Ohio Environmental Protection Agency
John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

January 3, 2012

Re: Pretreatment
Belmont Correctional Institution
Compliance Inspection
Fox Shannon WWTP
0PD00057*AP

Ms. Michele Miller
Warden, BeCI
P.O. Box 540
St. Clairsville, Ohio 43950

Dear Ms. Miller:

On October 19, 2011, I inspected Belmont Correctional Institution. The inspection was conducted to evaluate the facility's compliance with federal and state pretreatment regulations and its Indirect Discharge Permit (IDP). Tim McConahay, Deputy Warden of Operations, Ed Burke, Maintenance Superintendent, and Bob Waleisky, Institution Plumber represented Belmont Correctional Institution during the inspection.

General Facility Description

Belmont Correctional Institution (BeCI) is a minimum and medium security state prison which houses approximately 2750 inmates and employs roughly 500 staff. Wastewaters are generated from sanitary facilities, a large kitchen for meal preparation which includes a garbage grinder, dishwasher, and cafeteria, a small honors camp kitchen, and laundry facilities. No manufacturing or other inmate assembly or trade services which generate wastewaters are performed on site.

Pretreatment System

Plans for the prison's sewage collection and treatment facility were approved by Ohio EPA in November 1993 PTI Number 06-3728. The plans include a mechanical screen, two aerated equalization tanks, and a pumping station. The cafeteria is served by a 1500 gallon grease interceptor. BeCI replaced the original mechanical screen with a 0.25 inch mesh mechanical auger screen in January 2010. Float level controls at the pumping station are currently set to bypass equalization. Water levels are maintained below the diffusers so the blowers are not used regularly. The equalization tanks can be used for storage in the event of an equipment problem or power failure. The wastewater flows through the north equalization tank then enters the pumping station.

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All wastewaters at the prison are routed to the pretreatment system. Effluent from the system is pumped to Belmont County Sanitary Sewer District's (BCSSD) Fox Shannon wastewater treatment plant (WWTP). The pumping station utilizes two four inch PVC force mains which enter the BCSSD gravity sewer near SR 331. Review of flow totalizer readings showed daily flows from the prison averaged roughly 110,000 gallons during the January through June 2011 reporting period.

Required Actions

1. Part I.A. of BeCI's IDP requires collection of composite samples for BOD, TSS, ammonia nitrogen, and phosphorus. BeCI purchased a programmable composite sampler since the previous inspection. The sampler pickup is located in the influent channel after the auger screen. BeCI currently collects a 30 day composite sample and reports the results as a single date. BeCI should collect a discharge day (daily) composite sample for analysis to meet the IDP reporting requirements. The discharge day was previously defined as roughly between 8:00 am and 12:00 midnight, or when the treatment system is discharging. The 30 day composite samples exceed the holding times for all required parameters and the results of the samples are not valid.

2. Part II Paragraph 4 of BeCI's IDP requires BeCI to maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems...necessary to ensure compatibility of wastewater discharges with the Fox Shannon WWTP. One of the 3 blowers was not in working condition. Please repair the blower as soon as practical so that a standby blower is available when needed. Please notify Ohio EPA when the blower has been repaired.

3. Part II Paragraph 4 of BeCI's IDP requires BeCI to maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems...necessary to ensure compatibility of wastewater discharges with the Fox Shannon WWTP. BCSSD and BeCI performed pump and valve tests on the force main system on August 17, 2010. Results of the tests are attached. The tests indicate that there are two separate four inch sewer lines leading from the pump station to the BCSSD gravity manhole. Both lines are equipped with 2 air release valves, one pair near the sally port on the prison property and the second along SR 331 near the entrance to several businesses.

