Brookhaven Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Borough of Brookhaven**	Permit No.:	**PA N/A**
Mailing Address:	**2 Cambridge Road**	Effective Date:	**N/A**
City, State, Zip:	**Brookhaven, PA 19015**	Expiration Date:	**N/A**
Contact Person:	**Mary Ellen McKinley**	Renewal Due Date:	**N/A**
Title:	**Borough Secretary**	Municipality:	**Brookhaven Borough**
Phone:	**610-874-2557**	County:	**Delaware**
Email:	**mary.mckinley@brookhavenboro.com**	Consultant Name:	**NDI Engineering Company**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   N/A

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment A**)

List summarizing each extension or project attached (**Attachment**)

Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

The Borough has provided Sewer Planning Exemptions to the PA DEP for the following locations in 2018:
1. 315 W. Brookhaven Road - 7 lateral connections and sewer main extension

The Borough requests all developers to provide the removal of an equivalent amount of EDUs to allow for no net increase in flow.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Borough personnel observe conditions of the manhole frames and covers and look for evidence of overflows while performing routine Borough business. The Borough routinely cleans and jets mains known to be problematic for backups. The Borough, in 2018, purchased a camera capable of televising sanitary mains.

Attached plan shows locations of maintenance, repair/rehab completed in 2018:
Sanitary Sewer Root Control -
Street Lateral Replacments - 115 Roberts; 3432 Janney Avenue; 3408 Mt Vernon; 3700 Arlington; 3541 Morris
Vent/Trap - 3700 Arlington; 3541 Morris
House Lateral Replacement - (0)
Sewer Cleaning - 250LF 3731 Ridgewood; 200+LF Schoolhouse/Mt Vernon; 380LF Radio Park at Edgmont; 550LF Brookhaven/Edgmont
Sewer Televising - 260LF @ Schoolhouse/Mt Vernon; 300LF Brookhaven Road; televised lateral - Brookhaven Road; 500LF Brookhaven @ Edgmont
Sewer Cleaning/Televising - 929LF Trimble (vic of Victor); 2241LF lined, Brookhaven Road (vic Gray); Edgmont (Coeburn to Brookhaven)
Sewer Main Replacement - 8LF @ 115 Roberts; 8LF @ Schoolhouse/Mt Vernon; 20LF @ 3432 Janney; 20 LF 3408 Mt Vernon; 10LF 3541 Morris; 12LF 3700 Arlington
Manhole Rehabilitation (0)

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The Borough's system is primarily terracotta. The Borough has recevied a PA Small Water and Sewer Grant and will be replacing 618LF of sewer main and street laterals in 2019 along W. Brookhaven Road.

July 2018 - Edgmont Avenue, vicinity of McDonalds - Combination of sanitary sewer backup due to grease build-up at McDonald's restaurant diverting sanitary sewer flow into the storm sewer at the same time as a water main break in the CWA system, also diverting the main flow into the storm sewer. Note that we are investigating whether the storm sewer is owned by PennDOT or the Borough. Quantity of discharge is unkown.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

This report demonstrates an existing hydraulic overload condition.
This report demonstrates a projected hydraulic overload condition.
This report demonstrates an existing organic overload condition.
This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Mary Ellen McKinley	Mary Ellen McKinley
Name of Responsible Official	Signature
(610) 874-2557	02/14/2019
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

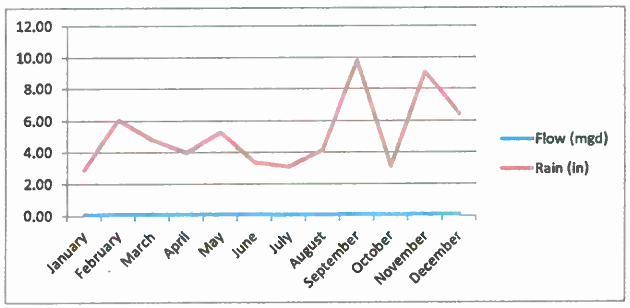
Eileen W. Mulvena, PE	Eileen W. Mulvena
Name of Preparer	Signature
(856) 848-0033	2/14/19
Telephone No.	Date

Brookhaven Delcora
Meter Location: MH01 - 3451 11th Street - 9.5" pipe

Month	2014	2015	2016	2017	2018	Rainfall (in) 2014	Rainfall (in) 2015	Rainfall (in) 2016	Rainfall (in) 2017	Rainfall (in) 2018
January	0.07	0.03	0.03	0.03	0.05	6.63	5	5.17	2.57	2.85
February	0.08	0.04	0.05	0.03	0.07	7.61	3.54	4.45	1.52	6.02
March	0.07	0.05	0.05	0.05	0.07	5.35	6.85	2.12	3.49	4.74
April	0.07	0.03	0.04	0.04	0.07	6.69	3.58	1.78	3.15	3.94
May	0.07	0.03	0.04	0.05	0.07	2.91	1.19	6.65	6.27	5.21
June	0.05	0.04	0.03	0.04	0.06	5.46	8.88	1.87	1.86	3.34
July	0.05	0.04	0.03	0.04	0.05	4.3	3.16	3.88	5.35	3.06
August	0.04	0.02	0.02	0.04	0.05	3.55	0.98	1.7	6.05	4.11
September	0.03	0.03	0.03	0.05	0.06	1.69	6.27	3.52	3.86	9.76
October	0.03	0.03	0.03	0.04	0.05	2.53	3.51	2.06	3.66	3.08
November	0.03	0.02	0.03	0.04	0.07	4.07	1.89	2.17	1.31	9.03
December	0.03	0.03	0.03	0.03	0.07	3.28	5.41	2.72	2.27	6.38
Annual Average	0.05	0.03	0.03	0.04	0.06					
3 Month Max. Average	0.07	0.04	0.05	0.04	0.07					
Ratio (3 mon Max to AA Ratio)	1.41	1.23	1.37	1.00	1.14					
5-YR Average Hydraulic Ratio			1.23							
Total						54.07	50.26	49.99	41.36	61.52

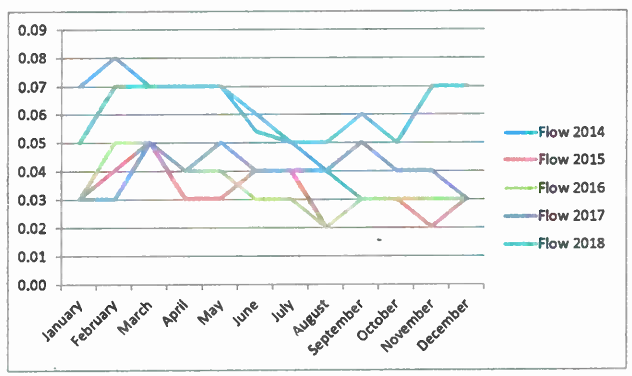
Meter Location: MH02 - 3451 11th Street - 9.5" pipe
2018 Monthly Flow / Rain

	Flow (mg	Rain (in)
January	0.05	2.85
February	0.07	6.02
March	0.07	4.74
April	0.07	3.94
May	0.07	5.21
June	0.06	3.34
July	0.05	3.06
August	0.05	4.11
September	0.06	9.76
October	0.05	3.08
November	0.07	9.03
December	0.07	6.38



5 year Average Monthly Flow

	Flow 201	Flow 201	Flow 201	Flow 201	Flow 2018
January	0.07	0.03	0.03	0.03	0.05
February	0.08	0.04	0.05	0.03	0.07
March	0.07	0.05	0.05	0.05	0.07
April	0.07	0.03	0.04	0.04	0.07
May	0.07	0.03	0.04	0.05	0.07
June	0.05	0.04	0.03	0.04	0.06
July	0.05	0.04	0.03	0.04	0.05
August	0.04	0.02	0.02	0.04	0.05
September	0.03	0.03	0.03	0.05	0.06
October	0.03	0.03	0.03	0.04	0.05
November	0.03	0.02	0.03	0.04	0.07
December	0.03	0.03	0.03	0.03	0.07

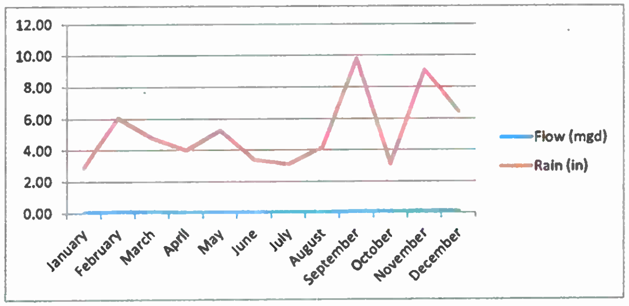


Meter Location: MH03 - Mt. Vernon, vicinity Upland Road, 8" pipe

Month	2014	2015	2016	2017	2018	Rainfall (in) 2014	Rainfall (in) 2015	Rainfall (in) 2016	Rainfall (in) 2017	Rainfall (in) 2018
January	0.03	0.04	0.02	0.03	0.03	6.63	5	5.17	2.57	2.85
February	0.08	0.02	0.05	0.02	0.07	7.61	3.54	4.45	1.52	6.02
March	0.04	0.05	0.02	0.05	0.07	5.35	6.85	2.12	3.49	4.74
April	0.04	0.04	0.02	0.05	0.04	6.69	3.58	1.78	3.15	3.94
May	0.04	0.02	0.05	0.05	0.04	2.91	1.19	6.65	6.27	5.21
June	0.02	0.06	0.02	0.04	0.04	5.46	8.88	1.87	1.86	3.34
July	0.02	0.04	0.03	0.05	0.03	4.3	3.16	3.88	5.35	3.06
August	0.02	0.02	0.02	0.05	0.04	3.55	0.98	1.7	6.05	4.11
September	0.01	0.02	0.03	0.03	0.08	1.69	6.27	3.52	3.86	9.76
October	0.01	0.03	0.02	0.03	0.07	2.53	3.51	2.06	3.66	3.08
November	0.02	0.02	0.02	0.02	0.09	4.07	1.89	2.17	1.31	9.03
December	0.02	0.03	0.03	0.02	0.09	3.28	5.14	2.72	2.27	6.38
Annual Average	0.03	0.03	0.03	0.04	0.06					
3 Month Max. Average	0.05	0.04	0.03	0.05	0.08					
Ratio (3 mon Max to AA Ratio)	1.83	1.23	1.21	1.36	1.45					
5-YR Average Hydraulic Ratio		1.42								
Total						54.07	49.99	38.09	41.36	61.52

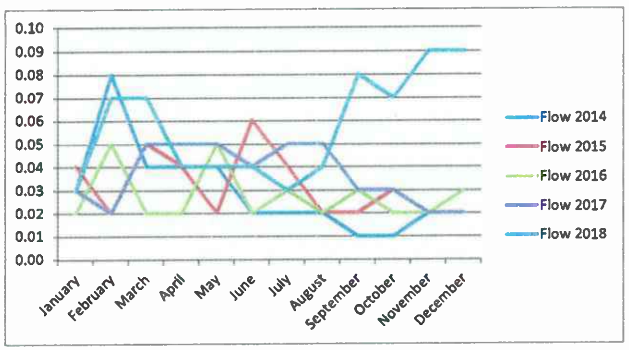
Meter Location: MH03 - Mt. Vernon, vicinity Upland Road, 8" pipe
2018 Monthly Flow / Rain

	Flow (mg	Rain (in)
January	0.03	2.85
February	0.07	6.02
March	0.07	4.74
April	0.04	3.94
May	0.04	5.21
June	0.04	3.34
July	0.03	3.06
August	0.04	4.11
September	0.08	9.76
October	0.07	3.08
November	0.09	9.03
December	0.09	6.38



5 year Average Monthly Flow

	Flow 201	Flow 201	Flow 201	Flow 201	Flow 2018
January	0.03	0.04	0.02	0.03	0.03
February	0.08	0.02	0.05	0.02	0.07
March	0.04	0.05	0.02	0.05	0.07
April	0.04	0.04	0.02	0.05	0.04
May	0.04	0.02	0.05	0.05	0.04
June	0.02	0.06	0.02	0.04	0.04
July	0.02	0.04	0.03	0.05	0.03
August	0.02	0.02	0.02	0.05	0.04
September	0.01	0.02	0.03	0.03	0.08
October	0.01	0.03	0.02	0.03	0.07
November	0.02	0.02	0.02	0.02	0.09
December	0.02	0.03	0.03	0.02	0.09

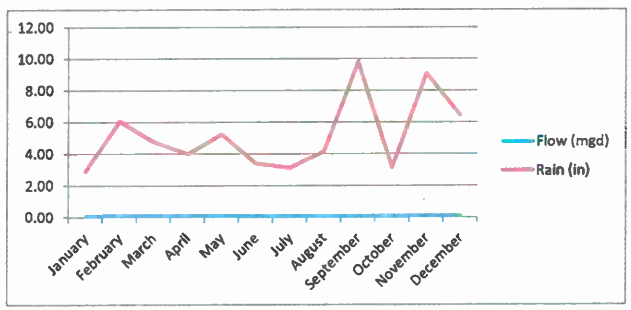


Meter Location MH04 - 141 Meadowbrook Lane, 18" pipe

Month	2014	2015	2016	2017	2018	Rainfall (in) 2014	Rainfall (in) 2015	Rainfall (in) 2016	Rainfall (in) 2017	Rainfall (in) 2018
January	0.58	0.47	0.48	0.45	0.44	6.63	5	5.17	2.57	2.85
February	0.69	0.44	0.49	0.42	0.53	7.61	3.54	4.45	1.52	6.02
March	0.65	0.56	0.48	0.45	0.60	5.35	6.85	2.12	3.49	4.74
April	0.65	0.46	0.45	0.46	0.47	6.69	3.58	1.78	3.15	3.94
May	0.67	0.43	0.46	0.46	0.44	2.91	1.19	6.65	6.27	5.21
June	0.54	0.52	0.42	0.40	0.42	5.46	8.88	1.87	1.86	3.34
July	0.45	0.52	0.42	0.44	0.38	4.3	3.16	3.88	5.35	3.06
August	0.39	0.45	0.41	0.42	0.41	3.55	0.98	1.7	6.05	4.11
September	0.37	0.48	0.41	0.38	0.45	1.69	6.27	3.52	3.86	9.76
October	0.38	0.48	0.42	0.40	0.52	2.53	3.51	2.06	3.66	3.08
November	0.41	0.44	0.42	0.42	0.62	4.07	1.89	2.17	1.31	9.03
December	0.42	0.54	0.44	0.42	0.69	3.28	5.14	2.72	2.27	6.38
Annual Average	0.52	0.48	0.44	0.43	0.50					
3 Month Max. Average	0.66	0.50	0.48	0.46	0.61					
Ratio (3 mon Max to AA Ratio)	1.28	1.03	1.09	1.07	1.23					
5-YR Average Hydraulic Ratio	1.14									
Total						54.07	49.99	49.99	41.36	61.52

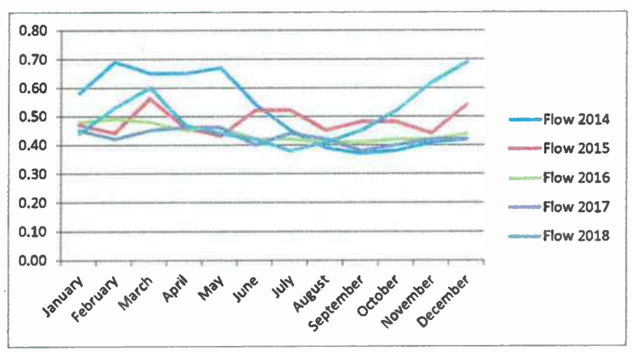
Meter Location MH04 - 141 Meadowbrook Lane, 18" pipe
2018 Monthly Flow / Rain

	Flow (mg	Rain (in)
January	0.44	2.85
February	0.53	6.02
March	0.60	4.74
April	0.47	3.94
May	0.44	5.21
June	0.42	3.34
July	0.38	3.06
August	0.41	4.11
September	0.45	9.76
October	0.52	3.08
November	0.62	9.03
December	0.69	6.38



5 year Average Monthly Flow

	Flow 201	Flow 201	Flow 201	Flow 201	Flow 2018
January	0.58	0.47	0.48	0.45	0.44
February	0.69	0.44	0.49	0.42	0.53
March	0.65	0.56	0.48	0.45	0.60
April	0.65	0.46	0.45	0.46	0.47
May	0.67	0.43	0.46	0.46	0.44
June	0.54	0.52	0.42	0.40	0.42
July	0.45	0.52	0.42	0.44	0.38
August	0.39	0.45	0.41	0.42	0.41
September	0.37	0.48	0.41	0.38	0.45
October	0.38	0.48	0.42	0.40	0.52
November	0.41	0.44	0.42	0.42	0.62
December	0.42	0.54	0.44	0.42	0.69



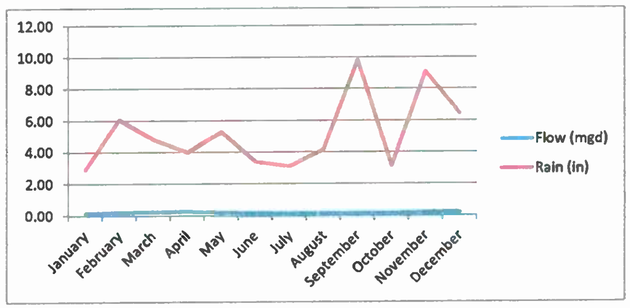
Meter Location MH05 / 05ALT- 115 Garrison Road, 10" pipe

Month	2014	2015	2016	2017	2018	Rainfall (in) 2014	Rainfall (in) 2015	Rainfall (in) 2016	Rainfall (in) 2017	Rainfall (in) 2018
January	0.18	0.11	0.09	0.14	0.13	6.63	5	5.17	2.57	2.85
February	0.21	0.12	0.16	0.11	0.19	7.61	3.54	4.45	1.52	6.02
March	0.18	0.19	0.11	0.16	0.21	5.35	6.85	2.12	3.49	4.74
April	0.19	0.12	0.10	0.16	0.22	6.69	3.58	1.78	3.15	3.94
May	0.19	0.09	0.11	0.15	0.17	2.91	1.19	6.65	6.27	5.21
June	0.14	0.12	0.09	0.13	0.15	5.46	8.88	1.87	1.86	3.34
July	0.12	0.09	0.10	0.14	0.12	4.3	3.16	3.88	5.35	3.06
August	0.10	0.07	0.09	0.14	0.12	3.55	0.98	1.7	6.05	4.11
September	0.10	0.07	0.10	0.14	0.12	1.69	6.27	3.52	3.86	9.76
October	0.10	0.10	0.10	0.14	0.12	2.53	3.51	2.06	3.66	3.08
November	0.10	0.09	0.10	0.14	0.17	4.07	1.89	2.17	1.31	9.03
December	0.11	0.10	0.12	0.14	0.18	3.28	5.14	2.72	2.27	6.38
Annual Average	0.14	0.11	0.11	0.14	0.16					
3 Month Max. Average	0.19	0.14	0.12	0.16	0.21					
Ratio (3 mon Max to AA Ratio)	1.35	1.35	1.17	1.11	1.31					
5-YR Average Hydraulic Ratio	1.26									
Total						54.07	49.99	38.09	41.36	61.52

NOTE: The meter appears to have stopped working on 8/4/17; new meter at next m/h installed on 8/22/17; readings incorporated here.

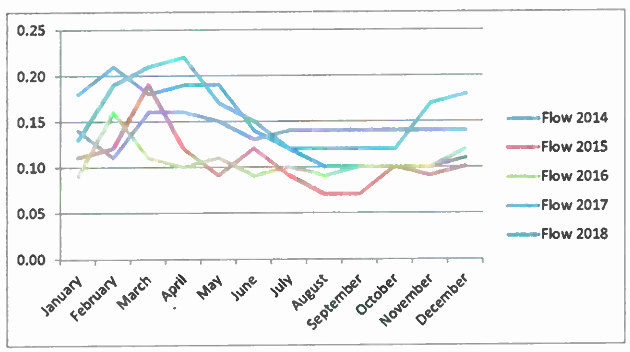
Meter Location MH05/05ALT - 115 Garrison Road, 10" pipe
2017 Monthly Flow / Rain

	Flow (mg	Rain (in)
January	0.13	2.85
February	0.19	6.02
March	0.21	4.74
April	0.22	3.94
May	0.17	5.21
June	0.15	3.34
July	0.12	3.06
August	0.12	4.11
September	0.12	9.76
October	0.12	3.08
November	0.17	9.03
December	0.18	6.38



5 year Average Monthly Flow

	Flow 201	Flow 201	Flow 201	Flow 201	Flow 2018
January	0.18	0.11	0.09	0.14	0.13
February	0.21	0.12	0.16	0.11	0.19
March	0.18	0.19	0.11	0.16	0.21
April	0.19	0.12	0.10	0.16	0.22
May	0.19	0.09	0.11	0.15	0.17
June	0.14	0.12	0.09	0.13	0.15
July	0.12	0.09	0.10	0.14	0.12
August	0.10	0.07	0.09	0.14	0.12
September	0.10	0.07	0.10	0.14	0.12
October	0.10	0.10	0.10	0.14	0.12
November	0.10	0.09	0.10	0.14	0.17
December	0.11	0.10	0.12	0.14	0.18

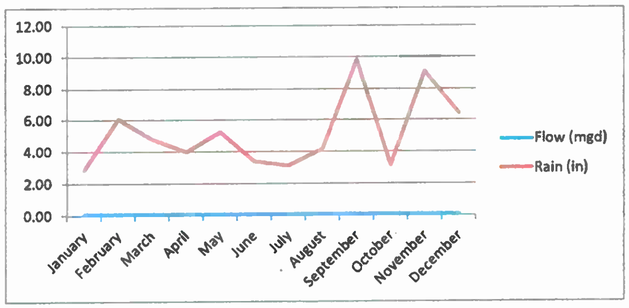


Meter Location MH06 - Meadowbrook and Williamson, 8" pipe

Month	2014	2015	2016	2017	2018	Rainfall (in) 2014	Rainfall (in) 2015	Rainfall (in) 2016	Rainfall (in) 2017	Rainfall (in) 2018
January	0.05	0.05	0.04	0.05	0.05	6.63	5	5.17	2.57	2.85
February	0.06	0.05	0.05	0.05	0.06	7.61	3.54	4.45	1.52	6.02
March	0.06	0.06	0.04	0.06	0.06	5.35	6.85	2.12	3.49	4.74
April	0.05	0.04	0.04	0.05	0.05	6.69	3.58	1.78	3.15	3.94
May	0.06	0.04	0.04	0.05	0.05	2.91	1.19	6.65	6.27	5.21
June	0.05	0.05	0.04	0.04	0.04	5.46	8.88	1.87	1.86	3.34
July	0.04	0.05	0.04	0.04	0.04	4.3	3.16	3.88	5.35	3.06
August	0.04	0.04	0.03	0.04	0.04	3.55	0.98	1.7	6.05	4.11
September	0.04	0.04	0.04	0.04	0.04	1.69	6.27	3.52	3.86	9.76
October	0.04	0.04	0.03	0.04	0.04	2.53	3.51	2.06	3.66	3.08
November	0.04	0.04	0.04	0.04	0.04	4.07	1.89	2.17	1.31	9.03
December	0.04	0.04	0.04	0.04	0.05	3.28	5.14	2.72	2.27	6.38
Annual Average	0.05	0.05	0.04	0.05	0.05					
3 Month Max. Average	0.06	0.05	0.04	0.05	0.06					
Ratio (3 mon Max to AA Ratio)	1.19	1.19	1.11	1.19	1.21					
5-YR Average Hydraulic Ratio	1.18									
Total						54.07	49.99	38.09	41.36	61.52

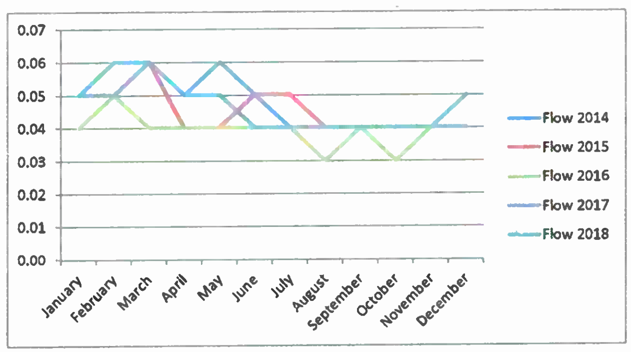
Meter Location MH06 - Meadowbrook and Williamson, 8" pipe
2018 Monthly Flow / Rain

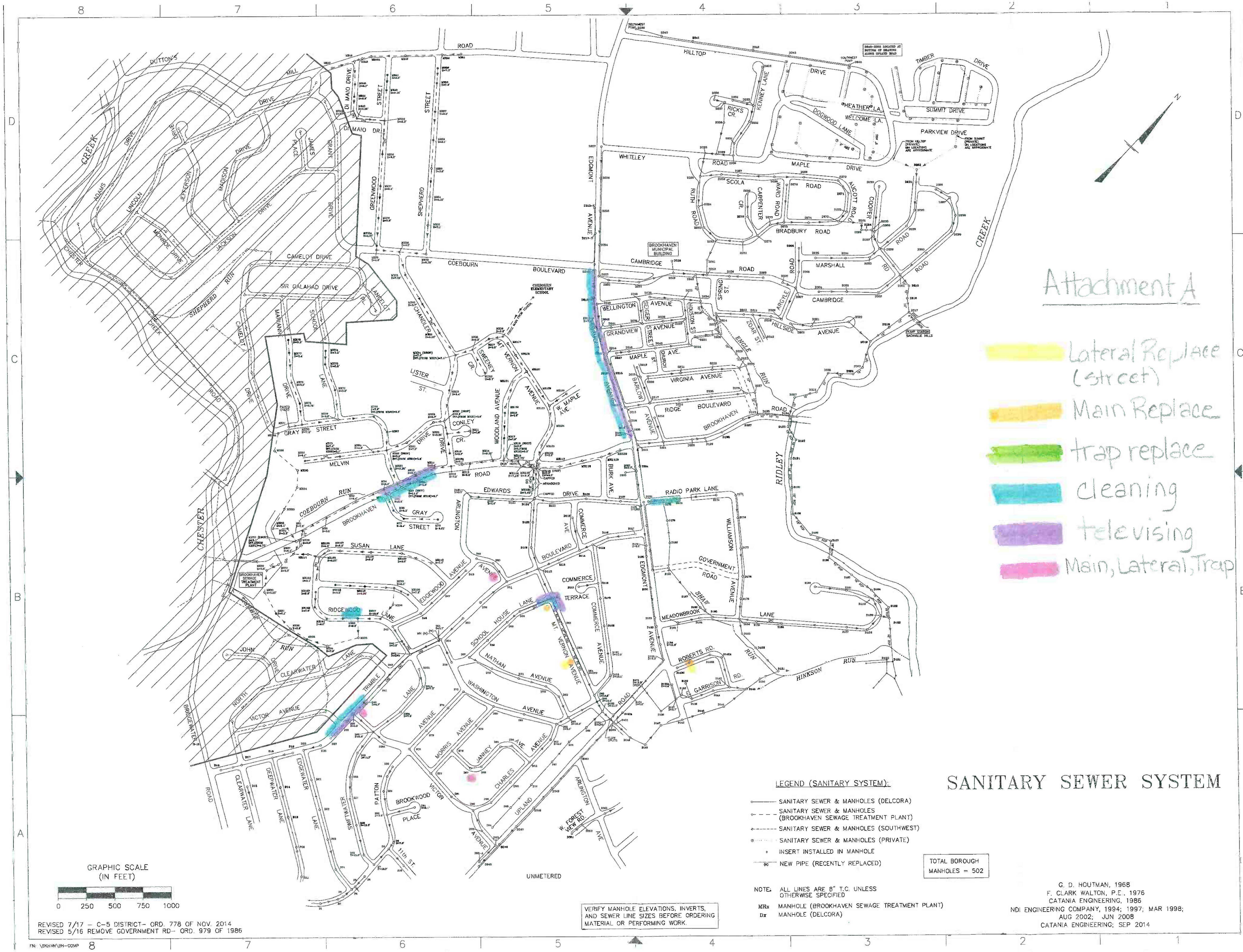
	Flow (mg	Rain (in)
January	0.05	2.85
February	0.06	6.02
March	0.06	4.74
April	0.05	3.94
May	0.05	5.21
June	0.04	3.34
July	0.04	3.06
August	0.04	4.11
September	0.04	9.76
October	0.04	3.08
November	0.04	9.03
December	0.05	6.38



5 year Average Monthly Flow

	Flow 201	Flow 201	Flow 201	Flow 201	Flow 2018
January	0.05	0.05	0.04	0.05	0.05
February	0.06	0.05	0.05	0.05	0.06
March	0.06	0.06	0.04	0.06	0.06
April	0.05	0.04	0.04	0.05	0.05
May	0.06	0.04	0.04	0.05	0.05
June	0.05	0.05	0.04	0.04	0.04
July	0.04	0.05	0.04	0.04	0.04
August	0.04	0.04	0.03	0.04	0.04
September	0.04	0.04	0.04	0.04	0.04
October	0.04	0.04	0.03	0.04	0.04
November	0.04	0.04	0.04	0.04	0.04
December	0.04	0.04	0.04	0.04	0.05




Attachment A
Lateral Replace (street)
Main Replace
trap replace
cleaning
televising
Main, Lateral, Trap
SANITARY SEWER SYSTEM
LEGEND (SANITARY SYSTEM):
SANITARY SEWER & MANHOLES (DELCORA)
SANITARY SEWER & MANHOLES (BROOKHAVEN SEWAGE TREATMENT PLANT)
SANITARY SEWER & MANHOLES (SOUTHWEST)
SANITARY SEWER & MANHOLES (PRIVATE)
INSERT INSTALLED IN MANHOLE
NEW PIPE (RECENTLY REPLACED)
TOTAL BOROUGH MANHOLES = 502
NOTE: ALL LINES ARE 8" T.C. UNLESS OTHERWISE SPECIFIED
MHx MANHOLE (BROOKHAVEN SEWAGE TREATMENT PLANT)
Dx MANHOLE (DELCORA)
G. D. HOUTMAN, 1968
F. CLARK WALTON, P.E., 1976
CATANIA ENGINEERING, 1986
NDI ENGINEERING COMPANY, 1994; 1997; MAR 1998;
AUG 2002; JUN 2008
CATANIA ENGINEERING; SEP 2014
VERIFY MANHOLE ELEVATIONS, INVERTS, AND SEWER LINE SIZES BEFORE ORDERING MATERIAL OR PERFORMING WORK.
UNMETERED
GRAPHIC SCALE (IN FEET)
0 250 500 750 1000
REVISED 7/17 – C-5 DISTRICT- ORD. 778 OF NOV. 2014
REVISED 5/16 REMOVE GOVERNMENT RD– ORD. 979 OF 1986
FN: \BKHVN\BN-COMP
BROOKHAVEN MUNICIPAL BUILDING
COEBOURN ELEMENTARY SCHOOL
BROOKHAVEN SEWAGE TREATMENT PLANT
PUMP STATION SACKVILLE MILLS
HILLTOP
EDGMONT AVENUE
COEBOURN BOULEVARD
BROOKHAVEN ROAD
RIDLEY CREEK
CHESTER CREEK
CAMBRIDGE ROAD
RADIO PARK LANE
MEADOWBROOK LANE
HINKSON RUN
SHEPHERD RUN
DUTTON'S MILL

Central Delaware County Authority

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Central Delaware County Authority**	Permit No.:	**PA N/A**
Mailing Address:	**212B Unity Terrace**	Effective Date:	**N/A**
City, State, Zip:	**Rutledge, PA 19070**	Expiration Date:	**N/A**
Contact Person:	**Charles J. Lillicrapp, Jr.**	Renewal Due Date:	**N/A**
Title:	**Chairman**	Municipality:	**N/A**
Phone:	**610-544-9944**	County:	**Delaware**
Email:	**cdca@craftech.com**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

   ☐ List summarizing each extension or project attached (**Attachment**)

   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

   No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is attached.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   See attachment.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☒ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☐ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

Based upon the video inspection program, the system is in fair to good condition. There are no known areas of capacity exceedance and no areas of capacity exceedance expected in the next five years. See attahced for the SSO noted for the 2018 calendar year.
Crum Creek Pump Station is projected to be 24 MGD.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☐ The collection system does not contain pump stations

☒ The collection system does contain pump stations (Number – **1**)

☒ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

- ☐ This report demonstrates an existing hydraulic overload condition.
- ☐ This report demonstrates a projected hydraulic overload condition.
- ☐ This report demonstrates an existing organic overload condition.
- ☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles J. Lillicrapp, Jr.	[signature]
Name of Responsible Official	Signature
610-544-9944	2-25-2019
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles Catania Jr.	Charles J Catania
Name of Preparer	Signature
610-532-2884	2/21/19
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Central Delaware County Authority - System Flows

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	0.36561	0.32963	0.29602	0.28065	0.27677
February	0.51889	0.34038	0.41099	0.28571	0.41929
March	0.40313	0.44435	0.32788	0.30968	0.43
April	0.43187	0.36618	0.31622	0.35	0.37433
May	0.47306	0.28882	0.34779	0.33226	0.36677
June	0.35193	0.33225	0.303	0.28667	0.34667
July	0.28019	0.31259	0.26325	0.26774	0.26871
August	0.26177	0.24047	0.23841	0.26452	0.28968
September	0.25603	0.23629	0.24334	0.26333	0.35567
October	0.24474	0.26592	0.23517	0.24839	0.32032
November	0.28227	0.25215	0.2395	0.25333	0.48033
December	0.29855	0.31136	0.26438	0.24516	0.45871
Annual Avg	0.34733811	0.3100326	0.2904964	0.28228623	0.36560445
Max 3-Mo Avg	0.45129619	0.38363669	0.35169545	0.33064516	0.41978853
Max : Avg Ratio	1.30	1.24	1.21	1.17	1.15
Existing EDUs	36,334.0	36,197.0	36,197.0	36,517.0	36,517.0
Flow/EDU (GPD)	9.6	8.6	8.0	7.7	10.0
Flow/Capita (GPD)	2.7	2.4	2.3	2.2	2.9
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	36,334	36,197	36,197	36,517	36,517
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	10.0	10.0	10.0	10.0	10.0
New EDU Flow	0.0001	0.0001	0.0001	0.0001	0.0001
Proj. Annual Avg	0.31925	0.31935	0.31945	0.31955	0.31965
Proj. Max 3-Mo Avg	0.38737	0.38749	0.38762	0.38774	0.38786
Proj. Overload?					

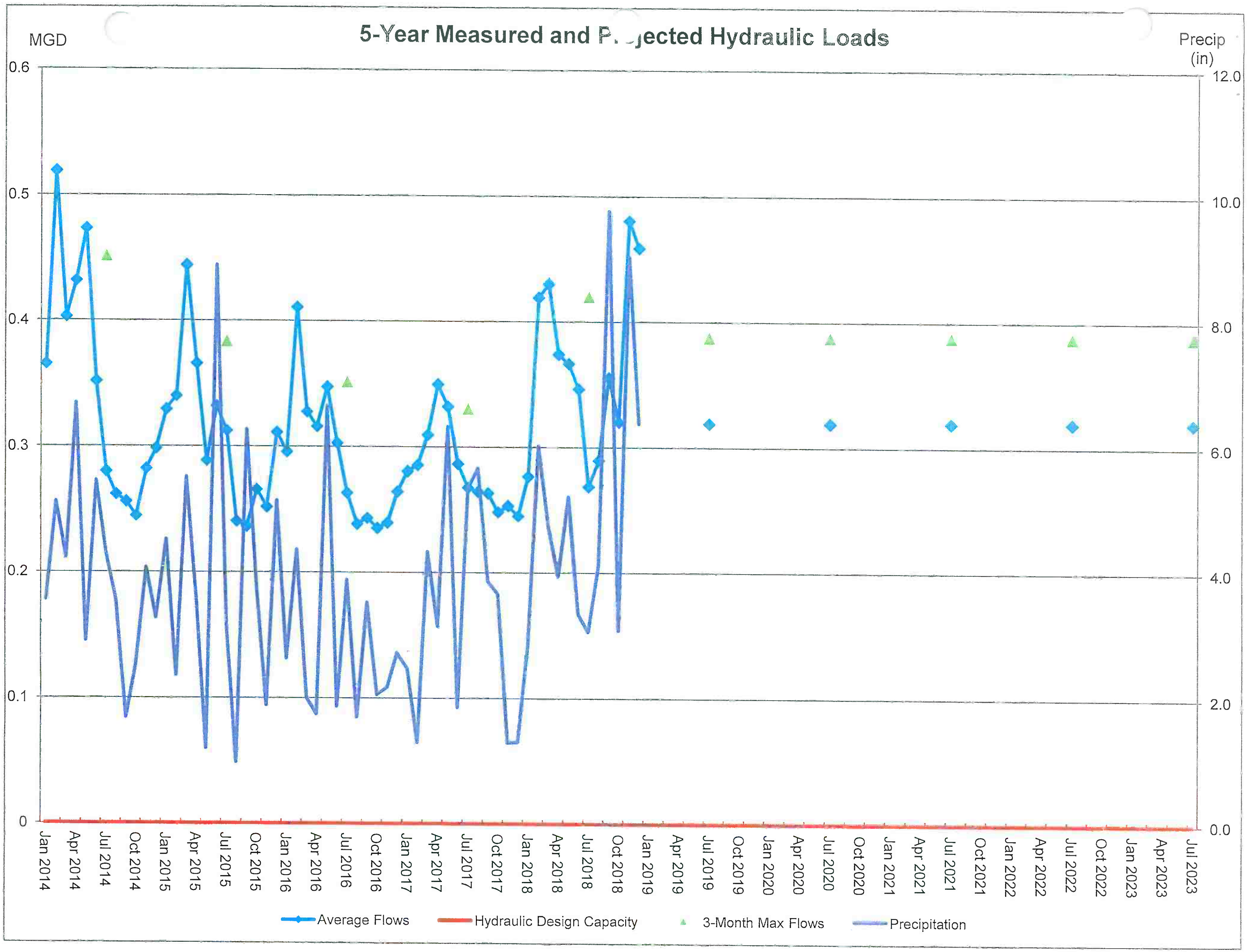
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	10	10	10	10	10
New EDU Load	5.840	5.840	5.840	5.840	5.840
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38


5-Year Measured and P. jected Hydraulic Loads
MGD
Precip (in)
0.6
0.5
0.4
0.3
0.2
0.1
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
Jul 2017
Oct 2017
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Central Delaware County Authority-Crum Creek Pump Station

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	0.16419	0.14387	0.13258	0.17323	0.19161
February	0.20393	0.15143	0.17586	0.17571	0.2175
March	0.18677	0.18677	0.13258	0.17194	0.21935
April	0.191	0.15733	0.194	0.20067	0.17733
May	0.19968	0.13323	0.13323	0.15806	0.12548
June	0.163	0.14933	0.14933	0.16633	0.172
July	0.13613	0.13613	0.13613	0.11323	0.17065
August	0.12581	0.11968	0.11968	0.1271	0.13839
September	0.12067	0.12367	0.12367	0.18	0.17267
October	0.11516	0.12645	0.12645	0.14452	0.11516
November	0.12767	0.12833	0.12833	0.15633	0.13033
December	0.13355	0.14129	0.14129	0.14839	0.21226
Annual Avg	0.15562935	0.14145955	0.14109424	0.15962494	0.17022805
Max 3-Mo Avg	0.19390092	0.1651787	0.1674809	0.18277215	0.20948925
Max : Avg Ratio	1.25	1.17	1.19	1.15	1.23
Existing EDUs	36,334.0	36,197.0	36,197.0	36,517.0	36,517.0
Flow/EDU (GPD)	4.3	3.9	3.9	4.4	4.7
Flow/Capita (GPD)	1.2	1.1	1.1	1.2	1.3
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	36,334	36,197	36,197	36,517	36,517
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	0.0	0.0	0.0	0.0	0.0
New EDU Flow	0	0	0	0	0
Proj. Annual Avg	0.15361	0.15361	0.15361	0.15361	0.15361
Proj. Max 3-Mo Avg	0.1836	0.1836	0.1836	0.1836	0.1836
Proj. Overload?					

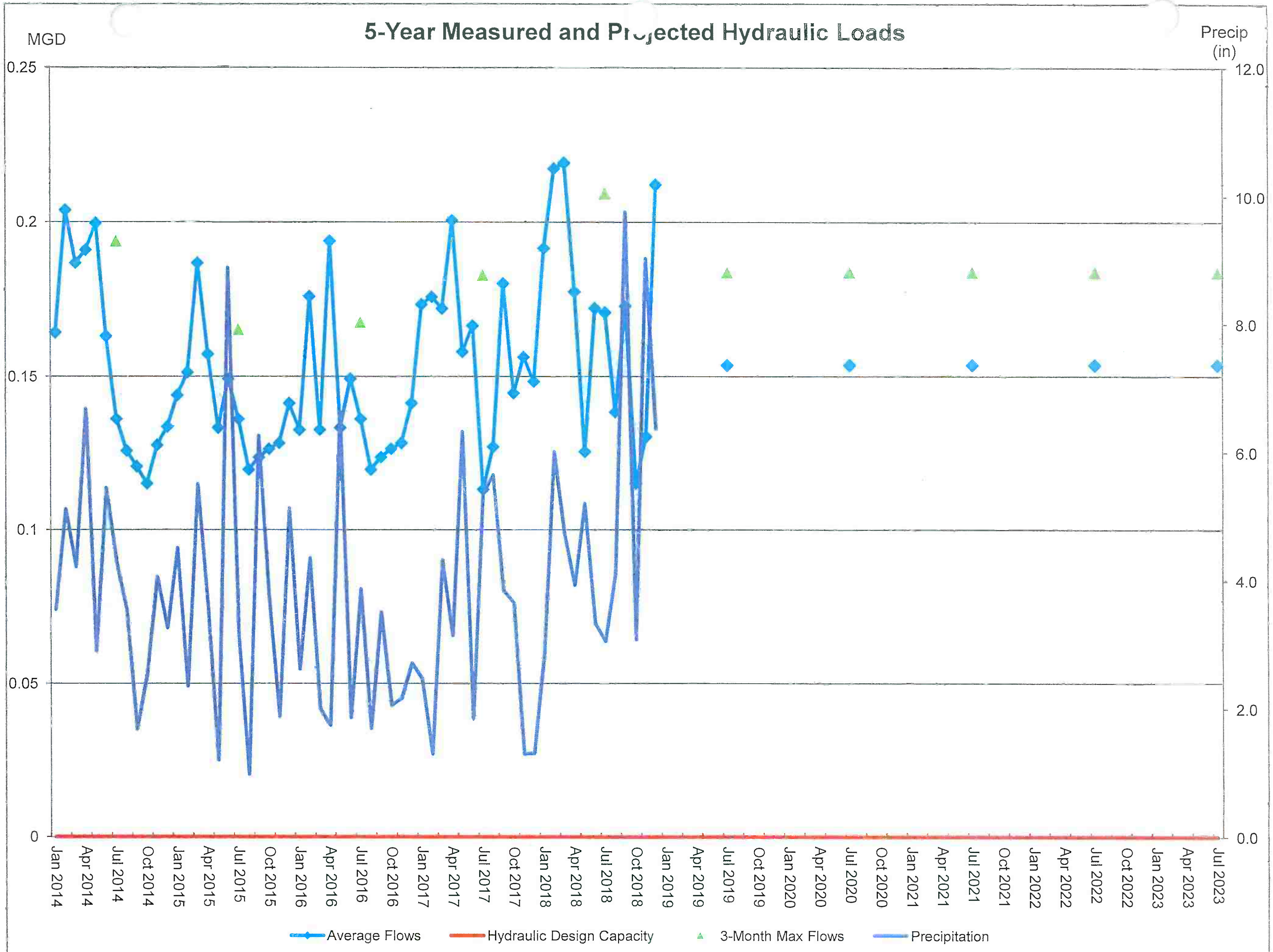
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	0	0	0	0	0
New EDU Load	0.000	0.000	0.000	0.000	0.000
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38


5-Year Measured and Projected Hydraulic Loads
MGD
Precip (in)
0.25
0.2
0.15
0.1
0.05
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
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Oct 2019
Jan 2020
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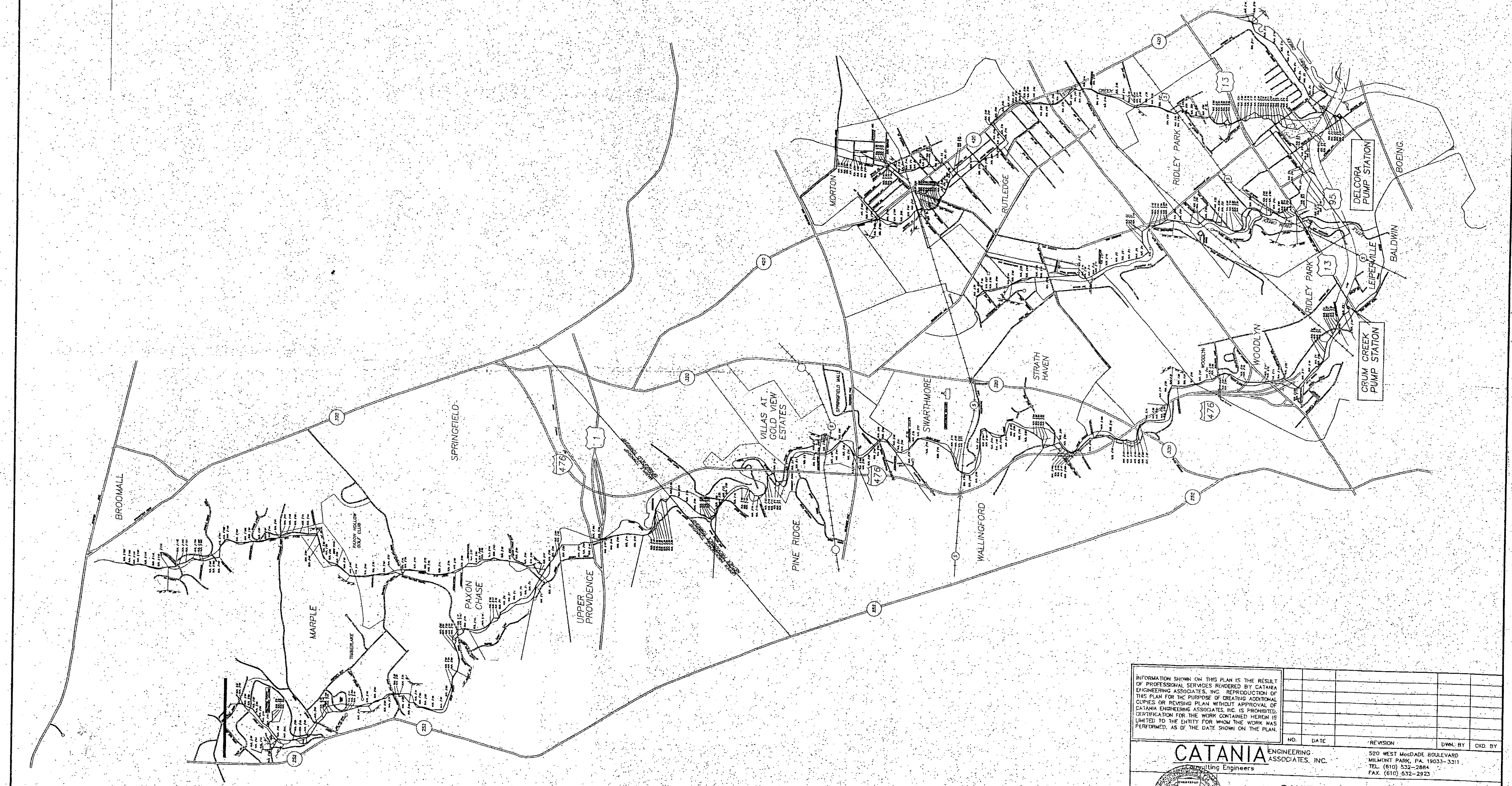
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation



REFERENCE DRAWINGS
CENTRAL DELAWARE COUNTY AUTHORITY
JOHN P. DAMON AND ASSOCIATES, INC.
CIVIL ENGINEERS
WALLINGFORD, PA

NO.	DATE	REVISION	DWN. BY	CKD. BY

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers
520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

REGISTERED PROFESSIONAL CHARLES J. CATANIA, JR ENGINEER No. 044557-E PENNSYLVANIA

SANITARY SEWER SYSTEM FOR CENTRAL DELAWARE COUNTY AUTHORITY

MAIN MAP

DWN. BY N.J.C.	DSG. BY C.	FIELD BOOK/PAGE NA	SCALE NTS	DRAWING NO. 84250
CKD. BY A.J.P.			DATE 11/18/02	SHEET 4 OF 4 SHEETS

Sanitary Sewer Monitoring Report

The CDCA regularly monitors, maintains, and repairs its system. Line cleaning and video inspections are performed on regular intervals. The interceptor line and manholes are inspected annually and a system inspection is completed after each major storm event to monitor any irregularities within the system such as manhole damage, exposed pipe, or sinkholes over the sewer line. Emergency repair work is performed when required.

In 2003, the CDCA began a twelve year program of monitoring, maintenance, rehabilitation, and repair. This program was updated and expanded in 2008 to continue through 2021. Monitoring and line cleaning is performed according to this program through video inspection and various line cleaning methods. Based on video from the inspections, a yearly Sanitary Sewer Assessment Report is created and a maintenance schedule is outlined. High priority, low priority, and I&I abatement issues are identified and addressed. The personnel and equipment used for routine monitoring, maintenance, repair, and rehabilitation is obtained through an outside contractor.

The CDCA, in coordination with DELCORA, instituted a system-wide flow metering system in 2006. A Flow Metering Quality Control Program which includes meter calibration and verification processes has been implemented. Standardized calibration of the flow metering equipment is performed and calibration reports are maintained by an outside contractor for DELCORA. Yearly review of metering data is performed by the CDCA Maintenance Committee and recommendations for metering program improvement are developed.

a. Monitoring and Maintenance: In 2018, Mr. Rehab, LLC performed part of the line cleaning and video inspection services as outlined in the CDCA Line Cleaning and Video Inspection Program outline.

b. Repair and Rehabilitation: Interceptor maintenance in 2018 was performed by A.J Jurich, Inc. Issues identified through the video monitoring and maintenance program as well as problems that arose through 2018 were addressed. The Authority maintains records of all work performed, personnel and equipment utilized.

c. Flow Data Analysis, Quality Assurance, and I&I Monitoring: DELCORA has placed flow metering equipment throughout the CDCA service area. Locations of flow meters should be noted on individual township maps. CSL Services, Inc. has been retained by DELCORA to calibrate and maintain the flow monitoring equipment through 2018. Calibration data is maintained by CSL. Flow metering and maintenance is performed according to the CDCA Flow Metering Quality Control Program. Data from the flow meters are used to evaluate where I & I occurs in the system. Analysis of the flow-meter data was performed periodically by the CDCA Maintenance Committee for abnormal data. Individual municipalities that had unusual readings were contacted to assist them in the identification and correction of infiltration into the system.

