ug/kg	3600	--	1
p-Isopropyltoluene	ND		ug/kg	3600	--	1
Naphthalene	ND		ug/kg	14000	--	1
n-Propylbenzene	ND		ug/kg	3600	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	7200	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7200	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7200	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7200	--	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	18000	--	1
Ethyl ether	ND		ug/kg	7200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	103		70-130

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 09/29/19 08:14
 Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1290298-5					
Methylene chloride	ND		ug/kg	250	--
1,1-Dichloroethane	ND		ug/kg	50	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	50	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	50	--
2-Chloroethylvinyl ether	ND		ug/kg	1000	--
Tetrachloroethene	ND		ug/kg	25	--
Chlorobenzene	ND		ug/kg	25	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	25	--
Bromodichloromethane	ND		ug/kg	25	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	25	--
1,3-Dichloropropene, Total	ND		ug/kg	25	--
1,1-Dichloropropene	ND		ug/kg	25	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	25	--
Benzene	ND		ug/kg	25	--
Toluene	ND		ug/kg	50	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	50	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--

Project Name: AYER IPP SAMPLING SLUDGE
Project Number: BROOK STREET WWTF

Lab Number: L1943012
Report Date: 09/30/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 09/29/19 08:14
 Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1290298-5					
Trichloroethene	ND		ug/kg	25	--
1,2-Dichlorobenzene	ND		ug/kg	100	--
1,3-Dichlorobenzene	ND		ug/kg	100	--
1,4-Dichlorobenzene	ND		ug/kg	100	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	50	--
Xylenes, Total	ND		ug/kg	50	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	100	--
1,4-Dichlorobutane	ND		ug/kg	500	--
1,2,3-Trichloropropane	ND		ug/kg	100	--
Styrene	ND		ug/kg	50	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	500	--
Carbon disulfide	ND		ug/kg	500	--
2-Butanone	ND		ug/kg	500	--
Vinyl acetate	ND		ug/kg	500	--
4-Methyl-2-pentanone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Ethyl methacrylate	ND		ug/kg	500	--
Acrolein	ND		ug/kg	1200	--
Acrylonitrile	ND		ug/kg	200	--
Bromochloromethane	ND		ug/kg	100	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	100	--
1,2-Dibromoethane	ND		ug/kg	50	--
1,3-Dichloropropane	ND		ug/kg	100	--

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 09/29/19 08:14
 Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1290298-5					
1,1,1,2-Tetrachloroethane	ND		ug/kg	25	--
Bromobenzene	ND		ug/kg	100	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	100	--
1,3,5-Trichlorobenzene	ND		ug/kg	100	--
o-Chlorotoluene	ND		ug/kg	100	--
p-Chlorotoluene	ND		ug/kg	100	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	150	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	100	--
1,2,4-Trichlorobenzene	ND		ug/kg	100	--
1,3,5-Trimethylbenzene	ND		ug/kg	100	--
1,2,4-Trimethylbenzene	ND		ug/kg	100	--
trans-1,4-Dichloro-2-butene	ND		ug/kg	250	--
Halothane	ND		ug/kg	500	--
Ethyl ether	ND		ug/kg	100	--
Methyl Acetate	ND		ug/kg	200	--
Ethyl Acetate	ND		ug/kg	500	--
Isopropyl Ether	ND		ug/kg	100	--
Cyclohexane	ND		ug/kg	500	--
Tert-Butyl Alcohol	ND		ug/kg	1000	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	100	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	100	--
1,4-Dioxane	ND		ug/kg	4000	--

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19

Method Blank Analysis Batch Quality Control

Analytical Method: 1,8260C
 Analytical Date: 09/29/19 08:14
 Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1290298-5					
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/kg	200	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	107		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1290298-3 WG1290298-4								
Methylene chloride	103		100		70-130	3		30
1,1-Dichloroethane	102		101		70-130	1		30
Chloroform	104		102		70-130	2		30
Carbon tetrachloride	112		110		70-130	2		30
1,2-Dichloropropane	99		100		70-130	1		30
Dibromochloromethane	99		102		70-130	3		30
1,1,2-Trichloroethane	102		103		70-130	1		30
2-Chloroethylvinyl ether	90		89		70-130	1		30
Tetrachloroethene	107		106		70-130	1		30
Chlorobenzene	100		100		70-130	0		30
Trichlorofluoromethane	138		132		70-139	4		30
1,2-Dichloroethane	108		108		70-130	0		30
1,1,1-Trichloroethane	112		111		70-130	1		30
Bromodichloromethane	113		112		70-130	1		30
trans-1,3-Dichloropropene	102		102		70-130	0		30
cis-1,3-Dichloropropene	111		111		70-130	0		30
1,1-Dichloropropene	108		107		70-130	1		30
Bromoform	96		100		70-130	4		30
1,1,2,2-Tetrachloroethane	94		96		70-130	2		30
Benzene	105		105		70-130	0		30
Toluene	98		96		70-130	2		30
Ethylbenzene	103		101		70-130	2		30
Chloromethane	94		93		52-130	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1290298-3 WG1290298-4								
Bromomethane	139		133		57-147	4		30
Vinyl chloride	120		116		67-130	3		30
Chloroethane	128		124		50-151	3		30
1,1-Dichloroethene	125		117		65-135	7		30
trans-1,2-Dichloroethene	106		104		70-130	2		30
Trichloroethene	113		112		70-130	1		30
1,2-Dichlorobenzene	98		98		70-130	0		30
1,3-Dichlorobenzene	98		98		70-130	0		30
1,4-Dichlorobenzene	97		97		70-130	0		30
Methyl tert butyl ether	98		100		66-130	2		30
p/m-Xylene	106		103		70-130	3		30
o-Xylene	106		104		70-130	2		30
cis-1,2-Dichloroethene	103		103		70-130	0		30
Dibromomethane	113		112		70-130	1		30
1,4-Dichlorobutane	84		87		70-130	4		30
1,2,3-Trichloropropane	94		93		68-130	1		30
Styrene	105		102		70-130	3		30
Dichlorodifluoromethane	103		101		30-146	2		30
Acetone	110		101		54-140	9		30
Carbon disulfide	124		114		59-130	8		30
2-Butanone	93		95		70-130	2		30
Vinyl acetate	98		96		70-130	2		30
4-Methyl-2-pentanone	83		84		70-130	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1290298-3 WG1290298-4								
2-Hexanone	81		79		70-130	3		30
Ethyl methacrylate	85		85		70-130	0		30
Acrolein	93		90		70-130	3		30
Acrylonitrile	93		92		70-130	1		30
Bromochloromethane	109		108		70-130	1		30
Tetrahydrofuran	95		92		66-130	3		30
2,2-Dichloropropane	114		110		70-130	4		30
1,2-Dibromoethane	101		102		70-130	1		30
1,3-Dichloropropane	98		100		69-130	2		30
1,1,1,2-Tetrachloroethane	107		106		70-130	1		30
Bromobenzene	91		93		70-130	2		30
n-Butylbenzene	105		104		70-130	1		30
sec-Butylbenzene	97		98		70-130	1		30
tert-Butylbenzene	94		94		70-130	0		30
1,3,5-Trichlorobenzene	103		103		70-139	0		30
o-Chlorotoluene	94		94		70-130	0		30
p-Chlorotoluene	93		96		70-130	3		30
1,2-Dibromo-3-chloropropane	88		87		68-130	1		30
Hexachlorobutadiene	98		96		67-130	2		30
Isopropylbenzene	94		92		70-130	2		30
p-Isopropyltoluene	99		99		70-130	0		30
Naphthalene	95		94		70-130	1		30
n-Propylbenzene	96		96		70-130	0		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1290298-3 WG1290298-4								
1,2,3-Trichlorobenzene	98		98		70-130	0		30
1,2,4-Trichlorobenzene	101		100		70-130	1		30
1,3,5-Trimethylbenzene	95		95		70-130	0		30
1,2,4-Trimethylbenzene	96		96		70-130	0		30
trans-1,4-Dichloro-2-butene	93		92		70-130	1		30
Halothane	109		109		70-130	0		20
Ethyl ether	129		124		67-130	4		30
Methyl Acetate	94		95		65-130	1		30
Ethyl Acetate	95		95		70-130	0		30
Isopropyl Ether	90		91		66-130	1		30
Cyclohexane	98		97		70-130	1		30
Tert-Butyl Alcohol	92		94		70-130	2		30
Ethyl-Tert-Butyl-Ether	93		95		70-130	2		30
Tertiary-Amyl Methyl Ether	100		99		70-130	1		30
1,4-Dioxane	102		96		65-136	6		30
1,1,2-Trichloro-1,2,2-Trifluoroethane	122		114		70-130	7		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	106		105		70-130
Toluene-d8	97		96		70-130
4-Bromofluorobenzene	88		90		70-130
Dibromofluoromethane	107		108		70-130

SEMIVOLATILES

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS**

Lab ID: L1943012-01 D
 Client ID: SLUDGE GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/18/19 08:25
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Liquid
 Analytical Method: 129,625.1
 Analytical Date: 09/24/19 17:26
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/22/19 12:36

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	200	--	20
Benzidine ¹	ND		ug/l	2000	--	20
1,2,4-Trichlorobenzene	ND		ug/l	500	--	20
Hexachlorobenzene	ND		ug/l	200	--	20
Bis(2-chloroethyl)ether	ND		ug/l	200	--	20
2-Chloronaphthalene	ND		ug/l	200	--	20
3,3'-Dichlorobenzidine	ND		ug/l	500	--	20
2,4-Dinitrotoluene	ND		ug/l	500	--	20
2,6-Dinitrotoluene	ND		ug/l	500	--	20
Azobenzene ¹	ND		ug/l	200	--	20
Fluoranthene	ND		ug/l	200	--	20
4-Chlorophenyl phenyl ether	ND		ug/l	200	--	20
4-Bromophenyl phenyl ether	ND		ug/l	200	--	20
Bis(2-chloroisopropyl)ether	ND		ug/l	200	--	20
Bis(2-chloroethoxy)methane	ND		ug/l	500	--	20
Hexachlorobutadiene	ND		ug/l	200	--	20
Hexachlorocyclopentadiene ¹	ND		ug/l	1000	--	20
Hexachloroethane	ND		ug/l	200	--	20
Isophorone	ND		ug/l	500	--	20
Naphthalene	ND		ug/l	200	--	20
Nitrobenzene	ND		ug/l	200	--	20
NDPA/DPA ¹	ND		ug/l	200	--	20
n-Nitrosodi-n-propylamine	ND		ug/l	500	--	20
Bis(2-ethylhexyl)phthalate	ND		ug/l	220	--	20
Butyl benzyl phthalate	ND		ug/l	500	--	20
Di-n-butylphthalate	ND		ug/l	500	--	20
Di-n-octylphthalate	ND		ug/l	500	--	20
Diethyl phthalate	ND		ug/l	500	--	20

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS**

Lab ID: L1943012-01 D
 Client ID: SLUDGE GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/18/19 08:25
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	500	--	20
Benzo(a)anthracene	ND		ug/l	200	--	20
Benzo(a)pyrene	ND		ug/l	200	--	20
Benzo(b)fluoranthene	ND		ug/l	200	--	20
Benzo(k)fluoranthene	ND		ug/l	200	--	20
Chrysene	ND		ug/l	200	--	20
Acenaphthylene	ND		ug/l	200	--	20
Anthracene	ND		ug/l	200	--	20
Benzo(ghi)perylene	ND		ug/l	200	--	20
Fluorene	ND		ug/l	200	--	20
Phenanthrene	ND		ug/l	200	--	20
Dibenzo(a,h)anthracene	ND		ug/l	200	--	20
Indeno(1,2,3-cd)pyrene	ND		ug/l	200	--	20
Pyrene	ND		ug/l	200	--	20
4-Chloroaniline ¹	ND		ug/l	500	--	20
Dibenzofuran ¹	ND		ug/l	200	--	20
2-Methylnaphthalene ¹	ND		ug/l	200	--	20
n-Nitrosodimethylamine ¹	ND		ug/l	200	--	20
2,4,6-Trichlorophenol	ND		ug/l	500	--	20
p-Chloro-m-cresol ¹	ND		ug/l	200	--	20
2-Chlorophenol	ND		ug/l	200	--	20
2,4-Dichlorophenol	ND		ug/l	500	--	20
2,4-Dimethylphenol	ND		ug/l	500	--	20
2-Nitrophenol	ND		ug/l	500	--	20
4-Nitrophenol	ND		ug/l	1000	--	20
2,4-Dinitrophenol	ND		ug/l	2000	--	20
4,6-Dinitro-o-cresol	ND		ug/l	1000	--	20
Pentachlorophenol	ND		ug/l	500	--	20
Phenol	ND		ug/l	500	--	20
2-Methylphenol ¹	ND		ug/l	500	--	20
3-Methylphenol/4-Methylphenol ¹	2300		ug/l	500	--	20
2,4,5-Trichlorophenol ¹	ND		ug/l	500	--	20
Benzoic Acid ¹	ND		ug/l	5000	--	20
Benzyl Alcohol ¹	ND		ug/l	200	--	20

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS**

Lab ID: L1943012-01 D
 Client ID: SLUDGE GRAB
 Sample Location: BROOK STREET, AYER, MA 01432

Date Collected: 09/18/19 08:25
 Date Received: 09/18/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	0	Q	25-87
Phenol-d6	0	Q	16-65
Nitrobenzene-d5	0	Q	42-122
2-Fluorobiphenyl	0	Q	46-121
2,4,6-Tribromophenol	0	Q	45-128
4-Terphenyl-d14	0	Q	47-138

Project Name: AYER IPP SAMPLING SLUDGE
Project Number: BROOK STREET WWTF

Lab Number: L1943012
Report Date: 09/30/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
Analytical Date: 09/23/19 11:37
Analyst: SZ

Extraction Method: EPA 625.1
Extraction Date: 09/22/19 12:36

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1287150-1					
Acenaphthene	ND		ug/l	2.0	--
Benzidine ¹	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene ¹	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA ¹	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 11:37
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/22/19 12:36

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1287150-1					
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
4-Chloroaniline ¹	ND		ug/l	5.0	--
Dibenzofuran ¹	ND		ug/l	2.0	--
2-Methylnaphthalene ¹	ND		ug/l	2.0	--
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	5.0	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Pentachlorophenol	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol ¹	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING SLUDGE
Project Number: BROOK STREET WWTF

Lab Number: L1943012
Report Date: 09/30/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 11:37
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/22/19 12:36

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1287150-1					
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--
Benzoic Acid ¹	ND		ug/l	50	--
Benzyl Alcohol ¹	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	40		25-87
Phenol-d6	25		16-65
Nitrobenzene-d5	53		42-122
2-Fluorobiphenyl	62		46-121
2,4,6-Tribromophenol	58		45-128
4-Terphenyl-d14	64		47-138

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287150-3								
Acenaphthene	84		-		60-132	-		48
Benzidine ¹	53		-		0-70	-		30
1,2,4-Trichlorobenzene	76		-		57-130	-		50
Hexachlorobenzene	93		-		8-142	-		55
Bis(2-chloroethyl)ether	72		-		43-126	-		108
2-Chloronaphthalene	86		-		65-120	-		24
3,3'-Dichlorobenzidine	38		-		8-213	-		108
2,4-Dinitrotoluene	107		-		48-127	-		42
2,6-Dinitrotoluene	105		-		68-137	-		48
Azobenzene ¹	89		-		44-115	-		23
Fluoranthene	101		-		43-121	-		66
4-Chlorophenyl phenyl ether	92		-		38-145	-		61
4-Bromophenyl phenyl ether	97		-		65-120	-		43
Bis(2-chloroisopropyl)ether	67		-		63-139	-		76
Bis(2-chloroethoxy)methane	77		-		49-165	-		54
Hexachlorobutadiene	83		-		38-120	-		62
Hexachlorocyclopentadiene ¹	79		-		7-118	-		35
Hexachloroethane	73		-		55-120	-		52
Isophorone	88		-		47-180	-		93
Naphthalene	78		-		36-120	-		65
Nitrobenzene	84		-		54-158	-		62
NDPA/DPA ¹	94		-		45-112	-		36
n-Nitrosodi-n-propylamine	88		-		14-198	-		87

Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287150-3								
Bis(2-ethylhexyl)phthalate	92		-		29-137	-		82
Butyl benzyl phthalate	111		-		1-140	-		60
Di-n-butylphthalate	100		-		8-120	-		47
Di-n-octylphthalate	104		-		19-132	-		69
Diethyl phthalate	102		-		1-120	-		100
Dimethyl phthalate	101		-		1-120	-		183
Benzo(a)anthracene	92		-		42-133	-		53
Benzo(a)pyrene	92		-		32-148	-		72
Benzo(b)fluoranthene	94		-		42-140	-		71
Benzo(k)fluoranthene	91		-		25-146	-		63
Chrysene	82		-		44-140	-		87
Acenaphthylene	100		-		54-126	-		74
Anthracene	87		-		43-120	-		66
Benzo(ghi)perylene	95		-		1-195	-		97
Fluorene	93		-		70-120	-		38
Phenanthrene	80		-		65-120	-		39
Dibenzo(a,h)anthracene	106		-		1-200	-		126
Indeno(1,2,3-cd)pyrene	86		-		1-151	-		99
Pyrene	92		-		70-120	-		49
4-Chloroaniline ¹	74		-		10-100	-		53
Dibenzofuran ¹	88		-		23-126	-		22
2-Methylnaphthalene ¹	87		-		40-109	-		18
n-Nitrosodimethylamine ¹	43		-		15-68	-		17

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Project Number: BROOK STREET WWTF

Lab Number: L1943012

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCS %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287150-3								
2,4,6-Trichlorophenol	105		-		52-129	-		58
p-Chloro-m-cresol ¹	103		-		68-130	-		73
2-Chlorophenol	78		-		36-120	-		61
2,4-Dichlorophenol	94		-		53-122	-		50
2,4-Dimethylphenol	91		-		42-120	-		58
2-Nitrophenol	93		-		45-167	-		55
4-Nitrophenol	66		-		13-129	-		131
2,4-Dinitrophenol	103		-		1-173	-		132
4,6-Dinitro-o-cresol	108		-		56-130	-		203
Pentachlorophenol	88		-		38-152	-		86
Phenol	39		-		17-120	-		64
2-Methylphenol ¹	78		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	78		-		35-103	-		26
2,4,5-Trichlorophenol ¹	108		-		47-126	-		28
Benzoic Acid ¹	23		-		2-55	-		27
Benzyl Alcohol ¹	76		-		31-103	-		23

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1287150-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	53				25-87
Phenol-d6	37				16-65
Nitrobenzene-d5	75				42-122
2-Fluorobiphenyl	81				46-121
2,4,6-Tribromophenol	85				45-128
4-Terphenyl-d14	83				47-138

METALS

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS**

Lab ID: L1943012-01

Date Collected: 09/18/19 08:25

Client ID: SLUDGE GRAB

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

TCLP/SPLP Ext. Date: 09/23/19 13:26

Matrix: Liquid

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Mansfield Lab											
Aluminum, TCLP	ND		mg/l	1.00	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Antimony, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Arsenic, TCLP	ND		mg/l	1.00	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Beryllium, TCLP	ND		mg/l	0.100	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Cadmium, TCLP	ND		mg/l	0.100	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Chromium, TCLP	ND		mg/l	0.200	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Copper, TCLP	ND		mg/l	0.200	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Lead, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/24/19 12:18	09/24/19 23:04	EPA 7470A	1,7470A	AL
Molybdenum, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Nickel, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Selenium, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Silver, TCLP	ND		mg/l	0.100	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Thallium, TCLP	ND		mg/l	0.200	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB
Zinc, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:13	EPA 3015	1,6010D	AB



Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Mansfield Lab for sample(s): 01 Batch: WG1287586-1										
Aluminum, TCLP	ND		mg/l	1.00	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Antimony, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Arsenic, TCLP	ND		mg/l	1.00	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Beryllium, TCLP	ND		mg/l	0.100	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Cadmium, TCLP	ND		mg/l	0.100	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Chromium, TCLP	ND		mg/l	0.200	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Copper, TCLP	ND		mg/l	0.200	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Lead, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Molybdenum, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Nickel, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Selenium, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Silver, TCLP	ND		mg/l	0.100	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Thallium, TCLP	ND		mg/l	0.200	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB
Zinc, TCLP	ND		mg/l	0.500	--	1	09/23/19 20:31	09/24/19 18:05	1,6010D	AB

Prep Information

Digestion Method: EPA 3015

TCLP/SPLP Extraction Date: 09/23/19 13:26

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Mansfield Lab for sample(s): 01 Batch: WG1287878-1										
Mercury, TCLP	ND		mg/l	0.0010	--	1	09/24/19 12:18	09/24/19 22:57	1,7470A	AL

Prep Information

Digestion Method: EPA 7470A

TCLP/SPLP Extraction Date: 09/23/19 13:26



Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING SLUDGE

Project Number: BROOK STREET WWTF

Lab Number: L1943012

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 Batch: WG1287586-2								
Aluminum, TCLP	97		-		75-125	-		20
Antimony, TCLP	92		-		75-125	-		20
Arsenic, TCLP	99		-		75-125	-		20
Beryllium, TCLP	100		-		75-125	-		20
Cadmium, TCLP	95		-		75-125	-		20
Chromium, TCLP	91		-		75-125	-		20
Copper, TCLP	88		-		75-125	-		20
Lead, TCLP	95		-		75-125	-		20
Molybdenum, TCLP	92		-		75-125	-		20
Nickel, TCLP	90		-		75-125	-		20
Selenium, TCLP	102		-		75-125	-		20
Silver, TCLP	91		-		75-125	-		20
Thallium, TCLP	94		-		75-125	-		20
Zinc, TCLP	95		-		75-125	-		20
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 Batch: WG1287878-2								
Mercury, TCLP	96		-		80-120	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287586-3 QC Sample: L1943012-01 Client ID: SLUDGE GRAB												
Aluminum, TCLP	ND	20	19.3	96		-	-		75-125	-		20
Antimony, TCLP	ND	5	4.56	91		-	-		75-125	-		20
Arsenic, TCLP	ND	1.2	1.31	109		-	-		75-125	-		20
Beryllium, TCLP	ND	0.5	0.501	100		-	-		75-125	-		20
Cadmium, TCLP	ND	0.51	0.477	94		-	-		75-125	-		20
Chromium, TCLP	ND	2	1.80	90		-	-		75-125	-		20
Copper, TCLP	ND	2.5	2.19	88		-	-		75-125	-		20
Lead, TCLP	ND	5.1	4.70	92		-	-		75-125	-		20
Molybdenum, TCLP	ND	10	9.03	90		-	-		75-125	-		20
Nickel, TCLP	ND	5	4.43	89		-	-		75-125	-		20
Selenium, TCLP	ND	1.2	1.22	102		-	-		75-125	-		20
Silver, TCLP	ND	0.5	0.454	91		-	-		75-125	-		20
Thallium, TCLP	ND	1.2	1.08	90		-	-		75-125	-		20
Zinc, TCLP	ND	5	4.84	97		-	-		75-125	-		20
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287878-3 QC Sample: L1943012-01 Client ID: SLUDGE GRAB												
Mercury, TCLP	ND	0.025	0.0220	88		-	-		80-120	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING SLUDGE

Project Number: BROOK STREET WWTF

Lab Number: L1943012

Report Date: 09/30/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287586-4 QC Sample: L1943012-01 Client ID: SLUDGE GRAB						
Aluminum, TCLP	ND	ND	mg/l	NC		20
Antimony, TCLP	ND	ND	mg/l	NC		20
Arsenic, TCLP	ND	ND	mg/l	NC		20
Beryllium, TCLP	ND	ND	mg/l	NC		20
Cadmium, TCLP	ND	ND	mg/l	NC		20
Chromium, TCLP	ND	ND	mg/l	NC		20
Copper, TCLP	ND	ND	mg/l	NC		20
Lead, TCLP	ND	ND	mg/l	NC		20
Molybdenum, TCLP	ND	ND	mg/l	NC		20
Nickel, TCLP	ND	ND	mg/l	NC		20
Selenium, TCLP	ND	ND	mg/l	NC		20
Silver, TCLP	ND	ND	mg/l	NC		20
Thallium, TCLP	ND	ND	mg/l	NC		20
Zinc, TCLP	ND	ND	mg/l	NC		20
TCLP Metals by EPA 1311 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287878-4 QC Sample: L1943012-01 Client ID: SLUDGE GRAB						
Mercury, TCLP	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

SAMPLE RESULTS

Lab ID: L1943012-01

Date Collected: 09/18/19 08:25

Client ID: SLUDGE GRAB

Date Received: 09/18/19

Sample Location: BROOK STREET, AYER, MA 01432

Field Prep: Not Specified

Sample Depth:

Matrix: Liquid

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	30000		mg/l	5000	NA	1000	-	09/19/19 14:03	121,2540D	DR
Cyanide, Total	0.039		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 15:21	121,4500CN-CE	LH
Nitrogen, Ammonia	9.61		mg/l	0.075	--	1	09/23/19 04:34	09/23/19 23:34	121,4500NH3-BH	AT
Phosphorus, Total	275.		mg/l	10.0	--	1000	09/23/19 09:15	09/23/19 15:54	121,4500P-E	SD
BOD, 5 day	12000		mg/l	3000	NA	1500	09/20/19 03:10	09/24/19 21:45	121,5210B	TE
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:18	121,3500CR-B	MA



Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**SAMPLE RESULTS****Lab ID:** L1943012-02**Date Collected:** 09/18/19 08:25**Client ID:** SLUDGE GRAB**Date Received:** 09/18/19**Sample Location:** BROOK STREET, AYER, MA 01432**Field Prep:** Not Specified**Sample Depth:****Matrix:** Sludge

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	2.70		%	0.100	NA	1	-	09/30/19 10:18	121,2540G	CG



Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285957-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:16	121,3500CR-B	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286012-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/19/19 14:03	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286066-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:34	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286546-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/20/19 03:10	09/24/19 21:45	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287244-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/23/19 04:34	09/23/19 23:08	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287299-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/23/19 09:15	09/23/19 14:59	121,4500P-E	SD



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Project Number: BROOK STREET WWTF

Lab Number: L1943012

Report Date: 09/30/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285957-2								
Chromium, Hexavalent	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286066-2								
Cyanide, Total	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286546-2								
BOD, 5 day	97		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287244-2								
Nitrogen, Ammonia	102		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287299-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING SLUDGE

Lab Number: L1943012

Project Number: BROOK STREET WWTF

Report Date: 09/30/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285957-4 QC Sample: L1943027-02 Client ID: MS Sample												
Chromium, Hexavalent	ND	0.1	0.093	93		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286066-4 QC Sample: L1942830-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.194	97		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286546-4 QC Sample: L1942975-01 Client ID: MS Sample												
BOD, 5 day	ND	100	92	92		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287244-4 QC Sample: L1943266-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.168	8	7.34	90		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287299-3 QC Sample: L1941678-01 Client ID: MS Sample												
Phosphorus, Total	0.143	0.5	0.640	99		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING SLUDGE

Project Number: BROOK STREET WWTF

Lab Number: L1943012

Report Date: 09/30/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1285957-3	QC Sample: L1943027-02	Client ID: DUP Sample		
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1286012-2	QC Sample: L1943029-01	Client ID: DUP Sample		
Solids, Total Suspended	89	87	mg/l	2		29
General Chemistry - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1286066-3	QC Sample: L1942830-01	Client ID: DUP Sample		
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1286546-3	QC Sample: L1942975-01	Client ID: DUP Sample		
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1287244-3	QC Sample: L1943266-01	Client ID: DUP Sample		
Nitrogen, Ammonia	0.168	ND	mg/l	NC		20
General Chemistry - Westborough Lab	Associated sample(s): 01	QC Batch ID: WG1287299-4	QC Sample: L1941678-01	Client ID: DUP Sample		
Phosphorus, Total	0.143	0.142	mg/l	1		20
General Chemistry - Westborough Lab	Associated sample(s): 02	QC Batch ID: WG1290192-1	QC Sample: L1943012-02	Client ID: SLUDGE GRAB		
Solids, Total	2.70	2.98	%	10		20

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943012-01A	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		ARCHIVE()
L1943012-01B	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		ARCHIVE()
L1943012-01C	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		ARCHIVE()
L1943012-01D	Plastic 250ml unpreserved	A	9	9	2.1	Y	Absent		HEXCR-3500(1)
L1943012-01E	Plastic 250ml NaOH preserved	A	>12	>12	2.1	Y	Absent		TCN-4500(14)
L1943012-01F	Plastic 500ml H2SO4 preserved	A	5	5	2.1	N	Absent		TPHOS-4500(28),NH3-4500(28)
L1943012-01G	Plastic 950ml unpreserved	A	9	9	2.1	Y	Absent		BOD-5210(2)
L1943012-01H	Plastic 950ml unpreserved	A	9	9	2.1	Y	Absent		TSS-2540(7)
L1943012-01I	Amber 1000ml Na2S2O3	A	9	9	2.1	Y	Absent		625.1(7)
L1943012-01J	Amber 1000ml Na2S2O3	A	9	9	2.1	Y	Absent		625.1(7)
L1943012-01X	Plastic 120ml HNO3 preserved Extracts	A	NA		2.1	Y	Absent		BE-CI(180),CD-CI(180),AS-CI(180),NI-CI(180),AL-CI(180),CU-CI(180),HG-C(28),PB-CI(180),ZN-CI(180),TL-CI(180),CR-CI(180),SE-CI(180),AG-CI(180),MO-CI(180),SB-CI(180)
L1943012-01X9	Tumble Vessel	A	NA		2.1	Y	Absent		-
L1943012-02A	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		8260(14)
L1943012-02B	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		8260(14)
L1943012-02C	Vial Na2S2O3 preserved	A	NA		2.1	Y	Absent		8260(14)
L1943012-02X	Vial MeOH preserved split	A	NA		2.1	Y	Absent		8260(14)

Container Comments

L1943012-01D pH difficult to determine due to nature of sample

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
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Container Comments

L1943012-01E	pH difficult to determine due to nature of sample								
L1943012-01F	pH difficult to determine due to nature of sample								
L1943012-01G	pH difficult to determine due to nature of sample								
L1943012-01H	pH difficult to determine due to nature of sample								
L1943012-01I	pH difficult to determine due to nature of sample								
L1943012-01J	pH difficult to determine due to nature of sample								

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING SLUDGE**Lab Number:** L1943012**Project Number:** BROOK STREET WWTF**Report Date:** 09/30/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING SLUDGE
Project Number: BROOK STREET WWTF

Lab Number: L1943012
Report Date: 09/30/19

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Lab Report To:

Hoyle Tanner

EST Invoice To: Hoyle Tanner

5555-Q#-xx

Q#00978

Site: Brook Street Wastewater Treatment Facility**Client:** Hoyle, Tanner & Associates, Inc.**Address:** Brook Street**Address:** 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson**Contact:** Paula Boyle**Phone #:** (978) 772-8243**Phone #:** (603) 669-5555☐ Rush ____ Day Turnaround**Description:** Town of Ayer IPP Sampling (Sludge)**Fax #:** (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes		
		Size	Type	#	Date	Time					
Sludge Grab	7	1 L	P	1	9/18	0825	None	TCLP Al,Sb,As,Be,Cd,Cu,Cr,Pb,Hg,Mo,Ni, Se,Ag,Tl,Zn, BOD			
Sludge Grab	7	250 ml	P	1			None	CrVI			
Sludge Grab	7	250 ml	P	1			NaOH	Total CN			
Sludge Grab	7	500 ml	P	1			H2SO4	Total Phosphorus, NH3			
Sludge Grab	7	1 L	P	1			None	TSS			
Sludge Grab	7	40 ml	V	3			Na2S2O3	624.1			
Sludge Grab	7	1 L	G	2			None	625.1			
Sampler's Name (Print) Signature					DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
Matt Gould					9/18/19	0825	1			9/18/19	1710
Additional Comments: *Please use lowest possible detection limit for each parameter - (6020) for metals if necessary ALPHA BOTTLE ORDER #302151							2			9/18/19	1741
							3				
							4				
							5				
*All samples chilled to 4 degrees celsius.											



ANALYTICAL REPORT

Lab Number:	L1942759
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 1
Project Number:	AYER, TOWN OF
Report Date:	09/25/19

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: AYER IPP SAMPLING DAY 1
Project Number: AYER, TOWN OF

Lab Number: L1942759
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1942759-01	SMH @ ANGARD LANE COMP	WATER	ANGARD LANE	09/17/19 08:25	09/17/19
L1942759-02	SMH @ ANGARD LANE GRAB	WATER	ANGARD LANE	09/17/19 08:45	09/17/19

Project Name: AYER IPP SAMPLING DAY 1
Project Number: AYER, TOWN OF

Lab Number: L1942759
Report Date: 09/25/19

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: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**Case Narrative (continued)**

Semivolatile Organics by Method 625

L1942759-01: The sample has elevated detection limits due to the dilution required by the sample matrix.

The WG1286874-2 LCS recoveries, associated with L1942759-01, are above the acceptance criteria for 2,4-dinitrotoluene (131%), fluoranthene (125%), nitrosodiphenylamine(ndpa)/dpa (115%), di-n-butylphthalate (123%) and diethyl phthalate (124%); however, the associated samples are non-detect to the RL for these target analytes. The results of the original analysis are reported.

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:

Melissa Sturgis Melissa Sturgis

Title: Technical Director/Representative

Date: 09/25/19

ORGANICS

VOLATILES

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942759-02
 Client ID: SMH @ ANGARD LANE GRAB
 Sample Location: ANGARD LANE

Date Collected: 09/17/19 08:45
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 09/18/19 22:21
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Chloroform	1.2		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942759-02
 Client ID: SMH @ ANGARD LANE GRAB
 Sample Location: ANGARD LANE

Date Collected: 09/17/19 08:45
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
Vinyl acetate	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrolein	ND		ug/l	8.0	--	1
Acrylonitrile	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	92		60-140
Fluorobenzene	107		60-140
4-Bromofluorobenzene	103		60-140

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1

Analytical Date: 09/18/19 13:05

Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1285721-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 09/18/19 13:05
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1285721-4					
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
Vinyl acetate	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrolein	ND		ug/l	8.0	--
Acrylonitrile	ND		ug/l	10	--
n-Hexane ¹	ND		ug/l	20	--
Methyl tert butyl ether	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--
1,4-Dioxane ¹	ND		ug/l	2000	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	90		60-140
Fluorobenzene	109		60-140
4-Bromofluorobenzene	100		60-140



Lab Control Sample Analysis Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Methylene chloride	95		-		60-140	-		28
1,1-Dichloroethane	90		-		50-150	-		49
Chloroform	95		-		70-135	-		54
Carbon tetrachloride	115		-		70-130	-		41
1,2-Dichloropropane	90		-		35-165	-		55
Dibromochloromethane	100		-		70-135	-		50
1,1,2-Trichloroethane	100		-		70-130	-		45
2-Chloroethylvinyl ether	100		-		1-225	-		71
Tetrachloroethene	105		-		70-130	-		39
Chlorobenzene	95		-		65-135	-		53
Trichlorofluoromethane	95		-		50-150	-		84
1,2-Dichloroethane	120		-		70-130	-		49
1,1,1-Trichloroethane	115		-		70-130	-		36
Bromodichloromethane	100		-		65-135	-		56
trans-1,3-Dichloropropene	95		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	95		-		70-130	-		42
1,1,2,2-Tetrachloroethane	110		-		60-140	-		61
Benzene	120		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Chloromethane	80		-		1-205	-		60
Bromomethane	75		-		15-185	-		61

Lab Control Sample Analysis Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Vinyl chloride	85		-		5-195	-		66
Chloroethane	100		-		40-160	-		78
1,1-Dichloroethene	95		-		50-150	-		32
trans-1,2-Dichloroethene	105		-		70-130	-		45
cis-1,2-Dichloroethene	100		-		60-140	-		30
Trichloroethene	130		-		65-135	-		48
1,2-Dichlorobenzene	105		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	105		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Styrene	100		-		60-140	-		30
Acetone	92		-		40-160	-		30
Carbon disulfide	85		-		60-140	-		30
2-Butanone	102		-		60-140	-		30
Vinyl acetate	80		-		60-140	-		30
4-Methyl-2-pentanone	114		-		60-140	-		30
2-Hexanone	104		-		60-140	-		30
Acrolein	82		-		60-140	-		30
Acrylonitrile	95		-		60-140	-		60
Methyl tert butyl ether	95		-		60-140	-		30
Dibromomethane	95		-		70-130	-		30
1,4-Dioxane ¹	110		-		60-140	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Tert-Butyl Alcohol	100		-		60-140	-		30
Tertiary-Amyl Methyl Ether	110		-		60-140	-		30
Dichlorodifluoromethane ¹	85		-		70-130	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	92				60-140
Fluorobenzene	114				60-140
4-Bromofluorobenzene	101				60-140

SEMIVOLATILES

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942759-01 D
 Client ID: SMH @ ANGARD LANE COMP
 Sample Location: ANGARD LANE

Date Collected: 09/17/19 08:25
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 09/23/19 19:46
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	20	--	10
Benzidine ¹	ND		ug/l	200	--	10
1,2,4-Trichlorobenzene	ND		ug/l	50	--	10
Hexachlorobenzene	ND		ug/l	20	--	10
Bis(2-chloroethyl)ether	ND		ug/l	20	--	10
2-Chloronaphthalene	ND		ug/l	20	--	10
3,3'-Dichlorobenzidine	ND		ug/l	50	--	10
2,4-Dinitrotoluene	ND		ug/l	50	--	10
2,6-Dinitrotoluene	ND		ug/l	50	--	10
Azobenzene ¹	ND		ug/l	20	--	10
Fluoranthene	ND		ug/l	20	--	10
4-Chlorophenyl phenyl ether	ND		ug/l	20	--	10
4-Bromophenyl phenyl ether	ND		ug/l	20	--	10
Bis(2-chloroisopropyl)ether	ND		ug/l	20	--	10
Bis(2-chloroethoxy)methane	ND		ug/l	50	--	10
Hexachlorobutadiene	ND		ug/l	20	--	10
Hexachlorocyclopentadiene ¹	ND		ug/l	100	--	10
Hexachloroethane	ND		ug/l	20	--	10
Isophorone	ND		ug/l	50	--	10
Naphthalene	ND		ug/l	20	--	10
Nitrobenzene	ND		ug/l	20	--	10
NDPA/DPA ¹	ND		ug/l	20	--	10
n-Nitrosodi-n-propylamine	ND		ug/l	50	--	10
Bis(2-ethylhexyl)phthalate	32		ug/l	22	--	10
Butyl benzyl phthalate	ND		ug/l	50	--	10
Di-n-butylphthalate	ND		ug/l	50	--	10
Di-n-octylphthalate	ND		ug/l	50	--	10
Diethyl phthalate	ND		ug/l	50	--	10



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942759-01 D
 Client ID: SMH @ ANGARD LANE COMP
 Sample Location: ANGARD LANE

