

**AMITY TOWNSHIP  
BERKS COUNTY, PENNSYLVANIA**

**CHAPTER 94  
MUNICIPAL WASTELOAD MANAGEMENT  
2013 ANNUAL REPORT**

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AMITY TOWNSHIP  
CHAPTER 94  
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Population Projections

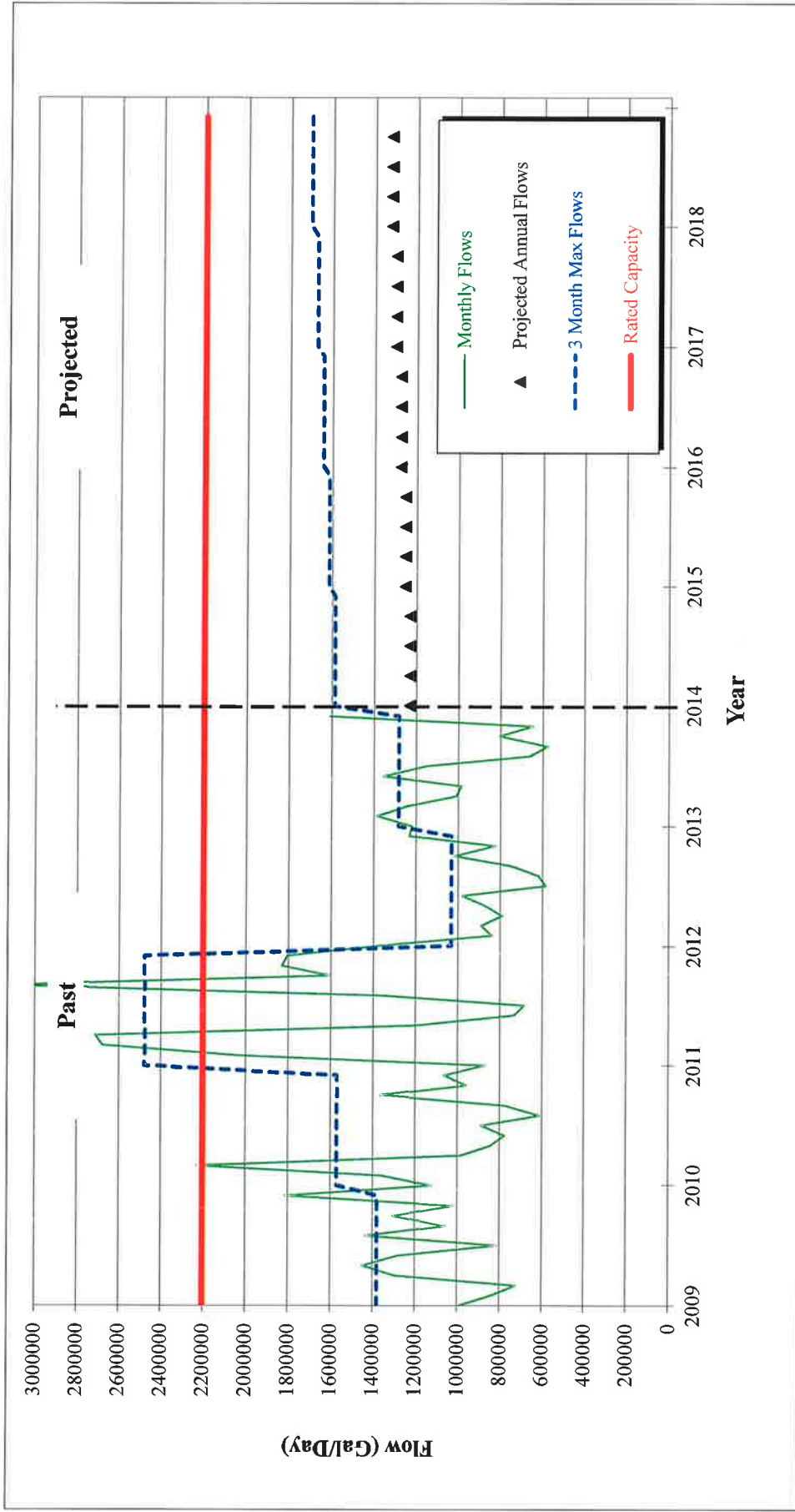
Proof of Flow Meter Calibration

Chapter 94 Report Information from Union Township

Chapter 94 Report Information from Douglass Township

Chapter 94 Report Information from Earl Township

**Amity Township  
2013 Annual Chapter 94 Report  
HYDRAULIC LOADING**



**EXHIBIT 1**

C. TREATMENT PLANT DESCRIPTION

The Amity wastewater treatment plant was expanded in 2003 and the expanded NPDES Permit was finalized in November 2004. The wastewater treatment plant is currently permitted to effectively treat an annual average daily flow of 2.2 MGD of wastewater flow. The current permitted organic capacity is 4,202 pounds of CBOD<sub>5</sub>/day. Wastewater treatment is accomplished through the use of biological and physical processes. The basic unit processes are raw sewage, screenings removal, grit removal, biological treatment using an oxidation ditch activated sludge process with sedimentation, chlorination disinfection, sludge digestion, and sludge removal. The digested sludge may be applied into the reed drying beds, dewatered on the belt filter press, or hauled away in liquid form for further treatment and disposal. Dewatered sludge is landfilled for disposal. Disposal of the final dewatered reed bed sludge product will occur once every five to seven years.

Laboratory tests are performed routinely by the plant operators in order to control treatment processes and to determine plant operating efficiency. The results of these tests are recorded on a weekly and monthly log. One copy is forwarded to PaDEP and one copy should be forwarded and reviewed by the Consulting Engineer. The average daily flow through the treatment plant during 2013 was 1,054,083 gallons. The average monthly influent loading during 2013 was 1,863.6 lbs BOD<sub>5</sub>/day. The average influent BOD<sub>5</sub> was 214 mg/L. The average effluent concentration was 2.69 mg/L CBOD<sub>5</sub>.

A revised NPDES Permit was issued and became effective on July 1, 2010, for the Amity Township wastewater treatment facility. The current permitted monthly average discharge limitations are as follows:

Flow	2.2 MGD
CBOD <sub>5</sub>	25 mg/L
Total Suspended Solids	30 mg/L
NH <sub>3</sub> N - Winter	12 mg/L (1/1 to 4/30)
NH <sub>3</sub> N - Summer	5 mg/L (5/1 to 10/31)
Total Dissolved Solids	1,000 mg/L
Fecal Coliform (5/1 to 9/30)	200/100 ml
Fecal Coliform (10/1 to 4/30)	2,000/100 ml
Dissolved Oxygen	5.0 mg/L (minimum at all times)
PH	6.0 to 9.0 SU

Total Residual Chlorine

0.5 mg/L

Total PCBs

Monitor and Report

The permit expires on June 30, 2015. Laboratory testing and WET testing are underway in anticipation of the permit renewal application.

#### Sludge Disposal

During 2013, there were 570,000 gallons of aerobically-digested sludge applied to the reed drying beds. There were 691.0 tons equal to 118.21 dry tons of dewatered sludge hauled to the Pioneer Crossing Landfill in Birdsboro, Pennsylvania, for disposal. There were 99,000 gallons of liquid sludge hauled to the Pottstown Wastewater Treatment Plant during the 2013 digester rehabilitation project.

#### Wastewater Treatment Plant

The mechanical equipment is inspected daily. Maintenance performed is logged. The following maintenance and improvements were made at the treatment plant during 2013:

1. All flow meters were recalibrated once per year. Copies of calibration certificates are included in the Appendix of this report.
2. Brush was cut and removed from the inside and outside of the dike.
3. Plant generators were serviced.
4. All equipment bearings were lubricated as scheduled.
5. All gear box oil changes were made as scheduled.
6. In the equalization basin, installed three new floating aerators, new pumps, and new piping to Headworks.
7. Installed new gear box for Primary Clarifier No. 3.
8. Rebuilt RAS Pump No. 2.
9. Polymer pump for BFP was replaced.
10. The anaerobic digester sludge mixers were replaced.
11. Replaced waste gas burner.
12. Improved ventilation in MCC Electrical Room.
13. Digester covers were removed and rehabilitated.

D. DISCUSSION OF HYDRAULIC AND ORGANIC LOADING PROJECTIONS

The hydraulic and organic loading projections were based on population projections developed by the tributary municipalities and ARRO Consulting, Inc. Data from the 2000 U.S. Census was also used to update current population figures. The projections of Earl Township, Union Township, and Douglass Township population growth included in their respective Chapter 94 report submissions have been taken into account. Table 4, which is included in the Appendix, shows the hydraulic and organic projections for the next five years for the entire wastewater treatment facility, which includes data from the contributing municipalities.

Population projections are based on the number of actual residential and commercial connections times the 2010 Census data of number of persons per household in each municipality. There is relatively little industrial flow generated in any of the sewer systems. Most industry has domestic wastewater generated.

The hydraulic loading for the past five years was plotted. The average daily flow for each month and the annual average daily flow are shown in Table 2 for each year from January 2009 through December 2013. The average gallons per capita per day contribution for the last five years as shown in Table 4 was 89.36. This value times the projected population was used to determine the projected annual average daily flows. The highest average daily flows for three consecutive months for each of the past five years were averaged to determine the maximum three-month average daily flow for each year. The ratio of maximum three-month average daily flow to annual average daily flow was determined. For the past five years the ratio ranged from 1.15 to 1.45. The average ratio, 1.288, was used to project the maximum three-month average daily flows. The projections indicate an overload condition is not expected to occur within the next five years. Continued infiltration/inflow control is still needed to maintain plant flows below the design capacity. The three-month maximum average flow in 2013 occurred in January, February, and March, was 1,281,667 gpd, and did not exceed the wastewater treatment plant capacity of 2.2 MGD.

The organic loading graph was developed by plotting the average daily organic load for each month for each of the past five years. The average pounds of BOD<sub>5</sub> per capita per day for the past five years as shown in Table 4 ranged from 0.101 to 0.163, and the average is 0.1264. The projected average annual organic load was determined by multiplying the projected population for each year by the average value of 0.1264 pounds of BOD<sub>5</sub> per capita per day. The maximum monthly loading for each of the past years was also used to project the maximum monthly loading in a similar

manner. The peak pounds of BOD<sub>5</sub> per capita per day for the past five years ranged from 0.171 to 0.285, and the average is 0.2050. The ratio of maximum monthly organic loading to annual average organic loading for each of the last five years was determined. The ratio ranged from 1.42 to 1.94. The organic peaking factor average five-year ratio of 1.628 was multiplied by the projected annual average BOD<sub>5</sub> loading to project the maximum monthly BOD<sub>5</sub> loading. The projections indicate an overload condition is not expected to occur within the next five years.

Both the hydraulic and organic five-year projections include the connections projected for all contributing municipalities as noted in their Chapter 94 Report information.

#### E. PLANS TO REDUCE OVERLOAD CONDITIONS

Amity Township completed a wastewater treatment plant expansion project and rerating of the permitted capacity in 2004. The Township has purchased a televising truck and equipment to implement a system-wide infiltration/inflow remediation project to reduce peak flows. The televising work is reviewed in phases and followed by rehabilitation of those areas. Phases 1 and 2 included areas that had the oldest sewers comprised of vitrified clay pipe. Phase 3 and 4 areas were televised in 2010 and followed by additional rehabilitation work. Additional Phases 5, 6, and 7 have been televised. More than 3/4 of the sewer system has been televised and reviewed since the Township purchased the cleaning and televising equipment. The rehabilitation work appears to have had a significant impact in reducing flows. The 2013 average daily flow is lower than four of the previous five years. Peak rainfall related inflow is still an issue needing attention. The three highest consecutive monthly flows in 2013 were January, February, and March, and averaged 1,281,667 which is well below the plant capacity of 2,200,000 gpd.

Amity Township is in the process of updating their Act 537 Sewage Facility Plan. The previous plan update was submitted to PaDEP and approved in December 2010. In January 2011 the Township requested PaDEP to revise the schedule for the future wastewater treatment plant upgrade to delay it until housing growth returns and shows signs of needing wastewater treatment plant capacity expansion.

A Corrective Action Plan submitted on June 17, 2013, and resubmitted on July 17, 2013, was approved on August 8, 2013. The Corrective Action Plan and schedule end December 2015 for elimination of the identified hydraulic restrictions in the Route 662 sewer, and an end date of

December 2017 for the installation of peak flow metering equipment at each Amity Township pump station.

F. SEWER CONNECTIONS AND EXTENSIONS

A total of 35 new connections to the Amity sewer system were made during 2013. No new connections were made in Union or Earl Township and 14 new connections were made in Douglass Township.

No sewer extensions were constructed in 2013 in any of the sewer systems tributary to the Amity wastewater treatment plant.

G. SEWER SYSTEM MONITORING, MAINTENANCE, REPAIR, AND REHABILITATION

Sewer System

The Amity Township sewage collection system consists of approximately 76 miles of gravity sewer line, ranging in size from 8 inches to 30 inches. The original system was built in the mid-1970s to serve a development of several hundred lots known as Amity Gardens.

The portion of the sewage collection system serving Amity Gardens consists of approximately 12 miles of 8- and 10-inch sewer line, predominately constructed of vitrified clay pipe in five-foot sections. This older portion of the sewage system is clay pipe and experiences some infiltration/inflow problems. The Township's ongoing internal sewer line videotaping projects have revealed some defective pipes, cracked pipes, and protruding lateral connections. Sewer rehabilitation work had been conducted following each phase of the sewer televising work.

The sewage collection system is in good, serviceable condition overall and functions in a satisfactory manner. The Township sewage treatment plant staff, which also operates the collection/conveyance system, are experienced and able to respond in a timely manner should a problem arise. Township staff performs regular maintenance to manholes, pumping stations, and pipes. Cleaning and televising of sewer mains is performed using Township-owned equipment and rehabilitation work follows by contracted services.



