(101)

Public Service of New Hampshire

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The Northeast Utilities System

John M. MacDonald
Vice President - Operations

June 27, 2002

D18737

Stephanie Larson, Environmental Inspector
NH Department of Environmental Services
Water Division
Wastewater Engineering Bureau
P.O. Box 95
6 Hazen Drive
Concord, NH 03302-0095

Subject: NPDES Inspection Worksheet, dated May 29, 2002.

Dear Ms Larson:

Schiller Station Compliance Inspection
NPDES Permit No. NH0001473

Public Service of New Hampshire has reviewed the three deficiencies identified on your NPDES Inspection Worksheet for Schiller Station from your May 29, 2002, inspection, and has the following corrective actions to report.

1. All total residual chlorine samples are routinely analyzed within 15 minutes of collection. The bench sheet was updated on May 31 to include a location to document the time of analysis.
2. All total suspended solids samples are routinely run through two stages of drying. The bench sheets were updated on June 11 to include a section to document both weights for all analyses.
3. The Quality Assurance (QA) Manual was updated on June 19 to document the addition of the atomic absorption spectrophotometer for metals analysis and to reflect other current laboratory practices.

Brief notations of these corrective actions are also included on the attached NPDES Inspection Worksheet. The laboratory bench sheets and the revised QA Manual are enclosed for your review. PSNH believes each of the issues is fully addressed by this response.

If you have any questions regarding this response, please call Mr. Allan Palmer, PSNH Generation, at 634-2439.

Very truly yours,

John M. MacDonald
Vice President

Attachment
Enclosures

cc: Ms. Joy Hilton, USEPA

EPA REPORTING
BENCH SHEET

Outfall	#016 W.W.T. Plant	#001 #3 WEIR	#011 Sch. Tk. Fm.	#018 NT1 Tk. Fm.
Date Sampled				
Time Sampled				
Sampler				
4 SAMPLES pH AND DUPLICATE	XXXXXXX XXXXXXX	Inches over weir	Dup. / / /	Dup. / / /
Analyst				
Date Analyzed				
Time Analyzed				
O&G STD/Result	15.0 /	15.0 /	15.0 /	15.0 /
O&G Samp/Dup	/	/	/	/

Date Sampled	
Time Sampled	
Sampler	
Analyst	
Date Analyzed	
Time Analyzed	
TSS Blank	
TSS Std/Result	20 /
TSS Samp/Dup	/
Fe Std/Result	1.0 /
Fe Samp/Dup	/
Cu Std/Result	0.3 /
Cu Samp/Dup	/
OVEN TEMP	

TSS

LESS THEN 4% DIFF. SECOND DRY WEIGHT
AND SECOND FINAL WEIGHT

BLANK

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

STANDARD

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

SAMPLE #1

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

SAMPLE #2

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

FORM= CHEM 3

EPA REPORTING
BENCH SHEET

Outfall	#016 W.W.T. Plant	#016 W.W.T. Plant	#016 W.W.T. Plant	#016 W.W.T. Plant
Date Sampled				
Time Sampled				
Sampler				
Analyst				
Date Analyzed				
Time Analyzed				
O&G STD/Result	15.0 /	15.0 /	15.0 /	15.0 /
O&G Samp/Dup	/	/	/	/

Date Sampled	
Time Sampled	
Sampler	
Analyst	
Date Analyzed	
Time Analyzed	
TSS Blank	
TSS Std/Result	20 /
TSS Samp/Dup	/
Fe Std/Result	1.0 /
Fe Samp/Dup	/
Cu Std/Result	0.3 /
Cu Samp/Dup	/
OVEN TEMP	

TSS

LESS THEN 4% DIFF. SECOND DRY WEIGHT
AND SECOND FINAL WEIGHT

BLANK

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

STANDARD

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

SAMPLE #1

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

SAMPLE #2

PREWET WEIGHT _____
PREWET WEIGHT _____
FINAL WEIGHT _____
FINAL WEIGHT _____
% DIFF. _____

FORM= CHEM 4

PUBLIC SERVICE CO. OF NEW HAMPSHIRE
SCHILLER STATION

ANALYST: | DAY | DATE:

UNIT	P ALKAL	M ALKAL	CL	PO4	SiO2	PH	T.D.SOLIDS MMHOS	T.D.SOLIDS PPM	BLOW DOWN
4									
5									
6									

UNIT	BOILER FEED PH	BOILER FEED NH3	BOILER FEED N2H4	HOTWELL PH	HOTWELL NH3	HOTWELL COND.	CL STD/ TIME SAMPLED	CL STD/ TIME ANALYZED	CL STD/ CLR. READING
4									
5									
6									

UNIT	AFTER COND. PH	AFTER COND. NH3	CLOSED COOLING WATER PH	MaMo	TTZ	TSS	BUGS
3	xxxxxxx	xxxxxxx					
4							
5							
6							

RAIN or SNOW DATE	TIME	PH	ANALYST

CHANGES OR ADDITIONS PUMPS			
UNIT	AMINE	PO4	OH
4			
5			
6			

LAB FRIDGE TEMP.	

