

# 2018 ANNUAL REPORT



775 W. BOGGSTOWN ROAD  
SHELBYVILLE, IN 46176

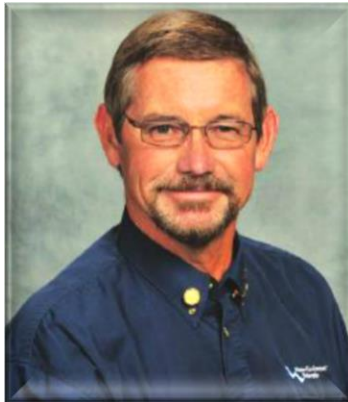
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RESPECTIVELY SUBMITTED

TOM DeBAUN, MAYOR

BRADLEY E. FIX  
SUPERINTENDENT



## ACKNOWLEDGEMENTS

### CITY OF SHELBYVILLE COMMON COUNCIL

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### SHELBYVILLE BOARD OF PUBLIC WORKS AND SAFETY & PUBLIC UTILITIES BOARD

TOM DEBAUN  
DAVID FINKEL  
ROBERT WILLIAMS

THANK YOU FOR YOUR COOPERATION AND ASSISTANCE DURING THE  
YEAR 2018

### A SPECIAL THANK YOU TO

CLERK-TREASURER – FRANK ZERR  
CITY ATTORNEY – TRENT MELTZER & JENNIFER MELTZER  
UTILITY OFFICE MANAGER – BETH CORLEY  
UTILITY OFFICE STAFF - MICHELLE THURSTON & AUTUM KUHN

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## **HISTORY OF THE SHELBYVILLE WATER RESOURCE RECOVERY FACILITY**

Plans for a Water Resource Recovery Facility was considered for Shelbyville over one hundred years ago.

In October 1908, the Riggs & Sherman Co., of Toledo, Ohio, submitted plans for a complete sewer system and treatment plant. Since this was to be the initial sewer system for the City, the entire project was too large to be completed. Portions of the sewer were constructed and the balance was completed throughout the years. The treatment plant was dropped.

The second set of plans for a Water Resource Recovery Facility was submitted in November 1944, by Ross Buck of Edinburg, Indiana. At that time, it seems the City was hesitant to assume such a large financial obligation and the project was postponed until the plans became antiquated.

On September 14, 1953, the Stream Pollution Control board of the State of Indiana ordered the City of Shelbyville to construct adequate sewage and industrial waste treatment facilities. The City was violating Chapter 214, Acts of 1943 of the stream Pollution Control Law. The S.P.C.B. charged that Big Blue River above the City sanitary outfall was physically clean, and below as grossly polluted, and that the discharge of untreated sewage and industrial waste directly into Blue River produced adverse effects on fish life and public health. It prevented normal growth and propagation of aquatic life and caused putrescent and objectionable sludge deposits plus floating material. Also, that the concentrations of sewage bacteria far exceeded the allowable limits for swimming or for a drinking water source.

Planning for the original plant started in April 1954, when Alfred LeFeber & Assoc., of Cincinnati, Ohio, began an engineering investigation of the sewer system. The report on this investigation was submitted to the City in June 1956.

On October 10, 1958, contracts were signed with three contractors for the construction of the wastewater treatment plant and sanitary extensions. Work began immediately, and the project was completed late in September 1960.

The project was financed by means of Sewage Works Revenue Bonds in the amount of \$2,350,000.00. These bonds were to be retired from the sewage service charges, which are levied on everyone using the sanitary sewers. The charges are based on water consumption at \$1.67 per thousand gallons used plus base rate per water meter size.

The approximate costs for the four principal installations are as follows:

Treatment Plant:	\$1,005,000.00
Conrey Pump Station:	\$ 222,000.00
McKay Pump Station	\$ 81,000.00
Approx. 6 miles trunk:	\$ 503,000.00

The balance of the bond issue was to cover costs of land purchase, legal and engineering fees, supervision, and administration.

The 1960 census showed Shelbyville with a population of 14,317 and the average daily flow at the plant was 1.3 MGD. This plant was designed for an average flow of 2.76 MGD.

In 1986, plans were started on a 5.5 million-dollar plant expansion. These bonds and all others will retire in fifteen years. Most of the expansion was done to the lab and administration building.

Construction began in February 1987 and was substantially completed in July 1988. Four million dollars was used on the plant and the one and a half million dollars was used for sewers on the north side of town.

This expansion was just Phase I of a two-part construction plan. Phase II of the construction project began in Oct. 1999 was completed in November 2001.

This Phase II construction was on an \$11.3 million-dollar expansion to upgrade the plant to 8.0 MGD with peak capacity of 16.0 MGD. The expansion basically affected all parts of the plant. The project was completed in November 2001.

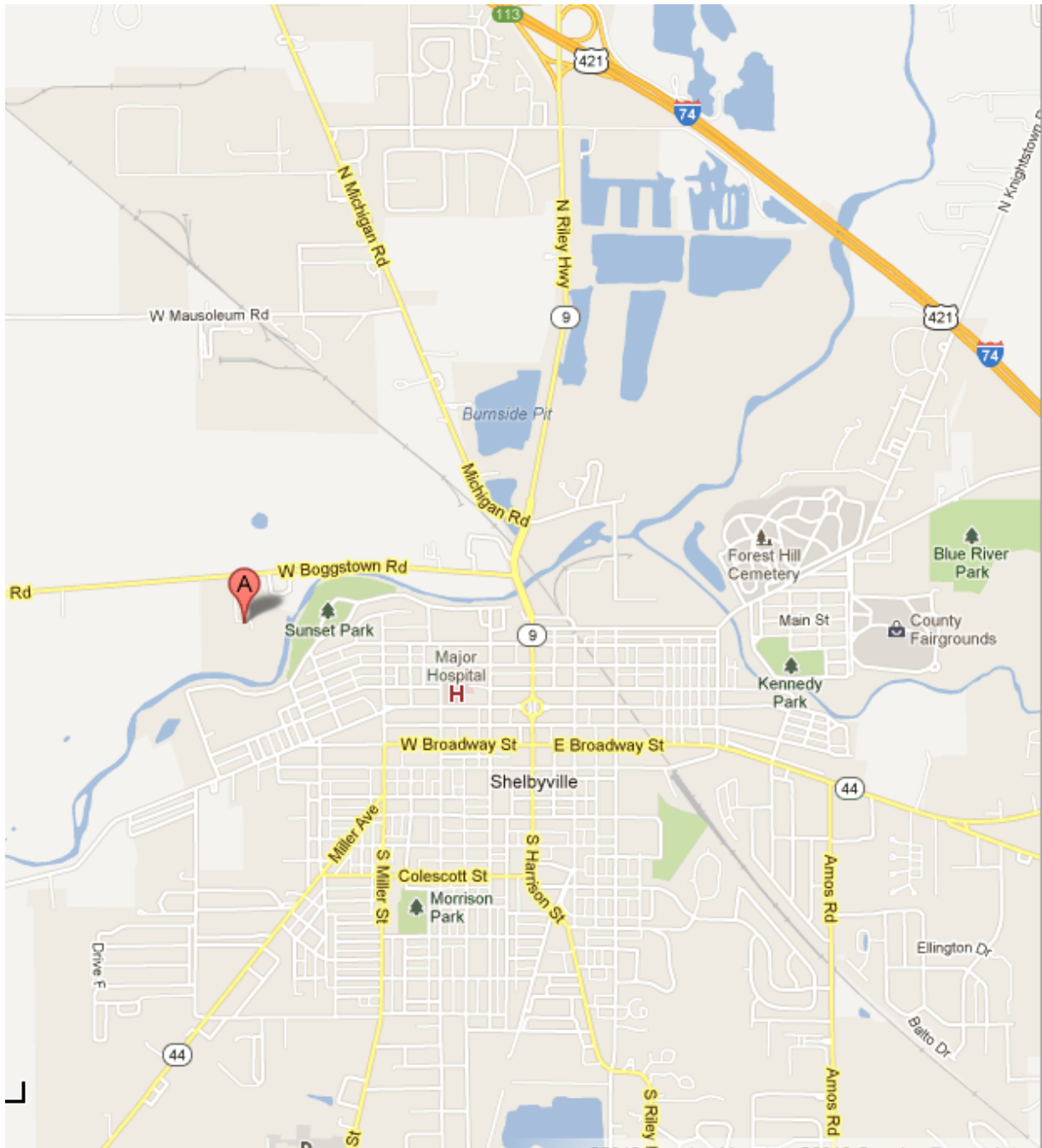
The name was changed from Shelbyville Wastewater Treatment Plant to Shelbyville Water Resource Recovery Facility on January 1, 2015.

The next scheduled expansion was planned for 2011 but due to reduced flows and customers, we believe that date will be moved back a few years.

In 2018 we added phosphorus treatment to the plant to meet a new limit set by IDEM. To reduce the biosolids we use RE-300 which is  $\text{CeCl}_3$  or Cerium Chloride. The new limit must be met by April 1, 2019.