Amity Township had ARRO Consulting build a computerized hydraulic model of the sewer system to evaluate the capacities of sewer lines and determine the effects of proposed development and infiltration/inflow repair work. The hydraulic model can be used to identify areas of the sewer system that are at or near capacity and to indicate the effect that proposed development will have on existing sewer mains. The hydraulic model will continue to be calibrated and refined and will be a useful tool for determining how growth in the sewer system will affect the existing sewers. During 2012, the hydraulic model was partially calibrated and used to evaluate sewers in the area of Pump Station #1 and Pump Station #5. The hydraulic model identified two manhole sections at 100% capacity and four manhole sections in the 85% to 100% capacity range. They are located on Route 662 downstream of the Pump Station #1 and Pump Station #6 discharge sewers. The Township Supervisors and ARRO Consulting have had discussions with property owners and developers to consider a new interceptor line that would eliminate the capacity issues and an existing pump station. Once decided, we will prepare plans and specifications and a permit application for enlarging those sewers to eliminate capacity issues. No other capacity problems were identified in the sewer system hydraulic model run.

#### Repair and Replacement

1. There were no main sewer or lateral stoppages cleared in 2013.
2. Main sewer flushing is performed on low flow and low slope lines, as well as those mains flushed and cleaned prior to televising the Phase 2, 3, 4, 5, 6, and 7 areas.

The Township owns equipment for sewer maintenance, which includes a flushing vector truck and Envirosight camera equipment. The sewer televising work is ongoing and continues to identify areas that will be scheduled for rehabilitation work. The sewer rehabilitation program efforts are mainly in vitrified clay pipe sewers in the older sections of the sewer system.

During 2013, sewer identification and rehabilitation work continued in the Phase 5, 6, and 7 areas.

### Amity Township Sewage Pumping Stations

There are nine pumping stations in the Amity Township sewerage system. All of the stations are in good physical condition and are operating satisfactorily.

1. All nine pumping stations had their generators serviced, including oil changes, by Township maintenance people.
2. At each station, pumps are checked, tested, and lubricated by Township personnel.
3. An SSO occurred at Pump Station #3 on June 17, 2013, due to a broken pipe. Broken pipe was repaired.
4. An SSO occurred at Pump Station #7 due to a broken force main. The broken force main was repaired.
5. Pump Station #1 will be upgraded to a submersible pump station in 2014.
6. Pump Station #5 will have pumps and controls replaced in 2014 and the force main rerouted to gravity sewers near Pump Station #1.

Previous Chapter 94 Reports listed pump station capacities based on both pumps in each pump station. This was revised in 2012 to only reflect the capacity of one pump with the largest pump out of service.

During 2012, Amity Township conducted drawdown tests on Pump Stations #1, #3, #5, #6, #7, #8, and #9 to determine capacity. These pump stations have hour meters on pumps and readings were used to calculate peak flows. Peak flows during the extremely wet year of 2011 were used because 2012 flows were significantly lower than 2011.

The results of the drawdown test capacities and peak flows are presented below.

<u>Pump Station</u>	<u>PaDEP WQM Permitted Capacities</u>	<u>Current Actual Station Capacity (mgd)</u>	<u>Average Flow (mgd)</u>	<u>Maximum Monthly Flow (mgd)</u>	<u>Maximum Monthly % of Capacity</u>
No. 1 – Amityville	0.252	0.350	0.045	0.100	28.6
No. 2 – Amity Gardens	1.44	1.296	0.059	0.130	9.0
No. 3 – Route 422 South	1.986	1.24	0.057	0.130	10.5
No. 4 – Monocacy Station	0.806	0.720	0.073	0.160	19.8
No. 5 – Manatawny Creek	0.504	0.497	0.031	0.050	10.1
No. 6 – Cider Mill	0.230	0.176	0.025	0.050	28.4
No. 7 – Rosecliff	0.202	0.117	0.070	0.170	100.0+
No. 8 – Sunset Knoll	0.216	0.174	0.015	0.020	11.5
No. 9 – Woods Edge	0.202	0.158	0.003	0.0035	2.2

+ During 2013, the peak flow from the new flow meter at Pump Station #2 was recorded as 1,342 gpm which is over the rated capacity of 1.44 MGD. There was no overflow or back-up and the pump station operated satisfactorily. During 2013, the peak flow from the new flow meter at Pump Station #4 was recorded as 1,229 gpm which is over the rated capacity of 0.806 MGD. There was no overflow or back-up and the pump station operated satisfactorily.

- 1) Pump data taken from annual pump station run time tables provided by system superintendent.
- 2) Pump Station #5 discharges into the same force main at Pump Station #1, but this will be changed in 2014.
- 3) The lower capacity values result for Pump Stations #1 and #5 when both stations are operating simultaneously.
- 4) Current actual station capacity is based on one pump operating with the largest pump out of service.
- 5) Copies of the pump station drawdown tests were included in the Appendix of the 2012 Chapter 94 Report.

Operation and maintenance of the sewer systems is carried out by municipal public works personnel. Amity treatment plant personnel do inspect the contributing municipalities meter stations on a periodic basis. Treatment plant personnel also maintain the Amity Township pump stations. When a new property connection is made, a plumbing inspector for the respective municipality inspects the new installation, and construction observation and testing of all new sewer mains is performed.

#### Union Township Pump Station

There is only one pumping station in the Union Township sewer system. The pumping station received maintenance on a regular basis. A test of the alarm system at the station is run weekly. An off-site standby generator is available during times of a power outage. Lubrication of the equipment, cleaning of control panels, and cleaning of stations are among regular maintenance activities that are performed to reduce potential problems and malfunctions.

There is one (1) pump station within the Union Township collection and conveyance system.

1. Pump Station #3 is equipped with two (2) 10 horsepower, 312 gpm submersible pumps. This station receives flow from the north side of the Schuylkill River in Union Township via gravity collection lines.
2. A new emergency generator was installed in 2013.
3. Improvements to the pump station were completed in 2013.
4. The maximum daily flow recorded during 2013 at the pump station was 100,244 gpd which is equal to 69 gpm or 22% of its capacity.

There were no sanitary sewer overflows in 2013.

An automatic telephone dialer at this site which was installed in 2012. The autodialer will notify the operator of alarm conditions so immediate action can be taken. In 2013, the Authority updated Pump Station #3 – Amity by updating and replacing aging valves and pump accessories. Electrical upgrades include installation of a data logger to monitor pumps and run times. At the time of this report, the data logger has not been placed into operation. A permanent generator was also installed, and security fencing was installed. The pump station currently does include a flow meter along with pump hour meter readings.

Design capacity of each pump within Pump Station #3 is 312 gpm. Based on the flow meter readings for 2013, the annual average daily flow was 47,620 gpd. The maximum three-month average recorded flow for 2013 at Pump Station #3 was 73,048 gpd which equates to 50 gpm. The maximum daily flow based on the weekly meter readings was 100,244 gpd which equates to 69 gpm. A total of 172 EDUs are currently connected to the system that flow to the pump station. The estimated average daily flow per EDU in 2013 was 277 gpd per EDU. For projected average daily flow conditions in future years, a flow of 229 gpd per EDU will be used since this is more conservative. For projected peak hourly flow conditions in future years, a peaking factor of 4.0 will be used.

Average daily projected flow for 2014 at Pump Station #3, adding five additional EDUs at 229 gpd per EDU is  $177 \text{ EDUs} \times 229 \text{ gpd/EDU} = 40,533 \text{ gpd} = 28 \text{ gpm}$ . Projected peak hourly flow for 2014 at Pump Station #3, adding five additional EDUs at 229 gpd per EDU is  $177 \text{ EDUs} \times 229 \text{ gpd/EDU} = 40,533 \text{ gpd} \times 4.0 = 162,132 \text{ gpd} = 112 \text{ gpm}$ .

are able to successfully respond if an occasional problem would arise, and access to the Authority Engineers is authorized on a continuing basis.

Section 94.12(a)(7)

There is a continuous sanitary sewer system maintenance repair and rehabilitation program for the Union Township Municipal Authority collection and conveyance system. The Authority's maintenance superintendent/operator (EEMA O&M Services Group) monitors the collection and conveyance system including one pump station on a weekly basis. The Authority's maintenance superintendent/operator is experienced and has the ability to purchase most replacement equipment and supplies and initiate their installation.

In most emergency situations, the Authority's maintenance superintendent/operator and their staff is capable of carrying out repair duties. However, if the Authority's maintenance superintendent/operator is unable to resolve the situation, they will either utilize the Township work force if available or various contractors will be contacted to respond to the problems. All emergencies are corrected as soon as possible. Please refer to Sections 94.12(a)(4) and 94.12(a)(9) for additional discussion concerning the sanitary sewer system.

In 2003 and 2004, the Authority Engineer inspected properties throughout the Authority's sewer system with respect to outstanding sewer vent problems (low vent caps, missing vent caps, etc.) and all problems found were corrected. The Authority Engineer along with the Union Township Code Enforcement Officer will be performing a system-wide inspection in 2014. Notices of Violation will be sent out as problems are found.

Union Township Sewer Extensions and Proposed Projects

Section 94.12(a)(6)

New Connections: There were no new sewer connections within the Authority's service area during 2013.

Sewer Extensions and Proposed Projects: Final plans for Heritage Building Group, Inc., were recorded in August 2006 for a residential subdivision known as Union Greene Subdivision that proposes 137 single-family residential lots (137 EDUs). The request for a Sewage Planning Module

There are no known problems or capacity issues in the Earl Township sewage collection system.

In early 2014, Earl Township requested an additional 8,627 gpd of reserve capacity in the Amity Township subregional wastewater treatment plant. If approved, this would raise the Earl Township capacity from 52,500 gpd to 61,127 gpd. The increase is requested to serve a new portion of Earl Township known as the Worman Area. Earl Township is discussing revising its Act 537 Plan with PaDEP.

Detailed information related to the condition of each municipality's respective collection systems and pump stations is found in their respective reports in the Appendix.

I. INDUSTRIAL WASTE REPORT

There are no significant industrial dischargers in the Amity sewer system or any of the tributary systems. The commercial and light industrial dischargers are monitored, and communications between them and the Township are ongoing.

Amity Township stopped accepting trucked-in leachate from landfills in 2005 due to problems with effluent total dissolved solids concentrations from the leachate treatment.

J. SIGNATURES

Report Prepared By

Permittee

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Amity Township

Name

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Address

Address

  
Signature of Preparer

3/10/2014  
Date

  
Signature of Permittee

3/12/14  
Date

# *Appendix*

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**Table 1**  
**Amity Township**  
**2013 PLANT PERFORMANCE SUMMARY**

Month	Ave. Flow (gal/day)	BOD5			CBOD5 Effluent (mg/l)
		Daily Load (lbs/day)	Influent (mg/l)	Effluent (mg/l)	
January	1,219,000	2,628.9	249	2.20	
February	1,383,000	2,505.0	204	3.13	
March	1,243,000	1,999.8	195	2.63	
April	1,010,000	1,600.9	210	3.50	
May	986,000	1,936.2	245	2.44	
June	1,354,000	2,173.5	199	2.25	
July	1,152,000	2,156.9	190	3.40	
August	663,000	937.3	185	2.63	
September	578,000	1,086.5	206	2.00	
October	804,000	1,147.8	219	2.44	
November	649,000	1,547.2	278	2.75	
December	1,608,000	2,643.3	188	2.89	
<b>Annual Average</b>	<b>1,054,083</b>	<b>1,863.6</b>	<b>214</b>	<b>2.69</b>	
<b>Max. 3 Month Average</b>	<b>1,281,667</b>				
<b>Max. Month</b>		<b>2,643.3</b>			
<b>Rated Monthly Capacity</b>	<b>2,200,000</b>	<b>4,202</b>			



**Table 2**  
**Amity Township**  
**HYDRAULIC LOADING DATA (GPD)**  
**2009 - 2013**

Month	2009	2010	2011	2012	2013
January	989,000	1,124,000	872,000	1,367,000	1,219,000
February	836,000	1,357,000	2,037,000	840,000	1,383,000
March	723,000	2,229,000	2,678,000	890,000	1,243,000
April	1,292,000	982,000	2,713,000	790,000	1,010,000
May	1,447,000	842,000	1,197,000	872,000	986,000
June	1,280,000	777,000	733,000	979,000	1,354,000
July	813,000	887,000	686,000	585,000	1,152,000
August	1,433,000	611,000	1,357,000	620,000	663,000
September	1,060,000	773,000	3,154,000	749,000	578,000
October	1,302,000	1,361,000	1,606,000	1,016,000	804,000
November	1,020,000	960,000	1,830,000	826,000	649,000
December	1,812,000	1,062,000	1,804,000	1,230,000	1,608,000
<b>Average Annual Flow (Gallons)</b>	<b>1,167,250</b>	<b>1,080,417</b>	<b>1,722,250</b>	<b>897,000</b>	<b>1,054,083</b>
<b>Max. 3 Month Ave. Flow (Gallons)</b>	<b>1,378,000</b>	<b>1,570,000</b>	<b>2,476,000</b>	<b>1,032,333</b>	<b>1,281,667</b>
<b>PEAKING FACTOR</b>					
Max. 3 Month Ave. Flow /					
Ave. Annual Flow	1.18	1.45	1.44	1.15	1.22
<b>Flow Peaking Factor:</b>					
<b>Average 5 Year Ratio</b>	<b>1.288</b>				

**Table 3**  
**Amity Township**  
**ORGANIC LOADING DATA (lbs BOD5/day)**  
**2009 - 2013**

Month	2009	2010	2011	2012	2013
January	975	1,219	1,995	2,627	2,629
February	1,184	1,207	1,512	1,351	2,505
March	1,078	1,975	3,022	1,353	2,000
April	1,596	1,623	2,360	1,344	1,601
May	1,924	1,232	1,942	1,600	1,936
June	1,531	1,400	1,982	1,138	2,173
July	1,130	2,247	1,450	957	2,157
August	1,889	1,121	1,948	1,095	937
September	1,270	1,217	3,780	1,187	1,087
October	955	1,424	1,564	1,639	1,148
November	2,309	1,377	2,587	745	1,547
December	2,259	1,953	1,814	1,180	2,643
<b>Average Annual BOD (lbs/day)</b>	<b>1,508</b>	<b>1,500</b>	<b>2,163</b>	<b>1,351</b>	<b>1,864</b>
<b>Max. 1 Month BOD5 Loading (lbs/day)</b>	<b>2,309</b>	<b>2,247</b>	<b>3,780</b>	<b>2,627</b>	<b>2,643</b>
<b>RATIO:</b>					
Max. 1 Month BOD5 /					
Ave. Annual BOD5	<b>1.53</b>	<b>1.50</b>	<b>1.75</b>	<b>1.94</b>	<b>1.42</b>
<b>Organic Peaking Factor:</b>	<b>1.628</b>				
<b>Average 5 Year Ratio</b>					