   The pump tests indicated there are one or more cross connections between the two sewer lines upstream of the Line A shutoff valve. BeCI should identify the location(s) of the cross connection(s) and remove it/them. Elimination of cross connections is needed to enable isolation of each of the sewer line in the event of the failure of one of the force mains or its components. The cross connection is not part of the system design, interferes with the ability to use both lines simultaneously, and would prevent the prison from being able to discharge to the Fox Shannon WWTP in the event of a failure until after repairs were completed. If repairs requiring more than a day are ever needed, the prison would be unable

to store the wastewater. The cross connection would increase the difficulty of repairs because both lines must be drained before performing repairs. Please provide a schedule to Ohio EPA for removal of the cross connection(s).

4. Part II Paragraph 4 of BeCI's IDP requires BeCI to maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems...necessary to ensure compatibility of wastewater discharges with the Fox Shannon WWTP. The air release valve on the west force main near the sally port had failed and had been replaced by a ball valve as a temporary repair. The air release should be replaced to facilitate testing and repairs on the force main. Please provide a schedule to Ohio EPA for replacing the air release valve.

5. Part I.B. Paragraph 2.C. requires BeCI to follow all procedures, schedules, staffing and any other requirements specified in the Operation and Maintenance Manual. Several maintenance actions need to be completed in accordance with the Manual. The flow meter needs to be calibrated and new charts are needed for the recorder. The pumps need to be amp tested semi-annually by an electrician. The blowers should be inspected and serviced semi-annually as specified. Please perform the maintenance items described above and notify Ohio EPA when these actions have been completed.

6. Part 1.B, Paragraph 1.a requires BeCI to provide adequate grease removal. The grease interceptor serving the cafeteria is undersized and utilizes an inferior design. The interceptor's performance is poor. BeCI must manually remove grease from the equalization tanks and the wet well of the pumping station using a pool skimmer. This manual operation is required at regular intervals to avoid problems with grease interfering with pump controls and/or obstructing the pump impellers. BeCI should install a larger grease interceptor, designed specifically for food service grease removal, to reduce maintenance requirements and ensure reliable pumping. Please provide a schedule to Ohio EPA for installation of an adequate grease interceptor.

Recommended Actions

BeCI currently collects 30 day composite samples using its programmable sampler. The intention of this effort was to document the wastewater properties in the event concerns are raised by BCSSD relating to unusual nitrogen in BeCI's discharges. However, the results of a 30 day composite sample are not valid as described in Paragraph 1 above. Another difficulty with this approach is that the collection of samples over such a long period would tend to mask any short term elevated discharges, preventing them from being detected by the sample. BeCI may wish to consider collecting daily composite samples during at least the month of July each year to help resolve any questions regarding suspected elevated nitrogen loading. The samples should be preserved and refrigerated, and can be disposed at the end of the month if no concerns are identified. The maximum holding time for Total Kjeldahl Nitrogen samples is 28 days after preservation with sulfuric acid to pH less than 2.0.

The samples could be analyzed for TKN if requested to determine whether or not BeCI is the source of elevated nitrogen detected at the Fox Shannon WWTP.

Comments

1. Part 1.B, Schedule of Compliance, Paragraph 1.A of BeCI's Indirect Discharge Permit required BeCI to restore the equalization system to operation. Ohio EPA's Compliance Assistance Unit (CAU) visited Fox Shannon to evaluate the plant's performance in July, 2011. One objective of CAU's visit was to evaluate the benefits to Fox Shannon's operations of restoring equalization at BeCI. After completing the initial review, CAU indicated that equalization at BeCI would most likely benefit Fox Shannon's operation. However, CAU determined that inadequate sludge storage capacity was the most critical factor limiting the Fox Shannon plant's performance. The impacts of flow surges from BeCI cannot be fully evaluated until after the sludge capacity problem is corrected at Fox Shannon.

   BeCI's equalization system never functioned as designed. The pumps did not perform as indicated by the supplier and there were frequent pump failures. The prison's actual sewage flow turned out to be less than half what was projected during system design, even with the inmate population at full capacity. The pumps selected in the original design were to have pumped at 250 gpm with one pump running constantly, and 350 gpm with two pumps running when the equalization tank water levels neared the tanks' capacity. The system design was intended to allow wastewater to accumulate in the equalization tanks when influent flow rates exceeded 250 gpm, and the tank water levels would drop when influent flow was less than 250 gpm. However, a pumping rate of roughly 105 gpm is needed to equalize BeCI's actual flows, which is less than half of the system design pumping rate. A redesign of the system and/or additional labor would be required to provide equalization on the discharge.