Date Collected: 09/17/19 08:25
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	50	--	10
Benzo(a)anthracene	ND		ug/l	20	--	10
Benzo(a)pyrene	ND		ug/l	20	--	10
Benzo(b)fluoranthene	ND		ug/l	20	--	10
Benzo(k)fluoranthene	ND		ug/l	20	--	10
Chrysene	ND		ug/l	20	--	10
Acenaphthylene	ND		ug/l	20	--	10
Anthracene	ND		ug/l	20	--	10
Benzo(ghi)perylene	ND		ug/l	20	--	10
Fluorene	ND		ug/l	20	--	10
Phenanthrene	ND		ug/l	20	--	10
Dibenzo(a,h)anthracene	ND		ug/l	20	--	10
Indeno(1,2,3-cd)pyrene	ND		ug/l	20	--	10
Pyrene	ND		ug/l	20	--	10
4-Chloroaniline ¹	ND		ug/l	50	--	10
Dibenzofuran ¹	ND		ug/l	20	--	10
2-Methylnaphthalene ¹	ND		ug/l	20	--	10
n-Nitrosodimethylamine ¹	ND		ug/l	20	--	10
2,4,6-Trichlorophenol	ND		ug/l	50	--	10
p-Chloro-m-cresol ¹	ND		ug/l	20	--	10
2-Chlorophenol	ND		ug/l	20	--	10
2,4-Dichlorophenol	ND		ug/l	50	--	10
2,4-Dimethylphenol	ND		ug/l	50	--	10
2-Nitrophenol	ND		ug/l	50	--	10
4-Nitrophenol	ND		ug/l	100	--	10
2,4-Dinitrophenol	ND		ug/l	200	--	10
4,6-Dinitro-o-cresol	ND		ug/l	100	--	10
Pentachlorophenol	ND		ug/l	50	--	10
Phenol	80		ug/l	50	--	10
2-Methylphenol ¹	ND		ug/l	50	--	10
3-Methylphenol/4-Methylphenol ¹	82		ug/l	50	--	10
2,4,5-Trichlorophenol ¹	ND		ug/l	50	--	10
Benzoic Acid ¹	ND		ug/l	500	--	10
Benzyl Alcohol ¹	26		ug/l	20	--	10

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942759-01 D
 Client ID: SMH @ ANGARD LANE COMP
 Sample Location: ANGARD LANE

Date Collected: 09/17/19 08:25
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	62		25-87
Phenol-d6	54		16-65
Nitrobenzene-d5	77		42-122
2-Fluorobiphenyl	90		46-121
2,4,6-Tribromophenol	124		45-128
4-Terphenyl-d14	100		47-138

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Acenaphthene	ND		ug/l	2.0	--
Benzidine ¹	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene ¹	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA ¹	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
4-Chloroaniline ¹	ND		ug/l	5.0	--
Dibenzofuran ¹	ND		ug/l	2.0	--
2-Methylnaphthalene ¹	ND		ug/l	2.0	--
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	5.0	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Pentachlorophenol	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol ¹	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality ControlAnalytical Method: 129,625.1
Analytical Date: 09/23/19 12:56
Analyst: SZExtraction Method: EPA 625.1
Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--
Benzoic Acid ¹	ND		ug/l	50	--
Benzyl Alcohol ¹	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		25-87
Phenol-d6	44		16-65
Nitrobenzene-d5	73		42-122
2-Fluorobiphenyl	83		46-121
2,4,6-Tribromophenol	84		45-128
4-Terphenyl-d14	104		47-138

Lab Control Sample Analysis Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Acenaphthene	96		-		60-132	-		48
Benzidine ¹	9		-		0-70	-		30
1,2,4-Trichlorobenzene	74		-		57-130	-		50
Hexachlorobenzene	111		-		8-142	-		55
Bis(2-chloroethyl)ether	84		-		43-126	-		108
2-Chloronaphthalene	93		-		65-120	-		24
3,3'-Dichlorobenzidine	49		-		8-213	-		108
2,4-Dinitrotoluene	131	Q	-		48-127	-		42
2,6-Dinitrotoluene	127		-		68-137	-		48
Azobenzene ¹	107		-		44-115	-		23
Fluoranthene	125	Q	-		43-121	-		66
4-Chlorophenyl phenyl ether	110		-		38-145	-		61
4-Bromophenyl phenyl ether	117		-		65-120	-		43
Bis(2-chloroisopropyl)ether	77		-		63-139	-		76
Bis(2-chloroethoxy)methane	90		-		49-165	-		54
Hexachlorobutadiene	76		-		38-120	-		62
Hexachlorocyclopentadiene ¹	72		-		7-118	-		35
Hexachloroethane	66		-		55-120	-		52
Isophorone	104		-		47-180	-		93
Naphthalene	82		-		36-120	-		65
Nitrobenzene	96		-		54-158	-		62
NDPA/DPA ¹	115	Q	-		45-112	-		36
n-Nitrosodi-n-propylamine	103		-		14-198	-		87

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Bis(2-ethylhexyl)phthalate	118		-		29-137	-		82
Butyl benzyl phthalate	140		-		1-140	-		60
Di-n-butylphthalate	123	Q	-		8-120	-		47
Di-n-octylphthalate	132		-		19-132	-		69
Diethyl phthalate	124	Q	-		1-120	-		100
Dimethyl phthalate	120		-		1-120	-		183
Benzo(a)anthracene	115		-		42-133	-		53
Benzo(a)pyrene	120		-		32-148	-		72
Benzo(b)fluoranthene	119		-		42-140	-		71
Benzo(k)fluoranthene	120		-		25-146	-		63
Chrysene	102		-		44-140	-		87
Acenaphthylene	113		-		54-126	-		74
Anthracene	104		-		43-120	-		66
Benzo(ghi)perylene	119		-		1-195	-		97
Fluorene	111		-		70-120	-		38
Phenanthrene	96		-		65-120	-		39
Dibenzo(a,h)anthracene	133		-		1-200	-		126
Indeno(1,2,3-cd)pyrene	111		-		1-151	-		99
Pyrene	114		-		70-120	-		49
4-Chloroaniline ¹	76		-		10-100	-		53
Dibenzofuran ¹	104		-		23-126	-		22
2-Methylnaphthalene ¹	92		-		40-109	-		18
n-Nitrosodimethylamine ¹	52		-		15-68	-		17

Lab Control Sample Analysis Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942759

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCS %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
2,4,6-Trichlorophenol	123		-		52-129	-		58
p-Chloro-m-cresol ¹	124		-		68-130	-		73
2-Chlorophenol	93		-		36-120	-		61
2,4-Dichlorophenol	110		-		53-122	-		50
2,4-Dimethylphenol	97		-		42-120	-		58
2-Nitrophenol	108		-		45-167	-		55
4-Nitrophenol	96		-		13-129	-		131
2,4-Dinitrophenol	129		-		1-173	-		132
4,6-Dinitro-o-cresol	128		-		56-130	-		203
Pentachlorophenol	105		-		38-152	-		86
Phenol	56		-		17-120	-		64
2-Methylphenol ¹	98		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	97		-		35-103	-		26
2,4,5-Trichlorophenol ¹	126		-		47-126	-		28
Benzoic Acid ¹	47		-		2-55	-		27
Benzyl Alcohol ¹	92		-		31-103	-		23

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	73				25-87
Phenol-d6	55				16-65
Nitrobenzene-d5	87				42-122
2-Fluorobiphenyl	93				46-121
2,4,6-Tribromophenol	104				45-128
4-Terphenyl-d14	103				47-138

METALS

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942759-01

Date Collected: 09/17/19 08:25

Client ID: SMH @ ANGARD LANE COMP

Date Received: 09/17/19

Sample Location: ANGARD LANE

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.2470		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00192		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Chromium, Total	0.00108		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Copper, Total	0.04907		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Lead, Total	0.00402		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/20/19 12:35	09/20/19 19:00	EPA 245.1	3,245.1	GD
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Nickel, Total	0.00828		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM
Zinc, Total	0.1871		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 10:50	EPA 3005A	3,200.8	AM



Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1285833-1									
Aluminum, Total	ND	mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Antimony, Total	ND	mg/l	0.00400	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Arsenic, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Beryllium, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Copper, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Thallium, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1286661-1									
Mercury, Total	ND	mg/l	0.00020	--	1	09/20/19 12:35	09/20/19 18:29	3,245.1	GD

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1285833-2								
Aluminum, Total	101		-		85-115	-		
Antimony, Total	93		-		85-115	-		
Arsenic, Total	108		-		85-115	-		
Beryllium, Total	102		-		85-115	-		
Cadmium, Total	110		-		85-115	-		
Chromium, Total	105		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	111		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	104		-		85-115	-		
Selenium, Total	106		-		85-115	-		
Silver, Total	104		-		85-115	-		
Thallium, Total	110		-		85-115	-		
Zinc, Total	110		-		85-115	-		

Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1286661-2

Mercury, Total	98		-		85-115	-		
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Matrix Spike Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1285833-3 QC Sample: L1942996-01 Client ID: MS Sample												
Aluminum, Total	ND	2	1.918	96		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.6106	122		-	-		70-130	-		20
Arsenic, Total	0.00673	0.12	0.1386	110		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05304	106		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05626	110		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2049	102		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2535	101		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5439	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.082	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5283	106		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1216	101		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04979	100		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1291	108		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5656	113		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-3 QC Sample: L1941364-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00487	97		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-5 QC Sample: L1941975-02 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00433	87		-	-		70-130	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942759

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1285833-4 QC Sample: L1942996-01 Client ID: DUP Sample						
Arsenic, Total	0.00673	0.00762	mg/l	12		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	ND	ND	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Molybdenum, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-4 QC Sample: L1941364-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1286661-6 QC Sample: L1941975-02 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942759

Project Number: AYER, TOWN OF

Report Date: 09/25/19

SAMPLE RESULTS

Lab ID: L1942759-01

Date Collected: 09/17/19 08:25

Client ID: SMH @ ANGARD LANE COMP

Date Received: 09/17/19

Sample Location: ANGARD LANE

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	130		mg/l	25	NA	5	-	09/18/19 15:15	121,2540D	DR
Nitrogen, Ammonia	33.2		mg/l	1.50	--	20	09/19/19 17:18	09/19/19 23:07	121,4500NH3-BH	AT
Phosphorus, Total	5.86		mg/l	0.250	--	25	09/20/19 10:00	09/23/19 13:15	121,4500P-E	SD
BOD, 5 day	240		mg/l	60	NA	30	09/18/19 04:55	09/23/19 10:05	121,5210B	TE



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1942759-02**Date Collected:** 09/17/19 08:45**Client ID:** SMH @ ANGARD LANE GRAB**Date Received:** 09/17/19**Sample Location:** ANGARD LANE**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/18/19 11:40	09/19/19 11:19	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 00:30	09/18/19 01:29	121,3500CR-B	JW



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285325-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 00:30	09/18/19 01:26	121,3500CR-B	JW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285426-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/18/19 04:55	09/23/19 10:05	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285435-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/18/19 15:15	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285510-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/18/19 11:40	09/19/19 11:00	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286156-13										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/19/19 17:18	09/19/19 22:43	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286503-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/20/19 10:00	09/23/19 11:47	121,4500P-E	SD



Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 1**Project Number:** AYER, TOWN OF**Lab Number:** L1942759**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285325-2								
Chromium, Hexavalent	100		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285426-2								
BOD, 5 day	86		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285510-2								
Cyanide, Total	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286156-14								
Nitrogen, Ammonia	95		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286503-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942759

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285325-4 QC Sample: L1942759-02 Client ID: SMH @ ANGARD LANE GRAB												
Chromium, Hexavalent	ND	0.1	0.088	88		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285426-4 QC Sample: L1942581-01 Client ID: MS Sample												
BOD, 5 day	ND	100	74	74		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285510-4 QC Sample: L1942547-01 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.196	98		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286156-16 QC Sample: L1942790-05 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.70	92		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-3 QC Sample: L1941364-01 Client ID: MS Sample												
Phosphorus, Total	0.309	0.5	0.790	96		-	-		75-125	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942759

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285325-3 QC Sample: L1942759-02 Client ID: SMH @ ANGARD LANE GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285426-3 QC Sample: L1942581-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285435-2 QC Sample: L1942573-05 Client ID: DUP Sample						
Solids, Total Suspended	ND	ND	mg/l	NC		29
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285510-3 QC Sample: L1942547-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286156-15 QC Sample: L1942790-05 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-4 QC Sample: L1941370-05 Client ID: DUP Sample						
Phosphorus, Total	3.73	3.70	mg/l	1		20

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1942759-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.2	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1942759-01B	Plastic 500ml unpreserved	B	7	7	3.9	Y	Absent		BOD-5210(2)
L1942759-01C	Plastic 950ml unpreserved	B	7	7	3.9	Y	Absent		TSS-2540(7)
L1942759-01D	Plastic 500ml H2SO4 preserved	B	<2	<2	3.9	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1942759-01E	Amber 1000ml Na2S2O3	C	7	7	3.8	Y	Absent		625.1(7)
L1942759-01F	Amber 1000ml Na2S2O3	C	7	7	3.8	Y	Absent		625.1(7)
L1942759-02A	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942759-02B	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942759-02C	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942759-02D	Plastic 250ml unpreserved	A	7	7	4.2	Y	Absent		HEXCR-3500(1)
L1942759-02E	Plastic 250ml NaOH preserved	A	>12	>12	4.2	Y	Absent		TCN-4500(14)

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

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.
LCS D	- 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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942759**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 1
Project Number: AYER, TOWN OF

Lab Number: L1942759
Report Date: 09/25/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Lab Invoice To: Hoyle Tanner

Lab Report To: Hoyle Tanner

11942759

EST Invoice To: Hoyle Tanner

5555-Q-xx
Q#00978

Site: Ayer, Town ofClient: Hoyle, Tanner & Associates, Inc.Address: Angard LaneAddress: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Paula BoyleContact: Paula BoylePhone #: (603) 669-5555Phone #: (603) 669-5555☐ Rush ____ Day TurnaroundDescription: Town of Ayer IPP Sampling Day 1 of 3 (Angard Ln) Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative	Laboratory Analysis	Notes
		Size	Type	#	Date	Time			
SMH @ Angard Lane Comp (time)	1	250 ml	P	1	9/16/17	0825	HNO3	Total Metals *See Comments*	pH = 7.61
SMH @ Angard Lane Comp	1	1 L	P	1	↓	↓	None	TSS	Flow = N/A
SMH @ Angard Lane Comp	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 17.1
SMH @ Angard Lane Comp	1	500 ml	P	1	↓	↓	None	BOD	
SMH @ Angard Lane Comp	1	1 L	G	2	↓	↓	Na2S2O3	Semi-VOA (625.1)	
SMH @ Angard Lane Grab	1	40 ml	V	3	9/17	0845	Na2S2O3	VOA (624.1)	
SMH @ Angard Lane Grab	1	250 ml	P	1	↓	↓	NaOH	Total CN	
SMH @ Angard Lane Grab (4x)	1	1 L	G	2	↓	↓	HCl	Oil & Grease MB	
SMH @ Angard Lane Grab	1	500 ml	P	1	↓	↓	None	CrVI	

Sampler's Name (Print)		Signature		DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
Matt Gould		[Signature]		9/17/19	0845	1	[Signature]	[Signature] AAL	9/17/19	1545
Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.						2	[Signature]	Alana Rigg AAL	9/17/19	1650
						3				
						4				
						5				

***All samples chilled to 4 degrees celsius.**



ANALYTICAL REPORT

Lab Number:	L1942757
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 1
Project Number:	AYER, TOWN OF
Report Date:	09/25/19

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: AYER IPP SAMPLING DAY 1
Project Number: AYER, TOWN OF

Lab Number: L1942757
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1942757-01	SMH @ SANDY POND COMP	WATER	MILL STREET	09/17/19 08:15	09/17/19
L1942757-02	SMH @ SANDY POND GRAB	WATER	MILL STREET	09/17/19 08:15	09/17/19

Project Name: AYER IPP SAMPLING DAY 1
Project Number: AYER, TOWN OF

Lab Number: L1942757
Report Date: 09/25/19

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: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**Case Narrative (continued)**

Semivolatile Organics

The WG1286874-2 LCS recoveries, associated with L1942757-01, are above the acceptance criteria for 2,4-dinitrotoluene (131%), fluoranthene (125%), nitrosodiphenylamine(ndpa)/dpa (115%), di-n-butylphthalate (123%) and diethyl phthalate (124%); however, the associated samples are non-detect to the RL for these target analytes. The results of the original analysis are reported.

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:

 Melissa Sturgis

Title: Technical Director/Representative

Date: 09/25/19

ORGANICS

VOLATILES

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942757-02
 Client ID: SMH @ SANDY POND GRAB
 Sample Location: MILL STREET

Date Collected: 09/17/19 08:15
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 128,624.1
 Analytical Date: 09/18/19 21:49
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	1.0	--	1
1,1-Dichloroethane	ND		ug/l	1.5	--	1
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	3.5	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.5	--	1
2-Chloroethylvinyl ether	ND		ug/l	10	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	3.5	--	1
Trichlorofluoromethane	ND		ug/l	5.0	--	1
1,2-Dichloroethane	ND		ug/l	1.5	--	1
1,1,1-Trichloroethane	ND		ug/l	2.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/l	1.5	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	1.0	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	5.0	--	1
Bromomethane	ND		ug/l	5.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.5	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942757-02
 Client ID: SMH @ SANDY POND GRAB
 Sample Location: MILL STREET

Date Collected: 09/17/19 08:15
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	1.0	--	1
1,2-Dichlorobenzene	ND		ug/l	5.0	--	1
1,3-Dichlorobenzene	ND		ug/l	5.0	--	1
1,4-Dichlorobenzene	ND		ug/l	5.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Acetone	ND		ug/l	10	--	1
Carbon disulfide	ND		ug/l	5.0	--	1
2-Butanone	ND		ug/l	10	--	1
Vinyl acetate	ND		ug/l	10	--	1
4-Methyl-2-pentanone	ND		ug/l	10	--	1
2-Hexanone	ND		ug/l	10	--	1
Acrolein	ND		ug/l	8.0	--	1
Acrylonitrile	ND		ug/l	10	--	1
Dibromomethane	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	93		60-140
Fluorobenzene	104		60-140
4-Bromofluorobenzene	103		60-140

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 09/18/19 13:05
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1285721-4					
Methylene chloride	ND		ug/l	1.0	--
1,1-Dichloroethane	ND		ug/l	1.5	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	3.5	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.5	--
2-Chloroethylvinyl ether	ND		ug/l	10	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	3.5	--
Trichlorofluoromethane	ND		ug/l	5.0	--
1,2-Dichloroethane	ND		ug/l	1.5	--
1,1,1-Trichloroethane	ND		ug/l	2.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	1.5	--
cis-1,3-Dichloropropene	ND		ug/l	1.5	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	1.0	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	5.0	--
Bromomethane	ND		ug/l	5.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.5	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 128,624.1
 Analytical Date: 09/18/19 13:05
 Analyst: GT

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 02 Batch: WG1285721-4					
1,2-Dichlorobenzene	ND		ug/l	5.0	--
1,3-Dichlorobenzene	ND		ug/l	5.0	--
1,4-Dichlorobenzene	ND		ug/l	5.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Acetone	ND		ug/l	10	--
Carbon disulfide	ND		ug/l	5.0	--
2-Butanone	ND		ug/l	10	--
Vinyl acetate	ND		ug/l	10	--
4-Methyl-2-pentanone	ND		ug/l	10	--
2-Hexanone	ND		ug/l	10	--
Acrolein	ND		ug/l	8.0	--
Acrylonitrile	ND		ug/l	10	--
n-Hexane ¹	ND		ug/l	20	--
Methyl tert butyl ether	ND		ug/l	10	--
Dibromomethane	ND		ug/l	1.0	--
1,4-Dioxane ¹	ND		ug/l	2000	--
Tert-Butyl Alcohol	ND		ug/l	100	--
Tertiary-Amyl Methyl Ether	ND		ug/l	20	--
Dichlorodifluoromethane ¹	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Pentafluorobenzene	90		60-140
Fluorobenzene	109		60-140
4-Bromofluorobenzene	100		60-140



