ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

847/294-4000
847/294-4018 (Fax)

July 6, 2018

City of Harvard
Mr. Jim Grant, Utilities Superintendent
201 W. Diggins St.
P.O. Box 310
Harvard, IL 60033

Re: Harvard WWTP
NPDES Number IL0020117
BOW ID Number W1110250005

Dear Mr. Grant:

On June 1, 2018, a compliance evaluation inspection of The Harvard WWTP was conducted by Ms. Karen Katamay, representing the Illinois Environmental Protection Agency. The purpose of the visit was to review facility operations with regard to applicable state and federal water pollution control laws and regulations.

A copy of the inspection report is enclosed for your information.

Please contact Ms. Karen Katamay at 847/294-4000 if you have any questions regarding this inspection.

Sincerely,

DIVISION OF WATER POLLUTION CONTROL

Jay Patel, Regional Manager
Field Operation Section - Des Plaines

Enclosure

cc: Record Unit (01)
Regional File

4302 N. Main St., Rockford, IL 61103 (815)987-7760
595 S. State, Elgin, IL 60123 (847)608-3131
2125 S. First St., Champaign, IL 61820 (217)278-5800
2009 Mall St., Collinsville, IL 62234 (618)346-5120

9511 Harrison St., Des Plaines, IL 60016 (847)294-4000
412 SW Washington St., Suite D, Peoria, IL 61602 (309)671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200
100 W. Randolph, Suite 4-500, Chicago, IL 60601

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

MEMORANDUM

DATE: June 29, 2018

CC: DWPC/RU (01)
DWPC/CAS

TO: Regional File

FROM: Karen Katamay, DWPC/FOS – Des Plaines

SUBJECT: **Harvard STP (McHenry County)**
NPDES No. IL0020117
BOW ID No. W1110250005

On June 1, 2018, a Compliance Evaluation Inspection was conducted at the subject facility. Attached is a copy of the report.

The permittee has met all their reporting and Special Condition requirements, but there were several effluent violations that were noted as follows:

Date	Parameter	Permit Limit	Reported Value
Aug. 2017	Fecal Coliform, daily max.	400/100 ml	>401/100ml
Sept. 2017	Chlorine residual, daily max.	0.05 mg/L	0.12 mg/L
Nov. 2017	TSS, monthly average	12 mg/L	13.4 mg/L
Dec. 2017	TSS, monthly average	12 mg/L	14.2 mg/L
Dec. 2017	TSS, daily maximum	24 mg/L	25 mg/L
Jan. 2018	TSS, monthly average	12 mg/L	12.8 mg/L
Feb. 2018	TSS, monthly average	12 mg/L	15.7 mg/L
March 2018	TSS, monthly average	12 mg/L	12.8 mg/L

There was also a discharge through the 002 outfall in July 2017 that occurred during a heavy rain event. The monthly and weekly average limits for TSS, BOD and fecal coliform were exceeded during the four day discharge period. This occurred during a significant rain event and the facility has not had to use the 002 outfall since then.

In addition, the facility has some performance limiting factors that make it difficult for the plant to maintain compliance.

EPA

United States Environmental Protection Agency

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1 N	2 5	3 I L 0 0 2 0 1 1 7 11	12 1 8 0 6 0 1 17	18 C	19 S	20 1

Remarks

21 66

Inspection Work Days	Facility Self-Monitoring Evaluation Rating	BI	QA	Reserved	
67 69	70	71	72	73 74	75 80

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number)	Entry Time/Date	Permit Effective Date
Harvard WWTP 801 W. Brink St. Harvard, IL 60033	June 1, 2018	August 1, 2016
	Exit Time/Date	**Permit Expiration Date**
	June 1, 2018	July 31, 2021

Name(s) of On-Site Representative(s)/Title(s)/ Phone and Fax Number(s)	Other Facility Data
Jim Grant Utilities Superintendent (815) 943-6626	

Name, Address of Responsible Official/Title/Phone and Fax Number	Contacted
Mike Kelly, Mayor City of Harvard, 201 W. Diggins St. Harvard, IL 60033	☐ Yes ☒ No

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

X	Permit	X	Flow Measurement	X	Operation & Maintenance		Storm Water
X	Records/Reports	X	Self-Monitoring Program	X	Sludge Handling/Disposal		Combined Sewer Overflow
X	Facility Site Review		Compliance Schedules		Pretreatment		Sanitary Sewer Overflow
X	Effluent/Receiving Waters	X	Laboratory		Pollution Prevention		MS4

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation Codes, as necessary)

Some effluent violations were noted. The facility currently has a CCA with the Agency.

SEV Codes

SEV Description

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Karen Katamay, EPE III/CPESC	IEPA / DWPC / FOS-DES PLAINES 847/294-4000 FAX # 847-294-4018	June 29, 2018
Signature of Management Q A Reviewer	**Agency/Office/Phone and Fax Numbers**	**Date**
	IEPA / DWPC / FOS-DES PLAINES 847/294-4000 FAX # 847-294-4018	7/3/2018

cc: BOW /DWPC/FOS/ RU . BOW/DWPC/CAS. BOW/DWPC/REGION FILE

Section A: National Data System Coding *(i.e., PCS)*

Column 1: Transaction Code: Use *N, C,* or *D for* New, Change, or Delete. All inspections will be *new* unless there is an error in the data entered.

Columns 3-11: NPDES Permit No. Enter the facility's NPDES permit number - third character in permit number indicates permit type for U=unpermitted, G=general permit, etc.. *(Use the Remarks columns to record the State permit number, if necessary.)*

Columns 12-17: Inspection Date. Insert the date entry was made into the facility. Use the year month day format (e.g., 04 10 01 = October 01, 2004).

Column 18: Inspection Type*. Use one of the codes listed below to describe the type of inspection:

A	Performance Audit	U	IU Inspection with Pretreatment Audit	!	Pretreatment Compliance (Oversight)
B	Compliance Biomonitoring	X	Toxics Inspection	@	Follow-up (enforcement)
C	Compliance Evaluation (non-sampling)	Z	Sludge - Biosolids	[	Storm Water-Construction-Sampling
D	Diagnostic	#	Combined Sewer Overflow-Sampling	]	Storm Water-Construction-Non-Sampling
F	Pretreatment (Follow-up)	$	Combined Sewer Overflow-Non-Sampling	:	Storm Water-Non-Construction-Sampling
G	Pretreatment (Audit)	+	Sanitary Sewer Overflow-Sampling	~	Storm Water-Non-Construction-Non-Sampling
I	Industrial User (IU) Inspection	&	Sanitary Sewer Overflow-Non-Sampling	<	Storm Water-MS4-Sampling
J	Complaints	^	CAFO-Sampling	-	Storm Water-MS4-Non-Sampling
M	Multimedia	=	CAFO-Non-Sampling	>	Storm Water-MS4-Audit
N	Spill	2	IU Sampling Inspection		
O	Compliance Evaluation (Oversight)	3	IU Non-Sampling Inspection		
P	Pretreatment Compliance Inspection	4	IU Toxics Inspection		
R	Reconnaissance	5	IU Sampling Inspection with Pretreatment		
S	Compliance Sampling	6	IU Non-Sampling Inspection with Pretreatment		
		7	IU Toxics with Pretreatment		

Column 19: Inspector Code. Use one of the codes listed below to describe the *lead agency* in the inspection.