**Table 4**  
**Amity Township**  
**PAST AND PROJECTED TREATMENT PLANT LOADINGS**

Year	Connected Population	Average Total Flow (gal.)	Max. 3 Month Ave. Flow (gal.)	Per Capita Flow (gpcd)	Average Total BOD5 (lbs/day)	Max. Month BOD5 (lbs/d)	Per Capita BOD5 (lbs/day)	Max. Per Capita BOD5 (lbs/day)
2009	12,969	1,167,250	1,378,000	90.0	1,508	2,309	0.116	0.178
2010	13,129	1,080,417	1,570,000	82.3	1,500	2,247	0.114	0.171
2011	13,258	1,722,250	2,476,000	129.9	2,163	3,780	0.163	0.285
2012	13,391	897,000	1,032,333	67.0	1,351	2,627	0.101	0.196
2013	13,577	1,054,083	1,281,667	77.6	1,864	2,643	0.137	0.195
<b>Average</b>	<b>13,265</b>	<b>1,184,200</b>		<b>89.36</b>	<b>1,677</b>		<b>0.1264</b>	<b>0.2050</b>
<b>Projected Loadings</b>								
2014	13,785	1,231,919	1,586,712	89.36	1,742	2,613	0.1264	0.2050
2015	14,036	1,254,325	1,615,570	89.36	1,774	2,661	0.1264	0.2050
2016	14,294	1,277,371	1,645,254	89.36	1,806	2,709	0.1264	0.2050
2017	14,554	1,300,653	1,675,241	89.36	1,839	2,759	0.1264	0.2050
2018	14,812	1,323,699	1,704,925	89.36	1,872	2,808	0.1264	0.2050

**Amity Township Sub-Regional Wastewater Treatment Facility**  
**2013 Chapter 94 Report**  
**Population Projections**

Year	Amity Twp.		Union Twp.		Douglass Twp.		Earl Twp.		Total Population
	EDUs	Pop Equv	EDUs	Pop Equv	EDUs	Pop Equv	EDUs	Pop Equv	
2008	4,107	11,294	171	443	250	663	131	346	12,745
2009	4,174	11,479	171	443	263	697	133	351	12,969
2010	4,228	11,627	172	445	266	705	133	351	13,129
2011	4,275	11,756	172	445	266	705	133	351	13,258
2012	4,313	11,861	172	445	277	734	133	351	13,391
2013	4,363	11,998	172	445	291	771	137	362	13,577
2014	4,413	12,136	177	458	311	824	139	367	13,785
2015	4,463	12,273	187	484	331	877	152	401	14,036
2016	4,513	12,411	212	549	351	930	153	404	14,294
2017	4,563	12,548	237	614	371	983	155	409	14,554
2018	4,613	12,686	262	679	391	1,036	156	412	14,812

Population equivalent calculated at 2.75 persons per EDU per 2010 Amity Township census data.  
Earl Twp. population equivalent calculated at 2.64 persons per EDU.  
Douglass Twp. population equivalent calculated at 2.65 persons per EDU.  
Union Twp. population equivalent calculated at 2.59 persons per EDU.

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***Proof of Flow Meter Calibration***



# LRM, Inc

Instrumentation & Disinfection Systems

Calibration Date

1/8/2013

User

Amity Township Subregional WWTP  
100 Old Philadelphia Pike

Amity Township WWTP

Job Site

Douglasville, Pa. 19518

Attn

Instrument Model No.

Instrument S/N

Endress & Hauser 53W3H

64035F16000

Instrument Loop

Input Type

Plant Influent Flow Meter

Magmeter

Primary Signal Producer

Calibrated Range

12in Mag Primary

0-15.00 MGD

### Instrument Settings

Found

Changed To

Zero	Span
0 MGD	15.00 MGD

Zero	Span
N/A	N/A

### Calibration Data

Input %	Input Value	Output Value	% Error After Calibration
0 %	0.00 MGD	4.00 mADC	0.00%
50 %	7.50 MGD	12.00 mADC	0.00%
100 %	15.00 MGD	20.00 mADC	0.00%

Equipment Used Multimeter FieldCare Software

Adjustments / Actions Taken : None

Comments :

Service Representative

Anthony Grbas

Date 1/8/2013

215 N. Main Street - Souderton, Pa 18964 - 215-721-4840 - Fax 215-721-4923



# LRM, Inc

Instrumentation & Disinfection Systems

Calibration Date  
1/8/2013

User

Amity Township Supregional WWTP  
120 Old Philadelphia Pike

Amity Township WWTP

Job Site

Douglasville, Pa. 19518

Attn David Wheeler

Instrument Model No.  
Endress & Hauser  
550861

Instrument S/N  
5A037301050

Instrument Loop

Input Type

Effluent Side A

Ultrasonic

Primary Signal Producer

Calibrated Range

48in Rectangular Weir

0-7.5 MGD

### Instrument Settings

Found

Changed To

Zero	Span
1.603 ft	7.5 MGD

Zero	Span
N/A	N/A

### Calibration Data

Input %	Input Value	Output Value	% Error After Calibration
0 %	0.00 MGD	4.00 mADC	0.00%
50 %	3.75 MGD	12.00 mADC	0.00%
100 %	7.50 MGD	20.00 mADC	0.00%

Equipment Used Isco Standards Book Stick Rule

Adjustments / Actions Taken : None

Comments :

Service Representative

Anthony Grbas

Date 1/8/2013

215 N. Main Street - Souderton, Pa 18964 - 215-721-4840 - Fax 215-721-4923



# LRM, Inc

Instrumentation & Disinfection Systems

Calibration Date

1/8/2013

User

Amity Township Subregional WWTP  
120 Old Philadelphia Pike

Amity Township WWTP

Job Site

Douglassville, Pa. 19518

Attn

Instrument Model No.  
Endress & Hauser  
FMU861

Instrument S/N  
5A036701050

Instrument Loop

Input Type

Effluent Side B

Ultrasonic

Primary Signal Producer

Calibrated Range

42in Rectangular Weir

0-7.5 MGD

### Instrument Settings

Found

Changed To

Zero	Span
1.594 ft	7.5 MGD

Zero	Span
N/A	N/A

### Calibration Data

Input %	Input Value	Output Value	% Error After Calibration
0 %	0.00 MGD	4.00 mADC	0.00%
50 %	3.75 MGD	12.00 mADC	0.00%
100 %	7.50 MGD	20.00 mADC	0.00%

Equipment Used Isco Standards Book Stick Rule

Adjustments / Actions Taken : None

Comments :

Service Representative

Anthony Grbas

Date 1/8/2013

215 N. Main Street - Souderton, Pa 18964 - 215-721-4840 - Fax 215-721-4923





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***Chapter 94 Report Information From  
Union Township***

**SANITARY SEWER COLLECTION SYSTEM**

**D.E.P. RULES AND REGULATIONS - CHAPTER 94  
UNION TOWNSHIP MUNICIPAL AUTHORITY  
OF BERKS COUNTY, PENNSYLVANIA  
2013 ANNUAL REPORT TO  
AMITY TOWNSHIP**

**FEBRUARY, 2014**

**PREPARED FOR**

**UNION TOWNSHIP MUNICIPAL AUTHORITY  
1445 E. MAIN STREET  
DOUGLASSVILLE, PA 19518**

**PREPARED BY**

**SYSTEMS DESIGN ENGINEERING, INC.  
1032 JAMES DRIVE  
LEESPORT, PA 19533**

14-0731-0201

## STATEMENT OF ACCEPTANCE

In accordance with the Pennsylvania Department of Environmental Protection (DEP) Rules and Regulations, the attached Chapter 94 Report – Amity Township for 2013 was approved to be submitted to Amity Township for inclusion within their Chapter 94 Report to be submitted to DEP.

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Chairman  
Union Township Municipal Authority  
of Berks County, Pennsylvania

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Date

**UNION TOWNSHIP MUNICIPAL AUTHORITY  
MUNICIPAL WASTELOAD MANAGEMENT REPORT  
2013 CHAPTER 94 ANNUAL REPORT**

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**UNION TOWNSHIP MUNICIPAL AUTHORITY  
MUNICIPAL WASTELOAD MANAGEMENT REPORT  
2013 CHAPTER 94 ANNUAL REPORT**

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**FIGURES**

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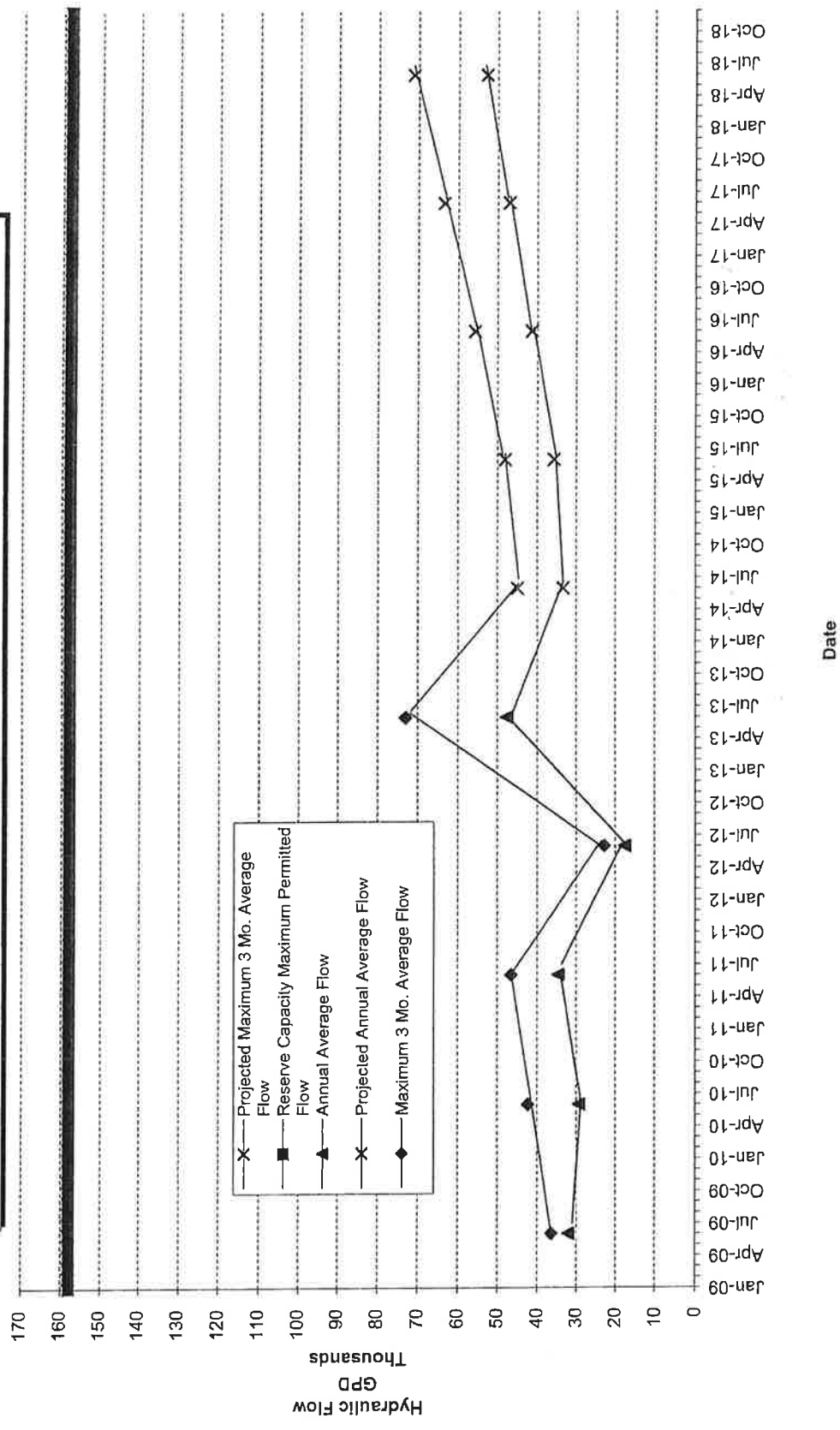
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Table 5 – Number of Connections and EDU's for 2009 to 2013

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**Union Township Municipal Authority to Amity  
Figure 1 - Hydraulic Loading Graph**



**UNION TOWNSHIP MUNICIPAL AUTHORITY  
MUNICIPAL WASTELOAD MANAGEMENT REPORT  
2013 CHAPTER 94 ANNUAL REPORT**

**INTRODUCTION**

The Union Township Municipal Authority operates sanitary sewer collection and conveyance lines in Union Township. The system connects and discharges to the Amity Township Wastewater Treatment Plant. The Union Township sewer system was put into service in August 1979. Currently, there are 172 EDU's and 156 connections on the system. There were no new connections made during 2013.

**HYDRAULIC LOADING TABLE AND GRAPH**

Section 94.12(a)(1)

A hydraulic loading table for 2009 to 2013 is provided, see Tables 1 and 2:

Hydraulic loading projection factors and projections are discussed in Section 94.12(a)(3), see Tables 3 and 4.

A hydraulic loading graph (Figure 1) is attached hereto showing the following:

- (i) Hydraulic loading from Union Township to the plant plotted from average daily flows for each quarter of the past five years (2009 - 2013): See Figure 1.\*
- (ii) A projection of the anticipated hydraulic loading to the plant for each of the next five years (2014 - 2018): See Figure 1.
- (iii) A projection of the peak loading to the plant for each of the next five years: See Figure 1.

In May of 1999, Authority Personnel removed the old inline component for the original Magmeter, replaced this component with a short section of pipe and had the flow meter recalibrated on May 27<sup>th</sup>, 1999. Since that time there has been a significant decrease in the recorded flows. Due to a significant rainfall event in June, 2006, there was flood damage to the flow meter and it was replaced with a new Polysonics Transit Time flow meter.

