

Sampling and Analysis Plan (SAP)

For

**Schiller Station
Thermal Plume Monitoring Project
Portsmouth/Newington, NH**

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND REGIONAL LABORATORY
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION
11 TECHNOLOGY DRIVE
NORTH CHELMSFORD, MASSACHUSETTS 01863

Title and Approval Page:

(Tim Bridges), EMT Project Manager

Date: _____

Diane Switzer, EMT Team Leader

Date: _____

Damien Houlihan, NPDES Permit Writer, OEP

Date: _____

1. Introduction

This site specific Sample Analysis Plan (SAP) was written in conjunction with the EMT generic Quality Assurance Project Plan (QAPP), 3/10. The general project goals, procedures, and quality control criteria in the generic QAPP are included in the specific SAP by reference. This SAP includes any additional site specific information not included in the generic QAPP along with a site map, sample locations, the number and type of samples to be collected including the quality control samples, the project manager and sampling team members, and any other pertinent information related to this project.

SAP Distribution List:

Name	Organization	Telephone #	Role
Tim Bridges	OEME	617-918-8603	Project Lead
John Nagle	OEP	617-918-1054	Field YSI Sondes
Meridith Timony	OEP	617-918-1533	Field GPS
Jennie Moonan	OEP	617-918-1319	Field Notes
Phil Colarruso	OEP	671-918-1506	Field Technical

All project staff are responsible for following the procedure outlined in this SAP and in the appropriate SOPs.

2. Project Description/Objective

OEP requested lab field work during the summer of 2010 to document the thermal characteristics of the plume resulting from the discharge of heated water from the Schiller Station operations.

The goal of the thermal characterization study is to document the size and extent of the thermal plume emitted from Schiller Station as it is dispersed in the Piscataqua River. This information will be valuable as OEP develops the facility's draft NPDES permit. Schiller Station's current NPDES permit expired in September 1995.

The study will take place under "critical" environmental conditions, meaning that the Piscataqua River should be at or near low flow, the river and air temperature should be at their seasonal high values, and the Station should be at or near maximum discharge (full power). Therefore, OEP requests this study during the late summer of 2010, during daylight hours which will be August 31st.

Table 2: Project Timeline Table

Task	Proposed completion Date
Field Reconnaissance	August 31 st
Sonde Transect w/ boat	August 31 st other if needed
Data delivered to permit writer	October 15
Sonde and GPS Monitoring Report	November 2010

Table 3: Analyses

Measurement	Parameter	Reporting Level or range	Project's Action Level
In-situ (real-time)	Temperature	0 to +40°C	Determine onsite
	pH	4 to 10 units	NA
	Salinity	0- 35 ppt	NA
	Dissolved Oxygen	0.5mg/l to Sat	≥5 mg/l , ≥60% saturation

Note:

For in-situ (sonde) measurements the following SOP will be followed: ECASOP-YSISondes10

3. Sampling Design

Field measurements will be collected to delineate the horizontal, vertical, and downstream extent, temperature and relative increase above ambient temperature of the thermal plume discharged from Schiller Station.

The boat crew will monitor by conducting multiple transects at an approximately 1 meter depth through the plume for a minimum of 2 hours if necessary. Other monitoring depths maybe needed depending on the location and depth of the plume determined by field crews. The addition of a pressure transducer measurement on the YSI sonde will enable the crew to determine exact depth of the YSI sonde used for monitoring and adjust the depth of the sonde with the tow fin or maintain a constant depth during a transect.

A boat will be used to monitor the track of the plume by measuring the temperature difference upstream and continuously past the plant as well as downstream of the plume or mixing zone. The boat will be a 23' Parker with cabin. The boat will each be equipped with a YSI 6000 series data sonde, datalogger, tow fin and a GPS unit. Calibration will be done on site before the survey and post calibration check will be performed to ensure the meter is not drifting.

Multiple bank-to-bank transects, perpendicular to the flow of the river, may be conducted as well as down river and up river transects as well as zig zag patterns through the plume if needed. The first transect shall be located just downstream of the facility starting at the Route 95 bridge upstream past the plant and into the plume. Most of the transect shall be located downstream of the discharge where field measurements have determined the approximate downstream distance closest to the discharge where the plume is fully mixed; and the other transects may be located in the thermal plume at 25%, 50% and 75% of the distance between the discharge and the downstream fully mixed transect.

Temperature measurement values to the nearest 0.5 degrees Fahrenheit shall be recorded in degrees Fahrenheit at a near-surface depth (approximately 1.0 meters below the surface), a near mid or bottom depth (approximately 3.0 meters below the surface, and possibly another depth in-between which will be determined on site by the project officer and the NPDES staff. If any position in the study has a water depth of two meters or less, then temperatures shall

be recorded at one depth near the surface. The mid depth and deep transects may be abandoned during the survey if the thermal plume is determined to be staying at the surface.