Below is a map of Shelbyville, Indiana. The arrow indicates where the Water Resource Recovery Facility is located.



## **SHELBYVILLE WATER RESOURCE RECOVERY FACILITY FLOW DESCRIPTION**

The water enters the plant from two main pumping stations. One pump station handles the flow from the north side of the Big Blue River, including the Northridge Industrial Park. This lift station was relocated and constructed in 1988 and upgraded in 2001. Three smaller pump stations pump into it. The other pump station is Conrey Street Pump Station. All domestic and industrial wastewater from south of Big Blue River flow through this pumping station before entering the plant. Before entering this pump station, the water may come from over seventy-five miles of sewers and five other smaller lift stations.

At the Conrey Pump Station, there is an inline double drum channel monster, which grinds waste material before it has a chance to get to the pumps. The wastewater is then pumped by four dry pit submersible Fairbanks-Morse pumps that move the wastewater through a 24-inch force main under the Big Blue River and into the treatment plant headworks.

As the water enters the plant, it goes through a Parshall flume, which is used to measure the flow. It then enters two grit chambers, at a 60/40 split, which slows the flow down so that the sand, gravel, seeds, and heavy inorganic particles may settle out. The grit is then pumped by two Wemco Model C grit pumps to a Westech Grit Mitt classifier and stored in a dumpster until transported to the landfill.

The water flows into three circular primary settling tanks, which slow the flow down even more. This is so we will have liquid and solid separation. The primary tanks are to remove floatables, such as grease and oil, and settleables, such as organic solids.

After the water leaves the primary settling tanks, it enters the recirculation pump station and is pumped by four variable speed driven Fairbanks-Morse pumps up onto three high rate trickling filters. The filters are fourteen feet tall and are filled with plastic crossflow media.

From there, the water flows into two aeration basins. After a single pass through the two aeration basins, which are supplied air by one or more of five Hoffman blowers, the water moves on to the three large secondary clarifiers. The sludge from these clarifiers are returned to the aeration basins and mixed with the water to allow solids contact within the aeration basins.

At this point we add RE300 or Cerium Chloride to remove the phosphorus from our system.

The water then flows through an UV tank for disinfection and flow measurement. The flow-measuring device is an ultrasonic metering element calibrated to a 36-inch Parshall flume. The treated flow is then discharged to Big Blue River.

The solids and floatables are separated and removed from the primary settling tanks. The solids are pumped from the bottom of the clarifiers into two primary digesters. The floatables are skimmed into collection boxes and removed via the Vactron machine to the scum drying beds for holding until transportation to the landfill.



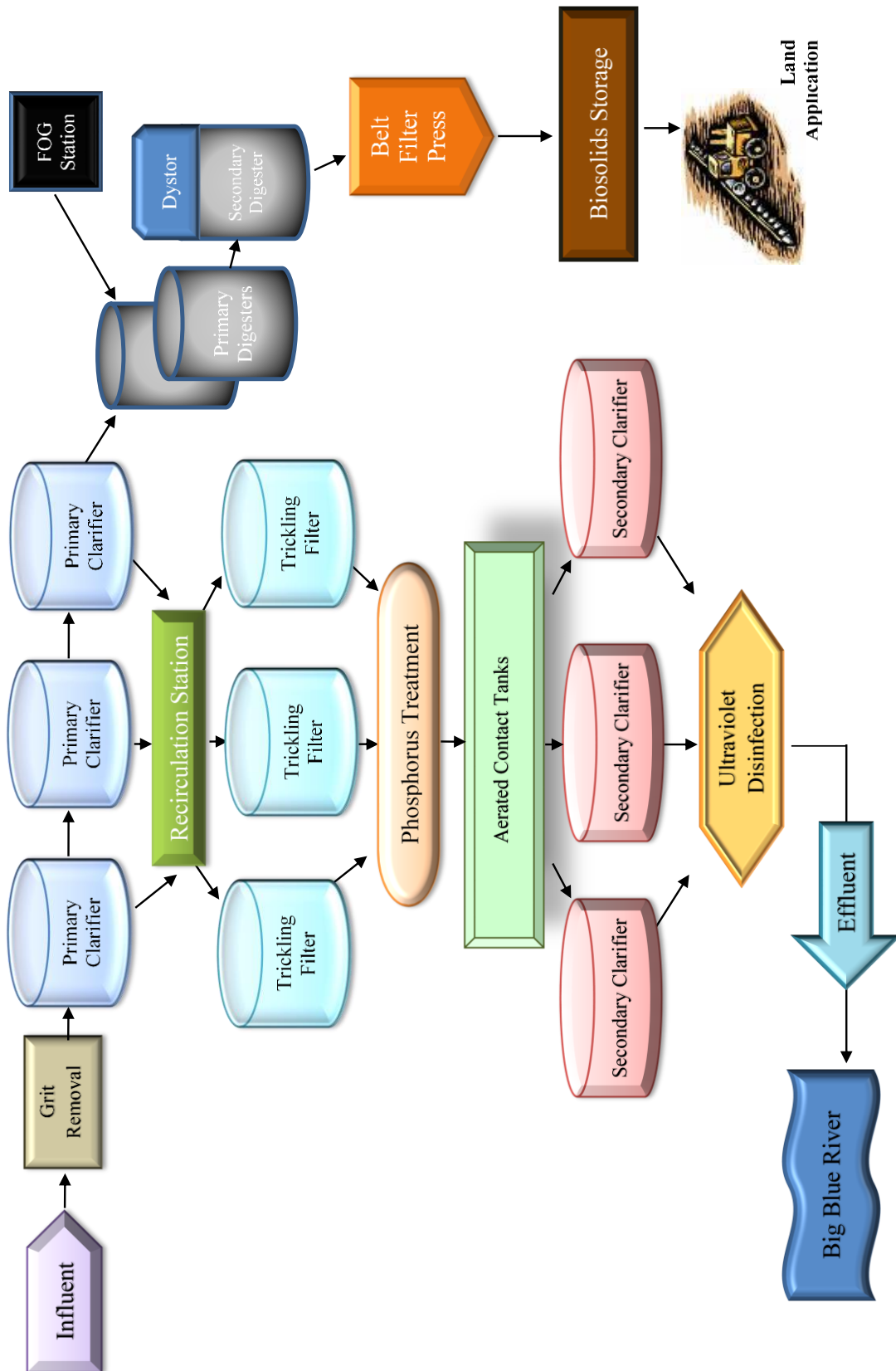
The sludge that is pumped to two primary digesters is heated at approximately 95 degrees and mixed by two Perth gas mixers then through six gas bubble boxes at the bottom of each tank. The sludge is then transferred to the secondary digester where it is stored for 7–14 days for liquid solid separation. This digester is not heated or mixed. We let the natural decomposition occur, which causes more liquid-solid separation. The water off the secondary digester is put back through the treatment system after receiving treatment in a pre-aeration tank. The solids from the secondary digester is mixed with polymer and pressed between two belts on a belt filter press.

Our facility involves anaerobic digestion where, in the absence of oxygen, bacteria digest residual solids and create methane gas as a byproduct. We have installed a Dystor® gas holder system design that uses a dome-shaped, engineered membrane system to store methane gas, provide sludge storage, and prevent odors. We use this gas as a substitute for natural gas to heat our primary digesters.

If methane is released directly into the atmosphere, it is a potent greenhouse gas. In fact, its global-warming potential is 21 times greater than that of carbon dioxide. Using it to generate energy encourages more efficient collection and thereby reduces emissions into the atmosphere. For this reason, energy recovery from methane, where economically viable, is of considerable benefit to the environment.

The solids are dewatered using a belt filter press; this process squeezes the sludge between two porous belts that thickens the sludge by removing a majority of the water. The solids enter the belt press at around 4% to 6% solids and leave at 24% to 27% solids. The solids are then stored on-site and land applied to farm ground.

A schematic drawing of the water resource recovery facility is on the following page.



**NPDES PERMIT**  
**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

Our present permit became effective April 1, 2016, and runs through March 31, 2020.  
below are the final effluent limitations and monitoring requirements.

Effluent Characteristic		Other Limitations				Measuring Requirements	
		lbs./day Monthly Average	lbs./day Weekly Average	Monthly Average	Weekly Average	Measuring Frequency	Sample Type
Flow, MGD		Report				Daily	24-Hr. Total
C.B.O.D.,	Summer*	1335	2003	20 mg/l	30 mg/l	Daily	24-Hr. Comp.
	Winter**	1669	2670	25 mg/l	40 mg/l	Daily	24-Hr. Comp.
T.S.S.,	Summer*	1602	2403	24 mg/l	36 mg/l	Daily	24-Hr. Comp.
	Winter**	2003	3004	30 mg/l	45 mg/l	Daily	24-Hr. Comp.
Ammonia as N							
	Summer*	227	340	3.4 mg/l	5.1 mg/l	Daily	24-Hr. Comp.
	Winter**	354	534	5.3 mg/l	8.0 mg/l	Daily	24-Hr. Comp.
Phosphorus							
	Interim	---	---	Report	---	Daily	24-Hr. Comp.
	Final	---	---	1.0 Mg/L	---	Daily	24-Hr. Comp.
E-Coli ++	125/100ml	Mth. Avg.	235/100ml Daily Max.			Daily	Grab
pH	6.0	Daily Minimum		9.0 Daily Maximum		Daily	Grab
Dissolved Oxygen		Minimum of 4.0 mg/l				Daily	6 Grabs/24-Hrs.