   Ohio EPA will modify BeCI's IDP to extend the compliance schedule date for restoration of equalization to January 2014. Ohio EPA will further evaluate the effects of BeCI's discharge on the Fox Shannon WWTP after Fox Shannon has corrected its sludge handling problems. If it is determined that equalization is not necessary, the requirement may be removed from the IDP. Ohio EPA will keep BeCI informed on the progress of the evaluation of Fox Shannon's WWTP.

2. BeCI installed a high level alarm at the influent channel since the previous inspection to detect failure of the mechanical auger screen. The alarm is intended to enable rapid detection of any failure of the mechanical auger screen.

3. BeCI now uses the Ohio EPA's e-DMR reporting system for submitting electronic 4519 forms. Reports for the July through December 2010 and January through June 2011, have been received electronically.

4. BeCI conducted a 7 day sampling study in April 2011. A summary of the study results is attached. The study revealed ammonia concentrations were higher than expected, but the ammonia did not change from the influent to effluent beyond expected variation and method error. The TKN concentrations did not vary widely during the study period, ranging between 53 and 69 mg/l.

Please respond to this letter in writing within 45 days. You may contact me at (740) 380-5423 with any questions.

Sincerely,

Fred J. Snell
Pretreatment Coordinator
Division of Surface Water

FJS/dh

Enclosures

c: Mark Esposito, BCSSD
c: Ron Pacifico, BCSSD
c: Ed Burke, Maintenance Supt., BeCI
c: Tim McConahay, BeCI
c: Kevin Wade, Project Mgr., Ohio Dept. of Rehab. & Correction
c: Pretreatment Unit, DSW, CO
c: Abbot Stevenson, DSW, SEDO

Pretreatment
Compliance Inspection Report

A. NATIONAL DATA SYSTEM CODING

Permit No.	NPDES No.	Date	Inspection Type	Inspector	Facility Type
0DP00057*AP	OHP000244	October 19, 2011	6	S	2

B. FACILITY DATA

Name & Location of Facility Inspected	Entry Time	Permit Effective Date
Ohio Dept. of Rehabilitation & Correction Belmont Correctional Institution 68518 Bannock Road, S.R. 331, P.O. Box 540 St. Clairsville, Ohio 43950	11:00 a.m.	February 1, 2010
	Exit Time	**Permit Expiration Date**
	1:00 p.m.	January 31, 2015

Name(s) & Title(s) of On-Site Representative(s)	Phone Number(s)
Tim McConahay, Deputy Warden of Operations Ed Burke, Maintenance Superintendent Bob Waleisky, Institution Plumber	(740) 298-0189 (740) 695-5169, Ext. 2236
Name, Address, & Title of Responsible Official	**Phone Number**
Michele Miller, Warden	(740) 695-5169, Ext. 2000

C. AREAS EVALUATED DURING INSPECTION

M	Permit	M	Flow Measurement	M	Pretreatment
S	Records/Reports	S	Laboratory	S	Compliance Schedules
M	Operations & Maintenance	S	Effluent/Receiving Waters	M	Self-Monitoring Program
S	Facility Site Review	N/A	Sludge Storage/Disposal		Other
M	Collection System				

(S = Satisfactory; M = Marginal; U = Unsatisfactory; N = Not Evaluated; N/A = Not Applicable)

D. SUMMARY OF FINDINGS/COMMENTS (attach additional sheets if necessary)

See attached letter.

