

Town of Allenstown Preliminary MS4 Sampling and Study



September 17, 2014

Prepared By:

Hoyle, Tanner
& Associates, Inc.

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Background

The National Pollutant Discharge Elimination System (NPDES) permit in New Hampshire is known as the New Hampshire Small Municipal Separate Storm Sewer System General Permit. The last enforceable New Hampshire Small MS4 General Permit (MS4) expired in 2008, but remains in effect until a new permit is issued. A Draft 2008 MS4 was written but never became enforceable as it stayed in draft form. The February 2013 draft version of the MS4 has served to update the requirements of the previous Draft 2008 MS4.

The MS4 permit applies to communities that contain urbanized areas within their political boundaries. The 2010 urbanized area data was released by the Bureau of the Census and as a result, many communities that did not fall under the MS4 permit during the 2008 draft now contain new "urbanized areas" which make them subject to the requirements of the MS4.

The Town of Allenstown New Hampshire is one of the many communities that were not included in the 2008 draft MS4, but contains a new urbanized area represented in Figure 1 on the next page. The "urbanized area" of Allenstown is considered part of the MS4 area as of the Draft 2013 Permit. This designation makes the Town responsible for meeting all of the MS4 conditions in the stormwater system. The Town of Allenstown is looking ahead in order to meet the requirements of this permit before the permit is finalized and then becomes enforceable by the USEPA. This urbanized area of Allenstown will be subject to the MS4 permit when it becomes final. In an effort to be proactive the Town of Allenstown has begun work to ensure that Allenstown will be in compliance when the Final NPDES MS4 permit is issued. A date has not been set yet for the Final MS4 release by the United States Environmental Protection Agency (USEPA).

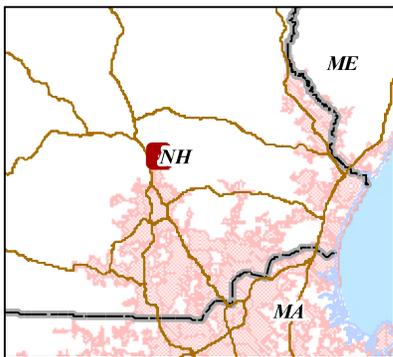
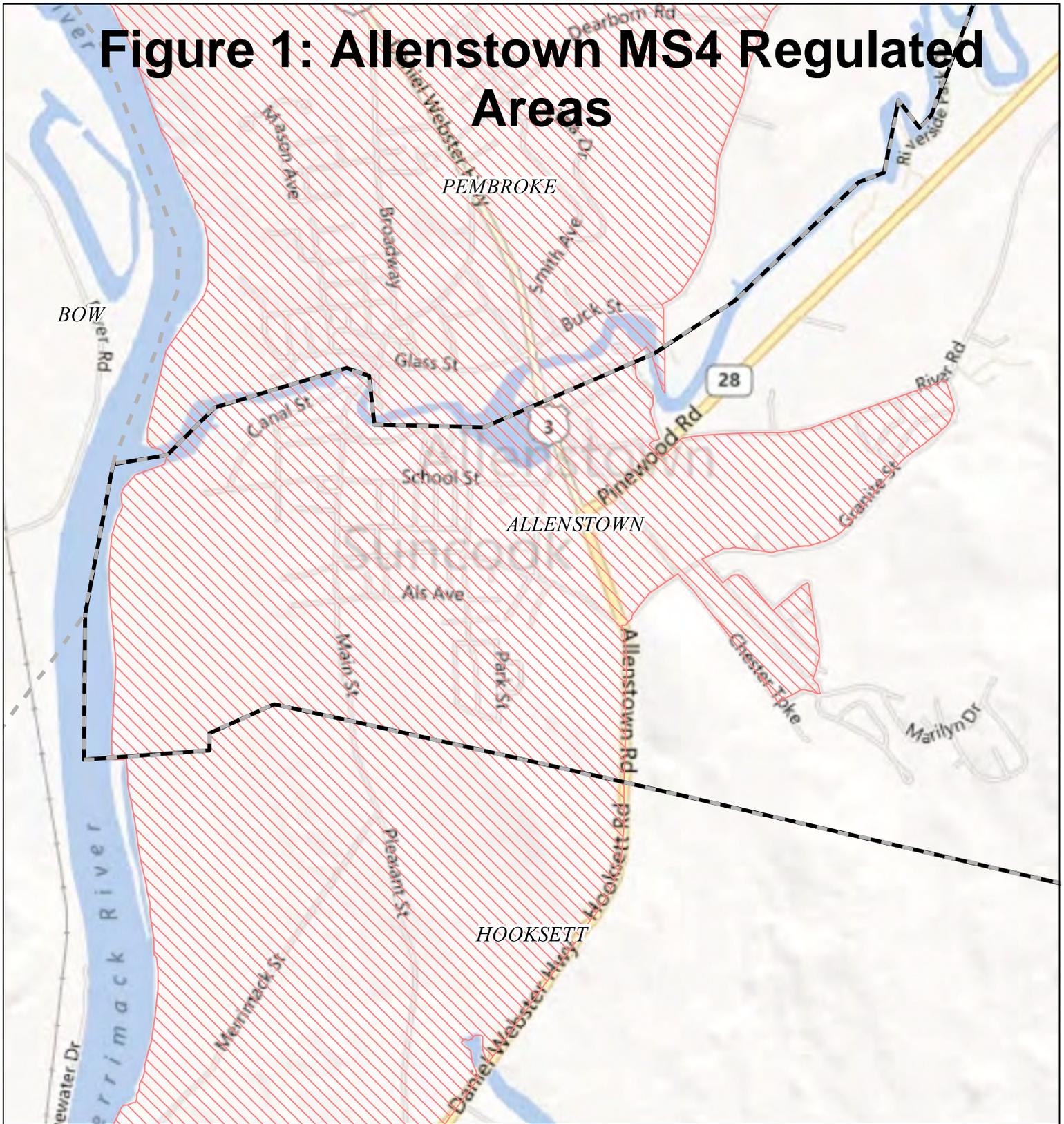
Purpose