\* Summer limitations apply from May 1 through November 30 each year.

\*\* Winter limitations apply from December 1 through April 30 of each year.

++ Calculated as a Geometric Mean. This limitation only applies from April through October 31 annually

## PLANT PERSONNEL REPORT

Our plant is staffed twenty-four hours a day, seven days a week. Staffing levels have changed little since 1991. We have eighteen full time employees with the Assistant Superintendent's position remaining open as of December 31, 2018. We have one Superintendent, one Wastewater Foreman, one Lead Operator, one Lab Manager, one Administrative Assistant, nine Operators, and five Sewer Crew Operators.

We have five employees who are certified by the Indiana Department of Environmental Management. We also have six employees that have their Collection System Certification through Indiana Water Environment Association. These employees are listed below.

EMPLOYEE NAME	MUNICIPAL	INDUSTRIAL
Bradley E. Fix	IV & CS IV	D
Kevin Kredit	IV	D
Michele R. Higdon	I	
Robin Weaver	I	
Blake Branum	I	
James L. Vierling	CS III	
Richard R. Richardson	CS I	
Richard L. Clouse	CS I	
Dustin N. Williams	CS II	
James F. Fowler	CS I	
Rolland Scudder	CS I	

## EMPLOYEE DATA 2018

### PLANT

<u>NAME</u>	<u>TITLE</u>	<u>LICENSE</u>	<u>HIRE DATE</u>
Bradley E. Fix	Superintendent Pretreatment Coordinator	IV D CS IV	1/1/1980
James Vierling	Wastewater Foreman	CS III	5/16/1988
Kevin Kredit	Lead Operator	IV D	5/17/2005
Michele Higdon	Lab Manager	I	4/14/1986
Bronda Vierling	Administrative Assistant		1/1/1992
Ed Williams	Belt Press Operator		9/30/2008
Robin Weaver	2nd Shift Operator	I	7/5/2011
Blake Branum	Operator	I	3/17/2014
Gary Karnes	Operator		3/10/2015
Larry Karnes	Operator		6/29/2015
Scott Gaudin	3rd Shift Operator		2/9/2016
Seth Mohr	Weekend Operator		1/30/2017
Ron Baughman**	Weekend Operator		8/31/2017
Dominique Huber +	Weekend Operator		8/20/2018

### COLLECTION SYSTEM

Richard Richardson	S.C. Operator	CS I	9/17/1990
Richard Clouse	S.C. Operator	CS I	8/14/1995
Dustin Williams	S.C. Operator	CS II	9/17/2007
James Fowler**	S.C. Operator	CS I	4/27/2011
Rolland Scudder	S.C. Operator	CS I	3/3/2014
Cody Riggs+	S.C. Operator		8/6/2018

+ New Employee  
 \*\* Employee Quit

## 2018 AWARDS

### LABORATORY EXCELLENCE AWARD

The IWEA Laboratory Excellence Award recognizes those laboratories that demonstrate a high level of commitment, outstanding achievement in the implementation of laboratory technique, laboratory practice, administration, and data reporting.

### 2018 PUBLIC OUTREACH/EDUCATION

March 3, 2018

Homeschool Tour of 10-12 children

May 22, 2018

We hosted the Indiana Water Environment Association Wastewater Challenge. Each May, teams from across Indiana get ready to compete in the Wastewater Challenge. This year, the competition was held at our plant. The Challenge is a series of events set up by five different IWEA committees – Residuals 7 Resource Recovery, Collections, Operations & Maintenance, Laboratory, & Safety.



*Fort Wayne Tin Craps at the Collections Event.*



*Brownsburg Bowl Busters at the Residuals Event.*



*Shelbyville Water Resource Recovery Facility Staff.*

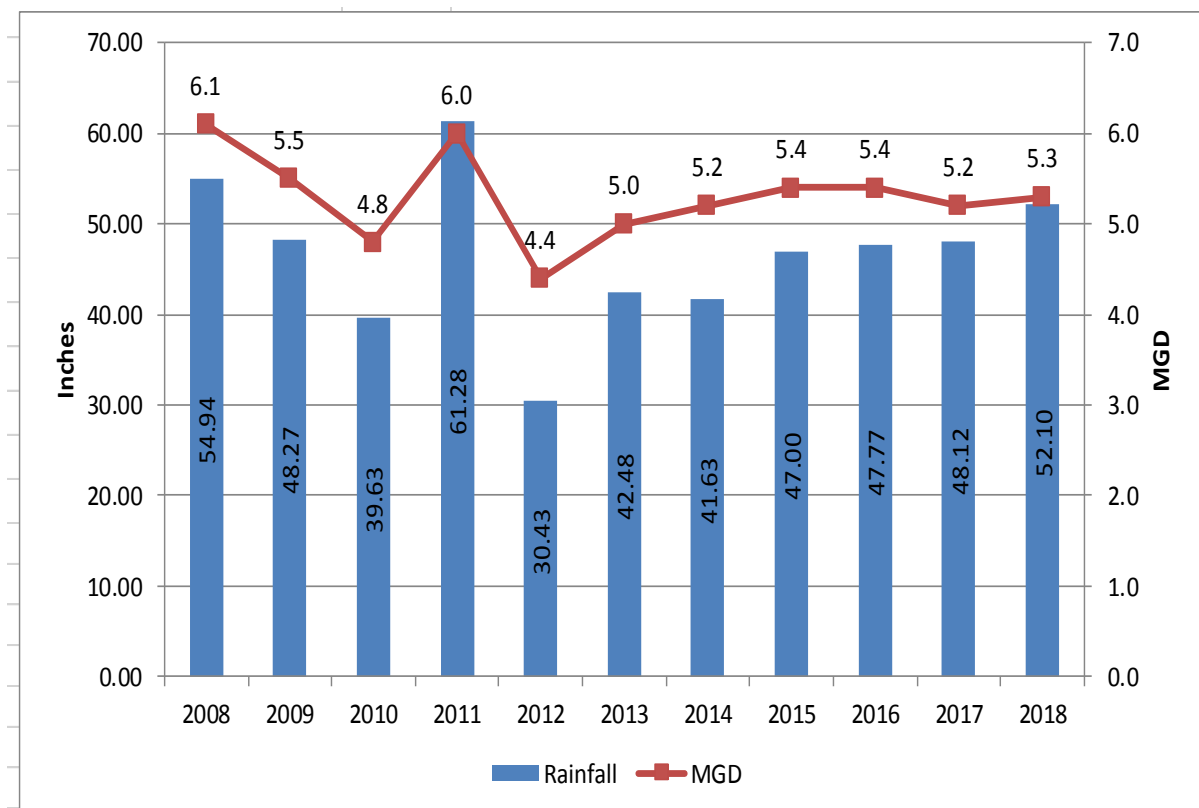


## UNITED STATES NATIONAL WEATHER BUREAU

The Water Resource Recovery Facility continues to be a part of NOAA's National Weather Service (NWS) Cooperative Observer Program (COOP). We provide observational meteorological data, consisting of daily maximum and minimum temperatures, snowfall, and 24-hour precipitation totals required to define the climate of the United States and to help measure long-term climate changes, rainfall and snowmelt values temperature and precipitation for climatology. Data from our station is sent to the National Weather Service using a web-based data entry form daily and published in the climatologically data for Indiana and in the hourly precipitation data for Indiana.