\* Although monthly figures have been used to calculate average daily flows, the quarterly average daily flows have been calculated and utilized for Flow Projection data in Tables 2 and 3 in order to remain consistent with past reports.



TABLE 1

UNION TOWNSHIP MUNICIPAL AUTHORITY  
 2013 CHAPTER 94 ANNUAL REPORT  
 AVERAGE DAILY FLOWS FROM PUMP STATION NO. 3

<u>MONTH</u>	<u>DAYS IN REPORTING PERIOD</u>	<u>TOTAL DAILY FLOWS (GPD)</u>	<u>AVG. DAILY FLOWS (GPD)</u>	<u>MAX. 3-MONTH AVERAGE FLOW (GPD)</u>	<u>RAINFALL (INCHES)</u>
Year 2013 - 172 EDU's					
January	35	689,700	19,706		4.01
February	28	529,600	18,914		1.87
March	(19*)	(240,100*)	(12,637*)		-
	(6*)	(356,870*)	(59,478*)		-
	25**	596,970**	23,879**		2.39
April	31	1,647,010	53,129		3.63
May	29	1,519,990	52,413		3.24
June	28	1,922,890	<b>68,675</b>		7.54
July	28	2,122,120	<b>75,790</b>	<b>73,048</b>	4.73
August	35	2,613,760	<b>74,679</b>		5.13
September	29	1,645,900	56,755		0.89
October	35	1,689,190	48,263		2.46
November	26	714,920	27,497		2.52
December	36	1,862,730	51,743		<u>4.67</u>
				<b>TOTAL</b>	<b>43.08</b>
Average Daily Flow (GPD)			<b>47,620</b>		

\* Meter reprogrammed at semi-annual calibration – calibration done 3/19/13

\*\* Combined pre and post-calibration figures for month

TABLE 1 (cont.)

UNION TOWNSHIP MUNICIPAL AUTHORITY  
2013 CHAPTER 94 ANNUAL REPORT  
AVERAGE DAILY FLOWS FROM PUMP STATION NO. 3

<u>MONTH</u>	<u>DAYS IN REPORTING PERIOD</u>	<u>TOTAL DAILY FLOWS (GPD)</u>	<u>AVG. DAILY FLOWS (GPD)</u>	<u>MAX. 3- MONTH AVERAGE FLOW (GPD)</u>	<u>RAINFALL (INCHES)</u>
Year 2012 - 172 EDU's					
January	30	675,800	22,527		2.32
February	27*	0*	0*		0.93
March	35	536,000	15,314		2.07
April	28	635,700	<b>22,704</b>		3.73
May	35	859,800	<b>24,566</b>	<b>22,807</b>	4.31
June	28	592,200	<b>21,150</b>		3.53
July	28	371,600	13,271		4.48
August	37	649,100	17,543		3.63
September	26	519,200	19,969		5.05
October	35	551,200	15,749		6.29
November	28	270,300	9,654		0.95
December	28	592,200	21,150		<u>3.75</u>
				TOTAL	41.04
Average Daily Flow (GPD)			<b>17,598</b>		

\* There were electrical problems at the pump station during the month of February and there were no flow meter readings available.

TABLE 1 (cont.)

UNION TOWNSHIP MUNICIPAL AUTHORITY  
2013 CHAPTER 94 ANNUAL REPORT  
AVERAGE DAILY FLOWS FROM PUMP STATION NO. 3

<u>MONTH</u>	<u>DAYS IN REPORTING PERIOD</u>	<u>TOTAL DAILY FLOWS (GPD)</u>	<u>AVG. DAILY FLOWS (GPD)</u>	<u>MAX. 3- MONTH AVERAGE FLOW (GPD)</u>	<u>RAINFALL (INCHES)</u>
Year 2011 - 172 EDU's					
January	31	588,300	18,977		2.62
February	28	1,123,100	40,111		2.88
March	30	1,528,100	50,937	46,054	5.33
April	31	1,460,500	47,113		6.55
May	31	1,035,800	33,413		2.95
June	30	727,600	24,253		1.94
July	30	588,900	19,360		1.55
August	34	710,700	20,903		10.29
September	27	1,780,400	65,941		11.38
October	33	1,081,800	32,782		3.82
November	31	1,073,600	34,632		5.08
December	22	580,900	26,404		<u>4.21</u>
				TOTAL	58.60
Average Daily Flow (GPD)			34,494		

TABLE 1 (cont.)

UNION TOWNSHIP MUNICIPAL AUTHORITY  
2013 CHAPTER 94 ANNUAL REPORT  
AVERAGE DAILY FLOWS FROM PUMP STATION NO. 3

<u>MONTH</u>	<u>DAYS IN REPORTING PERIOD</u>	<u>TOTAL DAILY FLOWS (GPD)</u>	<u>AVG. DAILY FLOWS (GPD)</u>	<u>MAX. 3- MONTH AVERAGE FLOW (GPD)</u>	<u>RAINFALL (INCHES)</u>
Year 2010 - 172 EDU's					
January	31	876,494	28,274		1.78
February	28	1,071,112	<b>38,254</b>		2.02
March	31	1,558,494	<b>50,274</b>	<b>42,280</b>	3.82
April	30	1,149,390	<b>38,313</b>		1.64
May	31	851,415	27,465		3.09
June*	30	801,810	26,727		1.18
July	31	808,015	26,065		5.63
August	31	547,088	17,648		1.97
September	30	665,700	22,190		2.79
October	31	772,086	24,906		6.73
November	30	698,310	23,277		2.23
December	31	877,300	28,300		<u>2.14</u>
				TOTAL	35.02
Average Daily Flow (GPD)			<b>29,253</b>		

\* NOTE: New Sewer Connection for Joseph Gergle-50 Unionville Road occurred on 6/18/10.

TABLE 1(cont.)

UNION TOWNSHIP MUNICIPAL AUTHORITY  
2013 CHAPTER 94 ANNUAL REPORT  
AVERAGE DAILY FLOWS FROM PUMP STATION NO. 3

<u>MONTH</u>	<u>DAYS IN REPORTING PERIOD</u>	<u>TOTAL DAILY FLOWS (GPD)</u>	<u>AVG. DAILY FLOWS (GPD)</u>	<u>MAX. 3- MONTH AVERAGE FLOW (GPD)</u>	<u>RAINFALL (INCHES)</u>
Year 2009 - 171 EDU's					
January	31	923,893	29,803		1.88
February	28	801,612	28,629		0.32
March	31	622,294	20,074		0.75
April	30	926,400	30,880		2.63
May	31	1,090,704	35,184		4.79
June	30	1,020,390	34,013		6.70
July	31	744,186	24,006		3.99
August	31	1,139,095	36,745		6.59
September	30	1,046,700	34,890		4.25
October	31	946,492	<b>30,532</b>		4.22
November	30	869,610	<b>28,897</b>	<b>36,430</b>	0.43
December	31	1,545,691	<b>49,861</b>		<u>5.10</u>
				<b>TOTAL</b>	<b>41.65</b>
Average Daily Flow (GPD)			<b>31,992</b>		

**TABLE 2**  
**HYDRAULIC LOADING**  
**UNION TOWNSHIP MUNICIPAL AUTHORITY**  
**2013 CHAPTER 94 ANNUAL REPORT**  
**QUARTERLY AVERAGE FLOWS AND ANNUAL AVERAGES**  
**2009 TO 2013 (GPD)**

<u>Quarter/Year</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
First	26,398	38,934	36,675	19,358	<b>20,833</b>
Second	33,379	30,835	34,926	22,807	<b>58,072</b>
Third	31,848	21,968	35,401	17,637	<b>69,075</b>
Fourth	<u>36,541</u>	<u>25,494</u>	<u>31,273</u>	<u>15,518</u>	<b><u>42,501</u></b>
Annual Avg. (GPD)	31,992	29,253	34,494	18,782	<b>47,620</b>

**ORGANIC LOADING TABLE AND GRAPH**

Section 94.12 (a)(2)

No discussion regarding organic loading will be provided since Union Township's sanitary sewer system consists of a collection and conveyance system to the Amity Wastewater Treatment Plant. The Chapter 94 Report for Amity should address the organic loading and projected organic loading for the Wastewater Treatment Plant.

**HYDRAULIC AND ORGANIC PROJECTIONS**

Section 94.12(a)(3)

The following hydraulic loading projection factors and projections have been calculated as stated in PA DEP's Chapter 94 Annual Report Requirements and Checklist as quoted below:

*"Flow Projection Factor – Divide the maximum 3-month average flow by the annual average flow for each year of the past five years. Then do an average of these five values, or take the average that is best representative of flow conditions. For example, if a major infiltration/inflow reduction project was completed two years ago, average only the past two years' values. Now multiply this result (flow projection factor) times each of the five year projected annual average flows to determine the projected maximum 3-month average flows.*

*All of the data, including monthly flows for the past five years, yearly averages, 3-month maximum flows, projection factors and projected flows should be tabulated so that we can check your calculations.*

*Graphs should show monthly data points for the past five years. Hydraulic graphs should include 3-month maximum flows, both past and projected. Put your annual average points in the middle of the spaces between year lines for ease of interpretation."*

See Tables 3 and 4 for hydraulic projection factors and hydraulic projections for 2014 to 2018. Please see Section 94.12(a)(6) for discussion of future sewer extensions and proposed projects. Please note organic loading projections are not discussed as stated in Section 94.12(a)(2). Provided in Table 5 are the number of connections in the past five (5) years and total number of connections and EDU's within the Authority's system.

**TABLE 3**  
**UNION TOWNSHIP MUNICIPAL AUTHORITY**  
**2013 CHAPTER 94 ANNUAL REPORT**  
**FLOW PROJECTION FACTOR TABULATION CHART**

<u>YEAR</u>	<u>MAX 3-MONTH AVE. FLOW (GPD)</u>	<u>ANNUAL AVE. FLOW (GPD)</u>	<u>PROJECTION FACTOR</u>
2009	36,430	31,992	1.14
2010	42,280	29,253	1.45
2011	46,054	34,494	1.34
2012	22,807	17,598	1.30
2013	73,048	47,620	1.53
Annual Average Flow (GPD)		32,191	
Average Flow Projection Factor			1.35

The base figure of 32,191 GPD was modified by adding the flow from the number of proposed connections for 2014 to create the projected 2014 flow. Then each year thereafter, the previous years calculated projected flow was modified by adding the flow from the number of proposed connections for that year. The flow per connection utilized in the calculations was 229 gpd/EDU or connection.

During 2013, no new home construction was occurring at the Heritage Builders - Union Greene Subdivision as it was in the state of being taken over by the bank/financial lending institution. This transaction has now been completed and the new owners have renamed the project as the "Buckingham Preserve Subdivision". For projection purposes, a limited number of new connections from the Buckingham Preserve Subdivision and miscellaneous connections are shown for 2014 and succeeding years due to the current economic conditions. New connections from the W.B. Homes, Inc's., Vistas at Riverside development is anticipated to begin in 2015 - 2016 (delay from previously anticipated start in 2014 based on PennDOT Permitting delays). The flow projections within this report are based on the following connections per year:

<u>Year</u>	<u>Number of Projected Connections</u>
2014	5* (from Buckingham Preserve and Unionville Road area)
2015	10* (5 from Buckingham Preserve /Misc. plus 5 from W.B. Homes, Inc.)
2016	25* (5 from Buckingham Preserve /Misc. plus 20 from W.B. Homes, Inc.)
2017	25* (5 from Buckingham Preserve /Misc. plus 20 from W.B. Homes, Inc.)
2018	25* (5 from Buckingham Preserve /Misc. plus 20 from W.B. Homes, Inc.)

*\* The number of proposed connections in the years denoted is estimated and is dependent on many factors.*

**TABLE 4**

**UNION TOWNSHIP MUNICIPAL AUTHORITY  
2013 CHAPTER 94 ANNUAL REPORT  
FLOW PROJECTION FOR 2014 TO 2018**

<u>YEAR</u>	<u>PROJECTION FACTOR</u>	<u>DAILY AVERAGE FLOW (GPD)*</u>	<u>MAX 3-MONTH AVG FLOW (GPD)**</u>
2014	1.35	33,336	45,004
2015	1.35	35,626	48,095
2016	1.35	41,351	55,824
2017	1.35	47,076	63,553
2018	1.35	52,801	71,281

*\* On Figure 1 - Projected Annual Average Daily Flows.*

*\*\* On Figure 1 - Projected Maximum 3-Month Average Daily Flows.*

See the previous discussion following Table 2 concerning how the projected flows were calculated.

**TABLE 5**

**UNION TOWNSHIP MUNICIPAL AUTHORITY  
2013 CHAPTER 94 ANNUAL REPORT  
SECTION 94.12(A)(3) 2009 TO 2013  
NUMBER OF CONNECTIONS AND EDU'S**

<u>YEAR</u>	<u>TOTAL NO. OF EDU'S</u>	<u>NUMBER OF CONNECTIONS PER YEAR</u>	<u>TOTAL NO. OF CONNECTIONS</u>
2009	171*	0 Connections	155
2010	172*	1 Connection	156
2011	172*	0 Connection	156
2012	172*	0 Connection	156
2013	172*	0 Connection	156

*\* Note: Represents the estimated Equivalent Dwelling Units of Residential, Commercial and Industrial connections based on formulas used for billing purposes*



## **REDUCING OR ELIMINATING EXISTING OR PROJECTED OVERLOAD CONDITIONS**

### Section 94.12(a)(4)

In January 1996, the Municipal Authority adopted an Ordinance to give the Authority the power to enforce corrective action of illegal connections. The Ordinance was created from the results of an Infiltration and Inflow (I & I) study performed at the end of 1995 whereby many illegal connections to the sanitary sewer system were discovered. All illegal connections were corrected as of 2001.