The goals of this study were: (1) to identify stormwater outfalls (point sources) conveying stormwater to waters of the United States (all bodies of water including wetlands) and (2) to sample any of the identified outfalls that were flowing during dry weather (no greater than 0.1 inches of rain in the past 24 hours).

Procedure

Baseline outfall sampling and screening was conducted pursuant to Part 2.3.4.9.a. (dry weather) and 2.3.4.8.d.i-iii. of the 2013 draft MS4. Prior field collection work was completed during the summer of 2013 where all potential outfalls were identified. The summer 2014 study focused on adding or eliminating the outfalls in accordance with the screening and sampling procedure noted above. The procedure that was followed was consistent with both the *EPA New England Stormwater Outfall Sampling Protocol*, and the *EPA Stormwater Monitoring Program QAPP*, dated March 11, 2011, both referred to in the 2013 draft MS4.

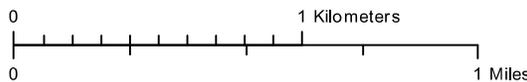
Figure 1: Allenstown MS4 Regulated Areas



NPDES Phase II Stormwater Program
Automatically Designated MS4 Areas

Allenstown NH

 Regulated Area (2000 + 2010 Urbanized Area)



Town Population: **6521**
Regulated Population: **2274**
(Populations estimated from 2010 Census)



Urbanized Areas, Town Boundaries:
US Census (2000, 2010)
Base map © 2010 Microsoft Corporation
and its data suppliers

During the screening and sampling study, an inventory of each outfall was conducted and included the condition of the outfall in addition to other relevant information. Refer to the Tables in Appendix A, as they include all of the field data that was collected for each outfall.

Any outfalls that were located outside the MS4 area (that did not contain stormwater from within the MS4) were excluded from the investigation. In addition, any State or privately-owned outfalls that do not contain stormwater from the permittee (Allenstown) are not the permittee's responsibility and as a result were also excluded as potential outfalls.

When flow was encountered at an outfall, a sample was collected and analyzed for the parameters listed in 2.3.4.8.d.v. which included: ammonia, chlorine, conductivity, salinity, E. coli, surfactants, temperature, and VOCs. VOCs were not a part of the required minimum parameters but were instead added per the Town's request and consultant's recommendation as a result of previous known contamination.

Ammonia, chlorine, conductivity, salinity, surfactants, and temperature were tested in the field using field test kits, while the E.coli and VOC's required lab analysis. Clean containers were used to collect all samples in their designated bottles. Samples that were sent to the lab were preserved according to lab recommendations and packed in ice. All holding times were noted and met.

The minimum parameters discussed above are deemed sufficient for the Town of Allenstown because the MS4 area is not discharging to an impaired water body per a search of the New Hampshire 303d Impaired Water List.

Threshold NPDES MS4 levels for each parameter are shown in Table 1 on page 5. If levels above the threshold were encountered in the field, the sampling crew was prepared to follow the flow upstream if necessary.

Findings/Results

A total of 22 outfalls were identified during this study, see Figure 2 on the next page. The outfalls were numbered and appear as blue hexagons with black dots in the middle. The two outfalls that had E.coli exceedances were colored yellow. 23 outfalls were labeled, however Outfall 23 (OF-23) required further investigation (see Recommendations section of this report). A detailed map of the Town of Allenstown Stormwater System and associated outfalls is in Figure 3. In addition to the Allenstown stormwater system (red), the state or privately-owned stormwater was depicted in yellow. Wetlands were shown on the map as well as surface water bodies. The purple symbols and font indicated numbered locations where further study was required.