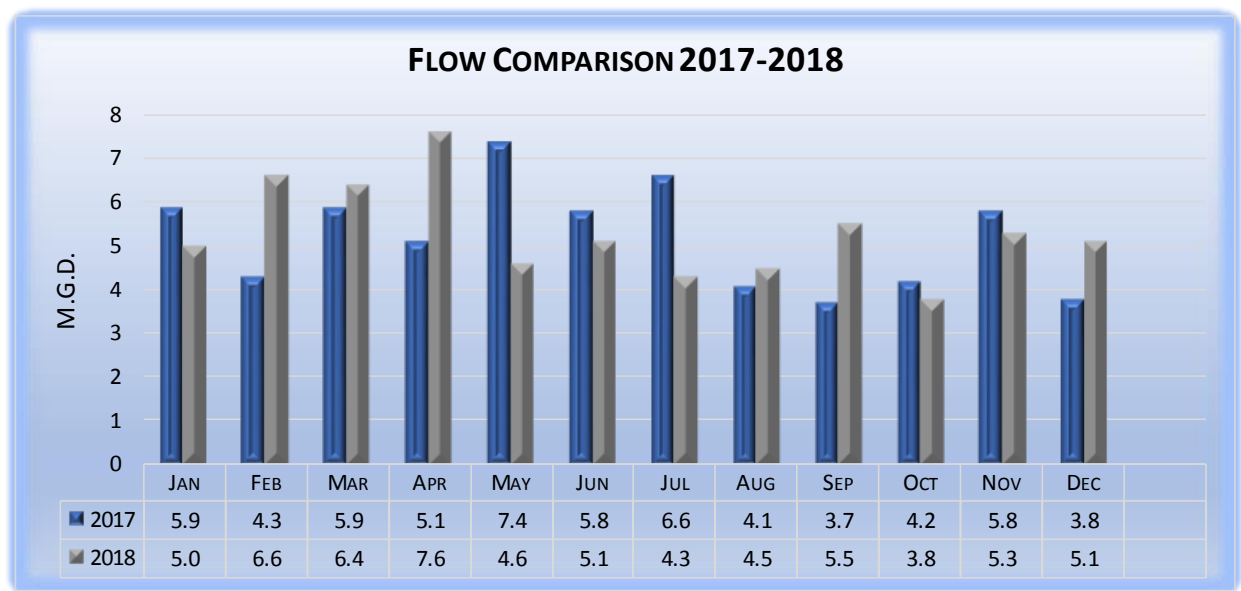
The United States Department of Interior maintains a river station located on River Road in Shelbyville.

The graph below compares the average daily flow in million gallons per day (MGD) to the annual precipitation over the last 10 years.



## FLOW DATA 2018

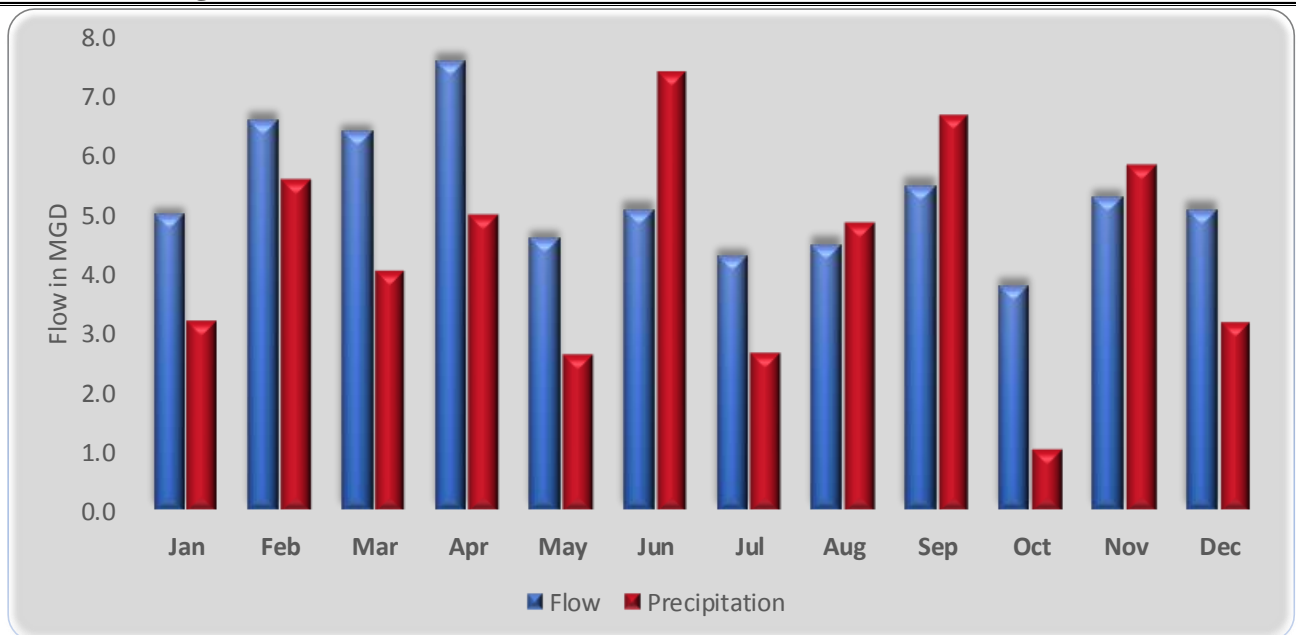
Month	Total Monthly Precipitation in Inches	Total Monthly M.G.D.	Monthly Daily Average	Daily Maximum Flow M.G.D.
January	3.21	156.1	5.0	9.4
February	5.58	184.8	6.6	14.2
March	4.06	199.9	6.4	14.0
April	4.98	228.8	7.6	17.3
May	2.64	141.8	4.6	5.4
June	7.39	153.5	5.1	8.8
July	2.67	131.9	4.3	6.2
August	4.85	138.1	4.5	5.1
September	6.67	164.8	5.5	12.8
October	1.05	116.7	3.8	4.8
November	5.82	157.9	5.3	11.4
December	3.18	157.0	5.1	7.7
<b>Total</b>	<b>52.1</b>	<b>1931.3</b>	<b>63.8</b>	<b>117.1</b>
<b>Average</b>	<b>4.34</b>	<b>160.94</b>	<b>5.32</b>	<b>9.76</b>



## 2018 FLOW TO PRECIPITATION COMPARISON

The following data and graph display a comparison of flow into the plant in million gallons a day as a monthly average to precipitation measured in inches for a total of each month. Snow or ice is measured as melted precipitation.

<u>MONTH</u>	<u>AVG. FLOW IN MGD</u>	<u>PRECIPITATION IN INCHES</u>
January	5.0	3.21
February	6.6	5.58
March	6.4	4.06
April	7.6	4.98
May	4.6	2.64
June	5.1	7.39
July	4.3	2.67
August	4.5	4.85
September	5.5	6.67
October	3.8	1.05
November	5.3	5.82
December	5.1	3.18
<b>Total</b>	<b>63.8</b>	<b>52.1</b>
<b>Average</b>	<b>5.3</b>	<b>4.34</b>



## 2018 LABORATORY REPORT

The laboratory manager is in responsible charge of the lab. Duties include supervising, ordering, maintaining equipment, recording, and checking of Quality Assurance and Quality Control for the laboratory. The laboratory technician is also responsible for performing the daily analysis of the plant samples and all the associated QA/QC.

Each year we participate in the mandatory EPA DMR-QA Study. We also participate in the IWEA Laboratory inspections and have won awards for Lab Excellence over the last several years.

The laboratory technician was trained on the job and through courses at Ivy Tech; Applied Chemistry & Operations I. She also has a Class I Operators Certification License. We also have several operators trained to run most of the lab on weekends and holidays.

Following is a list of the analysis and QA/QC performed in our lab along with the frequency of analysis performed.

<u>PARAMETER</u>	<u>FREQUENCY</u>	<u>BLANKS</u>	<u>DUPLICATES</u>
Total Suspended Solids	Daily	Daily	Daily
pH	Daily	---	Daily
C.B.O.D.	Daily	Daily	Daily
Dissolved Oxygen	Every 4 Hrs.	---	---
E-Coli Apr. - Oct.	Daily	Once/Lot#/Supplies	Weekly
E-Coli Positive Sample	Once/Lot#		
Ammonia	Daily	Once/Lot#	4 x Week
Ammonia Check Standard	2 x Week		
Ammonia Spike	3 x Week		
Phosphorus	Daily	Once/Lot#	4 x Week
Phosphorus Check Standard	2 x Week		
Phosphorus Spike	3 x Week		

## LABORATORY VOCABULARY AND DEFINITIONS

**Ammonia:** A chemical combination of hydrogen and nitrogen occurring extensively in nature. It is also one of the most important pollutants because it is relatively common but can be toxic, causing lower reproduction and growth, or death. The neutral, unionized form (NH<sub>3</sub>) is highly toxic to fish and other aquatic life.

**Biochemical Oxygen Demand, B.O.D.:** The quantity of oxygen used in the biochemical oxidation of organic material in a specific time of 5 days, at a specific temperature of 20°C, and under specific conditions.

**Carbonaceous Biochemical Oxygen Demand (CBOD)** -- a measure of the carbon-containing substances remaining in treated water that may exert a demand for oxygen when released into a stream. The lower the CBOD, the less likely there is to be an appreciable oxygen demand placed on the receiving waters. Adequate dissolved oxygen is important for fish and other aquatic life.

**Dissolved Oxygen, D.O.:** The oxygen dissolved in a liquid, usually expressed as mg/L.

**Effluent:** Wastewater, partially or completely treated, or in its natural state, flowing out of a reservoir, basin, treatment plant, or industrial treatment plant.

**E-Coli Test:** A microbiological exam of bacteria of fecal origin, (intestines of warm-blooded animals) (Pathogenic bacteria).