CDCA has implemented a program in the past year that allows member municipalities to utilize spare flow meters purchased by CDCA to further investigate potential sources of inflow and infiltration. CDCA has a total of 6 meters available for use and member municipalities can request to use them when they are available.

Sanitary Sewer Overflow (SSO) Report to PADEP– Water Management **DEP fax: 484-250-5971**

Please check the appropriate box ☐ Dry Weather Overflow ☒ Wet Weather Overflow

1. Date, Name, Phone # of person completing this report	Date : January 16, 2018 Name : Charles Catania Jr, PE Phone #: 610-532-2884
2. Your organization name and address ?	Name: Central Delaware County Authority (CDCA) County: Delaware Address: 212B Unity Terrace Township/Municipality: Rutledge PA 19070
Sewer system owner and permit number	Central Delaware County Authority; Permit #
3. Date found and specific location of SSO. Including Municipality/County (if different from #2) ?	Date: January 12, 2018 Municipality: Ridley Township Location(Street & #): Angelo Dr County: Delaware
4. How was SSO discovered? By whom ?	Construction Inspector checking construction site during heavy rain event
5. Start and end time of SSO (actual or estimate?)	Estimate 2PM start time, end time 3:30 PM
6. Date, time and name of person who notified PADEP originally to notify of SSO ?	Date : January 12, 2018 Time: 4:00PM Name: Charles Catania Jr, PE (Authority Engr)
7. Description and actual or estimated volume of SSO	Unknown volume of mainly graywater, no solids evident
8. Where, precisely, did SSO go ? (land, roadway, basement, swale, storm sewer, creek, etc) Please include creek name or street location.	SSO discharged into Crum Creek approximately 250 feet upstream of Chester Pike
9. What caused SSO ? How was it stopped ?	Pump station was pumping approximately 10.5 MGD when it can pump out over 14 MGD. Actual cause under investigation. By alternating pump combination, was able to increase flow rate to approximately 12 MGD and SSO subsided
10. Describe extent of contamination and how it was cleaned up	Area treated with lime
11. What actions will be taken to prevent a re-occurrence ? When ?	Pumps will be inspected to determine why flow rate was less than capacity
12. Other Comments ?	Follow up inspection of the four pumps found that pump #3 had become partially clogged with rags. Pump rotation had pump #3 as lead pump.
13. Downstream notifications made: (All downstream users such as public water supplies must be notified)	N/A

Sanitary Sewer Overflow (SSO) Report to PADEP– Water Management **DEP fax: 484-250-5971**

Please check the appropriate box ☒ Dry Weather Overflow ☐ Wet Weather Overflow

1. Date, Name, Phone # of person completing this report	Date : July 23, 2018 Name : Charles Catania Phone #: 610-532-2884
2. Your organization name and address ?	Name: Central Delaware County Authority (CDCA) County: Delaware Address: 212B Unity Terrace Township/Municipality: Rutledge, PA 19070
Sewer system owner and permit number	n/a
3. Date found and specific location of SSO. Including Municipality/County (if different from #2)?	Date: July 20, 2018 Municipality: Ridley Twp Location(Street & #): 204 E Chester Pike County: Delaware
4. How was SSO discovered? By whom?	Ridley Twp public works personnel were notified of sewage leak. Public works superintendent contacted CDCA engineer noon on Friday.
5. Start and end time of SSO (actual or estimate?)	Unknown, received notice July 20, 2018, 12 noon; flow stopped July 20, 2018 approximately 1:30 pm
6. Date, time and name of person who notified PADEP originally to notify of SSO?	Date : July 20, 2018 Time: 12:42 pm Name: Charles Catania
7. Description and actual or estimated volume of SSO	unknown
8. Where, precisely, did SSO go? (land, roadway, basement, swale, storm sewer, creek, etc) Please include creek name or street location.	SSO leaked through stone retaining wall along parking lot of Parkwoode Towers Apartments, 204 E Chester Pike, across parking lot and into Stoney Creek
9. What caused SSO? How was it stopped?	Construction project downstream had a temporary bypass in place; temporary bypass system had mechanical failure which led to surcharge in system; apparent joint leak in interceptor led to SSO. Fixing bypass stopped SSO
10. Describe extent of contamination and how it was cleaned up	Minor discoloration of a section of creek, no solids. Parking lot washed down to vactor truck and discharged back into sanitary sewer
11. What actions will be taken to prevent a re-occurrence? When?	Bypass system had personnel watching pumps. Bypass operation is expected to be completed now. Interceptor will be tested and open joint grouted
12. Other Comments?	Temporary collection ditch and automatic dewatering pump left in place at SSO site as precaution for further SSO leak until pipe is tested.
13. Downstream notifications made: (All downstream users such as public water supplies must be notified)	

Sanitary Sewer Overflow (SSO) Report to PADEP– Water Management

DEP fax: 484-250-5971

Please check the appropriate box ☐ Dry Weather Overflow ☒ Wet Weather Overflow

1. Date, Name, Phone # of person completing this report	Date : August 15, 2018 Name : Charles Catania Jr, PE Phone #: 610-532-2884
2. Your organization name and address ?	Name: Central Delaware County Authority (CDCA) County: Delaware Address: 212B Unity Terrace Township/Municipality: Rutledge PA 19070
Sewer system owner and permit number	Central Delaware County Authority; Permit #
3. Date found and specific location of SSO. Including Municipality/County (if different from #2) ?	Date: August 14, 2018 Municipality: Ridley Township Location(Street & #): Angelo Dr County: Delaware
4. How was SSO discovered? By whom ?	Inspector checking system after flood event
5. Start and end time of SSO (actual or estimate?)	Unknown but assumed to be August 13 during flood event
6. Date, time and name of person who notified PADEP originally to notify of SSO ?	Date : August 14 Time: 3:00PM Name: Charles Catania Jr, PE (Authority Engr)
7. Description and actual or estimated volume of SSO	Unknown volume of mainly graywater, no solids evident
8. Where, precisely, did SSO go ? (land, roadway, basement, swale, storm sewer, creek, etc) Please include creek name or street location.	SSO discharged into Crum Creek approximately 250 feet upstream of Chester Pike
9. What caused SSO ? How was it stopped ?	Flood event due to extreme heavy rain; flow subsided
10. Describe extent of contamination and how it was cleaned up	Area treated with lime
11. What actions will be taken to prevent a re-occurrence ? When ?	Pump station currently in design for capacity upgrade
12. Other Comments ?	There was no direct evidence of SSO. After extreme storm events, the system is checked for damage. Inspector found manhole casting ajar from manhole from apparent SSO.
13. Downstream notifications made: (All downstream users such as public water supplies must be notified)	N/A

Pump Station Summary

The Crum Creek Pump Station is owned by CDCA. The Pump Station has four 100 HP variable speed raw sewage pumps each rated at 5,000 GPM. Emergency stand-by power is provided to the Pump Station via a diesel generator. The permitted capacity of the pump station is 16 MGD.

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging to the Central Delaware County Authority. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits for the CDCA system.

The Delaware County Regional
Water Quality Control Authority

DELCORA

Edgmont Township

CRUM CREEK SEWER DISTRICT

TRIBUTARY MUNICIPALITY

"2018 Chapter 94 Report"

February 2019

Prepared by:

Bradford Engineering Associates, Inc.
2710 Concord Road, Suite 3
Aston, PA 19014
610.497.6200
610.500.5677 fax
info@bea-inc.com

TABLE OF CONTENTS

Attachments

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**DELCORA**	Permit No.:	**PA2314403,2314404,2314405**
Mailing Address:	**100 E. Fifth Street**	Effective Date:	**7-21-14**
City, State, Zip:	**Chester, PA 19016**	Expiration Date:	
Contact Person:	**Robert Willert**	Renewal Due Date:	
Title:	**Executive Director**	Municipality:	**Edgmont Township**
Phone:	**610.876.5523**	County:	**Delaware County**
Email:	**willertr@delcora.org**	Consultant Name:	**Bradford Engineering**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☒ Line graph for flows attached (**Attachment A**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☐ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Table 3 evaluates the projects in the Crum Creek System. See Attachment A

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment B**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Approximately 34,434 lf of sanitary sewer was televised in 2016. Approximatley 4,378 feet was cleaned. Manhole inserts with odor control were installed in three manholes.

The system is monitored by DELCORA's maintenance staff. A representative is onsite three times per week inspecting the pump stations. Additionally, an advance SCADA monitors pump station performance and operating conditions. This is essentially monitored by DELCORA 24-hrs a day as part of their overall system monitoring program. Attachement C are copies of the maintenance work on the system.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The system is in good condition overall. There are no known surcharge conditions and most of the system is fairly new. There were a number of capped sewer installed throughout Edgmont Township over the past 30 plus years. These systems were installed in the Crum Creek District in accordance with Township Ordinances. The Crum Creek Sewer Project was completed in 2016. This project essentially connected all of the exsiting capped sewer and commuity sewer system as well as installed new sewer to provide public sewer to the entire District. See map in Attachement B for details.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☐ The collection system does not contain pump stations
☒ The collection system does contain pump stations (Number – **3**)
☒ Discussion of condition of each pump station attached (**Attachment D**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)
☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Robert J. Willert
Name of Responsible Official

Robert J. Willert
Signature

610-876-5523
Telephone No.

February 25, 2019
Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Walter Fazler, PE
Name of Preparer

Walter Fazler
Signature

610.497.6200
Telephone No.

February 25, 2019
Date

Narrative Describing the Edgmont Crum Creek Sewer District

DELCORA is the owner and operator of the public sewer system in a section of Edgmont Township known as the Crum Creek Sewer District. The following is an excerpt from the latest revision to the Edgmont Township Act 537 Plan. This is a description of the current public sewer facilities in Edgmont Township.

Edgmont Township is a township of the second class located in the north central portion of Delaware County Pennsylvania. Total area is approximately 9.7 square miles. Its northern boundary is on the Delaware County-Chester County line where it lies adjacent to Westtown and Willistown Townships, Chester County. In Delaware County, it is bordered by Thornbury Township on the west, Middletown Township on the south, and Upper Providence Township on the southeast. On the east, the Township is bordered by Crum Creek, the Springton Reservoir, and Newtown Township.

The Crum Creek Sewer District was the focus of the 2010 Special Study. It is located in the northeast section of the Township. Broadly described, the District is bounded to the north by Chester County, to the east by Newtown Township, to the South by Upper Providence Township and to the west by the Ridley Creek State Park.

Previous Planning

An Act 537 Plan for the Crum Creek District was completed in 2007 (2007 Study) based on the potential for membership in the CDCA. The advantage of joining CDCA is the availability of a more extensive (350,000 gpd) disposal option that is cost effective, environmentally sound, and able to be implemented within a reasonable time frame to meet Edgmont's needs.

CDCA owns a conveyance system that discharges to the Delaware County Regional Water Quality Control Authority (DELCORA) system for final conveyance and treatment. DELCORA currently has the capacity available to meet Edgmont's needs and is willing to accept sewage flows from Edgmont Township. The plan outlined in the

2007 Study would provide for discharge to the CDCA facilities via the Newtown Township conveyance system.

2007 Study amends 2004 Plan:

1. Pursuant to the 2007 Study, Edgmont Township would enter an agreement with DELCORA to design, permit, finance, build, own, operate and maintain the proposed sewage facilities in the Crum Creek District and to accept, treat and dispose of the sewage from Edgmont Township. This is a change from the sewage treatment and land application contemplated under the 2004 (Aqua) Plan.
2. Edgmont Township would enter into an agreement with Newtown Township to accept and convey sewage to CDCA.
3. Edgmont Township would enter into an agreement with CDCA to accept and convey sewage to DELCORA.
4. Edgmont Township would adopt an ordinance establishing the Crum Creek Sewer District and require connection to the public sewer system.

Edgmont Township 2010 Special Study evaluates alternatives:

The current Special Study (2010 Study) is being undertaken to further develop and evaluate additional alternatives for both the collection system and conveyance methods to reach the CDCA system, as well as to provide for current sewage needs in the West Chester Pike corridor of Edgmont Township that exceed the Crum Creek District. The 2010 Study will look to identify cost effective options and alternatives that can be implemented in a time frame suitable to the needs of Edgmont Township. In addition to many internal service options, three major alternatives were reviewed for conveyance to the CDCA system. The conveyance options included pumping through Newtown Township in combination with Newtown flows, pumping through Newtown Township individually, and pumping through Upper Providence Township individually.

Alternatives Of Choice

The 2010 Special Study revises and updates the 2007 Plan and provides for the adoption of the following items:

Alternate 2. All of Service District C and District F (West Chester Pike corridor West) will be formally included in the Crum Creek District. Modifications to the CDCA service agreement will be required.

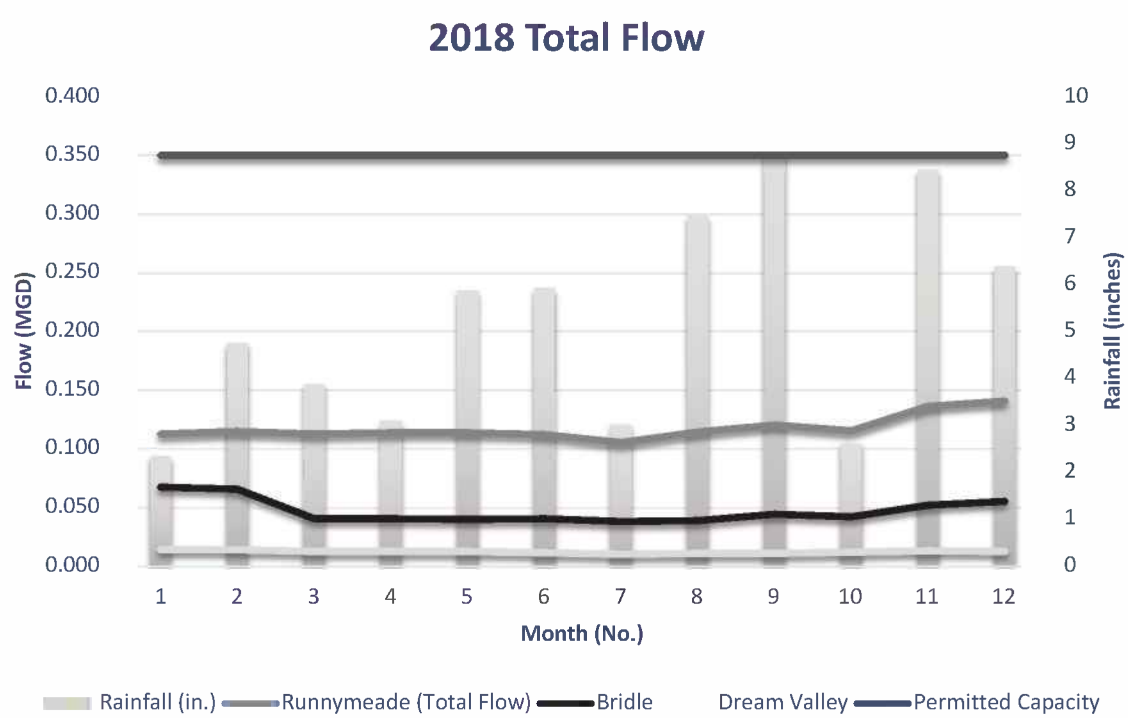
Conveyance of wastewater to the CDCA system will be implemented via adoption of **Alternates 1D and 1G.** These alternates provide for an internal collection system comprised of conventional gravity collection system, low-pressure system and pump station and force mains for Districts A-E. These districts will convey the flow to a regional pump station to be constructed by Edgmont on the West side of the Geist reservoir. The main pump station would discharge to the CDCA system via a route through Newtown Township along Gradyville Road.

ATTACHMENT A

Current Hydraulic Loading

Table 1 indicates the current hydraulic loading in the system. A line graph depicting the monthly average monthly flows is shown in Chart 1. The monthly rainfall is also shown for reference. Rainfall was taken from the National Weather Service rain gauge at the Brandywine River. The permitted capacity of the Crum Creek System is 0.350 MGD:

TABLE 1 Pump Station Hydraulic Loading Average Daily Flow (MGD)						
Pump Station	Bridle	Runnymeade	Dream Valley	Total Flow	Permitted Capacity	Rainfall (in.)
January	0.068	0.113	0.014	0.113	0.350	2.36
February	0.066	0.115	0.014	0.115	0.350	4.78
March	0.041	0.113	0.013	0.113	0.350	3.89
April	0.041	0.114	0.013	0.114	0.350	3.11
May	0.040	0.114	0.013	0.114	0.350	5.89
June	0.041	0.113	0.012	0.113	0.350	5.92
July	0.038	0.106	0.011	0.106	0.350	3.03
August	0.039	0.114	0.011	0.114	0.350	7.47
September	0.045	0.120	0.011	0.120	0.350	9.05
October	0.042	0.116	0.012	0.116	0.350	2.63
November	0.052	0.136	0.013	0.136	0.350	8.45
December	0.055	0.141	0.013	0.141	0.350	6.39
Average	0.047	0.118	0.013	0.118	0.350	5.2[illegible]



5 Year Hydraulic Loading Projections

The following table was developed utilizing the Map in Attachment B of this report. The flow was calculated using an average daily flow of 262.5 gallons per day per EDU. It should be noted that the flow projects shown in Table 2A are not approved flow and are being used as an engineering tool to predict infrastructure capacity.

TABLE 2

Projects that have received Planning Approval

Subdivision Name	Connection Point	Number of EDUs	Number of EDU's Remaining	Estimated ADF Remaining (gpd) *
Crum Creek District A	Bridle PS	100.00	14.00	3,675.00
Crum Creek District B	Bridle PS	162.00	8.00	2,100.00
Crum Creek District C	Bridle PS	105.00	15.00	3,937.50
Crum Creek District C1	Bridle PS	15.00	-	-
Crum Creek District D	Bridle PS	65.00	9.00	2,362.50
Crum Creek District E	Bridle/Runnymeade PS	919.00	97.00	25,462.50
Crum Creek District F	Bridle PS	171.00	171.00	44,887.50
				-
				-
Total		**1537.00**	**314.00**	**82,425.00**

*Based on 262.5 gpd/EDU

TABLE 2A

Projects that may require public sewer

Subdivision Name	Connection Point	Number of EDUs	Number of EDU's Remaining	Estimated ADF Remaining (gpd) *
Runnymeade Phase 7	Runnymeade	249	249	65,362.50
				-
				-
				-
				-
				-
Total		**249**	**249**	**65,363**

*Based on 262.5 gpd/EDU

Note: EDU Projections are for planning purposes. Assignment of EDUs does not guarantee capacity or assignment of capacity to the parcel or project listed.

Adjusted Annual Average Flow

Tables 3 was developed using the PaDEP example for calculating the five-year adjusted annual average flow. Flow projections are a best guess number and largely depend on regional economic conditions.

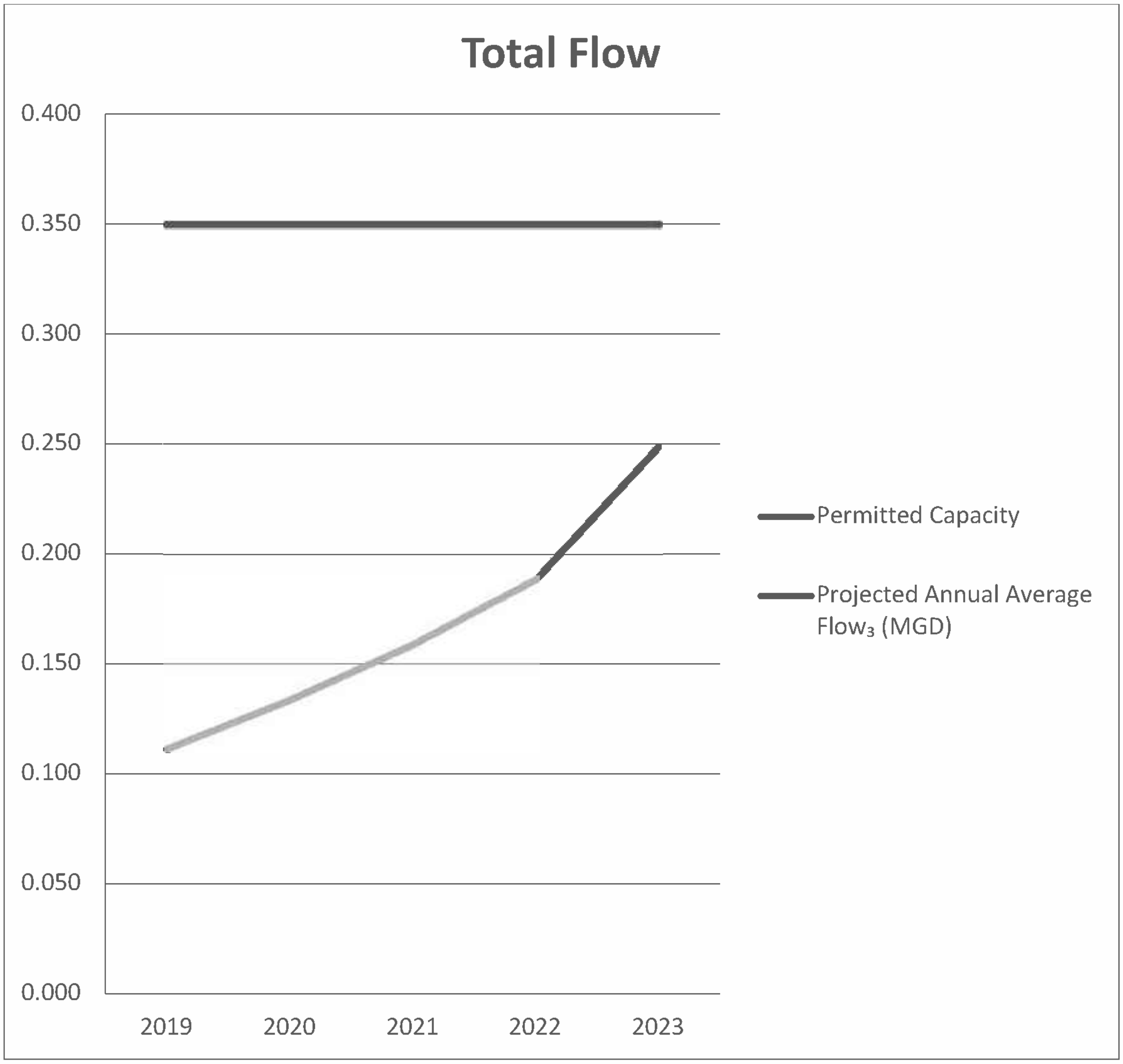
TABLE 3							
Calculation of Adjusted Annual Average Flow							
Year	AA Flow in MGD		All EDUs connected				Adjusted AA Flow
		2014	2015	2016	2017	2018	
2014	0.000		0.000	0.098	0.006	0.001	0.105
2015	0.000			0.098	0.006	0.001	0.105
2016	0.098				0.006	0.001	0.105
2017	0.108					0.001	0.109
2018	0.118						0.118
5 Year Average	0.065					5 Year Average	0.108

Annual Average Flow Projection for the Next 5 Years

The following Table 4 and Chart were developed using the PaDEP example for calculating the five-year adjusted annual average flow. Flow projections are a best guess number and largely depend on regional economic conditions.

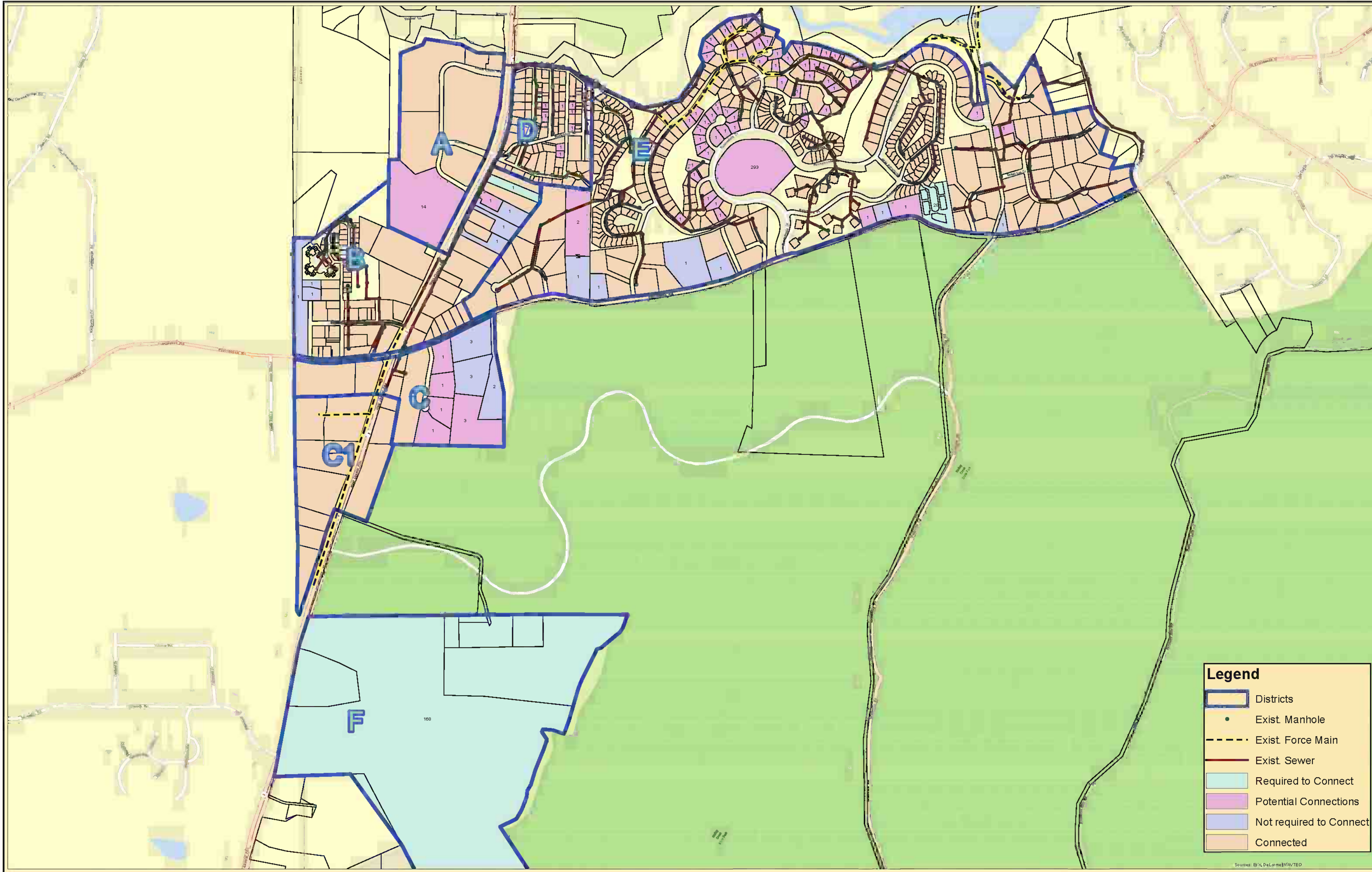
TABLE 4					
Adjusted Projections					
Year	Previous Year's Annual Average Flow[1]	New EDUs	Increased Flow[2] (MGD)	Projected Annual Average Flow[3] (MGD)	Permitted Capacity
2019	0.108	11	0.003	0.111	0.350
2020	0.111	85	0.022	0.134	0.350
2021	0.134	95	0.025	0.158	0.350
2022	0.158	113	0.030	0.188	0.350
2023	0.188	231	0.061	0.249	0.350

Notes
1. The 2019 projection starts with the 5-year adjusted annual average as calculated in Table 3
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average Flow + Increased Flow
4. Projections include all contemplated projects from Table 2A


Total Flow
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
2019
2020
2021
2022
2023
Permitted Capacity
Projected Annual Average Flow3 (MGD)

ATTACHMENT B

MAP OF THE SEWER SYSTEM



DELCORA
100 E. Fifth Street
Chester, PA 19016
(610) 876-5523

Crum Creek Sewer District
2018 Chapter 94 Report
February 2019

Bradford Engineering Associates, Inc.
2710 Concord Road, Suite 3
Aston, Pa 19014
(610) 497-6200

ATTACHMENT C

MAINTENANCE RECORDS

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 **Serial #:** C155000731 **Tag #:** Bridle Way Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1000	USGal/min
Select Meter Dia.	=	Inch	mm
		6	150
DN	=	150	mm
Diameter	=	6.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%\ (Hz)}$	=	1000	Hz
GK	=	3.2181	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{72407.25} = 3.640$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current	I	=	12.792	mA
Output Frequency	Freq $_{MAX}$	=	549.484	Hz
Calibrated Flowrate	Q	=	549.484	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	6.20	137.37	137.37	137.500	0.09%
B	8.40	274.74	274.74	275.000	0.09%
C	12.79	549.48	549.48	549.700	0.04%
D					
E					

Version: Rev 1.3.2-USA

William Doleski

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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
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Record printed: 2/23/2018 2:31 PM

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GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
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You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 **Serial #:** C155000731 **Tag #:** Bridle Way Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** W Doleski J Mullins

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1000	USGal/min
Select Meter Dia.	=	Inch / mm: 6 / 150	
DN	=	150	mm
Diameter	=	6.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%}$ (Hz)	=	1000	Hz
GK	=	3.2181	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{72407.25} = 3.640$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current	I	=	12.792	mA
Output Frequency	$Freq_{MAX}$	=	549.484	Hz
Calibrated Flowrate	Q	=	549.484	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	6.20	137.37	137.37	138.400	0.75%
B	8.40	274.74	274.74	276.000	0.46%
C	12.79	549.48	549.48	549.000	-0.09%
D					
E					

William Doleski

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Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Bridle Way Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Bridle Way Flowmeter	Next Due:	03/07/19	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500731	Zero Error	-0.0062%	-0.0062%
Calibrated Range:	0-1000 GPM	Span Error	-0.0062%	-0.0062%
Description:	Bridle Way Flowmeter	Max. Error	0.0447%	0.0447%
Instrument Accuracy:	1.5000%	Min. Error	-0.0062%	-0.0062%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1000.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9990	-0.0062%
13.7370%	137.3700	137.6000		6.1970	6.1970	0.0230%
27.4740%	274.7400	275.0000		8.3950	8.3980	0.0447%
54.9480%	549.4800	549.5000		12.7910	12.7950	0.0270%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9990	-0.0062%
13.7300%	137.3700	137.6000		6.1970	6.1970	0.0230%
27.4740%	274.7400	275.0000		8.3950	8.3980	0.0447%
54.9480%	549.4800	549.5000		12.7910	12.7950	0.0270%

Tag Notes

Shutdown:

FT = 0.0 GPM
mA = 3.999
LOI = 0.0 GPM
GK 3.2181

Meter and SCADA scaling do not match.

William Doleski

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Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Bridle Way Flowmeter

Instrument Data

Customer Name:	Delcora
Instrument Tag:	Bridle Way Flowmeter
Manufacturer:	Krohne
Model Number:	IFC 300
Serial Number:	C15500731
Calibrated Range:	0-1000 GPM
Description:	Bridle Way Flowmeter
Instrument Accuracy:	1.5000%

Test Results

Cal. Date: 09/21/18
Next Due: 12/21/18

	As Found	As Left
Zero Error	0.0000%	0.0000%
Span Error	0.0000%	0.0000%
Max. Error	4.5270%	0.0542%
Min. Error	0.0000%	-0.0050%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1000.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	4.0000	0.0000%
13.7370%	137.3700	137.6000		6.1970	6.2020	0.0542%
27.4740%	274.7400	274.8000		8.3950	8.4000	0.0373%
54.9480%	549.4800	594.5000		12.7910	12.7950	4.5270%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	4.0000	0.0000%
13.7300%	137.3700	137.6000		6.1970	6.2020	0.0542%
27.4740%	274.7400	274.8000		8.3950	8.4000	0.0373%
54.9480%	594.8000	594.5000		12.7910	12.7950	-0.0050%

Tag Notes

Shutdown:

FT = 0.0 GPM
mA = 3.999
LOI = 0.0 GPM
GK 3.2181

William Doleski

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Technician Certification: ISA Level III

Technician Signature

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KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 **Serial #:** C15500730 **Tag #:** Dream Valley Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	750	USGal/min
Select Meter Dia.	=	Inch 4	mm 100
DN	=	100	mm
Diameter	=	4.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%\,(Hz)}$	=	1000	Hz
GK	=	2.7266	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{197659.7768}{27266} = 7.249$$

Y_{MAX} = 5.0

Max Knob Setting: D

Output Current	I	=	15.036	mA
Output Frequency	Freq $_{MAX}$	=	689.720	Hz
Calibrated Flowrate	Q	=	517.290	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	5.10	68.97	51.73	52.000	0.52%
B	6.21	137.94	103.46	104.000	0.52%
C	8.41	275.89	206.92	207.110	0.09%
D	15.04	689.72	517.29		
E					

Version: Rev 1.3.2-USA

William Doleski

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GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 **Serial #:** C15500730 **Tag #:** Dream Valley Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** W Doleski/J Mullins

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	750	USGal/min
Select Meter Dia.	=	Inch	mm
		4	100
DN	=	100	mm
Diameter	=	4.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%\,(Hz)}$	=	1000	Hz
GK	=	2.7266	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{197659.7768}{27266} = 7.249$$

Y_{MAX} = 5.0

Max Knob Setting: D

Output Current	I	=	15.036 mA
Output Frequency	Freq MAX	=	689.720 Hz
Calibrated Flowrate	Q	=	517.290 USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	5.10	68.97	51.73	52.000	0.52%
B	6.21	137.94	103.46	104.000	0.52%
C	8.41	275.89	206.92	207.110	0.09%
D	15.04	689.72	517.29	517.300	0.00%
E					

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Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Dream Valley Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Dream Valley Flowmeter	Next Due:	03/07/19	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500730	Zero Error	-0.0188%	-0.0188%
Calibrated Range:	0-750 GPM	Span Error	-0.0197%	-0.0197%
Description:	Dream Valley Flowmeter	Max. Error	0.0346%	0.0346%
Instrument Accuracy:	1.5000%	Min. Error	-0.0188%	-0.0188%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	750.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9970	-0.0188%
6.8970%	51.7275	51.9400	5.1030	5.1040	0.0346%
13.7900%	103.4250	103.6600	6.2060	6.2060	0.0313%
27.5890%	206.9175	207.1300	8.4140	8.4130	0.0221%
68.9720%	517.2900	517.3300	15.0350	15.0340	-0.0009%

As Left Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9970	-0.0188%
6.8970%	51.7275	51.9400	5.1030	5.1040	0.0346%
13.7900%	103.4250	103.6600	6.2060	6.2060	0.0313%
27.5890%	206.9175	207.1300	8.4140	8.4130	0.0221%
69.9720%	517.2900	517.3300	15.0350	15.0340	-0.0009%

Tag Notes

GK 2.7266

William Doleski

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Technician Signature

Technician Certification ISA Level III

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Dream Valley Flowmeter

Instrument Data

Customer Name:	Delcora
Instrument Tag:	Dream Valley Flowmeter
Manufacturer:	Krohne
Model Number:	IFC 300
Serial Number:	C15500730
Calibrated Range:	0-750 GPM
Description:	Dream Valley Flowmeter
Instrument Accuracy:	1.5000%

Test Results

Cal. Date:	09/21/18
Next Due:	12/21/18

	As Found	As Left
Zero Error	0.0000%	0.0000%
Span Error	0.0576%	0.0576%
Max. Error	0.0893%	0.0893%
Min. Error	0.0000%	0.0000%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	750.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
6.8970%	51.7275	51.9600	5.1030	5.1110	0.0810%
13.7900%	103.4250	103.7200	6.2060	6.2140	0.0893%
27.5890%	206.9175	207.1000	8.4140	8.4220	0.0743%
68.9720%	517.2900	517.3000	15.0350	15.0440	0.0576%

As Left Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
6.8970%	51.7275	51.9600	5.1030	5.1110	0.0810%
13.7900%	103.4250	103.7200	6.2060	6.2140	0.0893%
27.5890%	206.9175	207.1000	8.4140	8.4220	0.0743%
69.9720%	517.2900	517.3000	15.0350	15.0440	0.0576%

Tag Notes

GK 2.7266

William Doleski

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Technician Certification: ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymede Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Runnymede Flowmeter	Next Due:	03/07/19	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15501259	Zero Error	-0.0250%	-0.0250%
Calibrated Range:	0-1500 GPM	Span Error	-0.0250%	-0.0250%
Description:	Runnymede Flowmeter	Max. Error	0.0514%	0.0514%
Instrument Accuracy:	1.5000%	Min. Error	-0.0552%	-0.0552%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1500.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9960	-0.0250%
20.4200%	306.3100	306.8000		7.2670	7.2700	0.0514%
40.8400%	612.6300	612.8000		10.5340	10.5310	-0.0074%
81.6800%	1225.2600	1224.9000		17.0660	17.0610	-0.0552%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9960	-0.0250%
20.4200%	306.3100	306.8000		7.2670	7.2700	0.0514%
40.8400%	612.6300	612.8000		10.5340	10.5310	-0.0074%
81.6800%	1225.2600	1224.9000		17.0660	17.0610	-0.0552%

Tag Notes

GK 2.486

Shutdown:
Recorder = 3.9 GPM
mA = 3.997
FT = 0.0
LOI = 0.0

William Doleski

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Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
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Runnymede Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	09/21/18	
Instrument Tag:	Runnymede Flowmeter	Next Due:	12/21/18	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15501259	Zero Error	-0.0125%	-0.0125%
Calibrated Range:	0-1500 GPM	Span Error	-0.0125%	-0.0125%
Description:	Runnymede Flowmeter	Max. Error	0.1147%	0.1147%
Instrument Accuracy:	1.5000%	Min. Error	-0.0882%	-0.0882%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1500.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input		As Found Data	Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9980	-0.0125%
20.4200%	306.3100	307.0000	7.2670	7.2780	0.1147%
40.8400%	612.6300	612.1900	10.5340	10.5310	-0.0481%
81.6800%	1225.2600	1224.5000	17.0660	17.0600	-0.0882%

Input		As Left Data	Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9980	-0.0125%
20.4200%	306.3100	307.0000	7.2670	7.2780	0.1147%
40.8400%	612.6300	612.1900	10.5340	10.5310	-0.0481%
81.6800%	1225.2600	1224.5000	17.0660	17.0600	-0.0882%

Tag Notes

GK 2.486

Shutdown:
Recorder = 2.25 GPM
mA = 3.998
FT = 0.0
LOI = 0.0

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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.10.08 13:42:32 -05'00'
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Technician Signature

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KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

This spreadsheet is protected, thus entry is only allowed in the drop-down boxes & bright green cells.
To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 **Serial #:** C15501259 **Tag #:** Runnymead Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1000	USGal/min
Select Meter Dia.	=	Inch	mm
		8	200
DN	=	200	mm
Diameter	=	8.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	4.0364	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{161456} = 1.632$$

Y_{MAX} = 1.0

Max Knob Setting: B

Output Current	I	=	13.802	mA
Output Frequency	Freq $_{MAX}$	=	612.628	Hz
Calibrated Flowrate	Q	=	612.628	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	8.90	306.31	306.31	307.000	0.22%
B	13.80	612.63	612.63	613.300	0.11%
C				1225.400	
D					
E					

Version: Rev 1.3.2-USA

William Doleski

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Date: 2018.02.23 14:34:59 -05'00'
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GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 **Serial #:** C15501259 **Tag #:** Runnymead Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** William Doleski

INPUT VARIABLES		DATA INPUT AREAS (in green)	
Converter	=	IFC 300(GK)	
Q Fullscale	=	1500	USGal/min
Select Meter Dia.	=	Inch 8	mm 200
DN	=	200	mm
Diameter	=	8.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%\ (Hz)}$	=	1000	Hz
GK	=	4.0364	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{395319.5535}{161456} = 2.448$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current	I	=	17.069	mA
Output Frequency	$Freq_{MAX}$	=	816.838	Hz
Calibrated Flowrate	Q	=	1225.257	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	7.27	204.21	306.31	307.000	0.22%
B	10.53	408.42	612.63	613.000	0.06%
C	17.07	816.84	1225.26	1225.000	-0.02%
D					
E					

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Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
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e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	03/07/19	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.2833%	0.2833%
Calibrated Range:	4-20 Ma	Span Error	0.3700%	0.3700%
Description:	Runnymead PS Flow Recorder	Max. Error	0.2833%	0.2833%
Instrument Accuracy:	0.5000%	Min. Error	0.0867%	0.0867%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	4.2500	0.2833%
25%	8.0000	8.0000		375.0000	378.4700	0.2313%
50%	12.0000	12.0000		750.0000	753.2100	0.2140%
75%	16.0000	16.0000		1125.0000	1127.4300	0.1620%
100%	20.0000	20.0000		1500.0000	1501.3000	0.0867%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	4.2500	0.2833%
25%	8.0000	8.0000		375.0000	378.4700	0.2313%
50%	12.0000	12.0000		750.0000	753.2100	0.2140%
75%	16.0000	16.0000		1125.0000	1127.4300	0.1620%
100%	20.0000	20.0000		1500.0000	1501.3000	0.0867%

Tag Notes

William Doleski

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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 10:30:09 -05'00'
Reason: I have reviewed this document

Technician Certification: ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

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Runnymead PS Flow Recorder

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	02/23/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	06/23/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.0747%	0.0747%
Calibrated Range:	4-20 Ma	Span Error	-0.7360%	-0.7360%
Description:	Runnymead PS Flow Recorder	Max. Error	0.0747%	0.0747%
Instrument Accuracy:	0.5000%	Min. Error	-0.8107%	-0.8107%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	1.1200	0.0747%
25%	8.0000	8.0000		375.0000	372.4800	-0.1680%
50%	12.0000	12.0000		750.0000	744.2400	-0.3840%
75%	16.0000	16.0000		1125.0000	1115.8000	-0.6133%
100%	20.0000	20.0000		1500.0000	1487.8400	-0.8107%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	1.1200	0.0747%
25%	8.0000	8.0000		375.0000	372.4800	-0.1680%
50%	12.0000	12.0000		750.0000	744.2400	-0.3840%
75%	16.0000	16.0000		1125.0000	1115.8000	-0.6133%
100%	20.0000	20.0000		1500.0000	1487.8400	-0.8107%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.999
Recorder = 1.12 GPM

Technician Certification ISA Level III

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Date: 2018.02.26 10:13:00 -05'00'
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Calibration Report

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Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	06/19/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	09/19/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.0173%	0.0173%
Calibrated Range:	4-20 Ma	Span Error	-0.9160%	-0.9160%
Description:	Runnymead PS Flow Recorder	Max. Error	0.0173%	0.0173%
Instrument Accuracy:	0.5000%	Min. Error	-0.9333%	-0.9333%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	0.2600	0.0173%
25%	8.0000	8.0000		375.0000	371.7000	-0.2200%
50%	12.0000	12.0000		750.0000	744.0000	-0.4000%
75%	16.0000	16.0000		1125.0000	1115.0000	-0.6667%
100%	20.0000	20.0000		1500.0000	1486.0000	-0.9333%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	0.2600	0.0173%
25%	8.0000	8.0000		375.0000	371.7000	-0.2200%
50%	12.0000	12.0000		750.0000	744.0000	-0.4000%
75%	16.0000	16.0000		1125.0000	1115.0000	-0.6667%
100%	20.0000	20.0000		1500.0000	1486.0000	-0.9333%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.997
Recorder = 0.26 GPM

William Doleski

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Date: 2018.07.05 14:18:39 -05'00'
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Certification

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Calibration Report

ICEA
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Runnymead PS Flow Recorder

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	09/21/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	12/21/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.1500%	0.1500%
Calibrated Range:	4-20 Ma	Span Error	-0.2093%	-0.2093%
Description:	Runnymead PS Flow Recorder	Max. Error	0.1500%	0.1500%
Instrument Accuracy:	0.5000%	Min. Error	-0.3593%	-0.3593%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input		As Found Data	Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000	0.0000	2.2500	0.1500%
25%	8.0000	8.0000	375.0000	375.4300	0.0287%
50%	12.0000	12.0000	750.0000	749.0400	-0.0640%
75%	16.0000	16.0000	1125.0000	1121.7800	-0.2147%
100%	20.0000	20.0000	1500.0000	1494.6100	-0.3593%

Input		As Left Data	Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000	0.0000	2.2500	0.1500%
25%	8.0000	8.0000	375.0000	375.4300	0.0287%
50%	12.0000	12.0000	750.0000	749.0400	-0.0640%
75%	16.0000	16.0000	1125.0000	1121.7800	-0.2147%
100%	20.0000	20.0000	1500.0000	1494.6100	-0.3593%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.998
Recorder = 2.25 GPM

Technician Certification ISA Level III

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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.10.08 11:24:14 -05'00'
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ATTACHMENT D

Sewage Pumping Stations

ATTACHMENT D

Sewage Pumping Stations

The following is a discussion of the Crum Creek Sewer District's 3 pump stations. The tables below are based on discharge meter readings for each. This method does not permit the determination of actual peak flows received by the stations. The tables indicate an estimated peak flow based on the WQM Permits.

Even with the WQM peaking factors, a level considered conservatively safe when reviewing station capacity, the reserve capacity is felt to be adequate for even the most severe wet weather conditions.

The tables also list the five-year estimated growth for each station based on the areas listed in Table 2.

The system is monitored by DELCORA's maintenance staff. A representative is onsite three times per week inspecting the pump stations. Additionally, an advance SCADA monitors pump station performance and operating conditions. This is essentially monitored by DELCORA 24-hrs a day as part of their overall system monitoring program.

Tables 5A, 5B and 5C are summary of the Pump Station Hydraulic Conditions along with the 5-year projections. Following the summaries are the monthly pump station flow data.