Figure 2: Outfall Locations - As of July 2014

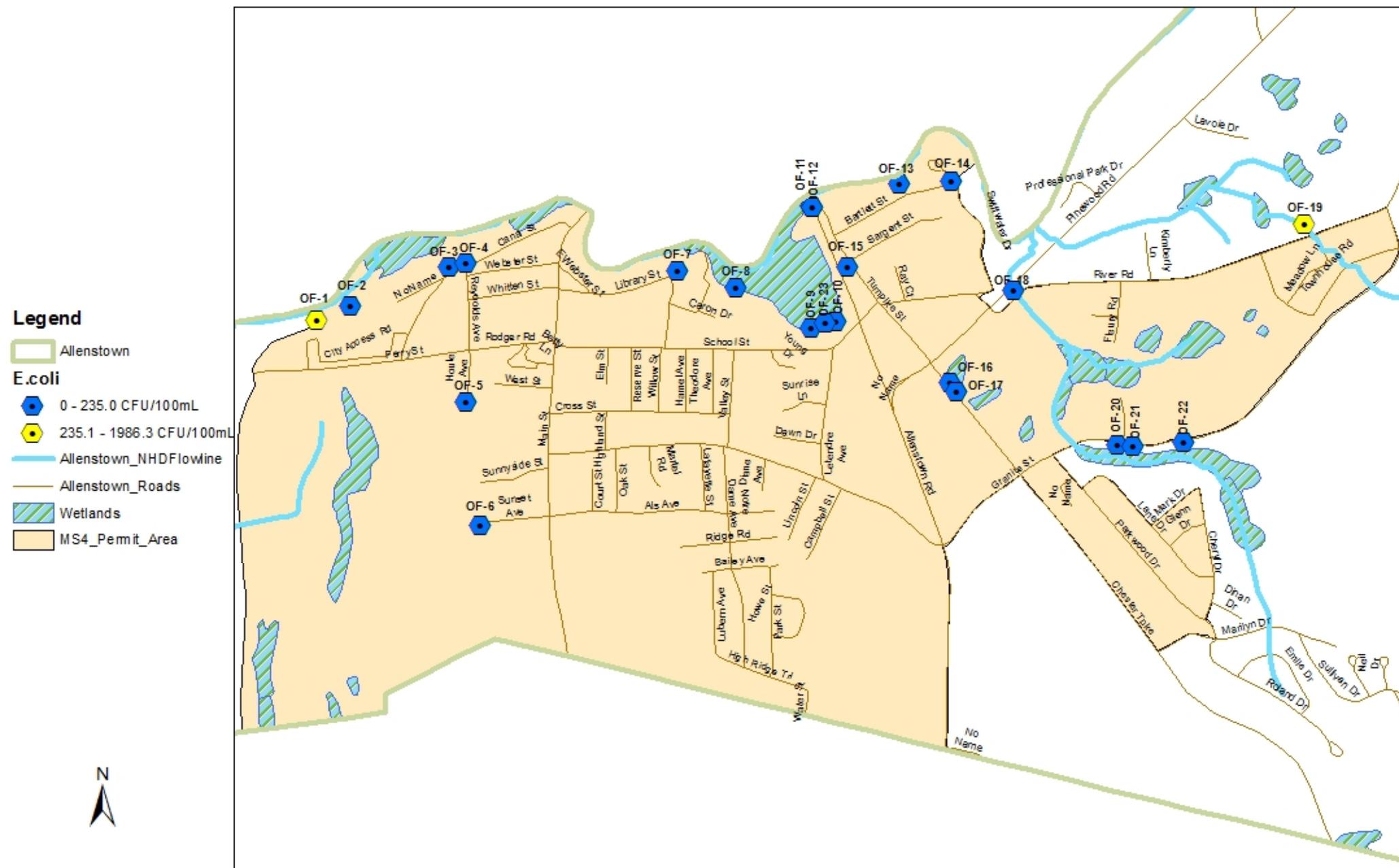
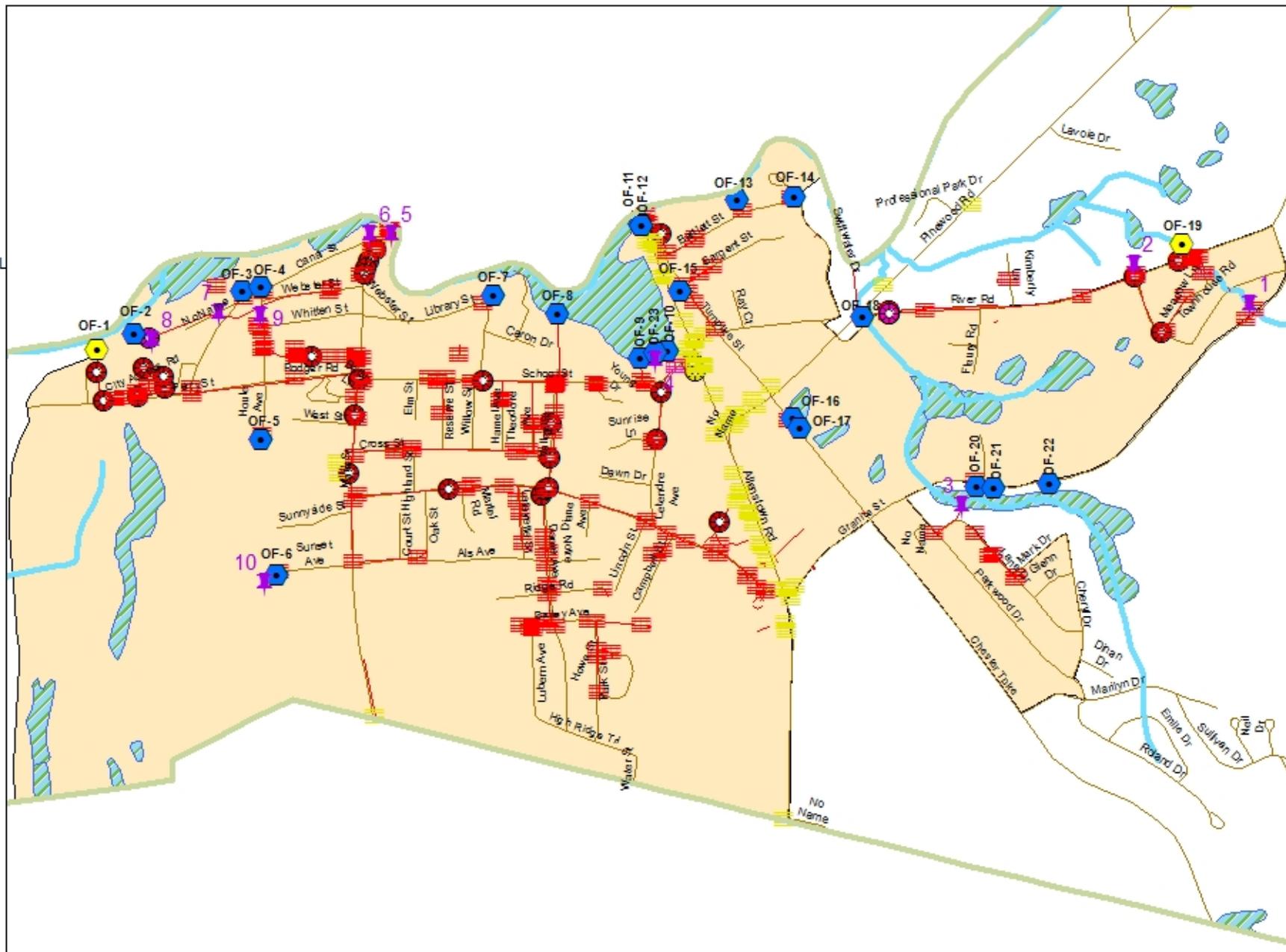