**Influent:** Wastewater, raw or partially treated, flowing into a reservoir, basin, treatment process, of treatment plant.

**pH:** A symbol denoting the negative logarithm of the hydrogen ion concentration in a solution. pH values run from 1 to 14. The number 7.0 indicates neutrality. Any reading above 7.0 indicates alkalinity and any reading below 7.0 indicates acidity.

**Pathogenic:** Disease causing.

**Phosphorus:** It is a natural element found in rocks, soils and organic material. It is used extensively in fertilizer and other chemicals, so it can be found in higher concentrations in areas of human activity. Many seemingly harmless activities added together can cause phosphorus overloads.

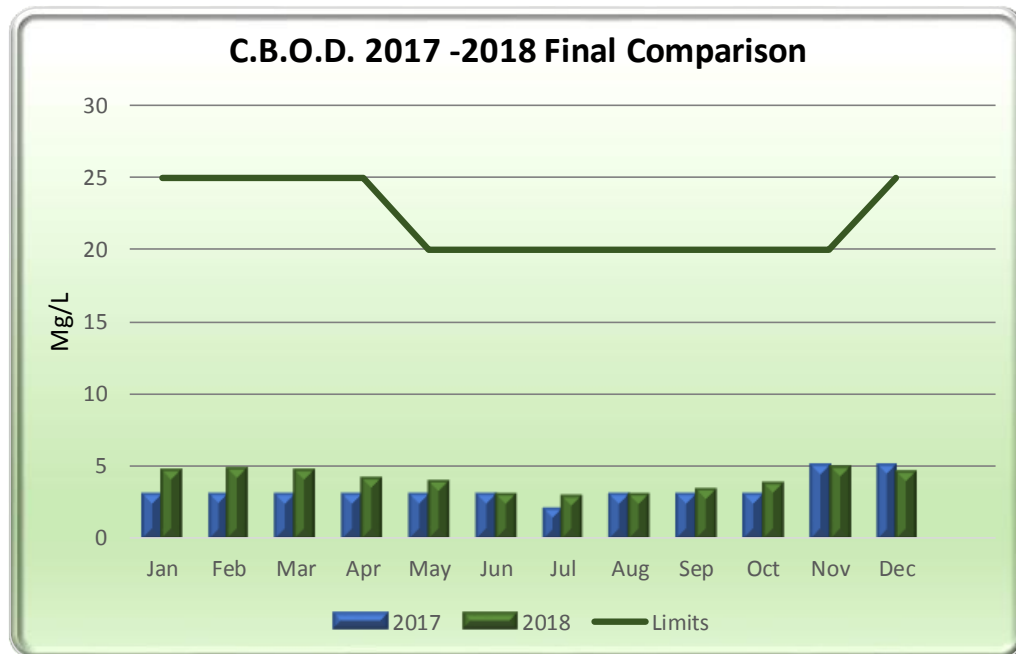
**Supernatant:** The liquid standing above a sediment or precipitate.

**Total Suspended Solids, T.S.S.:** Solids that either floats on a surface of or are in suspension in wastewater and which are removable through laboratory filtration.

**Ultra Violet Light Disinfection:** Similar to light produced by the sun; produced by special lamps. As organisms are exposed to this light, they are damaged or killed. Therefore, cleansing the water from harmful microorganisms.

**2018**  
**C.B.O.D. ANALYTICAL DATA**

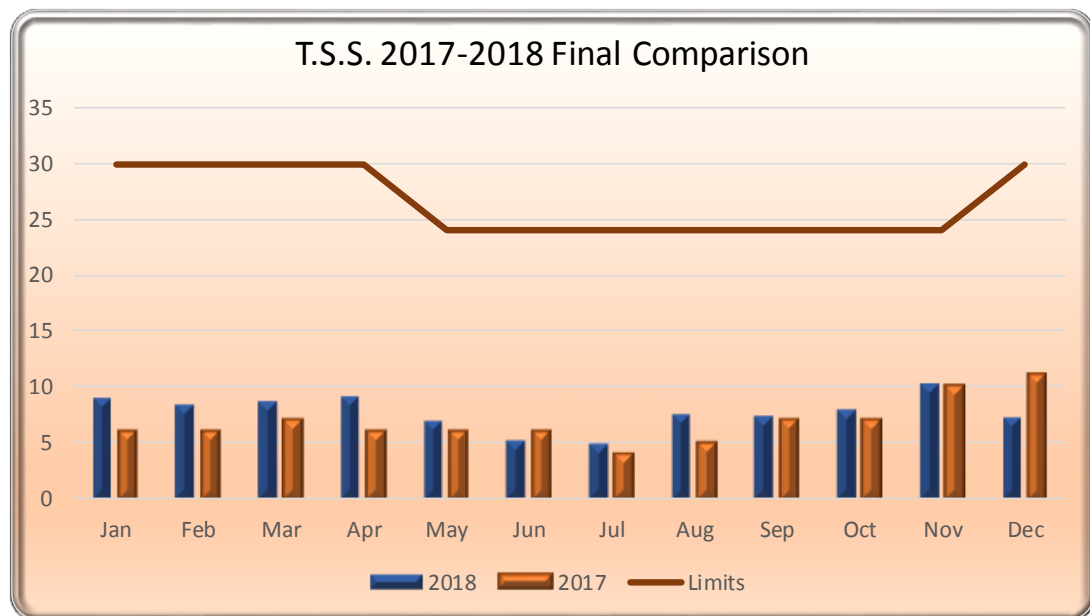
<u>Month</u>	<u>Avg. Raw Inf. Mg/L</u>	<u>Avg. Prim. Eff. Mg/L</u>	<u>Avg. Final Eff. Mg/L</u>
January	92	81	5
February	92	79	5
March	74	70	5
April	59	57	4
May	102	88	4
June	98	86	3
July	115	89	3
August	115	103	3
September	93	88	3
October	135	111	4
November	91	75	5
December	91	80	5
Total	1156	1007	47
Average	96	84	4





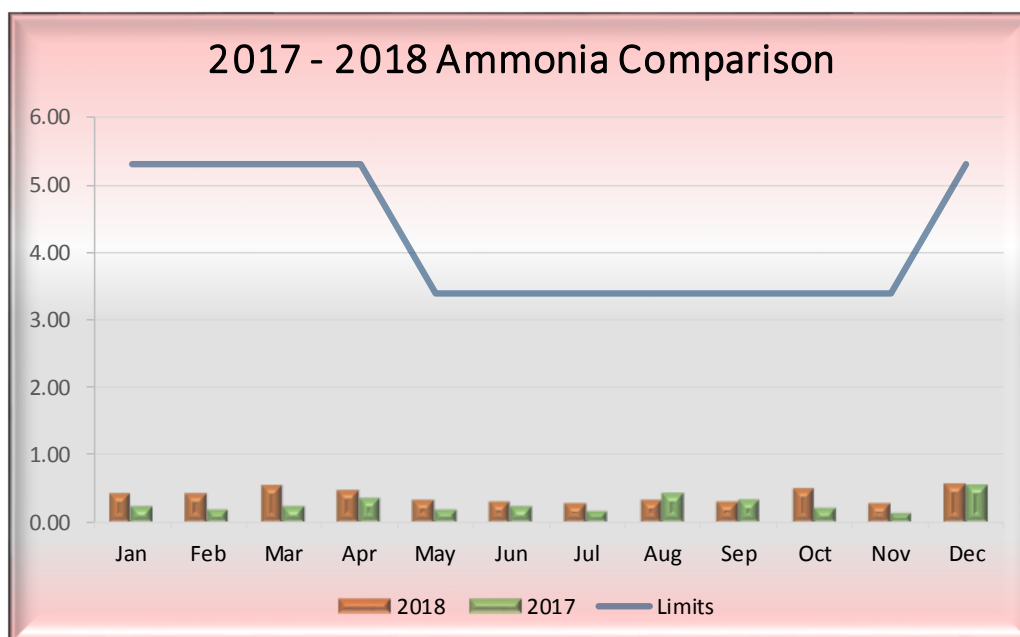
**2018**  
**T.S.S. ANALYTICAL DATA**

Month	Avg. Raw Inf. Mg/L	Avg. Prim. Eff. Mg/L	Avg. Final Eff. Mg/L
January	64	43	9
February	62	47	8
March	48	40	9
April	43	41	9
May	73	47	7
June	66	43	5
July	73	45	5
August	67	40	8
September	55	40	7
October	81	48	8
November	67	40	10
December	61	45	7
Total	760.7	516.9	92.4
Average	63	43	8