FORM= CHEM 9

N.P.D.E.S. COMPLIANCE MANUAL

PUBLIC SERVICE OF NEW HAMPSHIRE

Schiller Station

D. C. Corliss

Revised: June 19, 2002

Instrument and Equipment Calibration

Quality Control/Validity of Data

Data Accumulation and Reporting

Sample Collection Procedures

Appendix #1 Testing Methods

1.0 pH, Continuous Monitoring, Method 150.2 EPA 600/4-79-020
1.1 pH, Method 150.1 (Electrometric)
2.0 TSS-Residue, Non-Filterable, Method 160.2, EPA 600/4-79-020
3.0 Oil and Grease, Total, Recoverable, Method 413.1, EPA 600/4-79-020
4.0 Table 1 Recommendation for Sample and Preservation of Samples According to Measurement - EPA 600/4-79-020
5.0 Chlorine, Total Residual Method 330.1, EPA 600/4-79-020
6.0 Chlorine, Total, Hach DR/3000 Procedure C.3
7.0 Copper, Method 220.1 - EPA -600/4-79-020
8.0 Iron, Total, Method 236.1 - EPA - 600/4-79-020

Appendix #2 Bench Sheets - Test Results
Appendix #3 Non-Compliance Report Sheet
Appendix #4 Sample Point Locator Diagram

1.0 Laboratory Equipment Calibration

1.1 Spectrophotometer Model: Hach DR/3000
- 1.1.1 Annual Cleaning, Calibration and Maintenance by Factory Representative
- 1.1.2 Quality Control Standards Before Each Set of Composite Samples

1.2 Laboratory pH Meter
- 1.2.1 Beckman Model PHI50 - Bench Model, Hach - Sension 1 portable pH meter.
- 1.2.2 Daily Calibration, Each Meter is buffered daily before use with a buffer traceable to "National Institute of Standard and Technology SRM 185"
- 1.2.3 The Beckman meter is buffered with pH4, pH10 then placed in pH 7 buffer, if the meter is not within ± 5% or ± 0.35 pH units, the calibration with pH4 and pH10 must continue until results are acceptable or the unit is removed from service for repairs.
- 1.2.4 The Hach meter is buffered with pH4, pH7 and pH10 and then placed in pH7 buffer. The Calibration slope must be -58 ± 3 MV. If not within this range it must be recalibrated.

1.3 Balance, Sartorius, Model 2432
- 1.3.1 Semi Annual Cleaning and Calibration and necessary maintenance by New England Balance Service Inc. All test weights traceable to the National Bureau of Standards. See balance file for certificates.

1.4 AA Spectrophotometer Shimadzu Model # AA6200
- 1.4.1 Autosampler ASC 6100
- 1.4.2 For atomic absorption by direct aspiration the instrument is calibrated for the metals of interest, by the analysis of calibration standards of known concentrations. A minimum set of at least 3 standards are prepared by the dilution of a stock solution of known concentration.

The instrument is zeroed prior to calibration and sample analysis. A calibration curve is formed at the beginning of each run using the three calibration standards, the concentration of which are chosen so as to cover the range of sample concentrations that might be obtained. A reference standard, of known concentration is analyzed to verify the initial calibration curve. Each analytical batch consists of a blank sample, sample duplicate and standard that is analyzed with each sample set.

BLANK ANALYSES

A blank is a "clean" sample (i.e. containing no analyte of concern), most often deionized water, to which the acid matrix is matched to the sample and analytical procedures that are performed. The blank is analyzed in order to assess possible contamination from the laboratory and corrective actions taken if necessary. Corrective Actions—If high blank values were to be observed, the instrument would be re-zeroed and cleaned and the analysis repeated.

DUPLICATE SAMPLE ANALYSES

Duplicate analyses are performed to evaluate the reproducibility of the method. Results of the duplicate analyses should fall within acceptable range of each other. Duplicates are analyzed with every batch of samples. Corrective Actions—The duplicate results are reviewed by the Working Foreman Supervisor. If an unacceptable range occurs for the given parameter, the sample set is re-analyzed.