TABLE 5A					
Adjusted Projections Bridle Pump Station					
Year	Previous Year's Annual Average Flow (MGD)1	New EDUs	Increased Flow2 (MGD)	Projected Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2019	0.055	9	0.002	0.202	0.792
2020	0.058	18	0.005	0.218	0.792
2021	0.062	28	0.007	0.244	0.792
2022	0.070	27	0.007	0.269	0.792
2023	0.077	160	0.042	0.416	0.792

Notes
1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average
4. Projections include all contemplated projects from Table 2A

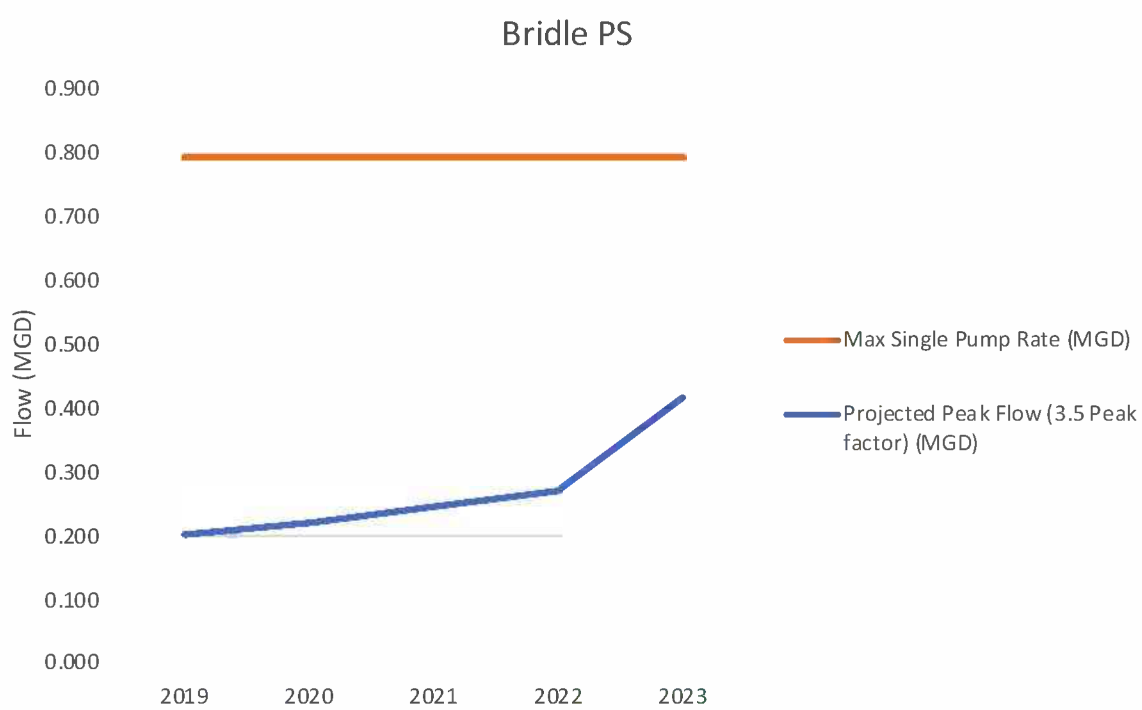


TABLE 5B					
Adjusted Projections Runnymeade Pump Station					
Year	Previous Year's Annual Average Flow (MGD)1	New EDUs	Increased Flow2 (MGD)	Projected Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2019	0.141	11	0.003	0.503	1.224
2019	0.144	85	0.022	0.581	1.224
2020	0.166	109	0.029	0.681	1.224
2021	0.195	120	0.032	0.791	1.224
2022	0.226	238	0.062	1.010	1.224

Notes
1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average
4. Projections include all contemplated projects from Table 2A

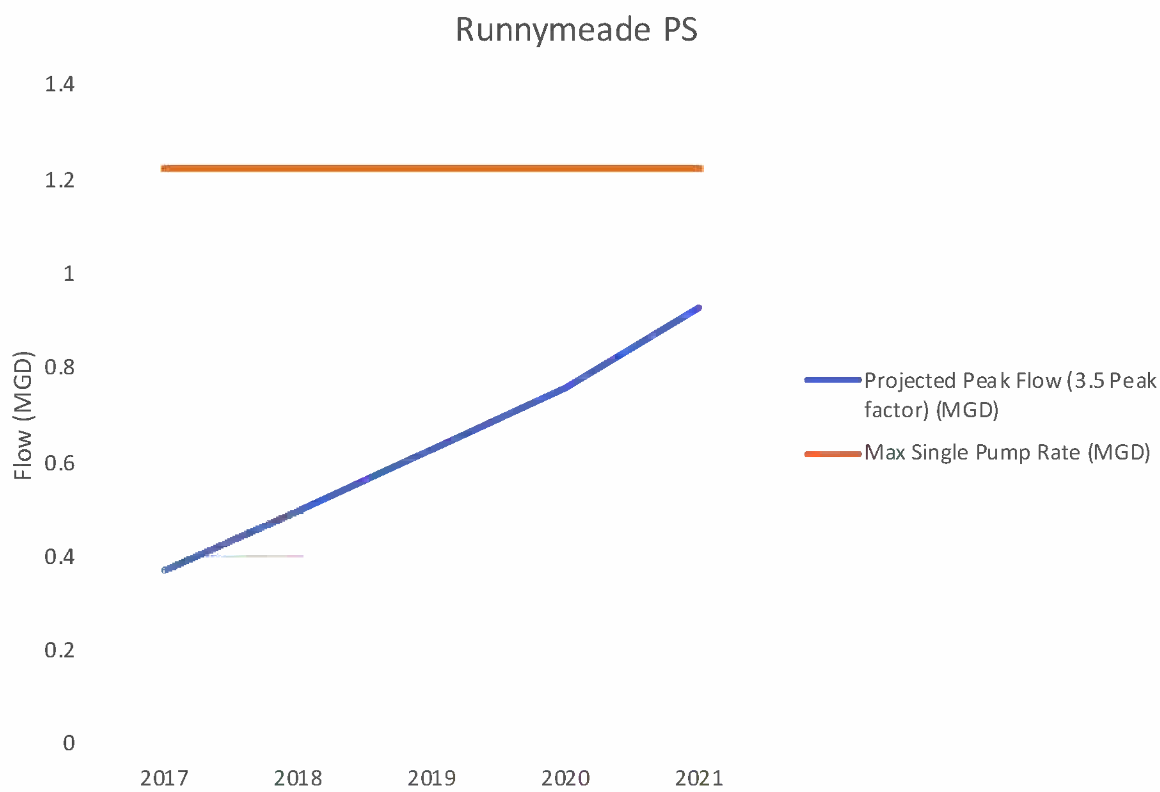
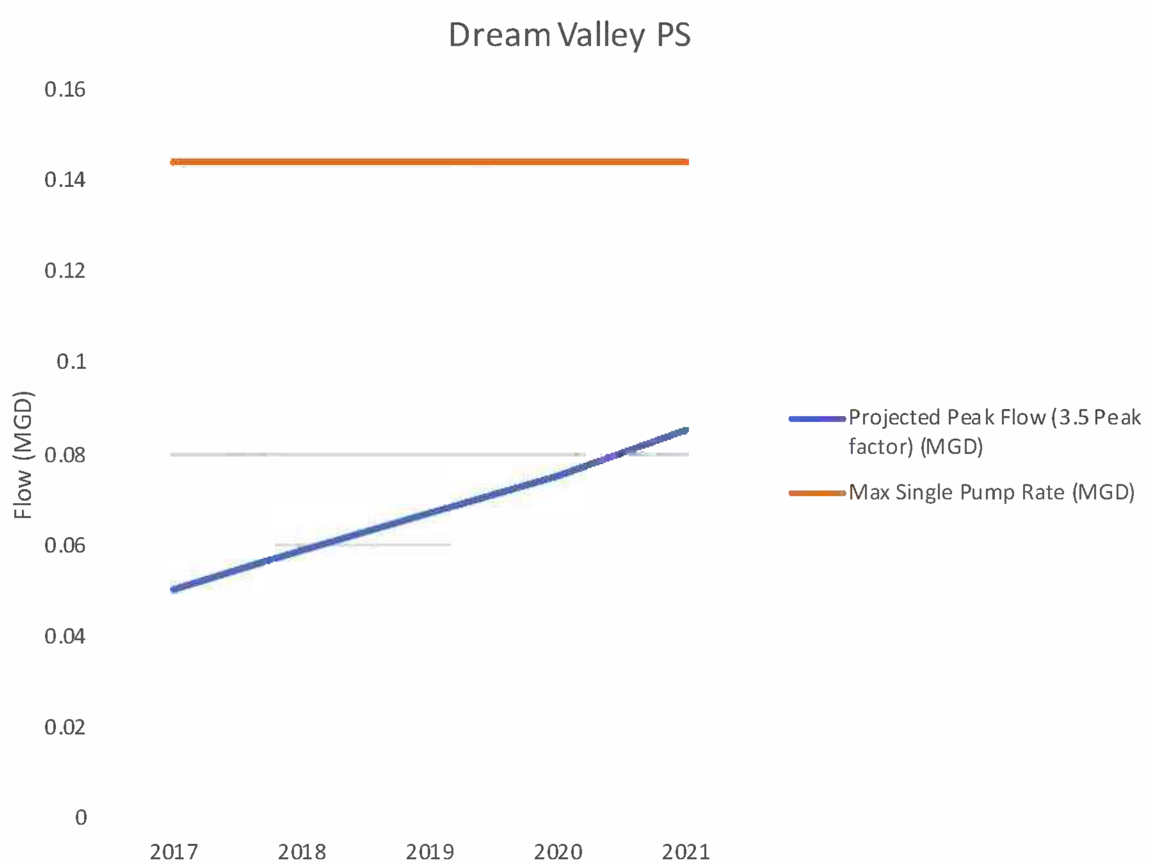


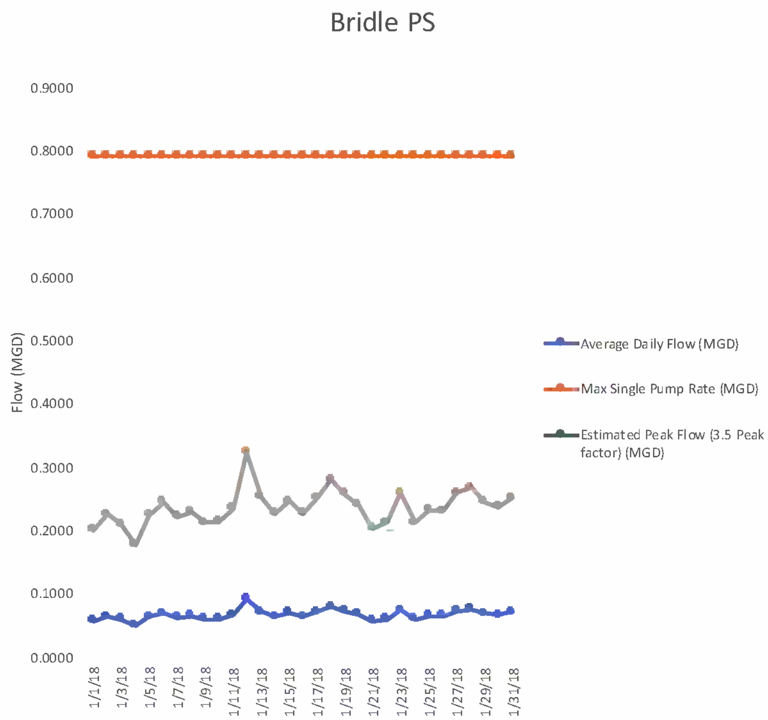
TABLE 5C					
Adjusted Projections Dream Valley Pump Station					
Year	Previous Year's Annual Average Flow (MGD)[1]	New EDUs	Increased Flow[2] (MGD)	Projected Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2019	0.013	0	0.000	0.050	0.144
2019	0.014	7	0.002	0.059	0.144
2020	0.017	7	0.002	0.067	0.144
2021	0.019	7	0.002	0.075	0.144
2022	0.022	7	0.003	0.085	0.144

Notes
1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average Flow + Increased Flow
4. Projections include all contemplated projects from Table 2A

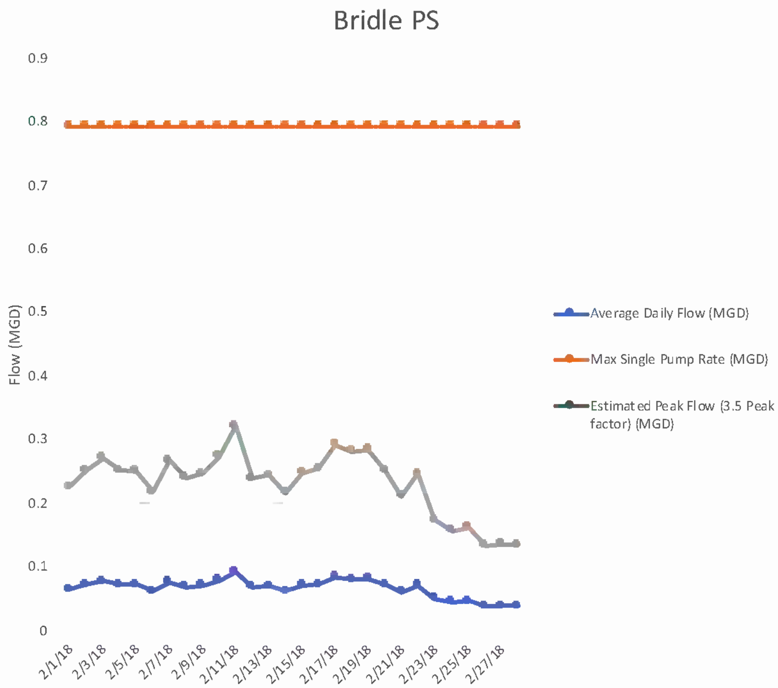


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.0577	0.202	0.792
1/2/18	0.0648	0.227	0.792
1/3/18	0.0603	0.211	0.792
1/4/18	0.0508	0.178	0.792
1/5/18	0.0642	0.225	0.792
1/6/18	0.0701	0.245	0.792
1/7/18	0.0637	0.223	0.792
1/8/18	0.0658	0.230	0.792
1/9/18	0.0610	0.213	0.792
1/10/18	0.0613	0.215	0.792
1/11/18	0.0674	0.236	0.792
1/12/18	0.0926	0.324	0.792
1/13/18	0.0727	0.254	0.792
1/14/18	0.0651	0.228	0.792
1/15/18	0.0706	0.247	0.792
1/16/18	0.0652	0.228	0.792
1/17/18	0.0721	0.252	0.792
1/18/18	0.0804	0.281	0.792
1/19/18	0.0740	0.259	0.792
1/20/18	0.0689	0.241	0.792
1/21/18	0.0582	0.204	0.792
1/22/18	0.0608	0.213	0.792
1/23/18	0.0745	0.261	0.792
1/24/18	0.0609	0.213	0.792
1/25/18	0.0665	0.233	0.792
1/26/18	0.0661	0.231	0.792
1/27/18	0.0742	0.260	0.792
1/28/18	0.0768	0.269	0.792
1/29/18	0.0701	0.245	0.792
1/30/18	0.0679	0.238	0.792
1/31/18	0.0723	0.253	0.792

Min	0.051
Max	0.093
Ave	0.068

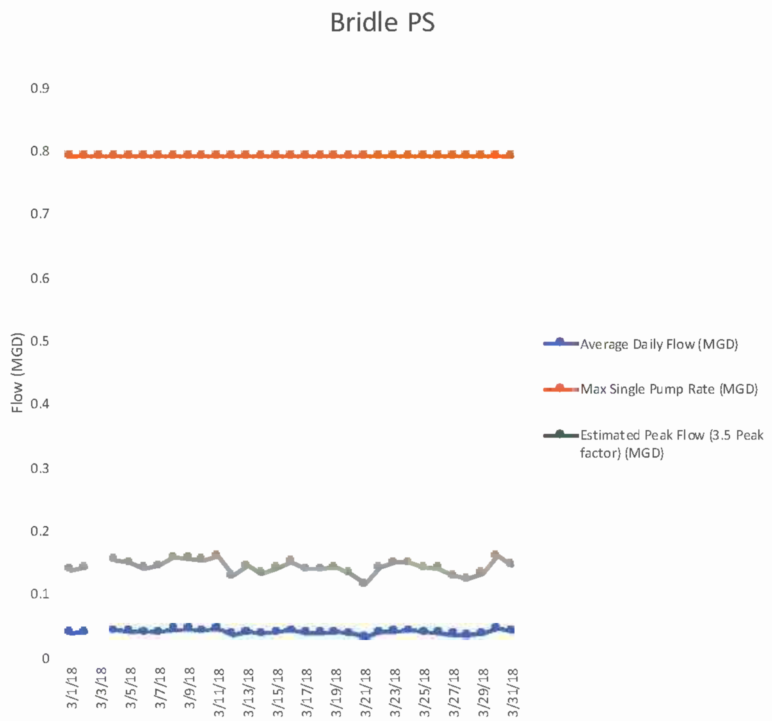


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.0643536	0.225	0.792
2/2/18	0.0720144	0.252	0.792
2/3/18	0.0773424	0.271	0.792
2/4/18	0.071712	0.251	0.792
2/5/18	0.0716976	0.251	0.792
2/6/18	0.0623808	0.218	0.792
2/7/18	0.0762336	0.267	0.792
2/8/18	0.0686304	0.240	0.792
2/9/18	0.0703152	0.246	0.792
2/10/18	0.078336	0.274	0.792
2/11/18	0.0919296	0.322	0.792
2/12/18	0.0682848	0.239	0.792
2/13/18	0.069696	0.244	0.792
2/14/18	0.0619056	0.217	0.792
2/15/18	0.0708768	0.248	0.792
2/16/18	0.0727344	0.255	0.792
2/17/18	0.0832896	0.292	0.792
2/18/18	0.08028	0.281	0.792
2/19/18	0.081072	0.284	0.792
2/20/18	0.0718128	0.251	0.792
2/21/18	0.0603792	0.211	0.792
2/22/18	0.0704304	0.247	0.792
2/23/18	0.0494928	0.173	0.792
2/24/18	0.0446976	0.156	0.792
2/25/18	0.0461088	0.161	0.792
2/26/18	0.0379872	0.133	0.792
2/27/18	0.0388224	0.136	0.792
2/28/18	0.038448	0.135	0.792



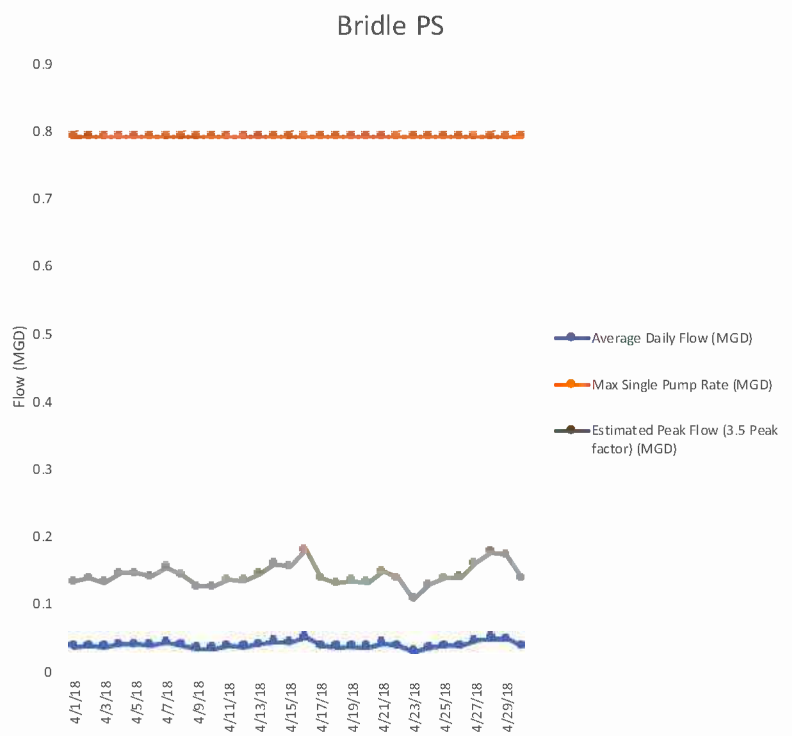
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.0398016	0.139	0.792
3/2/18	0.040824	0.143	0.792
3/3/18			0.792
3/4/18	0.044208	0.155	0.792
3/5/18	0.0430416	0.151	0.792
3/6/18	0.0406512	0.142	0.792
3/7/18	0.0415728	0.146	0.792
3/8/18	0.0453744	0.159	0.792
3/9/18	0.0447552	0.157	0.792
3/10/18	0.0443664	0.155	0.792
3/11/18	0.0459504	0.161	0.792
3/12/18	0.037152	0.130	0.792
3/13/18	0.0416016	0.146	0.792
3/14/18	0.0383616	0.134	0.792
3/15/18	0.0405936	0.142	0.792
3/16/18	0.0435168	0.152	0.792
3/17/18	0.040032	0.140	0.792
3/18/18	0.0402048	0.141	0.792
3/19/18	0.0407808	0.143	0.792
3/20/18	0.0383904	0.134	0.792
3/21/18	0.0335088	0.117	0.792
3/22/18	0.0407952	0.143	0.792
3/23/18	0.042912	0.150	0.792
3/24/18	0.0431712	0.151	0.792
3/25/18	0.0408384	0.143	0.792
3/26/18	0.040392	0.141	0.792
3/27/18	0.0371808	0.130	0.792
3/28/18	0.0355392	0.124	0.792
3/29/18	0.0380448	0.133	0.792
3/30/18	0.045936	0.161	0.792
3/31/18	0.0420912	0.147	0.792

Min	0.034
Max	0.046
Ave	0.041



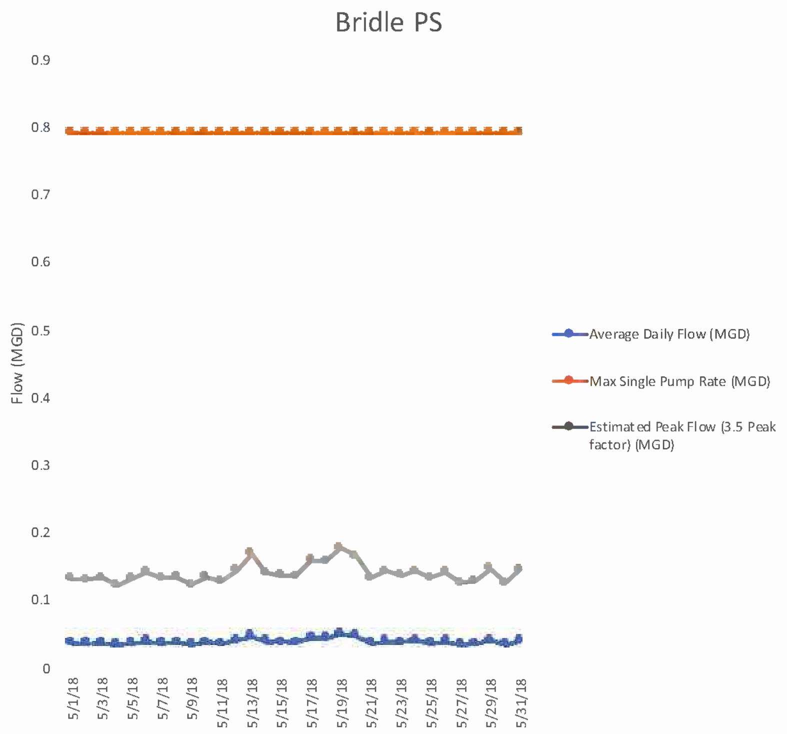
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.038376	0.134	0.792
4/2/18	0.0395424	0.138	0.792
4/3/18	0.0377856	0.132	0.792
4/4/18	0.0417312	0.146	0.792
4/5/18	0.0416736	0.146	0.792
4/6/18	0.0402768	0.141	0.792
4/7/18	0.0443232	0.155	0.792
4/8/18	0.0409536	0.143	0.792
4/9/18	0.036	0.126	0.792
4/10/18	0.0361296	0.126	0.792
4/11/18	0.0387792	0.136	0.792
4/12/18	0.0384912	0.135	0.792
4/13/18	0.0414144	0.145	0.792
4/14/18	0.0455616	0.159	0.792
4/15/18	0.0446112	0.156	0.792
4/16/18	0.0518256	0.181	0.792
4/17/18	0.0394992	0.138	0.792
4/18/18	0.0374976	0.131	0.792
4/19/18	0.0384048	0.134	0.792
4/20/18	0.0379728	0.133	0.792
4/21/18	0.0425088	0.149	0.792
4/22/18	0.0394704	0.138	0.792
4/23/18	0.0306	0.107	0.792
4/24/18	0.0366768	0.128	0.792
4/25/18	0.039672	0.139	0.792
4/26/18	0.0398016	0.139	0.792
4/27/18	0.04608	0.161	0.792
4/28/18	0.0507888	0.178	0.792
4/29/18	0.0496656	0.174	0.792
4/30/18	0.0397008	0.139	0.792

Min	0.031
Max	0.052
Ave	0.041

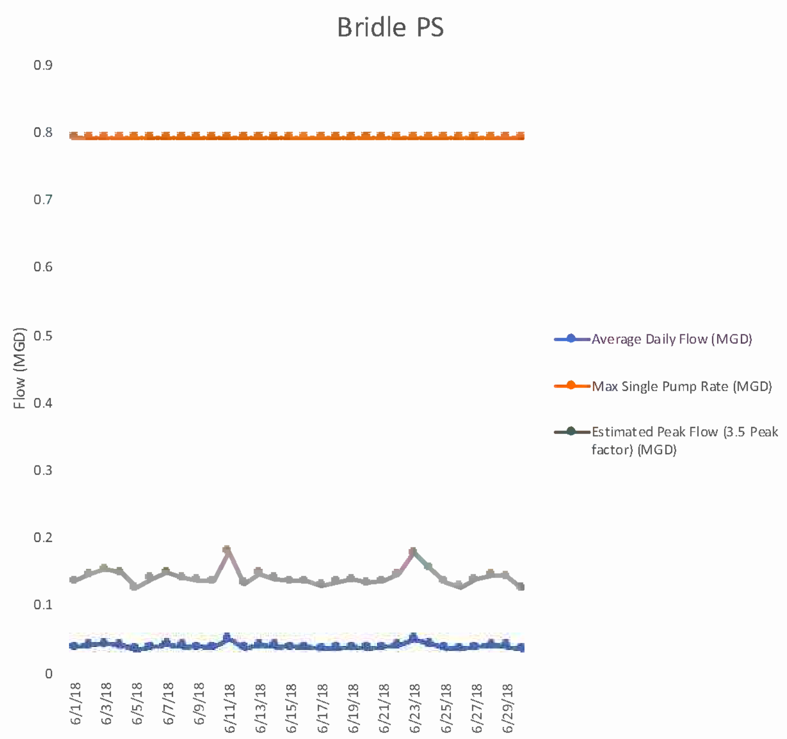


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.0380016	0.133	0.792
5/2/18	0.0374256	0.131	0.792
5/3/18	0.0382608	0.134	0.792
5/4/18	0.0350064	0.123	0.792
5/5/18	0.0378576	0.133	0.792
5/6/18	0.0407088	0.142	0.792
5/7/18	0.0383184	0.134	0.792
5/8/18	0.0387072	0.135	0.792
5/9/18	0.0353808	0.124	0.792
5/10/18	0.0386352	0.135	0.792
5/11/18	0.0367776	0.129	0.792
5/12/18	0.041256	0.144	0.792
5/13/18	0.0483696	0.169	0.792
5/14/18	0.0402192	0.141	0.792
5/15/18	0.039168	0.137	0.792
5/16/18	0.0389232	0.136	0.792
5/17/18	0.0457488	0.160	0.792
5/18/18	0.0451728	0.158	0.792
5/19/18	0.0509328	0.178	0.792
5/20/18	0.0473616	0.166	0.792
5/21/18	0.038232	0.134	0.792
5/22/18	0.0409536	0.143	0.792
5/23/18	0.0392112	0.137	0.792
5/24/18	0.0412128	0.144	0.792
5/25/18	0.0383328	0.134	0.792
5/26/18	0.040536	0.142	0.792
5/27/18	0.0361008	0.126	0.792
5/28/18	0.0366912	0.128	0.792
5/29/18	0.0419328	0.147	0.792
5/30/18	0.036072	0.126	0.792
5/31/18	0.0418896	0.147	0.792

Min	0.035
Max	0.051
Ave	0.040



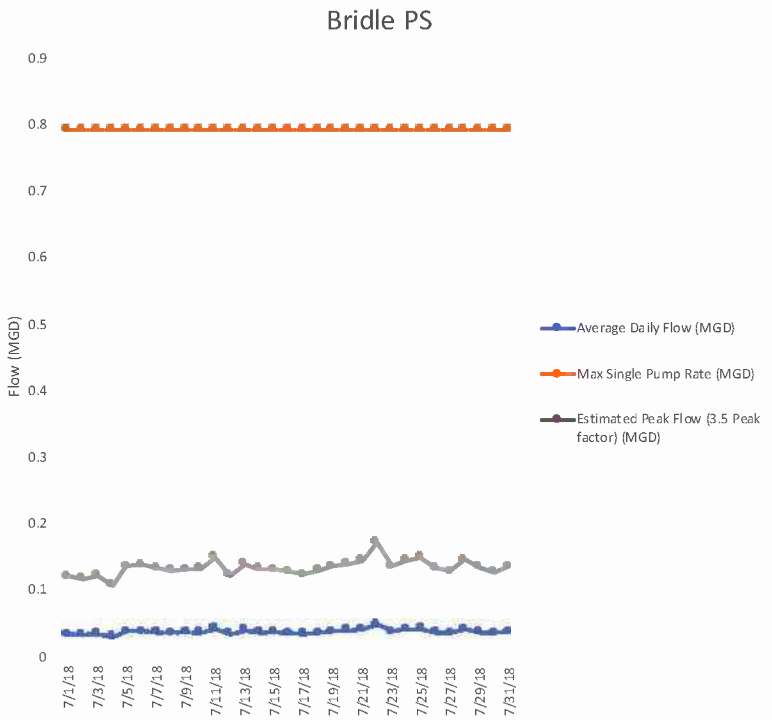
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.0387648	0.136	0.792
6/2/18	0.0418752	0.147	0.792
6/3/18	0.0439632	0.154	0.792
6/4/18	0.0422928	0.148	0.792
6/5/18	0.0360864	0.126	0.792
6/6/18	0.039816	0.139	0.792
6/7/18	0.0424656	0.149	0.792
6/8/18	0.0404352	0.142	0.792
6/9/18	0.0394416	0.138	0.792
6/10/18	0.0389808	0.136	0.792
6/11/18	0.0513216	0.180	0.792
6/12/18	0.0379008	0.133	0.792
6/13/18	0.0420192	0.147	0.792
6/14/18	0.0400896	0.140	0.792
6/15/18	0.0389088	0.136	0.792
6/16/18	0.0390096	0.137	0.792
6/17/18	0.0372816	0.130	0.792
6/18/18	0.0384912	0.135	0.792
6/19/18	0.0397152	0.139	0.792
6/20/18	0.0381168	0.133	0.792
6/21/18	0.0390672	0.137	0.792
6/22/18	0.0417168	0.146	0.792
6/23/18	0.0509472	0.178	0.792
6/24/18	0.0447552	0.157	0.792
6/25/18	0.0385632	0.135	0.792
6/26/18	0.0365184	0.128	0.792
6/27/18	0.039528	0.138	0.792
6/28/18	0.041256	0.144	0.792
6/29/18	0.0409104	0.143	0.792
6/30/18	0.0357696	0.125	0.792



Min	0.036
Max	0.051
Ave	0.041

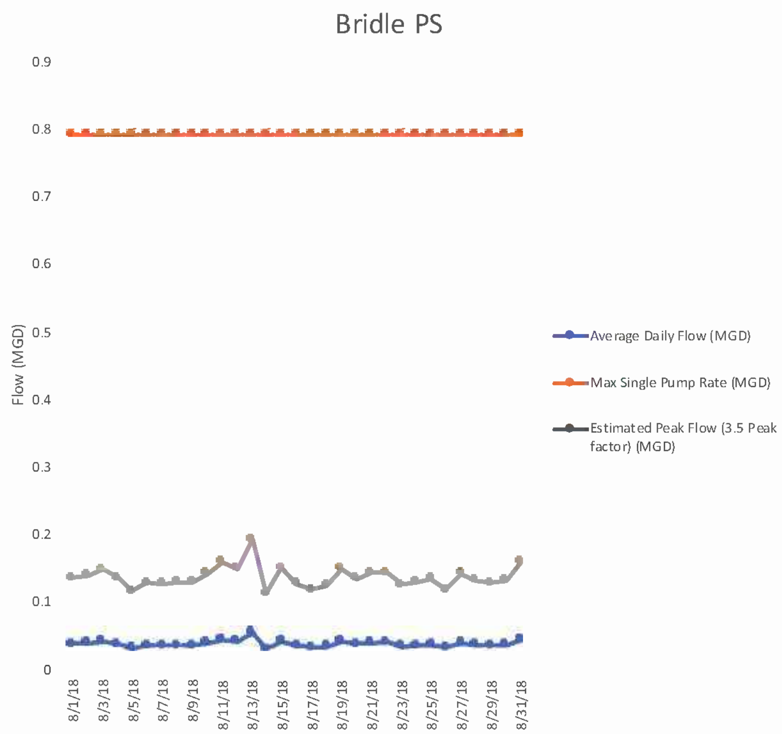
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.03456	0.121	0.792
7/2/18	0.0337248	0.118	0.792
7/3/18	0.035136	0.123	0.792
7/4/18	0.0306144	0.107	0.792
7/5/18	0.0389664	0.136	0.792
7/6/18	0.0395568	0.138	0.792
7/7/18	0.0382608	0.134	0.792
7/8/18	0.037008	0.130	0.792
7/9/18	0.037584	0.132	0.792
7/10/18	0.0379728	0.133	0.792
7/11/18	0.0428976	0.150	0.792
7/12/18	0.035064	0.123	0.792
7/13/18	0.0399456	0.140	0.792
7/14/18	0.0377424	0.132	0.792
7/15/18	0.0374544	0.131	0.792
7/16/18	0.0369216	0.129	0.792
7/17/18	0.0354816	0.124	0.792
7/18/18	0.0371232	0.130	0.792
7/19/18	0.0390096	0.137	0.792
7/20/18	0.0401472	0.141	0.792
7/21/18	0.041544	0.145	0.792
7/22/18	0.0491328	0.172	0.792
7/23/18	0.0389376	0.136	0.792
7/24/18	0.0414288	0.145	0.792
7/25/18	0.0429408	0.150	0.792
7/26/18	0.03816	0.134	0.792
7/27/18	0.0368352	0.129	0.792
7/28/18	0.0417312	0.146	0.792
7/29/18	0.0386064	0.135	0.792
7/30/18	0.0364464	0.128	0.792
7/31/18	0.039024	0.137	0.792

Min	0.031
Max	0.049
Ave	0.038



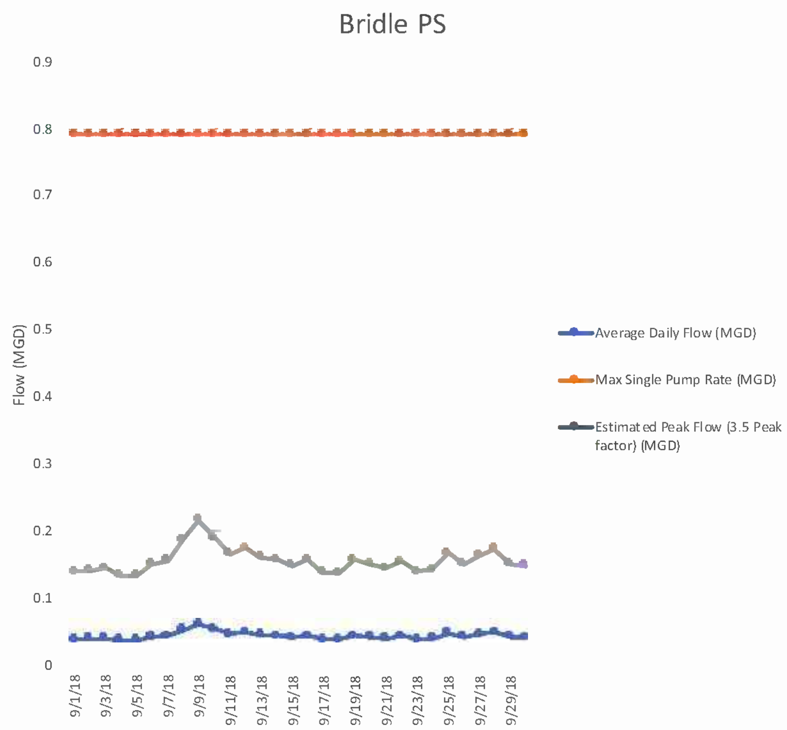
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.0389952	0.136	0.792
8/2/18	0.0400608	0.140	0.792
8/3/18	0.0426384	0.149	0.792
8/4/18	0.0387504	0.136	0.792
8/5/18	0.0333072	0.117	0.792
8/6/18	0.0368928	0.129	0.792
8/7/18	0.0363312	0.127	0.792
8/8/18	0.0372528	0.130	0.792
8/9/18	0.03708	0.130	0.792
8/10/18	0.0405936	0.142	0.792
8/11/18	0.0454896	0.159	0.792
8/12/18	0.0427824	0.150	0.792
8/13/18	0.055368	0.194	0.792
8/14/18	0.0323136	0.113	0.792
8/15/18	0.0430704	0.151	0.792
8/16/18	0.036432	0.128	0.792
8/17/18	0.0340416	0.119	0.792
8/18/18	0.0356112	0.125	0.792
8/19/18	0.0428976	0.150	0.792
8/20/18	0.0386784	0.135	0.792
8/21/18	0.0409392	0.143	0.792
8/22/18	0.0411984	0.144	0.792
8/23/18	0.0359136	0.126	0.792
8/24/18	0.0371664	0.130	0.792
8/25/18	0.0385488	0.135	0.792
8/26/18	0.0341136	0.119	0.792
8/27/18	0.0407232	0.143	0.792
8/28/18	0.0378	0.132	0.792
8/29/18	0.0368064	0.129	0.792
8/30/18	0.038016	0.133	0.792
8/31/18	0.0456768	0.160	0.792

Min	0.032
Max	0.055
Ave	0.039



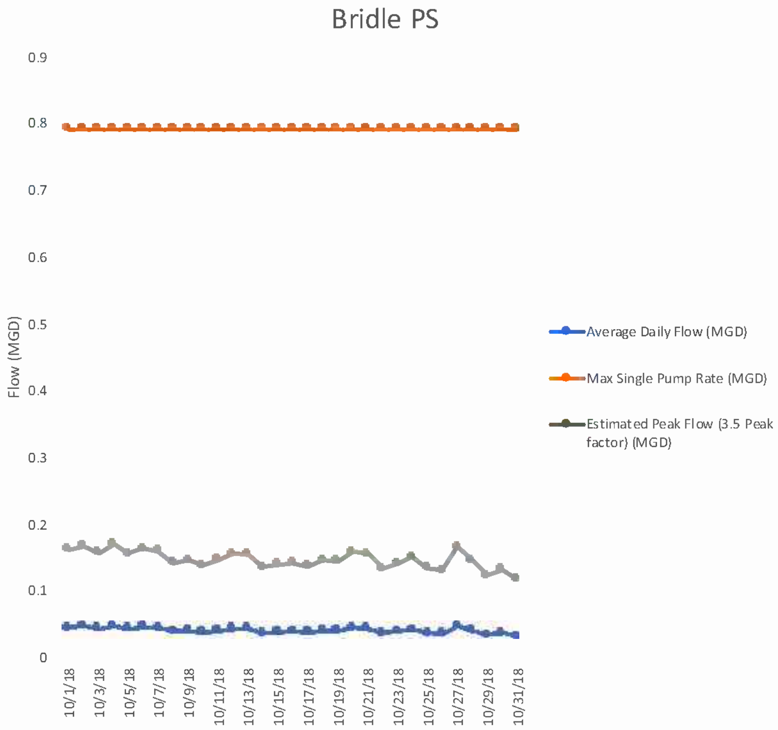
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.0400176	0.140	0.792
9/2/18	0.0404064	0.141	0.792
9/3/18	0.0414432	0.145	0.792
9/4/18	0.038088	0.133	0.792
9/5/18	0.0381744	0.134	0.792
9/6/18	0.043056	0.151	0.792
9/7/18	0.0446688	0.156	0.792
9/8/18	0.053568	0.187	0.792
9/9/18	0.061632	0.216	0.792
9/10/18	0.0541296	0.189	0.792
9/11/18	0.0474336	0.166	0.792
9/12/18	0.0499392	0.175	0.792
9/13/18	0.045936	0.161	0.792
9/14/18	0.0447984	0.157	0.792
9/15/18	0.0424368	0.149	0.792
9/16/18	0.0449856	0.157	0.792
9/17/18	0.0394848	0.138	0.792
9/18/18	0.0394128	0.138	0.792
9/19/18	0.045	0.158	0.792
9/20/18	0.0433152	0.152	0.792
9/21/18	0.0414144	0.145	0.792
9/22/18	0.0441504	0.155	0.792
9/23/18	0.0399024	0.140	0.792
9/24/18	0.0405072	0.142	0.792
9/25/18	0.0478368	0.167	0.792
9/26/18	0.0432576	0.151	0.792
9/27/18	0.0465984	0.163	0.792
9/28/18	0.0495216	0.173	0.792
9/29/18	0.0431568	0.151	0.792
9/30/18	0.0423504	0.148	0.792

Min	0.038
Max	0.062
Ave	0.045

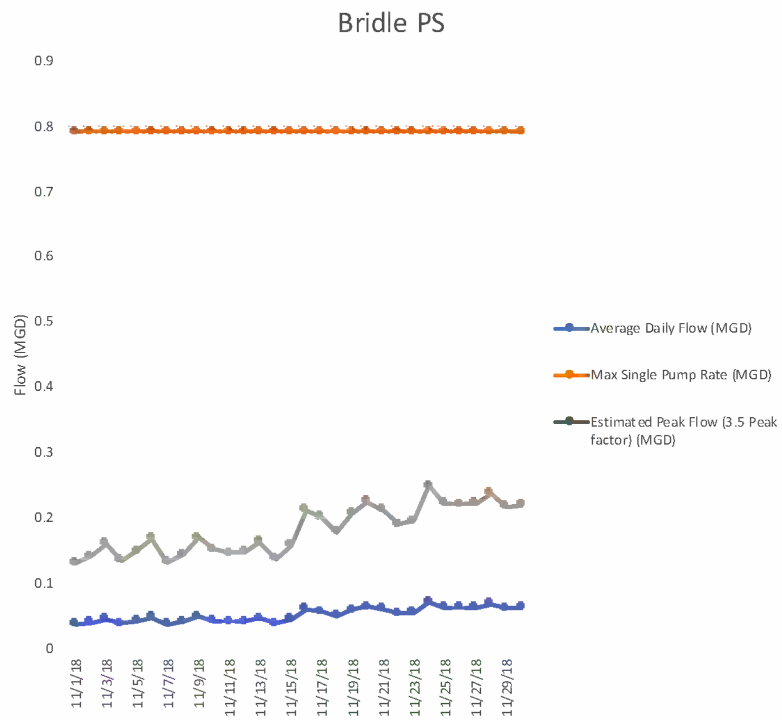


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.0464112	0.162	0.792
10/2/18	0.0479376	0.168	0.792
10/3/18	0.045216	0.158	0.792
10/4/18	0.0488304	0.171	0.792
10/5/18	0.0448992	0.157	0.792
10/6/18	0.0467568	0.164	0.792
10/7/18	0.0456768	0.160	0.792
10/8/18	0.040968	0.143	0.792
10/9/18	0.0419904	0.147	0.792
10/10/18	0.039744	0.139	0.792
10/11/18	0.0422784	0.148	0.792
10/12/18	0.044856	0.157	0.792
10/13/18	0.0444816	0.156	0.792
10/14/18	0.0388512	0.136	0.792
10/15/18	0.0400896	0.140	0.792
10/16/18	0.0409392	0.143	0.792
10/17/18	0.039528	0.138	0.792
10/18/18	0.0418608	0.147	0.792
10/19/18	0.0416736	0.146	0.792
10/20/18	0.0456192	0.160	0.792
10/21/18	0.044784	0.157	0.792
10/22/18	0.03816	0.134	0.792
10/23/18	0.040536	0.142	0.792
10/24/18	0.0433152	0.152	0.792
10/25/18	0.0386928	0.135	0.792
10/26/18	0.0375696	0.131	0.792
10/27/18	0.0477936	0.167	0.792
10/28/18	0.0417024	0.146	0.792
10/29/18	0.0353808	0.124	0.792
10/30/18	0.038016	0.133	0.792
10/31/18	0.033768	0.118	0.792

Min	0.034
Max	0.049
Ave	0.042



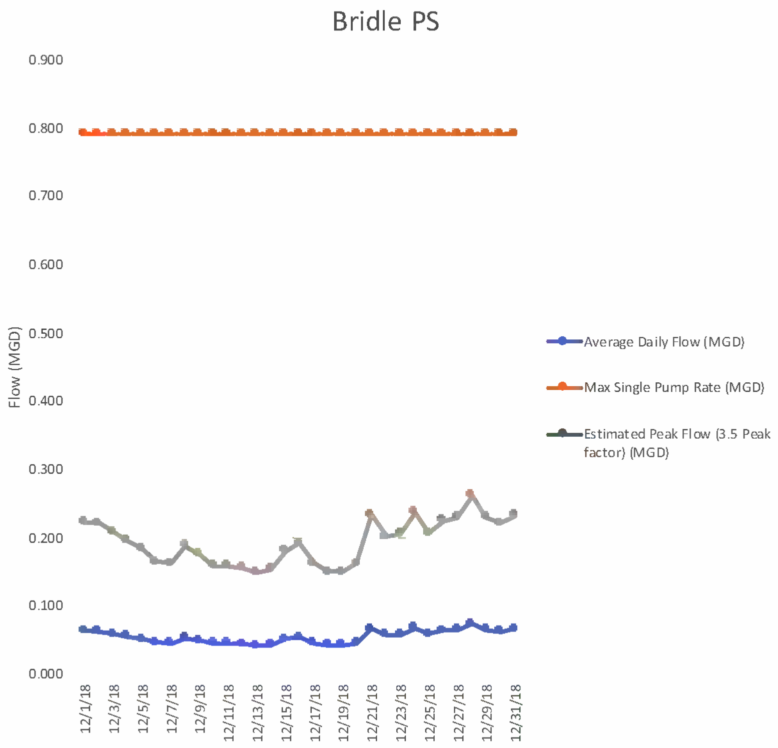
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.0374976	0.1312416	0.792
11/2/18	0.0406512	0.142	0.792
11/3/18	0.0461232	0.161	0.792
11/4/18	0.0385776	0.135	0.792
11/5/18	0.042624	0.149	0.792
11/6/18	0.048096	0.168	0.792
11/7/18	0.0379584	0.133	0.792
11/8/18	0.0413856	0.145	0.792
11/9/18	0.0487296	0.171	0.792
11/10/18	0.0435168	0.152	0.792
11/11/18	0.0418464	0.146	0.792
11/12/18	0.0423072	0.148	0.792
11/13/18	0.0468144	0.164	0.792
11/14/18	0.0393984	0.138	0.792
11/15/18	0.0454464	0.159	0.792
11/16/18	0.0608544	0.213	0.792
11/17/18	0.0576576	0.202	0.792
11/18/18	0.0510624	0.179	0.792
11/19/18	0.0593712	0.208	0.792
11/20/18	0.0644256	0.225	0.792
11/21/18	0.0608688	0.213	0.792
11/22/18	0.054504	0.191	0.792
11/23/18	0.0559728	0.196	0.792
11/24/18	0.0714528	0.250	0.792
11/25/18	0.0634752	0.222	0.792
11/26/18	0.0631008	0.221	0.792
11/27/18	0.0637344	0.223	0.792
11/28/18	0.068112	0.238	0.792
11/29/18	0.0620496	0.217	0.792
11/30/18	0.0629424	0.220	0.792



Min	0.037
Max	0.071
Ave	0.052

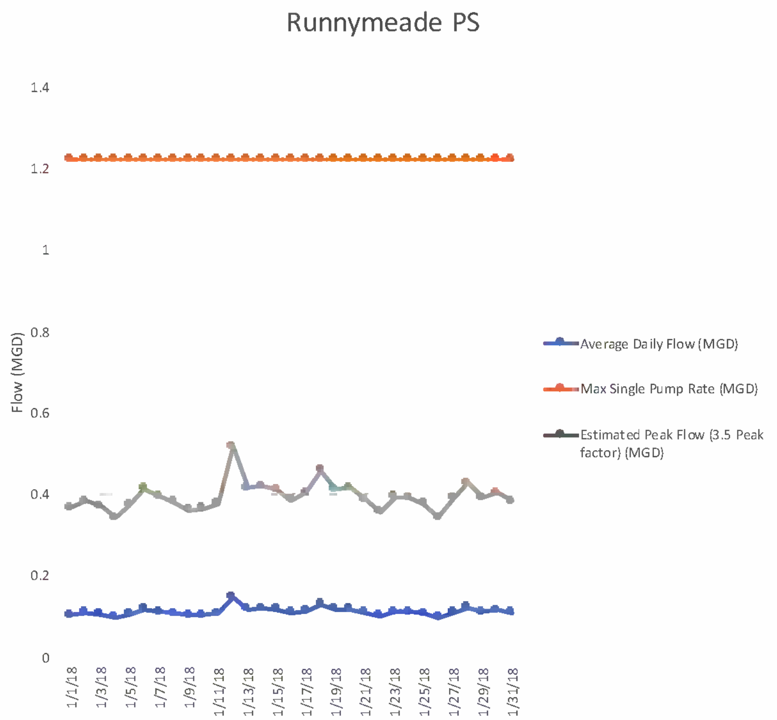
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.0639072	0.224	0.792
12/2/18	0.0634896	0.222	0.792
12/3/18	0.0599616	0.210	0.792
12/4/18	0.0558576	0.196	0.792
12/5/18	0.0527904	0.185	0.792
12/6/18	0.0472464	0.165	0.792
12/7/18	0.0464112	0.162	0.792
12/8/18	0.0537552	0.188	0.792
12/9/18	0.0502992	0.176	0.792
12/10/18	0.0454752	0.159	0.792
12/11/18	0.0455904	0.160	0.792
12/12/18	0.0446544	0.156	0.792
12/13/18	0.0427392	0.150	0.792
12/14/18	0.044136	0.154	0.792
12/15/18	0.0517824	0.181	0.792
12/16/18	0.0548352	0.192	0.792
12/17/18	0.0464688	0.163	0.792
12/18/18	0.0430704	0.151	0.792
12/19/18	0.0431712	0.151	0.792
12/20/18	0.0463536	0.162	0.792
12/21/18	0.0669312	0.234	0.792
12/22/18	0.0577296	0.202	0.792
12/23/18	0.0586944	0.205	0.792
12/24/18	0.0679248	0.238	0.792
12/25/18	0.0592992	0.208	0.792
12/26/18	0.064512	0.226	0.792
12/27/18	0.0657504	0.230	0.792
12/28/18	0.07488	0.262	0.792
12/29/18	0.0656928	0.230	0.792
12/30/18	0.0633168	0.222	0.792
12/31/18	0.0666288	0.233	0.792

Min	0.043
Max	0.075
Ave	0.055

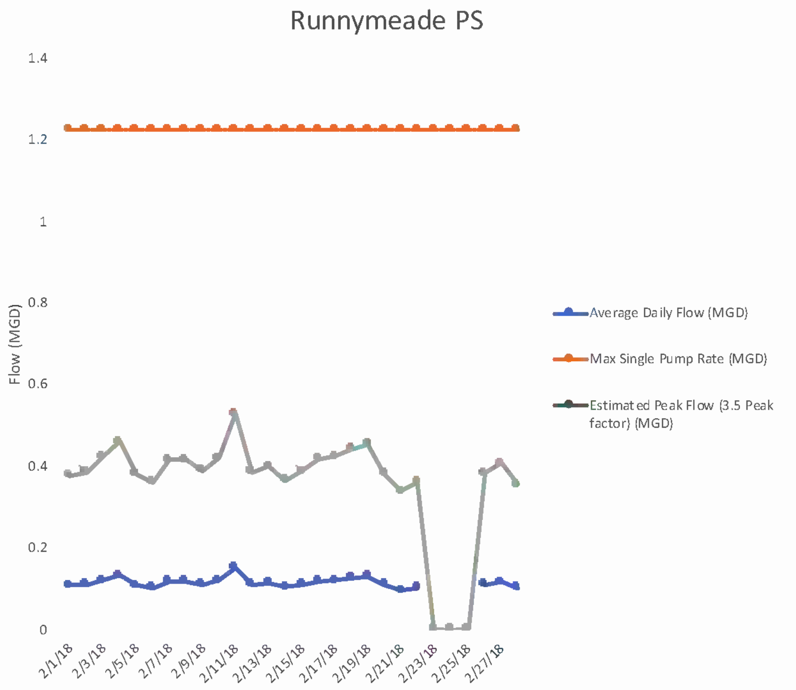


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.10507248	0.368	1.224
1/2/18	0.10992384	0.385	1.224
1/3/18	0.10662768	0.373	1.224
1/4/18	0.09846288	0.345	1.224
1/5/18	0.10692144	0.374	1.224
1/6/18	0.11871792	0.416	1.224
1/7/18	0.11336256	0.397	1.224
1/8/18	0.10909728	0.382	1.224
1/9/18	0.1037088	0.363	1.224
1/10/18	0.10477728	0.367	1.224
1/11/18	0.10816704	0.379	1.224
1/12/18	0.14831856	0.519	1.224
1/13/18	0.11901888	0.417	1.224
1/14/18	0.12012768	0.420	1.224
1/15/18	0.1179288	0.413	1.224
1/16/18	0.11060928	0.387	1.224
1/17/18	0.11573136	0.405	1.224
1/18/18	0.13133376	0.460	1.224
1/19/18	0.11788272	0.413	1.224
1/20/18	0.11926	0.417	1.224
1/21/18	0.111272	0.389	1.224
1/22/18	0.102541	0.359	1.224
1/23/18	0.113086	0.396	1.224
1/24/18	0.112313	0.393	1.224
1/25/18	0.107992	0.378	1.224
1/26/18	0.098489	0.345	1.224
1/27/18	0.1115	0.390	1.224
1/28/18	0.122549	0.429	1.224
1/29/18	0.112011	0.392	1.224
1/30/18	0.115956	0.406	1.224
1/31/18	0.109905	0.385	1.224