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Methylene chloride	95		-		60-140	-		28
1,1-Dichloroethane	90		-		50-150	-		49
Chloroform	95		-		70-135	-		54
Carbon tetrachloride	115		-		70-130	-		41
1,2-Dichloropropane	90		-		35-165	-		55
Dibromochloromethane	100		-		70-135	-		50
1,1,2-Trichloroethane	100		-		70-130	-		45
2-Chloroethylvinyl ether	100		-		1-225	-		71
Tetrachloroethene	105		-		70-130	-		39
Chlorobenzene	95		-		65-135	-		53
Trichlorofluoromethane	95		-		50-150	-		84
1,2-Dichloroethane	120		-		70-130	-		49
1,1,1-Trichloroethane	115		-		70-130	-		36
Bromodichloromethane	100		-		65-135	-		56
trans-1,3-Dichloropropene	95		-		50-150	-		86
cis-1,3-Dichloropropene	100		-		25-175	-		58
Bromoform	95		-		70-130	-		42
1,1,2,2-Tetrachloroethane	110		-		60-140	-		61
Benzene	120		-		65-135	-		61
Toluene	105		-		70-130	-		41
Ethylbenzene	105		-		60-140	-		63
Chloromethane	80		-		1-205	-		60
Bromomethane	75		-		15-185	-		61

Lab Control Sample Analysis Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Vinyl chloride	85		-		5-195	-		66
Chloroethane	100		-		40-160	-		78
1,1-Dichloroethene	95		-		50-150	-		32
trans-1,2-Dichloroethene	105		-		70-130	-		45
cis-1,2-Dichloroethene	100		-		60-140	-		30
Trichloroethene	130		-		65-135	-		48
1,2-Dichlorobenzene	105		-		65-135	-		57
1,3-Dichlorobenzene	100		-		70-130	-		43
1,4-Dichlorobenzene	100		-		65-135	-		57
p/m-Xylene	105		-		60-140	-		30
o-xylene	95		-		60-140	-		30
Styrene	100		-		60-140	-		30
Acetone	92		-		40-160	-		30
Carbon disulfide	85		-		60-140	-		30
2-Butanone	102		-		60-140	-		30
Vinyl acetate	80		-		60-140	-		30
4-Methyl-2-pentanone	114		-		60-140	-		30
2-Hexanone	104		-		60-140	-		30
Acrolein	82		-		60-140	-		30
Acrylonitrile	95		-		60-140	-		60
Methyl tert butyl ether	95		-		60-140	-		30
Dibromomethane	95		-		70-130	-		30
1,4-Dioxane ¹	110		-		60-140	-		30

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 02 Batch: WG1285721-3								
Tert-Butyl Alcohol	100		-		60-140	-		30
Tertiary-Amyl Methyl Ether	110		-		60-140	-		30
Dichlorodifluoromethane ¹	85		-		70-130	-		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Pentafluorobenzene	92				60-140
Fluorobenzene	114				60-140
4-Bromofluorobenzene	101				60-140

SEMIVOLATILES

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942757-01 D2
 Client ID: SMH @ SANDY POND COMP
 Sample Location: MILL STREET

Date Collected: 09/17/19 08:15
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 09/24/19 18:46
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Semivolatile Organics by GC/MS - Westborough Lab

Benzoic Acid ¹	830		ug/l	500	--	10
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Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942757-01 D
 Client ID: SMH @ SANDY POND COMP
 Sample Location: MILL STREET

Date Collected: 09/17/19 08:15
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 129,625.1
 Analytical Date: 09/23/19 20:39
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	4.0	--	2
Benzidine ¹	ND		ug/l	40	--	2
1,2,4-Trichlorobenzene	ND		ug/l	10	--	2
Hexachlorobenzene	ND		ug/l	4.0	--	2
Bis(2-chloroethyl)ether	ND		ug/l	4.0	--	2
2-Chloronaphthalene	ND		ug/l	4.0	--	2
3,3'-Dichlorobenzidine	ND		ug/l	10	--	2
2,4-Dinitrotoluene	ND		ug/l	10	--	2
2,6-Dinitrotoluene	ND		ug/l	10	--	2
Azobenzene ¹	ND		ug/l	4.0	--	2
Fluoranthene	ND		ug/l	4.0	--	2
4-Chlorophenyl phenyl ether	ND		ug/l	4.0	--	2
4-Bromophenyl phenyl ether	ND		ug/l	4.0	--	2
Bis(2-chloroisopropyl)ether	ND		ug/l	4.0	--	2
Bis(2-chloroethoxy)methane	ND		ug/l	10	--	2
Hexachlorobutadiene	ND		ug/l	4.0	--	2
Hexachlorocyclopentadiene ¹	ND		ug/l	20	--	2
Hexachloroethane	ND		ug/l	4.0	--	2
Isophorone	ND		ug/l	10	--	2
Naphthalene	ND		ug/l	4.0	--	2
Nitrobenzene	ND		ug/l	4.0	--	2
NDPA/DPA ¹	ND		ug/l	4.0	--	2
n-Nitrosodi-n-propylamine	ND		ug/l	10	--	2
Bis(2-ethylhexyl)phthalate	11		ug/l	4.4	--	2
Butyl benzyl phthalate	ND		ug/l	10	--	2
Di-n-butylphthalate	ND		ug/l	10	--	2
Di-n-octylphthalate	ND		ug/l	10	--	2
Diethyl phthalate	ND		ug/l	10	--	2

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942757-01 D
 Client ID: SMH @ SANDY POND COMP
 Sample Location: MILL STREET

Date Collected: 09/17/19 08:15
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Dimethyl phthalate	ND		ug/l	10	--	2
Benzo(a)anthracene	ND		ug/l	4.0	--	2
Benzo(a)pyrene	ND		ug/l	4.0	--	2
Benzo(b)fluoranthene	ND		ug/l	4.0	--	2
Benzo(k)fluoranthene	ND		ug/l	4.0	--	2
Chrysene	ND		ug/l	4.0	--	2
Acenaphthylene	ND		ug/l	4.0	--	2
Anthracene	ND		ug/l	4.0	--	2
Benzo(ghi)perylene	ND		ug/l	4.0	--	2
Fluorene	ND		ug/l	4.0	--	2
Phenanthrene	ND		ug/l	4.0	--	2
Dibenzo(a,h)anthracene	ND		ug/l	4.0	--	2
Indeno(1,2,3-cd)pyrene	ND		ug/l	4.0	--	2
Pyrene	ND		ug/l	4.0	--	2
4-Chloroaniline ¹	ND		ug/l	10	--	2
Dibenzofuran ¹	ND		ug/l	4.0	--	2
2-Methylnaphthalene ¹	ND		ug/l	4.0	--	2
n-Nitrosodimethylamine ¹	ND		ug/l	4.0	--	2
2,4,6-Trichlorophenol	ND		ug/l	10	--	2
p-Chloro-m-cresol ¹	ND		ug/l	4.0	--	2
2-Chlorophenol	ND		ug/l	4.0	--	2
2,4-Dichlorophenol	ND		ug/l	10	--	2
2,4-Dimethylphenol	ND		ug/l	10	--	2
2-Nitrophenol	ND		ug/l	10	--	2
4-Nitrophenol	ND		ug/l	20	--	2
2,4-Dinitrophenol	ND		ug/l	40	--	2
4,6-Dinitro-o-cresol	ND		ug/l	20	--	2
Pentachlorophenol	ND		ug/l	10	--	2
Phenol	26		ug/l	10	--	2
2-Methylphenol ¹	ND		ug/l	10	--	2
3-Methylphenol/4-Methylphenol ¹	150		ug/l	10	--	2
2,4,5-Trichlorophenol ¹	ND		ug/l	10	--	2
Benzoic Acid ¹	820	E	ug/l	100	--	2
Benzyl Alcohol ¹	18		ug/l	4.0	--	2

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942757-01 D
 Client ID: SMH @ SANDY POND COMP
 Sample Location: MILL STREET

Date Collected: 09/17/19 08:15
 Date Received: 09/17/19
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	70		25-87
Phenol-d6	55		16-65
Nitrobenzene-d5	90		42-122
2-Fluorobiphenyl	103		46-121
2,4,6-Tribromophenol	116		45-128
4-Terphenyl-d14	106		47-138

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Acenaphthene	ND		ug/l	2.0	--
Benzidine ¹	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene ¹	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene ¹	ND		ug/l	10	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA ¹	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	2.2	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Analytical Method: 129,625.1
 Analytical Date: 09/23/19 12:56
 Analyst: SZ

Extraction Method: EPA 625.1
 Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
4-Chloroaniline ¹	ND		ug/l	5.0	--
Dibenzofuran ¹	ND		ug/l	2.0	--
2-Methylnaphthalene ¹	ND		ug/l	2.0	--
n-Nitrosodimethylamine ¹	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol ¹	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	5.0	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Pentachlorophenol	ND		ug/l	5.0	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol ¹	ND		ug/l	5.0	--

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality ControlAnalytical Method: 129,625.1
Analytical Date: 09/23/19 12:56
Analyst: SZExtraction Method: EPA 625.1
Extraction Date: 09/21/19 03:15

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01 Batch: WG1286874-1					
3-Methylphenol/4-Methylphenol ¹	ND		ug/l	5.0	--
2,4,5-Trichlorophenol ¹	ND		ug/l	5.0	--
Benzoic Acid ¹	ND		ug/l	50	--
Benzyl Alcohol ¹	ND		ug/l	2.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		25-87
Phenol-d6	44		16-65
Nitrobenzene-d5	73		42-122
2-Fluorobiphenyl	83		46-121
2,4,6-Tribromophenol	84		45-128
4-Terphenyl-d14	104		47-138

Lab Control Sample Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Acenaphthene	96		-		60-132	-		48
Benzidine ¹	9		-		0-70	-		30
1,2,4-Trichlorobenzene	74		-		57-130	-		50
Hexachlorobenzene	111		-		8-142	-		55
Bis(2-chloroethyl)ether	84		-		43-126	-		108
2-Chloronaphthalene	93		-		65-120	-		24
3,3'-Dichlorobenzidine	49		-		8-213	-		108
2,4-Dinitrotoluene	131	Q	-		48-127	-		42
2,6-Dinitrotoluene	127		-		68-137	-		48
Azobenzene ¹	107		-		44-115	-		23
Fluoranthene	125	Q	-		43-121	-		66
4-Chlorophenyl phenyl ether	110		-		38-145	-		61
4-Bromophenyl phenyl ether	117		-		65-120	-		43
Bis(2-chloroisopropyl)ether	77		-		63-139	-		76
Bis(2-chloroethoxy)methane	90		-		49-165	-		54
Hexachlorobutadiene	76		-		38-120	-		62
Hexachlorocyclopentadiene ¹	72		-		7-118	-		35
Hexachloroethane	66		-		55-120	-		52
Isophorone	104		-		47-180	-		93
Naphthalene	82		-		36-120	-		65
Nitrobenzene	96		-		54-158	-		62
NDPA/DPA ¹	115	Q	-		45-112	-		36
n-Nitrosodi-n-propylamine	103		-		14-198	-		87

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
Bis(2-ethylhexyl)phthalate	118		-		29-137	-		82
Butyl benzyl phthalate	140		-		1-140	-		60
Di-n-butylphthalate	123	Q	-		8-120	-		47
Di-n-octylphthalate	132		-		19-132	-		69
Diethyl phthalate	124	Q	-		1-120	-		100
Dimethyl phthalate	120		-		1-120	-		183
Benzo(a)anthracene	115		-		42-133	-		53
Benzo(a)pyrene	120		-		32-148	-		72
Benzo(b)fluoranthene	119		-		42-140	-		71
Benzo(k)fluoranthene	120		-		25-146	-		63
Chrysene	102		-		44-140	-		87
Acenaphthylene	113		-		54-126	-		74
Anthracene	104		-		43-120	-		66
Benzo(ghi)perylene	119		-		1-195	-		97
Fluorene	111		-		70-120	-		38
Phenanthrene	96		-		65-120	-		39
Dibenzo(a,h)anthracene	133		-		1-200	-		126
Indeno(1,2,3-cd)pyrene	111		-		1-151	-		99
Pyrene	114		-		70-120	-		49
4-Chloroaniline ¹	76		-		10-100	-		53
Dibenzofuran ¹	104		-		23-126	-		22
2-Methylnaphthalene ¹	92		-		40-109	-		18
n-Nitrosodimethylamine ¹	52		-		15-68	-		17

Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942757

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCS %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2								
2,4,6-Trichlorophenol	123		-		52-129	-		58
p-Chloro-m-cresol ¹	124		-		68-130	-		73
2-Chlorophenol	93		-		36-120	-		61
2,4-Dichlorophenol	110		-		53-122	-		50
2,4-Dimethylphenol	97		-		42-120	-		58
2-Nitrophenol	108		-		45-167	-		55
4-Nitrophenol	96		-		13-129	-		131
2,4-Dinitrophenol	129		-		1-173	-		132
4,6-Dinitro-o-cresol	128		-		56-130	-		203
Pentachlorophenol	105		-		38-152	-		86
Phenol	56		-		17-120	-		64
2-Methylphenol ¹	98		-		38-102	-		23
3-Methylphenol/4-Methylphenol ¹	97		-		35-103	-		26
2,4,5-Trichlorophenol ¹	126		-		47-126	-		28
Benzoic Acid ¹	47		-		2-55	-		27
Benzyl Alcohol ¹	92		-		31-103	-		23

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01 Batch: WG1286874-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	73				25-87
Phenol-d6	55				16-65
Nitrobenzene-d5	87				42-122
2-Fluorobiphenyl	93				46-121
2,4,6-Tribromophenol	104				45-128
4-Terphenyl-d14	103				47-138

METALS

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1942757-01

Date Collected: 09/17/19 08:15

Client ID: SMH @ SANDY POND COMP

Date Received: 09/17/19

Sample Location: MILL STREET

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.1314		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Copper, Total	0.03614		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Lead, Total	0.00116		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 23:04	EPA 245.1	3,245.1	MG
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Nickel, Total	0.00329		mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM
Zinc, Total	0.1288		mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 10:45	EPA 3005A	3,200.8	AM



Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1285833-1									
Aluminum, Total	ND	mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Antimony, Total	ND	mg/l	0.00400	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Arsenic, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Beryllium, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Copper, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Thallium, Total	ND	mg/l	0.00100	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	09/19/19 02:25	09/19/19 09:31	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287393-1									
Mercury, Total	ND	mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 22:55	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1285833-2								
Aluminum, Total	101		-		85-115	-		
Antimony, Total	93		-		85-115	-		
Arsenic, Total	108		-		85-115	-		
Beryllium, Total	102		-		85-115	-		
Cadmium, Total	110		-		85-115	-		
Chromium, Total	105		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	111		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	104		-		85-115	-		
Selenium, Total	106		-		85-115	-		
Silver, Total	104		-		85-115	-		
Thallium, Total	110		-		85-115	-		
Zinc, Total	110		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287393-2								
Mercury, Total	89		-		85-115	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942757

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1285833-3 QC Sample: L1942996-01 Client ID: MS Sample												
Aluminum, Total	ND	2	1.918	96		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.6106	122		-	-		70-130	-		20
Arsenic, Total	0.00673	0.12	0.1386	110		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05304	106		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05626	110		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.2049	102		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2535	101		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5439	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.082	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.5283	106		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1216	101		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04979	100		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1291	108		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5656	113		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-3 QC Sample: L1942718-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00451	90		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-5 QC Sample: L1942757-01 Client ID: SMH @ SANDY POND COMP												
Mercury, Total	ND	0.005	0.00438	88		-	-		70-130	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942757

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1285833-4 QC Sample: L1942996-01 Client ID: DUP Sample						
Arsenic, Total	0.00673	0.00762	mg/l	12		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	ND	ND	mg/l	NC		20
Lead, Total	ND	ND	mg/l	NC		20
Molybdenum, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-4 QC Sample: L1942718-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-6 QC Sample: L1942757-01 Client ID: SMH @ SANDY POND COMP						
Mercury, Total	ND	ND	mg/l	NC		20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

SAMPLE RESULTS

Lab ID: L1942757-01

Date Collected: 09/17/19 08:15

Client ID: SMH @ SANDY POND COMP

Date Received: 09/17/19

Sample Location: MILL STREET

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	110		mg/l	20	NA	4	-	09/18/19 15:15	121,2540D	DR
Nitrogen, Ammonia	52.4		mg/l	1.50	--	20	09/18/19 16:16	09/20/19 22:54	121,4500NH3-BH	AT
Phosphorus, Total	7.64		mg/l	0.250	--	25	09/20/19 10:00	09/23/19 13:14	121,4500P-E	SD
BOD, 5 day	170		mg/l	60	NA	30	09/18/19 04:55	09/23/19 10:05	121,5210B	TE



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1942757-02**Date Collected:** 09/17/19 08:15**Client ID:** SMH @ SANDY POND GRAB**Date Received:** 09/17/19**Sample Location:** MILL STREET**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/18/19 11:40	09/19/19 11:16	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 00:30	09/18/19 01:30	121,3500CR-B	JW



Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1942757

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285240-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/18/19 00:30	09/18/19 01:26	121,3500CR-B	JW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285426-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/18/19 04:55	09/23/19 10:05	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285435-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/18/19 15:15	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285510-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/18/19 11:40	09/19/19 11:00	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1285549-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/18/19 16:16	09/20/19 22:51	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286503-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/20/19 10:00	09/23/19 11:47	121,4500P-E	SD



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942757

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285240-2								
Chromium, Hexavalent	100		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285426-2								
BOD, 5 day	86		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285510-2								
Cyanide, Total	103		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1285549-2								
Nitrogen, Ammonia	98		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286503-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942757

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285240-4 QC Sample: L1942757-02 Client ID: SMH @ SANDY POND GRAB												
Chromium, Hexavalent	ND	0.1	0.090	90		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285426-4 QC Sample: L1942581-01 Client ID: MS Sample												
BOD, 5 day	ND	100	74	74		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285510-4 QC Sample: L1942547-01 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.196	98		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285549-4 QC Sample: L1942710-09 Client ID: MS Sample												
Nitrogen, Ammonia	5.07	4	9.00	98		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-3 QC Sample: L1941364-01 Client ID: MS Sample												
Phosphorus, Total	0.309	0.5	0.790	96		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Project Number: AYER, TOWN OF

Lab Number: L1942757

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285240-3 QC Sample: L1942757-02 Client ID: SMH @ SANDY POND GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285426-3 QC Sample: L1942581-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285435-2 QC Sample: L1942573-05 Client ID: DUP Sample						
Solids, Total Suspended	ND	ND	mg/l	NC		29
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285510-3 QC Sample: L1942547-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1285549-3 QC Sample: L1942710-09 Client ID: DUP Sample						
Nitrogen, Ammonia	5.07	5.18	mg/l	2		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286503-4 QC Sample: L1941370-05 Client ID: DUP Sample						
Phosphorus, Total	3.73	3.70	mg/l	1		20

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
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A	Absent
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B	Absent
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C	Absent
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Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1942757-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.2	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1942757-01B	Plastic 500ml unpreserved	B	7	7	3.9	Y	Absent		BOD-5210(2)
L1942757-01C	Plastic 950ml unpreserved	B	7	7	3.9	Y	Absent		TSS-2540(7)
L1942757-01D	Plastic 500ml H2SO4 preserved	B	<2	<2	3.9	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1942757-01E	Amber 1000ml Na2S2O3	C	7	7	3.8	Y	Absent		625.1(7)
L1942757-01F	Amber 1000ml Na2S2O3	B	7	7	3.9	Y	Absent		625.1(7)
L1942757-02A	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942757-02B	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942757-02C	Vial Na2S2O3 preserved	A	NA		4.2	Y	Absent		624.1(3)
L1942757-02D	Plastic 250ml unpreserved	A	7	7	4.2	Y	Absent		HEXCR-3500(1)
L1942757-02E	Plastic 250ml NaOH preserved	A	>12	>12	4.2	Y	Absent		TCN-4500(14)

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1942757**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 1
Project Number: AYER, TOWN OF

Lab Number: L1942757
Report Date: 09/25/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 128 Method 624.1: Purgeables by GC/MS, EPA 821-R-16-008, December 2016.
- 129 Method 625.1: Base/Neutrals and Acids by GC/MS, EPA 821-R-16-007, December 2016.