2.0 Process pH Meters

2.1 Waste Treatment System #1, when processing is necessary contact Instrument Dept. for calibration of the process meter. Daily check the discharge pH with a portable meter against the process meter. If there is more than a ± 5% or 0.35 pH units difference between the meters, have the Instrument Dept. re-calibrate.

2.2 Waste Treatment System #2, calibrate daily against the portable pH meter. Record the calibration readings of the portable meter. Set the process meter to the portable meter reading if there is a difference.

2.3 Process Discharge Flow Meter System #2

2.3.1 Using the Francis Formula, we measure the height of the crest and calculate the flow bi-weekly. As long as the difference doesn't exceed ± 20% between the calculation and the meter, everything is fine. If there is a larger difference than the ± 20%, the Instrument Dept. will be notified and the meter re-calibrated. The meter is calibrated on an annual schedule if there are not any errors found between the normal scheduled calibrations by the Instrument Dept.

2.4 Process Discharge Flowmeter System #1

2.4.1 When flow is suspect, calibration is performed by the Instrument Dept. This system is used only during maintenance of System #2.

Quality Control/Validity of Data

1.0 Reagent Quality

1.1 All reagents shall be:
1.1.1 Certified as "reagent grade" or "analytical grade" by the American Chemical Society.
1.1.2 "Ultra Pure" reagents need only be used when specifically required.
1.1.3 Packed or prepared for approved tests in premeasured packages:
5.1.3.1 Hach Company

1.2 Reagent expiration dates must be displayed and not exceeded if provided by the supplier.
1.3 Dates reagents are received and opened shall be recorded on the container label.

2.0 Laboratory Pure Water will be used for rinsing, dilution and making standards, etc.

2.1 The quality of the water must be tested to ensure that it meets minimum requirements of the test being performed.
2.1.1 The conductivity must be tested monthly at < 2 micromhos/cm @ 25°C.

3.0 Quality Control Data

3.1 Duplicate samples - separate samples taken from the composite container or sample source at the same time.
3.1.1 One duplicate will be run for each parameter whenever an analyses is performed
3.1.2 The duplicate sample container must be labeled as such to avoid confusion
3.1.3 One duplicate is sufficient for a batch[1]
3.1.4 The duplicate result must be within 20% of the value of the corresponding sample
3.1.5 A single duplicate failure is not cause for alarm as long as the QC standard is within 20% deviation. However, several consecutive duplicate failures is cause for further investigation.
3.1.6 Use the following formula to determine percent error (% error) from the known value of the sample:

$$\frac{\text{Observed value - known value}}{\text{known value}} \times 100$$

3.1.7 A written explanation of a duplicate failure must be included with a bench sheet and on the DMR and corrective action must be implemented.

4.0 QC Standards are known quantities

4.1 At least one QC standard for each required parameter should be analyzed with each batch.
4.1.1 The analyses should be done in the following sequence:
4.1.2 Analyze the QC standard - record and compare with the known value
4.1.3 The QC result must be within ± 20% of the "true (known) value" of the standard analyzed or the QC standard is invalid.
4.1.4 Use the following formula to determine the percent error (% error) from the known value

[1]Batch - one or more samples analyzed at the same time for the same parameter.

of the standard.

$$\frac{\text{Observed value - known value}}{\text{known value}} \times 100$$

4.1.5 A written explanation of a QC standard failure must be included with a bench sheet and on the DMR and corrective action must be implemented and reported.

4.2 Analyze the sample and the duplicate and record the results.

5.0 Spikes - are samples that have had a "known" amount of the parameter being analyzed added to them. They are used to determine whether there is anything in the sample that would interfere with test results.

5.1 One spike will be done once per year on a composite for each required metal and chlorine.

5.2 The results must be within 20% of the true (known) value, use the following formula to determine percent (%) recovery of the standard in the spike

$$\frac{\text{Observed spike value - observed sample value}}{\text{known "calculated" standard value}} \times 100$$

5.3 Written explanation as to spike failure (what is causing the interference) must be noted in a log book or on a bench sheet and on the DMR and corrective action contingencies must be implemented.

6.0 Blanks - laboratory pure water with the required reagents for each test added; to be used to eliminate the influence of reagents and any color from the parameter being measured (to zero the spectrophotometer).