A —	State (Contractor)	C —	Other Inspectors, Federal/EPA, (Specify in Remarks columns)
B —	EPA (Contractor)	D —	Other Inspectors, State (Specify in Remarks columns)
E —	Corps of Engineers	F —	EPA Regional Inspector
J —	Joint EPA/State Inspectors—EPA Lead	S —	State Inspector
L —	Local Health Department (State)	T —	Joint State/EPA Inspectors—State lead
N —	NEIC Inspectors		

Column 20: Facility Type. Use one of the codes below to describe the facility.

1 — Municipal. Publicly Owned Treatment Works (POTWs) with 1987 Standard Industrial Code (SIC) 4952.
2 — Industrial. Other than municipal, agricultural, and Federal facilities.
3 — Agricultural. Facilities classified with 1987 SIC 0111 to 0971.
4 — Federal. Facilities identified as Federal by the EPA Regional Office.
5 — Oil & Gas. Facilities classified with 1987 SIC 1311 to 1389.

Columns 21-66: Remarks. These columns are reserved for remarks at the discretion of the Region.

Columns 67-69: Inspection Work Days. Estimate the total work effort (to the nearest 0.1 work day), up to 99.9 days, that were used to complete the inspection and submit a QA reviewed report of findings. This estimate includes the accumulative effort of all participating inspectors; any effort for laboratory analyses, testing, and remote sensing; and the billed payroll time for travel and pre and post inspection preparation. This estimate does not require detailed documentation.

Column 70: Facility Evaluation Rating. Use information gathered during the inspection (regardless of inspection type) to evaluate the quality of the facility self-monitoring program. Grade the program using a scale of 1 to 5 with a score of 5 being used for very reliable self-monitoring programs, 3 being satisfactory, and 1 being used for very unreliable programs.

Column 71: Biomonitoring Information. Enter D for static testing. Enter F for flow through testing. Enter N for no biomonitoring.

Column 72: Quality Assurance Data Inspection. Enter Q if the inspection was conducted as follow-up on quality assurance sample results. Enter N otherwise.

Columns 73-80: These columns are reserved for regionally defined information.

Section B: Facility Data

This section is self-explanatory except for "Other Facility Data," which may include new information not in the permit or PCS (e.g., new outfalls, names of receiving waters, new ownership, other updates to the record, SIC/NAICS Codes, Latitude/Longitude).

Section C: Areas Evaluated During Inspection

Check only those areas evaluated by marking the appropriate box. Use Section D and additional sheets as necessary. Support the findings, as necessary, in a brief narrative report. Use the headings given on the report form (e.g., Permit, Records/Reports) when discussing the areas evaluated during the inspection. The heading marked "Multimedia" may indicate medias such as CAA, RCRA, and TSCA.

Section D: Summary of Findings/Comments

Briefly summarize the inspection findings. This summary should abstract the pertinent inspection findings, not replace the narrative report. Reference a list of attachments, such as completed checklists taken from the NPDES Compliance Inspection Manuals and pretreatment guidance documents, including effluent data when sampling has been done. Use extra sheets as necessary.

*Footnote: In addition to the inspection types listed above under column 18, a state may continue to use the following wet weather and CAFO inspection types until the state is brought into ICIS-NPDES: K: CAFO, V: SSO, Y: CSO, W: Storm Water 9: MS4. States may also use the new wet weather, CAFO and MS4 inspections types shown in column 18 of this form. The EPA regions are required to use the new wet weather, CAFO, and MS4 inspection types for inspections with an inspection date (DTIN) on or after July 1, 2005.

Revised 1/2006

The City of Harvard currently has a Compliance Commitment Agreement (CCA) with the Agency to achieve and maintain compliance with their effluent limits. In accordance with the agreement, plant personnel have taken steps to aid in compliance, such as adding polymer prior to the secondary clarifiers to aid in settling. This helped initially, but the violations returned during the colder months from November through March.

Attachment: Compliance Inspection Report

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, DIRECTOR

INSPECTION REPORT

Facility Name:	Harvard WWTP (McHenry County)
NPDES Permit No.:	IL0020117
BOW ID No.:	W1110250005
Basin Code:	PQEA-111
Inspection Type:	Compliance Evaluation
Date of Inspection:	June 1, 2018
Inspected By:	Karen Katamay, EPE III/CPESC
Interviewed:	Jim Grant, Superintendent

GENERAL INFORMATION

Responsible Officials and Mailing Address:

Michael Kelly, Mayor
City of Harvard
201 W. Diggins
Harvard, IL 60033
815/943-6468

Dave Nelson, City Administrator
Jim Grant, Superintendent of Utilities

Plant Personnel and Certification Status:

Jim Grant	Superintendent	Class 1
Anthony DeRose	Operator	Class 1
Charles Keller	Operator	Class 1
Tim Perkins	Operator	Class 3

Plant Location:

The Harvard WWTP is located at 801 W. Brink Street, on the north side of Route 173, about ½ mile west of Route 14. Legal description is SW 1/4 of Section 35 T.46N.-R.5E., Chemung Township; McHenry County.

Receiving Waters:

The wastewater treatment plant discharges to Mokeler Creek, tributary to Piscasaw Creek, tributary to the Kishwaukee River, tributary to the Rock River. Mokeler Creek is a Class C - General Use Stream, with a 7Q10 of 0 CFS at the point of discharge.

NPDES Permit Requirements:

Effective Date:	August 1, 2016
Expiration Date:	July 31, 2021
Monthly Avg. CBOD:	10 mg/L
Monthly Avg. TSS:	12 mg/L
Ammonia Nitrogen as (N)	
(Monthly Average)	
June – Aug.:	1.1 mg/L
Nov. – Feb.:	1.8 mg/L
All other:	1.5 mg/L
Monthly Avg. Phosphorus:	1.0 mg/L

In addition to the above monitoring, the effluent is also monitored for flow, pH, fecal coliform (May through October), chlorine residual and dissolved oxygen. They also do monitoring only for total Nitrogen. Influent is monitored for flow, BOD and TSS.

There is also an outfall from their excess flow pond that is required to be monitored when it discharges. Outfall 002 monitoring requirements include total flow, BOD, TSS, fecal coliform, pH, chlorine residual, ammonia nitrogen, total phosphorus and dissolved oxygen.

There are also fifteen special conditions in the permit. Of special interest are the following:

Special Condition No. 11 – requires semi-annual monitoring of 20 additional parameters and an evaluation of their industries to see if a pretreatment program would be required.
Special Condition No. 16 – requires development of a CMOM program.
Special Condition No. 17 – requires a phosphorus removal feasibility study.
Special Condition No. 18 – requires a phosphorus discharge optimization plan.

Plant Description:

This is a secondary wastewater treatment plant with unit operations and processes including a comminutor, aerated grit tank, primary clarifiers, packed bed tower, rotating biological contactors (RBCs), and secondary clarifiers, with effluent disinfection and dechlorination. For sludge handling, they use both aerobic and anaerobic digesters, a sludge holding tank and drying

beds. An excess flow lagoon is also provided.

Attached is a current flow diagram of the facility (Attachment A). Also attached are some photos taken on the day of the inspection.

Plant Capacity and Loading:

The facility currently serves about 9,000 P.E. in the city of Harvard and is rated 1.8 MGD (DAF) and 4.5 MGD (DMF). Design loading is 18,000 PE with a design organic loading of 3,060 lbs. BOD/day and design solids loading of 3,600 lbs. TSS/day.

The DMR summary for the period of July 2017 through May 2018 indicated the following (see also Attachment B):

Average flow:	1.09 MGD
Average flow of the three lowest months:	0.95 MGD
Average maximum flow:	1.84 MGD
Average influent BOD loading:	295 mg/L
Average influent TSS loading:	258 mg/L

Restricted Status/Critical Review:

There were two permits issued within the past two years that totaled 76 P.E. One was for a new commercial building and includes a new lift station and the other was for a new restaurant.