Min	0.098
Max	0.148
Ave	0.113

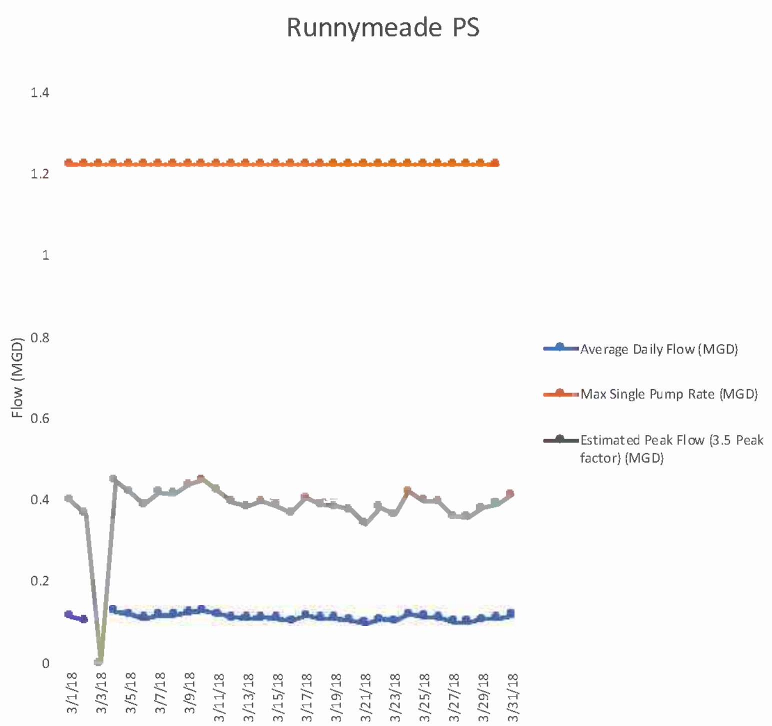


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.107582	0.377	1.224
2/2/18	0.110088	0.385	1.224
2/3/18	0.12094	0.423	1.224
2/4/18	0.131498	0.460	1.224
2/5/18	0.109008	0.382	1.224
2/6/18	0.103072	0.361	1.224
2/7/18	0.118603	0.415	1.224
2/8/18	0.118487	0.415	1.224
2/9/18	0.111113	0.389	1.224
2/10/18	0.119701	0.419	1.224
2/11/18	0.151233	0.529	1.224
2/12/18	0.110285	0.386	1.224
2/13/18	0.11405	0.399	1.224
2/14/18	0.104338	0.365	1.224
2/15/18	0.110421	0.386	1.224
2/16/18	0.119181	0.417	1.224
2/17/18	0.121116	0.424	1.224
2/18/18	0.126371	0.442	1.224
2/19/18	0.129504	0.453	1.224
2/20/18	0.109209	0.382	1.224
2/21/18	0.09661	0.338	1.224
2/22/18	0.102978	0.360	1.224
2/23/18		0.000	1.224
2/24/18		0.000	1.224
2/25/18		0.000	1.224
2/26/18	0.109477	0.383	1.224
2/27/18	0.116244	0.407	1.224
2/28/18	0.101212	0.354	1.224
			1.224
			1.224

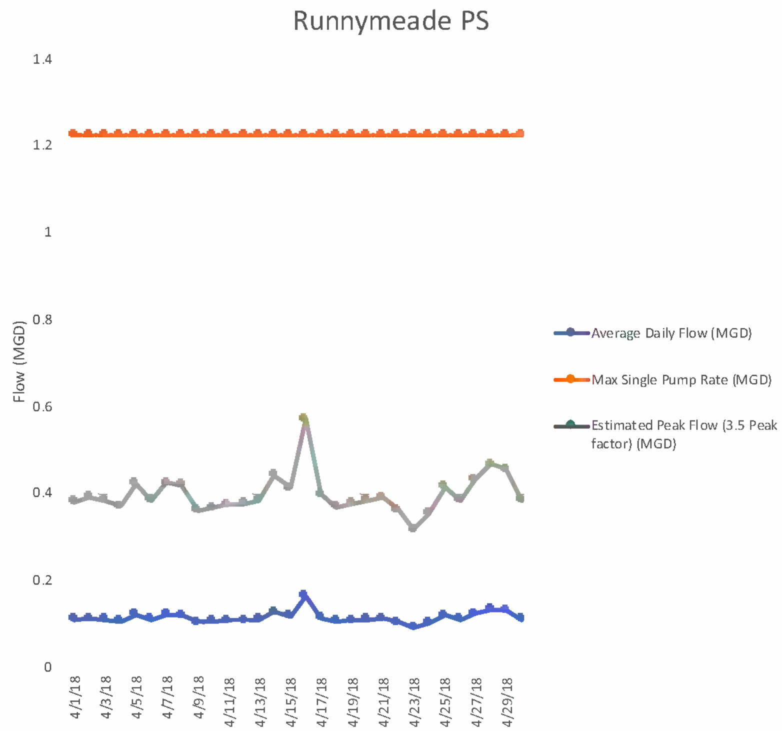


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.113915	0.399	1.224
3/2/18	0.104954	0.367	1.224
3/3/18		0.000	1.224
3/4/18	0.127665	0.447	1.224
3/5/18	0.120226	0.421	1.224
3/6/18	0.110838	0.388	1.224
3/7/18	0.11959	0.419	1.224
3/8/18	0.118856	0.416	1.224
3/9/18	0.124887	0.437	1.224
3/10/18	0.128691	0.450	1.224
3/11/18	0.120709	0.422	1.224
3/12/18	0.112517	0.394	1.224
3/13/18	0.110174	0.386	1.224
3/14/18	0.113485	0.397	1.224
3/15/18	0.110522	0.387	1.224
3/16/18	0.105453	0.369	1.224
3/17/18	0.115974	0.406	1.224
3/18/18	0.11081	0.388	1.224
3/19/18	0.11013	0.385	1.224
3/20/18	0.107593	0.377	1.224
3/21/18	0.097871	0.343	1.224
3/22/18	0.109218	0.382	1.224
3/23/18	0.10393	0.364	1.224
3/24/18	0.120284	0.421	1.224
3/25/18	0.114054	0.399	1.224
3/26/18	0.113113	0.396	1.224
3/27/18	0.103136	0.361	1.224
3/28/18	0.102287	0.358	1.224
3/29/18	0.108601	0.380	1.224
3/30/18	0.111541	0.390	1.224
3/31/18	0.118131	0.413	

Min	0.098
Max	0.129
Ave	0.113



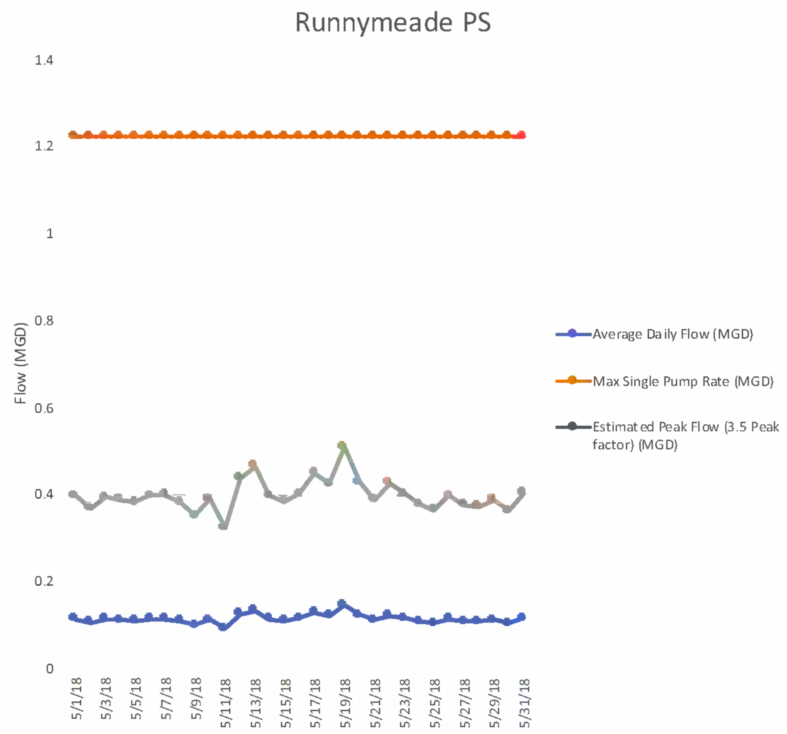
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.108458	0.380	1.224
4/2/18	0.111929	0.392	1.224
4/3/18	0.109633	0.384	1.224
4/4/18	0.105709	0.370	1.224
4/5/18	0.120495	0.422	1.224
4/6/18	0.109759	0.384	1.224
4/7/18	0.121295	0.425	1.224
4/8/18	0.119427	0.418	1.224
4/9/18	0.102829	0.360	1.224
4/10/18	0.104711	0.366	1.224
4/11/18	0.106656	0.373	1.224
4/12/18	0.107752	0.377	1.224
4/13/18	0.109753	0.384	1.224
4/14/18	0.126259	0.442	1.224
4/15/18	0.117888	0.413	1.224
4/16/18	0.163405	0.572	1.224
4/17/18	0.113748	0.398	1.224
4/18/18	0.10507	0.368	1.224
4/19/18	0.107492	0.376	1.224
4/20/18	0.109849	0.384	1.224
4/21/18	0.111165	0.389	1.224
4/22/18	0.103776	0.363	1.224
4/23/18	0.090621	0.317	1.224
4/24/18	0.100758	0.353	1.224
4/25/18	0.118793	0.416	1.224
4/26/18	0.109789	0.384	1.224
4/27/18	0.123533	0.432	1.224
4/28/18	0.13351	0.467	1.224
4/29/18	0.130192	0.456	1.224
4/30/18	0.109886	0.385	1.224



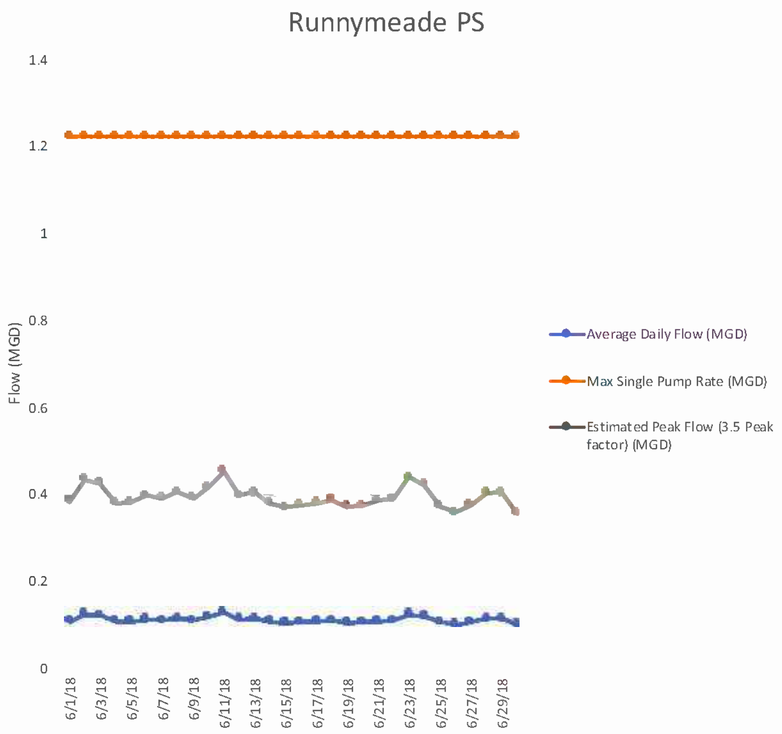
Min	0.091
Max	0.163
Ave	0.114

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.113423	0.397	1.224
5/2/18	0.105211	0.368	1.224
5/3/18	0.112471	0.394	1.224
5/4/18	0.110751	0.388	1.224
5/5/18	0.109201	0.382	1.224
5/6/18	0.113614	0.398	1.224
5/7/18	0.114005	0.399	1.224
5/8/18	0.109213	0.382	1.224
5/9/18	0.100044	0.350	1.224
5/10/18	0.111301	0.390	1.224
5/11/18	0.092278	0.323	1.224
5/12/18	0.125046	0.438	1.224
5/13/18	0.132804	0.465	1.224
5/14/18	0.11374	0.398	1.224
5/15/18	0.109866	0.385	1.224
5/16/18	0.114938	0.402	1.224
5/17/18	0.128258	0.449	1.224
5/18/18	0.121378	0.425	1.224
5/19/18	0.145653	0.510	1.224
5/20/18	0.122507	0.429	1.224
5/21/18	0.110589	0.387	1.224
5/22/18	0.121838	0.426	1.224
5/23/18	0.114675	0.401	1.224
5/24/18	0.108092	0.378	1.224
5/25/18	0.104239	0.365	1.224
5/26/18	0.113824	0.398	1.224
5/27/18	0.107547	0.376	1.224
5/28/18	0.106575	0.373	1.224
5/29/18	0.110913	0.388	1.224
5/30/18	0.103831	0.363	1.224
5/31/18	0.114992	0.402	1.224

Min	0.092
Max	0.146
Ave	0.114

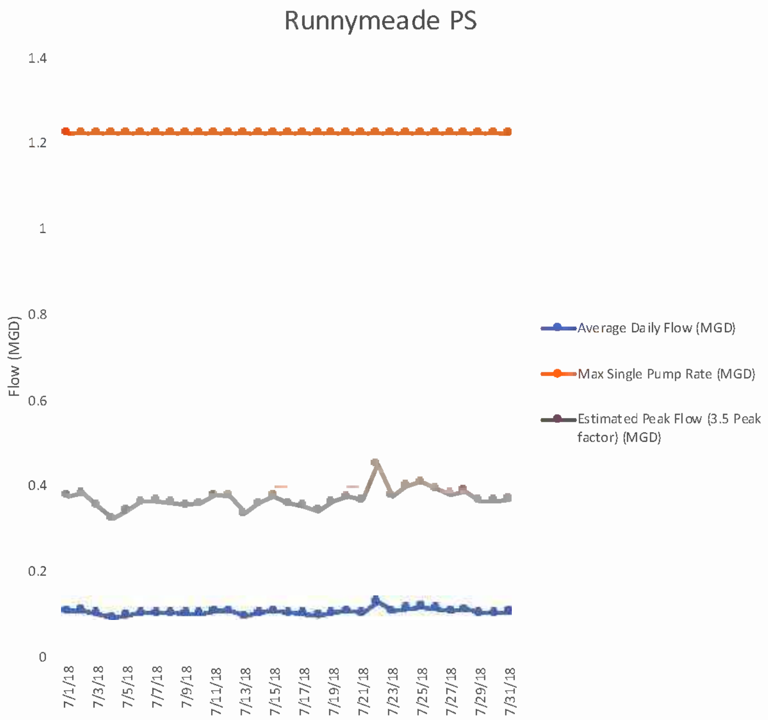


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.109789	0.384	1.224
6/2/18	0.124086	0.434	1.224
6/3/18	0.122065	0.427	1.224
6/4/18	0.108515	0.380	1.224
6/5/18	0.108863	0.381	1.224
6/6/18	0.11341	0.397	1.224
6/7/18	0.112037	0.392	1.224
6/8/18	0.115672	0.405	1.224
6/9/18	0.112049	0.392	1.224
6/10/18	0.118851	0.416	1.224
6/11/18	0.12943	0.453	1.224
6/12/18	0.11333	0.397	1.224
6/13/18	0.115958	0.406	1.224
6/14/18	0.108796	0.381	1.224
6/15/18	0.1057	0.370	1.224
6/16/18	0.107431	0.376	1.224
6/17/18	0.108487	0.380	1.224
6/18/18	0.110662	0.387	1.224
6/19/18	0.106251	0.372	1.224
6/20/18	0.107197	0.375	1.224
6/21/18	0.110048	0.385	1.224
6/22/18	0.111366	0.390	1.224
6/23/18	0.125599	0.440	1.224
6/24/18	0.120715	0.423	1.224
6/25/18	0.106633	0.373	1.224
6/26/18	0.102303	0.358	1.224
6/27/18	0.107324	0.376	1.224
6/28/18	0.115155	0.403	1.224
6/29/18	0.116018	0.406	1.224
6/30/18	0.101693	0.356	1.224



Min	0.102
Max	0.129
Ave	0.113

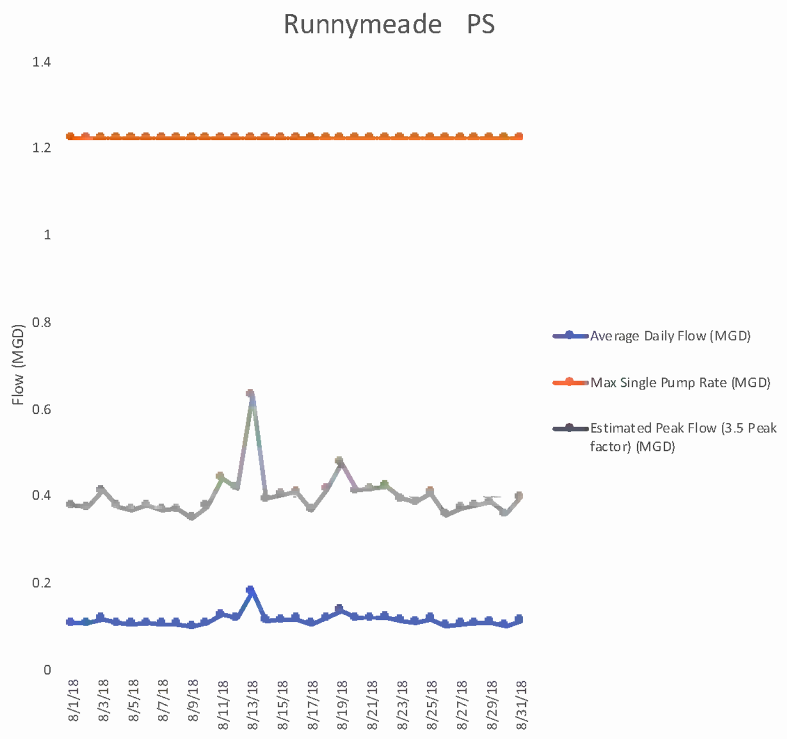
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.107701	0.377	1.224
7/2/18	0.10913	0.382	1.224
7/3/18	0.100917	0.353	1.224
7/4/18	0.092346	0.323	1.224
7/5/18	0.097365	0.341	1.224
7/6/18	0.103677	0.363	1.224
7/7/18	0.104269	0.365	1.224
7/8/18	0.10322	0.361	1.224
7/9/18	0.101204	0.354	1.224
7/10/18	0.102265	0.358	1.224
7/11/18	0.108181	0.379	1.224
7/12/18	0.107655	0.377	1.224
7/13/18	0.095913	0.336	1.224
7/14/18	0.102758	0.360	1.224
7/15/18	0.10742	0.376	1.224
7/16/18	0.102776	0.360	1.224
7/17/18	0.100956	0.353	1.224
7/18/18	0.097517	0.341	1.224
7/19/18	0.103795	0.363	1.224
7/20/18	0.107018	0.375	1.224
7/21/18	0.10445	0.366	1.224
7/22/18	0.128864	0.451	1.224
7/23/18	0.10732	0.376	1.224
7/24/18	0.114034	0.399	1.224
7/25/18	0.116841	0.409	1.224
7/26/18	0.11265	0.394	1.224
7/27/18	0.108339	0.379	1.224
7/28/18	0.110616	0.387	1.224
7/29/18	0.104237	0.365	1.224
7/30/18	0.104409	0.365	1.224
7/31/18	0.105372	0.369	1.224



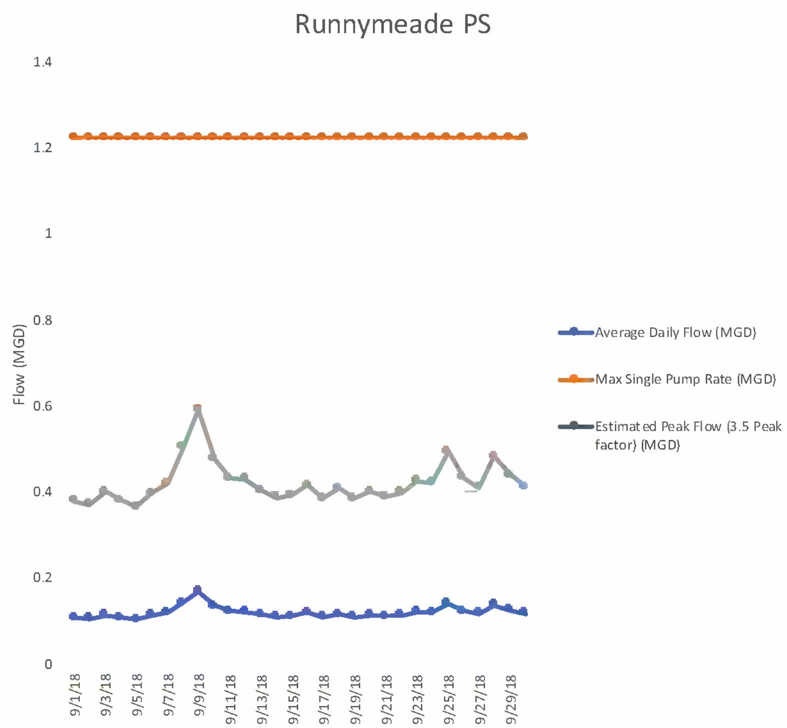
Min	0.092
Max	0.129
Ave	0.106

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.108073	0.378	1.224
8/2/18	0.106986	0.374	1.224
8/3/18	0.118061	0.413	1.224
8/4/18	0.107306	0.376	1.224
8/5/18	0.105302	0.369	1.224
8/6/18	0.107902	0.378	1.224
8/7/18	0.105305	0.369	1.224
8/8/18	0.105874	0.371	1.224
8/9/18	0.099684	0.349	1.224
8/10/18	0.107584	0.377	1.224
8/11/18	0.126335	0.442	1.224
8/12/18	0.119898	0.420	1.224
8/13/18	0.180892	0.633	1.224
8/14/18	0.112387	0.393	1.224
8/15/18	0.115383	0.404	1.224
8/16/18	0.116719	0.409	1.224
8/17/18	0.105274	0.368	1.224
8/18/18	0.118315	0.414	1.224
8/19/18	0.136342	0.477	1.224
8/20/18	0.118216	0.414	1.224
8/21/18	0.119264	0.417	1.224
8/22/18	0.120869	0.423	1.224
8/23/18	0.112313	0.393	1.224
8/24/18	0.110185	0.386	1.224
8/25/18	0.116297	0.407	1.224
8/26/18	0.10196	0.357	1.224
8/27/18	0.106273	0.372	1.224
8/28/18	0.108104	0.378	1.224
8/29/18	0.110178	0.386	1.224
8/30/18	0.102606	0.359	1.224
8/31/18	0.113706	0.398	1.224

Min	0.100
Max	0.181
Ave	0.114



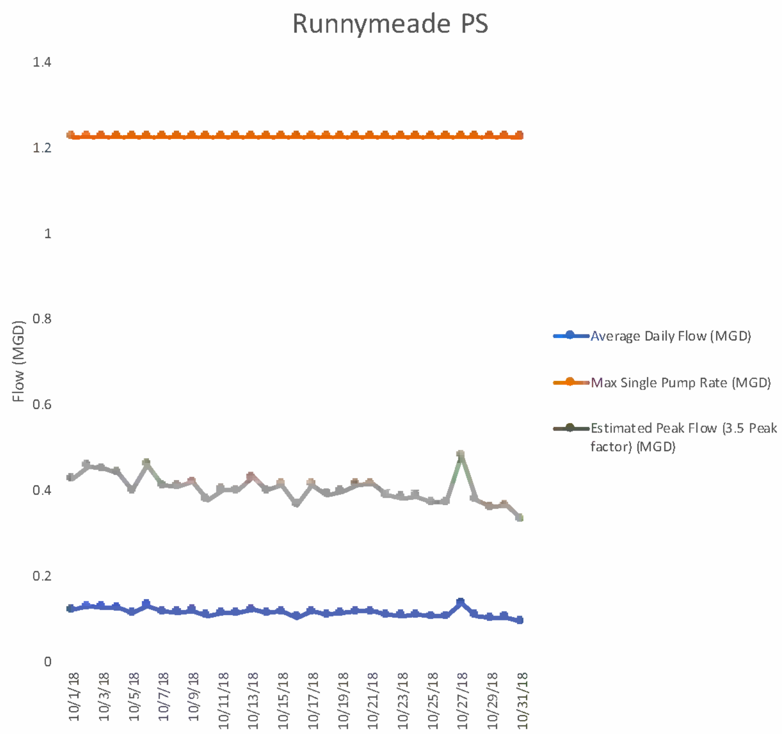
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.108622	0.380	1.224
9/2/18	0.106215	0.372	1.224
9/3/18	0.114783	0.402	1.224
9/4/18	0.108881	0.381	1.224
9/5/18	0.104719	0.367	1.224
9/6/18	0.113317	0.397	1.224
9/7/18	0.120209	0.421	1.224
9/8/18	0.14397	0.504	1.224
9/9/18	0.169004	0.592	1.224
9/10/18	0.136052	0.476	1.224
9/11/18	0.123479	0.432	1.224
9/12/18	0.122591	0.429	1.224
9/13/18	0.115742	0.405	1.224
9/14/18	0.110406	0.386	1.224
9/15/18	0.112043	0.392	1.224
9/16/18	0.119225	0.417	1.224
9/17/18	0.110263	0.386	1.224
9/18/18	0.116838	0.409	1.224
9/19/18	0.10978	0.384	1.224
9/20/18	0.114694	0.401	1.224
9/21/18	0.111328	0.390	1.224
9/22/18	0.113917	0.399	1.224
9/23/18	0.121945	0.427	1.224
9/24/18	0.120899	0.423	1.224
9/25/18	0.141174	0.494	1.224
9/26/18	0.123716	0.433	1.224
9/27/18	0.117501	0.411	1.224
9/28/18	0.138064	0.483	1.224
9/29/18	0.125665	0.440	1.224
9/30/18	0.11786	0.413	1.224



Min	0.105
Max	0.169
Ave	0.120

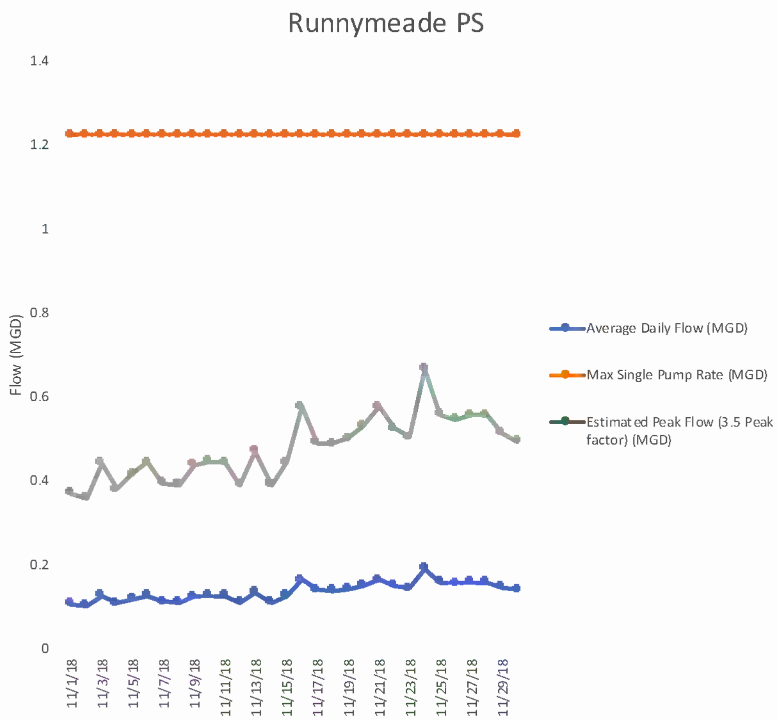
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.122477	0.429	1.224
10/2/18	0.130324	0.456	1.224
10/3/18	0.128661	0.450	1.224
10/4/18	0.126241	0.442	1.224
10/5/18	0.114239	0.400	1.224
10/6/18	0.131792	0.461	1.224
10/7/18	0.117509	0.411	1.224
10/8/18	0.117281	0.410	1.224
10/9/18	0.120192	0.421	1.224
10/10/18	0.108279	0.379	1.224
10/11/18	0.115045	0.403	1.224
10/12/18	0.11447	0.401	1.224
10/13/18	0.123077	0.431	1.224
10/14/18	0.11462	0.401	1.224
10/15/18	0.11837	0.414	1.224
10/16/18	0.104896	0.367	1.224
10/17/18	0.118395	0.414	1.224
10/18/18	0.111455	0.390	1.224
10/19/18	0.113712	0.398	1.224
10/20/18	0.118419	0.414	1.224
10/21/18	0.118852	0.416	1.224
10/22/18	0.11128	0.389	1.224
10/23/18	0.109441	0.383	1.224
10/24/18	0.110345	0.386	1.224
10/25/18	0.106453	0.373	1.224
10/26/18	0.106687	0.373	1.224
10/27/18	0.137762	0.482	1.224
10/28/18	0.108022	0.378	1.224
10/29/18	0.103171	0.361	1.224
10/30/18	0.104326	0.365	1.224
10/31/18	0.095442	0.334	1.224

Min	0.095
Max	0.138
Ave	0.116



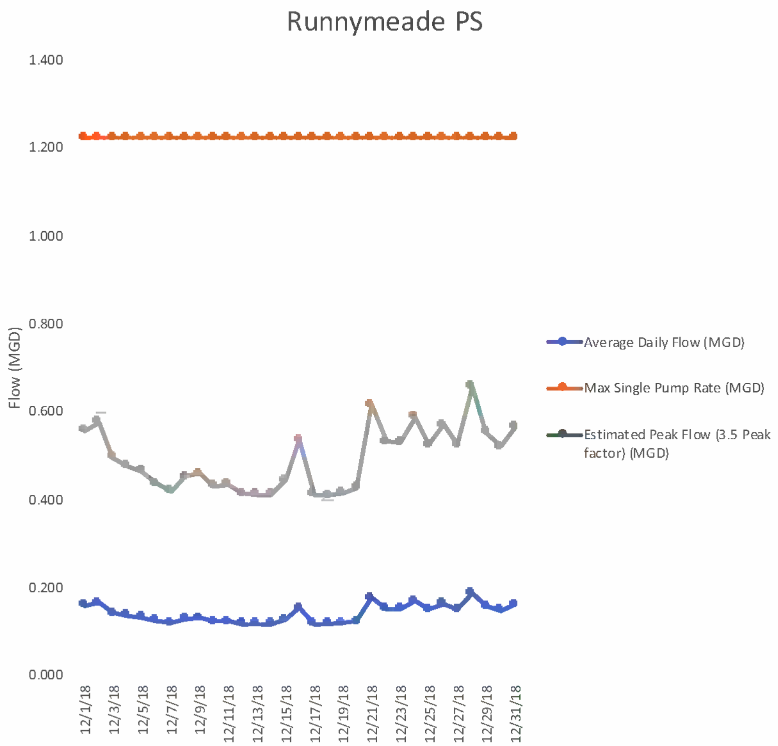
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.105923	0.3707305	1.224
11/2/18	0.102265	0.358	1.224
11/3/18	0.126598	0.443	1.224
11/4/18	0.108393	0.379	1.224
11/5/18	0.118769	0.416	1.224
11/6/18	0.126686	0.443	1.224
11/7/18	0.112532	0.394	1.224
11/8/18	0.111484	0.390	1.224
11/9/18	0.125373	0.439	1.224
11/10/18	0.127407	0.446	1.224
11/11/18	0.12692	0.444	1.224
11/12/18	0.111385	0.390	1.224
11/13/18	0.134357	0.470	1.224
11/14/18	0.111572	0.391	1.224
11/15/18	0.126989	0.444	1.224
11/16/18	0.164718	0.577	1.224
11/17/18	0.140145	0.491	1.224
11/18/18	0.139387	0.488	1.224
11/19/18	0.142675	0.499	1.224
11/20/18	0.151266	0.529	1.224
11/21/18	0.164362	0.575	1.224
11/22/18	0.149734	0.524	1.224
11/23/18	0.144225	0.505	1.224
11/24/18	0.190088	0.665	1.224
11/25/18	0.159194	0.557	1.224
11/26/18	0.155968	0.546	1.224
11/27/18	0.158914	0.556	1.224
11/28/18	0.158984	0.556	1.224
11/29/18	0.146975	0.514	1.224
11/30/18	0.141454	0.495	1.224

Min	0.102
Max	0.190
Ave	0.136



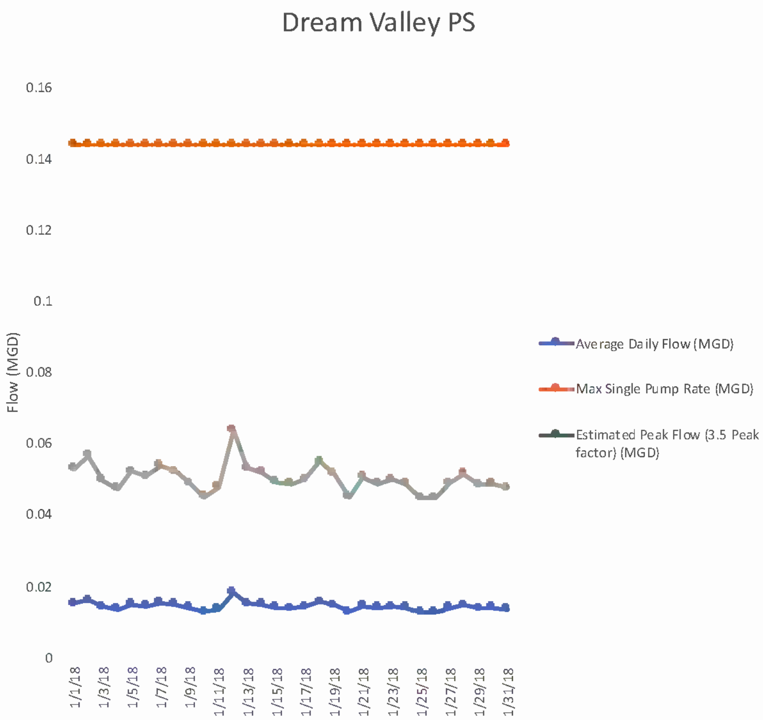
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.159021	0.557	1.224
12/2/18	0.164697	0.576	1.224
12/3/18	0.142049	0.497	1.224
12/4/18	0.136308	0.477	1.224
12/5/18	0.133295	0.467	1.224
12/6/18	0.12486	0.437	1.224
12/7/18	0.11968	0.419	1.224
12/8/18	0.129252	0.452	1.224
12/9/18	0.131395	0.460	1.224
12/10/18	0.123101	0.431	1.224
12/11/18	0.12415	0.435	1.224
12/12/18	0.118159	0.414	1.224
12/13/18	0.117875	0.413	1.224
12/14/18	0.117622	0.412	1.224
12/15/18	0.126764	0.444	1.224
12/16/18	0.153118	0.536	1.224
12/17/18	0.117895	0.413	1.224
12/18/18	0.117246	0.410	1.224
12/19/18	0.118864	0.416	1.224
12/20/18	0.122356	0.428	1.224
12/21/18	0.176321	0.617	1.224
12/22/18	0.152158	0.533	1.224
12/23/18	0.151745	0.531	1.224
12/24/18	0.168268	0.589	1.224
12/25/18	0.149876	0.525	1.224
12/26/18	0.163109	0.571	1.224
12/27/18	0.149807	0.524	1.224
12/28/18	0.187741	0.657	1.224
12/29/18	0.158322	0.554	1.224
12/30/18	0.148989	0.521	1.224
12/31/18	0.161293	0.565	1.224

Min	0.117
Max	0.188
Ave	0.141

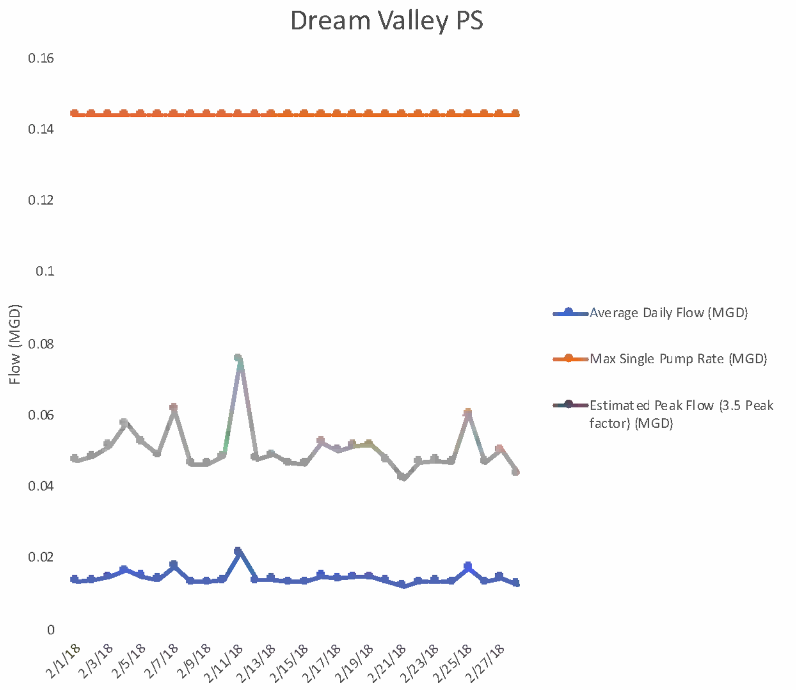


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.0151488	0.053	0.144
1/2/18	0.0162	0.057	0.144
1/3/18	0.0142272	0.050	0.144
1/4/18	0.0135648	0.047	0.144
1/5/18	0.0149472	0.052	0.144
1/6/18	0.0145296	0.051	0.144
1/7/18	0.0154368	0.054	0.144
1/8/18	0.0149184	0.052	0.144
1/9/18	0.0140256	0.049	0.144
1/10/18	0.0128592	0.045	0.144
1/11/18	0.0136656	0.048	0.144
1/12/18	0.0182592	0.064	0.144
1/13/18	0.0152064	0.053	0.144
1/14/18	0.0148608	0.052	0.144
1/15/18	0.0140976	0.049	0.144
1/16/18	0.0139248	0.049	0.144
1/17/18	0.0142848	0.050	0.144
1/18/18	0.0157392	0.055	0.144
1/19/18	0.0147168	0.052	0.144
1/20/18	0.0128736	0.045	0.144
1/21/18	0.0144576	0.051	0.144
1/22/18	0.0139824	0.049	0.144
1/23/18	0.014256	0.050	0.144
1/24/18	0.0139824	0.049	0.144
1/25/18	0.012816	0.045	0.144
1/26/18	0.012816	0.045	0.144
1/27/18	0.01404	0.049	0.144
1/28/18	0.0147168	0.052	0.144
1/29/18	0.0138672	0.049	0.144
1/30/18	0.013968	0.049	0.144
1/31/18	0.0136512	0.048	0.144

Min	0.013
Max	0.018
Ave	0.014

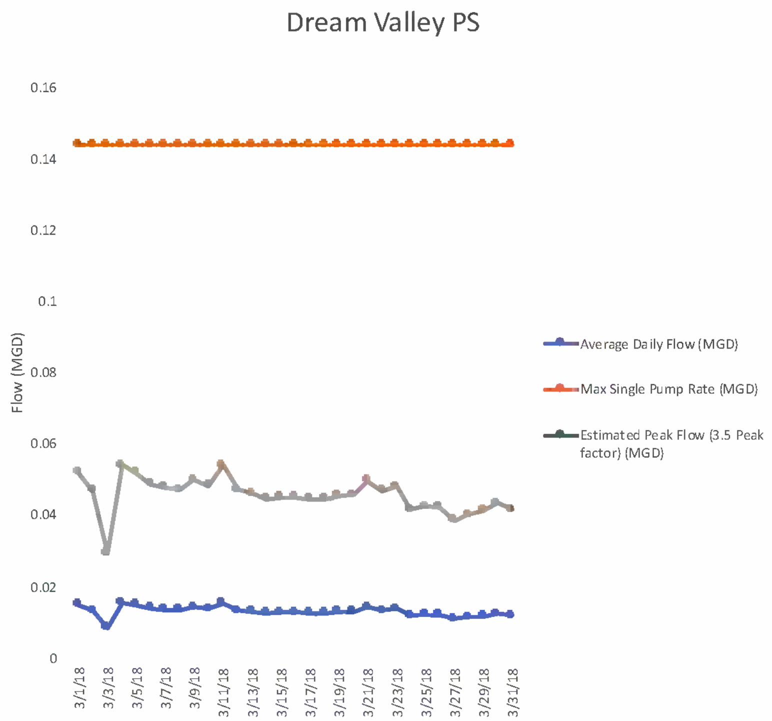


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.0135072	0.047	0.144
2/2/18	0.013824	0.048	0.144
2/3/18	0.0146736	0.051	0.144
2/4/18	0.0164736	0.058	0.144
2/5/18	0.0150192	0.053	0.144
2/6/18	0.013968	0.049	0.144
2/7/18	0.0176112	0.062	0.144
2/8/18	0.0132336	0.046	0.144
2/9/18	0.013248	0.046	0.144
2/10/18	0.0138528	0.048	0.144
2/11/18	0.0216288	0.076	0.144
2/12/18	0.0136512	0.048	0.144
2/13/18	0.0139392	0.049	0.144
2/14/18	0.0132768	0.046	0.144
2/15/18	0.013248	0.046	0.144
2/16/18	0.0149904	0.052	0.144
2/17/18	0.0142704	0.050	0.144
2/18/18	0.0147168	0.052	0.144
2/19/18	0.0147744	0.052	0.144
2/20/18	0.0135504	0.047	0.144
2/21/18	0.012024	0.042	0.144
2/22/18	0.0133488	0.047	0.144
2/23/18	0.0135072	0.047	0.144
2/24/18	0.0133776	0.047	0.144
2/25/18	0.0172656	0.060	0.144
2/26/18	0.0133632	0.047	0.144
2/27/18	0.0143568	0.050	0.144
2/28/18	0.0124848	0.044	0.144



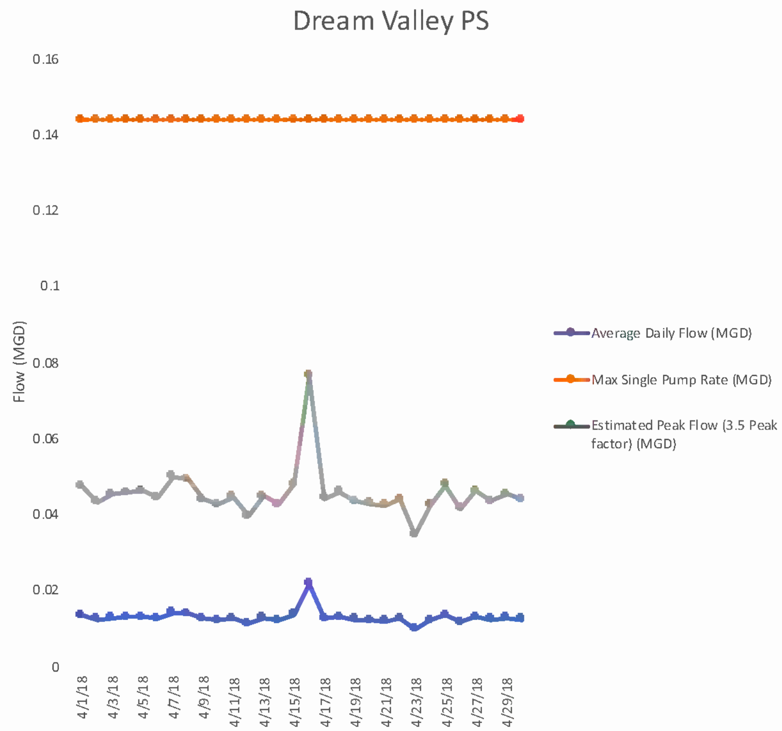
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.0148608	0.052	0.144
3/2/18	0.0134352	0.047	0.144
3/3/18	0.0084096	0.029	0.144
3/4/18	0.0155088	0.054	0.144
3/5/18	0.0148608	0.052	0.144
3/6/18	0.0139392	0.049	0.144
3/7/18	0.01368	0.048	0.144
3/8/18	0.0134928	0.047	0.144
3/9/18	0.014256	0.050	0.144
3/10/18	0.013824	0.048	0.144
3/11/18	0.0154944	0.054	0.144
3/12/18	0.013464	0.047	0.144
3/13/18	0.0132336	0.046	0.144
3/14/18	0.0127584	0.045	0.144
3/15/18	0.012888	0.045	0.144
3/16/18	0.0129024	0.045	0.144
3/17/18	0.012744	0.045	0.144
3/18/18	0.012744	0.045	0.144
3/19/18	0.013032	0.046	0.144
3/20/18	0.013104	0.046	0.144
3/21/18	0.0142128	0.050	0.144
3/22/18	0.0134496	0.047	0.144
3/23/18	0.013752	0.048	0.144
3/24/18	0.01188	0.042	0.144
3/25/18	0.0121536	0.043	0.144
3/26/18	0.0121104	0.042	0.144
3/27/18	0.0110304	0.039	0.144
3/28/18	0.0114912	0.040	0.144
3/29/18	0.011808	0.041	0.144
3/30/18	0.012456	0.044	0.144
3/31/18	0.0119088	0.042	0.144

Min	0.008
Max	0.016
Ave	0.013



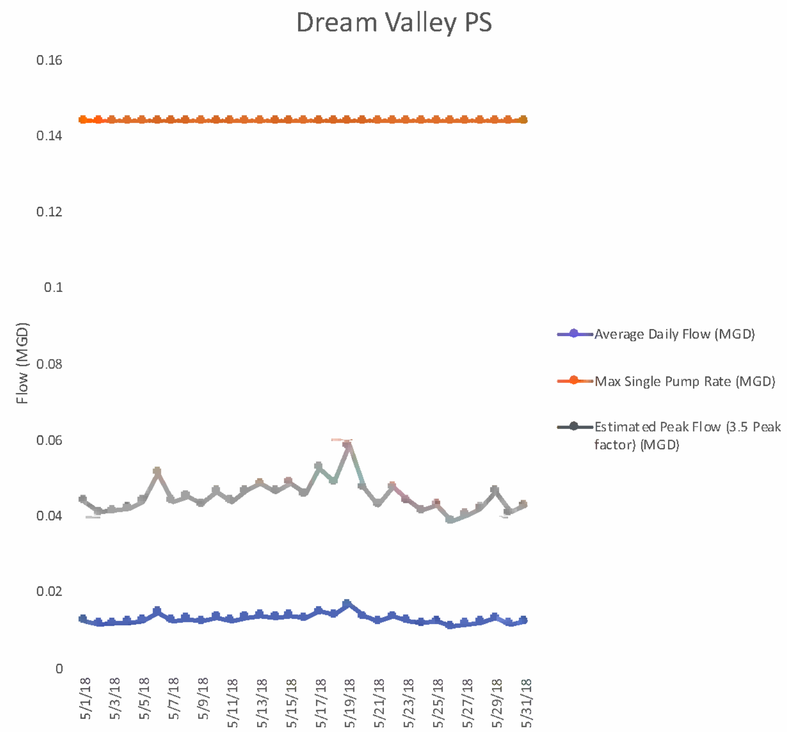
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.0135792	0.048	0.144
4/2/18	0.0123984	0.043	0.144
4/3/18	0.0129888	0.045	0.144
4/4/18	0.0130752	0.046	0.144
4/5/18	0.013248	0.046	0.144
4/6/18	0.0127152	0.045	0.144
4/7/18	0.0142992	0.050	0.144
4/8/18	0.0141264	0.049	0.144
4/9/18	0.0126144	0.044	0.144
4/10/18	0.01224	0.043	0.144
4/11/18	0.012816	0.045	0.144
4/12/18	0.0113328	0.040	0.144
4/13/18	0.0128592	0.045	0.144
4/14/18	0.0122112	0.043	0.144
4/15/18	0.0137664	0.048	0.144
4/16/18	0.0218592	0.077	0.144
4/17/18	0.0126864	0.044	0.144
4/18/18	0.0131472	0.046	0.144
4/19/18	0.012456	0.044	0.144
4/20/18	0.0122976	0.043	0.144
4/21/18	0.0121392	0.042	0.144
4/22/18	0.0126144	0.044	0.144
4/23/18	0.0099216	0.035	0.144
4/24/18	0.0121824	0.043	0.144
4/25/18	0.01368	0.048	0.144
4/26/18	0.01188	0.042	0.144
4/27/18	0.013248	0.046	0.144
4/28/18	0.0124416	0.044	0.144
4/29/18	0.0129744	0.045	0.144
4/30/18	0.0125856	0.044	0.144