6.1 A blank should be run on each weekly composite, for each required parameter that is analyzed.

7.0 Preparing Standards

7.1 Using accepted manufactured in range standard following the preparers instructions.

7.2 Using manufactured standards, i.e., AA standards for Iron at 1000 PPM.

7.2.1 Use the general concentration formula to prepare a QC standard of known concentration.

7.2.2 Using a known concentration of 1000 PPM, use the (C1)(V1) = (C2)(V2)

7.2.3 Concentration versus Volume formula:

EX: Make up 1000 ml of 2.5 mg/l from a 1000 mg/l standard

C1 = 1000 mg/l iron

V1 = volume of 1000 mg/l standard needed to prepare the desired concentration

C2 = desired concentration 2.5 mg/l

V2 = final volume of standard desired 1000 ml

$$(1000)(X) = (1000)(2.5)$$

$$(X) = \frac{2500}{1000}$$

$$X = 2.5 \text{ ml}$$

2.5 ml of 1000 mg/l iron standard diluted to 1000 ml will yield a solution of a known concentration of 2.5 mg/l.

8.0 Preparing Spikes

A spike is defined as known standard plus sample.

8.1 Decide the yield (value) desired

8.2 Calculate how much of a known standard will be needed to give a desired concentration.

8.2.1 Using an ampoule provided by Hach Company, follow the instructions included with the ampoule.

8.2.2 Using a standard of known value (1 mg/l)
Example:

(Standard Concentration)	(Volume of Standard to add to the spike)	=	(Desired concentration of the standard in the spike)	(Volume of the flask in in which the spike is
(50 mg/l)	(Volume of Std X)	=	(2 mg/l)	(100 ml)
	(Volume of Std X)	=	4 ml	

4 ml of standard is required in a final volume of 100 ml. (96 ml of sample + 4 ml of standard) to yield a value of 3 PPM; using a sample value 1 mg/l and a spike value of 2 PPM.

9.0 Preparing Standards and Spikes from a Very Concentrated Standard

9.1 Purchased standards that are very concentrated such as 1000 mg/l may need to be diluted more than once to obtain a volume that can be accurately measured and dispensed to obtain a desired value.

Data Accumulation and Reporting

1.0 Rules for Data Manipulation

1.1 The detection limit for each procedure is located at the top of the appropriate sheet; do not report numbers smaller than the detection limit.

2.0 Calculating Results

2.1 Rounding off numbers

2.1.1 Significant figures - the largest decimal place all the numbers being used have in common.

2.1.2 Rounding data

10.55 becomes 10.6
10.65 becomes 10.6
10.75 becomes 10.8
10.85 becomes 10.8

If the first number after the decimal point (underlined) is an odd number, round up if the second digit is 5 or more. If the first number after the decimal point (underlined) is an even number, round down even though the second number is a 5 or more.

3.0 Unit Conversion

3.1 Mass (weight)

1 gram (g) = 1000 milligrams (mg)
1 milligram (mg) - .001 gram (g)
1 milligram (mg) = 1000 micrograms (ug)

3.2 Volume (liquid)

(1 liter (l) = 1000 milliliters (ml)
(1 gallon (gal) = 3.785 liter (l) = 3785 milliliters (ml)

3.3 Concentration

1 gram/ liter (g/1) = 1000 milligrams/liter (mg/l)
1000 milligrams/liter (mg/l) = 1000 part per million (ppm)
1.0 milligram/liter (mg/1) = 1 part per million (ppm)
1.0 milligram/liter (mg/1) = 1000 micrograms/liter (ug/1)
1000 micrograms/liter (ug/1) = 1000 parts per billion (ppb)
1.0 microgram/liter (ug/1) = 1 part per billion (ppb)
1.0 part per million (ppm) = 1000 part per billion (ppb)

3.4 Basic Conversions:

3.4.1 To change from one unit to another:

grams to milligrams g x 1000 = mg
milligrams to grams mg ÷ 1000 = g
milligrams to micrograms mg x 1000 = ug
micrograms to milligrams ug ÷ 1000 = mg
parts per million to parts per billion
ppm x 1000 = ppb
parts per billion to parts per million
ppb ÷ 1000 = ppm
milligrams per liter to micrograms per liter
mg/L x 1000 = ug/L
micrograms per liter to milligrams per liter

ug/L ÷ 1000 = mg/L

3.4.2 Units:
Always carry along units when manipulating data.

$$\frac{100\ mg}{50\ mg} \quad \frac{90\ mg}{100\ ml} = 0.90\ mg/ml \times 1000\ ml/l = 900\ mg/l$$
150 mg

4.0 Check System

4.1 Each parameter will be checked by the Working Foreman or the Department Supervisor once per month.

5.0 Monthly Reporting

5.1 Transcribed figures should be checked by the Working Foreman or Departmental Supervisor before being submitted to the Environmental Department for reporting to State and Federal Agencies.