Current plant loading for the Harvard STP, based on the average flow of the three lowest months and P.E.'s added within the last two years indicates the following:

Average flow, three lowest months:	0.95 MGD
P.E.'s added, last two years:	76 P.E. (0.008 MGD)

$$\text{Percent of hydraulic design capacity} = \frac{(0.95 + 0.008)}{1.8} = 53.2\ \%$$

Percent of organic loading capacity:

$$295\ \text{mg/L} \times 8.34 \times 0.95\ \text{MGD} = \frac{2337\ \text{lbs/day}}{3060\ \text{lbs/day}} = 76.4\ \%$$

Percent of solids loading capacity:

$$258\ \text{mg/L} \times 8.34 \times 0.95\ \text{MGD} = \frac{2044\ \text{lbs/day}}{3600\ \text{lbs/day}} = 56.8\ \%$$

Based on the above calculations, this facility does not need to be considered for restricted status or critical review at this time.

SEWAGE COLLECTION SYSTEM

Type of System and Area Served:

Sewers tributary to this facility are all separate and cover only the City of Harvard. The collection system is maintained by the Harvard street department.

Lift Stations:

There are twelve lift stations tributary to this facility. Lift stations are maintained by plant personnel and checked weekly. Three of the lift stations have permanent generators and the rest have portable generator connections. All are now monitored using SCADA and alarmed to call operators.

1.	Route 14 L.S.:	2 pumps rated at 275 gpm each
2.	Willow L.S.:	2 pumps rated at 680 gpm each
3.	Northfield L.S.:	3 pumps rated at 750 gpm each
4.	Diggins L.S.:	2 pumps rated at 200 gpm each
5.	South Park L.S.:	2 pumps rated at 400 gpm each
6.	Kennedy L.S.:	2 pumps rated at 220 gpm each
7.	Marengo Road L.S.:	2 pumps rated at 250 gpm each
8.	Dewey St. L.S.:	1 pump rated at 200 gpm
9.	Pasquinellis L.S.:	2 pumps rated at 345 gpm each
10.	Autumn Glen L.S.:	2 pumps rated at 320 gpm each
11.	Crowley Road L.S.:	2 pumps rated at 945 gpm each
12.	Comanche Circle L.S.:	2 pumps rated at 80 gpm each

System Problems and Maintenance:

The city does get some grease in their system and occasionally will get rags from the commercial laundry in town. No significant problems were noted with either the collection system or lift stations and the city is continuing to do repairs and upgrades as their budget allows and has done some televising of lines.

The permit requires the city to develop a CMOM program within 24 months of the effective date of their permit, which the permittee has completed.

Industrial Users:

The city does have some industrial areas, but there are no known significant or categorical users. There were no significant problems noted with industry within the past year, although they do have occasional problems with the local laundromat when they wash commercial rags.

The permit requires the city to evaluate all their industrial users to determine if there are any that would be considered categorical or significant users, per the pretreatment requirements. The evaluation by the permittee was completed as required and none of their industries were determined to be significant or categorical users.

WASTEWATER TREATMENT PLANT

Inlet Structure:

There are three interceptors (one 15-inch and two 18-inches in diameter) that feed into the facility by gravity.

Raw Sewage and Influent Pumping:

Flow passes through a raw sewage pumping station consisting of two screw pumps, each rated at 3.75 MGD. Usually only one is used at a time. Influent passes through an auger following the pumping station.

Bypass:

Wastewater during high flow conditions (greater than the design maximum flow) can be pumped to the excess flow lagoon, a seven-acre pond, where it can be stored or it can be chlorinated and discharged through Outfall 002.

The facility occasionally has to discharge some flow to the pond, but usually the flows are able to be contained in the pond. The facility bypassed to the pond in July 2017 during a heavy rain event, which resulted in a discharge from the pond.

Influent Flow Measurement:

There is no influent flow measurement provided. Only effluent flow is monitored.

Grit Tank:

An aerated grit tank (12' by 12' by 15' SWD, 10,000-gallon capacity) is provided for grit removal. Grit is removed from the bottom of the tank by air lift to a grit washer and separator. Grit is then put in a dumpster and landfilled. The unit appeared to be operating satisfactorily at the time of the inspection.

Phosphorus Treatment:

Phosphorus treatment is done through chemical treatment. A polyethylene tank containing Ferric Chloride (12' diameter by 15' high) meters out a 30% solution to two locations, the primary tanks and the effluent from the trickling filter.

Primary Treatment:

Flow enters a divider box and is split between the two rectangular primary clarifiers (each 50' by 20' by 8'). Primary sludge is routed to the anaerobic digesters.

The primary clarifiers have a surface settling rate of 900 gpd/sq.ft. at DAF and 2250 gpd/sq. ft. at DMF. The Illinois recommended standard maximum loading rate for primary clarifiers is 1000

gpd/sq.ft. at peak flow. At the time of the inspection, the primary clarifiers were showing significant scum and foam.

Packed Bed Tower:

Following the primary clarifiers, flow then goes into another diversion box and is directed to the filter pumps, which pump it up to the top of the packed bed tower. There are three pumps, but usually only two are in use. The packed bed tower is 65' diameter by 20' media height and is capable of treating up to 4.0 MGD.

All flows from the primary clarifiers are pumped through the tower. In addition, 2/3 of flows from the RBCs are also re-circulated through the tower.

Heavy sloughing in the Spring of each year has the tendency to upset plant operations and lead to effluent violations. This occurred again this past Spring.

Rotating Biological Contactors (RBCs):

Following the packed bed tower, the flow then goes through another splitter box which routes it to the nine "Walker Process" RBCs. The RBCs are used in two rows of five and four. Each of the first two RBCs has a surface area of 100,000 sq. ft. and each of the remaining RBCs has a surface area of 150,000 sq. ft. The first four RBCs provide carbonaceous BOD removal and the remaining ones provide nitrification. All units appeared to be operating satisfactorily.

Secondary Settling Tanks:

Following the filter and RBCs, flow is then split between the five rectangular clarifiers, each 75' by 20' by 8' SWD. The secondary sludge is pumped to the aerobic digesters. The secondary clarifiers have a surface settling rate of 240 gpd/sq.ft. at DAF and 600 gpd/sq.ft. at DMF. The Illinois recommended standard maximum loading rate for secondary clarifiers is 1000 gpd/sq.ft. at peak flow.

The clarifiers have typically been carrying heavier solids loadings due to the sloughing from the packed tower, but the plant has been stepping up their wasting to try and minimize solids washout. In addition, they now add polymer at the end of their RBCs and prior to their secondary clarifiers to help settle out the solids.

At the time of the inspection, the clarifiers showed some turbidity, indicating poor settling.

Blowers:

Four blowers provide air to the treatment units. Two 15-hp blowers are used for the aerobic digesters and two 7.5-hp blowers are used for the grit tank. Two additional blowers were also recently added to supply air to the effluent channel to help meet the minimum dissolved oxygen effluent limit.

Effluent Flow Measurement:

A Parshall flume with an ultrasonic sensor is used for effluent flow measurement, and the signal is recorded on a chart and totalizer. The Parshall flume is located between the final clarifiers and the chlorine contact tank. The flow is measured prior to the contact tanks and the skimmers. It was estimated that 200,000 gpd is removed by the skimmers.