Min	0.010
Max	0.022
Ave	0.013

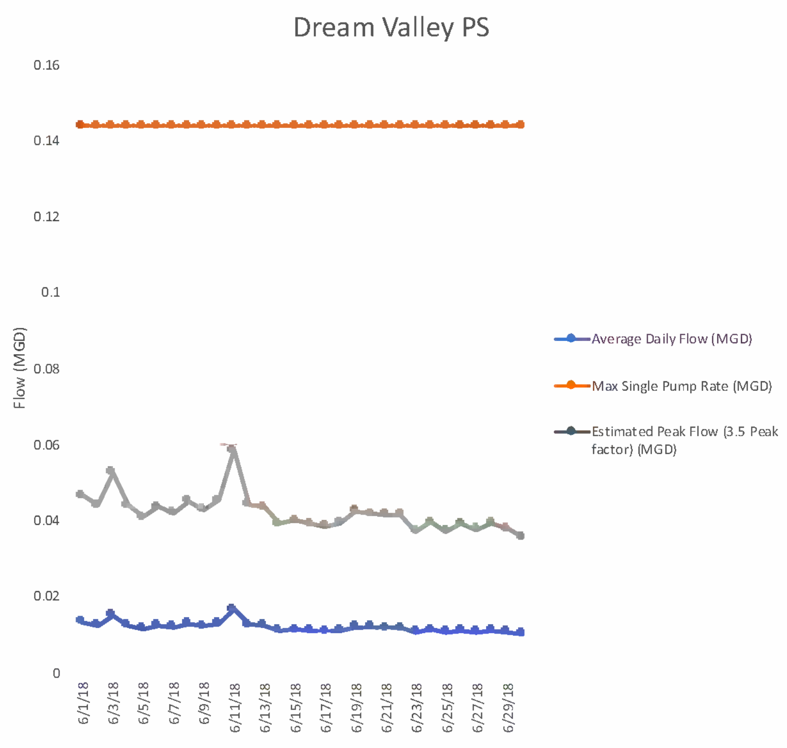


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.0125568	0.044	0.144
5/2/18	0.0117072	0.041	0.144
5/3/18	0.0118368	0.041	0.144
5/4/18	0.0120384	0.042	0.144
5/5/18	0.012528	0.044	0.144
5/6/18	0.014688	0.051	0.144
5/7/18	0.012528	0.044	0.144
5/8/18	0.012888	0.045	0.144
5/9/18	0.0123696	0.043	0.144
5/10/18	0.0132768	0.046	0.144
5/11/18	0.0125568	0.044	0.144
5/12/18	0.0133344	0.047	0.144
5/13/18	0.0138384	0.048	0.144
5/14/18	0.0132912	0.047	0.144
5/15/18	0.013896	0.049	0.144
5/16/18	0.013104	0.046	0.144
5/17/18	0.0150336	0.053	0.144
5/18/18	0.0139824	0.049	0.144
5/19/18	0.0167904	0.059	0.144
5/20/18	0.013536	0.047	0.144
5/21/18	0.0122832	0.043	0.144
5/22/18	0.0135792	0.048	0.144
5/23/18	0.0125856	0.044	0.144
5/24/18	0.0118224	0.041	0.144
5/25/18	0.0122688	0.043	0.144
5/26/18	0.0110592	0.039	0.144
5/27/18	0.0115344	0.040	0.144
5/28/18	0.0120384	0.042	0.144
5/29/18	0.0132624	0.046	0.144
5/30/18	0.0117216	0.041	0.144
5/31/18	0.0122112	0.043	0.144

Min	0.011
Max	0.017
Ave	0.013



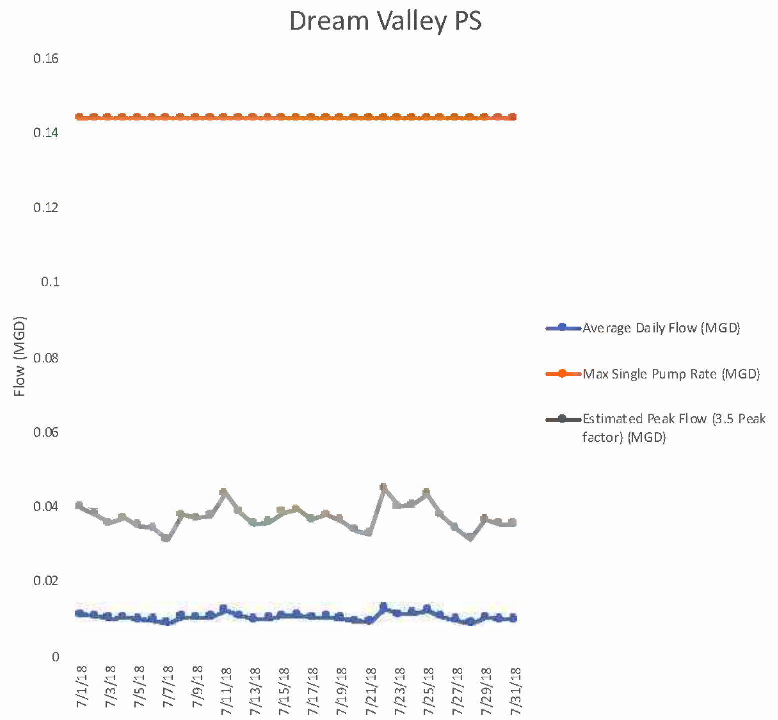
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.0133632	0.047	0.144
6/2/18	0.0125856	0.044	0.144
6/3/18	0.0150768	0.053	0.144
6/4/18	0.0125712	0.044	0.144
6/5/18	0.0117072	0.041	0.144
6/6/18	0.012456	0.044	0.144
6/7/18	0.0120528	0.042	0.144
6/8/18	0.0129312	0.045	0.144
6/9/18	0.0122976	0.043	0.144
6/10/18	0.0130032	0.046	0.144
6/11/18	0.0167904	0.059	0.144
6/12/18	0.0126432	0.044	0.144
6/13/18	0.0124992	0.044	0.144
6/14/18	0.0112176	0.039	0.144
6/15/18	0.011448	0.040	0.144
6/16/18	0.0111888	0.039	0.144
6/17/18	0.0110448	0.039	0.144
6/18/18	0.0112464	0.039	0.144
6/19/18	0.012168	0.043	0.144
6/20/18	0.0119808	0.042	0.144
6/21/18	0.0119232	0.042	0.144
6/22/18	0.0118944	0.042	0.144
6/23/18	0.0106704	0.037	0.144
6/24/18	0.0113472	0.040	0.144
6/25/18	0.010656	0.037	0.144
6/26/18	0.0112032	0.039	0.144
6/27/18	0.0107856	0.038	0.144
6/28/18	0.0112464	0.039	0.144
6/29/18	0.0108144	0.038	0.144
6/30/18	0.0102096	0.036	0.144



Min	0.010
Max	0.017
Ave	0.012

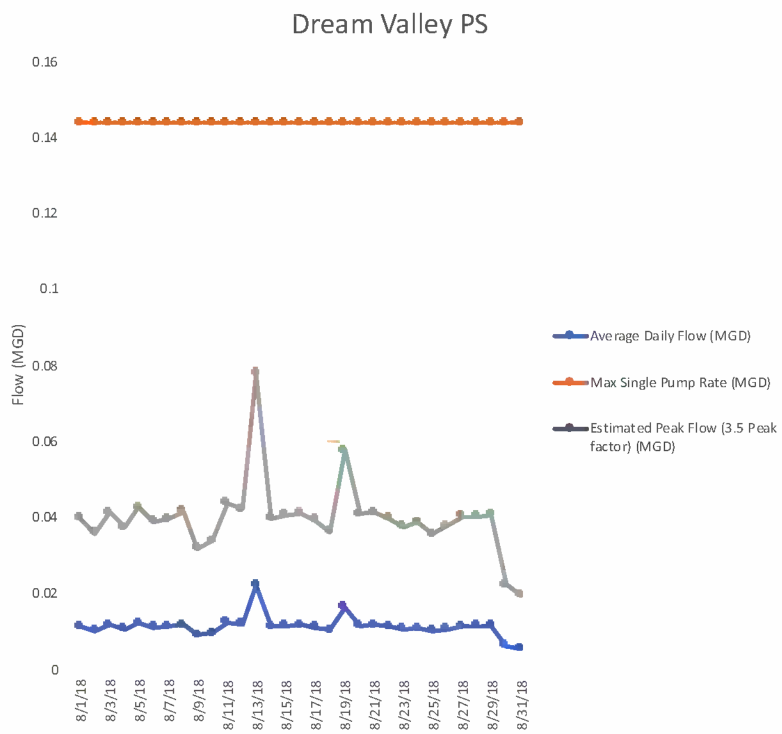
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.0114192	0.040	0.144
7/2/18	0.0109008	0.038	0.144
7/3/18	0.0101952	0.036	0.144
7/4/18	0.0105552	0.037	0.144
7/5/18	0.0100368	0.035	0.144
7/6/18	0.0098496	0.034	0.144
7/7/18	0.0089424	0.031	0.144
7/8/18	0.0108	0.038	0.144
7/9/18	0.0105552	0.037	0.144
7/10/18	0.0107568	0.038	0.144
7/11/18	0.0124992	0.044	0.144
7/12/18	0.0110448	0.039	0.144
7/13/18	0.0101664	0.036	0.144
7/14/18	0.0102672	0.036	0.144
7/15/18	0.0110304	0.039	0.144
7/16/18	0.0111888	0.039	0.144
7/17/18	0.0104832	0.037	0.144
7/18/18	0.0108144	0.038	0.144
7/19/18	0.0103968	0.036	0.144
7/20/18	0.0096336	0.034	0.144
7/21/18	0.0093744	0.033	0.144
7/22/18	0.0128448	0.045	0.144
7/23/18	0.0114336	0.040	0.144
7/24/18	0.0115632	0.040	0.144
7/25/18	0.0124128	0.043	0.144
7/26/18	0.0107424	0.038	0.144
7/27/18	0.0097776	0.034	0.144
7/28/18	0.0089856	0.031	0.144
7/29/18	0.0104256	0.036	0.144
7/30/18	0.0101376	0.035	0.144
7/31/18	0.0101664	0.036	0.144

Min	0.009
Max	0.013
Ave	0.011

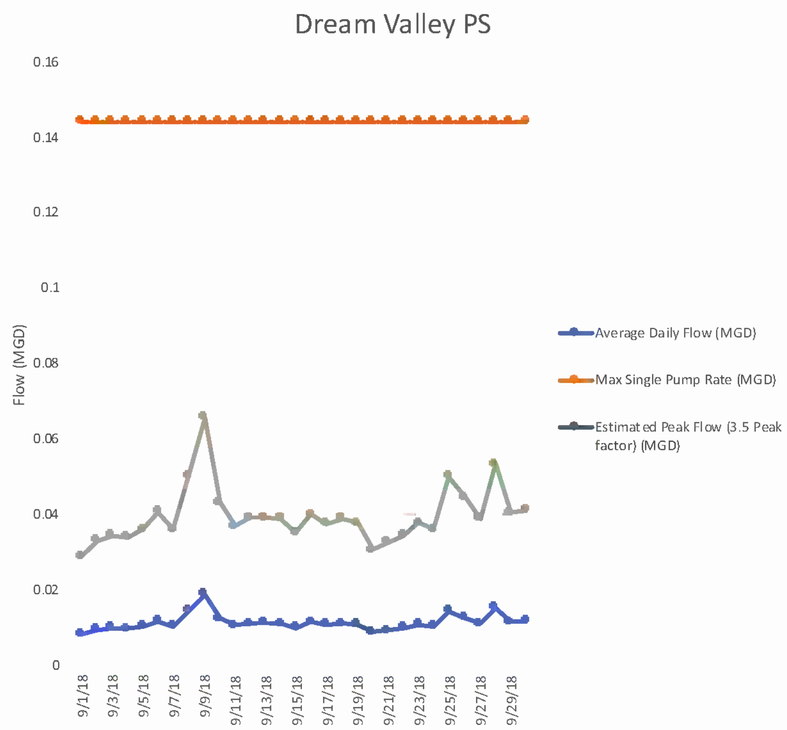


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.0113904	0.040	0.144
8/2/18	0.0102816	0.036	0.144
8/3/18	0.0118224	0.041	0.144
8/4/18	0.0106848	0.037	0.144
8/5/18	0.0121968	0.043	0.144
8/6/18	0.0111168	0.039	0.144
8/7/18	0.0113184	0.040	0.144
8/8/18	0.0119088	0.042	0.144
8/9/18	0.0091152	0.032	0.144
8/10/18	0.0096768	0.034	0.144
8/11/18	0.0125424	0.044	0.144
8/12/18	0.0121104	0.042	0.144
8/13/18	0.022248	0.078	0.144
8/14/18	0.0114192	0.040	0.144
8/15/18	0.0116352	0.041	0.144
8/16/18	0.011808	0.041	0.144
8/17/18	0.0112464	0.039	0.144
8/18/18	0.0104112	0.036	0.144
8/19/18	0.0165168	0.058	0.144
8/20/18	0.0116928	0.041	0.144
8/21/18	0.0118368	0.041	0.144
8/22/18	0.0114048	0.040	0.144
8/23/18	0.0107424	0.038	0.144
8/24/18	0.0110592	0.039	0.144
8/25/18	0.010224	0.036	0.144
8/26/18	0.0108	0.038	0.144
8/27/18	0.0115056	0.040	0.144
8/28/18	0.01152	0.040	0.144
8/29/18	0.0116496	0.041	0.144
8/30/18	0.0064224	0.022	0.144
8/31/18	0.0055872	0.020	0.144

Min	0.006
Max	0.022
Ave	0.011



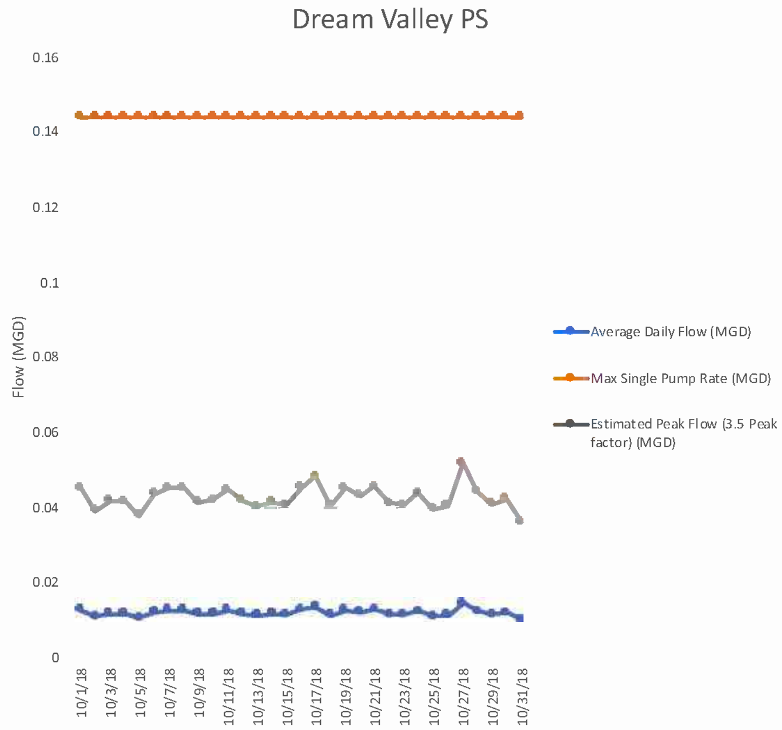
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.0082656	0.029	0.144
9/2/18	0.0094896	0.033	0.144
9/3/18	0.009864	0.035	0.144
9/4/18	0.0096912	0.034	0.144
9/5/18	0.0103104	0.036	0.144
9/6/18	0.0116064	0.041	0.144
9/7/18	0.0102816	0.036	0.144
9/8/18	0.0142848	0.050	0.144
9/9/18	0.0187344	0.066	0.144
9/10/18	0.0123264	0.043	0.144
9/11/18	0.0105552	0.037	0.144
9/12/18	0.0111456	0.039	0.144
9/13/18	0.0111744	0.039	0.144
9/14/18	0.011088	0.039	0.144
9/15/18	0.0100224	0.035	0.144
9/16/18	0.0114192	0.040	0.144
9/17/18	0.0107568	0.038	0.144
9/18/18	0.011088	0.039	0.144
9/19/18	0.0108	0.038	0.144
9/20/18	0.0087552	0.031	0.144
9/21/18	0.0093024	0.033	0.144
9/22/18	0.0098352	0.034	0.144
9/23/18	0.0107712	0.038	0.144
9/24/18	0.0102672	0.036	0.144
9/25/18	0.0143136	0.050	0.144
9/26/18	0.0127008	0.044	0.144
9/27/18	0.0111168	0.039	0.144
9/28/18	0.0152352	0.053	0.144
9/29/18	0.0115776	0.041	0.144
9/30/18	0.0117216	0.041	0.144



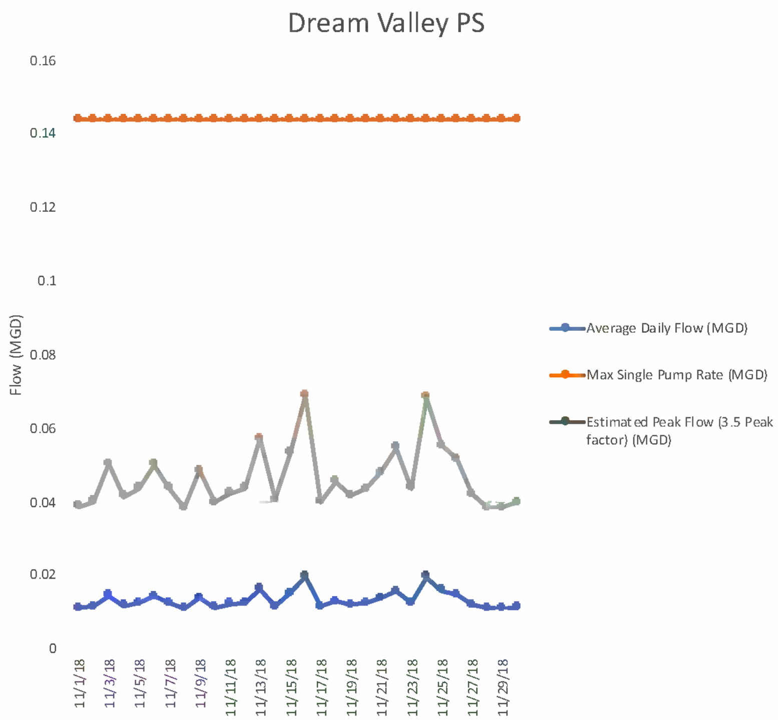
Min	0.008
Max	0.019
Ave	0.011

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.0129312	0.045	0.144
10/2/18	0.011232	0.039	0.144
10/3/18	0.0119664	0.042	0.144
10/4/18	0.0118944	0.042	0.144
10/5/18	0.0108144	0.038	0.144
10/6/18	0.0124704	0.044	0.144
10/7/18	0.01296	0.045	0.144
10/8/18	0.0129168	0.045	0.144
10/9/18	0.01188	0.042	0.144
10/10/18	0.0120384	0.042	0.144
10/11/18	0.0127872	0.045	0.144
10/12/18	0.0119664	0.042	0.144
10/13/18	0.0115632	0.040	0.144
10/14/18	0.0118656	0.042	0.144
10/15/18	0.0116928	0.041	0.144
10/16/18	0.0130176	0.046	0.144
10/17/18	0.013824	0.048	0.144
10/18/18	0.0115776	0.041	0.144
10/19/18	0.0129456	0.045	0.144
10/20/18	0.0123696	0.043	0.144
10/21/18	0.0130752	0.046	0.144
10/22/18	0.0117936	0.041	0.144
10/23/18	0.011664	0.041	0.144
10/24/18	0.0125568	0.044	0.144
10/25/18	0.0113184	0.040	0.144
10/26/18	0.0116208	0.041	0.144
10/27/18	0.0148752	0.052	0.144
10/28/18	0.0127152	0.045	0.144
10/29/18	0.011736	0.041	0.144
10/30/18	0.012096	0.042	0.144
10/31/18	0.0103824	0.036	0.144

Min	0.010
Max	0.015
Ave	0.012

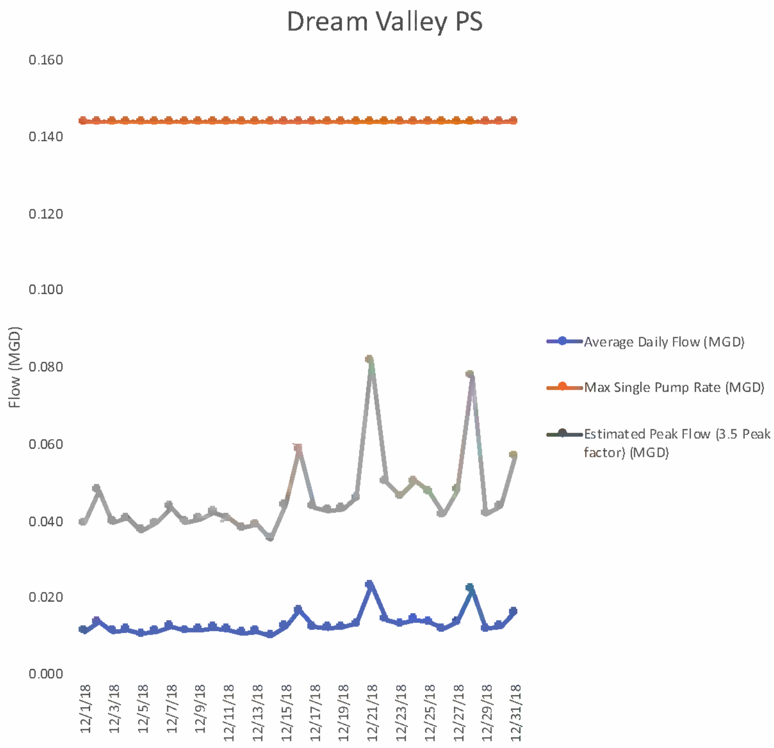


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.0110304	0.0386064	0.144
11/2/18	0.0114624	0.040	0.144
11/3/18	0.0144	0.050	0.144
11/4/18	0.011808	0.041	0.144
11/5/18	0.0125136	0.044	0.144
11/6/18	0.0142848	0.050	0.144
11/7/18	0.012456	0.044	0.144
11/8/18	0.0109728	0.038	0.144
11/9/18	0.0138672	0.049	0.144
11/10/18	0.0113616	0.040	0.144
11/11/18	0.0121104	0.042	0.144
11/12/18	0.0124848	0.044	0.144
11/13/18	0.016344	0.057	0.144
11/14/18	0.0116064	0.041	0.144
11/15/18	0.0152496	0.053	0.144
11/16/18	0.0196848	0.069	0.144
11/17/18	0.0114336	0.040	0.144
11/18/18	0.0129744	0.045	0.144
11/19/18	0.01188	0.042	0.144
11/20/18	0.0124272	0.043	0.144
11/21/18	0.0136944	0.048	0.144
11/22/18	0.0156096	0.055	0.144
11/23/18	0.0124848	0.044	0.144
11/24/18	0.0195264	0.068	0.144
11/25/18	0.0157968	0.055	0.144
11/26/18	0.0147888	0.052	0.144
11/27/18	0.0120096	0.042	0.144
11/28/18	0.0110016	0.039	0.144
11/29/18	0.011016	0.039	0.144
11/30/18	0.0113904	0.040	0.144



Min	0.011
Max	0.020
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.0112896	0.040	0.144
12/2/18	0.01368	0.048	0.144
12/3/18	0.0113328	0.040	0.144
12/4/18	0.0116208	0.041	0.144
12/5/18	0.0106848	0.037	0.144
12/6/18	0.0112752	0.039	0.144
12/7/18	0.012456	0.044	0.144
12/8/18	0.0113616	0.040	0.144
12/9/18	0.0116064	0.041	0.144
12/10/18	0.0120528	0.042	0.144
12/11/18	0.0116208	0.041	0.144
12/12/18	0.010872	0.038	0.144
12/13/18	0.0111744	0.039	0.144
12/14/18	0.0100656	0.035	0.144
12/15/18	0.0126144	0.044	0.144
12/16/18	0.0167472	0.059	0.144
12/17/18	0.0124416	0.044	0.144
12/18/18	0.0121824	0.043	0.144
12/19/18	0.0123264	0.043	0.144
12/20/18	0.0131328	0.046	0.144
12/21/18	0.0233712	0.082	0.144
12/22/18	0.0142992	0.050	0.144
12/23/18	0.0132768	0.046	0.144
12/24/18	0.0143712	0.050	0.144
12/25/18	0.0136656	0.048	0.144
12/26/18	0.0118944	0.042	0.144
12/27/18	0.01368	0.048	0.144
12/28/18	0.0221904	0.078	0.144
12/29/18	0.0119664	0.042	0.144
12/30/18	0.0125424	0.044	0.144
12/31/18	0.0162	0.057	0.144



Min	0.010
Max	0.023
Ave	0.013

Marple Township

CHAPTER 94
MUNICIPAL WASTELOAD MANAGEMENT
2018 ANNUAL REPORT

FOR THE

TOWNSHIP OF MARPLE

DELAWARE COUNTY, PA

Prepared by:

PENNONI ASSOCIATES INC.
1900 Market Street, Suite 300
Philadelphia, PA 19103

MARPL 00538

February 2019

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This report has been prepared in accordance with Title 25, Part 1, Subpart C, Article 11, Chapter 94, of the Commonwealth of Pennsylvania Regulations.

MUNICIPAL WASTELOAD MANAGEMENT
2018 ANNUAL REPORT

MARPLE TOWNSHIP
DELAWARE COUNTY, PA

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WASTELOAD MANAGEMENT
2018 ANNUAL REPORT

MARPLE TOWNSHIP
DELAWARE COUNTY, PA

1.0 INTRODUCTION

This Report is submitted in compliance with the latest regulation set forth under Title 25, Part I, Subpart C, Article II, Chapter 94 Municipal Wasteload Management Regulations of the Pennsylvania Department of Environmental Protection (DEP) concerning sewerage facilities.

1.1 Delineation of Sewerage Service Areas

Marple Township (Township) borders Haverford Township to the northeast; Springfield Township to the southeast; Upper Providence Township to the southwest; Newtown Township to the northwest; and Radnor Township to the north. The Township is primarily suburban residential; however, the Township zoning ordinance allows for a number of other land uses including commercial, office, apartment, multi-family and open space. The topography of the Township is defined primarily by two (2) drainage basins, the Crum Creek and Darby Creek Basins. The size of the entire Township is approximately 10.50 square miles; 97% of the Township is sewered. A copy of the Township Sewer Map has been previously provided and available upon request.

The Township does not own and operate a wastewater treatment facility; however, the Township does own and maintain a dedicated sanitary sewer collection and conveyance system (not a combined sewer system). The system consists of sanitary sewers including one (1) public pumping stations. The Township has Sewer Agreements with surrounding (downstream) municipalities and authorities, including Radnor-Haverford-Marple Sewer Authority (RHM), Central Delaware County Authority (CDCA) and DELCORA to provide for sewer conveyance and treatment. These Agreements establish the following items: terms of the relationship; identify connection points; address flow, loadings and billings information; and other necessary requirements for the Township's portion of wastewater which passes through the downstream municipalities.

1.2 Description of Existing Sewage Facilities

The Township is split by two (2) conveyance systems. The Eastern portion of the Township (4.5 square miles) discharges to the Radnor-Haverford-Marple (RHM) Interceptor, and the Western portion of the Township (6.0 square miles) discharges to the Central Delaware County Authority (CDCA) Interceptor. Both interceptors convey sewage to DELCORA for treatment at their facility and at the City of Philadelphia WWTP.

1.2.1 Collection System

There is approximately 105 miles of sanitary sewer pipe within the Township; the sewer lines range in size from 4-inch to as large as 18-inch and consist mainly of 8-inch lines. Only a very small section (1% of system) is 18-inch sewer, which is located where the RHM line reaches the eastern Township boundary with Haverford Township. The vast majority of piping is vitrified clay (terracotta pipe) with an average age of 50 to 60 years. The approximate size/material breakdown is as follows:

Size/Material	Length
8-inch SDR-35 PVC pipe	21,120 feet (4 miles)
8-inch VCP	522,720 feet (99 miles)
10-inch VCP	7,392 feet (1.4 miles)
12-inch VCP	4,224 feet
18-inch	528 feet

1.2.2 Pumping Station

There is one (1) pumping station within the Township, located at the Cedar Grove Farms development. The Cedar Grove Farms pumping station serves seventy (70) residential lots, each generating approximately 500 GPD of flow, which equates to a total flow of 35,000 GPD. The station consists of two (2) 7-horsepower submersible, alternating lift pumps; each pump operates at a peak flow capacity of 100 GPM. Some individual houses in both the Cedar Grove Farms and Beatty Hills developments utilize grinder pumps that are located and operated on the homeowners' properties. Low and high pressure force mains are located in the areas where the grinder pumps and the Cedar Grove Farms pump station discharge.

2.0 HYDRAULIC LOADINGS [§ 94.12.Sec. (a) (1), (2), (3)]

Marple Township does not own a sewage treatment plant. However, the following presents the historical flows for the past five (5) years for each collection system.

2.1 RHM System

Based upon metered flow information provided to Marple Township from RHM (see Appendix A), the flows are summarized as follows:

Table 1
RHM Historical and Present Sewer Flows (2014 - 2018)

Month	2014	2015	2016	2017	2018
Average Monthly (1) (MG)	48.4	41.2	36.4	34.3	47.7
Annual Average (MGD)	1.591	1.356	1.196	1.128	1.568
5-Year Average Hydraulic Flow:					**1.368**
Maximum Month (2) (MGD)	2.197	2.197	1.511	1.284	2.117
Max. Month Total Rainfall (inches)	7.85	7.85	6.32	5.73	8.96
Hydraulic Ratio (Max/Annual Average Flow)	1.381	1.620	1.263	1.139	1.350
	5-Year Average Hydraulic Ratio:				**1.350**

(1) Based on RHM's flow metered data. (Appendix A)

(2) Based on RHM's metered maximum month total flow in MG. (Appendix A)

2.2 CDCA System

Based upon metered flow information provided to Marple Township from CDCA (see Appendix B), the flows are summarized as follows:

Table 2 CDCA Historical and Present Sewer Flows (2014 - 2018)					
Month	**2014**	**2015**	**2016**	**2017**	**2018**
Average Monthly (1) (MG)	39.4	38.8	40.9	37.8	46.2
Annual Average (MGD)	1.296	1.274	1.345	1.274	1.557
5 -Year Average Hydraulic Flow:					**1.349**
Maximum Month (2) (MGD)	1.673	1.629	1.558	1.464	1.691
Hydraulic Ratio (Max/Annual Average Flow)	1.291	1.278	1.159	1.149	1.086
	5 -Year Average Hydraulic Ratio:				**1.193**

(1) Based on CDCA's flow metered data. (Appendix B)

(2) Based on CDCA's metered maximum month total flow in MG. (Appendix B)

3.0 5-YEAR HYDRAULIC LOADING PROJECTIONS [§ 94.12.Sec. (a) (1), (2), (3)]

The following presents the projected flows for the next five (5) years for each collection system:

3.1 RHM System

Per Table 1, the 5-year average hydraulic flow is 1.349 MGD which designates the 2019 *"Previous Year Annual Average Flow"* in Table 3. The new connections projected in the next five years are due to the Marple Associates development, consisting of the construction of a Giant Supermarket, LA Fitness, Royal Farms Convenience Store and an office building. For infill residential development, a conservative assumed ("flat-line") projection of 6 EDU's per year and an assumed unit flow rate of 262.5 GPD per EDU was utilized. Note the maximum monthly flow was calculated utilizing the 5-year average hydraulic ratio per Table 1.

TABLE 3: 5-Year Hydraulic Loading Projection							
Projected Years	Previous Year Annual Average Flow	New Connection	Unit Flow	Increased Flow from New Connections	Projected Annual Average Flow	Hydraulic Ratio	Maximum Monthly Flow
	(MGD)	(EDU)	(GPD/EDU)	(MGD)	(MGD)		(MGD)
2019	1.368	22	262.5	0.006	1.374	1.35	1.855
2020	1.374	24	262.5	0.006	1.380	1.35	1.863
2021	1.380	26	262.5	0.007	1.387	1.35	1.873
2022	1.387	6	262.5	0.002	1.388	1.35	1.875
2023	1.388	6	262.5	0.002	1.390	1.35	1.877

3.2 CDCA System

Per Table 2, the 5-year average hydraulic flow is 1.349 MGD which designates the 2019 *"Previous Year Annual Average Flow"* in Table 4. The new connections indicated for years one and two are based on the Ravenscliff development, the Village of the Four Seasons Development, and the Gradyville Road Subdivision. The Ravencliff development consists of three (3) phases. Phase 1 and 2 have been completed, and Phase 3 (138 townhouses) is currently under construction. For infill residential development, a conservative assumed ("flat-line") projection of 6 EDU's per year (a unit flow rate of 267 GPD per EDU was utilized). All connections have been accounted for in Table 4, based on an assumed schedule. Additionally, a unit flow rate of 267 GPD per EDU was utilized. Note the maximum monthly flow was calculated using the 5-year average hydraulic ratio per Table 2.

TABLE 4: 5-Year Hydraulic Loading Projection							
Projected Years	Previous Year Annual Average Flow	New Connection	Unit Flow	Increased Flow from New Connections	Projected Annual Average Flow	Hydraulic Ratio	Maximum Monthly Flow
	(MGD)	(EDU)	(GPD/EDU)	(MGD)	(MGD)		(MGD)
2019	1.349	27	267.0	0.007	1.356	1.19	1.618
2020	1.356	35	267.0	0.009	1.366	1.19	1.629
2021	1.366	16	267.0	0.004	1.370	1.19	1.634
2022	1.370	6	267.0	0.002	1.372	1.19	1.636
2023	1.372	6	267.0	0.002	1.373	1.19	1.638

4.0 SEWER EXTENSIONS [§ 94.12Sec. (a) (4)]

There were no sewer extensions in Marple Township in 2018.

5.0 SEWER SYSTEM MONITORING, MAINTENANCE, REPAIR, & REHABILITATON [§ 94.12.Sec. (a) (5)]

The Township has a full staff that does periodic monitoring of the sewer system in addition to the long-term maintenance of all of the lines. Specifically, the Township's public works department performs scheduled services including monitoring, maintenance and repairs. A breakdown of the specific monitoring and maintenance items completed in 2018 is as follows:

2017 MAINTENANCE RECORD			
Date	**Maintenance**	**Quantity/Description**	**Location/Date**
1/9/18 – 12/28/18	TV Line	40,290 linear feet	Throughout System
7/2/18 – 11/19/18	Root Control (RazoRooter®)	22,049 linear feet, 1,749 ounces	Throughout System
1/15/18 - 8/27/18	Manhole Repair and Rehabilitation	73 Manholes	Throughout System

The Township includes sewer repair and/or rehabilitation in its annual capital improvement program. Work is performed on an as-needed basis, either by the Township Public Works Department or private contractors.

5.1 Engineering Studies

There were no engineering studies performed within the township in 2018.

6.0 CONDITION OF SEWER SYSTEM [§ 94.12.Sec. (a) (6)]

The existing system is in good working order with. The Township has an in-house public works staff that, as required, does periodic maintenance of the system. Additionally, the Township will continue to plan for increased demands that are anticipated for the system. Furthermore, portions of the line are periodically videotaped for the purpose of maintaining the system and preventative maintenance. At the present time, any portions of the system that appear to be experiencing infiltration and inflow (I/I) problems are addressed and repaired on a case-by-case basis.

6.1 Population Statistics

The U.S. Census 2000 and 2010 Population Estimates and DVRPC 2020 Population Forecast for Marple Township were utilized for estimating population growth trend in the Township as shown in Table 5 below:

TABLE 5: TOWNSHIP STATISTICS

Description	Total Population	Average Household Size
2000 U.S. Census:	23,737	2.64
2010 Population Estimate, U.S. Census:	23,428	2.71
2012 Population Estimate, ACS(1):	23,452	2.70
2020 Population Forecast, DVRPC(2):	23,362	-

(1) Source: U.S. Census. "2008-2012 American Community Survey 5-Year Estimate."
(2) Source: Delaware Valley Regional Planning Commission, *"Regional, County and Municipal Population and Employment Forecasts"*, August 2007.

As indicated, only a small fluctuation in population is expected to over the next ten (10) years; thus, sewage flows and connections are anticipated to modestly increase.

6.2 Historical and Present Sewer Flows

The historical and present sewer flows for both systems have been shown in Tables 1 and 2, Section 2.0.

6.3 Projected Sewer Flows

The projected sewer flows for both systems have been shown in Tables 3 and 4, Section 3.0.

The overall capacity of the Township's sanitary sewer collection system is adequate for present and projected flows. No projects to increase the sewer capacity are scheduled at this time. Also, the Township's maintenance program to identify problem areas and minimize I/I will also serve to limit increases in future flows.

6.4 Discussion of Repaired, Replaced, or Rehabilitated Sewers

There were no portions of the sewer collection system in 2018 that have been identified as requiring repair, replacement, or rehabilitation, except as follows. These repairs did not result in a sanitary sewer overflow.

2018 SANITARY SEWER BLOCKAGES	
Location	**Description**
401 Milford Rd.	Main
2609 Springfield Rd.	Main
101 Brookthorpe Terr.	Lateral
2158 Brookthorpe Terr.	Lateral
Pennview	Lateral
2158 Brookthorpe Terr.	Lateral
3060 West Chester Pike	Lateral
15 Pine Tree Dr.	Lateral
3060 West Chester Pike	Lateral
2404 Patricia Dr.	Lateral
3060 West Chester Pike	Lateral
478 Hildale Rd.	Lateral
216 Cranbourne Dr.	Lateral
2773 Highland Ave.	Lateral
704 St. Francis Dr.	Lateral
2648 Springfield Rd.	Lateral
Broomall Gas Station (WCP)	Lateral
14 Franklin Getz Dr.	Lateral
2505 Highland Ave.	Lateral
26 Grove Ln.	Lateral
2427 West Chester Pike	Lateral
Drexle Ave.	Main
718 Cedar Grove Rd.	Lateral
29 Ferguson Ave.	Lateral
714 Elena Dr.	Lateral
126 Beachtree Dr.	Lateral
110 Brookthorpe Terr.	Main
4 Schoolhouse Ln.	Lateral
Alameda Rd.	Lateral

2018 SANITARY SEWER BLOCKAGES	
Location	**Description**
104 Lincoln Cir.	Lateral
440 Candlewood Rd.	Lateral
1283 Anthony Rd.	Lateral
Presbyterian Church	Main
Marple Rd.	Lateral
KFC	Lateral
1283 Anthony Rd.	Lateral
49 Ferguson	Lateral
2615 Caranel	Lateral
80 4th Ave.	Main
2020 Park Ln.	Main
Bella Ln.	Main
237 Fawn Hill Ln.	Main
44 Schoolhouse Ln.	Main
46 Malin Rd.	Main
Med. Center	Lateral
206 Brookthorpe Cir.	Lateral
2736 Stoneybrook Rd.	Lateral
200 Oldfield Way	Lateral
228 Brookthorpe Cir.	Lateral
10 Rose Tree Dr.	Lateral
243 Talbot Dr.	Lateral
16 Ann Rd.	Lateral
32 N. Sproul Rd.	Lateral
Wawa	Lateral
Alameda Rd.	Lateral
206 Morton Ave.	Main
2611 Oriole Ln.	Lateral
501 Paxon Hollow Rd.	Lateral
527 S. Central Blvd.	Main
2501 Highland Ave.	Lateral

6.5 Sanitary Sewer Surcharges and Overflows

6.5.1 RHM System

There were no sanitary sewer overflows in the RHM System in 2018.

6.5.2 CDCA System

There were no sanitary sewer overflows in the CDCA System in 2018.

7.0 PUMPING STATION [§ 94.12.Sec. (a) (7)]

The Cedar Grove Pump Station was put on-line in early 1992 and has been functioning within design parameter(s) since that time. The two (2) pumps in the station were replaced in 2000 with the same model pumps. No problems have been encountered with the station and no additional flows outside of the Cedar Grove Farms development have been introduced into the system.

8.0 INDUSTRIAL WASTES [§ 94.12.Sec. (a) (8)]

No known industrial wastes are currently discharged into the RHM and CDCA systems from Marple Township.

9.0 CORRECTIVE ACTION PLAN [§ 94.12.Sec. (a) (9)]

The Township continues to maintain the sanitary sewer system including identification and removal of illegal connections. The Township does not anticipate any overloads.

*** END ***

APPENDIX A

RHM
2018 MONTHLY FLOW DATA

2018	Marple Manholes						Total Monthly Flow	Average Daily Flow	Total Rainfall (in.)
	M1	M2	M3A	M3	M4	M5			
January	7.75	18.28	0.99	1.65	5.70	0.69	35.06	1.131	3.29
February	7.44	19.46	0.97	1.63	5.74	0.62	35.87	1.281	2.1
March	10.22	25.55	1.37	2.02	7.45	0.69	47.31	1.526	4.48
April	10.15	23.68	1.44	1.76	7.12	0.67	44.82	1.494	3.22
May	11.82	25.35	1.13	1.83	7.48	0.72	48.32	1.559	**5.73**
June	14.19	24.45	0.91	1.76	7.01	0.69	49.01	1.634	3.53
July	11.75	21.84	0.77	1.55	6.58	0.73	43.21	1.394	4.71
August	10.59	23.42	0.69	1.83	7.81	0.73	45.07	1.454	4.89
September	11.60	26.40	1.51	2.13	8.68	0.69	51.02	1.701	1.69
October	11.92	25.94	1.72	2.02	8.10	0.72	50.42	1.626	4.04
November	13.66	30.97	1.51	2.61	8.97	0.68	58.41	1.947	1.29
December	14.56	33.52	2.11	2.88	9.74	0.72	**63.53**	**2.049**	1.82
Total Yearly Flow	135.63	298.86	15.12	23.67	90.39	8.36	572.04	18.80	40.79
Average Monthly Flow	11.30	24.91	1.26	1.97	7.53	0.70	**47.7**	**1.566**	

Note: flows are in million gallons

APPENDIX B

CDCA
2018 MONTHLY FLOW DATA

2018	MH-01	Total Monthly Flow	Average Daily Flow
January	39.52	39.52	1.275
February	41.21	41.21	1.472
March	51.44	51.44	1.659
April	45.81	45.81	**1.527**
May	46.99	46.99	1.516
June	44.86	44.86	1.495
July	38.29	38.29	1.235
August	42.05	42.05	1.356
September	48.06	48.06	1.602
October	46.57	46.57	1.502
November	53.03	53.03	1.768
December	56.61	56.61	1.826
Total Yearly Flow	554.43	554.43	18.23
Average Monthly Flow	46.20	**46.2**	**1.519**

Note: flows are in million gallons

Morton Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Borough of Morton**	Permit No.:	**PAN/A**
Mailing Address:	**500 Highland Ave**	Effective Date:	**N/A**
City, State, Zip:	**Morton, PA 19070**	Expiration Date:	**N/A**
Contact Person:	**Martha Preston**	Renewal Due Date:	**N/A**
Title:	**Borough Secretary**	Municipality:	**Morton Borough**
Phone:	**610-543-4565**	County:	**Delaware**
Email:	**mpreston@mortonpa.org**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is attached.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Borough forces are used for inspection of the sanitary sewer system. Contract forces are used for troubleshooting and routine maintenance. The Borough executed a contract in late 2018 for line cleaning and video inspection of a portion of the sanitary lines. Attached is a copy of a plan depicting the location.

The Borough currently has 5 flow meters installed that monitor approximately 53% of the total flow throughout the Borough. These flow meters are part of a system wide program coordinated by DELCORA, which collects data continuously and saves data in 15 minute increments.

Flow meter data is analyzed annually, and areas with high / low flow data is researched further and is used to help target areas that need to be inspected further.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

A 4-phase video inspection program was implemented in 2014, with phase one completed in the summer of 2014. The result of the video inspection indicated the sewers are in fair to good condition, with no high priority repairs necessary.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

- ☐ This report demonstrates an existing hydraulic overload condition.
- ☐ This report demonstrates a projected hydraulic overload condition.
- ☐ This report demonstrates an existing organic overload condition.
- ☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Robert J. Poole	
Name of Responsible Official	Signature
610-543-4565	02/21/19
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles Catania Jr.	Charles J Catania Jr.
Name of Preparer	Signature
610-532-2884	2/19/15
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chap
Sewag

Reporting Year: 2018

Facility Name: Morton Borough - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	0.70868	0.50972	0.52814	0.47004	0.5203
February	0.75408	0.48342	0.63506	0.46553	0.65887
March	0.68398	0.63007	0.57418	0.55863	0.7222
April	0.69598	0.53672	0.52807	0.60265	0.67453
May	0.61232	0.43584	0.61076	0.59864	0.65855
June	0.49057	0.52879	0.49691	0.51367	0.60279
July	0.43011	0.50245	0.46985	0.51265	0.49232
August	0.36328	0.39954	0.44106	0.49654	0.49475
September	0.33961	0.37751	0.42342	0.43383	0.57487
October	0.34086	0.41866	0.41962	0.4421	0.53711
November	0.37335	0.39619	0.3985	0.40749	0.6953
December	0.43929	0.51675	0.43034	0.4495	0.69368
Annual Avg	0.519343389	0.47797156	0.496325145	0.495937635	0.610438343
Max 3-Mo Avg	0.715580781	0.550070231	0.579126967	0.586636509	0.685195987
Max : Avg Ratio	1.38	1.15	1.17	1.18	1.12
Existing EDUs	1,460.0	1,460.0	1,460.0	1,460.0	1,460.0
Flow/EDU (GPD)	355.7	327.4	339.9	339.7	418.1
Flow/Capita (GPD)	101.6	93.5	97.1	97.1	119.5
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	1,460	1,460	1,460	1,460	1,460
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0004	0.0004	0.0004	0.0004	0.0004
Proj. Annual Avg	0.5204	0.5208	0.5212	0.5216	0.522
Proj. Max 3-Mo Avg	0.62458	0.62506	0.62554	0.62602	0.6265
Proj. Overload?					

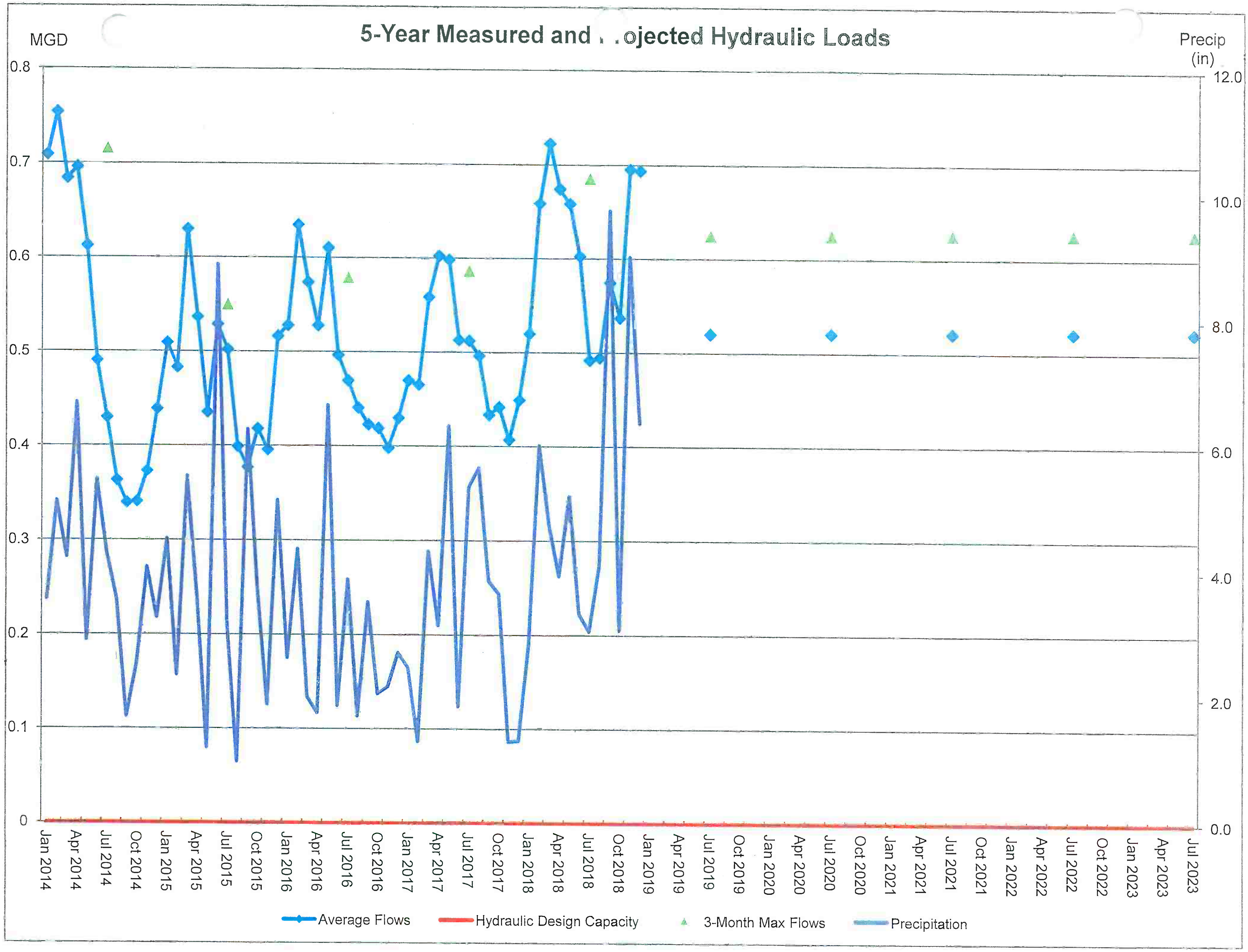
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.86	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38



5-Year Measured and . .ojected Hydraulic Loads
MGD
Precip (in)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
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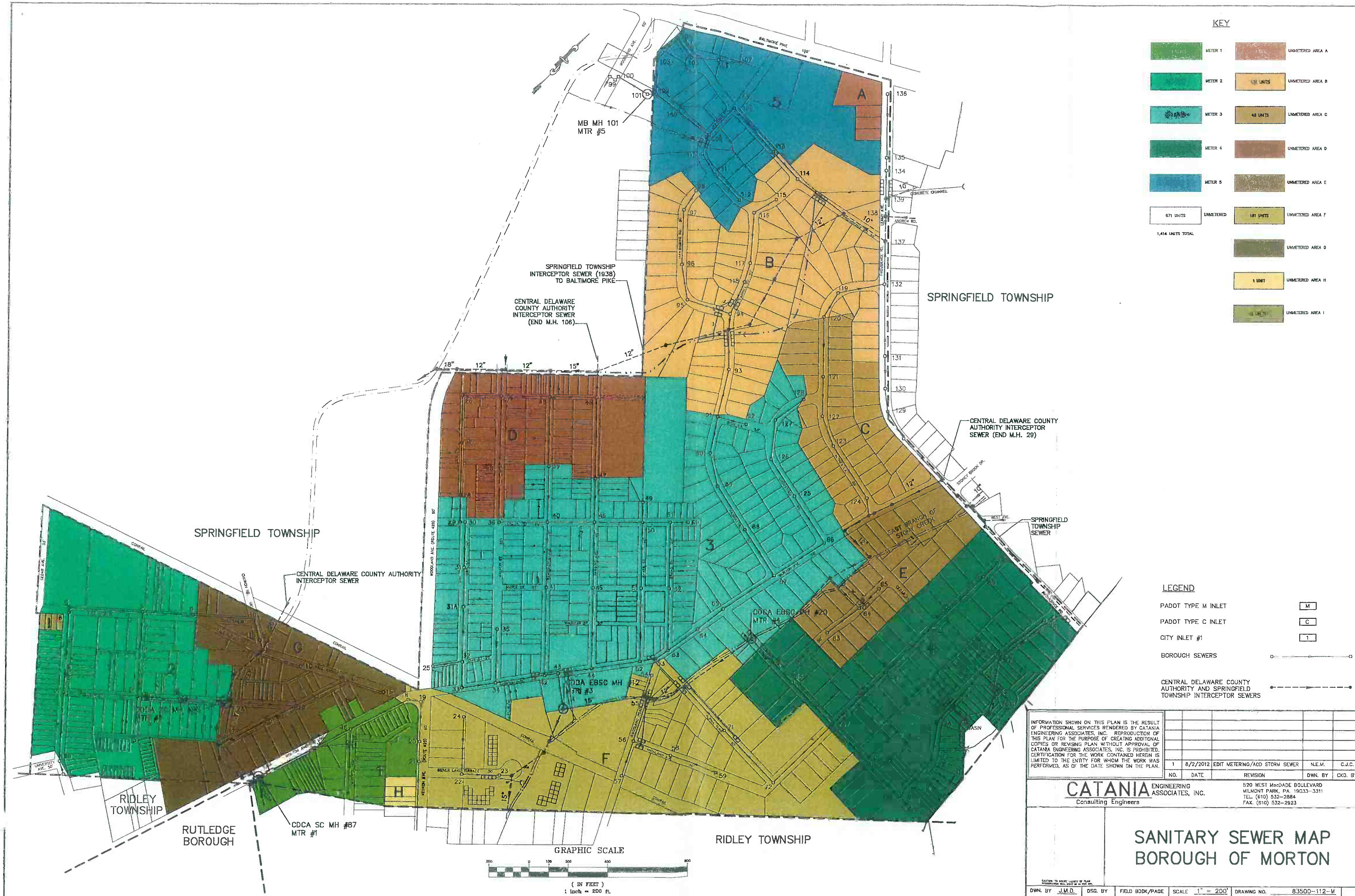
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation

MORTON BOROUGH MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs Served	January		February		March		April		May		June		Comments
			Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	
1	61 Morton Ave (along curb line, at Stony Creek)	64	630,267	318	1,134,761	633	1,202,629	606	931,720	485	418,510	407	673,727	351	
2A	Near 56 Bridge St (in road, at Stoney Ck)														Meter Removed. EDUs Reassigned to Unmetered.
2B	Near 56 Bridge St (in road, at Stoney Ck)	147	1,829,127	401	2,054,781	499	2,342,456	514	1,895,987	430	2,186,877	480	1,815,294	412	
3	111 N. Morton Ave, (behind Door/Window Co.)	295	3,800,776	416	4,199,889	508	5,165,401	565	4,956,567	560	4,918,843	538	4,557,622	515	
4	15 Sycamore Ave (in road)	181	1,188,427	212	1,362,723	269	1,965,823	350	1,773,712	327	1,801,474	321	1,503,298	277	
5	At CVS (100 ft behind bumpster, inside fence, site painted)	81	1,035,777	412	952,118	420	1,100,457	438	1,086,577	447	1,024,074	408	890,045	396	
	Unmetered Areas (average volume from all meters)	692	7,644,774	356	8,743,953	451	10,611,357	495	9,591,195	462	9,676,194	451	8,571,129	413	Uses average volume/EDU from all Morton Borough meters for estimate.
	TOTAL	**1,460**	**16,129,148**		**18,448,225**		**22,388,123**		**20,235,758**		**20,025,972**		**18,011,115**		

Meter No.	Meter Location	Total EDUs Served	July		August		September		October		November		December		Comments
			Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	
1	61 Morton Ave (along curb line, at Stony Creek)	64	524,895	265	550,114	277	776,979	405	537,566	271	1,001,410	522	886,438	447	
2A	Near 56 Bridge St (in road, at Stoney Ck)														Meter Removed. EDUs Reassigned to Unmetered.
2B	Near 56 Bridge St (in road, at Stoney Ck)	147	1,442,623	317	1,531,446	336	1,997,032	453	1,743,666	383	2,148,388	487	2,078,440	456	
3	111 N. Morton Ave, (behind Door/Window Co.)	295	3,729,502	408	3,814,792	417	4,000,145	452	4,126,788	451	5,159,392	583	5,227,336	572	
4	15 Sycamore Ave (in road)	181	1,381,921	246	1,213,859	216	1,237,334	228	1,209,450	216	1,364,237	251	1,835,424	327	
5	At CVS (100 ft behind bumpster, inside fence, site painted)	81	949,253	378	957,537	381	1,060,487	436	1,141,141	454	1,299,019	535	1,284,169	511	
	Unmetered Areas (average volume from all meters)	692	7,233,737	337	7,269,377	339	8,174,229	394	7,891,873	368	9,886,631	476	10,192,409	475	Uses average volume/EDU from all Morton Borough meters for estimate.
	TOTAL	**1,460**	**15,261,931**		**15,337,125**		**17,246,206**		**16,650,484**		**20,859,077**		**21,504,216**		



INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF PROFESSIONAL SERVICES RENDERED BY CATANIA ENGINEERING ASSOCIATES, INC. REPRODUCTION OF THIS PLAN FOR THE PURPOSE OF CREATING ADDITIONAL COPIES OR REVISING PLAN WITHOUT APPROVAL OF CATANIA ENGINEERING ASSOCIATES, INC. IS PROHIBITED. CERTIFICATION FOR THE WORK CONTAINED HEREIN IS LIMITED TO THE ENTITY FOR WHOM THE WORK WAS PERFORMED, AS OF THE DATE SHOWN ON THE PLAN.