Sample Collection Procedures

1.0 Container Descriptions

1.1 Polyethylene
- 1.1.1 Composite Sampler (2.5 gal.)
- 1.1.2 Metals (1 liter)

1.2 Glass
- 1.2.1 Oil and Grease 1 liter jar wide mouth without shoulders (straight sides)

2.0 Container Cleaning Procedures (EPA 600/4-79-020)

2.1 Sample Bottles Beakers, Measuring containers, etc.
- 2.1.1 Metals, solids and composite
  - 2.1.1.1 wash with detergent (alconox) and tap water
  - 2.1.1.2 rinse with 1:1 nitric acid ($HN0_3$)
  - 2.1.1.3 rinse with tap water
  - 2.1.1.4 rinse with 1:1 hydrochloric acid
  - 2.1.1.5 rinse with tap water
  - 2.1.1.6 rinse with deionized water
- 2.1.2 Oil and Grease
  - 2.1.2.1 wash with (alconox) soap and water
  - 2.1.2.2 rinse with solvent before leaving the lab

3.0 Sampling Procedure

3.1 Location
- 3.1.1 All samples will be collected at the EPA permit designated discharge location.
- 3.1.2 Samples may be taken at the point of entry to these discharges, example; discharge from the neutralizing tank 016, the standpipe in the tank on the discharge side of the weir.

4.0 Collection Methods

4.1 Composite sampler - neutralizer tank outfall 016 - weekly sample
- 4.1.1 note the start and stop time of the sampler
- 4.1.2 sample container cleaned/section 2.0 container cleaning procedure (EPA 600/4-79-020).
- 4.1.3 Sampler temperature, set to maintain 4°C and recorded in the daily diary when the container is inserted for the weekly composite sample.
- 4.1.4 The lab refrigerator for composite sample and standards, set to 4°C and recorded on the boiler log sheet.

4.2 Grab Samples
- 4.2.1 Sample containers cleaned/section 2.0 Container Cleaning Procedure (EPA 600/4-79-020).
- 4.2.2 Samples will be taken following the procedure for the specific parameter to be measured.

5.0 Composite Sample Splitting

5.1 Total Suspended Solids
- 5.1.1 Using a clean graduated cylinder; shake the composite sample container, measure one liter and process according to the procedure found in the methods section of this manual.

5.2 Iron and Copper

5.2.1 Use a one liter bottle, prepared as specified section 2.0 container cleaning procedure (EPA 600/4-79-020).

5.2.2 Sample preservation procedure, adjusting the pH to less than 2.0 (approx. 5 ml) Nitric acid (HNO_3) conc., if necessary, store at 4°C/EPA-600/4-79-020.

6.0 Grab Samples

6.1 Oil and Grease - grab sample

6.1.1 One liter wide mouth (shoulderless) straight side glass container, cleaned/section 2.0 container cleaning procedure (EPA-600/4-79-020).

6.1.2 Pre-rinse the container with solvent before leaving lab.

6.1.3 Sample preservation - 2 ml. sulfuric acid (H_2SO_4) conc. to reduce pH to less than 2.0

6.1.4 When the sample is being taken from a flowing source, fill the container by placing the opening into the flow, leaving enough room for adding the sulfuric acid after the container is filled with sample.

6.2 Total Residual Chlorine (TRC)

6.2.1 500 ml Polyethylene bottle

6.2.2 Take the sample from the condenser inlet leg.

6.2.3 Rinse the bottle several times with the sample.

6.2.4 Take the sample directly to the lab and analyze within five minutes, record the results and the time the sample was taken and analyzed.

6.3 pH

6.3.1 Continuous and Grab Samples

6.3.2 EPA-600/4-79-020 Method 150.2

7.0 Outlet, Specific, Instructions for Sampling and Reporting

7.1 001 Unit #3 Circulating Water Discharge

7.1.1 Oil and Grease - Grab Sample Section 6.0 above, monthly.

7.1.2 Temperature and Flow (MGD) by the Chem. lab.

7.1.3 Total Residual Chlorine as Section 6.2 above

7.2 002, 003, 004 Units #4, #5 and #6 Circulating Water Discharge

7.2.1 Temperature and flow (MGD) by computer log.

7.2.2 Total Residual Chlorine as Section 6.2 above, daily.

7.3 006 Emergency Boiler Blowdown or Deaerator Overflow.