Figure 3: Allenstown MS4 Sampling Map

Legend

-  Further_StudyReq'd
-  Allenstown
- E.coli**
-  0 - 235.0 CFU/100mL
-  235.1 - 1986.3 CFU/100mL
-  SamplePt_Catch_Basin
-  SamplePt_Manhole
-  Catch_Basin
-  State_Owned_CBs
-  State_Drainage_Manhole
-  Drainage_Manholes
-  DrainagePipes
-  Allenstown_NHDFlowline
-  Allenstown_Roads
-  Wetlands
-  MS4_Permit_Area



Threshold Water Quality Criteria are shown in Table 1 below. These criteria were used to determine which outfalls were considered higher risks. Sampling data is shown in Table 2.

Table 1: Threshold Water Quality Criteria

Minimum Parameters:	Threshold Levels / Single Sample
Ammonia	≥ 0.5 mg/L
Chlorine	>0.02 mg/L
Surfactants (MBAs)	≥0.25 mg/L
E. Coli	235 cfu/100 mL
Specific Conductivity	NA
VOCs	NA
Salinity	NA
Temperature	≥83°F (28.3°C) and change 5°C (2.8°C) in rivers

The 2013 Draft MS4 states that “catchments where sampling results are obtained that have ammonia levels greater than or equal to 0.5 mg/L, surfactants greater than or equal to 0.25 mg/L, and bacteria levels greater than 235 cfu/100 mL shall be considered highly likely to contain illicit discharges from sanitary sources” (2013 Draft MS4).

The lab and field results of this study are included in Appendix A. An abbreviated representation of this information is presented in Table 2 below. Outfalls 1 (OF-1) and 2 (OF-19) were found to have E.coli levels at 410.6 cfu/100 mL and 1986.3 cfu/100 mL, respectively, which are above the threshold level of 235 cfu/100 mL as specified in Table 1. Other than the noted exceedances, all other parameters were found to be below the threshold levels.

Table 2: Sampling Results (Abbreviated Version)

Asset ID	Flow* (gpm)	E.Coli (CFU/100mL)	VOCs (µg/L)	Ammonia (mg/L)	Chlorine (mg/L)	Temp (deg F)	Salinity (ppt)	Specific Conductivity (µs/cm)	Surfactants (mg/L)
OF-1	10	410.6	ND	ND	ND	64	0.2	617	ND
OF-2	30	160.7	ND	ND	ND	68	0.2	335	ND
OF-8	10	5.2	ND	ND	ND	65	0.3	663	<0.25
OF-10	6	13.4	ND	ND	ND	72	0.3	613	ND
OF-18	6	12.1	ND	ND	ND	69	0.3	653	ND
OF-19	15	1986.3	ND	ND	ND	74	0.1	119.8	ND

Notes:

* = An asterisk indicates that flow (gpm) was approximated and not exact.

ND = Indicates that the analyte was not detected and was below the sampling instrument's detection limit.

Bold font indicates that the analyte was detected. **Grey Shading** indicates that the analyte was detected at above the Threshold Limit (See Table 1).

Conclusions

This study served as the Town of Allenstown's first effort to comply with some of the requirements put in place in the Draft 2013 MS4. At this point, a large portion of the outfall inventory is complete, and the baseline dry weather sampling is complete. With regards to the E.coli results, the measured levels were above the threshold levels, but without the ammonia and surfactants also being above the threshold in addition to the E.coli, the results were considered inconclusive and study/follow-up is recommended.

Recommendations

The Town of Allenstown is considered a "New Permittee." What this means for the Town is though some of the deadlines don't change, others will be extended. Timelines that are currently posted for previous MS4 municipalities will be extended by the specified time for new permittees. Due to the work that was completed in this report, some of the extension items have already been completed, or are nearly completed, placing the Town in a good position to meet the MS4 requirements when they become finalized. In Section 1.10.3 of the 2013 Draft MS4, the *public education requirements (2.3.2.1.b) are extended by one year*, so for example, the Town isn't required to meet this until the second year as opposed to year 1. The *Outfall Inventory (2.3.4.7) should be completed within two years of the permit effective date* as opposed to only one year. The *Outfall Mapping (2.3.4.6) should be completed within four years of the permit effective date* as opposed to only 2 years. *All other timelines of the IDDE Program, program development, monitoring, and IDDE Program Implementation Goals and Milestones (2.3.4) shall be extended by two years*, requiring the IDDE Program to be complete in three years after the permit effective date, instead of only one year. Lastly, the *ordinances, by-laws, or other regulatory mechanisms required by Parts 2.3.4, 2.3.5, and 2.3.6 should be completed as soon as possible, but no later than three years from the permit effective date.*

Suggested further work that can be completed before the Final MS4 is released includes:

1. Review questionable outfalls/piping with the Allenstown Highway Department;
2. Complete maps of sanitary/drainage system for the Town;
3. Complete the Notice of Intent (NOI);
4. Create a Stormwater System Use Ordinance or incorporate stormwater regulations into existing subdivision site plan regulations;
5. Begin work on Public Outreach portion of the MS4;
6. Develop a detailed QAPP before the next sampling rounds; and
7. After maps are completed, resampling of Outfalls 1 and 19.

