Monthly Operating Report
November, 2009
Concord Wastewater Treatment Plant
Operated by Woodard &Curran

Date: December 14, 2009

To: Alan Cathcart, Concord Water & Sewer Superintendent
cc: Chris Whelan, Town Manager
Richard Reine, Director Concord Public Works
Elena Proakis Ellis, Water & Sewer Operations Engineer

From: Michael Thompson and Staff

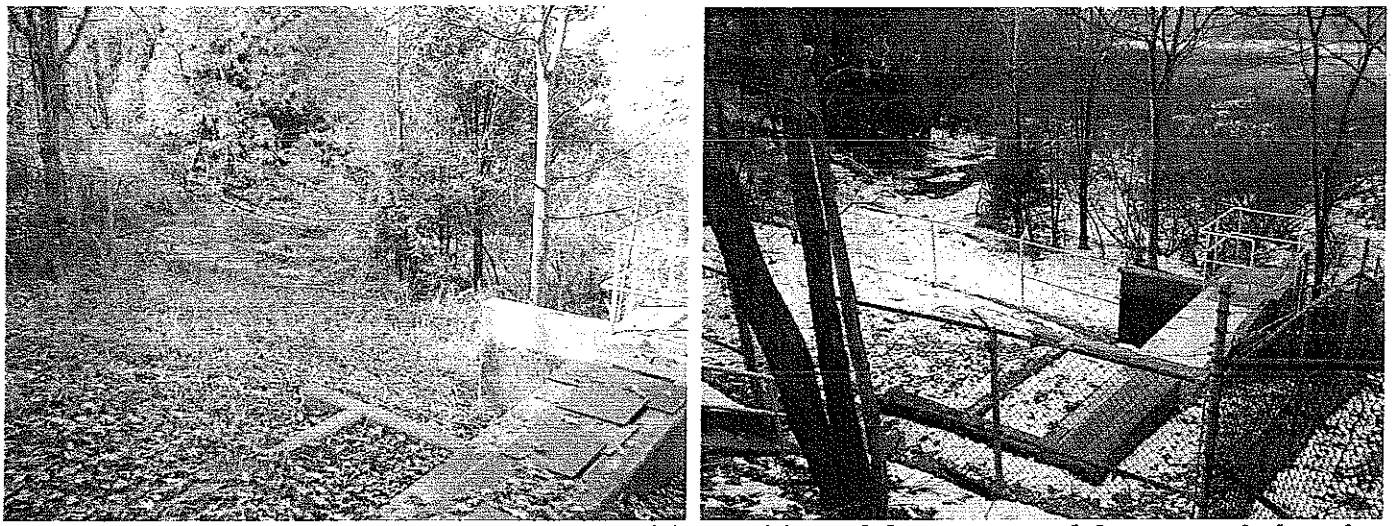
Key Activities This Month/Capital Program

During November all treatment processes were either operational or in ready standby. Flow through the facility in November averaged 0.931 million gallons per day (MGD) and the permit critical 12-month average flow has held steady for the second consecutive month at 1.05 MGD. The 12-month average daily flow permit limit is 1.2 MGD. This 1.05 MGD 12-month rolling average flow is the remains the lowest since September 2008. If historical trends hold, I would expect this rolling average flow rate to start a slow creep upward to peak again in the spring of 2010.

More notable events or tasks accomplished in November include:

1) The significant capital improvement project to sandblast, paint, and perform targeted mechanical rehab on the primary clarifiers and grit detritor, wrapped up in November. Work in November included the installation of new scum skimmer components and the cleanup of paint overspray on several fiberglass odor control covers.

2) In mid-November, Middlesex Fence installed a 37 foot section of new galvanized chain link fence to totally enclose the effluent flume area located adjacent to the Great Meadows Wildlife Refuge. This area had previously been open with the removal of the former chlorine contact tank as part of the facility upgrade. Additionally, plant staff installed new diamond plate covers over the effluent flume to prevent risk of entry by persons, animals, or debris.



A view of the effluent flume area before and after installation of fence and diamond plate covers intended to improve facility safety.

Maintenance Management

Following is a brief list of a portion of maintenance items completed in November:

a) outside electrical contractor installed heat tracing to main entrance roof awning drain pipe to prevent winter freeze-ups and ice damming onto walkway below.
b) recharged plant HVAC hot water loop with 110 gallons anti-freeze.
c) SCADA/electrical contractors installed hardwire resets to tertiary lift pump VFDs to ensure remote reset capability at utility power failure.
d) operators and painters completed installation of new primary scum skimmer components and corrected paint overspray on fiberglass odor covers associated with both primary clarifiers.
e) shutdown water flow to bio-odor control system and drained lines and pump to prevent winter freeze-ups. Placed unit pH probe and pressure regulator in winter storage.