7.3.1 Boiler blowdown pH, use the boiler water pH.

7.3.2 Deaerator overflow, use the boiler feedwater pH.

7.3.3 The Chem. lab. will report the flow in gallons and the duration of the flow.

7.4 011 Schiller Tank Farm Drains inspect tank area, open valve(s), purge line, sample.

7.4.1 Flow in gallons per day, average monthly and daily maximum by Chem. lab.

7.4.2 Oil and Grease Monthly Grab Sample, split the sample between the individual pipes when using more than one pipe to drain the area.

7.4.3 pH monthly grab sample between pipes when more than one is running, take four readings with one duplicate and record each time a sample is taken.

7.5 013 Emergency Spillway Overflow

7.5.1 In the event of sufficient rain, etc. to cause an overflow; report the flow in gallons and the duration of flow in hours estimated, gallons to be calculated by the Chem. lab.

7.5.2 pH of overflow by grab sample

7.5.3 pH of the rain

7.6 015 Waste Treatment Plant #1 Effluent

7.6.1 To be used when essential maintenance is being performed on Waste Treatment Plant #2.

7.6.2 The pH will be monitored continuously; report range.

7.6.3 Oil and grease sample shall be taken during the first discharge from the discharge pH sampling system discharge flow.

7.6.4 The flow in gallons per day will be reported as a monthly average and daily maximum.

7.7 016 Waste Water Treatment Facility #2 Discharge

7.7.1 Flow in gallons per day (GPD) reported as an average monthly and a daily maximum.

7.7.2 The remaining parameters as stated 4.0 and 5.0 above, the composite sampler will be operated for the same period as the system is discharging on the day of the composite sample, up to 24 hours. Keep the discharge flow within 10% for the 24 hours of sampling.

7.8 017 Waste Water Treatment facility #2 Discharge, treated waste water discharge during boiler chemical cleaning operations only.

7.81 Samples to be taken daily as a grab for oil and grease and 24 hour Composite for TSS, Total Iron and Total Copper, Flow and pH Continuous.

7.9 018 Schiller Station Yard Drains, Newington Station Tank Farm Yard Drains

7.9.1 Oil and Grease, monthly during the first of, either the first rain storm or when Newington Station Tank Farm drains are opened.

7.9.2 Flow in gallons per day.

7.10 020, 021, Intake Screen Wash for Units #4, #5 and #6.

7.10.1 An estimate in gallons per day reported as the daily maximum.

7.11 Sample Storage Procedures

7.11.1 EPA 600/4-79-020 Table 1 Recommendation for Sampling and Preservation of Samples According to Measurement

7.11.1.1 Chlorine - analyze within 5 minutes

7.11.1.2 Total Suspended Solids - Cool to 4°C up to 7 days

7.11.1.3 Metals; total - preserve by adjusting the pH to less than 2.0 (approx. 5 ml) Nitric acid (HNO_3) store up to 6 mos.

7.11.1.4 Oil and Grease - preserve with sulfuric acid (H_2SO_4) to less than 2.0 pH (approx. 2 ml), cool to 4°C and store up to 28 days.

7.11.1.5 pH - analyze immediately.

Analytical Procedures

1.0 Analytical Glassware Cleaning Procedures

1.1 Spectrophotometer Cells
- 1.1.1 Wash with detergent (alconox)
- 1.1.2 Rinse with condensate water
- 1.1.3 Rinse with deionized water
- 1.1.4 Rinse with alcohol before storing
- 1.1.5 Matched cells checked periodically to see if equivalent readings are obtained by filling each cell with the same solution and checking the % transmittance or absorbance readings

1.2 Process Glassware, (cylinders, beakers, etc.)
- 1.2.1 Wash with detergent (alconox) and water
- 1.2.2 Rinse with condensate water
- 1.2.3 Rinse with deionized water
- 1.2.4 Rinse with 1:1 nitric acid
- 1.2.5 Rinse with de-ionized water
- 1.2.6 Rinse with condensate immediately after use

2.0 Testing Procedure - Bench Work Sheets

2.1 Total Suspended Solids - Residue, non-filterable EPA 600/4-79-020 Method 160.2

2.1.1 Split sample from the composite as directed under "Sample Collection Procedures" Section; 5.1 - Composite Sample Splitting.

2.1.2 Method Summary Description

2.1.2.1 A well mixed sample is filtered through a glass fiber filter, the residue retained on the filter is dried to a constant weight at 103 - 105 degrees C.