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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Lab Report To: Hoyle Tanner

1942757

EST Invoice To: Hoyle Tanner

5555-Q-xx
Q#00978

Site: Ayer, Town of**Client:** Hoyle, Tanner & Associates, Inc.**Address:** Mill Street**Address:** 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Paula Boyle**Contact:** Paula Boyle**Phone #:** (603) 669-5555**Phone #:** (603) 669-5555☐ **Rush** ____ Day Turnaround**Description:** Ayer IPP Sampling Day 1 of 3 (Sandy Pond MH)**Fax #:** (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes
		Size	Type	#	Date	Time			
SMH @ Sandy Pond Comp (time)	1	250 ml	P	1	9/16-17	0900-0915	HNO3	Total Metals *See Comments*	pH = 7.84
SMH @ Sandy Pond Comp	1	1 L	P	1			None	TSS	Flow = N/A
SMH @ Sandy Pond Comp	1	500 ml	P	1			H2SO4	NH3, T-Phos	Temp = 17.1
SMH @ Sandy Pond Comp	1	500 ml	P	1			None	BOD	
SMH @ Sandy Pond Comp	1	1 L	G	3	↓	↓	None	Semi-VOA 625.1	
SMH @ Sandy Pond Grab	1	40 ml	V	3	9/17	0815	Na2S2O3	VOA 624.1	
SMH @ Sandy Pond Grab	1	250 ml	P	1			NaOH	Total CN	
SMH @ Sandy Pond Grab (4x)	1	1 L	G	2			HGI	Oil & Grease (126)	
SMH @ Sandy Pond Grab	1	500 ml	P	1	↓	↓	None	CrVI	

Sampler's Name (Print)		Signature		DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
Matt Gould		[Signature]		9/17/19	0815	1	[Signature]	[Signature] MAR	9/17/19	1545
Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.						2	[Signature]	Alana Rigg MAR	9/17/19	1650
						3				
						4				
						5				

***All samples chilled to 4 degrees celsius.**



ANALYTICAL REPORT

Lab Number:	L1943020
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 1
Project Number:	BROOK STREET WWTF
Report Date:	09/24/19

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: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943020
Report Date: 09/24/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943020-01	SMH @ SANDY POND GRAB (4X)	WATER	BROOK STREET, AYER, MA	09/17/19 14:45	09/18/19

Project Name: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943020
Report Date: 09/24/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/24/19

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943020**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**SAMPLE RESULTS****Lab ID:** L1943020-01**Date Collected:** 09/17/19 14:45**Client ID:** SMH @ SANDY POND GRAB (4X)**Date Received:** 09/18/19**Sample Location:** BROOK STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Oil & Grease, Hem-Grav	28.		mg/l	4.0	--	1	09/19/19 17:30	09/19/19 18:00	74,1664A	ML



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943020**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286261-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/19/19 17:30	09/19/19 18:00	74,1664A	ML

Lab Control Sample Analysis
Batch Quality Control**Project Name:** AYER IPP SAMPLING DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1943020**Report Date:** 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286261-2								
Oil & Grease, Hem-Grav	96		-		78-114	-		18

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943020
Report Date: 09/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286261-4 QC Sample: L1942616-01 Client ID: MS Sample												
Oil & Grease, Hem-Grav	12	50	80	137	Q	-	-		78-114	-		18

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** AYER IPP SAMPLING DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1943020**Report Date:** 09/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286261-3 QC Sample: L1942616-01 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	12	9.7	mg/l	21	Q	18

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943020**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

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

B Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943020-01A	Amber 1000ml HCl preserved	B	NA		2.0	Y	Absent		OG-1664(28)
L1943020-01B	Amber 1000ml HCl preserved	B	NA		2.0	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943020**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

GLOSSARY

Acronyms

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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.
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NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
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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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943020**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943020
Report Date: 09/24/19

REFERENCES

- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

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 its 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Hoyle Tanner

Lab Report To:

U94 3020

EST Invoice To: Hoyle Tanner

5555-Q-xx

Q#00978

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

Description: Ayer IPP Sampling Day 1 - Partial (Sandy)

Fax #: (603) 669-4168

☐ Rush ____ Day Turnaround[illegible]



ANALYTICAL REPORT

Lab Number:	L1943300
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 2
Project Number:	BROOK STREET WWTF
Report Date:	09/25/19

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: AYER IPP SAMPLING DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943300
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943300-01	SMH @ SANDY POND GRAB (4X)	WATER	BROOK STREET, AYER, MA	09/18/19 14:30	09/19/19

Project Name: AYER IPP SAMPLING DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943300
Report Date: 09/25/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/25/19

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943300**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1943300-01**Date Collected:** 09/18/19 14:30**Client ID:** SMH @ SANDY POND GRAB (4X)**Date Received:** 09/19/19**Sample Location:** BROOK STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Oil & Grease, Hem-Grav	39.		mg/l	4.0	--	1	09/20/19 17:30	09/20/19 18:00	74,1664A	ML



Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943300**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286777-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/20/19 17:30	09/20/19 18:00	74,1664A	ML

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 2**Lab Number:** L1943300**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286777-2								
Oil & Grease, Hem-Grav	97		-		78-114	-		18

Matrix Spike Analysis Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Lab Number: L1943300

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286777-4 QC Sample: L1943285-02 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	40	37	93		-	-		78-114	-		18

Lab Duplicate Analysis*Batch Quality Control***Project Name:** AYER IPP SAMPLING DAY 2**Project Number:** BROOK STREET WWTF**Lab Number:** L1943300**Report Date:** 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286777-3 QC Sample: L1943285-01 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943300**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

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

B Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943300-01A	Amber 1000ml HCl preserved	B	NA		4.1	Y	Absent		OG-1664(28)
L1943300-01B	Amber 1000ml HCl preserved	B	NA		4.1	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943300**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

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.
LCS D	- 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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943300**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943300
Report Date: 09/25/19

REFERENCES

- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

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 its 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: ~~Hoyle Tanner~~ EST

Hoyle Tanner

Lab Report To:

L1943300

EST Invoice To: Hoyle Tanner

5555-Q-xx-

Q#00978

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

Description: Ayer IPP Sampling Day 2 - Partial (Sandy)

Fax #: (603) 669-4168

☐ **Rush** _____Day Turnaround[illegible]



ANALYTICAL REPORT

Lab Number:	L1943029
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	TOWN OF AYER IPP DAY 2
Project Number:	AYER, TOWN OF
Report Date:	09/25/19

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: TOWN OF AYER IPP DAY 2
Project Number: AYER, TOWN OF

Lab Number: L1943029
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943029-01	SMH @ ANGARD LANE COMP	WATER	ANGARD LANE, AYER, MA	09/18/19 08:25	09/18/19
L1943029-02	SMH @ ANGARD LANE GRAB	WATER	ANGARD LANE, AYER, MA	09/18/19 08:25	09/18/19

Project Name: TOWN OF AYER IPP DAY 2
Project Number: AYER, TOWN OF

Lab Number: L1943029
Report Date: 09/25/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/25/19

METALS

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943029**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1943029-01

Date Collected: 09/18/19 08:25

Client ID: SMH @ ANGARD LANE COMP

Date Received: 09/18/19

Sample Location: ANGARD LANE, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.2000		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00166		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Chromium, Total	0.00220		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Copper, Total	0.1091		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Lead, Total	0.00490		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 23:28	EPA 245.1	3,245.1	MG
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Nickel, Total	0.00580		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM
Zinc, Total	0.2005		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 10:30	EPA 3005A	3,200.8	AM



Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943029

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287393-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 22:55	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287409-1										
Aluminum, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943029

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287393-2								
Mercury, Total	89		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287409-2								
Aluminum, Total	102		-		85-115	-		
Antimony, Total	86		-		85-115	-		
Arsenic, Total	106		-		85-115	-		
Beryllium, Total	98		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	106		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	115		-		85-115	-		
Silver, Total	98		-		85-115	-		
Thallium, Total	107		-		85-115	-		
Zinc, Total	106		-		85-115	-		

Matrix Spike Analysis **Batch Quality Control**

Project Name: TOWN OF AYER IPP DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943029

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-3 QC Sample: L1942718-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00451	90		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-5 QC Sample: L1942757-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00438	88		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-3 QC Sample: L1942810-01 Client ID: MS Sample												
Aluminum, Total	ND	2	2.127	106		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.3880	78		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1202	100		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05027	100		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05414	106		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1947	97		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2443	98		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5440	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.081	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4867	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1384	115		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04955	99		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1313	109		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5300	106		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2
Project Number: AYER, TOWN OF

Lab Number: L1943029
Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-5 QC Sample: L1942970-01 Client ID: MS Sample									
Aluminum, Total	2.005	2	4.325	116	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4256	85	-	-	70-130	-	20
Arsenic, Total	0.0099	0.12	0.1392	108	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.05117	102	-	-	70-130	-	20
Cadmium, Total	0.00024	0.051	0.05451	106	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2066	103	-	-	70-130	-	20
Copper, Total	0.01225	0.25	0.2686	102	-	-	70-130	-	20
Lead, Total	0.01672	0.51	0.5937	113	-	-	70-130	-	20
Molybdenum, Total	0.0050	1	1.140	113	-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5351	107	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1311	109	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05210	104	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1360	113	-	-	70-130	-	20
Zinc, Total	0.05371	0.5	0.6190	113	-	-	70-130	-	20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: TOWN OF AYER IPP DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943029

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-4 QC Sample: L1942718-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-6 QC Sample: L1942757-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-4 QC Sample: L1942810-01 Client ID: DUP Sample						
Lead, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-6 QC Sample: L1942970-01 Client ID: DUP Sample						
Aluminum, Total	2.005	1.886	mg/l	6		20
Antimony, Total	ND	ND	mg/l	NC		20
Cadmium, Total	0.00024	0.00022	mg/l	8		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.01225	0.01172	mg/l	4		20
Lead, Total	0.01672	0.01659	mg/l	1		20
Nickel, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.05371	0.05078	mg/l	6		20

INORGANICS & MISCELLANEOUS

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943029**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1943029-01**Date Collected:** 09/18/19 08:25**Client ID:** SMH @ ANGARD LANE COMP**Date Received:** 09/18/19**Sample Location:** ANGARD LANE, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	89.		mg/l	25	NA	5	-	09/19/19 14:03	121,2540D	DR
Nitrogen, Ammonia	53.2		mg/l	1.50	--	20	09/20/19 18:23	09/24/19 21:32	121,4500NH3-BH	AT
Phosphorus, Total	8.21		mg/l	0.125	--	12.5	09/23/19 09:15	09/23/19 15:58	121,4500P-E	SD
BOD, 5 day	270		mg/l	60	NA	30	09/20/19 03:10	09/24/19 21:45	121,5210B	TE



Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943029**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1943029-02**Date Collected:** 09/18/19 08:25**Client ID:** SMH @ ANGARD LANE GRAB**Date Received:** 09/18/19**Sample Location:** ANGARD LANE, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	0.046		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:56	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:21	121,3500CR-B	MA



Project Name: TOWN OF AYER IPP DAY 2

Lab Number: L1943029

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285957-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:16	121,3500CR-B	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286012-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/19/19 14:03	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286066-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:34	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286546-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/20/19 03:10	09/24/19 21:45	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286636-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/20/19 18:23	09/24/19 20:55	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287299-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/23/19 09:15	09/23/19 14:59	121,4500P-E	SD

Lab Control Sample Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943029

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285957-2								
Chromium, Hexavalent	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286066-2								
Cyanide, Total	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286546-2								
BOD, 5 day	97		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286636-2								
Nitrogen, Ammonia	98		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287299-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943029

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285957-4 QC Sample: L1943027-02 Client ID: MS Sample												
Chromium, Hexavalent	ND	0.1	0.093	93		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-4 QC Sample: L1942830-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.194	97		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286546-4 QC Sample: L1942975-01 Client ID: MS Sample												
BOD, 5 day	ND	100	92	92		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286636-4 QC Sample: L1943110-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.126	4	3.48	84		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287299-3 QC Sample: L1941678-01 Client ID: MS Sample												
Phosphorus, Total	0.143	0.5	0.640	99		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943029

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285957-3 QC Sample: L1943027-02 Client ID: DUP Sample						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286012-2 QC Sample: L1943029-01 Client ID: SMH @ ANGARD LANE COMP						
Solids, Total Suspended	89	87	mg/l	2		29
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-3 QC Sample: L1942830-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286546-3 QC Sample: L1942975-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286636-3 QC Sample: L1943110-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.126	0.101	mg/l	22	Q	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287299-4 QC Sample: L1941678-01 Client ID: DUP Sample						
Phosphorus, Total	0.143	0.142	mg/l	1		20

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943029**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**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(*)
L1943029-01A	Plastic 250ml HNO3 preserved	A	<2	<2	2.1	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943029-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	2.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1943029-01C	Plastic 500ml unpreserved	A	7	7	2.1	Y	Absent		BOD-5210(2)
L1943029-01D	Plastic 950ml unpreserved	A	7	7	2.1	Y	Absent		TSS-2540(7)
L1943029-02A	Plastic 250ml unpreserved	A	7	7	2.1	Y	Absent		HEXCR-3500(1)
L1943029-02B	Plastic 250ml NaOH preserved	A	>12	>12	2.1	Y	Absent		TCN-4500(14)

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943029**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: TOWN OF AYER IPP DAY 2**Lab Number:** L1943029**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: TOWN OF AYER IPP DAY 2
Project Number: AYER, TOWN OF

Lab Number: L1943029
Report Date: 09/25/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Lab Report To: Hoyle Tanner

L1943029

EST Invoice To: Hoyle Tanner

5555-Q-xx
Q#00978

Site: Ayer, Town ofAddress: Angard Lane

Ayer MA 01432-

Contact: Paula BoylePhone #: (603) 669-5555Client: Hoyle, Tanner & Associates, Inc.Address: 150 Dow Street

Manchester NH 03101-

Contact: Paula BoylePhone #: (603) 669-5555☐ Rush ____ Day TurnaroundDescription: Town of Ayer IPP Sampling Day 2 of 3 (Angard Ln) Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes																																										
		Size	Type	#	Date	Time																																													
SMH @ Angard Lane Comp (time)	1	250 ml	P	1	9/12-18	0825-0825	HNO3	Total Metals *See Comments*	pH = 7.56																																										
SMH @ Angard Lane Comp	1	1 L	P	1	↓	↓	None	TSS	Flow = N/A																																										
SMH @ Angard Lane Comp	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 17.6																																										
SMH @ Angard Lane Comp	1	500 ml	P	1	↓	↓	None	BOD																																											
SMH @ Angard Lane Grab	1	250 ml	P	1	9/18	0825	NaOH	Total CN																																											
SMH @ Angard Lane Grab (4x)	1	1 L	G	2			HCl	Oil & Grease (sub)																																											
SMH @ Angard Lane Grab	1	500 ml	P	1	9/18	0825	None	CrVI																																											
<table border="1"> <thead> <tr> <th>Sampler's Name (Print)</th> <th>Signature</th> <th>DATE</th> <th>TIME</th> <th>NUMBER</th> <th>TRANSFERS RELINQUISHED BY</th> <th>TRANSFERS ACCEPTED BY</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td>Matt Crowl</td> <td><i>[Signature]</i></td> <td>9/18/19</td> <td>0825</td> <td>1</td> <td><i>[Signature]</i></td> <td><i>[Signature]</i> HCL</td> <td>9/19/19</td> <td>1710</td> </tr> <tr> <td colspan="4" rowspan="4">Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.</td> <td>2</td> <td><i>[Signature]</i></td> <td><i>[Signature]</i> HCL</td> <td>9/19/19</td> <td>1741</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Sampler's Name (Print)	Signature	DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	Matt Crowl	<i>[Signature]</i>	9/18/19	0825	1	<i>[Signature]</i>	<i>[Signature]</i> HCL	9/19/19	1710	Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.				2	<i>[Signature]</i>	<i>[Signature]</i> HCL	9/19/19	1741	3					4					5				
Sampler's Name (Print)	Signature	DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME																																											
Matt Crowl	<i>[Signature]</i>	9/18/19	0825	1	<i>[Signature]</i>	<i>[Signature]</i> HCL	9/19/19	1710																																											
Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.				2	<i>[Signature]</i>	<i>[Signature]</i> HCL	9/19/19	1741																																											
				3																																															
				4																																															
				5																																															
*All samples chilled to 4 degrees celsius.																																																			



ANALYTICAL REPORT

Lab Number:	L1943301
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 3
Project Number:	BROOK STREET WWTF
Report Date:	09/26/19

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: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943301
Report Date: 09/26/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943301-01	SMH @ SANDY POND COMP	WATER	MILL STREET, AYER, MA	09/19/19 08:00	09/19/19
L1943301-02	SMH @ SANDY POND GRAB	WATER	MILL STREET, AYER, MA	09/19/19 08:00	09/19/19

Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943301
Report Date: 09/26/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/26/19

METALS

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS**

Lab ID: L1943301-01

Date Collected: 09/19/19 08:00

Client ID: SMH @ SANDY POND COMP

Date Received: 09/19/19

Sample Location: MILL STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.05741		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00046		mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Copper, Total	0.05733		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Lead, Total	0.00219		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/24/19 16:07	09/24/19 22:09	EPA 245.1	3,245.1	AL
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Nickel, Total	0.00350		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Zinc, Total	0.08414		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM



Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287993-1									
Aluminum, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Antimony, Total	ND	mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Arsenic, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Beryllium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Copper, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Thallium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287997-1									
Mercury, Total	ND	mg/l	0.0002	--	1	09/24/19 16:07	09/24/19 21:30	3,245.1	AL