The further work suggested above should be completed in the order that they are listed. The first item on the list should be completed as soon as possible. Discussion with the New Hampshire Department of Environmental Services (NHDES) revealed some indication that some of the draft MS4 will likely change between now and the final issue of the MS4. The suggested further work list was completed with this in mind.

1. Data analysis revealed some missing data in the drainage system that should be addressed. Figure 3 represents areas that have missing data in purple. In addition, there were some locations that could also be considered outfalls that should be discussed with the Highway Department. The Town of Allenstown Highway Department is currently working on many of these questionable areas, but will also require working directly with the consultant so that changes and updates can be made using appropriate GIS mapping software.
2. Item 2 (mapping) should be completed as soon as possible, but also before any further sampling is completed. Sewer/drainage design plans (if available) will be reviewed in addition to meeting with the Town's Highway Department in order to provide a complete and current map for the Town as required by the MS4. Completion of this map will ensure that if problem areas are found during sampling, the system can be reliably tracked in order to find the source(s) efficiently.
3. Item 3, the Notice of Intent (NOI), requires completion within one year and does not have an extension applied to it for new permittees. An NOI is required by any municipality seeking to discharge under the terms and conditions of the MS4.
4. A separate Stormwater System Use Ordinance should be prepared or stormwater regulations should be incorporated into existing subdivision site plans as soon as possible by a professional experienced in preparing stormwater ordinances in order to ensure that the stormwater system (drainage system) is being used in accordance with the MS4 permit terms and the Town can have an enforcement mechanism in place.
5. There are a total of eight public outreach messages that are required per year, and the outreach can be completed by cooperating with neighboring towns or completed alone. Currently Allenstown is part of the Central New Hampshire Stormwater Coalition, and materials on public outreach can be shared and exchanged through this program. A consultant could help to facilitate the first steps of the outreach.
6. A written Quality Assurance Project Plan (QAPP) should be completed prior to additional sampling, in accordance with the EPA Stormwater Monitoring Program QAPP from March 1, 2011.
7. Re-sampling of OF-1 and OF-19 should be completed after Items 1 and 2 are completed. If samples exceed the threshold levels for E. coli bacteria, the source(s) must be found and eliminated as soon as possible.

Appendix A

Table 3

Asset ID	Flow Estimate* (gpm)	Odor? (Y/N/ petroleum?)	Flotables (Y/N)	E.Coli (CFU/ 100mL)	VOCs (µg/L)	Ammonia (mg/L)	Chlorine (mg/L)	Temp (deg F)	Salinity (ppt)	Specific Conductivity (µs/cm)	Conductivity (µs/cm)	Surfactants (mg/L)
OF-1	10	N	N	410.6	ND	ND	ND	64	0.2	617	533	ND
OF-2	30	Y, petroleum	N	160.7	ND	ND	ND	68	0.2	335	303	ND
OF-3	-	-	-	-	-	-	-	-	-	-	-	-
OF-4	-	-	-	-	-	-	-	-	-	-	-	-
OF-5	-	-	-	-	-	-	-	-	-	-	-	-
OF-6	-	-	-	-	-	-	-	-	-	-	-	-
OF-7	-	-	-	-	-	-	-	-	-	-	-	-
OF-8	10	N	N	5.2	ND	ND	ND	65	0.3	663	492	<0.25
OF-9	-	-	-	-	-	-	-	-	-	-	-	-
OF-10	6	N	N	13.4	ND	ND	ND	72	0.3	613	461	ND
OF-11	-	-	-	-	-	-	-	-	-	-	-	-
OF-12	-	-	-	-	-	-	-	-	-	-	-	-
OF-13	-	-	-	-	-	-	-	-	-	-	-	-
OF-14	-	-	-	-	-	-	-	-	-	-	-	-
OF-15	-	-	-	-	-	-	-	-	-	-	-	-
OF-16	-	-	-	-	-	-	-	-	-	-	-	-
OF-17	-	-	-	-	-	-	-	-	-	-	-	-
OF-18	6	N	N	12.1	ND	ND	ND	69	0.3	653	487	ND
OF-19	15	N	N	1986.3	ND	ND	ND	74	0.1	119.8	88.6	ND
OF-20	-	-	-	-	-	-	-	-	-	-	-	-
OF-21	-	-	-	-	-	-	-	-	-	-	-	-
OF-22	-	-	-	-	-	-	-	-	-	-	-	-
OF-23**	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

* = An asterisk indicates that flow (gpm) was approximated and not exact.

** = Indicates that the outfall is under review and it has not been determined whether or not it is official. It will be tested at a later date by the Allenstown Highway Dept.

"-" = A dash indicates that data was not collected due to the fact that either the outfall was dry, or the condition could not be assessed at manholes.

ND = Indicates that the analyte was not detected and was below the sampling instrument's detection limit.