2.1.3 Sample Preservation, if desired, chill to 4 degrees C. The sample must be analyzed within seven (7) days.

2.1.4 On the appropriate bench sheet, record the date and time sampled, person sampling, type of sample (grab or composite), date and time analyzed, person analyzing and the results for the standard, sample and duplicate analyses.

2.1.5 TSS Bench Work Sheet

- 2.1.5.1 Label an aluminum weighing dish for each filter
- 2.1.5.2 Using forceps (tweezers) place an AP40 microfiber glass filter on the support screen of the filter holder, place the funnel on the filter holder and clamp it in place and place on the vacuum flask.
- 2.1.5.3 Apply vacuum to the flask, wash the filter with about 100 ml. of high purity water.
- 2.1.5.4 After all the rinse water has been drawn through the filter, secure the vacuum pump, remove the filter from the support screen and place it in the correct weighing dish and dry it in an oven at 103 to 105 degrees C for 1 hour.
- 2.1.5.5 Cool filter and dish in a desiccator.
- 2.1.5.6 Weigh each filter to the nearest 0.1 mg and record its weight. Weigh filter and

dish. And also 2.1.5.12. Repeat the cycle of drying, cooling, desiccating, and weighing until constant weight is obtained or until the weight change is than 4% of the previous weight or 0.5 MG, whichever is less.

2.1.5.7 Place the pre weighed filter on the support screen of the holder, attach the funnel, pour a well mixed sample into a clean graduated cylinder, then into the filter holder funnel with the vacuum applied.

2.1.5.8 After the pre-determined amount of sample has passed through the filter with the vacuum still on, rinse the funnel walls three times with 10 ml. quantities of high purity water.

2.1.5.9 Secure the vacuum, remove filter funnel, transfer the filter to its weighing dish.

2.1.5.10 Dry the sample in an oven at 103 to 105 degrees C for one hour.

2.1.5.11 Cool dish and filter in a desiccator.

2.1.5.12 Re-weigh the filter and record its final weight.

2.1.5.13 Subtract the initial weight of the filter from the final weight after filter to determine the weight of the residue. Duplicate determinations should agree within 5% of there average

2.1.5.14 Report the results as milligrams of suspended solids per liter of water, using the following formula

$$\frac{\text{Mg residue X 1000}}{\text{ml. of sample}} = \text{Mg. of suspended solids per liter of water}$$

2.2 Oil and grease, Total, Recoverable, Method 413.1 EPA 600/4-79-020.

2.2.1 Grab Sample/Section "Sample Collecting Procedures", Grab Samples 6.0

2.2.2 Collect two samples one duplicate and one sample container should be labeled as such. Use the outlet specific instructions 001, 011 etc.

2.2.3 After the sample has been taken, preserve by adding 2.0 ml. sulfuric acid ($H_2 S0_4$) conc. to reduce the pH to less than 2.0 Can be stored up to 28 days.

2.2.4 Record the date and time sampled, person sampling, type of sample, date and time analyzed, person analyzing and the results for the standard, duplicate and sample.

2.2.5 Oil and Grease Bench Work Sheet

2.2.5.1 Pour the 1 liter sample into separatory funnel

2.2.5.2 Add 30 ml. of freon TF solvent into the sample container and rinse into the separatory funnel.

2.2.5.3 Shake funnel for 2 minutes; allow the layers to separate, filter the solvent layer into a clean pre-weighed flask through a funnel containing solvent moistened (Whatman 40) filter paper.

2.2.5.4 Repeat steps two and three twice more, filtering each volume (30 ml) into the flask.

2.2.5.5 Rinse the lip of the funnel the filter paper and the funnel into the flask using 20 ml. of solvent.

2.2.5.6 Connect flask to the distilling head and evaporate the solvent by immersing the lower half of the flask in water at 70°C. Collect the distilled solvent in a clean container for reuse.

2.2.5.7 When the temperature in the distilling head reaches 50°C or when the flask is dry; remove the flask and insert the end of a clean hose from the suction side

of a vacuum pump for 15 seconds.

2.2.5.8 Remove the flask, wipe the outside with a clean tissue and place in a desiccator for 30 min.

2.2.5.9 Weigh the flask.

2.2.5.10 Run a blank by adding the same volume (110 ml.) of solvent to a clean pre-weighed flask and process like a sample starting with step 6 through step 9.

2.2.5.11 Calculation: mg/l total oil and grease = $\frac{R - B}{V}$

R = final weight of sample flask minus the original weight of the sample flask

B = Final weight of blank flask minus the original weight of the blank flask

V = the volume of the sample

2.3 Metals - Total Iron and Copper

2.3.1 Split the sample from the composite as directed under "Sample Collection Procedures", Composite Sample Splitting, 5.1 in a 1 liter container, prepared under section 2.0 Container Cleaning Procedure.