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287993-2								
Aluminum, Total	92		-		85-115	-		
Antimony, Total	85		-		85-115	-		
Arsenic, Total	97		-		85-115	-		
Beryllium, Total	97		-		85-115	-		
Cadmium, Total	100		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	92		-		85-115	-		
Lead, Total	101		-		85-115	-		
Molybdenum, Total	95		-		85-115	-		
Nickel, Total	95		-		85-115	-		
Selenium, Total	98		-		85-115	-		
Silver, Total	95		-		85-115	-		
Thallium, Total	105		-		85-115	-		
Zinc, Total	99		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287997-2								
Mercury, Total	90		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-3 QC Sample: L1943414-01 Client ID: MS Sample												
Aluminum, Total	0.2622	2	2.125	93		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.4386	88		-	-		70-130	-		20
Arsenic, Total	0.00718	0.12	0.1220	96		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.04655	93		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.04919	96		-	-		70-130	-		20
Chromium, Total	0.00166	0.2	0.1914	95		-	-		70-130	-		20
Copper, Total	0.00151	0.25	0.2291	91		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5026	98		-	-		70-130	-		20
Molybdenum, Total	0.0249	1	0.9951	97		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4850	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1263	105		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04611	92		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1211	101		-	-		70-130	-		20
Zinc, Total	0.01650	0.5	0.5128	99		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-5 QC Sample: L1943878-01 Client ID: MS Sample									
Aluminum, Total	2.262	2	4.594	117	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4460	89	-	-	70-130	-	20
Arsenic, Total	0.00527	0.12	0.1304	104	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.04913	98	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05103	100	-	-	70-130	-	20
Chromium, Total	0.00923	0.2	0.2080	99	-	-	70-130	-	20
Copper, Total	0.01500	0.25	0.2534	95	-	-	70-130	-	20
Lead, Total	0.00966	0.51	0.5431	104	-	-	70-130	-	20
Molybdenum, Total	0.0469	1	1.023	98	-	-	70-130	-	20
Nickel, Total	0.01493	0.5	0.4985	97	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1348	112	-	-	70-130	-	20
Silver, Total	ND	0.05	0.04851	97	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1258	105	-	-	70-130	-	20
Zinc, Total	0.07696	0.5	0.6009	105	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-3 QC Sample: L1943085-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0049	99	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-5 QC Sample: L1943220-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0039	78	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-4 QC Sample: L1943414-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.00718	0.00730	mg/l	2		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00166	0.00164	mg/l	1		20
Copper, Total	0.00151	0.00165	mg/l	9		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	0.00202	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.01650	0.01695	mg/l	3		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-6 QC Sample: L1943878-01 Client ID: DUP Sample					
Arsenic, Total	0.00527	0.00518	mg/l	2	20
Cadmium, Total	ND	ND	mg/l	NC	20
Chromium, Total	0.00923	0.00899	mg/l	3	20
Copper, Total	0.01500	0.01468	mg/l	2	20
Lead, Total	0.00966	0.00948	mg/l	2	20
Nickel, Total	0.01493	0.01446	mg/l	3	20
Selenium, Total	ND	ND	mg/l	NC	20
Silver, Total	ND	ND	mg/l	NC	20
Zinc, Total	0.07696	0.07399	mg/l	4	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-4 QC Sample: L1943085-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-6 QC Sample: L1943220-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

SAMPLE RESULTS

Lab ID: L1943301-01

Date Collected: 09/19/19 08:00

Client ID: SMH @ SANDY POND COMP

Date Received: 09/19/19

Sample Location: MILL STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	45.		mg/l	16	NA	3.3	-	09/20/19 09:05	121,2540D	DR
Nitrogen, Ammonia	45.7		mg/l	1.50	--	20	09/24/19 05:18	09/25/19 20:14	121,4500NH3-BH	AT
Phosphorus, Total	5.12		mg/l	0.125	--	12.5	09/23/19 11:05	09/24/19 10:21	121,4500P-E	SD
BOD, 5 day	130		mg/l	30	NA	15	09/20/19 06:30	09/25/19 00:45	121,5210B	TE



Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS****Lab ID:** L1943301-02**Date Collected:** 09/19/19 08:00**Client ID:** SMH @ SANDY POND GRAB**Date Received:** 09/19/19**Sample Location:** MILL STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/22/19 14:55	09/23/19 13:33	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:47	121,3500CR-B	JW



Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286396-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:45	121,3500CR-B	JW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286470-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/20/19 09:05	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286549-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/20/19 06:30	09/25/19 00:45	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1287157-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/22/19 14:55	09/23/19 14:45	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287301-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/23/19 11:05	09/24/19 09:03	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287667-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/24/19 05:18	09/25/19 19:42	121,4500NH3-BH	AT

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943301**Report Date:** 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286396-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286549-2								
BOD, 5 day	92		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1287157-2								
Cyanide, Total	109		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287301-2								
Phosphorus, Total	101		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287667-2								
Nitrogen, Ammonia	92		-		80-120	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286396-4 QC Sample: L1943301-02 Client ID: SMH @ SANDY POND GRAB												
Chromium, Hexavalent	ND	0.1	0.100	100		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286549-4 QC Sample: L1943205-01 Client ID: MS Sample												
BOD, 5 day	ND	100	89	89		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1287157-4 QC Sample: L1943322-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.185	92		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287301-3 QC Sample: L1941674-02 Client ID: MS Sample												
Phosphorus, Total	0.033	0.5	0.542	102		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287667-4 QC Sample: L1943260-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.55	89		-	-		80-120	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286396-3 QC Sample: L1943301-02 Client ID: SMH @ SANDY POND GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286470-2 QC Sample: L1943271-01 Client ID: DUP Sample						
Solids, Total Suspended	76	79	mg/l	4		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286549-3 QC Sample: L1943205-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1287157-3 QC Sample: L1943322-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287301-4 QC Sample: L1941674-02 Client ID: DUP Sample						
Phosphorus, Total	0.033	0.033	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287667-3 QC Sample: L1943260-01 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943301-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.1	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943301-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	4.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1943301-01C	Plastic 500ml unpreserved	A	9	9	4.1	Y	Absent		BOD-5210(2)
L1943301-01D	Plastic 950ml unpreserved	A	9	9	4.1	Y	Absent		TSS-2540(7)
L1943301-02A	Plastic 250ml unpreserved	A	9	9	4.1	Y	Absent		HEXCR-3500(1)
L1943301-02B	Plastic 250ml NaOH preserved	A	>12	>12	4.1	Y	Absent		TCN-4500(14)

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943301
Report Date: 09/26/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



Associates, Inc.

EST Associates, Inc.
 51 Fremont Street
 Needham, MA 02494
 Phone (781) 455-0003
 Fax (781) 455-8336
 www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
 G - Glass
 V - VOA
 B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
 2. Groundwater 6. Storm Water
 3. Soil 7. Other _____
 4. Drinking Water

Laboratory:

Alpha Analytical Labs
 (508) 898-9220

Lab Invoice To: Hoyle Tanner

EST

Lab Report To:

Hoyle Tanner

L1943301

EST Invoice To: Hoyle Tanner

5555-Q-xx-00

Q#00978

Site: Ayer, Town ofClient: Hoyle, Tanner & Associates, Inc.Address: Mill StreetAddress: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Paula BoyleContact: Paula BoylePhone #: (603) 669-5555Phone #: (603) 669-5555☐ Rush ____ Day TurnaroundDescription: Ayer IPP Sampling Day 3 of 3 (Sandy Pond MH)Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes																																																
		Size	Type	#	Date	Time																																																			
SMH @ Sandy Pond Comp (time)	1	250 ml	P	1	9/18-19	0800-0800	HNO3	Total Metals *See Comments*	pH = 8.58																																																
SMH @ Sandy Pond Comp	1	1 L	P	1	↓	↓	None	TSS	Flow = N/A																																																
SMH @ Sandy Pond Comp	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 15.4																																																
SMH @ Sandy Pond Comp	1	500 ml	P	1	↓	↓	None	BOD																																																	
SMH @ Sandy Pond Grab	1	250 ml	P	1	9/19	0800	NaOH	Total CN																																																	
SMH @ Sandy Pond Grab (4x)	1	1 L	G	2	↓	↓	HCl	Oil & Grease (mb)																																																	
SMH @ Sandy Pond Grab	1	500 ml	P	1	↓	↓	None	CrVI																																																	
<table border="1"> <thead> <tr> <th colspan="2">Sampler's Name (Print)</th> <th colspan="2">Signature</th> <th>DATE</th> <th>TIME</th> <th>NUMBER</th> <th>TRANSFERS RELINQUISHED BY</th> <th>TRANSFERS ACCEPTED BY</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td colspan="2">Matt Gould</td> <td colspan="2"></td> <td>9/19/19</td> <td>0800</td> <td>1</td> <td></td> <td></td> <td>9/19/19</td> <td>1445</td> </tr> <tr> <td colspan="6" rowspan="4"> Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter. *All samples chilled to 4 degrees celsius. </td> <td>2</td> <td></td> <td></td> <td>9/19/19</td> <td>1645</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Sampler's Name (Print)		Signature		DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	Matt Gould				9/19/19	0800	1			9/19/19	1445	Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter. *All samples chilled to 4 degrees celsius.						2			9/19/19	1645	3					4					5				
Sampler's Name (Print)		Signature		DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME																																															
Matt Gould				9/19/19	0800	1			9/19/19	1445																																															
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						3																																																			
						4																																																			
						5																																																			



ANALYTICAL REPORT

Lab Number:	L1943028
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 2
Project Number:	AYER, TOWN OF
Report Date:	09/25/19

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: AYER IPP SAMPLING DAY 2
Project Number: AYER, TOWN OF

Lab Number: L1943028
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943028-01	SMH @ SANDY POND COMP	WATER	MILL STREET, AYER, MA	09/18/19 08:00	09/18/19
L1943028-02	SMH @ SANDY POND GRAB	WATER	MILL STREET, AYER, MA	09/18/19 08:00	09/18/19

Project Name: AYER IPP SAMPLING DAY 2
Project Number: AYER, TOWN OF

Lab Number: L1943028
Report Date: 09/25/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/25/19

METALS

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943028**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS**

Lab ID: L1943028-01

Date Collected: 09/18/19 08:00

Client ID: SMH @ SANDY POND COMP

Date Received: 09/18/19

Sample Location: MILL STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.1790		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Chromium, Total	0.00233		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Copper, Total	0.07560		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Lead, Total	0.00311		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 23:26	EPA 245.1	3,245.1	MG
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Nickel, Total	0.00753		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM
Zinc, Total	0.2595		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 10:26	EPA 3005A	3,200.8	AM



Project Name: AYER IPP SAMPLING DAY 2

Lab Number: L1943028

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287393-1										
Mercury, Total	ND		mg/l	0.00020	--	1	09/23/19 12:37	09/23/19 22:55	3,245.1	MG

Prep Information

Digestion Method: EPA 245.1

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287409-1										
Aluminum, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/23/19 13:06	09/24/19 09:15	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Lab Number: L1943028

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287393-2								
Mercury, Total	89		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287409-2								
Aluminum, Total	102		-		85-115	-		
Antimony, Total	86		-		85-115	-		
Arsenic, Total	106		-		85-115	-		
Beryllium, Total	98		-		85-115	-		
Cadmium, Total	107		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	97		-		85-115	-		
Lead, Total	106		-		85-115	-		
Molybdenum, Total	104		-		85-115	-		
Nickel, Total	98		-		85-115	-		
Selenium, Total	115		-		85-115	-		
Silver, Total	98		-		85-115	-		
Thallium, Total	107		-		85-115	-		
Zinc, Total	106		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943028

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-3 QC Sample: L1942718-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00451	90		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-5 QC Sample: L1942757-01 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00438	88		-	-		70-130	-		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-3 QC Sample: L1942810-01 Client ID: MS Sample												
Aluminum, Total	ND	2	2.127	106		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.3880	78		-	-		70-130	-		20
Arsenic, Total	ND	0.12	0.1202	100		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.05027	100		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.05414	106		-	-		70-130	-		20
Chromium, Total	ND	0.2	0.1947	97		-	-		70-130	-		20
Copper, Total	ND	0.25	0.2443	98		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5440	107		-	-		70-130	-		20
Molybdenum, Total	ND	1	1.081	108		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4867	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1384	115		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04955	99		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1313	109		-	-		70-130	-		20
Zinc, Total	ND	0.5	0.5300	106		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943028

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-5 QC Sample: L1942970-01 Client ID: MS Sample									
Aluminum, Total	2.005	2	4.325	116	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4256	85	-	-	70-130	-	20
Arsenic, Total	0.0099	0.12	0.1392	108	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.05117	102	-	-	70-130	-	20
Cadmium, Total	0.00024	0.051	0.05451	106	-	-	70-130	-	20
Chromium, Total	ND	0.2	0.2066	103	-	-	70-130	-	20
Copper, Total	0.01225	0.25	0.2686	102	-	-	70-130	-	20
Lead, Total	0.01672	0.51	0.5937	113	-	-	70-130	-	20
Molybdenum, Total	0.0050	1	1.140	113	-	-	70-130	-	20
Nickel, Total	ND	0.5	0.5351	107	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1311	109	-	-	70-130	-	20
Silver, Total	ND	0.05	0.05210	104	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1360	113	-	-	70-130	-	20
Zinc, Total	0.05371	0.5	0.6190	113	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943028

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-4 QC Sample: L1942718-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287393-6 QC Sample: L1942757-01 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-4 QC Sample: L1942810-01 Client ID: DUP Sample						
Lead, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287409-6 QC Sample: L1942970-01 Client ID: DUP Sample						
Aluminum, Total	2.005	1.886	mg/l	6		20
Antimony, Total	ND	ND	mg/l	NC		20
Cadmium, Total	0.00024	0.00022	mg/l	8		20
Chromium, Total	ND	ND	mg/l	NC		20
Copper, Total	0.01225	0.01172	mg/l	4		20
Lead, Total	0.01672	0.01659	mg/l	1		20
Nickel, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.05371	0.05078	mg/l	6		20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 2

Lab Number: L1943028

Project Number: AYER, TOWN OF

Report Date: 09/25/19

SAMPLE RESULTS

Lab ID: L1943028-01

Date Collected: 09/18/19 08:00

Client ID: SMH @ SANDY POND COMP

Date Received: 09/18/19

Sample Location: MILL STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	78.		mg/l	25	NA	5	-	09/19/19 14:03	121,2540D	DR
Nitrogen, Ammonia	44.2		mg/l	1.50	--	20	09/20/19 18:23	09/24/19 21:31	121,4500NH3-BH	AT
Phosphorus, Total	5.96		mg/l	0.250	--	25	09/23/19 09:15	09/23/19 15:55	121,4500P-E	SD
BOD, 5 day	180		mg/l	30	NA	15	09/20/19 03:10	09/24/19 21:45	121,5210B	TE



Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943028**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1943028-02**Date Collected:** 09/18/19 08:00**Client ID:** SMH @ SANDY POND GRAB**Date Received:** 09/18/19**Sample Location:** MILL STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:55	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:20	121,3500CR-B	MA



Project Name: AYER IPP SAMPLING DAY 2

Lab Number: L1943028

Project Number: AYER, TOWN OF

Report Date: 09/25/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1285957-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/19/19 05:30	09/19/19 07:16	121,3500CR-B	MA
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286012-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/19/19 14:03	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286066-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/19/19 10:55	09/19/19 14:34	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286546-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/20/19 03:10	09/24/19 21:45	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286636-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/20/19 18:23	09/24/19 20:55	121,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287299-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/23/19 09:15	09/23/19 14:59	121,4500P-E	SD



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943028

Report Date: 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1285957-2								
Chromium, Hexavalent	96		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286066-2								
Cyanide, Total	97		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286546-2								
BOD, 5 day	97		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286636-2								
Nitrogen, Ammonia	98		-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287299-2								
Phosphorus, Total	99		-		80-120	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943028

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285957-4 QC Sample: L1943027-02 Client ID: MS Sample												
Chromium, Hexavalent	ND	0.1	0.093	93		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-4 QC Sample: L1942830-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.194	97		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286546-4 QC Sample: L1942975-01 Client ID: MS Sample												
BOD, 5 day	ND	100	92	92		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286636-4 QC Sample: L1943110-01 Client ID: MS Sample												
Nitrogen, Ammonia	0.126	4	3.48	84		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287299-3 QC Sample: L1941678-01 Client ID: MS Sample												
Phosphorus, Total	0.143	0.5	0.640	99		-	-		75-125	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY 2

Project Number: AYER, TOWN OF

Lab Number: L1943028

Report Date: 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1285957-3 QC Sample: L1943027-02 Client ID: DUP Sample						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286012-2 QC Sample: L1943029-01 Client ID: DUP Sample						
Solids, Total Suspended	89	87	mg/l	2		29
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286066-3 QC Sample: L1942830-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286546-3 QC Sample: L1942975-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286636-3 QC Sample: L1943110-01 Client ID: DUP Sample						
Nitrogen, Ammonia	0.126	0.101	mg/l	22	Q	20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287299-4 QC Sample: L1941678-01 Client ID: DUP Sample						
Phosphorus, Total	0.143	0.142	mg/l	1		20

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943028**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943028-01A	Plastic 250ml HNO3 preserved	A	<2	<2	2.1	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943028-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	2.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1943028-01C	Plastic 500ml unpreserved	B	7	7	2.0	Y	Absent		BOD-5210(2)
L1943028-01D	Plastic 950ml unpreserved	B	7	7	2.0	Y	Absent		TSS-2540(7)
L1943028-02A	Plastic 250ml unpreserved	A	7	7	2.1	Y	Absent		HEXCR-3500(1)
L1943028-02B	Plastic 250ml NaOH preserved	A	>12	>12	2.1	Y	Absent		TCN-4500(14)

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943028**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

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.
LCS D	- 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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943028**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943028**Project Number:** AYER, TOWN OF**Report Date:** 09/25/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Lab Invoice To: Hoyle Tanner

Lab Report To: Hoyle Tanner

L1943028

EST Invoice To: Hoyle Tanner

5555-Q-xx
Q#00978

Site: Ayer, Town ofAddress: Mill Street

Ayer MA 01432-

Contact: Paula BoylePhone #: (603) 669-5555Description: Ayer IPP Sampling Day 2 of 3 (Sandy Pond MH)Client: Hoyle, Tanner & Associates, Inc.Address: 150 Dow Street

Manchester NH 03101-

Contact: Paula BoylePhone #: (603) 669-5555Fax #: (603) 669-4168☐ Rush ____ Day Turnaround

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes	
		Size	Type	#	Date	Time				
SMH @ Sandy Pond Comp (time)	1	250 ml	P	1	9/17-18	0915-0800	HNO3	Total Metals *See Comments*	pH =	
SMH @ Sandy Pond Comp	1	1 L	P	1	↓	↓	None	TSS	Flow =	
SMH @ Sandy Pond Comp	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp =	
SMH @ Sandy Pond Comp	1	500 ml	P	1	↓	↓	None	BOD		
SMH @ Sandy Pond Grab	1	250 ml	P	1	9/18	0800	NaOH	Total CN		
SMH @ Sandy Pond Grab (4x)	1	1 L	G	2			HCl	Oil & Grease <i>MB</i>		
SMH @ Sandy Pond Grab	1	500 ml	P	1	9/18	0800	None	CrVI		
Sampler's Name (Print) Signature DATE TIME NUMBER TRANSFERS RELINQUISHED BY TRANSFERS ACCEPTED BY DATE TIME										
Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter.						1	<i>Matt Gould</i>	<i>John AAL</i>	9/18/19	1510
						2	<i>John</i>	<i>John</i>	9/18/19	1741
						3				
						4				
						5				

*All samples chilled to 4 degrees celsius.