Analysis of the sewage flow correlated with rain data to evaluate I & I reduction is ongoing. All manholes have been fitted with inserts, with the exception of those located within the cartway of 724 where the height of the insert would pose traffic hazards. The correction process to raise house lateral vents that may be taking in rainwater run-off above grade has been an ongoing process. It is anticipated that the Union Township Code Enforcement Officer and/or system operator will be performing a system-wide inspection in 2014 to confirm any outstanding issues with customers building sewers and will require correction in a timely manner. Notices of Violation will be sent out as problems are found.

## **INDUSTRIAL WASTES**

### Section 94.12(a)(5)

There are no industries in Union Township which discharge industrial wastes into their system and to the Amity Township Wastewater Treatment Plant.

## **SEWER EXTENSIONS AND PROPOSED PROJECTS**

### Section 94.12(a)(6)

New Connections: There were no new sewer connections within the Authority's service area during 2013.

Sewer Extensions and Proposed Projects: Final Plans for Heritage Building Group, Inc. were recorded in August, 2006 for a residential subdivision known as Union Greene Subdivision that proposes 137 single family residential lots (137 EDU's). The request for a Sewage Planning Module Exemption for a total estimated sewage flow of 41,100 gallons per day was approved by DEP letter dated May 24, 2004. The location of this subdivision is indicated on the plot plan included with this report. Construction of this development started in October, 2006 and is currently on-hold as the developer encountered financial trouble and the development was held by the bank/lending institution. A model home was built on Lot #62 and was connected in 2007. Six (6) new connections were made in 2008. To date, a total of seven (7) lots have been connected. Several other lots were under construction but construction stopped in 2009 due to the economy. For purposes of this report, we have provided a limited number of projected connections for years 2014 thru 2018, but the anticipated build out is unknown due to the current economic conditions and the state of ownership. Due to the economic conditions of the original developer, the financial institution (TD Bank North) became involved in 2012 with this

development, and there was some preliminary discussions between the bank and Union Township officials in 2012. In late 2013, a new developer took over the project which has been renamed the "Buckingham Preserve" subdivision.

Sketch Plans were originally submitted in 2004 and 2005 for the Donovan Tract also known as the Vistas at Riverside from W.B. Homes Inc. proposing 2 different scenarios (one being a Single Family Detached Cluster development and one being an Age Restricted development). Preliminary Plans were submitted in 2005 for the Vistas at Countryside Subdivision from W.B. Homes Inc. proposing 37 Single Family Residential Lots. A Preliminary Plan for a combined project known as the "Vistas at Riverside and Countryside" was submitted in December, 2006 by W.B. Homes, Inc. proposing an age restricted residential development with 274 total age restricted units plus 3 single family units along with approximately 20,000 square feet of commercial/retail area and a Club House Community Center. The location of this subdivision has been indicated on the plot plan included with this report. A Conditional Use for this latest preliminary plan was approved by Union Township and the preliminary plan was approved in November, 2009. The DEP Planning Module for this development was submitted and approved by DEP letter dated August 26, 2010 based on a total estimated sewage flow of 53,048 gallons per day.

W.B. Homes, Inc. submitted a Conditional Use Application to Union Township requesting some changes to the previously approved layout that results in a "Mixed Use Plan". The changes were approved in 2012 and there will be a slight increase in the estimated sewage flow and the number of EDU's needed to serve this tract. A minor change in the approved DEP Planning Module for this project was requested and approved by DEP letter dated September 21, 2012 for an additional flow of 699 gpd which changes the total estimated sewage flow for this development to 53,747 gpd. A breakdown of the estimated sewage flow based on the latest Mixed Use Plan is as follows:

Age Restricted Units	214 Units @ 180 gpd/unit =	38,520 gpd
Single Family Units	60 Units @233 gpd/unit=	13,980 gpd
20,000 SF Commercial Development & Clubhouse	Estimated Usage	<u>1,247 gpd</u>
	Total Estimated Sewage Flow	53,747 gpd
	Total EDU's Required (53,747/233)	231 E.D.U.'s

The Union Township Municipal Authority submitted a capacity request to Amity Township in November, 2006 for a total of 325 additional EDU's that included the EDU's needed for the "Vistas at Riverside and Countryside" development along with other future potential needs within Union Township. Amity Township approved the additional capacity request and a new Inter-Municipal Agreement was prepared and executed in 2010. The UTMA paid the required capacity reservation fees to Amity. As indicated in the new Inter-Municipal Agreement, the capacity reserved for the UTMA will increase from its current capacity of 83,585 gallons per day to 158,010 gallons per day. For purposes of this report, no EDU's from the Vistas at Riverside development are projected to occur in 2014. Connections from this development would be expected to begin in 2015, but this is probably optimistic under the current economic conditions.

## SEWER SYSTEM MONITORING, MAINTENANCE, REPAIRS AND REHABILITATION

### Section 94.12(a)(7)

There is a continuous sanitary sewer system maintenance repair and rehabilitation program for the Union Township Municipal Authority collection and conveyance system. The Authority's maintenance superintendent/operator (EEMA O & M Services Group) monitors the collection and conveyance system including one pump station on a weekly basis. The Authority's maintenance superintendent/operator is experienced and has the ability to purchase most replacement equipment and supplies and initiate their installation.

In most emergency situations, the Authority's maintenance superintendent/operator and their staff is capable of carrying out repair duties. However, if the Authority's maintenance superintendent/operator is unable to resolve the situation, they will either utilize the Township work force if available or various contractors will be contacted to respond to the problems. All emergencies are corrected as soon as possible. Please refer to Section 94.12(a)(4) and 94.12(a)(9) for additional discussion concerning the sanitary sewer system.

In 2003 and 2004, the Authority Engineer inspected properties throughout the Authority's sewer system with respect to outstanding sewer vent problems (low vent caps, missing vent caps, etc.) and all problems found were corrected. It is anticipated that the Union Township Code Enforcement Officer and/or system operator will be performing a system-wide inspection in 2014. Notices of Violation will be sent out as problems are found.

In 2004, the Authority Engineer along with the Authority's Maintenance Superintendent investigated potential sewer line problems in the sanitary sewer right-of-way area of Hillside Lane. Television inspection of this line was performed in 2004 and several recommended repair locations were identified. Pine trees along with other structures (i.e. pools, decks, sheds, etc.) are located within the existing sanitary sewer right-of-way. In 2005, the Authority met with the respective property owners in this area to discuss resolving the issue of trees being within the right-of-way. The pine trees within the sanitary sewer right-of-way were cut down and removed in 2006. The sewer line was re-televised in October, 2007 to verify the condition of the sewer line. The line is structurally sound but has some minor issues that should be addressed in the near future. This area will continued to be monitored. It is anticipated that several minor point lining and dig-up type repairs to the sanitary sewer line in the Hillside Lane area will be performed in the near future as the Authority's budget allows.

## CONDITION OF THE SEWER SYSTEM

### Section 94.12(a)(8)

The Union Township Municipal Authority sanitary sewer collection and conveyance system is in good serviceable condition and functions in a satisfactory manner. Experienced system personnel are able to successfully respond if an occasional problem would arise, and access to the Authority Engineers is authorized on a continuing basis.

## SEWAGE PUMPING STATIONS

The pumping station received maintenance on a regular basis. An auto dialer was installed at the pump station in 2012 which alerts the operator of any operational problems. In 2013, a permanent on-site generator was installed to eliminate the need for an off-site stand-by generator to be brought to the site during times of a power outage. Lubrication of the equipment, cleaning of control panels, and cleaning of stations are among regular maintenance activities that are performed to reduce potential problems and malfunctions.

There is one (1) pump station within the Authority's collection and conveyance system.

1. Pump Station No. 3 is equipped with two (2) 10 horsepower, 312 gpm submersible pumps. This station receives flow from the north side of the Schuylkill River in Union Township via gravity collection lines.

A heavy rainfall and storm event occurred on June 23, 2006 and there was much flooding in the Berks County area due to the storm. During the course of the storm event, the Authority's flow meter was damaged due to water and became inoperative. A new flow meter (Polysonics Model DCT6088) and chart recorder (Honeywell Model DR4500) was installed in August, 2006 and placed into operation on August 29, 2006. Per the new Inter-Municipal Agreement with Amity executed in December, 2008, the flow meter will need to be calibrated semi-annually or at least 2 times per year. Copies of the Meter Calibration and Service Reports for 2013 are included in Appendix C.

In 2011, there were two (2) major storm events which occurred in the months of August and September. On August 27 and August 28, Hurricane Irene was in the Berks County, Pennsylvania area which created significant flooding and electrical power outages throughout the area. In addition, Tropical Storm Lee then swept through the Berks County region on September 5 through September 8, 2011 which created significantly more flooding problems and electrical power outages. During both of these significant rainfall/storm events, there was significant flooding of the Schuylkill River which is relatively close to the Pump Station which prevented access to the Pump Station and caused electrical outages. The Authority's maintenance/operating personnel were checking on the pumps daily during the storm events and reported sanitary sewer overflows at the pump station to DEP as required. On August 28, 2011, the sanitary sewer overflow event was a result of a power failure due to Hurricane Irene and on September 8, 2011, the sanitary sewer overflow event was a result of the Schuylkill River overflowing its banks. A sanitary sewer overflow (SSO) report was submitted to DEP as required. Both of these events were a result of rain events and flooding which were unprecedented and higher than experienced in 40 years.

In 2012, there was an electrical issue at the pump station on January 6, 2012 which resulted in a sanitary sewer overflow. The Authority's operator notified the DEP Reading District Office of the incident and a Sanitary Sewer Overflow (SSO) report was prepared and submitted to DEP as required. A copy of the SSO report was included as part of the 2012 Chapter 94 Report. The overflow was caused by major failure of the pump control circuitry that prevented pump operation. A local electrical contractor was contacted to diagnose and correct the problem. The control circuitry was repaired and the pump station was placed back in service approximately 3 hours after discovery of the SSO.

As a follow-up to the SSO incident, the Authority approved the installation of an automatic telephone dialer at this site which was installed in 2012. The auto dialer will notify the operator of alarm conditions so immediate action can be taken. In addition, the Authority authorized the Authority Engineer to prepare design and bid documents for the furnishing and installation of a permanent emergency generator at the pump station electric service/control site along with upgrading the electrical controls and miscellaneous appurtenances. The pump station currently does include a flow meter along with pump hour meter readings.

There were no sanitary sewer overflows in 2013. As mentioned above, improvements at the UTMA's existing sewage pumping station (P.S. #3 – Amity) were performed in 2013. There was no change in the pump capacity or discharge rate at the pump station as part of these improvements. The improvements were to update and replace aging valves, pump accessories (i.e.: access hatch, pump guide bars/rails, lifting chain/cable, discharge elbows and piping where needed) that have deteriorated over the years of service. Electrical upgrades included the installation of data logging equipment to monitor the number of pumps running and run times. The data logger was installed but it has not been placed into full operation as of the time of this report. Data is expected to be available in 2014. In addition, a permanent stand-by generator was installed at the site to eliminate the need for a portable back-up generator to be brought to the site during the time of power outages. The permanent generator at P.S. #3 is a diesel fired 40KW unit and includes a sub-base fuel tank that can hold sufficient fuel for a least 48 hours of back-up power. Fencing was also installed at the site to secure the site and prevent vandalism. The pump station is equipped with an auto dialer that alerts the Authority's operator of any operational issues (i.e.: high water alarm, low water alarm, loss of main power/generator running, etc.)

Design capacity of each pump within Pump Station No. 3 is 312 gpm. A copy of the flow meter readings for 2013 is included in Appendix A. Based on the flow meter readings for 2013, the annual average daily flow was 47,620 gpd. The maximum 3-month average recorded flow for 2013 at Pump Station No. 3 was 73,048 gpd which equates to 50 gpm. The maximum daily flow based on the weekly meter readings was 100,244 gpd which equates to 69 gpm.

A copy of the pump hour meter readings for 2013 is included in Appendix B. Based on the pump hour meter readings for 2013, each pump runs approximately 0.5 to 1.5 hours per day. In 2013, the highest recorded pump hour meter reading was for the week of June 6 thru June 13 where each pump ran approximately 1.9 hours each day which corresponded to several rain events that occurred over a 5 day period and totaled approximately 3.1 inches.

A total of 172 EDU's are currently connected to the system that flow to the pump station. The estimated average daily flow per EDU in 2013 was 277 gpd per EDU based on 47,620 gpd and 172 EDU's. The estimated average daily flow per EDU based on the 5 year Average Daily Flow from 2009 to 2013 was 187 gpd per EDU based on 32,191 gpd and 172 EDU's. For projected average daily flow conditions in future years a flow of 229 gpd per EDU will be used since this is more conservative than the 5 year average daily flow per EDU. For projected peak hourly flow conditions in future years a peaking factor of 4.0 will be used.

Average Daily Projected Flow for 2014 at Pump Station No. 3, adding 5 additional EDU's @ 229 gpd per EDU is  $177 \text{ EDU's} \times 229 \text{ GPD/EDU} = 40,533 \text{ GPD} = 28 \text{ gpm}$ . Projected Peak Hourly Flow for 2014 at Pump Station No. 3, adding 5 additional EDU's @ 229 gpd per EDU is  $177 \text{ EDU's} \times 229 \text{ GPD/EDU} = 40,533 \text{ GPD} \times 4.0 = 162,132 \text{ GPD} = 112 \text{ gpm}$ .

Maximum Daily Projected Flow for 2015 at Pump Station No. 3, adding 10 additional EDU's @ 229 gpd per EDU is 187 EDU's X 229 GPD/EDU = 42,823 GPD = 30 gpm. Projected Peak Hourly Flow for 2015 at Pump Station No. 3, adding 10 additional EDU's @ 229 gpd per EDU is 187 EDU's X 229 GPD/EDU = 42,823 GPD X 4.0 = 171,292 GPD = 119 gpm.