2.3.2 Shake sample well and take 1 liter sample from composite. Add 5ml/ nitric acid (HNO_3)) to this 1 liter sample and store at 4° C if needed till run, sample can be stored up to six months. EPA - 600/4-79-020 4.1.4 Metals atomic absorption methods.

2.3.3 Record the date and time sampled, person sampling, type of sample (grab or composite), date and time analyzed, person analyzing and the results for the standard sample and duplicate.

2.3.4 Total Copper - Bench Work Sheet - Copper
Method 220.1 - EPA -600/4-79-020

2.3.4.1 Use sample acidified with 5 ml. nitric acid

2.3.4.2 Transfer 100 ml to 150 ml beaker

2.3.4.3 Add 5 ml hydrochloric acid solution 1:1

2.3.4.4 Heat on hot plate until reduced to 15-20 ml "DO NOT BOIL"

2.3.4.5 Filter through filter paper and adjust volume to 100 ml with deionized water

2.3.4.6 Run sample on AA using 3 standards and sample split in two for sample and duplicate. Also run a known sample to check for accuracy.

2.3.5 Total Iron - Bench Work Sheet
Method 236.1 - EPA - 600/4-79-020

2.3.5.1 Use the same sample used with the copper sample above.

2.4 Chlorine, Total Residual, Bench Work Sheet

2.4.1 Hach - DR/3000 Procedure Code C.3

2.4.1.1 Collect sample by filling bottle completely and cap tightly, return to lab and analyze immediately.

2.4.1.2 Press 8 and stored program.

2.4.1.3 Set wavelength to 530

2.4.1.4 Measure 25 ml. of sample add DPD total chlorine reagent, mix set timer for 3 min.

2.4.1.5 Place the blank in the cell holder, set the zero concentration by pressing zero and conc.

2.4.1.6 When 3 minute time period is up, place sample in cell holder and read direct in

mg/l.

2.4.2 EPA/4-79-020 Amperometric

2.4.2.1 Collect sample by filling bottle completely and cap tightly, return to lab and analyze immediately.

2.4.2.2 Place 200 ml of sample in container and place on the titrator -

2.4.2.3 Add 1 ml of potassium iodide solution and 1 ml of pH 4 buffer solution to the sample

2.4.2.4 Turn on the agitator, adjust the meter to read the maximum of the scale

2.4.2.5 Add the phenylarsine solution from the burette, dropwise, until the meter movement to the left does not move the same distance as the previous drop, the amount of solution, in milliliters, used from the burette represents the total residual chlorine in mg/l (1 ml - 1 mg/l).

1.0 Corrective Action Contingencies
Total Suspended Solids and Oil and Grease

1.1 Reasons for Unacceptable Sample Results
Resample/retest, check dual sample with another company lab

	Check QC Results	
If unacceptable	Check all sampling and testing procedures, if necessary against a known standard	If acceptable
If acceptable	If unacceptable	Check treatment process
Check another standard from another source	Discard Results	If unacceptable
If unacceptable	If acceptable Replace bad standard Resample/Retest to ensure 1/week permit requirement If later than 24th of the month, report as unacceptable because of QC. Also indicate not possible to resample/retest in cover letter to DMR	Inform Operating Supv. and fill out NPDES Permit Non-Compliance Report PSNH Form #7179 and send to Environmental Dept.

1.2 The Environmental Department will estimate the impact to the receiving water.
1.3 Steps to prevent recurrences to be reported by the Environmental Department.
1.4 Corrective action documentation at the Station is recorded on Form #7179.

2.0 Iron and Copper
Reasons for unacceptable sample results

	Check QC Results	If acceptable
If unacceptable	Check all sampling and testing	Check treatment process

	procedures, if necessary against a known standard	
If acceptable	If unacceptable	If unacceptable
Check another standard from another source	Discard Results	Inform Operating Supv. and fill out NPDES Permit Non-Compliance Report PSNH Form #7179 and send to Environmental Dept.
	If acceptable	
If unacceptable	Replace bad standard	
	Resample/Retest to ensure 1/week permit requirement	
	If later than 24th of the month, report as unacceptable because of QC. Also indicate not possible to resample/retest in cover letter to DMR	

2.1 The Environmental Department will estimate the impact to the receiving water.
2.2 Steps to prevent recurrences to be reported by the Environmental Department.
2.3 Corrective action documentation at the Station is recorded on Form #7179.

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