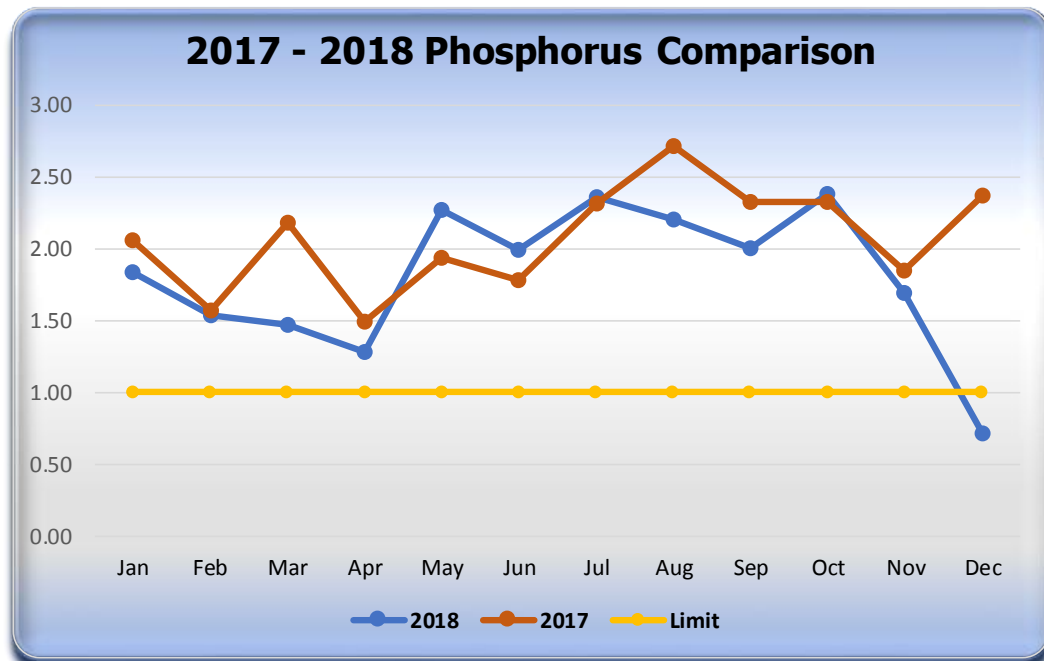
## 2018 Ammonia Analytical Data

Month	Avg. Raw Inf. Mg/L	Avg. Final Eff. Mg/L
January	10.9	0.43
February	9.2	0.43
March	8.3	0.55
April	6.8	0.48
May	12.5	0.33
June	11.7	0.32
July	14.7	0.29
August	13.4	0.34
September	11.6	0.32
October	16.1	0.50
November	10.2	0.30
December	10.3	0.58
<b>TOTAL</b>	<b>135.6</b>	<b>4.87</b>
Average	11	0.41



## 2018 Phosphorus Analytical Data

Month	Avg. Raw Inf. Mg/L	Avg. Final Eff. Mg/L
January	2.12	1.84
February	1.90	1.54
March	1.65	1.47
April	1.38	1.28
May	2.45	2.27
June	2.18	1.99
July	2.76	2.36
August	2.63	2.20
September	2.20	2.00
October	2.97	2.38
November	2.10	1.69
December	2.14	0.71
<b>TOTAL</b>	<b>26.48</b>	<b>21.73</b>
Average	2.21	1.81



# Shelbyville Water Resource Recovery Facility

## Annual Summation of Monthly Reports of Operation 2018

Shelbyville Water Resource Recovery Facility

Annual Summation of Monthly Reports of Operation

2018

	RAW SEWAGE															PRIMARY EFFLUENT				RBC				SECONDARY EFFLUENT				
	CHEMICALS USED																											
	Man-Hours at Plant (Plants less than 1 MGD only)	Precipitation - Inches	Bypass At Plant Site ("x" If Occurred)	Collection System Overflow ("x" If Occurred)	Chlorine - Lbs	Lbs/Day or Gal./Day	Lbs/Day or Gal./Day	Influent Flow Rate (If M	pH	CBOD5 - mg/l	CBOD5 - lbs	Susp. Solids - mg/l	Susp. Solids - lbs	Phosphorus - mg/l	Ammonia - mg/l													
Average							5.465		96.85	4107.43	63.53	2766.35	2.217	11.343				84.31	43.11									
Maximum		2.61			0	0	0	18	7.5	261	13427.4	167	9782.82	4.06	18.6	0			148	114	0	0	0	0	0	0	0	0
Minimum					0	0	0	3.2	6.8	33	2068.32	17	1034.16	0.552	0.022	0			34	26	0	0	0	0	0	0	0	0
Totals	0	52.1			0	0	0	1995			1482782		1009718															
No. of Data		137			0	0	0	365	365	361	361	365	365	365	365	0			357	365	0	0	0	0	0	0	0	0
Estimated Annual Totals (Average X 365)																												
1,995																												
1,499,212																												
1,009,718																												

	FINAL EFFLUENT														Ammonia		Other						
	Residual Chlorine - Contact Tank		Residual Chlorine - Final	E. Coll - colony/100 ml	pH	Dissolved Oxygen - mg/l	Phosphorus - mg/l	Effluent Flow Rate (MGD)	Effluent Flow	BOD			Total Suspended Solids			Ammonia			Other				
Average			20.78		7.781	1.819	5.291	3.942	177.16	CBOD5 - mg/l	Weekly Average	CBOD5 - lbs	CBOD5 - lbs/day	Weekly Average	Susp. Solids - mg/l	Weekly Average	Susp. Solids - lbs	Susp. Solids - lbs/day	Ammonia - mg/l	Weekly Average	Ammonia - lbs	Weekly Average	
Maximum	0	0	648	8.0	9.9	4.53	17.3	11.97	8	6	829.493	412.5	27	12.57	2473.46	1332	2.23	0.969	129.5	46.98	0	0	
Minimum	0	0	1	7.2	5.8	0.308	2.9	3.35	2	2.571	58.415	89.65	3	4	105.147	143.5	0.05	0.123	2.387	5.915	0	0	
Totals							1931										130556			6618		0	
No. of Data	0	0	214	365	365	365	365	365	346	346	346	365	365	365	365	365	365	365	365	365	365	0	0
Estimated Annual Totals (Average X 365)							1,931										130,556			6,618			

	DIGESTER OPERATION										SLUDGE TO DIGESTER	
	Anaerobic Only					Sludge - %					Primary Sludge	Secondary Sludge
Average	Gas Production	Temperature - F	Supernatant BOD5 mg/l	Supernatant Withdrawn	Supernatant BOD5 mg/l	Total Solids in Incoming	Total Solids in Incoming	Sludge - %	Sludge - %	Sludge - %	Gal. x 1000	Gal. x 1000
Maximum	0	93.44	0	0	0	0	0	0	0	0	20.86	48.33
Minimum	0	155	0	0	0	0	0	0	0	0	5.07	7613
Totals	0	61	0	0	0	0	0	0	0	0	365	7613
No. of Data	0	364	0	0	0	0	0	0	0	0	365	365

Plant Design Flow	8
Annual Average Flow	5,291
Capacity Used	66%

**CITY OF SHELBYVILLE  
PRETREATMENT ANNUAL REPORT**



2018

**BRADLEY E. FIX  
SUPERINTENDENT**

**(I) Industrial User Summary:**

**Categorical Users:**

American Finishing Resources	40 CFR 433.17
Brazeway Indiana	40 CFR 467.35
Brazeway Indiana #2	40 CFR 467.35
PK USA	40 CFR 433.17
Ryobi Die-Casting #1	40 CFR 464.16 and 433.17
Ryobi Die-Casting #3	40 CFR 464.16 and 433.17
Shelbyville Plating and Polishing	40 CFR 433.17
Triumph Fabrications	40 CFR 433.17
Toray Resin	40 CFR 463
Nippon Steel	40 CFR 433.17

**Significant Users:**

Knauf Fiberglass  
Pilkington North America  
Plymate Inc. (Uniform Facility)  
Plymate Inc. (Mat Facility)  
Ryobi Die-Casting #6

**(II) Permit Issuance/Reissuance:**

American Finishing Resources – issued 7/1/2018  
Plymate Uniform – issued 9/1/2018  
Plymate Mat Facility – issued 9/1/2018

**(III) Inspection and Monitoring:**

During this reporting period, the City conducted at least one (1) inspection and at least one (1) monitoring event on each of our SIU's. The City has also conducted inspections at non-permitted facilities to determine if the operations performed at the facility would necessitate a permit.

**(IV) Enforcement Actions:**

No enforcement actions



**(V) Program Evaluation:**

The City feels that the program has done an effective job of protecting the POTW, the receiving stream, and the Biosolids program. The City also feels that the program is continuing to improve by working more closely with industries in the community. We have a professional relationship with all of our users and believe that all parties involved understand the scope and importance of the program.

The City continues to use Element Laboratories for most of our pretreatment testing. The samples are picked up out of their Columbus, Indiana facility and we maintain a routine schedule with them to ensure that holding times are met.

**(VI) NPDES Compliance:**

During the year 2018, the POTW has had no exceedances of the NPDES permit and zero bypasses.