The projected maximum daily and peak hourly flows for 2014 and 2015 are within the capacity of the pumps. A summary table showing the present flows along with the 2-Year projected flows for Pump Station No. 3 is provided below:

Table 6							
Union Township Municipal Authority Pump Station No. 3 Flows							
Pump Station Name	Number of Pumps	Permitted Capacities		Present Flow-2013		Projected Flows	
		Annual Average Permitted Capacity (GPM)	Hydraulic Design Capacity (excluding capacity of backup pump) (GPM)	Annual Average Daily Flow (GPD)	Peak Hourly Flow (GPM)	2-Year Projected Average Daily Flow <sup>(2)</sup> (GPD)	2-Year Projected Peak Hourly Flow <sup>(3)</sup> (GPM)
P.S. #3 Amity	2	--	312	47,620 <sup>(1)</sup>	---	42,823	119

Footnotes:

- (1) Estimated Figure based on flow meter records for 2013.
- (2) Projected Average Daily Flow is based on the total estimated number of EDU's to be served and a flow of 229 gpd per EDU. For Pump Station No. 3, the projected total number of EDU's to be served in 2015 is 187 EDU's.
- (3) Projected Peak Hourly Flow based on a peaking factor of 4.0.

**APPENDIX "A"**

**2013 FLOW METER READINGS FROM  
PUMP STATION NO. 3**

# PUMP STATION FLOW METER READINGS

## Union Township Municipal Authority

<u>Date</u>	<u>AMITY P.S.</u>		
	<u>Meter</u>	<u>Flow</u>	<u>GPD</u>
12/27/12	62926700	287000	31,889
1/3/13	63112100	185400	26,486
1/8/13	63142000	29900	5,980
1/15/13	63237800	95800	13,686
1/24/13	63474700	236900	26,322
1/31/13	63616400	141700	20,243
2/5/13	63776700	160300	32,060
2/14/13	63909600	132900	14,767
2/21/13	64095800	186200	26,600
2/28/13	64146000	50200	7,171
3/9/13	64146000	0	0
3/14/13	64237900	91900	18,380
3/19/13	64386100	148200	29,640
3/21/13	* 657409	135480	67,740
3/28/13	693096	356870	50,981
4/4/13	722350	292540	41,791
4/11/13	752983	306330	43,761
4/18/13	790845	378620	54,089
4/23/13	822910	320650	64,130
4/29/13	857797	348870	58,145
5/7/13	885520	277230	34,654
5/14/13	935061	495410	70,773
5/21/13	969261	342000	48,857
5/28/13	1009796	405350	57,907
6/6/13	1048426	386300	42,922
6/13/13	1118597	701710	100,244
6/20/13	1165829	472320	67,474
6/25/13	1202085	362560	72,512
7/2/13	1266139	640540	91,506
7/9/13	1308449	423100	60,443
7/17/13	1371475	630260	78,783



<u>Date</u>	<u>AMITY P.S.</u>			
	<u>Meter</u>	<u>Flow</u>	<u>GPD</u>	
7/24/13	1414297	428220	61,174	
8/2/13	1482620	683230	75,914	
8/8/13	1525919	432990	72,165	
8/16/13	1587350	614310	76,789	
8/22/13	1636656	493060	82,177	
8/28/13	1675673	390170	65,028	
9/5/13	1717334	416610	52,076	
9/12/13	1762340	450060	64,294	
9/19/13	1797897	355570	50,796	
9/26/13	1840263	423660	60,523	
10/3/13	1884130	438670	62,667	
10/10/13	1922516	383860	54,837	
10/17/13	1957448	349320	49,903	
10/25/13	1985296	278480	34,810	
10/31/13	2009182	238860	39,810	
11/8/13	2032360	231780	28,973	
11/14/13	2048230	158700	26,450	
11/21/13	2067941	197110	28,159	
11/26/13	2080674	127330	25,466	
12/5/13	2115531	348570	38,730	
12/11/13	2150511	349800	58,300	
12/19/13	Inter.	2189404	388925	48,616
12/26/13		2228296	388925	55,561
1/2/14		2266947	386510	55,216

*Note: \* Meter recalibration on 3/19/2013 - flow values x10*

**APPENDIX "B"**

**2013 PUMP HOUR METER READINGS FROM  
PUMP STATION NO. 3**

**PUMP STATION PUMP HOUR METER READINGS**  
**Union Township Municipal Authority**

<u>Date</u>	AMITY P. S.		
	Pump	Hours	Hours/Day
12/27/12	1		0.0
	2		0.0
01/03/13	1		0.0
	2		0.0
01/08/13	1	30.3	
	2	31.7	
01/15/13	1	37.9	1.1
	2	35.4	0.5
01/24/13	1	44.3	0.7
	2	48.8	1.5
01/31/13	1	52	1.1
	2	58	1.3
02/05/13	1	58	1.8
	2	65	2.0
02/14/13	1	68	1.1
	2	77	1.3
02/21/13	1	76	1.1
	2	85	1.1
02/28/13	1	83	1.0
	2	94	1.3
03/09/13	1	92	1.0
	2	104	1.1
03/14/13	1	97	1.0
	2	110	1.2
03/21/13	1	106	1.3
	2	121	1.6
03/28/13	1	113	1.0
	2	130	1.3
04/04/13	1	119	0.9
	2	138	1.1
04/11/13	1	125	0.9
	2	143	0.7
04/18/13	1	132	1.0
	2	152	1.3
04/23/13	1	140	1.6
	2	158	1.2
04/29/13	1	146	1.0
	2	166	1.3
05/07/13	1	152	0.8
	2	173	0.9
05/14/13	1	161	1.3
	2	183	1.4
05/21/13	1	168	1.0
	2	189	0.9

05/28/13	1	174	0.9
	2	194	0.7
06/06/13	1	181	0.8
	2	201	0.8
06/13/13	1	194	1.9
	2	214	1.9
06/20/13	1	202	1.1
	2	222	1.1
06/25/13	1	207	1.0
	2	226	0.8
07/02/13	1	217	1.4
	2	236	1.4
07/09/13	1	225	1.1
	2	243	1.0
07/17/13	1	238	1.6
	2	255	1.5
07/24/13	1	244	0.9
	2	262	1.0
08/02/13	1	252	0.9
	2	270	0.9
08/08/13	1	257	0.8
	2	275	0.8
08/16/13	1	264	0.9
	2	283	1.0
08/22/13	1	269	0.8
	2	287	0.7
08/28/13	1	274	0.8
	2	292	0.8
09/05/13	1	279	0.6
	2	297	0.6
09/12/13	1	285	0.9
	2	302	0.7
09/19/13	1	288	0.4
	2	306	0.6
09/26/13	1	293	0.7
	2	310	0.6
10/03/13	1	298	0.7
	2	314	0.6
10/10/13	1	303	0.7
	2	318	0.6
10/17/13	1	311	1.1
	2	326	1.1
10/25/13	1	316	0.6
	2	332	0.8
10/31/13	1	322	1.0
	2	336	0.7
11/08/13	1	327	0.6
	2	341	0.6
11/14/13	1	331	0.7
	2	344	0.5

11/21/13	1	335	0.6
	2	348	0.6
11/26/13	1	338	0.6
	2	351	0.6
12/05/13	1	347	1.0
	2	358	0.8
12/11/13	1	356	1.5
	2	365	1.2
12/19/13	1	363	0.9
	2	372	0.9
12/26/13	1	373	1.4
	2	381	1.3
01/02/14	1	381	1.1
	2	391	1.4

**APPENDIX "C"**

**2013 FLOW METER CALIBRATION  
AND SERVICE REPORTS**

W.G. MALDEN

P.O. BOX 196, EAST EARL, PA 17519  
PHONE: (717) 768-0800 FAX: (717) 768-0802

\*\*\*SERVICE REPORT\*\*\*

DAVID FREIDMAN  
EEMA O&M SERVICES GROUP  
P.O. BOX 232  
KULPSVILLE, PA 19443

SERVICE DATE: 3/19/2013  
METER#: C8586 AA  
LOCATION: AMITY PUMP STATION #3  
SERIAL #: B05IB021  
MANUFACTURER: THERMO  
RECORDER: N/A  
TRANSMITTER: DCT6088  
PRIMARY: 6" D.J.  
MAXIMUM CAPACITY: 500 GPM  
SERVICE CONTRACT: SEMI-ANNUAL

---

\*WORK PERFORMED\*

CLEANED EQUIPMENT: X      PRIMARY: X

**\*RECORDER CALIBRATION\***      CHECKED AT: N/A  
ERROR: N/A      CORRECTED ACCURACY: N/A

**\*TOTALIZER CALIBRATION\***      CHECKED AT: OPERATING RATE  
ERROR: 0%      CORRECTED ACCURACY:  $\pm 1\%$

**\*TRANSMITTER CALIBRATION\***  
VOLUMETRIC DRAWDOWN  
ERROR: \*      CORRECTED ACCURACY:  $\pm 2\%$

---

COMMENTS: \*PERFORMED SEMI-ANNUAL CALIBRATION. FOUND SIGNAL FLUCTUATING WHEN FLOW IS ON AND METER DROPS TO ZERO. FOUND TRANSDUCERS SET TO WRONG SPACING. REMOUNTED TRANSDUCERS TO IRON PIPE. REPROGRAMMED METER. DECREASED LOW FLOW CUTOFF FROM 90 TO 20 GPM. CHANGED TOTALIZER MULTIPLIER TO x10. TOTALIZER 644059 x10. LEFT EQUIPMENT OPERATING PROPERLY.

SERVICE REPRESENTATIVE: BOB  
copies:

PERSON SEEN: DAVID

W.G. MALDEN

P.O. BOX 196, EAST EARL, PA 17519  
PHONE: (717) 768-0800 FAX: (717) 768-0802

\*\*\*SERVICE REPORT\*\*\*

DAVID FREIDMAN  
EEMA O&M SERVICES GROUP  
P.O. BOX 232  
KULPSVILLE, PA 19443

SERVICE DATE: 10/8/2013  
METER#: C8586 AA  
LOCATION: AMITY PUMP STATION #3  
SERIAL #: B05IB021  
MANUFACTURER: THERMO  
RECORDER: N/A  
TRANSMITTER: DCT6088  
PRIMARY: 6" D.I.  
MAXIMUM CAPACITY: 500 GPM  
SERVICE CONTRACT: SEMI-ANNUAL

---

\*WORK PERFORMED\*

CLEANED EQUIPMENT: X      PRIMARY: X

**\*RECORDER CALIBRATION\***      CHECKED AT: N/A  
ERROR: N/A      CORRECTED ACCURACY: N/A

**\*TOTALIZER CALIBRATION\***      CHECKED AT: OPERATING RATE  
ERROR: 0%      CORRECTED ACCURACY:  $\pm 1\%$

**\*TRANSMITTER CALIBRATION\***  
VOLUMETRIC DRAWDOWN  
ERROR: 0%      CORRECTED ACCURACY:  $\pm 2\%$

---

COMMENTS: PERFORMED SEMI-ANNUAL CALIBRATION. FOUND METER SHOWING 20 GPM UPON ARRIVAL. RE-ZEROED METER. NO OTHER CHANGES NEEDED. LEFT EQUIPMENT OPERATING PROPERLY.

SERVICE REPRESENTATIVE: BOB  
copies:

PERSON SEEN: WILLIAM



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***Chapter 94 Report Information From  
Douglass Township***

**SANITARY SEWER COLLECTION SYSTEM**

**D.E.P. RULES AND REGULATIONS  
CHAPTER 94**

**DOUGLASS TOWNSHIP'S ANNUAL REPORT TO  
THE TOWNSHIP OF AMITY  
2013**

**PREPARED FOR:**

**DOUGLASS TOWNSHIP  
1068 DOUGLASS DRIVE  
BOYERTOWN, PA 19512**

**PREPARED BY:**

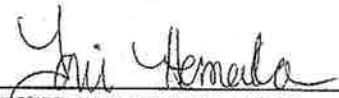
**SYSTEMS DESIGN ENGINEERING, INC.  
1032 JAMES DRIVE  
LEESPORT, PA 19533**

14-0428-0218

---

**STATEMENT OF ACCEPTANCE**

IN ACCORDANCE WITH D.E.P. RULES AND REGULATIONS, CHAPTER 94, THE  
ATTACHED REPORT IS HEREBY SUBMITTED TO AMITY TOWNSHIP.

  
\_\_\_\_\_  
TOWNSHIP MANAGER  
DOUGLASS TOWNSHIP, BERKS COUNTY

---

DOUGLASS TOWNSHIP  
BERKS COUNTY, PENNSYLVANIA

CHAPTER 94 – MUNICIPAL WASTELOAD MANAGEMENT  
ANNUAL REPORT – 2013  
CONTRIBUTORY FLOW TO AMITY TOWNSHIP

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Pursuant to P.L. 1987, Chapter 94 - Municipal Wasteload Management, Douglass Township submits the following information for compilation into the Township of Amity Sewage Treatment Plant - Chapter 94:

**A. PRESENT CONNECTION AND QUARTERLY AVERAGE DAILY FLOWS**

The number of residential, light commercial and light industrial connections from Douglass Township, Berks County served by Amity Township's Sewage Treatment Plant is approximately 291. The number of sewer EDU's from Douglass Township for 2013 was approximately 317. This number is based on a billing EDU of 12,500 gallons per quarter.

The sewage is metered at the wet well type (Duplex - submersible pumps) pumping station.

The latest quarterly meter readings were:

1st Quarter	2013	4,368,070	gallons
2nd Quarter	2013	4,754,460	gallons
3rd Quarter	2013	4,636,440	gallons
4th Quarter	2013	4,127,750	gallons

The three month max occurred in April, May and June with a total flow of 4,754,460 gallons or 52,246 GPD.

**B. NEW CONNECTIONS AND EXTENSIONS**

The system was constructed during the years 1999 and 2000. The system came on line with the first connections being May / June 2000. In year 2013, there were fourteen (14) new connections to the collection system. The total EDU's were adjusted per Douglass Township's sewer account records. At this time no new extensions are anticipated by the Township. Any new extensions will be provided by individual developers.

The following Subdivision/Land Development plan is currently in the preliminary plan stage.

1. Crable Tract                      44 single family units

Presently there is one (1) development which is currently under construction. This is an active project and connections are on-going.

1. Douglass Village              302 proposed total connections (142 current connections)  
Mobile Home Park

The following subdivision/land development plans have received final plan approval and are recorded but construction has not yet begun.

1. 84 Lumber LDP                      1-2 EDU's (expand lumber yard and new office building)

The following subdivision/land development plan is presently at final plan stage and will be recorded in the near future.