There is currently no flow measurement for the excess flow lagoon. Any excess flow discharges are estimated based on the flows that are pumped to the pond.

Effluent Disinfection:

The permit has disinfection requirements for May through October, so the facility uses a chlorination/dechlorination system. They use 150 lb. cylinders of chlorine gas for disinfection and sodium bisulfite for disinfection. Chlorine is added at the end of the Parshall flume prior to the chlorine contact tank and dechlorination is added at the end of the contact tank.

The excess flow lagoon has piping for chlorine gas disinfection in the event of a discharge.

Anaerobic Digesters:

There are two anaerobic digesters provided and they are used in series. Sludge and scum collected from the primary settling tanks are sent to the first stage digester where the sludge is heated (with natural gas in the heat exchanger) and mixed. This sludge, in turn, is sent to the second stage digester (which is not heated) where the sludge is concentrated and stored and decanted.

Aerobic Digesters:

Two aerobic digesters are used to digest sludge produced in the secondary clarifiers. Decanting is performed by allowing the digested sludge to gravity flow to a sludge thickener. The digesters had significant foam, but appeared to be operating satisfactorily.

The facility has also occasionally used an excess flow tank at the head of the plant as temporary liquid sludge storage when they have significant sloughing, although they try to avoid this due to odors. The digester capacity should be evaluated in regard to the additional solids loading in the clarifiers due to the filter sloughing.

Sludge Thickener:

Aerobically digested sludge is thickened in this tank. The supernatant is sent to the head of the treatment process and the thickened sludge is pumped to the drying beds. The facility recently added VFDs for the digester pumps.

Sludge Drying Beds:

There are twelve sludge-drying beds provided for dewatering of digested aerobic and anaerobic

sludge, with a total surface area of 33,600 square feet. The facility has also brought in a portable press in the past when they have had to reduce the loading in the clarifiers and aerobic digesters to offset the sloughing.

Sludge Disposal:

Disposal of sludge is through land application and the current hauler is Dahm Enterprises. In 2017, 179.29 dry tons were land applied. The Harvard STP has a current land application permit as follows:

Permit No.:	2016-SC-61103
Issue Date:	July 14, 2016
Expiration Date:	June 30, 2021
Amount permitted:	300 dry tons (approximate)

MISCELLANEOUS

Plant Buildings:

Plant buildings were small, but appeared to be adequate and maintained. The main control building houses the laboratory, office, master electrical controls and flow chart.

The public works department stores materials next to the excess flow pond and in the past, some of these materials had entered the pond. The department has since put up barriers to protect the pond.

Potable Water Supply Protection:

Backflow prevention devices are provided for potable water supply protection.

Auxiliary Power System:

This facility is served by two separate incoming electrical power sources (dual feed).

Plant Alarm System:

The facility has a SCADA system which monitors all the major units except for the RBCs, the aerobic digesters and the aerated grit tank. The SCADA system is set to call the on-call operator if there is an alarm. The units that are not alarmed are checked daily by the plant operators.

NPDES PERMIT COMPLIANCE

Permit:

Permit verification was satisfactory. The permit is current and all known outfalls are included.

Records and Reports:

Records appeared to be adequate and chain of custody sheets are used for samples sent to a contract lab. All reports have been submitted as required.

Flow Measurement:

Only effluent flow monitoring is available at this facility. The flow meter is calibrated annually and was last calibrated in May 2018. The flow meter is located prior to the chlorine contact tank, so some of the measured flows are actually caught in the contact tank skimmers and diverted to the head of the plant.

Laboratory:

All regular NPDES permit parameters are analyzed on site. Total nitrogen, effluent metals and sludge samples are sent to PDC laboratories for analyses. Laboratory equipment is calibrated as required and the facility received all acceptable results on their last DMR-QA study.

Effluent and Receiving Waters:

At the time of the inspection, the treated effluent appeared clear.

A summary of the DMR results for outfall 001 for the period of July 2017 through May 2018 indicated the following (see also the DMR summary – Attachment B):

Monthly Average Flow:	1.09 MGD
Monthly Average CBOD:	6.6 mg/L
Monthly Average TSS:	11.8 mg/L
Monthly Average Phosphorus:	0.77 mg/L
Monthly Average Amm-N as (N):	0.73 mg/L
Average Minimum D.O.:	7.75 mg/L
Average CBOD removal efficiency:	96.1 %
Average TSS removal efficiency:	95.4 %

The following violations were noted during the reporting period:

Date	Parameter	Permit Limit	Reported Value
Aug. 2017	Fecal Coliform, daily max.	400/100 ml	>401/100ml
Sept. 2017	Chlorine residual, daily max.	0.05 mg/L	0.12 mg/L
Nov. 2017	TSS, monthly average	12 mg/L	13.4 mg/L
Dec. 2017	TSS, monthly average	12 mg/L	14.2 mg/L
Dec. 2017	TSS, daily maximum	24 mg/L	25 mg/L
Jan. 2018	TSS, monthly average	12 mg/L	12.8 mg/L
Feb. 2018	TSS, monthly average	12 mg/L	15.7 mg/L
March 2018	TSS, monthly average	12 mg/L	12.8 mg/L

There was also a discharge through the 002 outfall in July 2017 that occurred during a heavy rain event. The monthly and weekly average limits for TSS, BOD and fecal coliform were exceeded during the four day discharge period. This occurred during a significant rain event and the facility has not had to use the 002 outfall since then.

Self-Monitoring Program:

Sampling and analysis of the influent and effluent have been performed at the required frequency and sample type. Automatic composite samplers collect time-based composites and the samples are refrigerated during the collection process. In addition, the permittee committed to some process control monitoring of their solids in response to the effluent violations noted.

Operation & Maintenance:

The equipment adjustments and the alarm on the packed bed filter has helped, but the facility continues to have compliance issues. Operation and maintenance logs are kept and routine maintenance is performed.

Sludge Disposal:

All sludge appeared to be disposed of in accordance with the NPDES and sludge land application permits. Sludge from this facility is rated Class B and the requirements for Class B sludge appear to have been met. They use option B1 for pathogen reduction (fecal coliform monitoring) and option 1 for vector attraction reduction (38% volatile solids reduction).

Performance Limiting Factors:

The primary clarifiers currently have surface settling rates of 900 gpd/sq.ft. at DAF and 2250 gpd/sq.ft. at DMF. The loading at DMF exceeds the recommended design standard of 1000 gpd/sq.ft. Additional primary treatment capacity would also aid the facility by reducing loading to their packed bed filter.

Digester capacity should also be evaluated with regard to the additional solids loading due to sloughing from the filter and limits to how much wasting they can do from the clarifiers. The facility would also benefit from either covered sludge storage or a sludge press, which would help to free up some of their drying beds to allow additional sludge processing.

In addition, this is an aging facility, which requires higher maintenance requirements in order to keep equipment operating properly and try to maintain compliance. The filter is close to or at the design performance life for its bio-media and many of the units are showing signs of wear. The facility could also consider inflow and infiltration reduction which may help reduce high hydraulic loading during rain events that contribute to filter sloughing and short circuiting of the clarifiers.

The city of Harvard is currently evaluating a plant upgrade to address the compliance and equipment issues.