Fred J Snell

Fred J. Snell, Inspector, Ohio EPA, Southeast District Office — 1/3/12 Date

Jennifer M. Witte

Jennifer M. Witte, Reviewer, Ohio EPA, Southeast District Office — 1/4/12 Date

Belmont Correctional Sampling Study

Date	Parameter	Influent	Effluent	Units
4/14/2011	DO	5.23	5.97	mg/l
	pH	9.05	8.74	SU
	Temp	20.86	21.32	C
	Cond.	969	898	umhos
4/19/2011	DO	5.23	5.97	mg/l
	pH	8.46	8.47	SU
	Temp	19.8	16.3	C
	Cond.	968	969	umhos
	Ammonia	40	43	mg/l
	NO2/NO3	0.247	0.235	mg/l
	TKN	56.5	65.9	mg/l
4/20/2011	DO	5.33	4.95	mg/l
	pH	8.3	8.7	SU
	Temp	22.8	21.4	C
	Cond.	964	964	umhos
	Ammonia	33.8	41.6	mg/l
	NO2/NO3	0.308	0.319	mg/l
	TKN	56.4	56	mg/l
4/21/2011	DO	5.99	3.8	mg/l
	pH	8.29	8.37	SU
	Temp	16.5	15.5	C
	Cond.	982	981	umhos
	Ammonia	40.3	38.7	mg/l
	NO2/NO3	0.269	0.256	mg/l
	TKN	60.9	49.9	mg/l
4/22/2011	DO	5.68	4.81	mg/l
	pH	8.4	8.6	SU
	Temp	16.8	17.4	C
	Cond.	978	977	umhos
	Ammonia	40.9	48.4	mg/l
	NO2/NO3	0.289	AA	mg/l
	TKN	60.4	53.4	mg/l

Belmont Correctional Sampling Study

Date	Parameter	Influent	Effluent	Units
4/26/2011	DO	5.63	4.34	mg/l
	pH	8.28	8.5	SU
	Temp	23	23.1	C
	Cond.	965	965	umhos
	Ammonia	46.2	51.5	mg/l
	NO2/NO3	0.289	AA	mg/l
	TKN	66.2	69.1	mg/l
4/27/2011	DO	4.98	5.6	mg/l
	pH	8.26	8.37	SU
	Temp	23.1	28	C
	Cond.	962	962	umhos
	Ammonia	47.9	37.6	mg/l
	NO2/NO3	0.194	0.207	mg/l
	TKN	62.5	54.1	mg/l

BELMONT CORRECTIONAL INSTITUTION

Flow test results at BeCi performed on August 17, 2010.
Belmont County employees present; Mark Esposito, Dan Walls, Dale Jendrusik
BeCi employees; Ed Burke, Bob Maleski.

The new 4" force main built in 1993 will be labeled line A.
The original 4" force main built in 1990 will be labeled line B
4" force main valve on line A located along SR 331.
Essco Pumps; 250 gpm @ 182 feet of head, 13" impellors, 1750 rpm.
Two pumps CAN run at the same time in the hand position!
Pump # 2 out of service.

Test #1
Line A open/ Line B closed
Pump #1 Amps 69/70/70
Pump #3 Amps 55/57/57
Flow from line A and B at manhole.

Test #2
Line A closed/ Line B open
Pump #1 Amps; Pump tripped out due to check valve limit switch
Pump #3 Amps 56/57/58
Flow from line A and B from manhole

Test #3
Line A open/Line B closed/4" valve 331 closed
Pump #1 Amps 64/64/65
Pump #3 Amps 50/51/51
Flow from Line B at manhole/ No flow from Line A

Test #4
Line A open/Line B open/4" valve 331 closed
Pump #1 Amps 65/66/65
Pump #3 Amps 52/52/52
Flow from Line B at manhole/ No flow from line A

Test #5
Line A open/Line B open/4" valve 331 open
Pump #1 Amps 70/70/71
Pump #3 Amps 56/56/57
Flow from Line A and B at manhole

Test #6
Line A open/Line B open/4" valve 331 open
Pump #1 and Pump #3 on

Pump #1 Amps 64/63/62
Pump #3 Amps 51/51/51
Flow from Line A and B at manhole.