**ATTACHMENT I**  
**SIGNIFICANT INDUSTRIAL USERS**

<b>SIU</b>	<b>ISSUANCE DATE</b>	<b>LIMITS MODIFICATION</b>	<b>EXPIRATION DATE</b>	<b>NOTES</b>
American Finishing	07/01/2013	None	06/30/2023	
Brazeway, Indiana	06/01/2016	None	05/31/2021	
Knauf Fiberglass	07/01/2016	None	06/30/2021	
Nippon Steel	10/01/2017	None	09/30/2022	
Pilkington North America	06/01/2016	None	05/31/2021	
PK USA	04/08/2017	None	04/07/2022	
Plymate Inc. (Mat)	09/1/2013	None	08/31/2023	
Plymate Inc. (Uniform)	09/01/2013	None	08/31/2023	
Ryobi Die-Casting #1	05/01/2015	None	04/30/2020	
Ryobi Die-Casting #3	05/01/2015	None	04/30/2020	
Ryobi Die-Casting #6	05/01/2016	None	04/30/2021	
Shelby Plating	04/15/2014	None	04/14/2019	
Toray Resin	02/01/2017	None	01/31/2022	
Triumph Fabrications	01/1/2014	None	12/31/2019	

**ATTACHMENT II  
INSPECTION & MONITORING**

<b>SIU</b>	<b>INSPECTIONS</b>	<b>MONITORING EVENTS</b>
American Finishing Resources	1	1
Brazeway, Indiana	1	0
Brazeway, Indiana #2	1	0
Knauf Fiberglass	1	1
Nippon Steel	1	1
Pilkington North America	1	2
PK USA	1	1
Plymate Inc. (Mat)	1	1
Plymate Inc. (Uniform)	1	1
Ryobi Die-Casting #1	1	1
Ryobi Die-Casting #3	1	1
Ryobi Die-Casting #6	1	1
Shelby Plating	1	1
Toray Resin	1	1
Triumph Fabrications	1	1

### ATTACHMENT III COMPLIANCE SUMMARY

SIU	In Compliance	Occasional Non-Compliance	Significant Non-Compliance	On compliance Schedule	Back In Compliance	Published for Non-Compliance
American Finishing Resources		X				
Brazeway	X					
Brazeway #2	X					
Knauf	X					
Nippon Steel	X					
Pilkington	X					
PK USA	X					
Plymate (Mat)	X					
Plymate (Uniform)	X					
Ryobi Die-Casting #1	X					
Ryobi Die-Casting #3	X					
Ryobi Die-Casting #6		X				
Shelby Plating	X					
Toray	X					
Triumph Fabrications	X					

## PRETREATMENT PERFORMANCE SUMMARY

### I. GENERAL INFORMATION

Control Authority Name:	Shelbyville Water Resource Recovery	NPDES No.:	IN 0032867
Address:	775 W. Boggstown Rd.	Reporting Period:	2018
City, State, Zip:	Shelbyville, IN 46176	No. Categorical Users:	10
Contact Person:	Bradley E. Fix	No. Non-categorical SIUs:	5
Contact Telephone:	317-392-5131		

### II. SIU COMPLIANCE

	Categorical <u>SIUs</u>	No-categorical <u>SIUs</u>
No. of SIUs Submitting BMRs/No. Required	0/0	NA
No. of SIUs Submitting 90-Day Compliance Reports/No. Required	0/0	NA
No. of SIUs Submitting Semi-annual Report/No. Required	10/10	5/5
No. of SIUs Meeting Compliance Schedule/No. Required	0/0	0/0
No. of SIUs in Significant Noncompliance/No. of SIUs	0/10	0/5

Rate of SNCs for all SIUs (categorical and non-categorical) 0/15

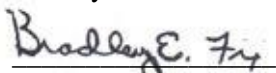
### III. Compliance Monitoring Program

No. of Control Documents Issued/No. Required	1/10	2/5
No. of Non-Sampling Inspections Conducted	0	0
No. of Sample Visits Conducted	7	5
No. of Facilities Inspected (non-sampling)	10	5
No. of Facilities Samples	10	5

### IV. Enforcement Actions

Compliance Schedules Issued/Schedules Required	0	0
Notices of Violation Issued to SIUs	0	0
Administrative Orders Issued to SIUs	0	0
Civil Suits Files	0	0
Criminal Suits Filed	0	0
Significant Violators (newspaper list attached)	0	0
Amount of Penalties Collected (Total Amount/No. of Users assessed)	0	0
Other Actions	0	0

I certify that the information contained is complete and accurate to the best of my knowledge.



Authorized Representative

April 1, 2019

Date

## 2018 COLLECTION SYSTEM REPORT

The Water Resource Recovery Facility Collection System Department consists of highly trained state certified staff, which includes a Foreman, five collection system operators with a 24-hour-a-day, 7-day-a-week responsibility. This department maintains over 90 miles of sanitary gravity sewer lines, and a series of force mains with over 1,600 manholes.

The water is collected from over 7,000 individual connections to the system of a network of gravity lines and force mains ranging from size from 6" to 48" in diameter. The system functions to collect and transport wastewater from kitchen sinks, bathtubs, toilets, washing machines, and dishwashers from residential, commercial, and other facilities in our area. The collection system is designed to handle used water, human waste, and toilet paper, not foreign materials like grease, oils, fat, and debris from household items. The wastewater is transported to the plant where it goes through a treatment process and then is delivered back to the Big Blue River.

The collection system operators inspect all sewer lines constructed for new development and businesses. These inspections consist of a mandrel test, air test, vacuum test, and a video test. We also inspect any repairs or replacements of the older sewer lines and homeowner's lateral taps.

Other jobs included in maintaining the sanitary system are using closed circuit television to inspect lines and lateral tap connections where there is no other way to observe the system or a problem. Along with removing stoppages, maintaining equipment, repairing, and replacing the lines, equipment, and facilities. Part of the preventive maintenance program includes, inspecting grease traps of restaurants and business along with cleaning and flushing sewer lines and manholes to keep the wastewater flowing. Preventive maintenance is performed year-round as equipment, time, and weather permits. This is to increase the efficiency of the sewers and lift stations by detecting and correcting problems before they cause a breakdown of the system or lift station and cause overflows. These problems consist of root buildup, grease, paper products, sewer gas smell, and broken pipes.

The Infiltration and Inflow elimination program is constantly in effect. This program was started to help prevent excess rainwater and surface water from entering the sanitary system to be treated at the plant. Infiltration is the ground water that leaks into a pipe through joints, porous walls, or breaks. Inflow is usually the rainfall that enters a sewer system through direct connections. Some of these may be roof drains, sump pumps, or cleanouts that are not properly capped or may even be a storm sewer that may be hooked to a sanitary line. The dye-testing program is always in effect but has diminished to new growth of homes and businesses in the City.

The Infiltration and Inflow removal program in the collection system and treatment plant is in place to reduce the operation and maintenance costs in the treatment of the wastewater. We have started to repair the Infiltration and Inflow problem in the past years and will be for years to come with the rehabilitation of manholes and changing frames and covers to self-sealing covers. We are relining and replacing the old sewer lines and working to preserve our collect system. Ultimately, our goal is to protect both the environment and the quality of life not only for the City of Shelbyville, but also for our neighboring communities as well as our future generations.



We have split the city into 5 basins and our intentions are to clean and video one basin a year and then in 5 years start all over again. We are finding a lot of old lines that are in need of rehabilitation. Hopefully as funds become available we can start repairing these old lines.

Listed below is a list of the work completed by the collection system department in 2018.

Total feet of sanitary sewers flushed .....	50,440 ft.
Total feet of sanitary sewers derooted .....	2,240 ft.
Sanitary manhole frames replaced .....	22
Sanitary manhole frames repaired .....	7
Sanitary sewers videotaped .....	38,146 ft.
Sanitary sewer relined .....	0 ft.
Sanitary manholes rehabilitated .....	19

Respectfully Submitted  
James L. Vierling  
Foreman  
Water Resource Recovery Facility