SUMMARY

The permittee has met all their reporting and Special Condition requirements, but there were several effluent violations that were noted as follows:

Date	Parameter	Permit Limit	Reported Value
Aug. 2017	Fecal Coliform, daily max.	400/100 ml	>401/100ml
Sept. 2017	Chlorine residual, daily max.	0.05 mg/L	0.12 mg/L
Nov. 2017	TSS, monthly average	12 mg/L	13.4 mg/L
Dec. 2017	TSS, monthly average	12 mg/L	14.2 mg/L
Dec. 2017	TSS, daily maximum	24 mg/L	25 mg/L
Jan. 2018	TSS, monthly average	12 mg/L	12.8 mg/L
Feb. 2018	TSS, monthly average	12 mg/L	15.7 mg/L
March 2018	TSS, monthly average	12 mg/L	12.8 mg/L

There was also a discharge through the 002 outfall in July 2017 that occurred during a heavy rain event. The monthly and weekly average limits for TSS, BOD and fecal coliform were exceeded during the four day discharge period. This occurred during a significant rain event and the facility has not had to use the 002 outfall since then.

In addition, the facility has some performance limiting factors that make it difficult for the plant to maintain compliance.

The City of Harvard currently has a Compliance Commitment Agreement (CCA) with the Agency to achieve and maintain compliance with their effluent limits. In accordance with the agreement, plant personnel have taken steps to aid in compliance, such as adding polymer prior to the secondary clarifiers to aid in settling. This helped initially, but the violations returned during the colder months from November through March.