< = Indicates that the analyte was detected, but still below the minimum detection limit.

Bold font indicates that the analyte was detected.

Grey Shading indicates that the the analyte was detected at above the Threshold Limit (See Table 1).

1. VOC's were grouped together in this summary report, but reported separately in the lab report (See Appendices).

Table 4: Outfall Inventory

Asset ID	Time Collected	Date Collected	Diameter (in)	Evidence of Dry Weather Flow? (Y/N)	Condition (1-5)	Weather During Sampling	Precipitation in past 24 Hours? (Y/N)	Notes
OF-1	9:08:27am	7/22/2014	30	N	1	Sunny, 80's	N	Concrete pipe outfall to Suncook River.
OF-2	10:49:57am	7/22/2014	-	-	-	Sunny, 80's	N	Outfall was submerged - moved to upstream DM.
OF-3	12:48:39pm	7/22/2014	12	N	1	Sunny, 90's	N	
OF-4	12:51:51pm	7/22/2014	6	N	3	Sunny, 90's	N	Last 6 to 7 feet were of outfall piping was not buried or anchored.
OF-5	01:06:21pm	7/22/2014	-	N	1	Sunny, 90's	N	
OF-6	01:21:37pm	7/22/2014	~8	N	4	Sunny, 90's	N	Could not access outfall - very steep eroded channel.
OF-7	01:33:33pm	7/22/2014	8	N	5	Sunny, 90's	N	Rusted out - needs replacement.
OF-8	01:52:51pm	7/22/2014	12	N	1	Sunny, 90's	N	Likely a spring input here - DPW workers indicated.
OF-9	02:36:21pm	7/22/2014	14	N	5	Sunny, 90's	N	Completely rusted bottom.
OF-10	02:51:04pm	7/22/2014	30	-	-	Sunny, 90's	N	Outfall submerged; sampled at US DM.
OF-11	07:39:58am	7/23/2014	16	N	1	Sunny, 80's	N	
OF-12	07:41:47am	7/23/2014	14	N	1	Sunny, 80's	N	
OF-13	08:19:13am	7/23/2014	8	N	5	Sunny, 80's	N	Pipe was broken and is located in a heavily eroded river bank.
OF-14	08:45:13am	7/23/2014	12	N	5	Sunny, 80's	N	Outfall was eroded and could not access due to deep ravine. Water from outfall flows into private community then to Suncook River. End of the Town's land is at outfall.
OF-15	08:42:45am	7/23/2014	14	N	1	Sunny, 80's	N	Located on edge of Town's property and outfall is right before it discharges to State property then to the State outfall and river.
OF-16	08:56:38am	7/23/2014	8	N	1	Sunny, 80's	N	Located in wetland - water table very high. Slight trickle through the outfall, but not enough to sample

Asset ID	Time Collected	Date Collected	Diameter (in)	Evidence of Dry Weather Flow? (Y/N)	Condition (1-5)	Weather During Sampling	Precipitation in past 24 Hours? (Y/N)	Notes
OF-17	09:19:45am	7/23/2014	10	N	1	Sunny, 80's	N	Outfall submerged, but upstream no catch basin, so no other place to sample - could be considered a simple culvert so may be eliminated?
OF-18	10:14:00am	7/23/2014	-	N	1	Sunny, 80's	N	Sampled at upstream drainage MH, at point where the sewer was separated from the drainage at one point. Outfall to river is on prov. Prop. And nearest US CB is State-owned, so moved US.
OF-19	01:00:16pm	7/23/2014	24	N	1	Sunny, 90's	N	Poisonous plant near outfall. End point where stream finally exits culvert/drainage system for the roads.
OF-20	01:15:28pm	7/23/2014	12	N	1	Sunny, 90's	N	Might not be considered outfall - To examine at a TBD time.
OF-21	01:21:21pm	7/23/2014	6	N	1	Sunny, 90's	N	Might not be considered outfall - To examine at a TBD time.
OF-22	01:41:12pm	7/23/2014	6	N	1	Sunny, 90's	N	Might not be considered outfall - To examine at a TBD time.
OF-23 (under review)	02:00:20pm	7/23/2014	24	N	5	Sunny, 90's	N	Bottom half completely rusted out. Was not originally on map, homeowner made us aware of it, and if it is a drainage outfall will be confirmed later by Mark at DPW.
Notes: "-" = A dash indicates that data was not collected due to the fact that either the outfall was dry, or due to the fact that the sampling took place at a drainage manhole (DM). DM = Drainage Manhole US = Upstream OF = Outfall								

Heidi Lemay
Hoyle Tanner & Associates (NH)
150 Dow Street
Manchester, NH 03101-1227



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 133854
Client Identification: Allenstown MS4 / 013625
Date Received: 7/22/2014

Dear Ms. Lemay :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.eailabs.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

- Solid samples are reported on a dry weight basis, unless otherwise noted
- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,


Lorraine Olashaw, Lab Director

B. 4.14
Date

4
of pages (excluding cover letter)



SAMPLE CONDITIONS PAGE

EAI ID#: 133854

Client: **Hoyle Tanner & Associates (NH)**

Client Designation: **Allenstown MS4 / 013625**

Temperature upon receipt (°C): 10

Received on ice or cold packs (Yes/No): Y

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
133854.01	OF-1	7/22/14	7/22/14	aqueous		Adheres to Sample Acceptance Policy
133854.02	OF-2	7/22/14	7/22/14	aqueous		Adheres to Sample Acceptance Policy
133854.03	OF-10	7/22/14	7/22/14	aqueous		Adheres to Sample Acceptance Policy
133854.04	OF-8	7/22/14	7/22/14	aqueous		Adheres to Sample Acceptance Policy
133854.05	Trip Blank	7/22/14	7/15/14	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis. Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater, 20th Edition, 1998 and 22nd Edition, 2012
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 2nd edition, 1992