1, NYCE Truck Terminal (At Trap Rock Business Center) 2 EDU's

### C. SEWER SYSTEM MONITORING AND MAINTENANCE

Douglass Township employs three (3) full time people whom do all monitoring and maintenance work on the sanitary sewer. The metering equipment exists at the pumping station site. This metering equipment is checked periodically for unusual readings and preventative maintenance.

A pumping station is maintained near Old Philadelphia Pike adjacent to S.R. 0442 and the Pottstown Bypass. This station is checked daily except weekends and holidays. Inspection of the collection system is accomplished as time permits. All connections installed into the sanitary collection system are inspected as completed.

The collection system lines and manholes were inspected as well as all non-residential user facilities by the Township staff. A 24-hour composite sampler was installed during the 4<sup>th</sup> quarter of 2013 and is being maintained by the Township at the Good West Industries facility.

### D. CONDITION OF SEWER COLLECTION SYSTEM

The sanitary sewer collection system consists of approximately 4,453 linear feet of 10" PVC pipe, 19,042 linear feet of 8" PVC pipe, 2,568 linear feet of 6" pipe, 2,701 linear feet of 8" SDR 21 plastic force main, and a duplex submersible pump pumping station with valve box and metering equipment. The sewer system is in good condition. Presently the system has sufficient capacity to handle all proposed and existing flows during the next five (5) years with no areas of the system exceeding conveyance capacity due to projected flows for the next five (5) years.

The pump station force main receiving manhole at the intersection of Old River Road and River Road Bridge Road was rehabilitated with an epoxy liner.

### E. PUMP STATION

Location:	Old Philadelphia Pike adjacent to S.R. 0442 and the Pottstown Bypass
Pumps To:	Amity Township Municipal Authority's interceptor at Old River Road and River Bridge Road for treatment at Amity Township's wastewater treatment plant.
Pumps:	Two (2) - Gorman-Rupp

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Specified Capacity: 349 GPM at 37.4 feet TDH each pump

The pumping station is in good operating condition and is being maintained adequately.

The pump station was inspected and serviced by Envirep the pump station manufacturer representative.

**F. INDUSTRIAL WASTELOADS**

There are no industrial discharges that fall within EPA pretreatment regulations draining to the pumping station.

**G. OTHER CONNECTIONS**

There is one (1) Amity Township connection with multiple users connected to the Douglass Township sanitary sewer collection system.

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***Chapter 94 Report Information From  
Earl Township***



# Ebert Engineering, Inc.

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Water and Wastewater Engineering

March 6, 2014

Mr. Michael D. Sassaman  
ARRO Consulting, Inc.  
50 Berkshire Court, Suite 209  
Wyomissing, PA 19610

Subject: 2013 Chapter 94 Report  
Re: Earl Township  
EE, Inc. No.: 044-001

Dear Mike,

On behalf of Earl Township, we are transmitting the completed questionnaire for your use in completing the Amity Township Chapter 94 Report for 2013. We have also enclosed three copies of the current Earl Township Public Sanitary Sewer District.

We have included copies of the flow meter calibration certificates. Please note that on June 18, 2013 the flow meter scale shifted from 0 to 500 gpm to 0 to 399.9 gpm. This resulted in the recording of flows that were 30 gpm higher than actual flows. The representative from LRM, Inc. tried to unsuccessfully to adjust the Badger flow meter and the scale. The flow meter after numerous attempts to repair and calibrate was finally replaced with a new flow meter on October 16, 2013. It is noted that flow meter information was not accurate from June 18, 2013 until October 16, 2013 and was not used in the calculations for the 2013 Chapter 94 Report. This is documented on the August 27, 2013 field report from LRM, Inc.

Should you have any questions concerning this matter, please feel free to contact either this office or Earl Township directly.

Very truly yours,



Frederick E. Ebert, P.E.  
President

Enclosure

CC: Amity Township (w/enclosure)  
Earl Township (w/enclosure)

**Amity Township Question One**

- 1. A detailed determination of how population equivalent calculations are determined for residential, commercial and industrial customers.*

**Earl Township Response**

Earl Township requires that every residential unit purchase one edu. The flow per edu is defined as being equal to 300 gpd/edu. Earl Township has one commercial user in its current service area which is the Tiki Bar. The number of edus assigned to this commercial user is four. This was calculated by dividing their actual flows by 300 gpd/edu and rounding up to the next higher edu. Earl Township has 137 edus connected to the public sanitary sewer system. This includes 133 residential edus and 4 commercial edus. There were four residential connections to the public sanitary sewer system in 2013.

The Earl Township connected population is 362 persons. This figure is based on the existing connection of 137 edus and census data that indicates an average of 2.64 persons per household (137 edus x 2.64 persons per household = 362 persons). The following table presents the Earl Township population projections based on the same methodology:

<b>Year</b>	<b>Projected EDU Connections</b>	<b>Equivalent Population Projection*</b>
2014	139	367
2015	152	401
2016	153	404
2017	155	409
2018	156	412

\* - based on 2.64 persons per household

**Amity Township Question Two**

- 2. Include a map showing the entire tributary sewer system and identifying all sewer extensions constructed within the past year. Indicate all proposed sewer extensions that are not yet constructed and estimated schedules for construction and connection of new EDUs.*

**Earl Township Response**

Three copies of the latest public sanitary sewer map are attached to this questionnaire. The map is entitled "Earl Township, Berks County, PA Sewer District Map". This map illustrates the current public sanitary sewer service area of Earl Township that is tributary to Amity Township.

There are no sanitary sewer extensions that were completed last year. There are currently no sanitary sewer extensions projected in 2014. The next anticipated sanitary sewer extension will be the connection of Camp Manatawny. The construction schedule for this project is not currently known. There were however four connections made to the existing collection system in 2013.

It is anticipated that the connections in 2014 will be connection of existing lots that have not previously connected because the lots are located in a approved subdivision (Esterly Subdivision) that has lots remaining to sell. We have also included a spreadsheet that summarizes all of the proposed connections and the location of the lots is identified by letter and number on the plan.

<b>Year</b>	<b>Projected EDU Connections</b>	<b>Equivalent Population Projection*</b>
2014	139	367
2015	152	401
2016	153	404
2017	155	409
2018	156	412

\* - based on 2.64 persons per household

**Amity Township Question Three**

- 3. Include a detailed discussion of the tributary sewer system program for sewer system monitoring, maintenance, repair, and rehabilitation including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, and I/I monitoring.*

**Earl Township Response**

The annual average flow was 15,150 gpd, the three consecutive months flow was 16,432 gpd and the maximum monthly flow that was recorded in 2013 was 17,556 gpd. The maximum monthly flow is 34,944 gpd (52,500 gpd - 17,556 gpd) less than the allocation. The ratio of the maximum monthly flow to the annual average is 1.16 (17,556 gpd / 15,150 gpd). The flow per edu is 114 gpd/edu (15,150 gpd / 133 edus). This is significantly below the 300 gpd/ edu that was used to design the low pressure system.

All of the flows are conveyed through a single meter pit. The flow meter is calibrated every quarter. On June 18, 2013 the flow meter malfunctioned and needed to be replaced. The repair and replacement of the flow meter was completed on October 16, 2013. Amity Township was made aware of the flow meter issues and the previous annual average flow was utilized for the period of time when the flow meter was not accurately measuring the flows. The flow meter has since been accurately recording the flows. The above analysis excludes the flows from the period of June to October of 2013. The meter inaccuracies were found through the flow meter quarterly calibration procedures and the remote monitoring capability of the flow meter. Earl Township has since established a standard operating procedure to monitor the flows and be able to react to a flow meter malfunction in a more timely fashion in the future.

**Amity Township Question Four**

- 4. Include a discussion of the condition of the sewer system, identify portions where conveyance capacity is exceeded or will be exceeded in the next five years, and areas where rehabilitation or cleaning is necessary to prevent sanitary sewer overflows (SSO), excessive infiltration, or other system problems.*

**Earl Township Response**

The public sanitary sewer system is in excellent condition. There are no areas or sections where the capacity is anticipated to be exceeded or projected to be exceeded in the next five years. There are no known problems in the conveyance system. Earl Township may have the low-pressure system flushed in 2014 as part of its preventative maintenance program.

The actual flows are significantly lower than the design flow per edu primarily due to the fact that there is little opportunity for I/I to entering into the collection since the majority of the collection system is a low pressure system. The installation of the collection system was also recently installed and the installation was inspected by representatives of the Township.

**Amity Township Question Five**

5. *A detailed discussion of the condition of each pumping station including a comparison of maximum pumping rate with present maximum flows and projected two-year maximum flows for each station.*

*Pumping station capacities and current peak flow rates must be determined and documented based on flow meter readings at each pumping station or by accurate draw down tests and hourly run time meters. If no flow meters or hourly run time meters are available at a pumping station, contact Amity Township immediately to discuss.*

**Earl Township Response**

The Earl Township public sanitary sewer service area does not contain any municipally owned and operated pump stations. The majority of the Earl Township's sanitary sewer collection system is however a low pressure system with individual grinder pumps on each property.

**Amity Township Question Six**

6. *Industrial Wastes - A report of industrial wastes discharged into the sewer system. This report shall include the following:*
  - a. *A copy of any current ordinance or regulation governing industrial waste discharges to the sewer system.*
  - b. *A discussion of the municipality's program for surveillance and monitoring of industrial waste discharges into the sewer system during the past year.*
  - c. *A discussion of specific problems in the sewer system known or suspected to be caused by industrial waste discharges and a summary of the steps being taken to alleviate or eliminate the problems. The discussion shall include a list of industries known to be discharging wastes which create problems in the plant or in the sewer system and action taken to eliminate the problem or prevent its recurrence. The report may describe pollution prevention techniques in the summary of steps taken to alleviate current problems caused by industrial waste dischargers and in actions taken to eliminate or prevent potential or recurring problems caused by industrial waste dischargers.*

**Earl Township Response**

The Earl Township public sanitary sewer service area does not include any industrial waste discharges.

**Amity Township Question Seven**

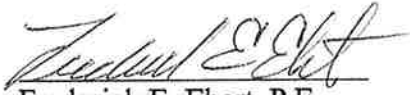
7. *A proposed plan to reduce or eliminate present or projected overloaded conditions in any part of the tributary sewer system or pumping stations.*

**Earl Township Response**

There are no present or projected overload conditions in the low pressure or gravity sanitary sewer collection and conveyance system. There are no pump stations in the public sanitary sewer collection system. It is noted that the majority of the connected edus are connected to the low pressure portion of the public sanitary sewer collection system.

Earl Township has purchased 175 edus from Amity Township. The flow per edu that is defined in the intermunicipal agreement is 300 gpd/edu. This is a flow allocation of 52,500 gpd (175 edus x 300 gpd/edu). The annual average flow was 15,150 gpd, the three consecutive months flow was 16,432 gpd and the maximum monthly flow that was recorded in 2013 was 17,556 gpd. The maximum monthly flow is 34,944 gpd (52,500 gpd - 17,556 gpd) less than the allocation. The ratio of the maximum daily flow to the annual average is 1.16 (17,556 gpd / 15,150 gpd). The flow per edu is 114 gpd/edu (15,150 gpd / 133 edus). This is significantly below the 300 gpd/ edu that was used to design the low pressure system.

Completed By:

  
Frederick E. Ebert, P.E.

Title: Earl Township Wastewater Engineer

Address: Ebert Engineering, Inc.  
4092 Skippack Pike  
PO Box 540  
Skippack, PA

Phone: (610) 584.6701



# LRM, Inc

Instrumentation & Disinfection Systems

Calibration Date

2/12/2013

User

Earl Township  
19 Schoolhouse Rd

Job Site

Boyertown Pa 19512

Attn

Instrument Model No.

Instrument S/N

Estech Badger Vantage  
2210

10376

Instrument Loop

Input Type

RT 562 Metering Station

Ultrasonic

Primary Signal Producer

Calibrated Range

8" Palmer - Bowlus Flume

0 - 500 GPM

### Instrument Settings

Found

Changed To

Zero	Span
24.45"	500

Zero	Span
n/c	n/c

### Calibration Data

Input %	Input Value	Output Value	% Error After Calibration
0 %	n/a	mADC	100.00%
50 %	n/a	mADC	100.00%
100 %	n/a	mADC	100.00%

Equipment Used Stick Rule Isco Standards Book

Adjustments / Actions Taken : None

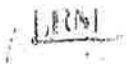
Comments :

Service Representative

Dean R. Witt

Date 2/19/2013

215 N. Main Street - Souderton, Pa 18964 - 215-721-4840 - Fax 215-721-4923



# LRM, Inc

Instrumentation & Disinfection Systems

Calibration Date

8/15/2013

User

Earl Township  
19 Schoolhouse Rd  
Boyertown Pa 19512

Job Site

[Empty box]

Attn

Instrument Model No.

Estech Badger Vantage  
2210

Instrument S/N

10376

Instrument Loop

RT 562 Metering Station

Input Type

Ultrasonic

Primary Signal Producer

8" Palmer - Bowlus Flume

Calibrated Range

0 - 500 GPM

### Instrument Settings

Found

Changed To

Zero	Span
24.45"	500

Zero	Span
n/c	399.9

### Calibration Data

Input %	Input Value	Output Value	% Error After Calibration
0 %	n/a	mADC	100.00%
50 %	n/a	mADC	100.00%
100 %	n/a	mADC	100.00%

Equipment Used    Stick Rule    Isco Standards Book

Adjustments / Actions Taken :    None

Comments :

July 18, 2013 at 3:12 PM the scale shifted from 0 - 500 GPM to 0 - 399.9 GPM which resulted in recording flows 30 GPM higher than actual. Tried to reset the scale and the Badger unit would not accept a change to 500. Could not move the program through it's functions and presume that the unit is defective. Changed the scale on the Ecograph to 399.9 to match the Badger unit.

Service Representative

Dean R. Witt

Date 8/27/2013

215 N. Main Street - Souderton, Pa 18964 - 215-721-4840 - Fax 215-721-4923



# LRM, L

Instrumentation & Disinfection Systems

Startup Date  
10/15/2013

User

1st Township  
15 Schoolhouse Rd  
Boyertown Pa 19512

Job Site

RT 502 Metering Station

Instrument Model No.