Karen Katamay, CPESC
Environmental Protection Engineer III – BOW

Attachments: Photos, flow diagram, and DMR summary

Photo 1 – Influent screw pumps

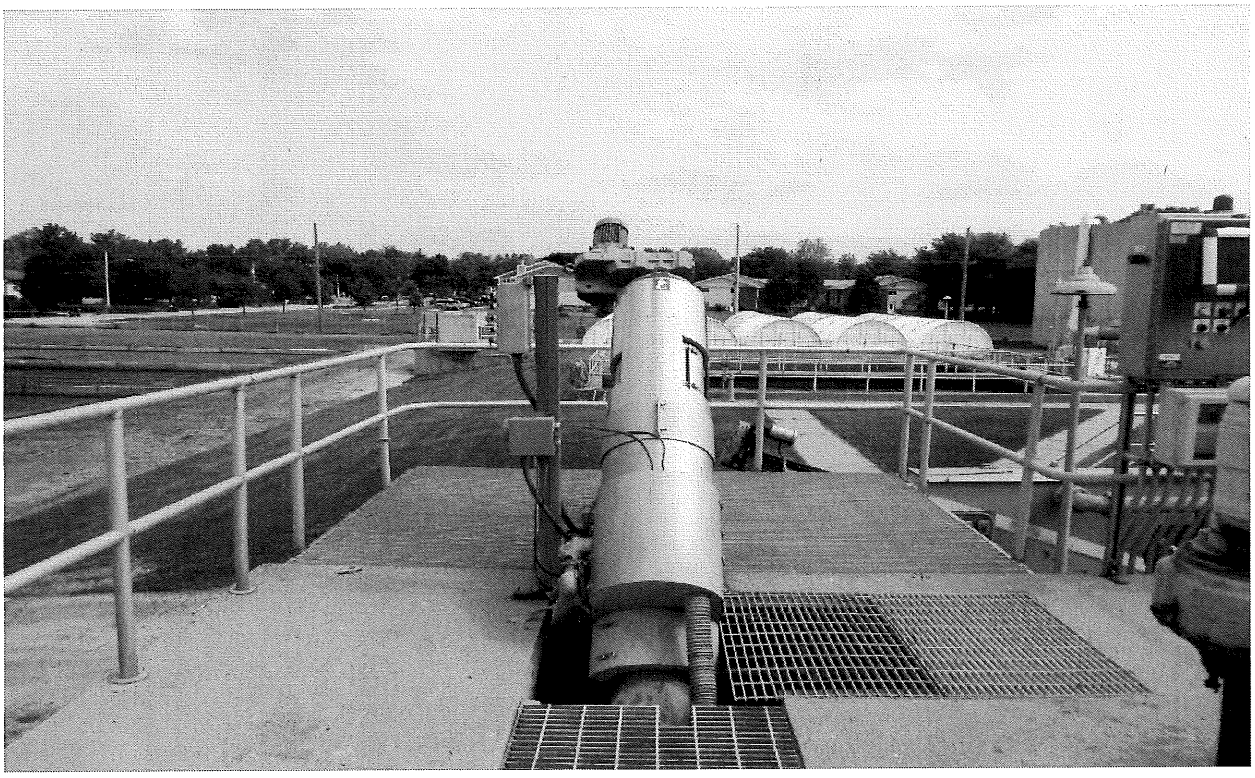


Photo 2 – Mechanical screen

Photo 3 – Aerated grit tank

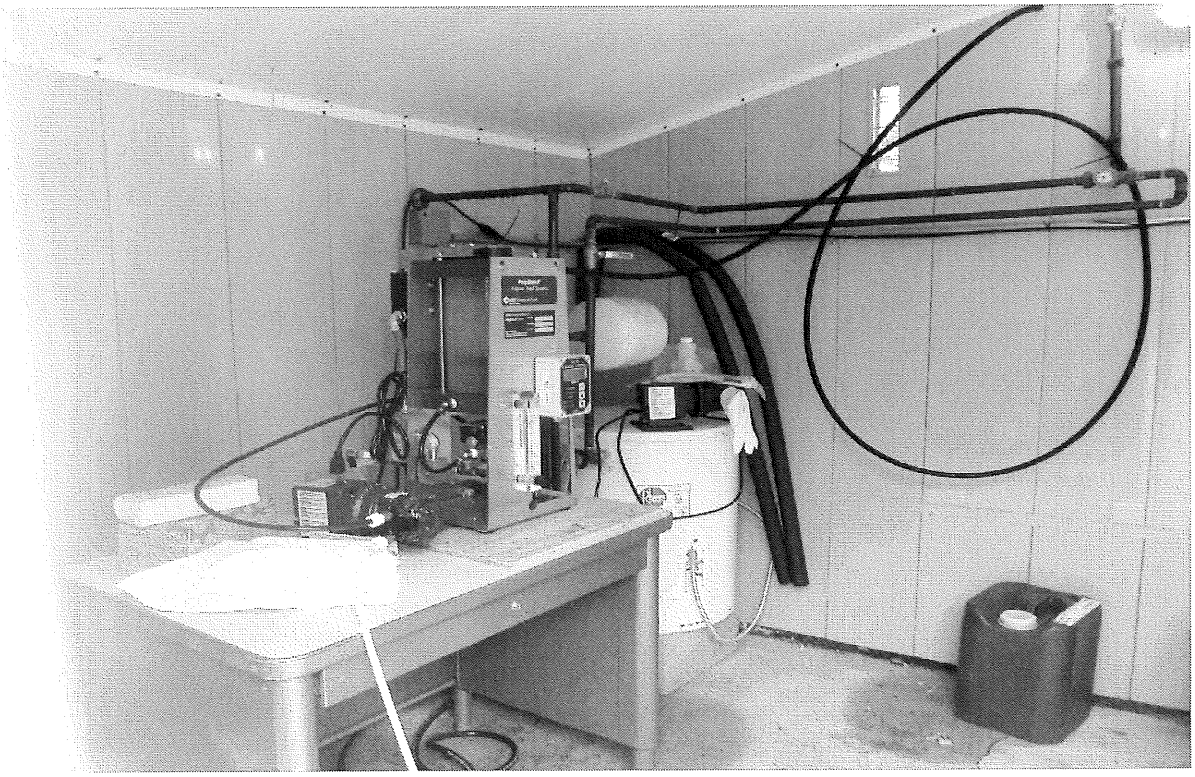


Photo 4 – New polymer feed system for settling clarifiers

Photo 5 – Primary clarifiers showing foam and scum

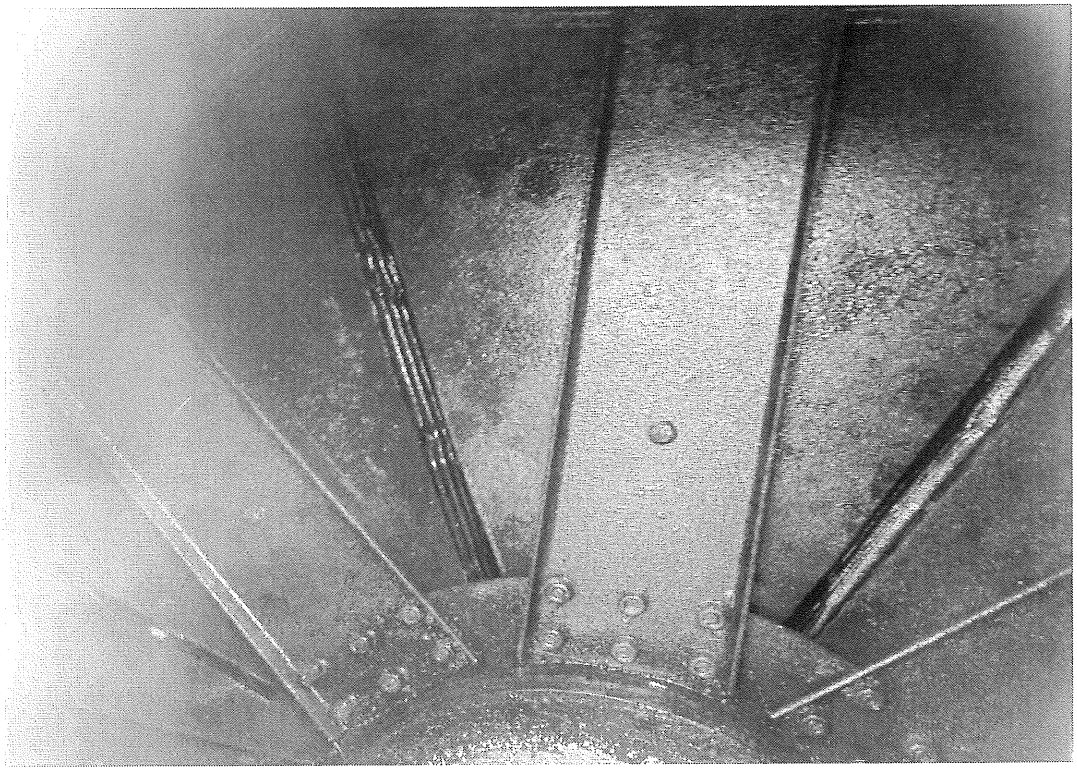


Photo 6 – Looking inside one of the RBC units

Photo 7 – The outside of one of the RBCs and feed location for the polymer

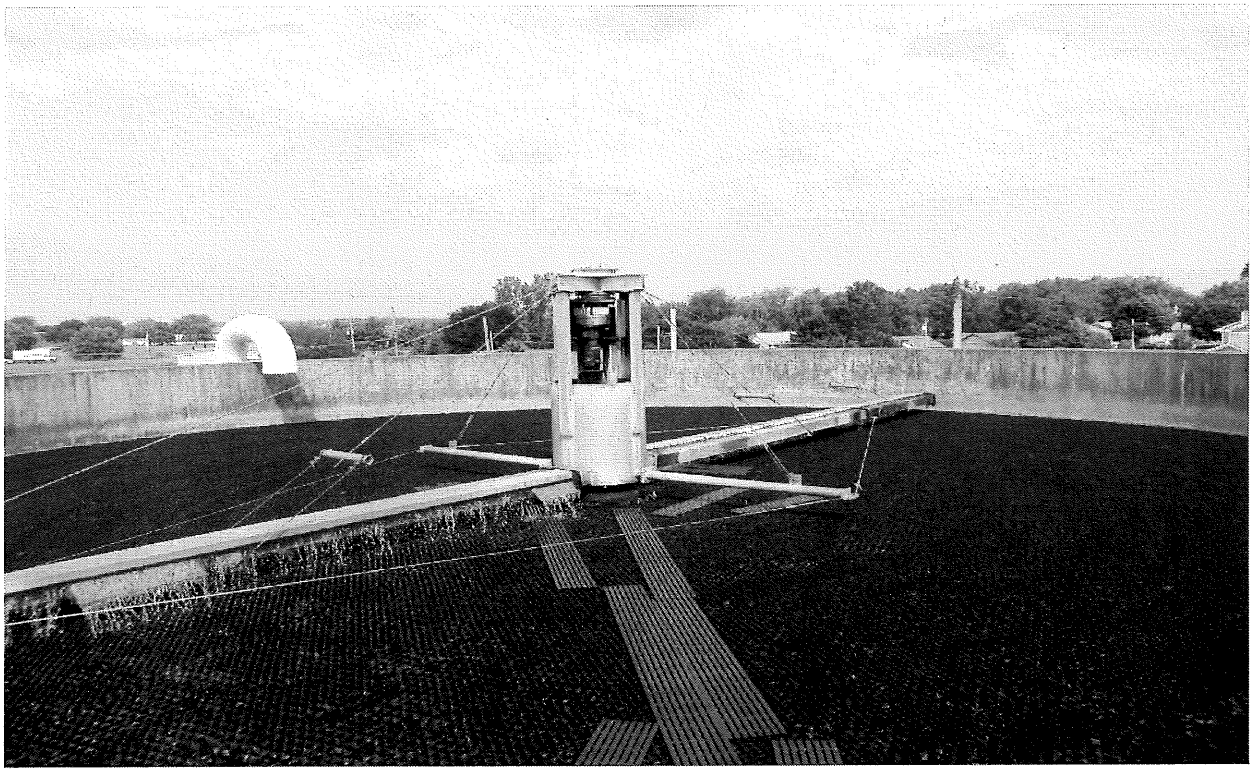


Photo 8 – Top of the packed bed filter tower

Photo 9 – View of the secondary clarifiers from the filter tower

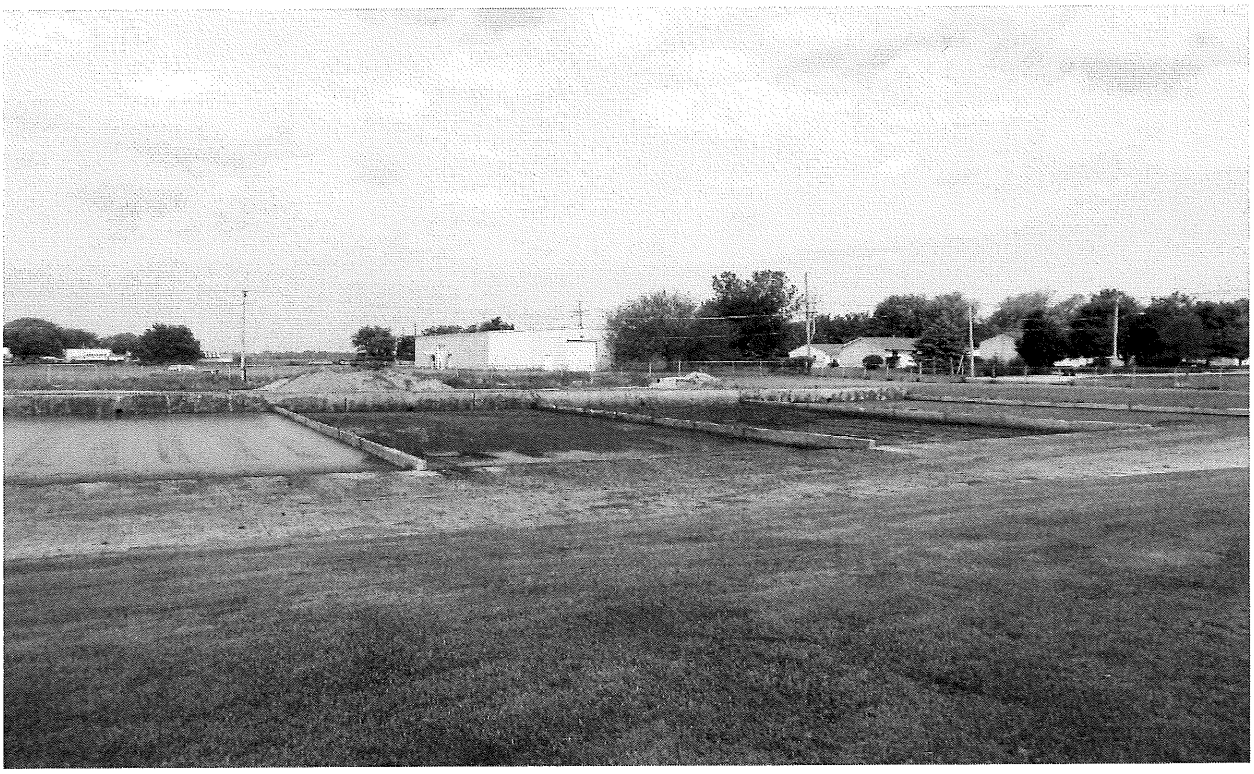


Photo 10 – Some of the sludge drying beds

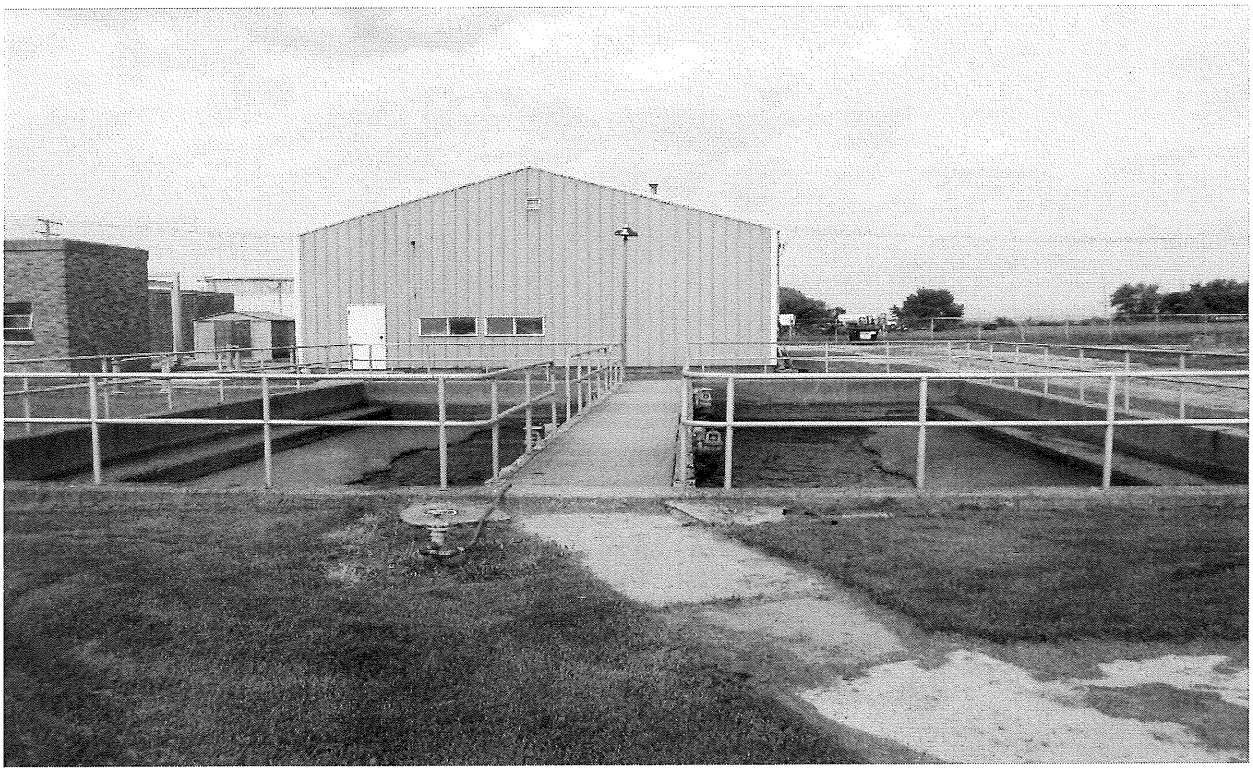


Photo 11 – Aerobic digesters with significant foam