LABORATORY REPORT

EAI ID#: 133854

Client: Hoyle Tanner & Associates (NH)

Client Designation: Allenstown MS4 / 013625

Sample ID:	OF-1	OF-2	OF-10	OF-8	Trip Blank
Lab Sample ID:	133854.01	133854.02	133854.03	133854.04	133854.05
Matrix:	aqueous	aqueous	aqueous	aqueous	aqueous
Date Sampled:	7/22/14	7/22/14	7/22/14	7/22/14	7/15/14
Date Received:	7/22/14	7/22/14	7/22/14	7/22/14	7/22/14
Units:	ug/l	ug/l	ug/l	ug/l	ug/l
Date of Analysis:	7/24/14	7/23/14	7/23/14	7/23/14	7/23/14
Analyst:	KJP	KJP	KJP	KJP	KJP
Method:	624	624	624	624	624
Dilution Factor:	1	1	1	1	1
Chloromethane	< 5	< 5	< 5	< 5	< 5
Vinyl chloride	< 2	< 2	< 2	< 2	< 2
Bromomethane	< 2	< 2	< 2	< 2	< 2
Chloroethane	< 5	< 5	< 5	< 5	< 5
Trichlorofluoromethane	< 5	< 5	< 5	< 5	< 5
Acrolein	< 50	< 50	< 50	< 50	< 50
Acetone	< 50	< 50	< 50	< 50	< 50
1,1-Dichloroethene	< 1	< 1	< 1	< 1	< 1
Methylene chloride	< 5	< 5	< 5	< 5	< 5
Acrylonitrile	< 50	< 50	< 50	< 50	< 50
Methyl-t-butyl ether(MTBE)	< 10	< 10	< 10	< 10	< 10
trans-1,2-Dichloroethene	< 2	< 2	< 2	< 2	< 2
Vinyl acetate	< 10	< 10	< 10	< 10	< 10
1,1-Dichloroethane	< 2	< 2	< 2	< 2	< 2
cis-1,2-Dichloroethene	< 2	< 2	< 2	< 2	< 2
2-Butanone(MEK)	< 10	< 10	< 10	< 10	< 10
Chloroform	< 2	< 2	< 2	< 2	< 2
1,1,1-Trichloroethane	< 2	< 2	< 2	< 2	< 2
Carbon tetrachloride	< 2	< 2	< 2	< 2	< 2
Benzene	< 1	< 1	< 1	< 1	< 1
1,2-Dichloroethane	< 2	< 2	< 2	< 2	< 2
Trichloroethene	< 2	< 2	< 2	< 2	< 2
1,2-Dichloropropane	< 2	< 2	< 2	< 2	< 2
Bromodichloromethane	< 2	< 2	< 2	< 2	< 2
2-Chloroethylvinylether	< 2	< 2	< 2	< 2	< 2
4-Methyl-2-pentanone(MIBK)	< 10	< 10	< 10	< 10	< 10
cis-1,3-Dichloropropene	< 2	< 2	< 2	< 2	< 2
Toluene	< 1	< 1	< 1	< 1	< 1
trans-1,3-Dichloropropene	< 2	< 2	< 2	< 2	< 2
1,1,2-Trichloroethane	< 2	< 2	< 2	< 2	< 2
2-Hexanone	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	< 2	< 2	< 2	< 2	< 2
Dibromochloromethane	< 2	< 2	< 2	< 2	< 2
Chlorobenzene	< 2	< 2	< 2	< 2	< 2
Ethylbenzene	< 1	< 1	< 1	< 1	< 1
mp-Xylene	< 1	< 1	< 1	< 1	< 1
o-Xylene	< 1	< 1	< 1	< 1	< 1
Styrene	< 1	< 1	< 1	< 1	< 1
Bromoform	< 2	< 2	< 2	< 2	< 2
1,1,2,2-Tetrachloroethane	< 2	< 2	< 2	< 2	< 2
1,3-Dichlorobenzene	< 1	< 1	< 1	< 1	< 1
1,4-Dichlorobenzene	< 1	< 1	< 1	< 1	< 1
1,2-Dichlorobenzene	< 1	< 1	< 1	< 1	< 1
4-Bromofluorobenzene (surr)	97 %R	100 %R	98 %R	100 %R	96 %R
1,2-Dichlorobenzene-d4 (surr)	98 %R	104 %R	105 %R	103 %R	97 %R
Toluene-d8 (surr)	96 %R	91 %R	95 %R	95 %R	99 %R



LABORATORY REPORT

EAI ID#: 133854

Client: **Hoyle Tanner & Associates (NH)**

Client Designation: **Allenstown MS4 / 013625**

Sample ID:	OF-1	OF-2	OF-10	OF-8					
Lab Sample ID:	133854.01	133854.02	133854.03	133854.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	7/22/14	7/22/14	7/22/14	7/22/14					
Date Received:	7/22/14	7/22/14	7/22/14	7/22/14					
E.coli	410.6	160.7	13.4	5.2	MPN/100ml	7/22/14	16:40	9223B	SEL

Heidi Lemay
Hoyle Tanner & Associates (NH)
150 Dow Street
Manchester, NH 03101-1227