Environmental Compliance

Parameter	Monthly Avg.	Permit Limit	Notes
Flow, MGD	1.05 MGD (12-month. Avg.)	1.2 MGD	Nov. avg. = 0.931 MGD
BOD5 (mg/l)	5 mg/l	30 mg/l	99% average BOD removal in Nov.
TSS (mg/l)	10 mg/l	30 mg/l	96 % average TSS removal in Nov.
Coliform, Geo.Mean #/100ml	1 cfu*/100ml	200 cfu/100ml	Daily max. of 2 cfu/100ml on Tue. 11/24
Phosphorus	0.76 mg/l	1.0 mg/l Nov.'09 – Mar. '10	0.81 mg/l daily max. on Wed. 11/11
Total Ammonia Nitrogen	1.29 mg/l	Report Only	1.66 mg/l daily max. on Mon. 11/23

**cfu =coliform forming unit or colony.*

There was one NPDES permit exceedance during the month of November at the Concord WWTP. Specifically, on November 30, between 7:16 AM and 7:42 AM, a 26 minute period, the CWWTP effluent pH exceeded its 8.3 maximum pH permit limit with a maximum reading of 9.62 SU occurring at 7:24 AM. It appears a fault in the facility's plant water pumping system resulted in no plant water being delivered to the caustic feed system as "carrier water". When plant operators restored plant water to normal operation, normal carrier water restored at caustic feed. This return water flow pushed a concentrated dose of caustic from delivery lines and into the process flow just upstream of the UV disinfection system. Through SCADA monitoring, plant operators were able to recognize how this "unseen before" event was unfolding, and in response, manually shut a plant water valve at caustic feed to prevent further concentrated caustic from flushing to the process. Additional written and automation controls are being implemented to reduce the risk of a similar event in the future.

During November, the Concord WWTP performed continuous two-stage total phosphorus (TP) removal using aluminum sulfate. First stage chemical TP treatment occurred in the secondary clarifiers and second stage TP treatment took place within the CoMag® advanced treatment process. The monthly average effluent TP concentration in November is 0.76 mg/l, thereby meeting the CWWTP's winter permit limit not to exceed 1.0 mg/l TP.

Additionally, during November all effluent disinfection was performed using ultra violet light.

Septage Receiving

During November, the facility received 155,400 gallons of septage from Concord residences and businesses.

WWTP Septage Receipts in gallons

	2009	2008	2007
January	10,500	22,750	61,850
February	41,250	60,300	55,000
March	83,250	55,550	48,550
April	168,250	152,300	127,000
May	150,900	135,150	153,800
June	151,450	126,450	128,750
July	138,500	117,000	159,050
August	137,750	142,400	140,250
September	203,750	219,950	112,250
October	172,400	262,900	199,700
November	155,400	165,300	179,950
December		104,050	42,000
Annual Totals:	1,413,400	1,636,000	1,408,150

Sludge Production

During November, 99,000 gallons of liquid sludge, equivalent to 16.03 dry tons, was transported to Upper Blackstone Water Pollution Abatement District (UBWPAD) in Millbury, Massachusetts.

WWTP Sludge Production in gallons / dry tons

	2009	2008	2007
January	107,500/16.71	112,227/20.15	97,500/12.83
February	86,000/14.13	107,124/18.35	89,500/11.94
March	99,000/17.56	98,500/17.97	99,000/12.91
April	153,000/23.94	90,000/17.98	143,500/21.55
May	170,670/24.27	107,000/19.74	170,200/26.40
June	153,000/20.83	98,500/17.76	152,000/21.29
July	126,000/20.57	117,000/20.98	161,500/23.60
August	76,376/11.81	99,000/16.51	143,500/21.31
September	126,000/21.65	98,000/16.82	126,000/15.27
October	99,000/16.03	108,000/18.54	230,614/30.28
November	99,000/16.51	80,500/12.62	128,669/21.13
December		126,000/18.46	140,555/22.69
Annual Totals:	1,295,546/214.01	1,241,851/215.88	1,682,535/241.2

Alarm Activity

This section provides the Town information on events that activate the facility's alarm response system. These events occur while the plant is unmanned and while both the plant's SCADA system and *Lexington Alarm* are monitoring the facility's alarm system. This report identifies alarm activity from the start of the calendar year to the present.

Concord WWTP Off-Hours Alarm Log

Date	Time	Alarm Source	Observations/Corrective Action/Comments
01/03/09	11:21 am	Intrusion	Headworks building door not properly latching following installation of new weather security strip by facility upgrade contractor. High wind rocked door – setting off alarm. Plant staff worked on weather strip to improve door latching.
01/07/09	7:45 pm	Hi Effluent Turbidity	Recent M2 backwash cycles producing very brief jump in turbidity as forward flow resumes. Solution is to shorten time between backwash cycles until overall treatment performance improves with slight operational adjustments over coming days.
02/08/09	10:26 am	Intrusion	High wind blew open addition door. Plant staff already on the way for normal weekend rounds, checked door and securely locked. Contractor made aware of need to rework this as well as other facility upgrade doors and locksets.
Various times in March		HVAC Common alarm	Faulty operation of plant boilers-particularly boiler #2-causing a brief dip in plant hot water loop temperature. Lag or backup boiler reliably responded and automatically brought hot water loop temp back above alarm setpoint. Boiler install vendor and others continue to monitor/troubleshoot plant heating system.
04/09	NA	NA	No after hours alarms in April
5/27/09	7-9pm	CoMag eff pH	pH meter inaccurately reading –required cleaning and calibration. Caustic pumps checked for normal operation.
6/20/09	2 pm	CoMag low eff pH	Both caustic feed pumps to CoMag effluent had become air bound. On call operator came on site and bled air from pump and restored normal auto feed of caustic based on pH input from SCADA.
07/09	NA	NA	No after hours alarms in July.
08/09	NA	NA	No after hours alarms in August.
9/3/09	10:00 PM	Intrusion	CoMag settling tank room – north motion sensor activated. No doors, windows, or other motion sensors activated. Police investigate – apparent false alarm.
10/09	NA	NA	No after hours alarms in October.
11/15	5 pm	Power Failure	Brief power bump resulted in a handful of drive and panel faults. The on call operator responded on site and reset equipment without incident.