Photo 12 – View of one of the anaerobic digesters and the excess flow tank

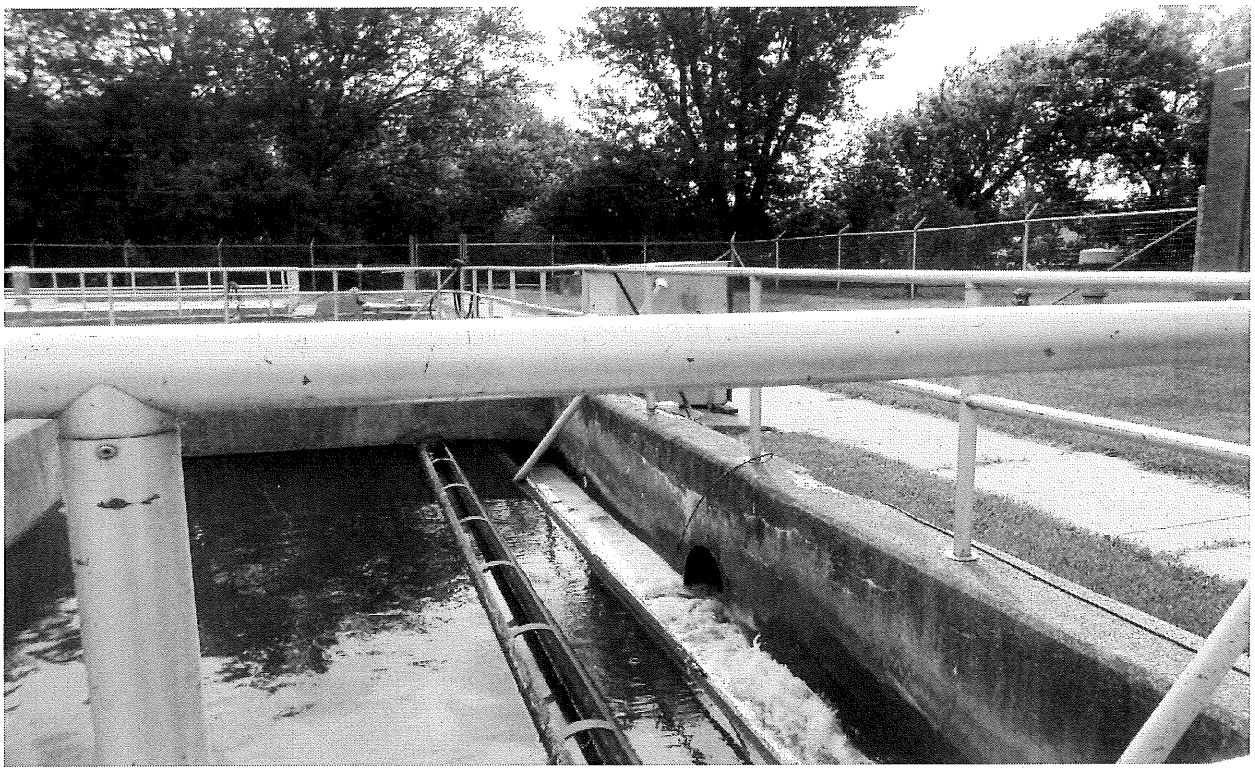
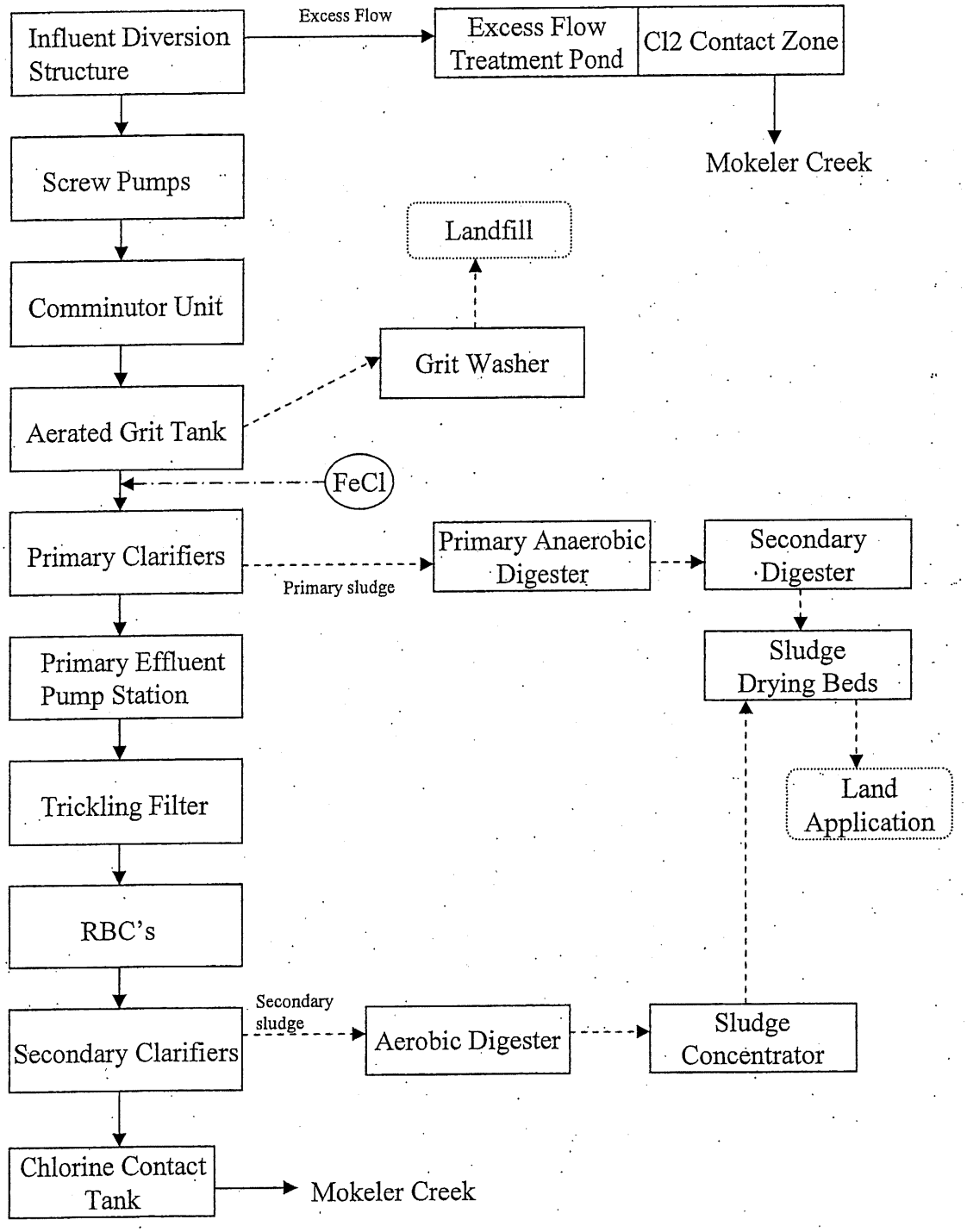


Photo 13 – End of contact tank and effluent channel

Photo 14 – Effluent outfall to creek

ATTACHMENT A

City of Harvard STP



DMR SUMMARY

Facility HARVARD STP, CITY OF
NPDES IL0020117
Outfall 0010

	Infl Flow		EFFL Flow		pH		Infl	Effl CBOD		Infl	Effl TSS		Nitrogen, Ammonia Total			CL2 Residual		Phosphorus		Fecal	DO - Minimums		
Date	M-Avg	D-Max	M-Avg	D-Max	Min	Max	BOD	M-Avg	D-Max	TSS	M-Avg	D-Max	W-Avg	M-Avg	D-Max	M-Avg	D-Max	M-Avg	D-Max	D-Max	M-Avg	D-Max	W-Avg
7/31/2017	2.068	4.171	4.171	2.068	7.62	8.45	197	5.5	8	173	11.9	19	0.32	0.28	0.38	0.05		0.62		340	–	7.09	7.46
8/31/2017	1.437	1.091	1.091	1.437	7.91	8.55	255	6.3	9	225	9	14	1.36	0.65	0.95	0.03		0.81		401	6.5	6.5	6.88