The following information shall be recorded:

1. The distance of the five transects from the facility discharge.
2. The time, depth, transect and location for each temperature measurement taken, along with the water temperature at each specified depth.
3. Facility discharge flow and temperature every 15 minutes beginning at least four hours before field measurements are taken and ending after field measurements are concluded. (OEP shall obtain this data from PSNH)
6. Ambient air temperature at the facility every 15 minutes beginning at least four hours before field measurements are taken and ending after field measurements are concluded (if possible). (OEP shall obtain this data from PSNH)

Water Quality Instrumentation

Water quality values shall be collected using a YSI 6000 series sonde on a tow fin attached to a YSI 650 DM data logger to collect at a minimum the water quality parameter listed in Table 3 above with the addition of depth. The instrumentation used must be calibrated on the morning on site in accordance with the manufacturer's specifications as well as the ECASOP-YSISondes10 as well as a post calibration check at the end of the day on site.

Data Handling

Field water quality data will be stored every 10 seconds in the YSI sonde. GPS data will be collected every 10 seconds at matching times. Data from the two separate systems will be combined into the GPS units with latitude, longitude and field water quality readings through matching the times in each unit. Correlating times will be matched into a single EXCEL file from the GPS and YSI sonde readings. Data will be texted out to columns to match the EXCEL format in the final data report and distributed to the NPDES permit writer for decision making and the GIS group for map making.

4.0 Site Map

Figure 1: Schiller Station Outfall Locations

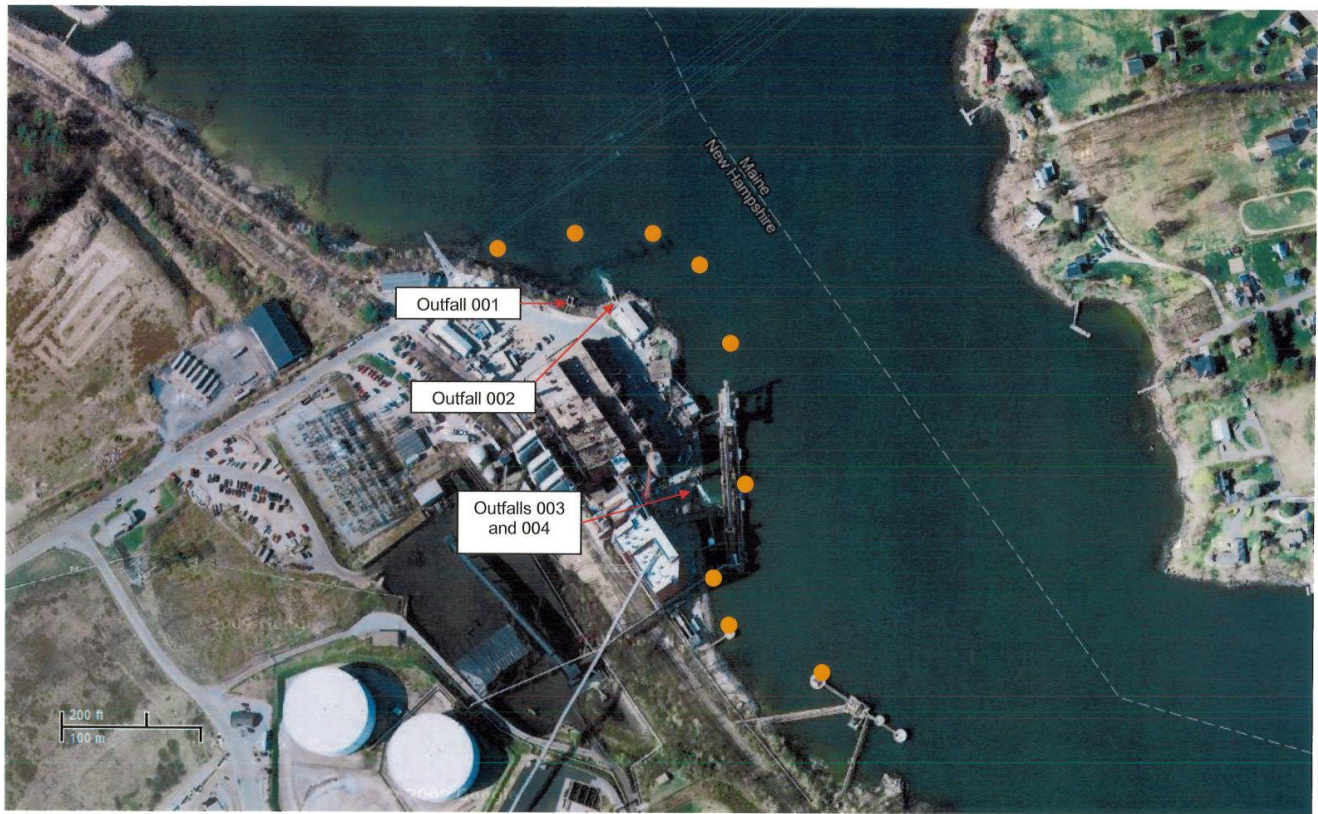


Figure 1: Approximate thermistor locations