FMU90-R21CA111AA1A

Instrument Loop

Station Flow

Primary Signal Producer

8" Palmer - Bowlus Flume

Instrument S/N

H9002C150E6

Input Type

Ultrasonic

Calibrated Range

0 - 500 GPM

Instrument Settings

Zero	Span
23.25"	500

## Calibration Data

Input %	Input Value	Output Value	% Error After Calibration
0 %	0.00 GPM	4.00 mADC	0.00%
50 %	250.00 GPM	12.00 mADC	0.00%
100 %	500.00 GPM	20.00 mADC	0.00%

Comments:

Equipment Used

Stick Rule

Unit Generated  
Flow Curve

FieldCare  
Software

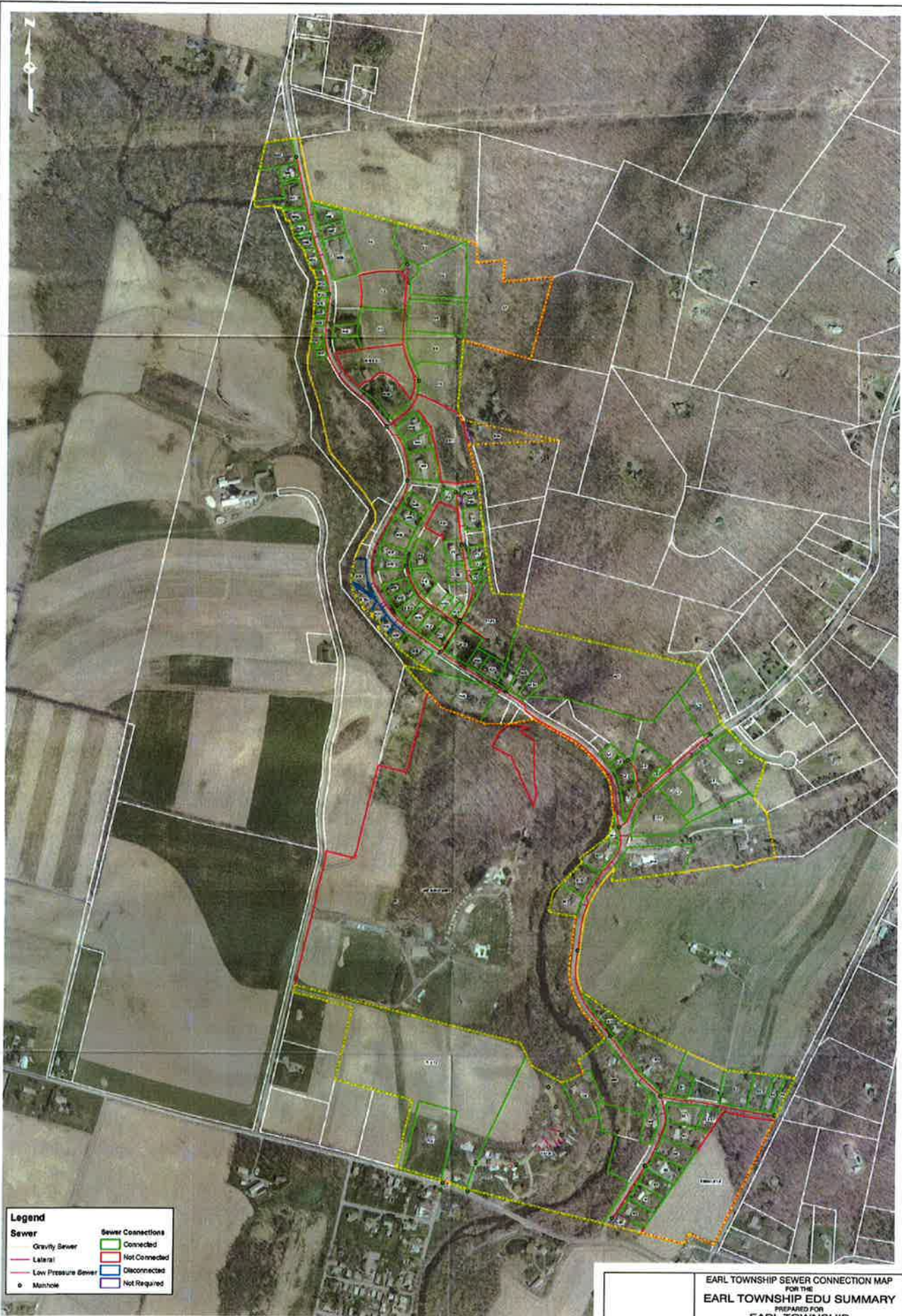
Adjustments / Actions Taken .

Startup

Service Representative Dean R Witt



Date 10/16/2013



Legend	
Sewer	Sewer Connections
— Gravity Sewer	— Connected
— Lateral	— Not Connected
— Low Pressure Sewer	— Disconnected
● Manhole	— Not Required

EARL TOWNSHIP SEWER CONNECTION MAP  
 FOR THE  
 EARL TOWNSHIP EDU SUMMARY  
 PREPARED FOR  
 EARL TOWNSHIP

**Ebert Engineering, Inc.**  
 Water and Wastewater Engineering  
 170 Box 640  
 4000 Strickland Pike, Suite 200  
 Elliptical, PA 16714  
 Phone: (810) 884-6701  
 Fax: (810) 884-6704  
 E-mail: [kw@eberengineering.com](mailto:kw@eberengineering.com)

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Number	Description	Date	Drawn By	Project Engr.	Checked By	Scale	Job No.	Date	Drawing No.
1	ISSUED FOR 2010 CHAPTER 94 REPORT	02/18/11							
			EMK	FEE	FEE	AS NOTED	044-001	02/10/11	1 OF 1

# Ebert Engineering, Inc.

## Water and Wastewater Engineering

February 6, 2014

Mr. Charles E. Lyons  
Amity Township  
2004 Weavertown Road  
Douglassville, PA 19518

FEB 10 2014

Subject: Amity Township Act 537 Plan Update  
Re: Earl Township - Sanitary Sewer Capacity Request  
EE, Inc. No.: 044-005

Dear Mr. Lyons,

On behalf of Earl Township, I am providing you the requested information concerning Earl Township's potential wastewater needs for treatment by Amity Township for the next ten years.

- Current Reserved Capacity = 52,500 gpd
- Future Wastewater Treatment Needs (Beyond Current Reservation) = 8,627 gpd
- Total Capacity Requested (Current + Future) = 61,127 gpd

The above request is based upon the following preliminary Earl Township sewage facilities planning efforts and analysis of existing capacity allocation.

Earl Township is in early discussions with the PA DEP concerning updating Earl Township's Act 537 Plan. One of the study areas known as the Worman Area could be serviced through a connection to Amity Township. This area consists of approximately 115 parcels of land. It is currently estimated that Earl Township will require 130 edus to service this area. The difference between the number of parcels and the total estimated edus is to account for existing commercial properties, properties that currently have multiple dwellings on them and the limited potential for development of the existing parcels in the potential public sanitary sewer service area. The total wastewater flow that will be generated from the Worman Area is approximately 39,000 gpd (130 edus x 300 gpd/edu). We have attached a copy of the potential sanitary sewer service area for your information.

Earl Township has purchased 52,500 gpd of wastewater capacity in the existing Amity Township WWTP to service the Manatawny Sewer Service Area. The flows from Earl Township to Amity Township from this area are as follows:

- Annual Average Flow = 11,152 gpd
- Maximum Three Consecutive Monthly Flow = 11,689 gpd

Earl Township currently has connected 133 edus. They have also currently allocated an additional twenty two (22) edus that are not currently connected. Earl Township would like to keep an additional five (5) edus as a buffer for this area. This is a total of twenty seven (27) edus. Using the flow per edu of 300 gpd/edu, the total additional flow to fully service the Manatawny Sewer Service Area is 8,100 gpd (27 edus x 300 gpd/edu).

**Earl Township Capacity Request**

**February 6, 2014**

**Page 2 of 2**

The current base flow was calculated to be 14,027 gpd (11,689 gpd x 1.2) by taking the maximum three consecutive monthly flow multiplied by 1.2 (allocation for future I/I). The additional flows for twenty seven (27) above described allocated and future edus is 8,100 gpd (27 edus x 300 gpd/edu). The total projected flows for the Manatawny Sewer Service Area is 22,127 gpd (14,027 gpd + 8,100 gpd). This will leave Earl Township will an excess allocation of 30,373 gpd (52,500 gpd - 22,127 gpd) for their Manatawny Sewer Service Area.

Earl Township as part of this capacity request would like to transfer the 30,373 gpd of excess capacity from the Manatawny Sewer Service Area to the potential Worman Sewer Service Area contingent on the PA DEP approval of both Township's Act 537 Plan updates. This will result in an additional capacity request of 8,627 gpd (39,000 gpd - 30,373 gpd).

In summary the total anticipated wastewater needs of Earl Township for treatment by Amity Township would be 61,127 gpd. This is composed of 22,127 gpd for the Manatawny Sewer Service Area and 39,000 gpd for the potential Worman Sewer Service Area. The result is a request to increase Earl Township's current allocation by 8,627 gpd (61,127 gpd - 52,500 gpd).

Should you have any questions or require any additional information, please feel free to contact Earl Township or myself.

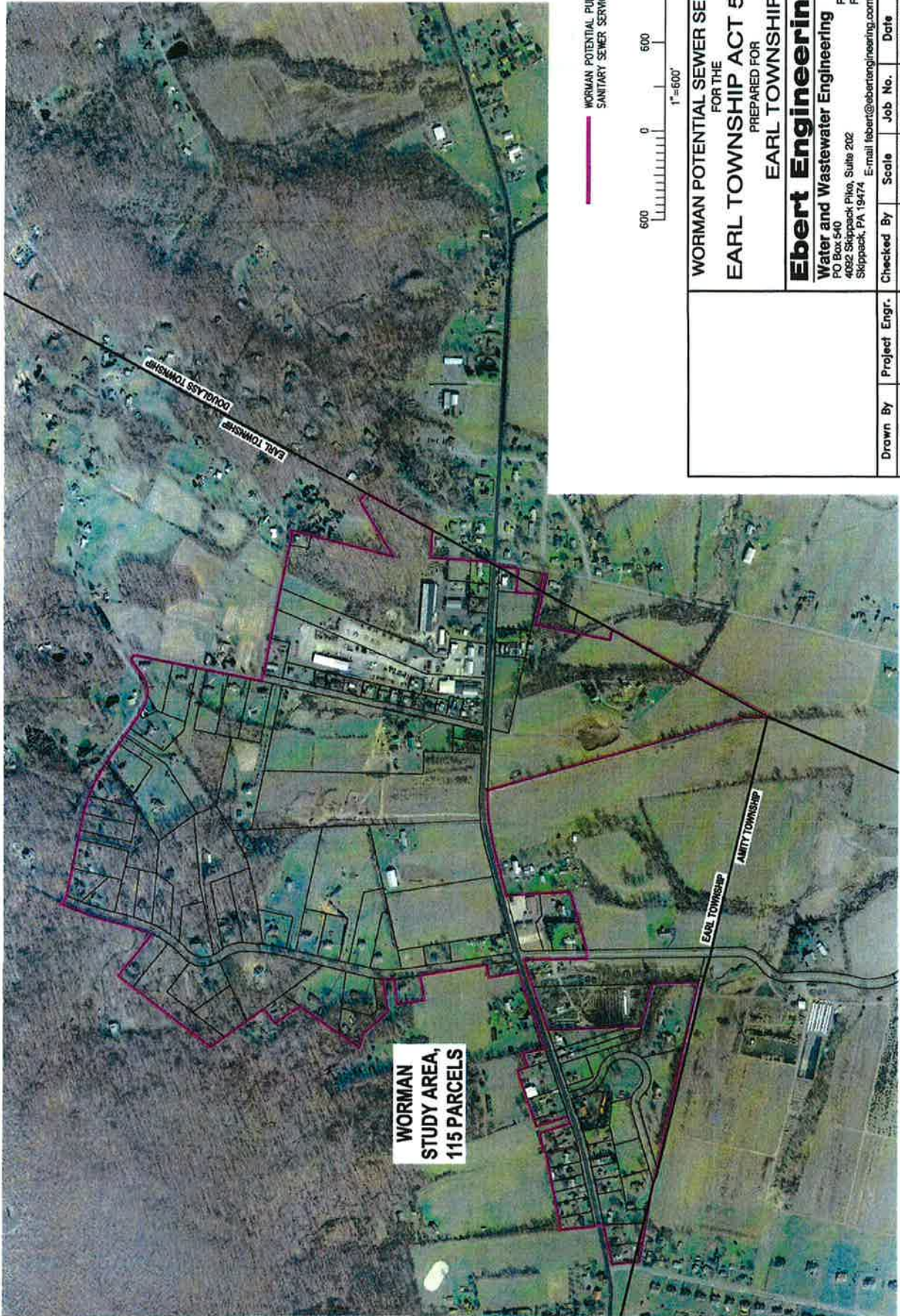
Very truly yours,



Frederick E. Ebert, P.E.  
President

Enclosure

CC: Earl Township (w/enclosure)  
Dennis Smaglinski, P.E. (w/enclosure)



**WORMAN  
STUDY AREA,  
115 PARCELS**

WORMAN POTENTIAL PUBLIC  
SANITARY SEWER SERVICE AREA



**WORMAN POTENTIAL SEWER SERVICE AREA  
FOR THE  
EARL TOWNSHIP ACT 537 PLAN**  
PREPARED FOR  
**EARL TOWNSHIP**

**Ebert Engineering, Inc.**  
Water and Wastewater Engineering  
PO Box 540  
4022 Skippeck Pike, Suite 202  
Skippeck, PA 19474  
E-mail: [lebert@ebertengineering.com](mailto:lebert@ebertengineering.com)  
Phone (610) 594 6701  
Fax (610) 594 6704

Drawn By	Project Engr.	Checked By	Scale	Job No.	Date	Drawing No.
AR	MCW	FEE	1" = 600'	044-005	02/06/14	1 OF 1