NO.	DATE	REVISION	DWN. BY	CKD. BY
1	8/2/2012	EDIT METERING/ADD STORM SEWER	N.E.M.	C.J.C.

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers

520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

SANITARY SEWER MAP
BOROUGH OF MORTON

DWN. BY J.M.D.	DSG. BY	FIELD BOOK/PAGE	SCALE 1" = 200'	DRAWING NO. 83500-112-M
CKD. BY S.B.			DATE 11/01/10	SHEET 1 OF 1 SHEETS

Industrial Waste Report

There is one industrial user for the Borough: Mobile Car Wash located at Leamy Avenue and Baltimore Pike. No known problems are associated with the industrial wastewater discharges.

Nether Providence Township

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Nether Providence Township**	Permit No.:	**PAN/A**
Mailing Address:	**214 Sykes Lane**	Effective Date:	**N/A**
City, State, Zip:	**Wallingford, PA 19086**	Expiration Date:	**N/A**
Contact Person:	**Gary Cummings**	Renewal Due Date:	**N/A**
Title:	**Township Manager**	Municipality:	**Nether Providence**
Phone:	**610-566-4516**	County:	**Delaware**
Email:	**gcummings@netherprovidence.org**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)
   ☐ List summarizing each extension or project attached (**Attachment**)
   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

   No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is attached.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   Nether Providence Township public works department has a sewer maintenance schedule for cleaning and inspecting lines. During these cleanings the crew is looking for blockages, broken pipes, roots in lines and I&I issues.

   Nether Providence, in coordination with DELCORA has flow metering equipment to monitor flows through the sanitary system. CSL Services, Inc. was contracted by DELCORA to calibrate and maintain the flow monitoring equipment throughout 2018. Calibration reports are maintained by DELCORA. Flow data is utilized to assist in the identification of areas that require attention.

   See attachment for more information.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The general condition of the sewer system is good. No SSOs were reported for the 2018 calendar year.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☐ The collection system does not contain pump stations

☒ The collection system does contain pump stations (Number – **1**)

☒ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

- ☐ This report demonstrates an existing hydraulic overload condition.
- ☐ This report demonstrates a projected hydraulic overload condition.
- ☐ This report demonstrates an existing organic overload condition.
- ☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Gary Cummings	[signature]
Name of Responsible Official	Signature
610-566-4516	February 23, 2017
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Charles Catania Jr.	
Name of Preparer	Signature
610-532-2884	2/20/14
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Nether Providence - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	1.55807	1.20116	1.17	1.02426	0.98641
February	1.99497	1.16213	1.51404	0.91081	1.28476
March	1.76404	1.66449	1.31848	1.19116	1.45387
April	1.79288	1.30678	1.27999	1.28731	1.3723
May	1.67622	1.12618	1.40151	1.23107	1.36185
June	1.27647	1.27421	1.10978	1.06908	1.16595
July	0.97238	1.14909	0.99924	0.98309	0.92801
August	0.8666	0.96145	0.89593	0.96628	0.96698
September	0.79532	0.96288	0.86382	0.92347	1.10344
October	0.77478	1.02555	0.85574	0.89798	1.07083
November	0.94074	0.99681	0.85993	0.90237	1.5067
December	0.97325	1.22955	0.95659	0.91084	1.52041
Annual Avg	1.28214404	1.17168935	1.10208632	1.02480914	1.22679308
Max 3-Mo Avg	1.8506323	1.3777976	1.37083409	1.23651158	1.39600953
Max : Avg Ratio	1.44	1.18	1.24	1.21	1.14
Existing EDUs	2,829.0	2,829.0	2,829.0	2,829.0	2,829.0
Flow/EDU (GPD)	453.2	414.2	389.6	362.3	433.6
Flow/Capita (GPD)	129.5	118.3	111.3	103.5	123.9
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	2,829	2,829	2,829	2,829	2,829
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0004	0.0004	0.0004	0.0004	0.0004
Proj. Annual Avg	1.1619	1.1623	1.1627	1.1631	1.1635
Proj. Max 3-Mo Avg	1.44254	1.44304	1.44353	1.44403	1.44453
Proj. Overload?					

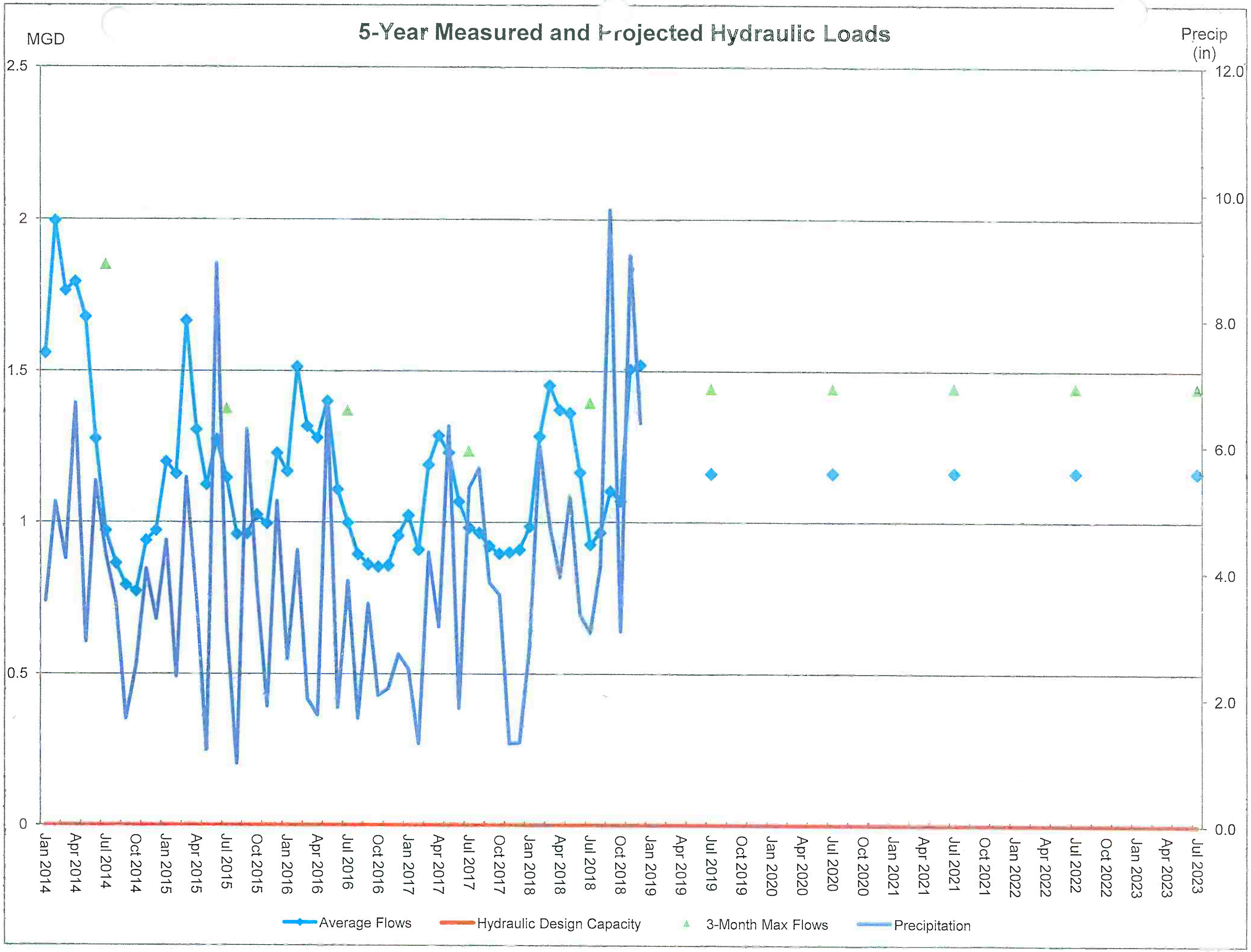
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38



5-Year Measured and Projected Hydraulic Loads
MGD
Precip (in)
2.5
2
1.5
1
0.5
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
Jul 2017
Oct 2017
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation

NETHER PROVIDENCE TOWNSHIP MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	January		February		March		April		May		June		Comments
			Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	
1	Bullens Lane (before bridge, 30 ft. from guard rail)	195	1,237,670	205	1,459,698	267	1,788,032	296	1,395,722	239	1,267,872	210	1,020,732	174	
2	Avondale Road (at underpass for I-476)	492	6772879	444	7,926,341	575	9,851,629	646	8,589,824	582	9,011,164	591	7,276,972	493	
3	E. Rose Valley Road (at Avondale Lane, 25' in field from stop sign)	952	9,382,358	318	10,990,769	412	14,649,923	496	13,874,116	486	14,205,500	481	11,217,709	393	
4	I-476 (near stone support in creek, 40' up hill)	387	4,506,215	376	5,385,630	497	5,987,560	499	5,623,673	484	5,749,698	479	5,534,637	477	
	Unmetered Areas (average volume from all meters)	803	8,679,662	349	10,210,877	454	12,792,965	514	11,685,646	485	11,983,263	481	9,928,524	412	
	TOTAL	**2,829**	**30,578,784**		**35,973,315**		**45,070,109**		**41,168,981**		**42,217,497**		**34,978,574**		

Meter No.	Meter Location	Total EDUs	July		August		September		October		November		December		Comments
			Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	Recorded Volume	Gallons EDU/Day	
1	Bullens Lane (before bridge, 30 ft. from guard rail)	195	923,143	153	1,032,658	171	1,176,777	201	1,135,136	188	1,419,196	243	1,331,724	220	
2	Avondale Road (at underpass for I-476)	492	6,157,991	404	6,188,180	406	6,625,825	449	6,434,205	422	9,123,994	618	10,122,951	664	
3	E. Rose Valley Road (at Avondale Lane, 25' in field from stop sign)	952	8,912,077	302	8,942,977	303	10,809,383	378	11,187,698	379	14,995,304	525	15,355,674	520	
4	I-476 (near stone support in creek, 40' up hill)	387	4,609,387	384	5,303,789	442	5,094,904	439	5,016,294	418	6,832,345	588	6,943,890	579	
	Unmetered Areas (average volume from all meters)	803	8,165,788	328	8,508,631	342	9,396,166	390	9,422,501	379	12,830,101	533	13,378,408	537	
	TOTAL	**2,829**	**28,768,386**		**29,976,235**		**33,103,055**		**33,195,834**		**45,200,940**		**47,132,647**		


CRUM CREEK
CRUM
CREEK
Reservoir
CREEK
RIDLEY CREEK
RIDLEY
SANITARY SEWER SYSTEM
NETHER PROVIDENCE TOWNSHIP
DELAWARE COUNTY, PENNSYLVANIA
Scale 300 0 300 600 Feet
JOHN P. DAMON ASSOCIATES, INC., CIVIL ENGINEERS (Sep90)
NDI ENGINEERING CO. (Jan96; Mar98; Jun02)

Pump Station Summary

There is one pumping station within the Township sewerage system. It is located at the "Mills of Rose Valley" development, just off of Brookhaven Road. It has two (2) pumps (rated 1,150 GPM each). This pump station is owned and maintained by the Mills of Rose Valley.

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging into Nether Providence Township Sewers. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits in the Nether Providence system.

Newtown Township

610-356-9550
FAX 610-356-5032

Herbert E. MacCombie, Jr., P.E.

CONSULTING ENGINEERS & SURVEYORS, INC.
1000 PALMERS MILL ROAD
MEDIA, PA 19063

James W. MacCombie, P.E., P.L.S.
Herbert E. MacCombie, III, Technician

REPLY TO:
P.O. BOX 118
BROOMALL, PA 19008-0118

March 12, 2019

Ms. Elizabeth Mahoney, Environmental Group Manager
Clean Water Section
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, PA 19401

Re: Chapter 94 Municipal Wasteload Management Plan
2018 Annual Report
Newtown Township, Delaware County, Municipal Authority

Dear Ms. Mahoney:

In accordance with PA DEP Chapter 94 Municipal Wasteload Management Plan, enclosed please find two (2) copies each of the 2018 Annual Report for the Newtown Township, Delaware County, Municipal Authority, for the Central Delaware County Authority (CDCA) service area and the Radnor-Haverford-Marple (RHM) service area.

Very Truly Yours,

James W. MacCombie, P.E.
Newtown Township Sewer Consultant

copy: Stephen Nease, NTMA Operations Officer
Charles Catania, Jr., P.E., CDCA Engineer
Dave Adams, Operations Manager at RHM Sewer Authority
File

Chapter 94 Wasteload Management

2018 Annual Report

Newtown Township, Delaware County, Municipal Authority
Tributary Municipality Report
FOR THE
Central Delaware County Authority (CDCA)

REGISTERED
PROFESSIONAL
JAMES W. MacCOMBIE
ENGINEER
No. 31635-E

3/11/19

March 2019

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Newtown Township, Delaware County, Municipal Authority**	Permit No.:	**PA N/A**
Mailing Address:	**209 Bishop Hollow Road**	Effective Date:	**N/A**
City, State, Zip:	**Newtown Square, PA 19073**	Expiration Date:	**N/A**
Contact Person:	**Joseph Sweeney**	Renewal Due Date:	**N/A**
Title:	**Authority Chairman**	Municipality:	**Township of Newtown**
Phone:	**610-356-0200**	County:	**Delaware**
Email:	**cdpropertiesinc@comcast.net**	Consultant Name:	**Herbert E. Mac Combie, Jr, PE, Consulting Engineers & Surveyors, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

Hydraulic loading to Camelot Pump Station, Ashford Pump Station, and Ellis Preserve Pump Station included in Attachment 1, Appendix B.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment 1**)

☒ List summarizing each extension or project attached (**Attachment 1**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

- Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

The Authority became an operating Authority in January of 2016, which means it now owns and is responsible for operation and maintenance of the sewer system Township-wide. The Authority currently uses Township administrative staff for billing as well as the Township Public Works Department to do periodic monitoring of the sewer system. The Authority has a contract with KBX Golden, LLC (formerly AQUA Wastewater, Inc.) to operate and maintain all Authority owned pump stations. Work is performed on an as needed basis, by Township staff or by private contractors, in addition to the long-term maintenance of all of the lines.

The Authority follows up on all complaints and inspections to repair Infiltration & Inflow (I&I) sources on an as-needed basis. The Radnor-Haverford-Marple (RHM) Sewer Authority also assists the Authority in identifying and repairing sources of I&I during video inspection of sewer pipe. There have not been any major maintenance, repair, and/or rehabilitation projects performed in the CDCA service area in the past five (5) years.

The Authority has established a capital reserve for future infrastructure improvements including video surveillance of existing sewer lines to determine problem areas of grease build-up and I&I. An infrastructure fee has been implemented and is being charged on a per dwelling unit basis every quarter.

All sewage flows in the CDCA service area are conveyed to the CDCA Interceptor near the intersection of Newtown Street Road (Rt 252) and Media Line Road.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

There were no Sanitary Sewer Overflows (SSOs) in the CDCA Service Area in 2018. There were no overload conditions and no major repairs in 2018.

The existing system is in good/fair working condition. The Authority has established a capital reserve for future infrastructure improvements including video surveillance of existing sewer lines to determine problem areas of grease build-up and I&I. An infrastructure fee has been implemented and is being charged on a per dwelling unit basis every quarter.

The Township adopted a Grease Trap Ordinance in 2016, which the Authority is enforcing. The Grease Trap Ordinance requires proper sizing and installation of traps or interceptors for establishments that generate Fats, Oils, and Grease (FOG) as well as establish a schedule of surveillance of sewer mains to determine problem areas and to establish a schedule for cleaning and maintenance.

During the next five (5) years the connection rate is anticipated to substantially increase as a result of new developments and pending sewer extension projects. In addition, the Newtown Township Municipal Authority has begun implementation of the Township's "Act 537 Plan Update". The projects were bid in 2018 and construction has commenced.

It is anticipated that there will be about two (2) to five (5) miscellaneous connections of existing (infill) EDUs per year within the CDCA Service Area of the Township.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☐ The collection system does not contain pump stations

☒ The collection system does contain pump stations (Number – **4**)

☒ Discussion of condition of each pump station attached (**Attachment 1**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

   Check the appropriate boxes:

   ☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment 1**)
   ☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

   Check the appropriate boxes:

   ☐ This report demonstrates an existing hydraulic overload condition.
   ☐ This report demonstrates a projected hydraulic overload condition.
   ☐ This report demonstrates an existing organic overload condition.
   ☐ This report demonstrates a projected organic overload condition.

   If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

   ☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

    ☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

    ☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

    ☒ Flow calibration report attached (**Attachment 1**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Stephen Nease, Operations Officer — Stephen M Nease
Name of Responsible Official — Signature

610-356-0200 — 3/4/2019
Telephone No. — Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

James W. MacCombie, P.E., P.L.S.
Name of Preparer — Signature

610-356-9550 — 3/4/2019
Telephone No. — Date

ATTACHMENT 1

Chapter 94 Wasteload Management

2018 Annual Report

Newtown Township, Delaware County, Municipal Authority
Tributary Municipality Report
for the
Central Delaware County Authority (CDCA)

March 2019

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NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY

WASTELOAD MANAGEMENT REPORT
FOR THE
CDCA SERVICE AREA

2018 ANNUAL REPORT

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1.0 Introduction

This report has been prepared and submitted on behalf of Newtown Township as a tributary municipality to the DELCORA Western Regional Treatment Plant in the Central Delaware County Authority (CDCA) service area in compliance with PA Code Title 25, Part I, Subpart C, Article II, Chapter 94 Wasteload Management.

1.1 Sewer Service Area

Newtown Township is situated in the northwestern portion of Delaware County and is bounded by Radnor Township to the northeast, Marple Township to the southeast, Upper Providence Township to the south, Edgmont Township to the southwest, and Willistown Township, Chester County to the west and Easttown Township, Chester County to the northwest. Newtown Township is comprised of approximately 10.11 square miles in area.

Newtown Township is divided into two (2) drainage basins, the Crum Creek Basin and Darby Creek Basin. The Crum Creek Basin contains approximately 20% of the sewer collection system with a force main connection through Marple Township via the Crum Creek Interceptor in the CDCA service area. The existing CDCA service area is situated in the south-central portion of the Township.

The Newtown Township Municipal Authority (NTMA) took ownership of the Springton Pointe Estates Wastewater Treatment Plant (SPE WWTP) in 2007, which is permitted for an Annual Average Flow of 35,000 GPD and a Design Hydraulic Capacity of 60,900 GPD. The WWTP uses a Sequencing Batch Reactor (SBR) treatment process with land disposal of treated effluent. The WWTP only services the Springton Pointe Estates Community (including the Hempstead area), as well as the single-family dwellings along the easterly side of Stoney Brook Boulevard and townhouses along Wiltshire Lane. There are two (2) public pumping stations owned and operated by the Municipal Authority within the Springton Pointe Estates WWTP service area. One (1) is located on Wiltshire Lane and one (1) is located on Bakers Lane. Although the NTMA owns the SPE WWTP and has contracted KBX Golden, LLC (formerly AQUA Wastewater, Inc.) for the operation and maintenance, the

WWTP does not fall under the auspices of Chapter 94 for annual reporting. In the alternative, the Water Quality Management (WQM) Part II Permit for the WWTP requires Discharge Monitoring Reports be submitted to the PA DEP on a monthly basis. The Water Quality Management (WQM) permit for the WWTP had an expiration date of August 31, 2018. In lieu of renewing the permit, the Authority received approval of a Closure Plan since the WWTP has been shut down since April of 2016 when flow was diverted to the existing Camelot Lane Pump Station via the existing headworks pump station at the WWTP. The Closure Plan was submitted to the PA DEP under cover letter dated August 24, 2018 and was found to be acceptable as indicated in a response email from the Department dated October 22, 2018, with the requirement that groundwater monitoring and reporting to continue until the final groundwater monitoring report is approved by the Department.

It is important to note that the Authority got permission from the DEP to temporarily divert flow from the WWTP to the Camelot Lane Pump Station (public sewer system). The existing lift station for the WWTP is being used to pump sewage to the Camelot Lane Pump Station. The WWTP was rated to treat 35,000 GPD of sewage. The Authority is currently constructing the sewer extension as part of implementation of the approved Act 537 Plan Update. The Authority filed a Closure Plan, which was reviewed and approved by the DEP in lieu of filing for a renewal of the WQM Permit for the WWTP. The Authority continues to perform the required groundwater monitoring of the disposal fields even though no effluent was discharged since April 2016. Groundwater monitoring will continue until at least September 2019 per DEP approval of the Closure Plan.

The Municipal Authority owns, operates, and maintains a dedicated sanitary sewage collection system and does not utilize a combined sewer system. There are seven (7) public pumping stations owned and operated by the Municipal Authority within the CDCA service area. One (1) is located on Hickory Lane, one (1) is located off of Lewis Run Road within the Liseter development, one (1) is located along the westerly side of Newtown Street Road (SR 0252) in Ellis Preserve,one (1) is located on Camelot Lane, and as previously mentioned, one (1) is on Bakers Lane, one (1) on Wiltshire Lane, and one (1) at the Springton Pointe Estates WWTP, which is being used temporarily to pump to the Camelot Lane Pump Station until replaced as part of the public sewer extension project currently underway. Up until December, 2014, all flow leaving Newtown Township that is tributary to the CDCA system was pumped and metered at the Camelot Pump Station. Beginning on December 5, 2014 the Ashford (Liseter) Pump Station began receiving flow from the homes constructed in the Liseter Subdivision as well as receiving flow from the Episcopal Academy beginning on December 17, 2014. The Ashford Pump Station Force Main is the second point of discharge from Newtown Township into the CDCA system. The sewage is conveyed via force main in and along Newtown Street Road (SR 0252) to a newly constructed manhole along the CDCA interceptor just south of the intersection of Newtown Street Road and Media Line Road adjacent to the Delaware County Community College. The Ellis Pump Station, owned, operated, and maintained by the NTMA, currently pumps into the Ashford Force Main. The Gradyville Road Force Main, which is owned, operated, and maintained by DELCORA, conveys flow from Edgmont Township through the portion of the Ashford (Liseter) Force Main from Gradyville Road to the CDCA interceptor.

In 2016, the Newtown Township Municipal Authority became an "Operating Authority," when it began having ownership, as well as operation and maintenance responsibility of the public sewer system, including that of the Springton Pointe Estates Wastewater Treatment Plant. The Episcopal Academy Pump Station will continue to be privately owned, operated and maintained.

1.2 Wastewater Collection System

The wastewater collection system in the CDCA service area within Newtown Township that is tributary to the Camelot Pump Station is for the most part, comprised of eight (8) inch diameter pipe. The sewage is then pumped to the CDCA Interceptor and is conveyed to the DELCORA system for treatment at their Western Regional WWTP. In addition to the Camelot Pumping Station, the Municipal Authority also owns, operates, and maintains the Newtown Heights Pump Station (Hickory Lane P.S.), which is tributary to the Camelot Pump Station.

The wastewater collection system in the CDCA service area within Newtown Township that is tributary to the Ashford Pump Station is comprised of eight (8) inch diameter gravity sewer pipe. The sewage is then pumped from the Ashford (Liseter) Pump Station to the CDCA Interceptor via an eight (8) inch transitioning to a 10-inch HDPE force main and is conveyed to the DELCORA system for treatment at their Western Regional WWTP. The Episcopal Academy Pump Station, which is tributary to the Ashford Pump Station, is privately owned and operated and has a contract with McGovern for operations and maintenance. It is not to be dedicated to the Authority.

The wastewater collection system in the CDCA service area within Newtown Township that is tributary to the Ellis Preserve Pump Station is comprised of eight (8) inch diameter gravity sewer pipe. The sewage is then pumped from the Ellis Preserve Pump Station to the CDCA Interceptor via a 10-inch HDPE force main and is conveyed to the DELCORA system for treatment at their Western Regional WWTP.

All of the public pump stations within the CDCA service area in Newtown Township are operated and maintained by KBX Golden, LLC under a service contract with the Authority. The contract also includes operation and maintenance of the SPE WWTP lift station, the Wiltshire Lane, and the Bakers Lane Pump Stations.

The Camelot Pump Station is equipped with two (2) submersible Fairbanks Morse pumps. The current pumps are designed as follows: 850 gpm each @ 194' TDH @ 1760 RPM. The Hickory Lane Pump Station, which is tributary to the Camelot Pump Station, is equipped with two (2) Gorman-Rupp pumps. The current pumps are designed as follows: 80 gpm each @ 70' TDH.

The Ashford Pump Station is equipped with two (2) Fairbanks-Morse Submersible Solids-handling Pumps (Model 5435MV) with 14-inch diameter impellers, four (4) inch discharge connections, and 75 horsepower, 460-volt, three-phase 1780 rpm motors. The pump station has a design capacity of 570 gpm with an initial average daily flow (ADF) of 115,000 GPD and an ultimate ADF of 213,000 GPD subject to modification of the existing WQM permit.

The Ellis Preserve Pump Station is equipped with two (2) Fairbanks-Nijhuis Submersible Solids-handling Pumps (Model 5436MV) with 13.54-inch diameter impellers, six (6) inch discharge connections, and 100 horsepower, 460-volt, three-phase 1780 rpm motors. The pump station has an initial design capacity of 700 gpm with an initial average daily flow (ADF) of 185,000 GPD and an ultimate design capacity of 1,300 gpm with an ultimate ADF of 398,000 GPD subject to additional sewage planning approval(s).

2.0 Discussion of Hydraulic and Organic Loading Projections

During 2018 there were 18 days where greater than one (1) inch of rainfall in a 24-hour period was recorded. In nine (9) out of the 18 events there appears to be a direct correlation between increases in flow and rainfall greater than one (1) inch. In comparison, half of all rainfall events where greater than one (1) inch of rainfall occurred in a 24-hour period were recorded between September and the end of the year. The total rainfall amount recorded for this timespan (28.25 inches) represented about 46% of the total for the year (61.52 inches). Furthermore, 1/3 of all rainfall events where greater than one (1) inch of rainfall occurred in a 24-hour period occurred in the last two (2) months of the year (3 each month). Approximately 25% of the total rainfall for the year (15.41 inches) fell in this timespan.

Camelot Pump Station

The highest recorded 24-hour rainfall for 2018, 5.17 inches, occurred on September 7th into the 8th. On the same day, Camelot Pump Station saw a daily flow of 236,688 GPD, which is slightly higher than the average daily flow for the month of September. The highest daily flow of the year was recorded on December 20th, which was 309,600 GPD. This was preceded by a rainfall event of greater than one (1) inch four (4) days earlier and occurred during a rainfall event of greater than one (1) inch. The highest Average Daily Flow (ADF) of 224,226 GPD and the Maximum Daily Flow (MDF) of 309,600 GPD were both recorded in December. By comparison, the ADF for 2018 at the Camelot PS was 191,088 GPD.

The rest of the year saw similar results in rainfall events greater than one (1) inch in 24-hours and elevated peak flows. Although, the highest ratio of MDF to ADF for any month was 1.38 recorded in December. The average MDF to ADF ratio for the year was 1.24. Therefore, although there is a correlation in elevated flow in relation to peak rainfall events, the peaks in flow are not drastic.

The projected 2-year ADF at the Camelot Pump Station is 196,000 GPD as depicted on Table 5C. There were no flow metering devices installed on the collection system in 2018 for recording flow to the pump station in a peak instantaneous or peak hourly flow format. Therefore, based upon the PA DEP Water Management Program SERO Sewage Pumping Station Guidance a peaking factor of 3.8 was applied to the Annual Average Flow to derive a Peak Instantaneous Flow and a peaking factor of 3.8 was applied to the 2-year projected annual average flow to derive the 2-year projected maximum flow depicted on Table 6. As part of the Implementation of the "Act 537 Plan Update," expansion of the Camelot Pump Station will include the installation of an influent meter in order to monitor peak instantaneous or peak hourly flow as well as hydraulic loading of the pump station.

It should be noted that the Newtown Heights Pumping Station (Hickory Lane P.S.) is not equipped with a flow meter. Because this station is publicly owned it is required to document and report flows to DEP. No flow data is available at this time. The Authority has been apprised of this situation and is working to allocate funding for installation of a meter at this station. The Authority is exploring the feasibility of a gravity connection of the Hickory Lane Pump Station Service Area to the proposed Act 537 Plan Update sewer expansion project. If it is proven that a gravity connection is not feasible the Authority will seek to relocate the pump station to facilitate better access and provide the station with three-phase electric and evaluate upgrading motors and pumps at that time.

Ashford Pump Station

The highest recorded 24-hour rainfall for 2018, 5.17 inches, occurred on September 7th into the 8th. On the same day, the Ashford Pump Station saw a daily flow of 42,479 GPD, which is slightly higher than the average daily flow for the month of September. The highest daily flow of the year was recorded on December 17th, which was 74,834 GPD.

This was preceded by a rainfall event of greater than one (1) inch the previous day. The highest Average Daily Flow (ADF) of 44,637 GPD occurred for the month of November and the Maximum Daily Flow (MDF) of 74,834 GPD was recorded in December. By comparison, the ADF for 2018 at the Ashford PS was 37,575 GPD.

The projected 2-year ADF at the Ashford Pump Station is 73,000 GPD as depicted on Table 5A. There was no influent metering device installed on the collection system for recording flow to the pump station in a peak instantaneous or peak hourly flow format. Therefore, based upon the PA DEP Water Management Program SERO Sewage Pumping Station Guidance a peaking factor of 4.0 was applied to the Annual Average Flow to derive a Peak Instantaneous Flow and a peaking factor of 3.9 was applied to the 2-year projected annual average flow to derive the 2-year projected maximum flow.

Ellis Preserve Pump Station

The highest daily flow of 27,175 GPD occurred on September 25th and does not appear to be related to a rainfall event. The highest recorded 24-hour rainfall for 2018, 5.17 inches, occurred on September 7th into the 8th. On the same day, the Ellis Preserve Pump Station saw a daily flow of 22,284 GPD, which is higher than the average daily flow for the month of September. The next highest ADF of 2018 occurred on October 10th, which was 24,060 gpd. There was a couple of minor rainfall events during the preceding week totaling 0.52 inches of rainfall. There does not appear to be a direct correlation between rainfall events greater than one (1) inch in a 24-hour period and peak flow at the Ellis Preserve Pump Station.

The projected 2-year ADF at the Ellis Preserve Pump Station is 58,000 GPD as depicted on Table 5B. There was no influent metering device installed on the collection system for recording flow to the pump station in a peak instantaneous or peak hourly flow format. Therefore, based upon the PA DEP Water Management Program SERO Sewage Pumping Station Guidance a peaking factor of 4.2 was applied to the Annual Average Flow to derive a Peak Instantaneous Flow and a peaking factor of 3.9 was applied to the 2-year projected annual average flow to derive the 2-year projected maximum flow.

Edgmont/DELCORA Gradyville Road Force Main

The Gradyville Road Force Main is connected to the Ashford Force Main at the intersection of Gradyville Road and Newtown Street Road (SR 0252). The NTMA owns, operates, and maintains the Ashford Force Main to its discharge point into the CDCA sewer system. Edgmont is permitted to convey up to 0.350 MGD of sewage through the Gradyville Road Force Main. By agreement the NTMA is allowed to convey up to 0.050 MGD of future sewage flow through the line subject to additional planning approval. According to "The Delaware County Regional Water Quality Control Authority, Edgmont Township, Crum Creek Sewer District, Tributary Municipality, 2017 Chapter 94 Report," February 2018, prepared by Bradford Engineering Associates, Inc. included in Appendix D of this report, there is no anticipated hydraulic overload within the next five (5) years.

3.0 Sanitary Sewer Extensions & Proposed Projects

The sanitary sewer collection system is shown on the Newtown Township Sewer Map in Appendix A. The Township has completed their "Act 537 Plan Update", which addresses anticipated development in the CDCA service areas within the Township. All sewage flows in the CDCA service area would be conveyed to the CDCA Interceptor. The Act 537 Plan was approved on September 24, 2013 and was subsequently appealed. The Environmental Hearing Board upheld the Pennsylvania Department of Environmental Protection (PA DEP)'s approval of the plan by dismissing the appeal on August 31, 2015. The Newtown Township Municipal Authority has begun construction of the sewer expansion project.

There were new sanitary sewer extensions in 2018. The Ashford (Liseter) Subdivision, located on the northwest corner of Route 252 and Goshen Road, commenced construction of their sanitary sewer lines in 2013 and continued construction in Phases 3 and 4 through the end of 2018. The sewage pump station, and force main connection to the CDCA Interceptor located at Rt. 252 and Media Line Rd. was completed and placed into operation on December 5, 2014. However, as of the end of 2018, the pump station and collection system were not dedicated to the NTMA and were still in private ownership by Toll Brothers, who contracted with AQUA, PA Wastewater and KBX Golden, LLC to serve as the licensed wastewater operators of the station. Through the end of 2018, there are approximately 299 homes that were connected to the sewer system and occupied, with 63 connections being made in 2018. Ultimately, the Ashford (Liseter) Subdivision will consist of 449 new residential units with several accessory buildings for communal use and is anticipated to generate 115,000 GPD of sewage that will be conveyed via the CDCA Crum Creek Interceptor to the DELCORA WWTP. The pump station has initial planning approval for annual average flows of 115,000 GPD, as permitted by the Water Quality Management Part II Permit No. 2311403 by the PA DEP and has been designed to accept future connections from the Melmark campus and the Echo Valley and Hunt Valley Circle developments subject to modification of the WQM permit for up to 213,000 GPD. As previously mentioned, the Episcopal Academy Pump Station is currently discharging flow into the Ashford (Liseter) Pump Station. Additional sewage planning required for the Episcopal Academy connection to the Ashford (Liseter) Pump Station according to the PA DEP has been obtained through approval of the Township's Act 537 Plan Update.

The Episcopal Academy has Sewage Planning Approval to send 11,000 GPD to the Ashford (Liseter) Pump Station (DEP Code No.1-23943-147a-3J). However, based on metered flow data for 2018, the actual flow was approximately 8,045 GPD. Flow is conveyed to the Ashford (Liseter) Pump Station via a pump station and force main from the Episcopal Academy Campus. Water Quality Management Part II Permit No. 2314402 was issued by the PA DEP on June 27, 2014. The Episcopal Academy Pump Station was put into service and began contributing flow to the Ashford Pump Station on December 17, 2014.

There are several projects ongoing at the Ellis Preserve. Toll Brothers obtained Sewage Facilities Planning Module approval (DEP Code No. 1-23943-202-3J) for 76 townhomes in Sector 3. Construction commenced in late 2018 but no units were connected and occupied. The project is expected to generate 17,100 GPD of sewage. BPG obtained Sewage Facilities Planning Module approval (DEP Code No. 1-23943-209-3J) for 256 apartment units in three (3) buildings, 66 stacked townhouse units in 33 buildings, a clubhouse, and a pool house for a total of 325 units. The project is expected to generate 73,125 GPD of sewage. BPG also obtained Sewage Facilities Planning Exemption approval (DEP Code No. 1-23943-224-E) for the Sector J Office Building (AmeriHealth), which proposes construction of a 5-story office building expected to generate 37,800 GPD of sewage. The Ellis Preserve Pump Station construction has been completed and became operational on August 1, 2018. A Water Quality Management Part 2 Permit was issued by the DEP (Permit No. 2316403) as indicated by letter dated October 17, 2016 with the permit attached. The pump station includes a 10 ft square precast concrete wet well with a sewage grinder, two (2) 100 HP Fairbanks Nijhuis Submersible Solids-handling Pumps (Model 5436MV), a precast concrete valve vault, which includes a flow meter and an emergency connection point, along with a control building that will house a control panel, chemical treatment system, auto-dialer, and an emergency generator. The pump station has a design capacity of 700 gpm with an average annual flow of 185,000 GPD.

4.0 Sewerage System Monitoring, Maintenance, and Repairs

The Authority became an operating Authority in January of 2016, which means it now owns and is responsible for operation and maintenance of the sewer system Township-wide. The Authority currently uses Township administrative staff for billing as well as the Township Public Works Department to do periodic monitoring of the sewer system. The Authority has a contract with KBX Golden, LLC (formerly AQUA Wastewater Management, Inc.) to operate and maintain all Authority owned pump stations. Work is performed on an as needed basis, by Township staff or by private contractors, in addition to the long-term maintenance of all of the lines.

The Authority follows up on all complaints and inspections to repair Infiltration & Inflow (I&I) sources on an as-needed basis. The Radnor-Haverford-Marple (RHM) Sewer Authority also assists the Authority in identifying and repairing sources of I&I during video inspection of sewer pipe. There has not been any major maintenance, repair, and/or rehabilitation projects performed in the CDCA service area in the past five (5) years.

5.0 Condition of the Wastewater Collection System

The existing system is in good working condition. At present, no long-term plan has been developed by the Authority to address I&I detection, or to mitigate I&I. Newtown Township has adopted DELCORA's "Lateral Inspection and Repair/Replace Design Standards" to incorporate within their ordinance. Any portions of the system that appears to be experiencing I&I problems are addressed on a case-by-case basis. However, the

Authority has established a capital reserve for future infrastructure improvements including video surveillance of existing sewer lines to determine problem areas of grease build-up and I&I. An infrastructure fee has been implemented and is being charged on a per dwelling unit basis every quarter.

There are approximately 42.5 miles of eight (8) inch diameter sewer within the Township. Approximately 70% was constructed between 45 to 55 years ago between 1960 and 1970 with a total length of 157,080 l.f., which mainly drains through the RHM system, approximately 15% was constructed between 20 to 40 years ago between 1970 and 1980 with a total length of 33,600 l.f., and the remaining 15% was constructed within the past 25 years between the 1990s through present with a total length of 33,600 l.f. The large majority, about 80%, of the pipe is vitrified clay pipe (VCP) and transite pipe. The remainder of the system is comprised of PVC pipe. The CDCA service area covers about two (2) square miles and contains approximately 10.6 miles of pipe. The extension of the public sewer system associated with the Ashford/Liseter Subdivision is anticipated to ultimately consist of 20,353 L.F. of 8" diameter PVC pipe, 8,349 L.F. of 8" diameter HDPE force main, and 8,720 L.F. of 10" diameter HDPE force main, as well as a short distance of 12" diameter PVC pipe at the connection point to the CDCA interceptor.

The United States Census data for 2000 and 2010 was used to determine current population and the anticipated connections associated with proposed and future development within the CDCA service area in the Township (Refer to Table 1, 2A, & 2B).

TABLE 1
TOWNSHIP POPULATION STATISTICS

Description	Total Population	Average Household Size
2000 U.S. Census:	11,700	2.50
2010 U.S. Census:	12,216	2.49
Change in Population:	+516 Approx. 52 persons per Year or 0.44% Annual Increase	
2018 Population Estimate:	12,712	-

A projection was determined based upon projecting the growth rate of population between 2000 and 2010, which yielded a 4.4% increase. This was compared with DVRPC 2040 Municipal Level Population Forecast, which only had a 1.8% change. The DVRPC projections appear to under estimate future development within the Township. The CDCA service area estimated population connected to the public sewer in 2018 was 2,531. The U.S. Census estimates approximately 2.5 people per household as the average household size.

TABLE 2A HISTORICAL AND 5-YEAR POPULATION PROJECTION		
Year	**Township Population Growth**[1]	
	Total	**Crum Creek Basin (20%) (CDCA Service Area)**
2010	12,270	2,443
2011	12,324	2,454
2012	12,379	2,465
2013	12,434	2,476
2014	12,489	2,487
2015	12,544	2,498
2016	12,600	2,509
2017	12,712	2,520
2018	12,270	2,531
5-Year (2019-2023)	**12,939**[2]	**2,588**

(1) Based on U.S. Census: a population trend of 0.44% annual person increase between 2000 and 2010

(2) Based on projection of population trend of 0.44% annual person increase

During the next five (5) years the connection rate is anticipated to substantially increase as a result of new developments and pending sewer extension projects. In addition, the Newtown Township Municipal Authority has begun implementation of the Township's "Act 537 Plan Update". Refer to Tables 4A and 4B for a summary of anticipated connections to the public sewer within the CDCA service area in the next five (5) years. It is anticipated that there will be about two (2) to five (5) miscellaneous connections of existing (infill) EDUs per year within the Township.

Refer to Tables 5A, B, C, and D for the 5-Year Hydraulic Loading Projections for the CDCA service area within Newtown Township. Refer to Table 5E for the 5-Year Hydraulic Loading Projection for the Ashford Force Main discharge to the CDCA system, including tributary municipality flow from the Edgmont/DELCORA Force Main on Gradyville Road that connects to the NTMA Ashford Force Main at the intersection of Gradyville Road and Newtown Street Road (SR 0252).

