

**Monthly Operating Report
September, 2011
Concord Wastewater Treatment Plant
Operated by Woodard & Curran**

Date: October 18, 2011

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

From: Michael Thompson and Staff

Key Activities This Month/Capital Program

During September all treatment processes were either operational or in ready standby. Flow through the facility in September averaged 1.179 million gallons per day (MGD) and the permit critical 12-month average flow settled at 1.13 MGD. The permit upper limit for the 12-month average flow is 1.2 MGD.

More notable events or tasks accomplished in September include:

1.) During September, the WWTF continued to perform a series of full-scale dose response tests to gain a better understanding of how effluent metals concentration relates to varying aluminum sulfate (alum) feed rates to the treatment process. Currently alum is used to coagulate and precipitate phosphorus out of the wastewater stream prior to discharge to the Concord River. Information gained in the study will be useful in determining how best to respond if/when the facility's NPDES (discharge) permit changes and what the potential operation cost impact would be if such a change were necessary.



A view of the CWWTF aluminum sulfate (alum) bulk storage and pumping equipment.

2.) In September, a number of different polymers were tested in the operation of the rotary drum sludge thickener (RDT). This investigation was in response to an apparent chemical change in the secondary/tertiary sludge generated at the facility. These sludges tend to be very thin and require a polymer to pull solids together in flocs that are then captured on the RDT screen while clear water drains back to the treatment process. The RDT operates from 30-40 hours per week to keep up with the sludge generation rate. Finding the "best" polymer is critical in sustaining cost effective sludge disposal. Outside polymer vendors were onsite in September to jar test their products with subsequent product recommendation for full scale.

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Maintenance Management

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

- a) Performed semi-annual preventive maintenance inspection and lubrication replacement on both primary clarifiers.
- b) Performed final adjustment of new plastic squeegees and performed break-in adjustment of all rake arm hardware following this summer's rehab of the #1 secondary clarifier.
- c) Inspected the bottom contents of the #1 aluminum sulfate tank to determine if sedimentation/crystallization might be occurring and flushed alum delivery lines with hot water.
- d) Replaced failed batteries and control relay in the south basement emergency lighting system.
- e) Patched a 12-inch crack that developed in the biological odor control unit inlet air plenum.

Environmental Compliance

Parameter	Monthly Avg.	Permit Limit	Notes
Flow, MGD	1.13 MGD (12month avg)	1.2 MGD	Sept avg. = 1.18 MGD Max. Daily Flow = 1.39 MG
BOD5 (mg/l)	2 mg/l	30 mg/l	99% average BOD removal in September
TSS (mg/l)	1 mg/l	30 mg/l	99% average TSS removal in September
Coliform, Geo.Mean #/100ml	1 cfu*/100ml	200 cfu/100ml	All daily f-coliform counts were actually 0 colonies/100 throughout Sept.
Phosphorus	0.07 mg/l	0.2 mg/l Apr '11– Oct. '11	0.13 mg/l daily max. occurred on Thu. 9/29
Total Ammonia Nitrogen	1.47 mg/l	Report Only	1.97 mg/l daily max. on Thu. 9/29

*cfu = coliform forming unit or colony.

During September, the Concord WWTP performed continuous two-stage total phosphorus (TP) removal using aluminum sulfate. First stage chemical TP treatment occurred in the #2 secondary clarifier and second stage TP treatment took place within the CoMag® advanced treatment process. The monthly average effluent TP concentration in September is 0.07 mg/l, thereby meeting the CWWTTP's summer permit limit not to exceed 0.2 mg/l TP.

Over the week of September 11, the Concord WWTF conducted the 2011, third-quarter Whole Effluent Toxicity (WET) sampling event. The 48-hour LC50, a.k.a. acute toxicity test, for *Ceriodaphnia* was >100% and permit complying. The 7-day NOEC, a.k.a. chronic toxicity test, was 50%. Monitoring of chronic toxicity is a permit requirement; however, there are currently no chronic toxicity limitations.

Finally, during September all effluent disinfection was performed using ultra violet light.

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.

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Alarm Activity, cont'd

Concord WWTP Off-Hours Alarm Log

Date	Time	Alarm Source	Observations/Corrective Action/Comments
Jan. '11	NA	NA	
Feb. '11	3:00 am	Hi-Effluent turbidity	Links in process monitoring data/trends reveal an inaccurate caustic feed to CoMag effluent. Operations staff ultimately performs hotwater flush of the caustic feed system to remove solidified caustic and restore accurate caustic pumping.
Mar. '11	NA	NA	
Apr. '11	NA	NA	
May '11	NA	NA	
June 26-Sunday	9:30 am	Intrusion	South Clarifier Rm. dbl. door not fully engaged in closed position – wind rocked door.
July '11	NA	NA	
Aug. '11	Scattered	Intrusion	South Clarifier Rm. single door triggered several nuisance intrusion alarms in mid-August. Plant personnel were finally able to stop the trouble by firming up an apparent loose/wet wire connection within the door frame.
Sep. '11	NA	NA	

Septage Receiving

The Concord WWTP receives septage only from in-Town sources. A total of 98,750 gallons of septage was received at the Concord WWTP in September.

WWTP Septage Receipts in gallons

	2011	2010	2009
January	44,050	32,500	10,500
February	31,750	25,750	41,250
March	102,950	171,750	83,250
April	139,750	211,500	168,250
May	113,500	125,950	150,900
June	130,000	184,950	151,450
July	73,750	90,800	138,500
August	69,500	173,250	137,750
September	98,750	182,250	203,750
October		210,250	172,400
November		194,100	155,400
December		132,750	109,600
Annual Totals:	803,750	1,735,800	1,523,000

Sludge Production

During September, 108,008 gallons of liquid sludge, equivalent to 15.10 dry tons, was transported to Upper Blackstone Water Pollution Abatement District (UBWPAD) in Millbury, Massachusetts.

WWTP Sludge Production in gallons /dry tons

	2011	2010	2009
January	98,309/16.78	89,000/15.61	107,500/16.71
February	72,916/13.5	90,000/16.81	86,000/14.13
March	72,617/13.89	90,000/15.65	99,000/17.56
April	81,000/14.90	135,000/23.57	153,000/23.94
May	108,000/27.85	97,980/15.76	170,670/24.27
June	108,000/19.67	99,000/18.28	153,000/20.83
July	106,060/17.69	99,000/16.81	126,000/20.57
August	135,224/18.83	108,000/18.61	76,376/11.81
September	108,008/15.10	106,160/17.88	126,000/21.65
October		107,558/17.31	99,000/16.03
November		142,500/21.18	99,000/16.51
December		134,750/21.73	117,000/17.79
Annual Totals:	890,134/143.29	1,298,945/219.20	1,421,546/223.58