ANALYTICAL REPORT

Lab Number:	L1943023
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 1
Project Number:	BROOK STREET WWTF
Report Date:	09/24/19

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: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943023
Report Date: 09/24/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943023-01	SMH @ ANGARD LANE GRAB (4X)	WATER	BROOK STREET, AYER, MA	09/17/19 14:15	09/18/19

Project Name: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943023
Report Date: 09/24/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/24/19

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1943023**Report Date:** 09/24/19**SAMPLE RESULTS****Lab ID:** L1943023-01**Client ID:** SMH @ ANGARD LANE GRAB (4X)**Sample Location:** BROOK STREET, AYER, MA**Date Collected:** 09/17/19 14:15**Date Received:** 09/18/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Oil & Grease, Hem-Grav	50.		mg/l	4.0	--	1	09/19/19 17:30	09/19/19 18:00	74,1664A	ML



Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943023**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286261-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/19/19 17:30	09/19/19 18:00	74,1664A	ML

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 1**Lab Number:** L1943023**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286261-2								
Oil & Grease, Hem-Grav	96		-		78-114	-		18

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 1

Lab Number: L1943023

Project Number: BROOK STREET WWTF

Report Date: 09/24/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286261-4 QC Sample: L1942616-01 Client ID: MS Sample												
Oil & Grease, Hem-Grav	12	50	80	137	Q	-	-		78-114	-		18

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** AYER IPP SAMPLING DAY 1**Project Number:** BROOK STREET WWTF**Lab Number:** L1943023**Report Date:** 09/24/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286261-3 QC Sample: L1942616-01 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	12	9.7	mg/l	21	Q	18

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943023**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

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

B Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943023-01A	Amber 1000ml HCl preserved	B	NA		2.0	Y	Absent		OG-1664(28)
L1943023-01B	Amber 1000ml HCl preserved	B	NA		2.0	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943023**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 1**Lab Number:** L1943023**Project Number:** BROOK STREET WWTF**Report Date:** 09/24/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 1
Project Number: BROOK STREET WWTF

Lab Number: L1943023
Report Date: 09/24/19

REFERENCES

- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

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 its 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

Certification Information

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

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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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: Hoyle Tanner

Hoyle Tanner

Lab Report To:

Liquor 3023

EST Invoice To: Hoyle Tanner

5555-Q-xx

Q#00978

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

Description: Ayer IPP Sampling Day 1 - Partial (Angard)

Fax #: (603) 669-4168

☐ Rush ____Day Turnaround[illegible]



ANALYTICAL REPORT

Lab Number:	L1943304
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 2
Project Number:	BROOK STREET WWTF
Report Date:	09/25/19

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: AYER IPP SAMPLING DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943304
Report Date: 09/25/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943304-01	SMH @ ANGARD LANE GRAB (4X)	WATER	BROOK STREET, AYER, MA	09/18/19 08:25	09/19/19

Project Name: AYER IPP SAMPLING DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943304
Report Date: 09/25/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/25/19

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943304**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**SAMPLE RESULTS****Lab ID:** L1943304-01**Date Collected:** 09/18/19 08:25**Client ID:** SMH @ ANGARD LANE GRAB (4X)**Date Received:** 09/19/19**Sample Location:** BROOK STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Oil & Grease, Hem-Grav	43.		mg/l	4.0	--	1	09/20/19 17:30	09/20/19 18:00	74,1664A	ML



Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943304**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286777-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/20/19 17:30	09/20/19 18:00	74,1664A	ML

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 2**Lab Number:** L1943304**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286777-2								
Oil & Grease, Hem-Grav	97		-		78-114	-		18

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 2

Lab Number: L1943304

Project Number: BROOK STREET WWTF

Report Date: 09/25/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286777-4 QC Sample: L1943285-02 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	40	37	93		-	-		78-114	-		18

Lab Duplicate Analysis
*Batch Quality Control***Project Name:** AYER IPP SAMPLING DAY 2**Project Number:** BROOK STREET WWTF**Lab Number:** L1943304**Report Date:** 09/25/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286777-3 QC Sample: L1943285-01 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943304**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

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

B Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943304-01A	Amber 1000ml HCl preserved	B	NA		4.1	Y	Absent		OG-1664(28)
L1943304-01B	Amber 1000ml HCl preserved	B	NA		4.1	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943304**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 2**Lab Number:** L1943304**Project Number:** BROOK STREET WWTF**Report Date:** 09/25/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 2
Project Number: BROOK STREET WWTF

Lab Number: L1943304
Report Date: 09/25/19

REFERENCES

- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

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 its 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.



Alpha Analytical, Inc.

ID No.:17873

Facility: **Company-wide**

Revision 15

Department: **Quality Assurance**

Published Date: 8/15/2019 9:53:42 AM

Title: **Certificate/Approval Program Summary**

Page 1 of 1

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**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.

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.****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.



EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
G - Glass
V - VOA
B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Laboratory:

Alpha Analytical Labs
(508) 898-9220

Lab Invoice To: ~~Moyle Tanner~~ EST

Hoyle Tanner

Lab Report To:

L1943304

EST Invoice To: Hoyle Tanner

5555-Q-xx

Q#00978

☐ Rush ____Day Turnaround

Site: Brook Street Wastewater Treatment Facility

Client: Hoyle, Tanner & Associates, Inc.

Address: Brook Street

Address: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Rick Hudson

Contact: Paula Boyle

Phone #: (978) 772-8243

Phone #: (603) 669-5555

Description: Ayer IPP Sampling Day 2 - Partial (Angard)

Fax #: (603) 669-4168

[illegible]



ANALYTICAL REPORT

Lab Number:	L1943302
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	TOWN OF AYER IPP DAY 3
Project Number:	BROOK STREET WWTF
Report Date:	09/26/19

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: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943302
Report Date: 09/26/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943302-01	SMH @ ANGARD LANE COMP	WATER	ANGARD LANE, AYER, MA	09/19/19 08:25	09/19/19
L1943302-02	SMH @ ANGARD LANE GRAB	WATER	ANGARD LANE, AYER, MA	09/19/19 08:25	09/19/19

Project Name: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943302
Report Date: 09/26/19

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: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943302
Report Date: 09/26/19

Case Narrative (continued)

Total Metals

L1943302-01: The sample has elevated detection limits for beryllium due to the dilution required by the high concentrations of non-target elements.

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/26/19

METALS

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943302**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS**

Lab ID: L1943302-01

Date Collected: 09/19/19 08:25

Client ID: SMH @ ANGARD LANE COMP

Date Received: 09/19/19

Sample Location: ANGARD LANE, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.1384		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Arsenic, Total	0.00173		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00500	--	5	09/24/19 16:54	09/25/19 12:31	EPA 3005A	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Copper, Total	0.06656		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Lead, Total	0.00327		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/24/19 16:07	09/24/19 22:12	EPA 245.1	3,245.1	AL
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Nickel, Total	0.00443		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM
Zinc, Total	0.1082		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:49	EPA 3005A	3,200.8	AM



Project Name: TOWN OF AYER IPP DAY 3

Lab Number: L1943302

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287993-1									
Aluminum, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Antimony, Total	ND	mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Arsenic, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Beryllium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Cadmium, Total	ND	mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Chromium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Copper, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Lead, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Molybdenum, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Nickel, Total	ND	mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Selenium, Total	ND	mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Silver, Total	ND	mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Thallium, Total	ND	mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Zinc, Total	ND	mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287997-1									
Mercury, Total	ND	mg/l	0.0002	--	1	09/24/19 16:07	09/24/19 21:30	3,245.1	AL

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943302

Report Date: 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287993-2								
Aluminum, Total	92		-		85-115	-		
Antimony, Total	85		-		85-115	-		
Arsenic, Total	97		-		85-115	-		
Beryllium, Total	97		-		85-115	-		
Cadmium, Total	100		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	92		-		85-115	-		
Lead, Total	101		-		85-115	-		
Molybdenum, Total	95		-		85-115	-		
Nickel, Total	95		-		85-115	-		
Selenium, Total	98		-		85-115	-		
Silver, Total	95		-		85-115	-		
Thallium, Total	105		-		85-115	-		
Zinc, Total	99		-		85-115	-		

Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287997-2

Mercury, Total	90		-		85-115	-		
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Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 3

Lab Number: L1943302

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-3 QC Sample: L1943414-01 Client ID: MS Sample												
Aluminum, Total	0.2622	2	2.125	93		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.4386	88		-	-		70-130	-		20
Arsenic, Total	0.00718	0.12	0.1220	96		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.04655	93		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.04919	96		-	-		70-130	-		20
Chromium, Total	0.00166	0.2	0.1914	95		-	-		70-130	-		20
Copper, Total	0.00151	0.25	0.2291	91		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5026	98		-	-		70-130	-		20
Molybdenum, Total	0.0249	1	0.9951	97		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4850	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1263	105		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04611	92		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1211	101		-	-		70-130	-		20
Zinc, Total	0.01650	0.5	0.5128	99		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943302

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-5 QC Sample: L1943878-01 Client ID: MS Sample									
Aluminum, Total	2.262	2	4.594	117	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4460	89	-	-	70-130	-	20
Arsenic, Total	0.00527	0.12	0.1304	104	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.04913	98	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05103	100	-	-	70-130	-	20
Chromium, Total	0.00923	0.2	0.2080	99	-	-	70-130	-	20
Copper, Total	0.01500	0.25	0.2534	95	-	-	70-130	-	20
Lead, Total	0.00966	0.51	0.5431	104	-	-	70-130	-	20
Molybdenum, Total	0.0469	1	1.023	98	-	-	70-130	-	20
Nickel, Total	0.01493	0.5	0.4985	97	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1348	112	-	-	70-130	-	20
Silver, Total	ND	0.05	0.04851	97	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1258	105	-	-	70-130	-	20
Zinc, Total	0.07696	0.5	0.6009	105	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-3 QC Sample: L1943085-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0049	99	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-5 QC Sample: L1943220-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0039	78	-	-	70-130	-	20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943302

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-4 QC Sample: L1943414-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.00718	0.00730	mg/l	2		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00166	0.00164	mg/l	1		20
Copper, Total	0.00151	0.00165	mg/l	9		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	0.00202	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.01650	0.01695	mg/l	3		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943302

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-6 QC Sample: L1943878-01 Client ID: DUP Sample					
Arsenic, Total	0.00527	0.00518	mg/l	2	20
Cadmium, Total	ND	ND	mg/l	NC	20
Chromium, Total	0.00923	0.00899	mg/l	3	20
Copper, Total	0.01500	0.01468	mg/l	2	20
Lead, Total	0.00966	0.00948	mg/l	2	20
Nickel, Total	0.01493	0.01446	mg/l	3	20
Selenium, Total	ND	ND	mg/l	NC	20
Silver, Total	ND	ND	mg/l	NC	20
Zinc, Total	0.07696	0.07399	mg/l	4	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-4 QC Sample: L1943085-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-6 QC Sample: L1943220-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943302**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS****Lab ID:** L1943302-01**Date Collected:** 09/19/19 08:25**Client ID:** SMH @ ANGARD LANE COMP**Date Received:** 09/19/19**Sample Location:** ANGARD LANE, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	74.		mg/l	16	NA	3.3	-	09/20/19 09:05	121,2540D	DR
Nitrogen, Ammonia	34.2		mg/l	1.50	--	20	09/24/19 05:18	09/25/19 20:18	121,4500NH3-BH	AT
Phosphorus, Total	5.37		mg/l	0.125	--	12.5	09/23/19 11:05	09/24/19 10:22	121,4500P-E	SD
BOD, 5 day	210		mg/l	30	NA	15	09/20/19 06:30	09/25/19 00:45	121,5210B	TE



Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943302**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS****Lab ID:** L1943302-02**Date Collected:** 09/19/19 08:25**Client ID:** SMH @ ANGARD LANE GRAB**Date Received:** 09/19/19**Sample Location:** ANGARD LANE, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/22/19 14:55	09/23/19 13:34	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:46	121,3500CR-B	JW



Project Name: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943302
Report Date: 09/26/19

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286398-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:45	121,3500CR-B	JW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286470-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/20/19 09:05	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286549-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/20/19 06:30	09/25/19 00:45	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1287157-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/22/19 14:55	09/23/19 14:45	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287301-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/23/19 11:05	09/24/19 09:03	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287667-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/24/19 05:18	09/25/19 19:42	121,4500NH3-BH	AT



Lab Control Sample Analysis

Batch Quality Control

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943302

Report Date: 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286398-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286549-2								
BOD, 5 day	92		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1287157-2								
Cyanide, Total	109		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287301-2								
Phosphorus, Total	101		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287667-2								
Nitrogen, Ammonia	92		-		80-120	-		20

Matrix Spike Analysis **Batch Quality Control**

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943302

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286398-4 QC Sample: L1943302-02 Client ID: SMH @ ANGARD LANE GRAB												
Chromium, Hexavalent	ND	0.1	0.093	93		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286549-4 QC Sample: L1943205-01 Client ID: MS Sample												
BOD, 5 day	ND	100	89	89		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1287157-4 QC Sample: L1943322-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.185	92		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287301-3 QC Sample: L1941674-02 Client ID: MS Sample												
Phosphorus, Total	0.033	0.5	0.542	102		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287667-4 QC Sample: L1943260-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.55	89		-	-		80-120	-		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: TOWN OF AYER IPP DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943302

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286398-3 QC Sample: L1943302-02 Client ID: SMH @ ANGARD LANE GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286470-2 QC Sample: L1943271-01 Client ID: DUP Sample						
Solids, Total Suspended	76	79	mg/l	4		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286549-3 QC Sample: L1943205-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1287157-3 QC Sample: L1943322-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287301-4 QC Sample: L1941674-02 Client ID: DUP Sample						
Phosphorus, Total	0.033	0.033	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287667-3 QC Sample: L1943260-01 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943302**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943302-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.1	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943302-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	4.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1943302-01C	Plastic 500ml unpreserved	A	7	7	4.1	Y	Absent		BOD-5210(2)
L1943302-01D	Plastic 950ml unpreserved	B	7	7	4.1	Y	Absent		TSS-2540(7)
L1943302-02A	Plastic 250ml unpreserved	A	7	7	4.1	Y	Absent		HEXCR-3500(1)
L1943302-02B	Plastic 250ml NaOH preserved	A	>12	>12	4.1	Y	Absent		TCN-4500(14)

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943302**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: TOWN OF AYER IPP DAY 3**Lab Number:** L1943302**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: TOWN OF AYER IPP DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943302
Report Date: 09/26/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



Associates, Inc.

EST Associates, Inc.
 51 Fremont Street
 Needham, MA 02494
 Phone (781) 455-0003
 Fax (781) 455-8336
 www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
 G - Glass
 V - VOA
 B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
 2. Groundwater 6. Storm Water
 3. Soil 7. Other _____
 4. Drinking Water

Laboratory:

Alpha Analytical Labs
 (508) 898-9220

Lab Invoice To: Hoyle Tanner **EST**

Lab Report To: Hoyle Tanner

L1943302

EST Invoice To: Hoyle Tanner

5555-G-xxbo
 Q#00978

Site: Ayer, Town of

Address: Angard Lane

Ayer

MA

01432-

Contact: Paula Boyle

Phone #: (603) 669-5555

Client: Hoyle, Tanner & Associates, Inc.

Address: 150 Dow Street

Manchester

NH

03101-

Contact: Paula Boyle

Phone #: (603) 669-5555

☐ **Rush** _____ Day Turnaround

Description: Town of Ayer IPP Sampling Day 3 of 3 (Angard Ln) **Fax #:** (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes																																										
		Size	Type	#	Date	Time																																													
SMH @ Angard Lane Comp (time)	1	250 ml	P	1	9/18-19	0825	HNO3	Total Metals *See Comments*	pH = 7.91																																										
SMH @ Angard Lane Comp	1	1 L	P	1	↓	↓	None	TSS	Flow = N/A																																										
SMH @ Angard Lane Comp	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 17.6																																										
SMH @ Angard Lane Comp	1	500 ml	P	1	↓	↓	None	BOD																																											
SMH @ Angard Lane Grab	1	250 ml	P	1	9/19	0825	NaOH	Total CN																																											
SMH @ Angard Lane Grab (4x)	1	1 L	G	2	↓	↓	HCl	Oil & Grease UG																																											
SMH @ Angard Lane Grab	1	500 ml	P	1	↓	↓	None	CrVI																																											
<table border="1"> <thead> <tr> <th>Sampler's Name (Print)</th> <th>Signature</th> <th>DATE</th> <th>TIME</th> <th>NUMBER</th> <th>TRANSFERS RELINQUISHED BY</th> <th>TRANSFERS ACCEPTED BY</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td>Matt Gould</td> <td><i>[Signature]</i></td> <td>9/19/19</td> <td>0825</td> <td>1</td> <td><i>[Signature]</i></td> <td><i>[Signature]</i> AAL</td> <td>9/19/19</td> <td>1445</td> </tr> <tr> <td colspan="4" rowspan="4"> Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter. *All samples chilled to 4 degrees celsius. </td> <td>2</td> <td><i>[Signature]</i></td> <td><i>[Signature]</i> #12</td> <td>9/19/19</td> <td>1645</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Sampler's Name (Print)	Signature	DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	Matt Gould	<i>[Signature]</i>	9/19/19	0825	1	<i>[Signature]</i>	<i>[Signature]</i> AAL	9/19/19	1445	Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter. *All samples chilled to 4 degrees celsius.				2	<i>[Signature]</i>	<i>[Signature]</i> #12	9/19/19	1645	3					4					5				
Sampler's Name (Print)	Signature	DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME																																											
Matt Gould	<i>[Signature]</i>	9/19/19	0825	1	<i>[Signature]</i>	<i>[Signature]</i> AAL	9/19/19	1445																																											
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				3																																															
				4																																															
				5																																															



ANALYTICAL REPORT

Lab Number:	L1943301
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 3
Project Number:	BROOK STREET WWTF
Report Date:	09/26/19

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: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943301
Report Date: 09/26/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943301-01	SMH @ SANDY POND COMP	WATER	MILL STREET, AYER, MA	09/19/19 08:00	09/19/19
L1943301-02	SMH @ SANDY POND GRAB	WATER	MILL STREET, AYER, MA	09/19/19 08:00	09/19/19

Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943301
Report Date: 09/26/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/26/19

METALS

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS**

Lab ID: L1943301-01

Date Collected: 09/19/19 08:00

Client ID: SMH @ SANDY POND COMP

Date Received: 09/19/19

Sample Location: MILL STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	0.05741		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Cadmium, Total	0.00046		mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Copper, Total	0.05733		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Lead, Total	0.00219		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Mercury, Total	ND		mg/l	0.00020	--	1	09/24/19 16:07	09/24/19 22:09	EPA 245.1	3,245.1	AL
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Nickel, Total	0.00350		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM
Zinc, Total	0.08414		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 10:44	EPA 3005A	3,200.8	AM



Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287993-1										
Aluminum, Total	ND		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Antimony, Total	ND		mg/l	0.00400	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Arsenic, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Beryllium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Cadmium, Total	ND		mg/l	0.00020	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Chromium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Copper, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Lead, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Molybdenum, Total	ND		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Nickel, Total	ND		mg/l	0.00200	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Selenium, Total	ND		mg/l	0.00500	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Silver, Total	ND		mg/l	0.00040	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Thallium, Total	ND		mg/l	0.00100	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM
Zinc, Total	ND		mg/l	0.01000	--	1	09/24/19 16:54	09/25/19 09:29	3,200.8	AM

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1287997-1										
Mercury, Total	ND		mg/l	0.0002	--	1	09/24/19 16:07	09/24/19 21:30	3,245.1	AL

Prep Information

Digestion Method: EPA 245.1



Lab Control Sample Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287993-2								
Aluminum, Total	92		-		85-115	-		
Antimony, Total	85		-		85-115	-		
Arsenic, Total	97		-		85-115	-		
Beryllium, Total	97		-		85-115	-		
Cadmium, Total	100		-		85-115	-		
Chromium, Total	97		-		85-115	-		
Copper, Total	92		-		85-115	-		
Lead, Total	101		-		85-115	-		
Molybdenum, Total	95		-		85-115	-		
Nickel, Total	95		-		85-115	-		
Selenium, Total	98		-		85-115	-		
Silver, Total	95		-		85-115	-		
Thallium, Total	105		-		85-115	-		
Zinc, Total	99		-		85-115	-		
Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1287997-2								
Mercury, Total	90		-		85-115	-		