TABLE 2B
Population Projections

		New Residential Connections[2]					
Projected Years	**Previous Year Population[1]**	**Ashford PS Service Area**	**Ellis Preserve PS Service Area**	**Camelot PS Service Area**	**Total**	**Persons per Household**	**Projected Population**
2018							*2,531*
2019	2,531	50	199	5	**254**	2.5	**3,166**
2020	3,166	86	31	17	**134**	2.5	**3,501**
2021	3,501	133	33	159	**325**	2.5	**4,314**
2022	4,314	78	28	80	**186**	2.5	**4,779**
2023	4,779	18	0	99	**117**	2.5	**5,071**

(1) The 2018 estimated population from Table 2A

(2) Refer to Table 4 - Only anticipated Residential connections were considered (Commercial and Institutional excluded) for Population Projection

TABLE 3

CRUM CREEK BASIN (CDCA SERVICE AREA) HISTORICAL AND PRESENT SEWER FLOWS

(2013 THROUGH 2018)

Year	2013	2014[1]	2015[2]	2016[2]	2017[2,3]	2018[5]
Total Annual Daily Flow (GPD)	134,840	132,565	153,040	181,863	202,509	234,742
Max Daily Flow (GPD)	218,434	379,922	263,126	251,713	264,501[4]	394,117
Ratio (Max DF/ADF)	1.62	2.87	1.72	1.38	1.32[4]	1.68

Years 2012, 2013, and January to November of 2014, are comprised of flow from Camelot Pump Station only

1. Includes flow from Ashford (Liseter) Pump Station from December only
2. Includes flow from Ashford (Liseter) Pump Station from the entire year
3. Includes flow from Ellis Preserve Pump and Haul (aka By-Pass Pumping) from October, November, and December 2017
4. Max Daily Flow and Ratio include flows from Ashford (Liseter) Pump Station and Camelot Pump Stations only
5. Includes Ellis Preserve Pump Station flow data beginning August 1, 2018

TABLE 4A

Projection of Anticipated Connections and Flows

Project Name	Plan Status	Total Flow (gpd)	Total Units of Allocation	Prior to 2018	2018	Remaining Units of Allocation	2019	2020	2021	2022	2023	Total in 5 Years	Total Beyond 5 Years	TOTAL
Echo Valley Development	Existing Neighborhood	35,700	136	0	0	136	0	26	50	50	10	136	0	136
Goshen Road Area	Existing Neighborhoods	9,975	38	0	0	38	0	10	15	10	3	38	0	38
Boot Road Area	Existing Neighborhoods	2,625	10	0	0	10	0	0	8	2	0	10	0	10
Boot Road Area	Existing Neighborhoods	5,775	22	0	0	22	0	0	15	5	2	22	0	22
Florida Park	Existing Neighborhood	33,338	127	0	0	127	0	0	50	40	30	120	7	127
Hunt Valley Circle	Existing Neighborhood	8,138	31	0	0	31	0	0	10	5	5	20	11	31
Hunter's Run	Existing Neighborhood	19,950	76	0	0	76	0	0	76	0	0	76	0	76
Campus Boulevard	Existing Commercial Office (North)	7,750	30	0	0	30	0	0	20	10	0	30	0	30
Campus Boulevard	Existing Commercial Office (South)	18,250	70	0	0	70	0	0	45	25	0	70	0	70
Springton Pointe Estates	Existing Neighborhood	35,000	133	133	0	0	0	0	0	0	0	0	0	133
Township Park Area (Bishop Hollow Rd)	Existing Neighborhood	1,050	4	0	0	4	0	4	0	0	0	4	0	4
Dogwood Area	Existing Neighborhood	2,100	8	0	0	8	0	8	0	0	0	8	0	8
Melmark School	Existing School	25,000	95	0	0	95	0	0	95	0	0	95	0	95
Episcopal Academy	Existing School (Currently Pump & Haul)	11,000	42	42	0	0	0	0	0	0	0	0	0	42
Ashford (Liseter) Development (250 gpd/EDU)	Prop. Mixed Use Development SFPM Approval (1-23943-171-3J)	115,000	460	236	63	161	50	50	50	11	0	161	0	460
Ellis Preserve Pumping Station	SFPM Approval (1-23943-202-3J)	185,000	705	51	227	427	199	31	33	28	0	291	136	705
BPG - Ellis Preserve Multifamily	Prop. Mixed Use Development SFPM Approval (1-23943-209-3J) 256 Apartment Units in 3 Bldgs; 66 Stacked Townhouse Units in 33 Bldgs; Clubhouse & Pool	73,125	325	51	208	66	15	15	18	18	0	66	0	325
	Building A (84 Units)		84	0	84	0	0	0	0	0	0	0	0	84
	Building B (89 Units)		89	0	89	0	0	0	0	0	0	0	0	89
	Building C (83 Units)		83	51	32	0	0	0	0	0	0	0	0	83
	Clubhouse (2 Units) & Pool (1 Unit)		3	0	3	0	0	0	0	0	0	0	0	3
	Stacked Townhouses (66 Units)		66	0	0	66	15	15	18	18	0	66	0	66
BPG - Ellis Preserve - Sector 2	AmeriHealth (Front Lawn Office)	37,800	168	0	0	168	168	0	0	0	0	168	0	168
Toll Brothers - Ellis Preserve Townhouses	Prop. Mixed Use Development SFPM Approval (1-23943-202-3J) 76 Townhouses	17,100	76	0	19	57	16	16	15	10	0	57	0	76
National Developers Realty, Inc.														
1.a. Marville Site Existing	Existing Newtown Business Center	3,500	13	0	0	13	0	0	13	0	0	13	0	13
1.b. Marville Site Proposed	Marville, Parcels D-1 & D-2, and Lot A	83,950	320	0	0	320	0	0	0	0	32	32	288	320
2. Olde Masters Property	Ex. Golf Course - Prop. Development	78,100	298	0	0	298	0	0	0	30	30	60	238	298
3. "Four Seasons" - Gradyville Rd	Prop. 5 Lots and 37 Lots	9,450	36	0	0	36	0	0	0	0	0	0	36	36
CAMELOT P.S. EXISTING FLOWS														
Camelot P.S. Existing Developments	Newtown Heights, Newtown Woods, Dudie Drive, Mary Jane Lane, Greenbriar Lane	71,900	-	-	-	-	-	-	-	-	-	-	-	-
Pulte Residential & Commercial	Existing Residential & Commercial	43,100	164	164	0	0	0	0	0	0	0	0	0	164
Existing Alberto/Terrazza														
Teca Restaurant (formerly	300 Seats	1,520	-	-	-	-	-	-	-	-	-	-	-	-
Existing Phase I Terrazza Condos	103 of 206 Units @ 200 gpd	20,600	103	103	0	0	0	0	0	0	0	0	0	103
Proposed Somerset/Cornerstone (109,600 gpd - PA DEP)	Bozzuto: 250 Apartments @ 200 gpd	50,000	250	250	0	0	0	0	0	0	0	0	0	250
	Muirwood: 137 Townhomes @ 225 gpd	30,825	137	137	0	0	0	0	0	0	0	0	0	137
	Remaining Flow not Assigned	28,775	128	0	0	128	0	0	0	0	0	0	128	128
	Remaining from 7-Party Agreement	3,280	15	0	0	15	0	0	0	0	0	0	15	15
Newtown Twp - CDCA	Misc Existing (Infill) @ 225 gpd/EDU 2018: 409 Hempstead	21,325	94	8	1	85	5	5	5	5	5	25	60	94
TOTAL Units of Allocation			3,545	1,124	291	2,130	254	134	485	221	117	1,211	919	3,545
TOTAL FLOW (GPD) @ 262.5 GPD/Unit (Unless Otherwise Noted)		961,975		338,628	75,563	548,500	65,863	34,363	126,500	57,688	30,525	[illegible]	[illegible]	[illegible]

Tributary to Ashford PS
Tributary to Ellis Preserve PS
Tributary to Camelot PS

TABLE 4B

Projection of Anticipated Connections and Flows

2018 Tabulation of Units of Allocation and Flow by Pump Station Service Area for Population and Hydraulic Loading Projections			Remaining Units of Allocation	2019	2020	2021	2022	~2023	Total in 5 Years	Total Beyond 5 Years	TOTAL
Ashford PS	Residential Units Only		376	50	86	133	78	18	365	11	675
	Total Units		471	50	86	228	78	18	460	11	812
	Flow from Total Units	(GPD)	121,625	12,500	21,950	59,225	20,338	4,725	118,738	2,888	207,400
		(MGD)	0.122	0.013	0.022	0.059	0.020	0.005	0.119	0.003	0.207
Ellis Preserve PS	Residential Units Only		427	199	31	33	28	0	291	136	702
	Total Units		427	199	31	33	28	0	291	136	705
	Flow from Total Units	(GPD)	112,025	44,775	6,975	7,425	6,300	0	65,475	35,637	185,000
		(MGD)	0.112	0.045	0.007	0.007	0.006	0.000	0.065	0.036	0.185
Camelot PS	Residential Units Only		1,132	5	17	159	80	99	360	772	1,928
	Total Units		1,232	5	17	224	115	99	460	772	2,028
	Flow from Total Units	(GPD)	314,850	1,125	4,275	58,613	30,000	25,800	119,813	195,038	496,263
		(MGD)	0.315	0.001	0.004	0.059	0.030	0.026	0.120	0.195	0.496
TOTAL	Residential Units Only		1,935	254	134	325	186	117	1,016	918	3,305
	Total Units		2,130	254	134	485	221	117	1,211	919	3,545
	Flow from Total Units	(GPD)	548,500	58,400	33,200	125,263	56,638	30,525	304,075	233,562	888,662
		(MGD)	0.548	0.058	0.033	0.125	0.057	0.031	0.304	0.234	0.889

6.0 Sewage Pumping Stations

Prior to December 5, 2014, the Camelot Pumping Station provided wastewater conveyance for the entire CDCA service area within the Township. Currently, the Ashford Force Main is the only other point of discharge from Newtown Township to the CDCA system. As previously mentioned, the Camelot Pump Station consists of two (2) submersible, explosion-proof, Fairbanks Morse pumps. The conditions of service of the pumps are as follows: 850 gpm each @ 194' TDH @ 1760 RPM. The station also is comprised of a below-grade precast concrete wet well and valve vault structures, and an influent grinder to macerate heavy solids and debris entering the station. A flow totalizer is in place on the force main to display the total gallons of wastewater pumped at the station. Refer to Appendix B for totalizer readings.

The Camelot Pump Station is owned and operated by the Newtown Township, Delaware County, Municipal Authority, who has engaged KBX Golden, LLC (formerly AQUA-PA Wastewater Management, Inc.) to maintain the pump station under a service contract. The flows are recorded approximately five (5) days per week. The pump station is also equipped with an alarm system/auto-dialer that contacts KBX Golden for wet well high and low water levels, pump motor failure, sewage grinder motor failure, loss of electric service, and emergency generator shut down and low fuel alarm. The station is in good operating condition with no current problems.

The station is designed for an average daily flow of 330,000 GPD for the service area within the Crum Creek Basin. As mentioned previously, the station's permitted capacity is the maximum pumping rate of one (1) pump of 850 gpm (1.22 MGD). Refer to Appendix C for a pump curve. Refer to Section 2.0 and Table 6 (this section) for Hydraulic Load Projection. This pump station is to be replaced as part of the Upper Crum Creek Watershed Public Sewer Extension Project in the next two (2) years under WQM Permit No. 2317401.

The Hickory Lane Pump Station, which is tributary to the Camelot Pump Station, is equipped with two (2) Gorman-Rupp pumps. The current pumps are designed as follows: 80 gpm each @ 70' TDH.

The Springton Pointe WWTP headworks pump station is equipped with two (2) F.E. Myers, Inc. Model 4V50 non-clog sewage pumps with five (5) horsepower 480V, three (3) phase motors, rated for 285 gpm at 35 feet of Total Dynamic Head (TDH). This is more than sufficient to handle the 35,000 GPD of flow to the plant/pump station. This station receives flow from the Bakers Lane Pump Station, Wiltshire Lane Pump Station, and surrounding Springton Pointe Estates residential community. This station currently pumps to the Camelot Lane Pump Station. There is no flow meter at this station. The station is to be replaced as part of the public sewer extension project currently underway.

The Bakers Lane Pump Station is situated at the end of the Bakers Lane cul-de-sac and is rated for 90 gpm. This station is tributary to the Springton Pointe Estates WWTP headworks pump station. There is no flow meter at this station.
The Wiltshire Lane Pump Station is situated along the southerly side of Wiltshire Lane and is rated for a hydraulic capacity of 65 gpm. The station was specified to be equipped with two (2) Hydromatic Pumps, Inc. Model No. G2FX500 or approved equal pumps, with 7.5-inch diameter impeller, 2-inch diameter discharge piping, with five (5) horsepower, 240V, three (3) phase motors. The station has a design flow rate of 50 gpm with a TDH of 33 feet. There is no flow meter at this station.

The Ashford Pump Station is equipped with two (2) Fairbanks-Morse Submersible Solids-handling Pumps (Model 5435MV) with 14-inch diameter impellers, four (4) inch discharge connections, and 75 horsepower, 460-volt, three-phase 1780 rpm motors. The pump station has a design capacity of 570 gpm with an initial average daily flow (ADF) of 115,000 GPD and an ultimate ADF of 213,000 GPD subject to additional sewage planning approval(s). The station is comprised of a 10 ft. square below-grade precast concrete wet well and valve vault structures as well as an influent grinder (Muffin Monster) to macerate heavy solids and debris entering the station. A flow totalizer is in place on the force main to display the total gallons of wastewater pumped at the station.

The Ashford Pump Station is owned and operated by Toll Brothers, who has engaged KBX Golden to maintain the pump station under a service contract. The pump station was put into operation on December 5, 2014. The pump station is also equipped with an alarm system/auto-dialer that contacts KBX Golden for wet well high and low water levels, pump motor failure, sewage grinder motor failure, loss of electric service, and emergency generator shut down and low fuel alarm. The station is in good operating condition with no current problems. It is anticipated that dedication of the Ashford (Liseter) Pump Station, Sanitary Sewer Force Main will be accepted by the NTMA in Spring of 2019. The station is designed for an ultimate average daily flow of 213,000 GPD. The station's permitted capacity is the maximum pumping rate of one (1) pump of 570 gpm (0.821 MGD). Refer to Appendix C for a pump curve. Refer to Section 2.0 and Table 6 (this section) for Hydraulic Load Projection.

The Ellis Preserve Pump Station began operation on August 1, 2018. A Water Quality Management Part 2 Permit was issued by the DEP (Permit No. 2316403) as indicated by letter dated October 17, 2016 with the permit attached. The pump station includes a 10 ft square precast concrete wet well with a sewage grinder, two (2) 100 HP Fairbanks Nijhuis Submersible Solids-handling Pumps (Model 5436MV), a precast concrete valve vault, which includes a flow meter and an emergency connection point, along with a control building that will house a control panel, chemical treatment system, auto-dialer, and an emergency generator. The pump station has a design capacity of 700 gpm with an average annual flow of 185,000 GPD.

TABLE 5A

5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Ashford Pump Station				
		New Connections[2]		
Projected Years	Previous Year Annual Average Flow[1]	Ashford PS Service Area	Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.038	50	0.013	0.051
2020	0.051	86	0.022	0.073
2021	0.073	228	0.059	0.132
2022	0.132	78	0.020	0.152
2023	0.152	18	0.005	0.157

(1) The 2019 previous year annual average flow starts with 2018 ADF

(2) Refer to Table 4A and 4B for flow allocations per unit.
New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5B
5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Ellis Preserve Pump Station				
		New Connections[2]		
Projected Years	Previous Year Annual Average Flow[1]	Ellis Preserve PS Service Area	Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.006	199	0.045	0.051
2020	0.051	31	0.007	0.058
2021	0.058	33	0.007	0.065
2022	0.065	28	0.006	0.071
2023	0.071	0	0.000	0.071

(1) The 2019 previous year annual average flow starts with December 2018 Pump and Haul ADF

(2) Refer to Table 4A and 4B for flow allocations per unit
New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5C
5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Camelot Lane Pump Station/Force Main to CDCA				
		New Connections[2]		
Projected Years	Previous Year Annual Average Flow[1]	Camelot PS Service Area	Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.191	5	0.001	0.192
2020	0.192	17	0.004	0.196
2021	0.196	224	0.059	0.255
2022	0.255	115	0.030	0.285
2023	0.285	99	0.026	0.311

(1) The 2019 previous year annual average flow starts with 2018 ADF

(2) Refer to Table 4A and 4B for flow allocations per unit
New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5D

5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Total CDCA Area within Newtown Twp										
		New Connections[2]								
Projected Years	Previous Year Annual Average Flow[1]	Ashford PS Service Area		Ellis Preserve PS Service Area		Camelot PS Service Area			Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.235	50	0.013	199	0.045	5	0.001	**254**	0.059	**0.294**
2020	0.294	86	0.022	31	0.007	17	0.004	**134**	0.033	**0.327**
2021	0.327	228	0.059	33	0.007	224	0.059	**485**	0.125	**0.452**
2022	0.452	78	0.020	28	0.006	115	0.030	**221**	0.056	**0.508**
2023	0.508	18	0.005	0	0.000	99	0.026	**117**	0.031	**0.539**

(1) The 2019 previous year annual average flow starts with 2018 ADF

(2) Refer to Table 4A and 4B for flow allocations per unit

New Connections Account for Commercial and Institutional Units for flow projections

TABLE 5E

5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Total from Ashford Force Main to CDCA (including Edgmont/DELCORA Force Main)										
		New Connections[2]								
Projected Years	Previous Year Annual Average Flow[1]	Ashford PS Service Area		Ellis Preserve PS Service Area		Edgmont/DELCORA Runnymeade PS Service Area[3]			Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.162	50	0.013	199	0.045	11	0.003	**260**	0.061	0.223
2020	0.223	86	0.022	31	0.007	85	0.022	**202**	0.051	0.274
2021	0.274	228	0.059	33	0.007	95	0.025	**356**	0.091	0.365
2022	0.365	78	0.020	28	0.006	113	0.030	**219**	0.056	0.421
2023	0.421	18	0.005	0	0.000	231	0.061	**249**	0.066	0.487

(1) The 2019 previous year annual average flow starts with 2018 ADF (including Edgmont/DELCORA flow per Reference (3) below)

(2) Refer to Table 4A, 4B, and Reference (3) below for flow allocations per unit
New Connections Account for Commercial and Institutional Units for flow projections

(3) Refer to Table 4 of Attachment A (pg A-3) of "The Delaware County Regional Water Quality Control Authority, Edgmont Township, Crum Creek Sewer District, Tributary Municipality 2018 Chapter 94Report, February 2019," prepared by Bradford Engineering Associates, Inc.
for Annual Average Flow Projection for Edgmont Twp.

TABLE 5F
5-Year Hydraulic Loading Projections

Hydraulic Loading Projection - Total Discharge to CDCA from NTMA System								
		New Connections[2]						
Projected Years	Previous Year Annual Average Flow[1]	TOTAL Increased Flow from Ashford FM to CDCA		TOTAL Increased Flow from Camelot FM to CDCA			Increased Flow from New Connections	Projected Annual Average Flow
	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(EDU)	(MGD)	(MGD)
2019	0.353	260	0.061	5	0.001	**265**	0.062	**0.415**
2020	0.415	202	0.051	17	0.004	**219**	0.055	**0.470**
2021	0.470	356	0.091	224	0.059	**580**	0.150	**0.620**
2022	0.620	219	0.056	115	0.030	**334**	0.086	**0.706**
2023	0.706	249	0.066	99	0.026	**348**	0.092	**0.798**

(1) The 2019 previous year annual average flow starts with 2018 ADF (including Edgmont/DELCORA flow per Reference (3) below)

(2) Refer to Table 4A, 4B, and Reference (3) below for flow allocations per unit
New Connections Account for Commercial and Institutional Units for flow projections.

(3) Refer to Table 4 of Attachment A (pg A-3) of "The Delaware County Regional Water Quality Control Authority, Edgmont Township, Crum Creek Sewer District, Tributary Municipality 2018 Chapter 94Report, February 2019," prepared by Bradford Engineering Associates, Inc. for Annual Average Flow Projection for Edgmont Twp.

TABLE 6

Pump Stations						
		Permitted Capacities		Present Flows		Projected Flows
Pump Station Name	**Number of Pumps**	**AA Permitted Capacity[4] (GPD)**	**Hydraulic Design Capacity[1] (GPD)**	**Annual Average Flows (GPD)**	**Peak Instantaneous (or Peak Hourly) Flow[2] (gpm)**	**2-Year Projected Maximum Flow[3] (GPD)**
Camelot Pump Station	2	330,000 (229.2 gpm)	1.224 MGD (850 gpm)	191,146	504[2]	744,800 (517 gpm)
Ashford Pump Station	2	115,000 (79.9 gpm) 213,000 (147.9 gpm)	0.821 MGD (570 gpm)	37,575	104[2]	284,700 (198 gpm)
Ellis Preserve Pump Station	2	185,000 (128.5 gpm)	1.008 MGD (700 gpm)	6,058[5]	18[2]	220,400 (153 gpm)

1. Excluding Capacity of Backup Pump = Maximum Pump Rate
2. The Peak Instantaneous Flow was determined by applying a Peaking Factor pursuant to the *Pennsylvania Department of Environmental Protection, Water Management Program, Southeast Regional Office, Sewage Pumping Station Guidance*, last revised March 24, 1999.
   a. Peaking Factor = 3.8 for Camelot P.S. based on AADF of 0.191 MGD
   b. Peaking Factor = 4.0 for Ashford P.S. based on AADF of 0.038 MGD
   c. Peaking Factor = 4.2 for Ellis Preserve P.S. based on Design Calculation Report and AADF of 0.006 MGD
3. 2-Year Projected Peak Flow = (Projected 2-Year AA Flow to P.S.) x (Pump Station Peaking Factor); pursuant to the *Pennsylvania Department of Environmental Protection, Water Management Program, Southeast Regional Office, Sewage Pumping Station Guidance*, last revised March 24, 1999:
   a. Projected 2-Year AA Flow to Camelot P.S. Based on Proposed Connections (0.196 MGD in 2020 per Table 5C) x (P.S. Peaking Factor of 3.8)
   b. Projected 2-Year AA Flow to Ashford P.S. Based on Proposed Connections (0.073 MGD in 2020 per Table 5A) x (P.S. Peaking Factor of 3.9)
   c. Projected 2-Year AA Flow to Ellis Preserve P.S. Based on Proposed Connections (0.058 MGD in 2020 per Table 5B) x (P.S. Peaking Factor of 3.9)
4. The Permitted Capacity of the Ashford P.S. is currently 115,000 GPD with an ultimate Permitted Capacity of 213,000 GPD subject to additional planning approvals for adjacent surrounding areas.
5. The Annual Average Flow for Ellis Preserve was taken from the date the pump station was placed into operation (August 1, 2018).

7.0 Sanitary Sewer Overflow 2018

There were no Sanitary Sewer Overflows (SSOs) in the CDCA Service Area in 2018. There were no overload conditions and no major repairs in 2018.

8.0 Industrial Wastewater

No industrial waste is discharged to the system. As part of the recently approved Act 537 Plan and revised Sewer Lateral Connection Application, commercial and industrial users are required to complete a "Commercial/Industrial User Survey" as part of any future connection application to the system.

9.0 Proposed Plan to Reduce Projected Overload Conditions

The Authority continues to identify and remove illegal connections to the system, addresses sources of I&I on an as-needed basis, and maintains the system in good working order. In planning to reduce sources of I&I, Newtown Township has adopted DELCORA's new lateral standards. No overloads in the CDCA service area are anticipated.

APPENDIX

A. NEWTOWN TOWNSHIP SEWER MAP

B. PUMP STATIONS – FLOW DATA

C. PUMP STATIONS – PUMP CURVES

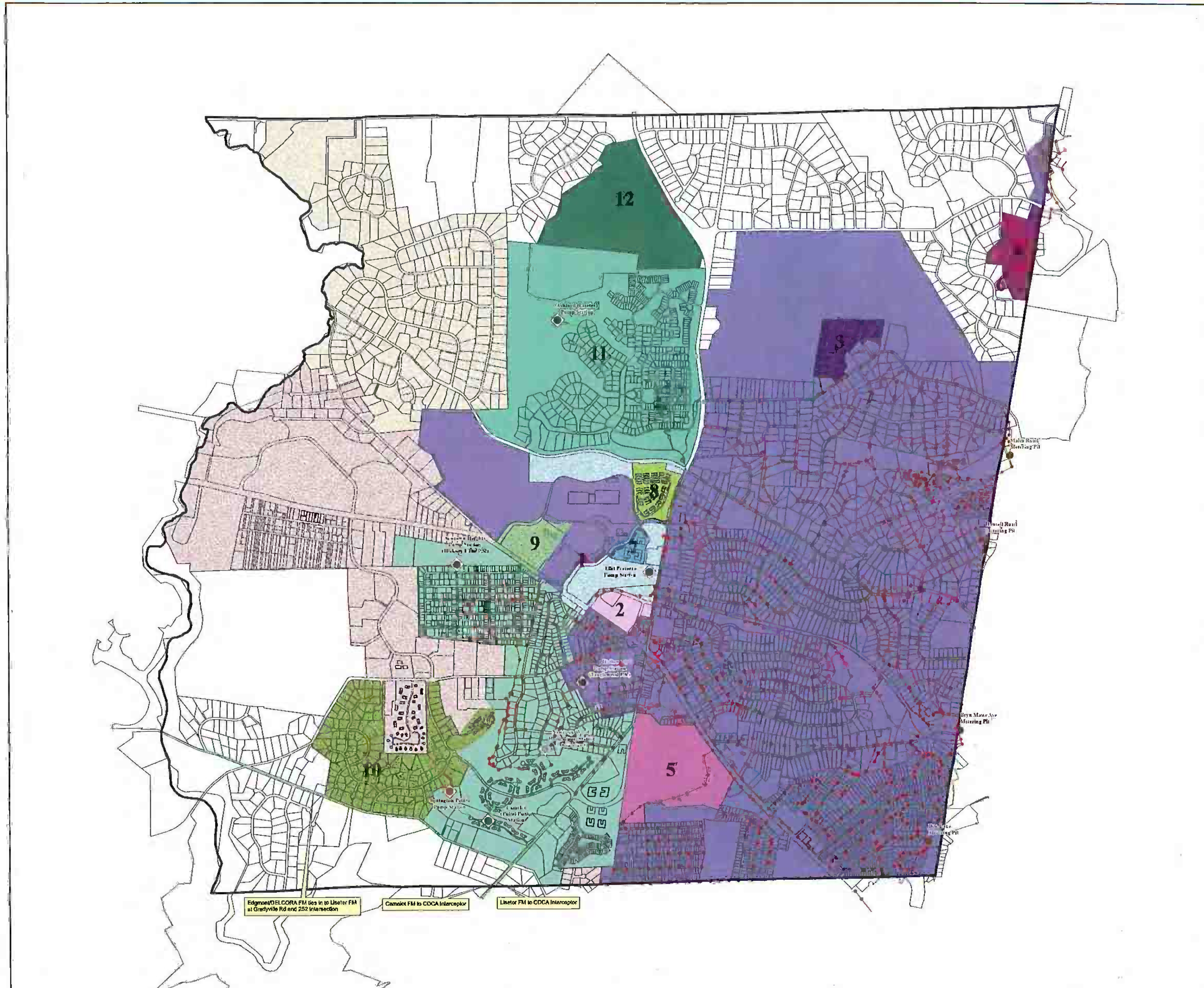
D. THE DELAWARE COUNTY REGIONAL WATER QUALITY CONTROL AUTHORITY, EDGMONT TOWNSHIP, CRUM CREEK SEWER DISTRICT, TRIBUTARY MUNICIPALITY, 2018 CHAPTER 94 REPORT, FEBRUARY 2019, PREPARED BY BRADFORD ENGINEERING ASSOCIATES, INC.

APPENDIX (A)

NEWTOWN TOWNSHIP SANITARY SEWER SYSTEM MAP

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY
TRIBUTARY MUNICIPALITY
ANNUAL REPORT
2018

Newtown Township Sanitary Sewer System



- Metering Pits
- Treatment Plants
- Pump Stations
- Pump Stations Abandoned
- Manholes
- Sewer Lines

- Radnor Haverford Marple Sewer Authority
- 1. Ellis Preserve Town Center - Newtown Square Firehouse PADEP Code 1-23943-222-X
- 2. Ellis Town Center (Phase 1, Sector 1) PADEP Code 1-23943-194-X
- 3. Timber Lane Area Serviced by Existing Sanitary Sewer
- 4. Worthing Subdivision connected to public sewer via Planning Module. PADEP Code No. 1--23943-453-3JREV
- 5. Dunwoody Village (Penrose Carriage Homes) PADEP Code No. 1-23943-201-3J
- 6. No Planning Needed - PA DEP Code No. 1-23943-200-X
- Central Delaware County Authority
- 7. Ellis Preserve Town Center Multi-family PADEP Code 1-23943-209-3J
- 8. Ellis Preserve Townhouses PADEP Code 1-23943-202-3J
- 9. Ellis Preserve Sector 2 Office Building PADEP Code 1-23943-224-E
- 10. Springton Pointe Estates PS
- 11. Ashford (Liseter). PA DEP Code No. 1-23943-171-3J
- 12. Episcopal Academy - DEP Code No. 1-23943-147A-3J
- BPG (Ellis Preserve) P.S. Service Area
- Camelot P.S. Service Area
- Ashford P.S. Service Area

Data:
Roads, Water, Parcels, Municipal Boundary - DCPD Data

Metering Pits locations were created from Kelly Engineering Newtown Sewer Map, 2003

Sewer Lines, manhole, & pumpstation locations digitized by JMT in 2003 and updated by DCPD using Kelly Engineering and Pennoni Assoc. Inc Newtown Sewer Maps, 2003 and 2007.

Important
This map is for analytical purposes only. It is not intended for navigation or exact location of infrastructure. The reliability of this map depends on the accuracy of its underlying data sources which have not been verified. Unauthorized duplication or distribution is prohibited.

Prepared by
Delaware County
Planning Department
2019

0 1,000 2,000 4,000 Feet

1 inch = 1,000 feet

APPENDIX (B)

PUMP STATIONS – FLOW DATA

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY
TRIBUTARY MUNICIPALITY
ANNUAL REPORT
2018

CAMELOT PUMP STATION
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		190,442	4,908,857	123,800	58,455	229,222		193,086
2	9,778,264	211,716	5,032,657	193,333	287,677	**236,825**	6,364,731	196,205
3	9,989,980	144,691		193,333		**236,825**	6,560,936	200,206
4	134,672	141,047		193,333		**236,825**	6,761,142	199,081
5	275,719	185,610	5,612,657	122,315	998,151	184,522	6,960,223	152,638
6		185,610	5,734,972	183,259	1,182,673	189,323	7,112,861	192,033
7		185,610	5,918,231	205,937	1,371,996	206,572		192,033
8	832,548	**216,641**	6,124,168	149,031		206,572		192,033
9	1,049,189	142,203	6,273,199	214,634	1,785,139	209,789	7,688,959	178,118
10		142,203		214,634		209,789	7,867,077	127,784
11	1,333,595	187,000		214,634		209,789	7,994,861	198,371
12	1,520,595	180,868	6,917,100	174,776	2,414,505	185,368	8,193,232	172,231
13		180,868	7,091,876	182,883	2,599,873	194,885	8,365,463	211,039
14		180,868	7,274,759	**217,063**	2,794,758	184,734		211,039
15	2,063,198	189,390	7,491,822	180,630	3,026,777	184,734		211,039
16	2,252,588	135,168	7,672,452	189,516	3,164,225	194,895	8,998,580	175,378
17	2,387,756	203,210		189,516		194,895	9,173,958	**232,106**
18	2,590,966	176,163		189,516		194,895	9,406,064	153,580
19	2,767,129	165,724	8,241,001	161,691	3,748,910	170,765	9,559,644	213,622
20		165,724	8,402,692	213,272	3,919,675	163,986	9,773,266	172,165
21		165,724	8,615,964	148,806	4,083,661	232,081		172,165
22	3,264,302	144,178	8,764,770	164,294	4,315,742	172,917		172,165
23	3,408,480	191,408	8,929,064	200,326	4,488,659	204,335	289,762	192,392
24	3,599,888	158,936		200,326		204,335	482,154	186,610
25	3,758,824	127,280		200,326		204,335	668,764	183,011
26	3,886,104	170,605	9,530,042	173,734	5,101,665	204,856	851,775	142,373
27		170,605	9,703,776	189,252	5,306,521	124,624	994,148	194,487
28		170,605	9,893,028	165,426	5,431,145	171,830		194,487
29	4,397,920	149,689			5,602,975	182,498		194,487
30	4,547,609	155,679			5,785,473	193,086	1,577,610	178,460
31	4,703,288	205,569				193,086		

> 1" of Rainfall in 24-hours

	January 2018	February 2018	March 2018	April 2018
Daily Avg.	**171,646**	183,914	**197,200**	**186,147**
Max	**216,641**	**217,063**	**236,825**	**232,106**

CAMELOT PUMP STATION
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	1,756,070	166,359	7,612,241	201,152		167,289	8,247,815	230,671
2	1,922,429	177,135		201,152	3,182,802	172,623	8,478,486	112,548
3	2,099,564	177,384		201,152	3,355,425	184,611	8,591,034	177,471
4	2,276,948	185,621	8,215,696	173,048		184,611		177,471
5		185,621	8,388,744	175,192	3,724,647	130,187		177,471
6		185,621	8,563,936	201,610	3,854,834	159,974	9,123,446	167,212
7	2,833,811	193,575	8,765,546	149,494		159,974	9,290,658	161,246
8	3,027,386	171,114	8,915,040	187,219		159,974	9,451,904	214,742
9	3,198,500	181,058		187,219	4,334,755	**216,366**	9,666,646	129,200
10	3,379,558	135,785		187,219	4,551,121	130,615	9,795,846	200,984
11	3,515,343	212,032	9,476,698	199,724	4,681,736	187,797		200,984
12		212,032	9,493,470	199,724	4,869,533	125,002		200,984
13		212,032	9,876,146	185,041	4,994,535	170,868	398,800	207,039
14	4,151,439	169,184	124,729	185,041		170,868	605,839	174,959
15	4,320,623	152,261	246,229	173,383		170,868	780,798	190,207
16	4,472,884	225,968		173,383	5,507,138	176,582	971,005	167,000
17	4,698,852	201,080		173,383	5,683,720	181,578	1,138,005	194,076
18	4,899,932	**227,006**	766,377	170,653	5,865,298	159,604		194,076
19		**227,006**	937,030	170,746	6,024,902	121,819		194,076
20		**227,006**	1,107,776	**217,103**	6,146,721	184,142	1,720,234	**233,411**
21	5,580,949	191,628	1,324,879	138,963		184,142	1,953,645	232,103
22	5,772,577	218,252	1,463,842	180,138		184,142	2,185,748	119,320
23	5,990,829	200,845		180,138	6,699,147	165,839	2,305,068	132,763
24	6,191,674	171,643		180,138	6,864,986	166,743	2,437,831	178,938
25	6,363,317	168,434	2,004,255	172,100	7,031,729	182,975		178,938
26		168,434	2,176,355	182,356	7,271,785	182,975		178,938
27	6,700,185	203,655	2,358,711	118,505	7,397,678	176,369	2,974,646	163,572
28		203,655	2,477,216	203,719		176,369	3,138,218	198,109
29	7,107,494	169,912	2,680,935	167,289		176,369	3,336,327	172,367
30	7,277,406	181,542		167,289	7,926,786	179,375	3,508,694	156,495
31	7,458,948	153,293			8,106,161	141,654	3,665,189	195,149

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	**188,909**	**180,109**	**168,784**	**181,049**
Max	**227,006**	**217,103**	216,366	233,411

CAMELOT PUMP STATION
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		195,149	9,862,324	191,806	5,705,346	152,214		220,190		245,692
2	4,055,486	155,677	54,131	192,308	5,857,560	205,074		220,190		245,692
3		155,677	246,439	191,061		205,074	2,821,470	264,762		0
4	4,366,840	165,213	437,500	188,987		205,074	3,086,232	139,940		0
5	4,532,053	180,986	626,487	199,371	6,472,782	208,922	3,226,172	218,757		0
6	4,713,039	205,620		199,371	6,681,704	235,459	3,444,929	191,012		0
7	4,918,659	236,688		199,371	6,917,163	206,698	3,635,941	209,552		0
8		236,688	1,224,599	175,167	7,123,861	171,172		209,552		0
9		236,688	1,399,766	191,863	7,295,033	220,457		209,552		0
10	5,628,723	218,448	1,591,629	176,482		220,457	4,264,598	190,895		0
11	5,847,171	191,439	1,817,826	176,482		220,457	4,455,493	197,274		0
12	6,038,610	**249,841**	1,944,592	208,542	7,956,405	269,069	4,652,767	206,165		0
13	6,288,451	157,398		208,542	8,225,474	166,176	4,858,932	186,758		0
14	6,445,849	202,536		208,542	8,391,650	203,506	5,045,690	242,515		0
15		202,536	2,570,219	170,168	8,595,156	**283,628**		242,515		0
16		202,536	2,740,387	174,124	8,878,784	241,181		242,515		0
17	7,053,457	187,920	2,914,511	**217,710**	9,630,014	241,181	5,773,235	191,226		0
18	7,241,377	205,776	3,132,221	147,132		241,181	5,964,461	197,720		0
19	7,447,153	212,300	3,279,353	192,818		241,181	6,162,181	272,406		0
20	7,659,453	134,325		192,818	9,843,508	183,999	6,434,587	**309,600**		0
21	7,793,778	190,175		192,818	27,508	206,328	6,744,187	232,514		0
22		**190,175**	3,857,807	165,881		206,328		232,514		0
23		**190,175**	4,023,688	**174,871**	440,163	269,893		232,514		0
24	8,364,303	188,265	4,198,559	182,447		269,893	7,441,728	219,102		0
25	8,552,568	237,285	4,381,006	163,494		269,893		219,102		0
26	9,016,162	237,285	4,544,500	203,070	1,249,843	250,037	7,879,931	268,111		0
27		237,285		203,070	1,499,880	244,166	8,148,042	222,742		0
28	9,264,422	199,301		203,070	1,744,046	219,961	8,370,784	245,692		0
29		199,301	5,153,709	177,572	1,964,007	196,892		245,692		0
30		199,301	5,331,281	181,208	2,160,899	220,190		245,692		0
31			5,512,489	192,857			9,107,860	245,692		

> 1" of Rainfall in 24-hours

	September 2018	October 2018	November 2018	December 2018		
Daily Avg.	**200,066**	188,485	222,525	224,918	AADF 2018	191,146
Max	249,841	217,710	283,628	309,600	Annual Max.	309,600

Episcopal Academy 2018

	Begin	End	Days	Usage (Gallons)
Quarter 1	1/1/2018	3/31/2018	90	688,070
Quarter 2	4/1/2018	6/30/2018	91	625,285
Quarter 3	7/1/2018	9/30/2018	92	795,552
Quarter 4	10/1/2018	12/31/2018	92	827,392
			365	
TOTAL Gallons				2,936,299
Average Daily Flow (Gallons)				**8,045**

NOTE: Flow is tributary to the Ashford PS and is accounted for in the Ashford PS meter readings

ASHFORD PUMP STATION
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		37,217	9,588,472	34,936	580,227	39,461		27,411
2	8,445,902	43,780	9,623,408	39,461	619,688	27,866	1,610,000	32,285
3	8,489,682	30,114		39,461		27,866		32,285
4	8,519,796	29,712		39,461		27,866	1,674,570	55,368
5	8,549,508	34,487	9,741,792	23,332	703,287	34,425	1,729,938	22,987
6		34,487	9,765,124	46,198	737,712	31,651	1,752,925	38,271
7		34,487	9,811,322	37,062	769,363	**42,080**		38,271
8	8,652,970	54,950	9,848,384	19,972	811,443	29,931		38,271
9	8,707,920	39,444	9,868,356	38,781	841,374	32,785	1,867,737	25,308
10	8,747,364	32,376		38,781		32,785	1,893,045	39,624
11	8,779,740	36,882		38,781		32,785	1,981,871	39,624
12	8,816,622	39,315	9,984,700	33,563	939,730	36,622		39,624
13		39,315	18,264	40,423	976,352	36,528	2,011,916	49,253
14		39,315	58,687	50,880	1,012,880	36,844		49,253
15	8,934,568	38,640	109,567	24,412	1,065,836	36,844		49,253
16	8,973,208	35,026	133,979	30,725	1,086,568	33,665	2,159,676	27,590
17	9,008,234	54,112		30,725		33,665	2,187,266	54,782
18	9,062,346	25,144		30,725		33,665	2,242,048	27,487
19	9,087,490	38,221	226,153	27,442	1,187,563	35,038	2,269,535	34,421
20		38,221	253,595	51,578	1,222,601	29,926	2,303,956	34,796
21		38,221	305,173	23,319	1,252,527	36,929		34,796
22	9,202,154	39,226	328,492	29,796	1,289,456	32,420		34,796
23	9,241,380	57,942	358,288	36,117	1,321,876	33,331	2,408,344	40,552
24	9,299,322	39,394		36,117		33,331	2,448,896	40,113
25	9,338,716	20,492		36,117		33,331	2,489,009	38,971
26	9,359,208	37,013	466,640	37,316	1,421,870	32,041	2,527,980	34,887
27		37,013	503,956	41,456	1,453,911	18,105	2,562,867	30,403
28		37,013	545,412	34,815	1,472,016	26,325		30,403
29	9,470,248	37,338			1,498,341	29,426		30,403
30	9,507,586	39,474			1,527,767	27,411	2,654,075	59,354
31	9,547,060	41,412				27,411		

> 1" of Rainfall in 24-hours

	January	February	March	April
	Daily Avg. (GPD)	**Daily Avg.**	**Daily Avg.**	**Daily Avg.**
	38,046	**35,420**	**32,334**	**37,695**
	Max (GPD)	**Max**	**Max**	**Max**
	57,942	**51,578**	**42,080**	**59,354**

ASHFORD PUMP STATION
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	2,713,429	36,824	3,875,389	36,828		28,442	5,803,546	31,711
2	2,750,253	44,514		36,828	4,854,248	29,923	5,835,257	32,034
3	2,794,767	32,486		36,828	4,884,171	25,791	5,867,291	34,394
4	2,827,253	35,351	3,985,874	28,377		25,791		34,394
5		35,351	4,014,251	31,903		25,791		34,394
6		35,351	4,046,154	41,343	4,961,545	27,203	5,970,472	34,325
7	2,933,305	39,740	4,087,497	20,539	4,988,748	23,344	6,004,797	34,337
8	2,973,045	39,165	4,108,036	32,064		23,344	6,039,134	45,934
9	3,012,210	37,277		32,064		23,344	6,085,068	20,516
10	3,049,487	29,713		32,064	5,058,780	38,827	6,105,584	40,403
11	3,079,200	44,098	4,204,228	37,246	5,097,607	41,301		40,403
12		44,098	4,241,474	32,042	5,138,908	24,609		40,403
13		44,098	4,273,516	32,107	5,163,517	25,609	6,226,792	23,184
14	3,211,495	32,508	4,319,460	32,107	5,189,126	29,462	6,249,976	31,948
15	3,244,003	37,540	4,337,729	28,547		29,462	6,281,924	38,836
16	3,281,543	46,659		28,547		29,462	6,320,760	27,350
17	3,328,202	38,020		28,547	5,277,512	38,472	6,348,110	34,490
18	3,366,222	37,592	4,423,369	30,520	5,315,984	34,481		34,490
19		37,592	4,453,889	32,139	5,350,465	27,341		34,490
20		37,592	4,486,028	**45,922**	5,377,806	25,914	6,451,581	**50,497**
21	3,478,999	37,077	4,531,950	20,645	5,403,720	29,304	6,502,078	29,700
22	3,516,076	**51,346**	4,552,595	29,659		29,304	6,531,778	44,100
23	3,567,422	32,391		29,659		29,304	6,575,878	25,088
24	3,599,813	34,310		29,659	5,491,633	34,245	6,600,966	32,652
25	3,634,123	36,485	4,641,573	27,431	5,525,878	34,340		32,652
26		36,485	4,669,004	44,931	5,560,218	35,461		32,652
27	3,707,093	30,058	4,713,935	25,275	5,613,002	35,461	6,698,923	31,814
28		30,058	4,739,210	29,712	5,631,139	**53,237**	6,730,737	43,485
29	3,767,208	36,702	4,768,922	28,442		**53,237**	6,774,222	29,462
30	3,803,910	41,558		28,442	5,737,613	36,782	6,803,684	34,268
31	3,845,468	29,921			5,774,395	29,151	6,837,952	41,049

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	**37,483**	31,681	31,540	34,692
Max	51,346	45,922	53,237	50,497

ASHFORD PUMP STATION
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		41,049	8,126,129	43,991	9,422,936	34,588		40,913		0
2	6,920,049	30,925	8,170,120	43,477	9,457,524	42,507		40,913		0
3		30,925	8,213,597	46,193		42,507	843,879	65,841		0
4	6,981,898	36,591	8,259,790	34,229		42,507	909,720	26,934		0
5	7,018,489	38,928	8,294,019	39,044	9,585,044	46,192	936,654	52,245		0
6	7,057,417	48,048		39,044	9,631,236	49,066	988,899	39,641		0
7	7,105,465	42,479		39,044	9,680,302	49,058	1,028,540	41,749		0
8		42,479	8,411,150	34,466	9,729,360	36,912		41,749		0
9		42,479	8,445,616	44,084	9,766,272	40,790		41,749		0
10	7,232,902	44,020	8,489,700	38,341		40,790	1,153,787	46,701		0
11	7,276,922	43,892	8,550,178	38,341		40,790	1,200,488	41,683		0
12	7,320,814	44,276	8,566,382	40,703	9,888,642	45,591	1,242,171	48,990		0
13	7,381,806	27,560		40,703	9,954,492	45,591	1,291,161	41,890		0
14	7,409,366	41,519		40,703	9,979,824	53,519	1,333,051	32,875		0
15		41,519	8,688,490	41,586	33,344	44,118		32,875		0
16		41,519	8,730,076	44,292	77,462	48,927		32,875		0
17	7,533,924	41,972	8,774,368	43,166		48,927	1,431,677	74,834		0
18	7,575,896	46,384	8,832,082	43,166		48,927	1,506,511	41,783		0
19	7,622,280	41,552	8,860,700	41,620	224,244	39,859	1,548,294	60,835		0
20	7,675,391	41,552		41,620	264,103	36,914	1,609,129	65,426		0
21	7,705,384	38,339		41,620	301,017	42,018	1,674,555	40,789		0
22		38,339	8,985,560	39,504		42,018		40,789		0
23		38,339	9,025,064	41,938	385,052	50,011		40,789		0
24	7,820,402	44,191	9,067,002	**49,306**		50,011	1,796,921	46,696		0
25	7,864,593	**51,654**	9,116,308	37,052		50,011		46,696		0
26	7,916,247	51,239	9,153,360	42,353	535,085	49,154	1,890,313	48,718		0
27	7,967,486	44,072		42,353	584,239	45,374	1,939,031	47,949		0
28	8,011,558	38,190		42,353	629,613	**59,046**	1,986,980	38,840		0
29		38,190	9,280,420	46,664	688,659	32,481		38,840		0
30		38,190	9,327,084	47,208	721,140	40,913		38,840		0
31			9,374,292	48,644			2,103,500	38,840		

> 1" of Rainfall in 24-hours

	September 2018	October 2018	November 2018	December 2018		
Daily Avg.	41,014	41,832	44,637	44,525	AADF 2018	37,575
Max	51,654	49,306	59,046	74,834	Annual Max.	74,834

ELLIS PRESERVE PUMP STATION
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1							931,561	9,667
2							941,228	7,091
3							948,319	12,495
4								12,495
5								12,495
6							985,805	9,728
7							995,533	9,659
8							1,005,192	15,476
9							1,020,668	7,477
10							1,028,145	15,663
11							1,080,780	15,663
12								15,663
13								15,663
14							1,090,797	10,384
15							1,101,181	13,076
16							1,114,257	9,253
17							1,123,510	12,827
18								12,827
19								12,827
20							1,161,992	13,813
21							1,175,805	5,392
22							1,181,197	18,000
23							1,199,197	9,468
24							1,208,665	10,719
25								10,719
26								10,719
27							1,240,822	9,163
28							1,249,985	13,736
29							1,263,721	9,157
30							1,272,878	9,192
31							1,282,070	13,935

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	0	0	0	11,756
Max	0	0	0	18,000

ELLIS PRESERVE PUMP STATION
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		13,935	1,731,788	15,263	2,266,160	9,758		15,467		0
2	1,309,939	9,565	1,747,051	12,793	2,275,918	15,890		15,467		0
3		9,565	1,759,844	17,132		15,890	2,754,624	16,420		0
4	1,329,068	11,479	1,776,976	14,727		15,890	2,771,044	9,051		0
5	1,340,547	12,191	1,791,703	18,708	2,323,589	15,812	2,780,095	14,880		0
6	1,352,738	13,650		18,708	2,339,401	18,906	2,794,975	11,265		0
7	1,366,388	22,284		18,708	2,358,307	14,361	2,806,240	14,247		0
8		22,284	1,847,828	19,289	2,372,668	9,851		14,247		0
9		22,284	1,867,117	18,883	2,382,519	16,295		14,247		0
10	1,433,239	12,901	1,886,000	24,060		16,295	2,848,982	14,232		0
11	1,446,140	11,445	1,910,060	11,997		16,295	2,863,214	11,251		0
12	1,457,585	18,551	1,922,057	20,178	2,431,404	16,955	2,874,465	14,259		0
13	1,476,136	7,653		20,178	2,456,264	16,955	2,888,724	13,542		0
14	1,483,789	12,231		20,178	2,465,314	14,342	2,902,266	16,213		0
15		12,231	1,982,590	18,130	2,479,656	20,149		16,213		0
16		12,231	2,000,720	17,504	2,499,805	16,748		16,213		0
17	1,520,483	12,248	2,018,224	21,833		16,748	2,950,904	11,238		0
18	1,532,731	12,995	2,040,057	13,614		16,748	2,962,142	9,272		0
19	1,545,726	13,692	2,053,671	19,440	2,550,048	13,830	2,971,414	19,742		0
20	1,559,418	9,920		19,440	2,563,878	13,100	2,991,156	19,091		0
21	1,569,338	16,681		19,440	2,576,978	13,976	3,010,247	12,032		0
22		16,681	2,111,990	16,845		13,976		12,032		0
23		16,681	2,128,835	18,640	2,604,930	16,453		12,032		0
24	1,619,381	17,295	2,147,475	20,165		16,453	3,046,342	11,854		0
25	1,636,676	27,175	2,167,640	10,550		16,453		11,854		0
26	1,663,851	16,108	2,178,190	15,528	2,654,290	14,158	3,070,049	15,881		0
27	1,679,959	16,171		15,528	2,668,448	13,488	3,085,930	14,245		0
28	1,696,130	11,886		15,528	2,681,936	16,481	3,100,175	13,738		0
29		11,886	2,224,774	16,613	2,698,417	9,805		13,738		0
30		11,886	2,241,387	10,555	2,708,222	15,467		13,738		0
31			2,251,942	14,218			3,141,389			

> 1" of Rainfall in 24-hours

	September 2018	October 2018	November 2018	December 2018		
Daily Avg.	14,526	17,238	15,251	13,923	AADF 2018	6,058
Max	27,175	24,060	20,149	19,742	Annual Max.	24,060

TOTAL TO CDCA (NTMA ONLY)
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	0	227,659	14,497,329	158,736	638,682	268,683	0	**220,497**
2	18,224,166	255,496	14,656,065	232,795	907,365	264,691	7,974,731	228,490
3	18,479,662	174,805	0	232,795	0	264,691	6,560,936	232,491
4	8,654,468	170,759	0	232,795	0	264,691	8,435,712	254,449
5	8,825,227	220,097	15,354,449	145,647	1,701,438	218,947	8,690,161	175,625
6	0	220,097	15,500,096	229,457	1,920,385	220,974	8,865,786	230,303
7	0	220,097	15,729,553	242,999	2,141,359	248,652	0	230,303
8	9,485,518	**271,591**	15,972,552	169,003	811,443	236,503	0	230,303
9	9,757,109	181,647	16,141,555	253,415	2,626,513	242,574	9,556,696	203,426
10	8,747,364	174,579	0	253,415	0	242,574	9,760,122	167,408
11	10,113,335	223,882	0	253,415	0	242,574	9,976,732	237,995
12	10,337,217	220,183	16,901,800	208,339	3,354,235	221,990	8,193,232	211,855
13	0	220,183	7,110,140	223,306	3,576,225	231,413	10,377,379	260,292
14	0	220,183	7,333,446	**267,943**	3,807,638	221,578	0	260,292
15	10,997,766	228,030	7,601,389	205,042	4,092,613	221,578	0	260,292
16	11,225,796	170,194	7,806,431	220,241	4,250,793	228,560	11,158,256	202,968
17	11,395,990	257,322	0	220,241	0	228,560	11,361,224	**286,888**
18	11,653,312	201,307	0	220,241	0	228,560	11,648,112	181,067
19	11,854,619	203,946	8,467,154	189,133	4,936,473	205,803	11,829,179	248,043
20	0	203,946	8,656,287	264,850	5,142,276	193,912	12,077,222	206,961
21	0	203,946	8,921,137	172,125	5,336,188	**269,010**	0	206,961
22	12,466,456	183,404	9,093,262	194,090	5,605,198	205,337	0	206,961
23	12,649,860	249,350	9,287,352	236,443	5,810,535	237,667	2,698,106	232,944
24	12,899,210	198,330	0	236,443	0	237,667	2,931,050	226,723
25	13,097,540	147,772	0	236,443	0	237,667	3,157,773	221,982
26	13,245,312	207,619	9,996,682	211,050	6,523,535	236,897	3,379,755	177,260
27	0	207,619	10,207,732	230,708	6,760,432	142,729	3,557,015	224,890
28	0	207,619	10,438,440	200,241	6,903,161	198,155	0	224,890
29	13,868,168	187,027			7,101,316	211,924	0	224,890
30	14,055,195	195,153			7,313,240	220,497	4,231,685	237,814
31	14,250,348	246,981				220,497		

> 1" of Rainfall in 24-hours

	January 2018	February 2018	March 2018	April 2018
Daily Avg. (GPD)	209,704	219,334	229,534	223,842
Max (GPD)	271,591	267,943	269,010	286,888