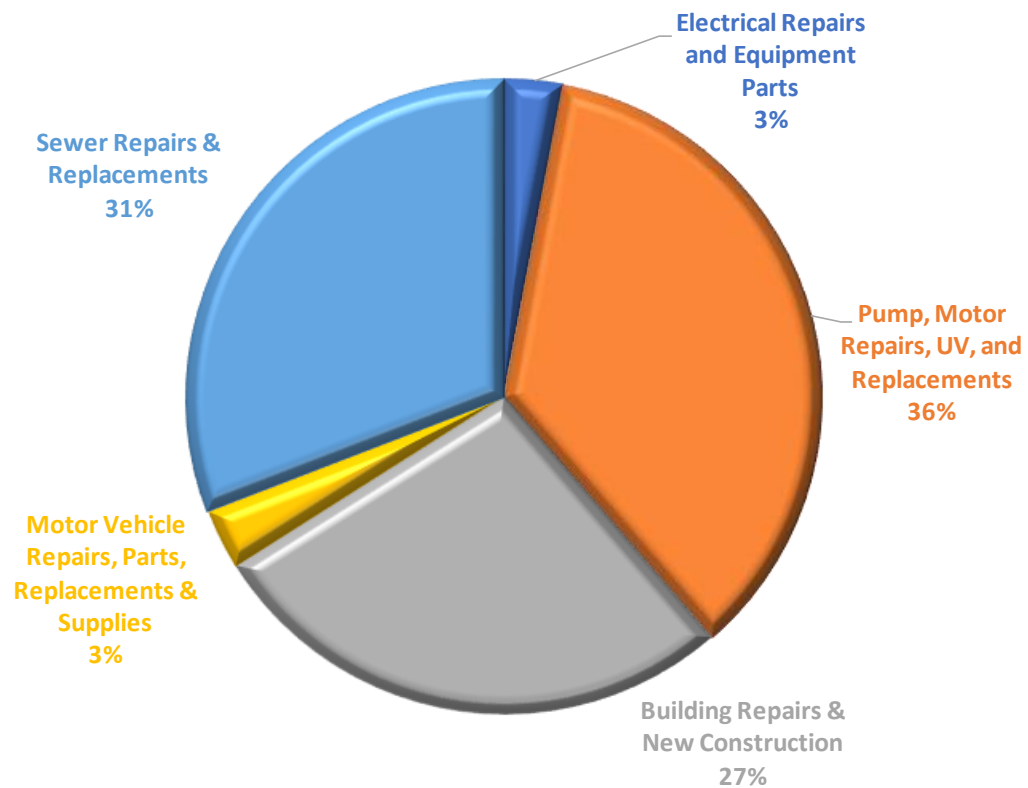
## 2018 Bio-Solids Status and Handling

<u>Month</u>	<u>Gal. Fed x 1000 to Belt Press</u>	<u>Dry tons Disposed</u>	<u>Cost of Disposal</u>
January	763.94	0	\$ -
February	746.91	0	\$ -
March	735.84	0	\$ -
April	839.16	456.4	\$ 9,693.94
May	932.12	0	\$ -
June	830.53	0	\$ -
July	816.8	302.12	\$ 6,545.37
August	895.8	0	\$ -
September	825.35	0	\$ -
October	876.94	151.71	\$ 3,302.88
November	741.18	268.41	\$ 5,815.05
December	907.33	0	\$ -
<b>Total</b>	<b>9911.9</b>	<b>1178.64</b>	<b>\$ 25,357.24</b>
<b>Average</b>	<b>825.99</b>	<b>98.22</b>	<b>\$ 2,113.10</b>

Digested secondary sludge is pumped to a 1.5-meter Belt Filter Press. The sludge is first mixed with a cationic polymer solution to achieve coagulation. The coagulated sludge is then applied to a filter belt to allow dewatering by gravity. After the gravity stage, the sludge enters a series of rollers to press the liquid out of the sludge to approximately a 26% - 29% dried state. The sludge is then scraped from the belts onto a conveyor that carries the dewatered residual (bio-solids), to a dump truck. From the dump truck, the bio-solids are stored in a building on-site until the bio-solids can be land applied to farm ground. The city has a hybrid specific permit issued in 2011. The belt press filtrate is pumped to a pre-aeration basin and fed into the plant influent after aeration lowering the effects of the ammonia on our system.

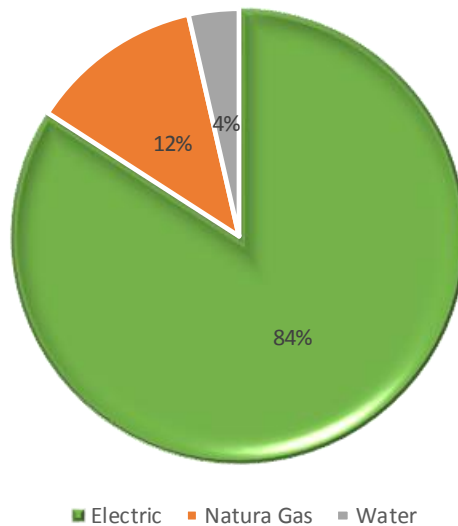
## MAINTENANCE COST FOR 2018

Electrical Repairs and Equipment Parts	\$ 11,765.06
Pump, Motor Repairs, UV, and Replacements	\$141,300.62
Building Repairs & New Construction	\$108,632.43
Motor Vehicle Repairs, Parts, Replacements & Supplies	\$ 12,158.11
<u>Sewer Repairs &amp; Replacements</u>	<u>\$122,093.40</u>
<b>Total</b>	<b>\$395,949.62</b>



**2018  
UTILITY PURCHASES**

MONTH	ELECTRIC	NATURAL GAS	WATER
January	\$13,731.25	\$3,927.91	\$3,158.26
February	\$18,028.26	\$3,682.87	\$1,600.14
March	\$22,104.46	\$3,800.25	\$673.37
April	\$16,841.64	\$3,174.20	\$590.26
May	\$26,612.10	\$2,284.25	\$656.52
June	\$16,125.48	\$1,827.57	\$581.79
July	\$18,459.77	\$1,717.07	\$464.19
August	\$16,256.48	\$1,825.22	\$393.65
September	\$17,393.39	\$1,813.06	\$344.06
October	\$22,847.34	\$2,322.61	\$341.74
November	\$16,742.61	\$2,631.83	\$343.96
December	\$17,160.48	\$3,525.40	\$284.46
<b>TOTAL</b>	<b>\$222,303.26</b>	<b>\$32,532.24</b>	<b>\$9,432.40</b>
<b>AVERAGE</b>	<b>\$18,525.27</b>	<b>\$2,711.02</b>	<b>\$786.03</b>



Here are the 2018 receipts and disbursements using the figures I received from the Clerk Treasurer's Office, which includes interest earned from investments and other miscellaneous receipts.

<b>DISBURSEMENTS:</b>		
	Water Resource Recovery Facility	\$ 2,660,142.70
	Public Utilities Office	\$ 397,472.23
	P & I on Bonds	\$ 401,761.33
	<b>Total</b>	<b>\$ 3,459,376.26</b>
<b>RECEIPTS</b>		
	Collections	\$ 4,321,437.10
	Earned on Investments	\$ 95,400.76
	Refunds and other Receipts	\$ 47,259.79
	Sewer Tap & Connection Fees	\$ 44,550.00
	Certification Money from County	\$ 39,170.02
	<b>Total</b>	<b>\$ 4,547,817.67</b>
	<b>RECEIPTS</b>	<b>\$ 4,547,817.67</b>
	<b>DISBURSEMENTS</b>	<b>\$ 3,459,376.26</b>
	<b>NET EARNINGS</b>	<b>\$ 1,088,441.41</b>

In 2017, we certified \$28,449.80 to the County for unpaid 2017-2018 utility bills. In 2018 we collected \$39,170.02 from the County for unpaid 2015 through 2017 wastewater bills. These totals do not include storm water charges.

These figures show a net gain of \$1,088,440.41.

## **Operation Summary**

Again, this year, 2018 was a good year for the WRRF. The construction of the phosphorus treatment system was completed in December. Permit compliance must be completed by April 2019. The operators continue to do more mechanical and electrical work within the plant plus help other departments. We now have more operators being certified than we have ever had. The lead operator will be moved to the Assistant Superintendent position on January 1, 2019 to transition him into new leadership position for January 2020.

Several more pump and motors were switched to variable frequency drives to continue to improve on our electrical use footprint.

## Conclusion

The Shelbyville Water Resource Recovery Facility has come a long way in the last thirty-nine years. With updated equipment, major repairs to trunk sewers, better-trained employees, a cleaner safer facility, the city should be proud. I, as Superintendent, do not deserve all the credit. The Administration, the City Council, the Public Utilities Board, and most of all, the employees make this plant work. I know that it has not always been a popular subject, but the rewards will be the type of system that we leave our grandchildren. The citizens of Shelbyville in the future will not have to pay as dearly because the problems have been addressed now instead of postponing them. This facility and collection system is the largest asset owned by the City and one of the most important. No new industries, homes, or businesses could be built if it was not for this facility.

As you can see by the effluent discharge numbers, this facility is putting out some of the cleanest water ever discharged to the Big Blue River. If you look at the financial page, you will see that we did show a profit for 2018. We have several projects planned in 2019

The employees have brought a much-needed professionalism to the water resource recovery utility. They should be commended for taking pride in the water resource recovery facility and collection system. These jobs are not just a position that can be filled by just anybody anymore. All of us look forward to serving the citizens of this community for several years in the future (or at least one more for me).

Thank You

A handwritten signature in black ink that reads "Bradley E. Fix". The signature is written in a cursive, slightly slanted style.

Bradley E. Fix  
Superintendent  
Shelbyville Water Resource Recovery Facility