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-3 QC Sample: L1943414-01 Client ID: MS Sample												
Aluminum, Total	0.2622	2	2.125	93		-	-		70-130	-		20
Antimony, Total	ND	0.5	0.4386	88		-	-		70-130	-		20
Arsenic, Total	0.00718	0.12	0.1220	96		-	-		70-130	-		20
Beryllium, Total	ND	0.05	0.04655	93		-	-		70-130	-		20
Cadmium, Total	ND	0.051	0.04919	96		-	-		70-130	-		20
Chromium, Total	0.00166	0.2	0.1914	95		-	-		70-130	-		20
Copper, Total	0.00151	0.25	0.2291	91		-	-		70-130	-		20
Lead, Total	ND	0.51	0.5026	98		-	-		70-130	-		20
Molybdenum, Total	0.0249	1	0.9951	97		-	-		70-130	-		20
Nickel, Total	ND	0.5	0.4850	97		-	-		70-130	-		20
Selenium, Total	ND	0.12	0.1263	105		-	-		70-130	-		20
Silver, Total	ND	0.05	0.04611	92		-	-		70-130	-		20
Thallium, Total	ND	0.12	0.1211	101		-	-		70-130	-		20
Zinc, Total	0.01650	0.5	0.5128	99		-	-		70-130	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943301
Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-5 QC Sample: L1943878-01 Client ID: MS Sample									
Aluminum, Total	2.262	2	4.594	117	-	-	70-130	-	20
Antimony, Total	ND	0.5	0.4460	89	-	-	70-130	-	20
Arsenic, Total	0.00527	0.12	0.1304	104	-	-	70-130	-	20
Beryllium, Total	ND	0.05	0.04913	98	-	-	70-130	-	20
Cadmium, Total	ND	0.051	0.05103	100	-	-	70-130	-	20
Chromium, Total	0.00923	0.2	0.2080	99	-	-	70-130	-	20
Copper, Total	0.01500	0.25	0.2534	95	-	-	70-130	-	20
Lead, Total	0.00966	0.51	0.5431	104	-	-	70-130	-	20
Molybdenum, Total	0.0469	1	1.023	98	-	-	70-130	-	20
Nickel, Total	0.01493	0.5	0.4985	97	-	-	70-130	-	20
Selenium, Total	ND	0.12	0.1348	112	-	-	70-130	-	20
Silver, Total	ND	0.05	0.04851	97	-	-	70-130	-	20
Thallium, Total	ND	0.12	0.1258	105	-	-	70-130	-	20
Zinc, Total	0.07696	0.5	0.6009	105	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-3 QC Sample: L1943085-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0049	99	-	-	70-130	-	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-5 QC Sample: L1943220-01 Client ID: MS Sample									
Mercury, Total	ND	0.005	0.0039	78	-	-	70-130	-	20

Lab Duplicate Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-4 QC Sample: L1943414-01 Client ID: DUP Sample						
Antimony, Total	ND	ND	mg/l	NC		20
Arsenic, Total	0.00718	0.00730	mg/l	2		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.00166	0.00164	mg/l	1		20
Copper, Total	0.00151	0.00165	mg/l	9		20
Lead, Total	ND	ND	mg/l	NC		20
Nickel, Total	ND	0.00202	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20
Zinc, Total	0.01650	0.01695	mg/l	3		20

Lab Duplicate Analysis *Batch Quality Control*

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287993-6 QC Sample: L1943878-01 Client ID: DUP Sample					
Arsenic, Total	0.00527	0.00518	mg/l	2	20
Cadmium, Total	ND	ND	mg/l	NC	20
Chromium, Total	0.00923	0.00899	mg/l	3	20
Copper, Total	0.01500	0.01468	mg/l	2	20
Lead, Total	0.00966	0.00948	mg/l	2	20
Nickel, Total	0.01493	0.01446	mg/l	3	20
Selenium, Total	ND	ND	mg/l	NC	20
Silver, Total	ND	ND	mg/l	NC	20
Zinc, Total	0.07696	0.07399	mg/l	4	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-4 QC Sample: L1943085-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20
Total Metals - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1287997-6 QC Sample: L1943220-01 Client ID: DUP Sample					
Mercury, Total	ND	ND	mg/l	NC	20

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943301

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

SAMPLE RESULTS

Lab ID: L1943301-01

Date Collected: 09/19/19 08:00

Client ID: SMH @ SANDY POND COMP

Date Received: 09/19/19

Sample Location: MILL STREET, AYER, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Suspended	45.		mg/l	16	NA	3.3	-	09/20/19 09:05	121,2540D	DR
Nitrogen, Ammonia	45.7		mg/l	1.50	--	20	09/24/19 05:18	09/25/19 20:14	121,4500NH3-BH	AT
Phosphorus, Total	5.12		mg/l	0.125	--	12.5	09/23/19 11:05	09/24/19 10:21	121,4500P-E	SD
BOD, 5 day	130		mg/l	30	NA	15	09/20/19 06:30	09/25/19 00:45	121,5210B	TE



Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**SAMPLE RESULTS****Lab ID:** L1943301-02**Date Collected:** 09/19/19 08:00**Client ID:** SMH @ SANDY POND GRAB**Date Received:** 09/19/19**Sample Location:** MILL STREET, AYER, MA**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Cyanide, Total	ND		mg/l	0.005	--	1	09/22/19 14:55	09/23/19 13:33	121,4500CN-CE	LH
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:47	121,3500CR-B	JW



Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

Method Blank Analysis Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1286396-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	09/20/19 01:00	09/20/19 01:45	121,3500CR-B	JW
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286470-1										
Solids, Total Suspended	ND		mg/l	5.0	NA	1	-	09/20/19 09:05	121,2540D	DR
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1286549-1										
BOD, 5 day	ND		mg/l	2.0	NA	1	09/20/19 06:30	09/25/19 00:45	121,5210B	TE
General Chemistry - Westborough Lab for sample(s): 02 Batch: WG1287157-1										
Cyanide, Total	ND		mg/l	0.005	--	1	09/22/19 14:55	09/23/19 14:45	121,4500CN-CE	LH
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287301-1										
Phosphorus, Total	ND		mg/l	0.010	--	1	09/23/19 11:05	09/24/19 09:03	121,4500P-E	SD
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287667-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	09/24/19 05:18	09/25/19 19:42	121,4500NH3-BH	AT



Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943301**Report Date:** 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1286396-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1286549-2								
BOD, 5 day	92		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 02 Batch: WG1287157-2								
Cyanide, Total	109		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287301-2								
Phosphorus, Total	101		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287667-2								
Nitrogen, Ammonia	92		-		80-120	-		20

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Project Number: BROOK STREET WWTF

Lab Number: L1943301

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286396-4 QC Sample: L1943301-02 Client ID: SMH @ SANDY POND GRAB												
Chromium, Hexavalent	ND	0.1	0.100	100		-	-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286549-4 QC Sample: L1943205-01 Client ID: MS Sample												
BOD, 5 day	ND	100	89	89		-	-		50-145	-		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1287157-4 QC Sample: L1943322-02 Client ID: MS Sample												
Cyanide, Total	ND	0.2	0.185	92		-	-		90-110	-		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287301-3 QC Sample: L1941674-02 Client ID: MS Sample												
Phosphorus, Total	0.033	0.5	0.542	102		-	-		75-125	-		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287667-4 QC Sample: L1943260-01 Client ID: MS Sample												
Nitrogen, Ammonia	ND	4	3.55	89		-	-		80-120	-		20

Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1943301
Report Date: 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1286396-3 QC Sample: L1943301-02 Client ID: SMH @ SANDY POND GRAB						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286470-2 QC Sample: L1943271-01 Client ID: DUP Sample						
Solids, Total Suspended	76	79	mg/l	4		29
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1286549-3 QC Sample: L1943205-01 Client ID: DUP Sample						
BOD, 5 day	ND	ND	mg/l	NC		35
General Chemistry - Westborough Lab Associated sample(s): 02 QC Batch ID: WG1287157-3 QC Sample: L1943322-01 Client ID: DUP Sample						
Cyanide, Total	ND	ND	mg/l	NC		30
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287301-4 QC Sample: L1941674-02 Client ID: DUP Sample						
Phosphorus, Total	0.033	0.033	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287667-3 QC Sample: L1943260-01 Client ID: DUP Sample						
Nitrogen, Ammonia	ND	ND	mg/l	NC		20

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1943301-01A	Plastic 250ml HNO3 preserved	A	<2	<2	4.1	Y	Absent		AL-2008T(180),CD-2008T(180),NI-2008T(180),BE-2008T(180),ZN-2008T(180),CU-2008T(180),AG-2008T(180),AS-2008T(180),HG-U(28),SE-2008T(180),MO-2008T(180),CR-2008T(180),PB-2008T(180),SB-2008T(180),TL-2008T(180)
L1943301-01B	Plastic 500ml H2SO4 preserved	A	<2	<2	4.1	Y	Absent		TPHOS-4500(28),NH3-4500(28)
L1943301-01C	Plastic 500ml unpreserved	A	9	9	4.1	Y	Absent		BOD-5210(2)
L1943301-01D	Plastic 950ml unpreserved	A	9	9	4.1	Y	Absent		TSS-2540(7)
L1943301-02A	Plastic 250ml unpreserved	A	9	9	4.1	Y	Absent		HEXCR-3500(1)
L1943301-02B	Plastic 250ml NaOH preserved	A	>12	>12	4.1	Y	Absent		TCN-4500(14)

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

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.
LCS D	- 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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943301**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943301
Report Date: 09/26/19

REFERENCES

- 3 Methods for the Determination of Metals in Environmental Samples, Supplement I. EPA/600/R-94/111. May 1994.
- 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

Page 1 of 1

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**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.

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.****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.



Associates, Inc.

EST Associates, Inc.
 51 Fremont Street
 Needham, MA 02494
 Phone (781) 455-0003
 Fax (781) 455-8336
 www.estassociates.com

Chain of Custody Record

Container Type

P - Plastic
 G - Glass
 V - VOA
 B - Bacteria

Sample Type

1. Wastewater 5. Surface Water
 2. Groundwater 6. Storm Water
 3. Soil 7. Other _____
 4. Drinking Water

Laboratory:

Alpha Analytical Labs
 (508) 898-9220

Lab Invoice To: Hoyle Tanner

EST

Lab Report To:

Hoyle Tanner

L1943301

EST Invoice To: Hoyle Tanner

5555-Q-xx-00

Q#00978

Site: Ayer, Town ofClient: Hoyle, Tanner & Associates, Inc.Address: Mill StreetAddress: 150 Dow Street

Ayer MA 01432-

Manchester NH 03101-

Contact: Paula BoyleContact: Paula BoylePhone #: (603) 669-5555Phone #: (603) 669-5555☐ Rush ____ Day TurnaroundDescription: Ayer IPP Sampling Day 3 of 3 (Sandy Pond MH)Fax #: (603) 669-4168

LOCATION (Sample Identification)	Sample Type	Container			Sampling		Preservative *	Laboratory Analysis	Notes																																																
		Size	Type	#	Date	Time																																																			
SMH @ Sandy Pond Comp (time)	1	250 ml	P	1	9/18-19	0800-0800	HNO3	Total Metals *See Comments*	pH = 8.58																																																
SMH @ Sandy Pond Comp	1	1 L	P	1	↓	↓	None	TSS	Flow = N/A																																																
SMH @ Sandy Pond Comp	1	500 ml	P	1	↓	↓	H2SO4	NH3, T-Phos	Temp = 15.4																																																
SMH @ Sandy Pond Comp	1	500 ml	P	1	↓	↓	None	BOD																																																	
SMH @ Sandy Pond Grab	1	250 ml	P	1	9/19	0800	NaOH	Total CN																																																	
SMH @ Sandy Pond Grab (4x)	1	1 L	G	2	↓	↓	HCl	Oil & Grease (mb)																																																	
SMH @ Sandy Pond Grab	1	500 ml	P	1	↓	↓	None	CrVI																																																	
<table border="1"> <thead> <tr> <th colspan="2">Sampler's Name (Print)</th> <th colspan="2">Signature</th> <th>DATE</th> <th>TIME</th> <th>NUMBER</th> <th>TRANSFERS RELINQUISHED BY</th> <th>TRANSFERS ACCEPTED BY</th> <th>DATE</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td colspan="2">Matt Gould</td> <td colspan="2">[Signature]</td> <td>9/19/19</td> <td>0800</td> <td>1</td> <td>[Signature]</td> <td>[Signature]</td> <td>9/19/19</td> <td>1445</td> </tr> <tr> <td colspan="6" rowspan="4"> Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter. *All samples chilled to 4 degrees celsius. </td> <td>2</td> <td>[Signature]</td> <td>[Signature]</td> <td>9/19/19</td> <td>1645</td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										Sampler's Name (Print)		Signature		DATE	TIME	NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	Matt Gould		[Signature]		9/19/19	0800	1	[Signature]	[Signature]	9/19/19	1445	Additional Comments: *Metals to Include* Al,As,Cd,Cu,Cr,Pb,Hg,Ni,Se,Ag,Tl,Zn,Sb,Be, Mo. *Please use lowest possible detection limit for each parameter. *All samples chilled to 4 degrees celsius.						2	[Signature]	[Signature]	9/19/19	1645	3					4					5				
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						3																																																			
						4																																																			
						5																																																			



ANALYTICAL REPORT

Lab Number:	L1943396
Client:	EST Associates, Inc. 51 Fremont Street Needham, MA 02494
ATTN:	John D'Andrea
Phone:	(781) 455-0003
Project Name:	AYER IPP SAMPLING DAY 3
Project Number:	BROOK STREET WWTF
Report Date:	09/26/19

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: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943396
Report Date: 09/26/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1943396-01	SMH @ SANDY POND GRAB (4X)	WATER	BROOK STREET, AYER, MA 01432	09/19/19 14:30	09/20/19

Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943396
Report Date: 09/26/19

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:



Caitlin Walukevich

Title: Technical Director/Representative

Date: 09/26/19

INORGANICS & MISCELLANEOUS

Project Name: AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943396**Report Date:** 09/26/19**SAMPLE RESULTS****Lab ID:** L1943396-01**Client ID:** SMH @ SANDY POND GRAB (4X)**Sample Location:** BROOK STREET, AYER, MA 01432**Date Collected:** 09/19/19 14:30**Date Received:** 09/20/19**Field Prep:** Not Specified**Sample Depth:****Matrix:** Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Oil & Grease, Hem-Grav	42.		mg/l	4.0	--	1	09/23/19 16:00	09/23/19 17:00	74,1664A	ML



Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943396**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**Method Blank Analysis**
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01 Batch: WG1287518-1										
Oil & Grease, Hem-Grav	ND		mg/l	4.0	--	1	09/23/19 16:00	09/23/19 17:00	74,1664A	ML

Lab Control Sample Analysis**Batch Quality Control****Project Name:** AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943396**Report Date:** 09/26/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 Batch: WG1287518-2								
Oil & Grease, Hem-Grav	93		-		78-114	-		18

Matrix Spike Analysis

Batch Quality Control

Project Name: AYER IPP SAMPLING DAY 3

Lab Number: L1943396

Project Number: BROOK STREET WWTF

Report Date: 09/26/19

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287518-4 QC Sample: L1900009-146 Client ID: MS Sample												
Oil & Grease, Hem-Grav	ND	40	37	92		-	-		78-114	-		18

Lab Duplicate Analysis*Batch Quality Control***Project Name:** AYER IPP SAMPLING DAY 3**Project Number:** BROOK STREET WWTF**Lab Number:** L1943396**Report Date:** 09/26/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01 QC Batch ID: WG1287518-3 QC Sample: L1900009-145 Client ID: DUP Sample						
Oil & Grease, Hem-Grav	ND	ND	mg/l	NC		18

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943396**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19**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(*)
L1943396-01A	Amber 1000ml HCl preserved	A	NA		2.0	Y	Absent		OG-1664(28)
L1943396-01B	Amber 1000ml HCl preserved	A	NA		2.0	Y	Absent		OG-1664(28)

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943396**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

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.
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.

Footnotes

Report Format: Data Usability Report

Project Name: AYER IPP SAMPLING DAY 3**Lab Number:** L1943396**Project Number:** BROOK STREET WWTF**Report Date:** 09/26/19

- 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.

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. If a 'Total' result is requested, the results of its individual components will also be reported.

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.
- 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 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.

Report Format: Data Usability Report



Project Name: AYER IPP SAMPLING DAY 3
Project Number: BROOK STREET WWTF

Lab Number: L1943396
Report Date: 09/26/19

REFERENCES

- 74 Method 1664, Revision A: N-Hexane Extractable Material (HEM; Oil & Grease) and Silica Gel Treated N-Hexane Extractable Material (SGT-HEM; Non-polar Material) by Extraction and Gravimetry, EPA-821-R-98-002, February 1999.

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 its 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.



Alpha Analytical, Inc.Facility: **Company-wide**Department: **Quality Assurance**Title: **Certificate/Approval Program Summary**ID No.: **17873**

Revision 15

Published Date: 8/15/2019 9:53:42 AM

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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**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.

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.****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.

EST Associates, Inc.
51 Fremont Street
Needham, MA 02494
Phone (781) 455-0003
Fax (781) 455-8336
www.estassociates.com

1. Wastewater 5. Surface Water
2. Groundwater 6. Storm Water
3. Soil 7. Other _____
4. Drinking Water

Alpha Analytical Labs
(508) 898-9220

5555-Q-xx 00
Q#00978

Fax #: (603) 669-4168

☐ Rush ____ Day Turnaround

**All samples chilled to 4 degrees celsius.*

APPENDIX F

Local Limits Plant Removal Efficiency - AYER, MA																								
Sample Date																								
	Aluminum	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Chromium V	Copper	Cyanide	Lead	Mercury	Molybdenum	Nickel	Oil/Grease	Total P	Selenium	Silver	Sulfide	Thallium	Ammonia	Zinc	TTO	TSS	BOD
Influent Average	0.151	0.003	0.031	0.001	0.001	0.002	0.005	0.028	0.0025	0.002	0.000	0.004	0.007	13.460	2.334	0.003	0.0011	0.003	0.003	8.942	0.078	183.17	74.60	136.40
Effluent Average	0.067	0.002	0.004	0.001	0.001	0.002	0.005	0.006	0.0025	0.002	0.000	0.002	0.005	1.333	0.122	0.003	0.0013	0.003	0.003	0.092	0.026	125.30	1.88	3.30
Removal Efficiency	56%	32%	87%	0%	0%	21%	0%	79%	0%	27%	0%	37%	23%	90%	95%	0%	-16%	-9%	-9%	99%	67%	32%	97%	98%

Efficiency (%)	48%	19%	88%	0%	0%	31%	-	78%	33%	31%	0%	31%	25%	88%	95%	0%				99%	44%	-	98%	98%
Min. Rem.	48%	19%	87%	0%	0%	21%	0%	78%	0%	27%	0%	31%	23%	88%	95%	0%	-16%	-9%	-9%	99%	44%	32%	97%	98%

APPENDIX G

Maximum Allowable Headworks

AYER, MA																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Notes

¹ Domestic flow = 0.69 MGD

I/I = 27 % of ADF

² Hauled Waste 10 gpd

³ Hardness dependent = 38, from permit - used Table in NPDES permit

SIU permitted flow and Nasova increased to 210,000 gpd for planning

Note about Hq - human consump.

Column 21 - BOD and TSS based on influent concs. using renegotiated flow (0.35 mgd)

Column 24 BOD and TSS based on Avg. of monthly Max. (2015-2022)

Column 25 BOD and TSS based on Avg. of monthly Aves. (2015-2022)

Cr, AG- used criteria * factor