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 133905
Client Identification: Allenstown MS4 / 013625
Date Received: 7/23/2014

Dear Ms. Lemay :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.eailabs.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

- Solid samples are reported on a dry weight basis, unless otherwise noted
- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,


Lorraine Olashaw, Lab Director

8.1.14
Date

4
of pages (excluding cover letter)



SAMPLE CONDITIONS PAGE

EAI ID#: 133905

Client: **Hoyle Tanner & Associates (NH)**
 Client Designation: **Allenstown MS4 / 013625**

Temperature upon receipt (°C): 1

Received on ice or cold packs (Yes/No): Y

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date	Date	Sample	% Dry	Exceptions/Comments (other than thermal preservation)
		Received	Sampled	Matrix	Weight	
133905.01	OF-21 (20)	7/23/14	7/23/14	aqueous		Adheres to Sample Acceptance Policy
133905.02	OF-18	7/23/14	7/23/14	aqueous		Adheres to Sample Acceptance Policy

↗

This outfall was changed to OF-19 after later analysis and recorded as such.

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis. Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater, 20th Edition, 1998 and 22nd Edition, 2012
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 2nd edition, 1992



LABORATORY REPORT

EAI ID#: 133905

Client: Hoyle Tanner & Associates (NH)

Client Designation: Allenstown MS4 / 013625

Sample ID:	OF-21 (20) OF-19	OF-18
Lab Sample ID:	133905.01	133905.02
Matrix:	aqueous	aqueous
Date Sampled:	7/23/14	7/23/14
Date Received:	7/23/14	7/23/14
Units:	ug/l	ug/l
Date of Analysis:	7/25/14	7/25/14
Analyst:	KJP	KJP
Method:	624	624
Dilution Factor:	1	1
Chloromethane	< 5	< 5
Vinyl chloride	< 2	< 2
Bromomethane	< 2	< 2
Chloroethane	< 5	< 5
Trichlorofluoromethane	< 5	< 5
Acrolein	< 50	< 50
Acetone	< 50	< 50
1,1-Dichloroethene	< 1	< 1
Methylene chloride	< 5	< 5
Acrylonitrile	< 50	< 50
Methyl-t-butyl ether(MTBE)	< 10	< 10
trans-1,2-Dichloroethene	< 2	< 2
Vinyl acetate	< 10	< 10
1,1-Dichloroethane	< 2	< 2
cis-1,2-Dichloroethene	< 2	< 2
2-Butanone(MEK)	< 10	< 10
Chloroform	< 2	< 2
1,1,1-Trichloroethane	< 2	< 2
Carbon tetrachloride	< 2	< 2
Benzene	< 1	< 1
1,2-Dichloroethane	< 2	< 2
Trichloroethene	< 2	< 2
1,2-Dichloropropane	< 2	< 2
Bromodichloromethane	< 2	< 2
2-Chloroethylvinylether	< 2	< 2
4-Methyl-2-pentanone(MIBK)	< 10	< 10
cis-1,3-Dichloropropene	< 2	< 2
Toluene	< 1	< 1
trans-1,3-Dichloropropene	< 2	< 2
1,1,2-Trichloroethane	< 2	< 2
2-Hexanone	< 10	< 10
Tetrachloroethene	< 2	< 2
Dibromochloromethane	< 2	< 2
Chlorobenzene	< 2	< 2
Ethylbenzene	< 1	< 1
mp-Xylene	< 1	< 1
o-Xylene	< 1	< 1
Styrene	< 1	< 1
Bromoform	< 2	< 2
1,1,2,2-Tetrachloroethane	< 2	< 2
1,3-Dichlorobenzene	< 1	< 1
1,4-Dichlorobenzene	< 1	< 1
1,2-Dichlorobenzene	< 1	< 1
4-Bromofluorobenzene (surr)	89 %R	89 %R
1,2-Dichlorobenzene-d4 (surr)	108 %R	104 %R
Toluene-d8 (surr)	103 %R	98 %R



LABORATORY REPORT

EAI ID#: 133905

Client: **Hoyle Tanner & Associates (NH)**

Client Designation: **Allenstown MS4 / 013625**

Sample ID: ~~OF-21 (20)~~ OF-18
OF-19

Lab Sample ID: 133905.01 133905.02

Matrix: aqueous aqueous

Date Sampled: 7/23/14 7/23/14

Date Received: 7/23/14 7/23/14

E.coli 1986.3 12.1

		Analysis			
	Units	Date	Time	Method	Analyst
E.coli	MPN/100ml	7/23/14	15:00	9223B	SEL

Field Photos

Figure 4: Outfall 1



Figure 5: Outfall 2, Submerged, Sampled at Upstream Drainage Manhole



Figure 6: Outfall 3



Figure 7: Outfall 4



Note: No figure is available for Outfall 5.

Figure 8: Outfall 6



Figure 9: Outfall 7



Figure 10: Outfall 8



Figure 11: Outfall 9



Figure 12: Outfall 10, Sampled at Upstream Manhole



Figure 13: Outfall 11



Figure 14: Outfall 12



Figure 15: Outfall 13



Figure 16: Outfall 14



Figure 17: Outfall 15



Figure 18: Outfall 16



Figure 19: Outfall 17



Figure 20: Outfall 18 – Sampled at Upstream Manhole



Figure 21: Outfall 19



Figure 22: Outfall 20



Figure 23: Outfall 21



Figure 24: Outfall 22



Figure 25: Outfall 23 (Potential Outfall)