9/30/2017	1.045	10170	1.17	1.045	7.56	8.13	307	7.3	9	294	9.8	15	0.76	0.61	1.1	0.12		0.83		346	6.38	6.38	6.8
10/31/2017	1.028	1.553	1.553	1.028	7.83	8.2	322	7	10	231	8.9	13	0.32	0.51	0.91	0.02		0.56		400	6.91	6.91	7.16
11/30/2017	0.948	1.119	1.119	0.948	7.33	8.3	348	7.7	11	280	13.4	18	–	0.52	1.3	–		0.72		–	8.57	7.78	8.33
12/31/2017	0.869	0.951	0.951	0.869	7.56	8.2	401	7.9	14	311	14.2	25	–	1.04	5.2	–		0.91		–	8.18	8.18	8.88
1/31/2018	1.039	1.843	1.843	1.039	7.84	8.3	341	7.5	11	309	12.8	19	–	1.77	3.7	–		0.81		–	8.1	8.1	9.38
2/28/2018	1.261	3.399	3.399	1.261	7.83	8.12	345	6.6	9	215	15.7	33	–	0.6	1.2	–		0.8		–	9.55	9.38	9.38
3/31/2018	1.145	1.393	1.393	1.145	7.6	8.42	382	5.5	7	306	12.8	21	0.52	0.48	0.64	–		0.77		–	–	9.15	9.7
4/30/2018	1.153	1.483	1.483	1.153	7.49	8.19	349	5.8	7	286	12	17	1.1	0.73	1.2	–		0.94		–	–	8.7	9.04
5/31/2018	1.302	2.066	2.066	1.302	7.6	8.15	320	5.1	6	204	9.2	17	1.3	0.88	1.4	0.04		0.74		94	–	7.09	8.36

ATTACHMENT B