TOTAL TO CDCA (NTMA ONLY)
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	4,469,499	203,183	11,487,630	237,980	0	195,731	14,982,922	272,049
2	4,672,682	221,649	0	237,980	8,037,050	202,546	15,254,971	151,673
3	4,894,331	209,870	0	237,980	8,239,596	210,402	15,406,644	224,360
4	5,104,201	220,972	12,201,570	201,425	0	210,402	0	224,360
5	0	220,972	12,402,995	207,095	3,724,647	155,978	0	224,360
6	0	220,972	12,610,090	242,953	8,816,379	187,177	16,079,723	211,265
7	5,767,116	233,315	12,853,043	170,033	4,988,748	183,318	16,290,988	205,242
8	6,000,431	210,279	13,023,076	219,283	0	183,318	16,496,230	276,152
9	6,210,710	218,335	0	219,283	4,334,755	**239,710**	16,772,382	157,193
10	6,429,045	165,498	0	219,283	9,609,901	169,442	16,929,575	257,050
11	6,594,543	256,130	13,680,926	236,970	9,779,343	229,098	1,080,780	257,050
12	0	256,130	13,734,944	231,766	10,008,441	149,611	0	257,050
13	0	256,130	14,149,662	217,148	10,158,052	196,477	6,625,592	245,886
14	7,362,934	201,692	4,444,189	217,148	5,189,126	200,330	7,946,612	217,291
15	7,564,626	189,801	4,583,958	201,929	0	200,330	8,163,903	242,119
16	7,754,427	**272,627**	0	201,929	5,507,138	206,044	8,406,022	203,603
17	8,027,054	239,100	0	201,929	10,961,232	220,050	8,609,625	241,394
18	8,266,154	264,598	5,189,746	201,173	11,181,282	194,085	0	241,394
19	0	264,598	5,390,919	202,885	11,375,367	149,160	0	241,394
20	0	264,598	5,593,804	**263,025**	11,524,527	210,056	9,333,807	**297,721**
21	9,059,948	228,705	5,856,829	159,608	5,403,720	213,446	9,631,528	267,195
22	9,288,653	269,598	6,016,437	209,797	0	213,446	9,898,723	181,420
23	9,558,251	233,236	0	209,797	6,699,147	195,143	10,080,143	167,319
24	9,791,487	205,953	0	209,797	12,356,619	**200,988**	10,247,462	222,310
25	9,997,440	204,919	6,645,828	199,531	12,557,607	**217,315**	0	222,310
26	0	204,919	6,845,359	227,287	12,832,003	218,435	0	222,310
27	10,407,278	233,712	7,072,646	143,780	13,010,680	211,830	10,914,391	204,549
28	0	233,712	7,216,426	233,431	5,631,139	229,606	11,118,940	255,330
29	10,874,702	206,614	7,449,857	195,731	0	229,606	11,374,270	210,986
30	11,081,316	223,100	0	195,731	13,664,399	216,157	11,585,256	199,955
31	11,304,416	183,214			13,880,556	170,805	11,785,211	250,132

> 1" of Rainfall in 24-hours

May 2018	June 2018	July 2018	August 2018
Daily Avg. (GPD)	Daily Avg. (GPD)	Daily Avg. (GPD)	Daily Avg. (GPD)
226,391	211,790	200,324	227,497
Max (GPD)	Max (GPD)	Max (GPD)	Max (GPD)
272,627	263,025	239,710	297,721

TOTAL TO CDCA (NTMA ONLY)
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	0	250,132	19,720,241	251,060	17,394,442	196,560	0	276,571		
2	12,285,474	196,166	9,971,302	248,578	17,591,002	263,471	0	276,571		
3	0	196,166	10,219,880	254,386	0	263,471	6,419,973	347,023		
4	12,677,806	213,283	10,474,266	237,943	0	263,471	6,766,996	175,925		
5	12,891,089	232,105	10,712,209	257,123	18,381,415	270,926	6,942,921	285,882		
6	13,123,194	267,318	0	257,123	18,652,341	303,431	7,228,803	241,918		
7	13,390,512	301,451	0	257,123	18,955,772	270,117	7,470,721	265,549		
8	0	301,451	11,483,577	228,922	19,225,889	217,935	0	265,549		
9	0	301,451	11,712,499	254,830	19,443,824	277,542	0	265,549		
10	14,294,864	275,369	11,967,329	**238,883**	0	277,542	8,267,367	251,828		
11	14,570,233	246,776	12,278,064	226,820	0	277,542	8,519,195	250,208		
12	14,817,009	312,668	12,433,031	269,423	20,276,451	331,615	8,769,403	269,414		
13	15,146,393	192,611	0	269,423	20,636,230	228,722	9,038,817	242,190		
14	15,339,004	256,287	0	269,423	20,836,788	271,367	9,281,007	291,603		
15	0	256,287	13,241,299	229,884	11,108,156	**347,895**	0	291,603		
16	0	256,287	13,471,183	235,920	11,456,051	306,856	0	291,603		
17	16,107,864	242,140	13,707,103	282,709	9,630,014	306,856	10,155,816	277,298		
18	16,350,004	265,155	14,004,360	203,912	0	306,856	10,433,114	248,775		
19	16,615,159	267,544	14,193,724	253,878	2,774,292	294,870	10,681,889	352,983		
20	16,894,262	185,797	0	253,878	12,671,489	234,013	11,034,872	**394,117**		
21	17,068,500	245,195	0	253,878	2,905,503	262,321	11,428,989	285,334		
22	0	245,195	14,955,357	222,230	0	262,321	0	285,334		
23	0	245,195	15,177,587	235,449	3,430,145	336,358	0	285,334		
24	17,804,086	249,751	15,413,036	251,918	0	336,358	12,284,991	277,651		
25	18,053,837	**316,114**	15,664,954	211,096	0	336,358	0	277,651		
26	18,596,260	304,632	15,876,050	260,951	4,439,218	313,349	12,840,293	332,710		
27	9,647,445	297,528	0	260,951	4,752,567	303,028	13,173,003	284,936		
28	18,972,110	249,377	0	260,951	5,055,595	295,488	13,457,939	298,270		
29	0	249,377	16,658,903	240,849	5,351,083	239,178	0	298,270		
30	0	249,377	16,899,752	238,971	5,590,261	276,571	0	298,270		
31			17,138,723	255,719			14,352,749	284,532		

	September 2018	October 2018	November 2018	December 2018		
Daily Avg. (GPD)	255,606	247,555	282,413	282,918	AADF 2018	234,742
Max (GPD)	316,114	282,709	347,895	394,117	Annual Max.	394,117

GRADYVILLE RD FORCE MAIN FROM EDGMONT TWP
2018 FLOW

Date	January 2018 Total	January 2018 Daily	February 2018 Total	February 2018 Daily	March 2018 Total	March 2018 Daily	April 2018 Total	April 2018 Daily
1		105,072		107,582		113,915		108,458
2		109,924		110,088		104,954		111,929
3		106,628		120,940		112,972		109,633
4		98,463		131,498		127,665		105,709
5		**106,921**		109,008		120,226		120,495
6		118,718		**103,072**		110,838		109,759
7		113,363		118,603		119,590		121,295
8		109,097		118,487		118,856		119,427
9		103,709		111,113		124,887		102,829
10		104,777		119,701		**128,691**		104,711
11		108,167		151,233		**120,709**		106,656
12		148,319		110,285		**112,517**		107,752
13		119,019		114,050		110,174		109,753
14		120,128		104,338		113,485		126,259
15		117,929		110,421		110,522		117,888
16		110,609		119,181		105,453		163,405
17		115,731		121,116		115,974		113,748
18		131,334		126,371		110,810		105,070
19		117,883		129,504		110,130		107,492
20		119,260		109,209		107,593		**109,849**
21		111,272		96,610		97,871		111,165
22		102,541		102,978		109,218		103,776
23		113,086		114,893		103,930		90,621
24		112,313		114,893		120,284		100,758
25		107,992		114,893		114,054		118,793
26		98,489		109,477		113,113		109,789
27		111,500		116,244		103,136		123,533
28		122,549		101,212		102,287		133,510
29		112,011				108,601		130,192
30		115,956				111,541		109,886
31		109,905				118,131		

> 1" of Rainfall in 24-hours

Daily Avg. (GPD)	**Daily Avg.**	**Daily Avg.**	**Daily Avg.**
112,604	**114,893**	**112,972**	**113,805**
Max (GPD)	**Max**	**Max**	**Max**
148,319	**151,233**	**128,691**	**163,405**

GRADYVILLE RD FORCE MAIN FROM EDGMONT TWP
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		113,423		109,789		107,701		108,073
2		105,211		124,086		109,130		106,986
3		112,471		122,065		100,917		118,061
4		110,751		108,515		92,346		107,306
5		109,201		108,863		97,365		105,302
6		113,614		113,410		103,677		107,902
7		114,005		112,037		104,269		105,305
8		109,213		115,672		103,220		105,874
9		100,044		112,049		101,204		99,684
10		111,301		118,851		102,265		107,584
11		92,278		129,430		108,181		126,335
12		125,046		113,330		107,655		119,898
13		132,804		115,958		95,913		180,892
14		113,740		108,796		102,758		112,387
15		109,866		105,700		107,420		115,383
16		114,938		107,431		102,776		116,719
17		128,258		108,487		100,956		105,274
18		121,378		110,662		97,517		118,315
19		145,653		106,251		103,795		136,342
20		122,507		107,197		107,018		118,216
21		110,589		110,048		104,450		119,264
22		121,838		111,366		128,864		120,869
23		114,675		**125,599**		107,320		**112,313**
24		108,092		**120,715**		114,034		110,185
25		104,239		**106,633**		116,841		116,297
26		113,824		102,303		**112,650**		101,960
27		107,547		107,324		108,339		106,273
28		106,575		115,155		110,616		108,104
29		110,913		116,018		104,237		110,178
30		103,831		101,693		104,409		102,606
31		114,992				105,372		113,706

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg.	113,639	112,514	105,588	114,309
Max	145,653	129,430	128,864	180,892

GRADYVILLE RD FORCE MAIN FROM EDGMONT TWP
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1		108,622		122,477		105,923		159,021		0
2		106,215		130,324		102,265		164,697		0
3		114,783		128,661		126,598		142,049		0
4		108,881		126,241		108,393		136,308		0
5		104,719		114,239		118,769		133,295		0
6		113,317		131,792		126,686		124,860		0
7		**120,209**		117,509		112,532		119,680		0
8		143,970		117,281		111,484		129,252		0
9		169,004		120,192		125,373		131,395		0
10		136,052		108,279		127,407		123,101		0
11		123,479		115,045		126,920		124,150		0
12		122,591		114,470		111,385		118,159		0
13		115,742		123,077		134,357		117,875		0
14		110,406		114,620		111,572		117,622		0
15		112,043		118,370		126,989		126,764		0
16		119,225		104,896		164,718		153,118		0
17		110,263		118,395		140,145		117,895		0
18		116,838		111,455		139,387		117,246		0
19		109,780		113,712		142,675		118,864		0
20		114,694		118,419		151,266		122,356		0
21		111,328		118,852		164,362		176,321		0
22		113,917		111,280		149,734		152,158		0
23		121,945		109,441		144,225		151,745		0
24		120,899		**110,345**		190,088		168,268		0
25		141,174		106,453		159,194		149,876		0
26		123,716		106,687		155,968		**163,109**		0
27		117,501		137,762		158,914		149,807		0
28		138,064		108,022		158,984		187,741		0
29		125,665		103,171		**146,975**		158,322		0
30		117,860		104,326		141,454		148,989		0
31				95,442				161,293		

> 1" of Rainfall in 24-hours

	September 2018	October 2018	November 2018	December 2018		
Daily Avg.	120,430	115,524	136,158	140,817	AADF 2018	117,771
Max	169,004	137,762	190,088	187,741	Annual Max.	190,088

TOTAL TO CDCA (NTMA and EDGMONT)
2018 FLOW

Date	January 2018		February 2018		March 2018		April 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	0	332,731	14,497,329	266,318	638,682	382,598	0	**328,955**
2	18,224,166	365,420	14,656,065	342,883	907,365	369,645	7,974,731	340,419
3	18,479,662	281,433	0	353,735	0	377,663	6,560,936	342,124
4	8,654,468	269,222	0	364,293	0	**392,356**	8,435,712	360,158
5	8,825,227	327,018	15,354,449	254,655	1,701,438	339,173	8,690,161	296,120
6	0	338,815	15,500,096	332,529	1,920,385	331,812	8,865,786	340,062
7	0	333,460	15,729,553	361,602	2,141,359	368,242	0	351,598
8	9,485,518	**380,688**	15,972,552	287,490	811,443	355,359	0	349,730
9	9,757,109	285,356	16,141,555	364,528	2,626,513	367,461	9,556,696	306,255
10	8,747,364	279,356	0	373,116	0	371,265	9,760,122	272,119
11	10,113,335	332,049	0	**404,648**	0	363,283	9,976,732	344,651
12	10,337,217	368,502	16,901,800	318,624	3,354,235	334,507	8,193,232	319,607
13	0	339,202	7,110,140	337,356	3,576,225	341,587	10,377,379	370,045
14	0	340,311	7,333,446	372,281	3,807,638	335,063	0	386,551
15	10,997,766	345,959	7,601,389	315,463	4,092,613	332,100	0	378,180
16	11,225,796	280,803	7,806,431	339,422	4,250,793	334,013	11,158,256	366,373
17	11,395,990	373,053	0	341,357	0	344,534	11,361,224	**400,636**
18	11,653,312	332,641	0	346,612	0	339,370	11,648,112	286,137
19	11,854,619	321,829	8,467,154	318,637	4,936,473	315,933	11,829,179	355,535
20	0	323,206	8,656,287	374,059	5,142,276	301,505	12,077,222	316,810
21	0	315,218	8,921,137	268,735	5,336,188	366,881	0	318,126
22	12,466,456	285,945	9,093,262	297,068	5,605,198	314,555	0	310,737
23	12,649,860	362,436	9,287,352	351,336	5,810,535	341,597	2,698,106	323,565
24	12,899,210	310,643	0	351,336	0	357,951	2,931,050	327,481
25	13,097,540	255,764	0	351,336	0	351,721	3,157,773	340,775
26	13,245,312	306,108	9,996,682	320,527	6,523,535	350,010	3,379,755	287,049
27	0	319,119	10,207,732	346,952	6,760,432	245,865	3,557,015	348,423
28	0	330,168	10,438,440	301,453	6,903,161	300,442	0	358,400
29	13,868,168	299,038			7,101,316	320,525	0	355,082
30	14,055,195	311,109			7,313,240	332,038	4,231,685	347,700
31	14,250,348	356,886						

> 1" of Rainfall in 24-hours

	January 2018	February 2018	March 2018	April 2018
Daily Avg. (GPD)	322,693	334,227	342,635	337,647
Max (GPD)	380,688	404,648	392,356	400,636

TOTAL TO CDCA (NTMA and EDGMONT)
2018 FLOW

Date	May 2018		June 2018		July 2018		August 2018	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	4,469,499	316,606	11,487,630	347,769	0	303,432	14,982,922	380,122
2	4,672,682	326,860	0	362,066	8,037,050	311,676	15,254,971	258,659
3	4,894,331	322,341	0	360,045	8,239,596	311,319	15,406,644	342,421
4	5,104,201	331,723	12,201,570	309,940	0	302,748	0	331,666
5	0	330,173	12,402,995	315,958	3,724,647	253,343	0	329,662
6	0	334,586	12,610,090	356,363	8,816,379	290,854	16,079,723	319,167
7	5,767,116	347,320	12,853,043	282,070	4,988,748	287,587	16,290,988	310,547
8	6,000,431	319,492	13,023,076	334,955	0	286,538	16,496,230	382,026
9	6,210,710	318,379	0	331,332	4,334,755	340,914	16,772,382	256,877
10	6,429,045	276,799	0	338,134	9,609,901	271,707	16,929,575	364,634
11	6,594,543	348,408	13,680,926	366,400	9,779,343	337,279	1,080,780	383,385
12	0	381,176	13,734,944	345,096	10,008,441	257,266	0	376,948
13	0	388,934	14,149,662	333,106	10,158,052	292,390	6,625,592	**426,778**
14	7,362,934	315,432	4,444,189	325,944	5,189,126	303,088	7,946,612	329,678
15	7,564,626	299,667	4,583,958	307,629	0	307,750	8,163,903	357,502
16	7,754,427	387,565	0	309,360	5,507,138	308,820	8,406,022	320,322
17	8,027,054	367,358	0	310,416	10,961,232	321,006	8,609,625	346,668
18	8,266,154	385,976	5,189,746	311,835	11,181,282	291,602	0	359,709
19	0	**410,251**	5,390,919	309,136	11,375,367	252,955	0	377,736
20	0	387,105	5,593,804	**370,222**	11,524,527	317,074	9,333,807	415,937
21	9,059,948	339,294	5,856,829	269,656	5,403,720	317,896	9,631,528	386,459
22	9,288,653	391,436	6,016,437	321,163	0	**342,310**	9,898,723	302,289
23	9,558,251	347,911	0	335,396	6,699,147	302,463	10,080,143	279,632
24	9,791,487	314,045	0	330,512	12,356,619	315,022	10,247,462	332,495
25	9,997,440	309,158	6,645,828	306,164	12,557,607	334,156	0	338,607
26	0	318,743	6,845,359	329,590	12,832,003	331,085	0	324,270
27	10,407,278	341,259	7,072,646	251,104	13,010,680	320,169	10,914,391	310,822
28	0	340,287	7,216,426	348,586	5,631,139	340,222	11,118,940	363,434
29	10,874,702	317,527	7,449,857	311,749	0	333,843	11,374,270	321,164
30	11,081,316	326,931	0	297,424	13,664,399	320,566	11,585,256	302,561
31	11,304,416	298,206			13,880,556	276,177	11,785,211	363,838

> 1" of Rainfall in 24-hours

	May 2018	June 2018	July 2018	August 2018
Daily Avg. (GPD)	**340,031**	**324,304**	**305,912**	**341,807**
Max (GPD)	**410,251**	**370,222**	**342,310**	**426,778**

TOTAL TO CDCA (NTMA and EDGMONT)
2018 FLOW

Date	September 2018		October 2018		November 2018		December 2018		January 2019	
	Total	Daily	Total	Daily	Total	Daily	Total	Daily	Total	Daily
1	0	358,754	19,720,241	373,537	17,394,442	302,483	0	435,592		
2	12,285,474	302,381	9,971,302	378,902	17,591,002	365,736	0	441,268		
3	0	310,949	10,219,880	383,047	0	390,069	6,419,973	489,072		
4	12,677,806	322,164	10,474,266	364,184	0	371,864	6,766,996	312,233		
5	12,891,089	336,824	10,712,209	371,362	18,381,415	389,695	6,942,921	419,177		
6	13,123,194	380,635	0	388,915	18,652,341	430,117	7,228,803	366,778		
7	13,390,512	421,660	0	374,632	18,955,772	382,649	7,470,721	385,229		
8	0	445,**421**	11,483,577	346,203	19,225,889	329,419	0	394,801		
9	0	**470,455**	11,712,499	375,022	19,443,824	402,915	0	396,944		
10	14,294,864	411,421	11,967,329	347,162	0	404,949	8,267,367	374,929		
11	14,570,233	370,255	12,278,064	341,865	0	404,462	8,519,195	374,358		
12	14,817,009	435,259	12,433,031	383,893	20,276,451	443,000	8,769,403	387,573		
13	15,146,393	308,353	0	392,500	20,636,230	363,079	9,038,817	360,065		
14	15,339,004	366,693	0	384,043	20,836,788	382,939	9,281,007	409,225		
15	0	368,330	13,241,299	348,254	11,108,156	474,884	0	418,367		
16	0	375,512	13,471,183	340,816	11,456,051	471,574	0	444,721		
17	16,107,864	352,403	13,707,103	**401,104**	9,630,014	447,001	10,155,816	395,193		
18	16,350,004	381,993	14,004,360	315,367	0	446,243	10,433,114	366,021		
19	16,615,159	377,324	14,193,724	367,590	2,774,292	437,545	10,681,889	471,847		
20	16,894,262	300,491	0	372,297	12,671,489	385,279	11,034,872	**516,473**		
21	17,068,500	356,523	0	372,730	2,905,503	426,683	11,428,989	461,655		
22	0	359,112	14,955,357	333,510	0	412,055	0	437,492		
23	0	367,140	15,177,587	344,890	3,430,145	480,583	0	437,079		
24	17,804,086	370,650	15,413,036	362,263	0	**526,446**	12,284,991	445,919		
25	18,053,837	457,288	15,664,954	317,549	0	495,552	0	427,527		
26	18,596,260	428,348	15,876,050	367,638	4,439,218	469,317	12,840,293	495,819		
27	9,647,445	415,029	0	398,713	4,752,567	461,942	13,173,003	434,743		
28	18,972,110	387,**441**	0	368,973	5,055,595	454,472	13,457,939	486,011		
29	0	375,042	16,658,903	344,020	5,351,083	386,153	0	456,592		
30	0	367,237	16,899,752	343,297	5,590,261	418,025	0	447,259		
31			17,138,723	351,161			14,352,749	445,825		

	September 2018	October 2018	November 2018	December 2018		
	Daily Avg. (GPD) 376,036	Daily Avg. (GPD) 363,079	Daily Avg. (GPD) 418,571	Daily Avg. (GPD) 423,735	AADF 2018	352,556
	Max (GPD) 470,455	Max (GPD) 401,104	Max (GPD) 526,446	Max (GPD) 516,473	Annual Max.	526,446

NOAA Local Climatological Data
for Philadelphia International Airport

Summary of Hourly Data

Days >1" Rainfall

Water Equivalent of Snowfall

Date	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
1	0.00	0.03	0.56	0.00	0.00	0.06	0.00	0.41	0.08	0.00	0.00	0.07
2	0.00	0.17	[illegible]	0.12	0.00	0.25	0.00	0.08	0.00	0.34	0.37	0.55
3	0.00	0.00	0.00	0.08	0.00	0.61	0.01	0.51	0.00	0.01	0.27	0.00
4	[illegible]	0.86	0.00	0.06	0.00	0.24	0.00	0.10	0.00	0.18	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.03
6	0.00	0.00	0.23	0.03	0.00	0.00	0.10	0.00	0.01	0.00	1.65	0.00
7	0.00	0.82	1.28	0.00	0.00	0.00	0.00	0.05	4.54	0.00	0.00	0.00
8	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.63	0.03	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	1.84	0.00	0.75	0.00
10	0.00	0.41	0.00	0.00	0.00	0.77	0.00	0.00	0.23	0.00	0.00	0.00
11	0.00	1.68	0.00	0.00	0.00	0.69	0.00	0.79	0.00	0.73	0.00	0.00
12	1.42	0.00	0.06	0.00	1.49	0.00	0.15	0.00	0.00	0.36	0.23	0.00
13	0.05	0.00	0.03	0.00	0.49	0.00	0.00	0.52	0.00	0.07	1.04	0.00
14	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.11
15	0.00	0.25	0.00	0.56	0.55	0.00	0.38	0.00	0.00	0.10	[illegible]	0.44
16	0.00	0.33	0.00	2.28	0.25	0.00	0.00	0.00	0.00	0.00	0.26	1.01
17	0.07	0.40	0.00	0.00	0.36	0.00	0.07	0.00	0.01	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.34	0.26	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.34	0.00	0.00	0.00	0.00
20	0.00	0.00	0.40	0.00	0.01	0.29	0.00	0.00	0.00	0.07	0.02	0.56
21	0.00	0.01	1.06	0.00	0.00	0.00	0.74	0.02	0.00	0.00	0.00	1.16
22	0.00	0.06	0.00	0.00	0.35	0.16	0.24	0.05	0.01	0.00	0.00	0.09
23	0.46	0.23	0.00	0.00	0.00	0.01	0.00	0.00	0.70	0.00	0.00	0.00
24	0.00	0.06	0.00	0.11	0.00	0.00	0.09	0.00	0.05	0.00	2.01	0.02
25	0.00	0.66	0.00	0.16	0.00	0.00	1.14	0.00	0.36	0.00	0.01	0.00
26	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.14	0.31	0.89	0.00
27	0.00	0.00	0.00	0.25	0.08	0.00	0.15	0.00	0.02	0.87	0.00	0.00
28	0.40	0.00	0.02	0.14	0.00	0.25	0.00	0.00	0.88	0.00	0.00	1.67
29	0.00		0.08	0.15	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
30	[illegible]		0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00		0.00		0.02		0.00	0.11		0.00		0.67
TOTAL	**2.85**	**6.02**	**4.74**	**3.94**	**5.21**	**3.34**	**3.06**	**4.11**	**9.76**	**3.08**	**9.03**	**6.38**
MAX	**1.42**	**1.68**	**1.28**	**2.28**	**1.49**	**0.77**	**1.14**	**0.79**	**4.54**	**0.87**	**2.01**	**1.67**
MAX 24HR	**1.47**	**2.09**	**1.51**	**2.84**	**1.98**	**1.46**	**1.22**	**1.25**	**5.17**	**1.18**	**2.02**	**1.72**

APPENDIX (C)

PUMP STATIONS – PUMP CURVES

NEWTOWN TOWNSHIP, DELAWARE COUNTY, MUNICIPAL AUTHORITY
TRIBUTARY MUNICIPALITY
ANNUAL REPORT
2018

ASHFORD PUMP STATION

Fairbanks Morse
Pentair Water

Company: EEI
...me:
...: 8/20/2010

Pump:

Size: 4"5435MV

Type: 5430-SOLIDS HANDLING
Synch speed: 1800 rpm
Speed: 1780 rpm
Dia: 14.0 inch

Curve: 35M404E
Impeller: T4E1E

Specific Speeds:
Ns: 1111
Nss: 7106

Dimensions:
Suction: 4 in
Discharge: 4 in

Pump Limits:

Temperature: 104 °F
Pressure: 125 psi g
Sphere size: 3 in
Power: —
Eye area: —

Search Criteria:

Flow: 750 US gpm
Head: 200 ft TDH

Fluid:

Water
Density: 62.25 lb/ft³
Viscosity: 1.105 cP
NPSHa: —
Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

Motor:

Consult Fairbanks Morse Pump, 60 Hz to select a motor for this pump.

— Data Point —

Flow:	562 US gpm
Head:	186 ft
Eff:	62%
Power:	42.8 hp
NPSHr:	11.5 ft

— Design Curve —

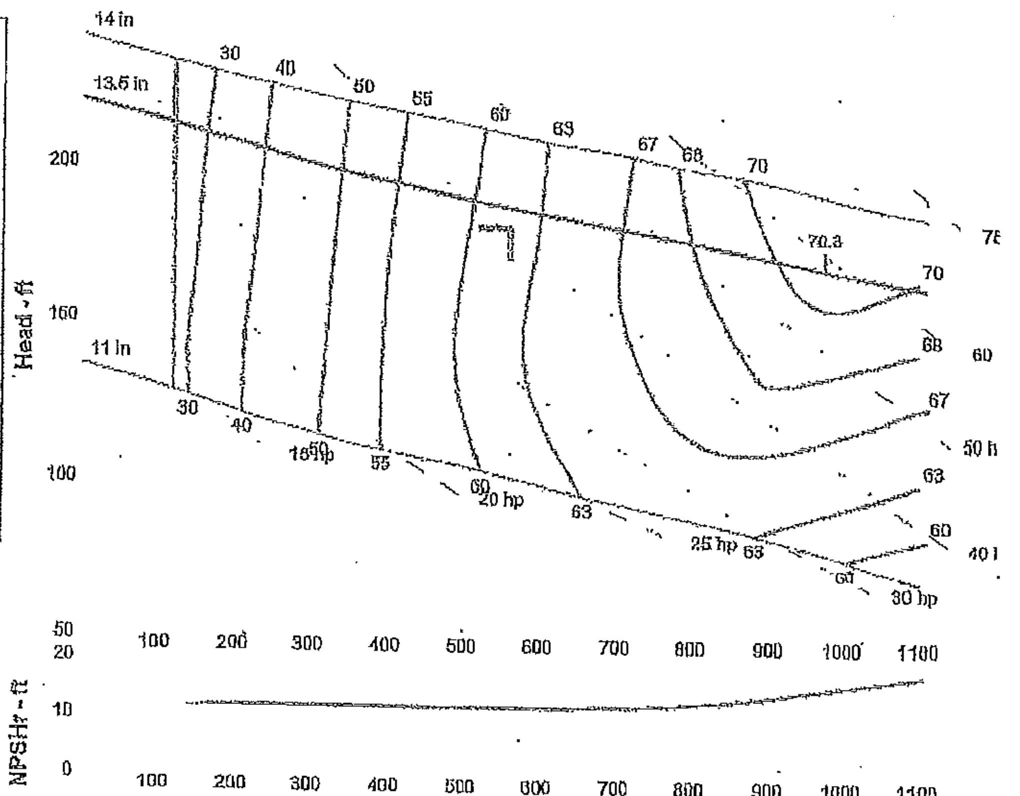
Shutoff head:	220 ft
Shutoff dP:	95 psi
Min flow:	120 US gpm

BEP: 70% @ 974 US gpm

NOL power:
64.5 hp @ 1107 US gpm

— Max Curve —

Max power:
72.6 hp @ 1108 US gpm



Curve efficiencies are typical. For guaranteed values, contact Fairbanks Morse or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Fairbanks Morse o a su distribuidor local.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
674	1780	181	66	46.8	11.7
562	1780	186	62	42.8	11.5
450	1780	192	57	38.1	11.5
337	1780	198	50	33.8	11.5
225	1780	205	38	30.2	11.5

CAMELOT PUMP STATION

4" 5435
MV
SUBMERSIBLE

1780 RPM

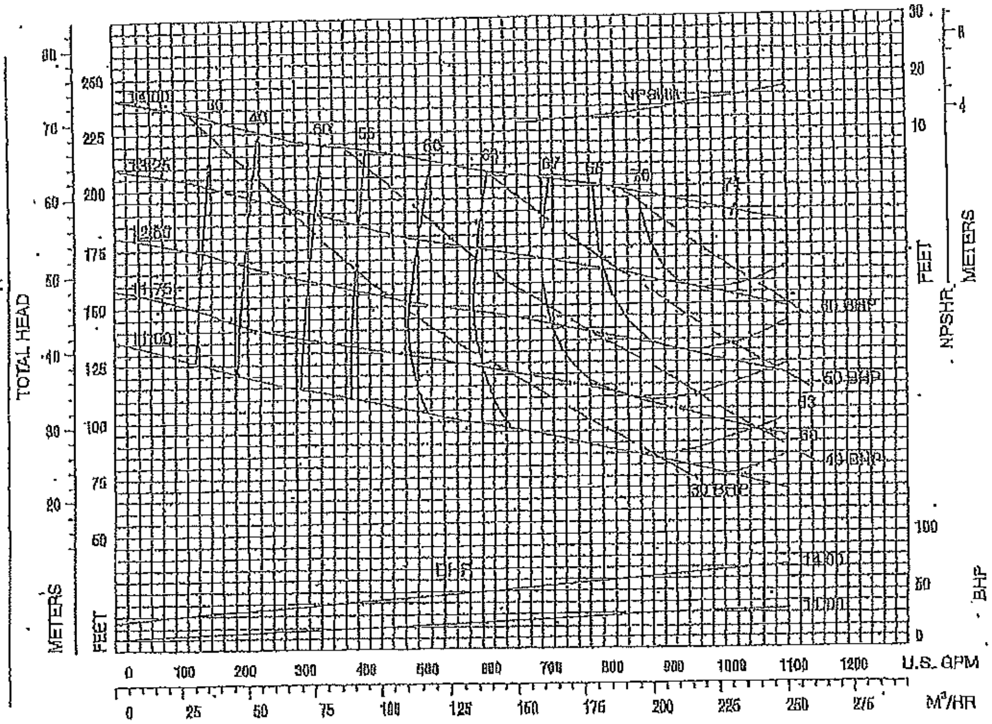
NO. OF VANES
2

SUCTION SIZE
4"

IMPELLER
T4E1E

INLET AREA
35.65 SQ.IN.

MAX. SPHERE
3"



5" 5436
MT, W, WD
SUBMERSIBLE

1780 RPM

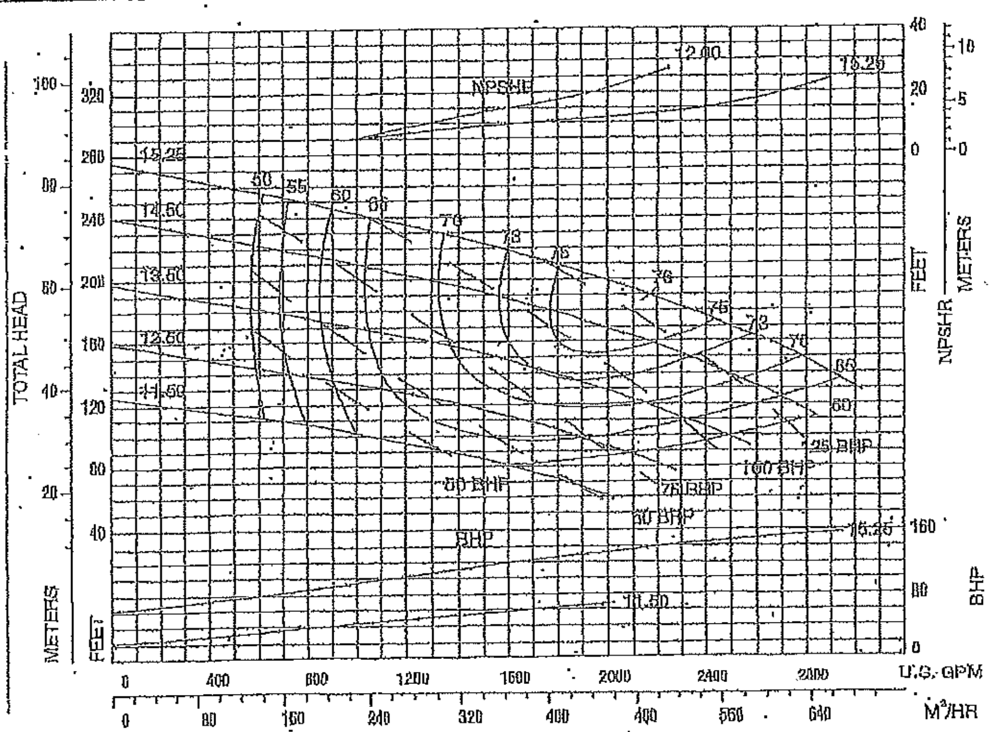
NO. OF VANES
2

SUCTION SIZE
6"
(WD: 8" OR 10")

IMPELLER
T5D1AS

INLET AREA
62.05 SQ.IN.

MAX. SPHERE
3"

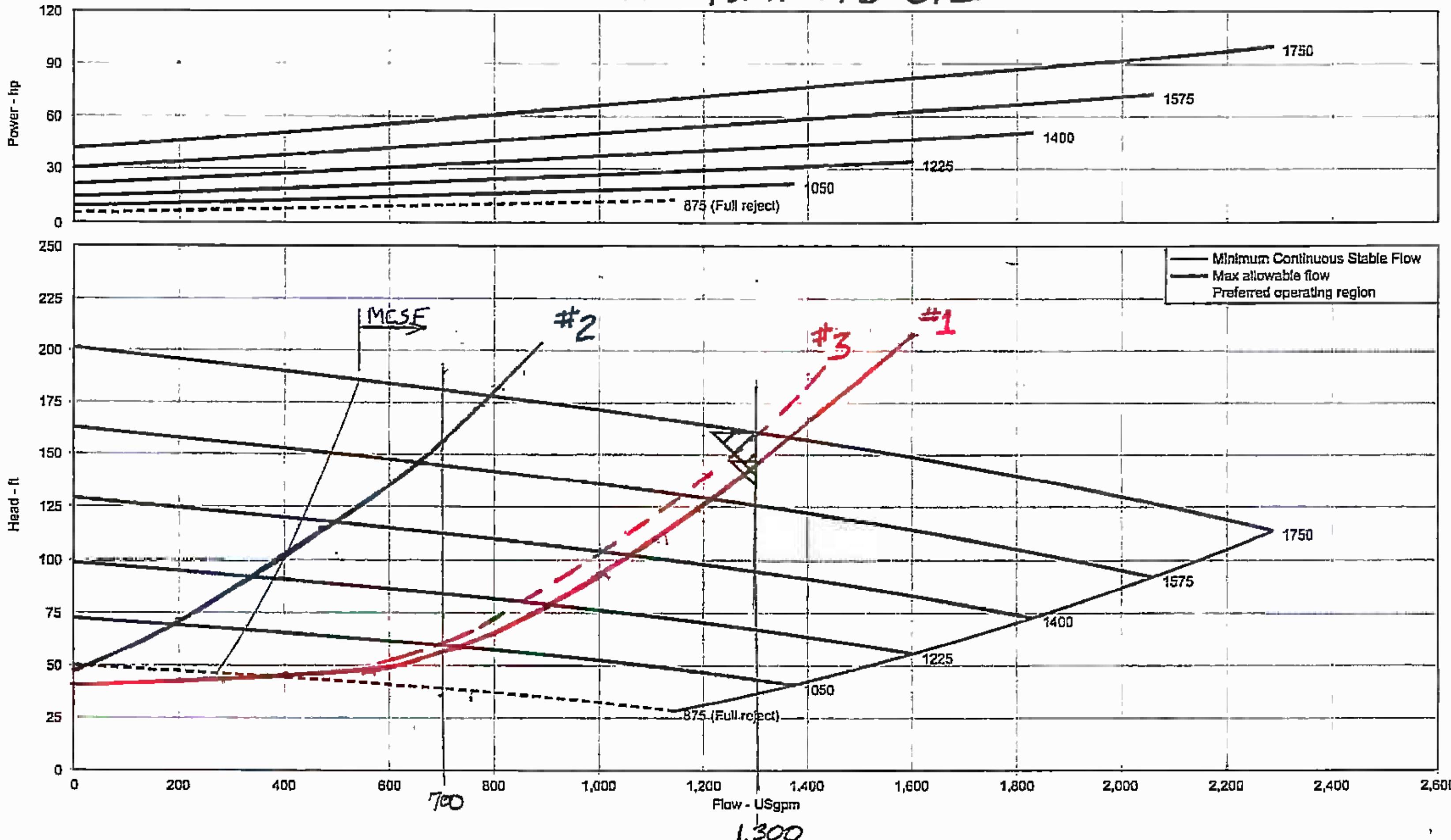


PENTAIR

Customer
Project name

ELLIS PUMP STATION
ANALYSIS OF PUMPING SCENARIOS
AND PUMP VFD SPEED

Multi-Speed Performance Curve
Encompass 2.0 - 15.5.1.0



Item number	: Default	Size	: 6" 6438 (W, MT, WD)	Flow, rated	: 1,300.0 USgpm
Service	:	Stages	: 1	Differential head / pressure, rated	: 161.0 ft
Quantity	: 1	Speed, rated	: 1750 rpm	NPSH required	: 20.08 ft
Quote number	:	Based on curve number	: 6-54x6-1800-T5D1AS	Fluid density, rated / max	: 1.000 / 1.000 SG
Date last saved	: 01 Dec 2015 11:46 AM	Efficiency	: 71.23 %	Viscosity	: 1.00 cP
		Power, rated	: 74.18 hp	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
				Impeller diameter, rated	: 13.54 INCH

PUMPING SCENARIOS:

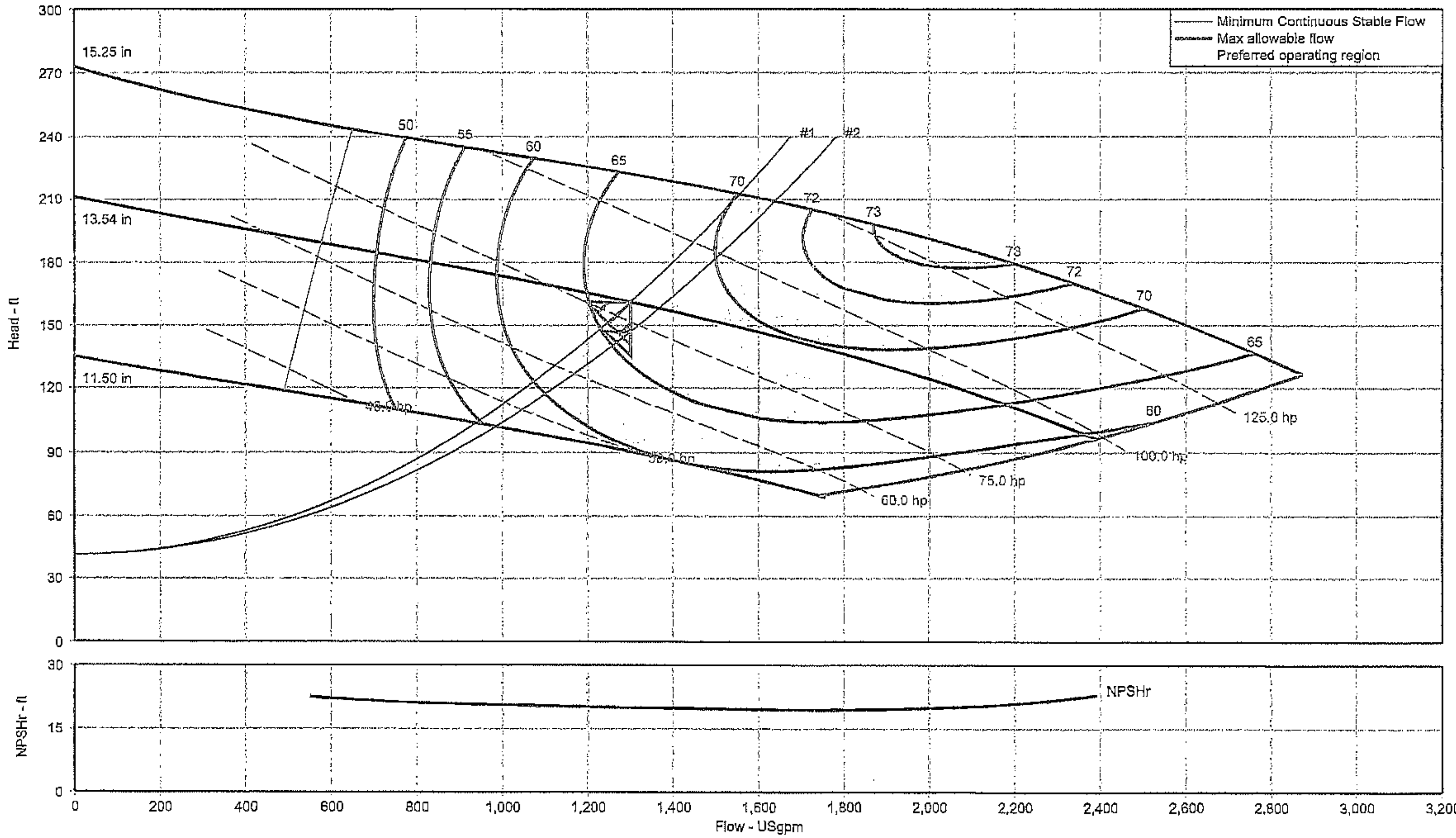
1. Ellis PS Pumping Independently: Design 700 gpm@ 52 ft TDH, Maximum 1,365 gpm @ 160 ft TDH
2. Ellis PS Pumping and sharing Force Main with Lister PS @ 625 gpm + Crum Creek PS @ 800 gpm: Design 700 gpm @ 158 ft TDH
3. Future Ellis PS Pumping + Crum Creek PS @ 800 gpm: 1,300 gpm @ 161 ft TDH

PENTAIR

Customer :
Project name :

Pump Performan urve

Encompass ... - 15.5.1.0



Item number	: Default	Size	: 5" 5436MV	Flow, rated	: 1,300.0 USgpm
Service	:	Stages	: 1	Differential head / pressure, rated	: 161.0 ft
Quantity	: 1	Speed, rated	: 1780 rpm	NPSH required	: 20.08 ft
Quote number	:	Based on curve number	: 5-5436MV-1800-T5D1AS	Fluid density, rated / max	: 1.000 / 1.000 SG
Date last saved	: 01 Dec 2015 12:50 PM	Efficiency	: 78.2 %	Viscosity	: 1.00 cP
		Power, rated	: 67.6	Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00

PENTAIR

FAIRBANKS NIJHUIS
3501 FAIRBANKS AVENUE · KANSAS CITY, KANSAS 66106
WWW.FAIRBANKSNIJHUIS.COM

PHONE: +1-913-371-5000 · FAX:

Appendix (D)

DELCORA/Edgmont Township
Tributary Municipality Report

Newtown Township, Delaware County, Municipal Authority
Tributary Municipality
Annual Report
2018

The Delaware County Regional Water Quality Control Authority

Edgmont Township

CRUM CREEK SEWER DISTRICT

TRIBUTARY MUNICIPALITY

"2018 Chapter 94 Report"

February 2019

Prepared by:

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TABLE OF CONTENTS

Attachments

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**DELCORA**	Permit No.:	**PA2314403,2314404,2314405**
Mailing Address:	**100 E. Fifth Street**	Effective Date:	**7-21-14**
City, State, Zip:	**Chester, PA 19016**	Expiration Date:	
Contact Person:	**Robert Willert**	Renewal Due Date:	
Title:	**Executive Director**	Municipality:	**Edgmont Township**
Phone:	**610.876.5523**	County:	**Delaware County**
Email:	**willertr@delcora.org**	Consultant Name:	**Bradford Engineering**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☒ Line graph for flows attached (**Attachment A**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☐ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Table 3 evaluates the projects in the Crum Creek System. See Attachment A

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☒ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment B**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Approximately 34,434 lf of sanitary sewer was televised in 2016. Approximatley 4,378 feet was cleaned. Manhole inserts with odor control were installed in three manholes.

The system is monitored by DELCORA's maintenance staff. A representative is onsite three times per week inspecting the pump stations. Additionally, an advance SCADA monitors pump station performance and operating conditions. This is essentially monitored by DELCORA 24-hrs a day as part of their overall system monitoring program. Attachement C are copies of the maintenance work on the system.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

The system is in good condition overall. There are no known surcharge conditions and most of the system is fairly new. There were a number of capped sewer installed throughout Edgmont Township over the past 30 plus years. These systems were installed in the Crum Creek District in accordance with Township Ordinances. The Crum Creek Sewer Project was completed in 2016. This project essentially connected all of the exsiting capped sewer and commuity sewer system as well as installed new sewer to provide public sewer to the entire District. See map in Attachement B for details.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☐ The collection system does not contain pump stations

☒ The collection system does contain pump stations (Number – **3**)

☒ Discussion of condition of each pump station attached (**Attachment D**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☐ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.

☐ This report demonstrates a projected hydraulic overload condition.

☐ This report demonstrates an existing organic overload condition.

☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Robert J. Willert	Robert J. Willert
Name of Responsible Official	Signature
610-876-5523	February 25, 2019
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Walter Fazler, PE	Walter Fazler
Name of Preparer	Signature
610.497.6200	February 25, 2019
Telephone No.	Date

Narrative Describing the Edgmont Crum Creek Sewer District

DELCORA is the owner and operator of the public sewer system in a section of Edgmont Township known as the Crum Creek Sewer District. The following is an excerpt from the latest revision to the Edgmont Township Act 537 Plan. This is a description of the current public sewer facilities in Edgmont Township.

Edgmont Township is a township of the second class located in the north central portion of Delaware County Pennsylvania. Total area is approximately 9.7 square miles. Its northern boundary is on the Delaware County-Chester County line where it lies adjacent to Westtown and Willistown Townships, Chester County. In Delaware County, it is bordered by Thornbury Township on the west, Middletown Township on the south, and Upper Providence Township on the southeast. On the east, the Township is bordered by Crum Creek, the Springton Reservoir, and Newtown Township.

The Crum Creek Sewer District was the focus of the 2010 Special Study. It is located in the northeast section of the Township. Broadly described, the District is bounded to the north by Chester County, to the east by Newtown Township, to the South by Upper Providence Township and to the west by the Ridley Creek State Park.

Previous Planning

An Act 537 Plan for the Crum Creek District was completed in 2007 (2007 Study) based on the potential for membership in the CDCA. The advantage of joining CDCA is the availability of a more extensive (350,000 gpd) disposal option that is cost effective, environmentally sound, and able to be implemented within a reasonable time frame to meet Edgmont's needs.

CDCA owns a conveyance system that discharges to the Delaware County Regional Water Quality Control Authority (DELCORA) system for final conveyance and treatment. DELCORA currently has the capacity available to meet Edgmont's needs and is willing to accept sewage flows from Edgmont Township. The plan outlined in the

2007 Study would provide for discharge to the CDCA facilities via the Newtown Township conveyance system.

2007 Study amends 2004 Plan:

1. Pursuant to the 2007 Study, Edgmont Township would enter an agreement with DELCORA to design, permit, finance, build, own, operate and maintain the proposed sewage facilities in the Crum Creek District and to accept, treat and dispose of the sewage from Edgmont Township. This is a change from the sewage treatment and land application contemplated under the 2004 (Aqua) Plan.
2. Edgmont Township would enter into an agreement with Newtown Township to accept and convey sewage to CDCA.
3. Edgmont Township would enter into an agreement with CDCA to accept and convey sewage to DELCORA.
4. Edgmont Township would adopt an ordinance establishing the Crum Creek Sewer District and require connection to the public sewer system.

Edgmont Township 2010 Special Study evaluates alternatives:

The current Special Study (2010 Study) is being undertaken to further develop and evaluate additional alternatives for both the collection system and conveyance methods to reach the CDCA system, as well as to provide for current sewage needs in the West Chester Pike corridor of Edgmont Township that exceed the Crum Creek District. The 2010 Study will look to identify cost effective options and alternatives that can be implemented in a time frame suitable to the needs of Edgmont Township. In addition to many internal service options, three major alternatives were reviewed for conveyance to the CDCA system. The conveyance options included pumping through Newtown Township in combination with Newtown flows, pumping through Newtown Township individually, and pumping through Upper Providence Township individually.

Alternatives Of Choice

The 2010 Special Study revises and updates the 2007 Plan and provides for the adoption of the following items:

Alternate 2. All of Service District C and District F (West Chester Pike corridor West) will be formally included in the Crum Creek District. Modifications to the CDCA service agreement will be required.

Conveyance of wastewater to the CDCA system will be implemented via adoption of **Alternates 1D and 1G.** These alternates provide for an internal collection system comprised of conventional gravity collection system, low-pressure system and pump station and force mains for Districts A-E. These districts will convey the flow to a regional pump station to be constructed by Edgmont on the West side of the Geist reservoir. The main pump station would discharge to the CDCA system via a route through Newtown Township along Gradyville Road.

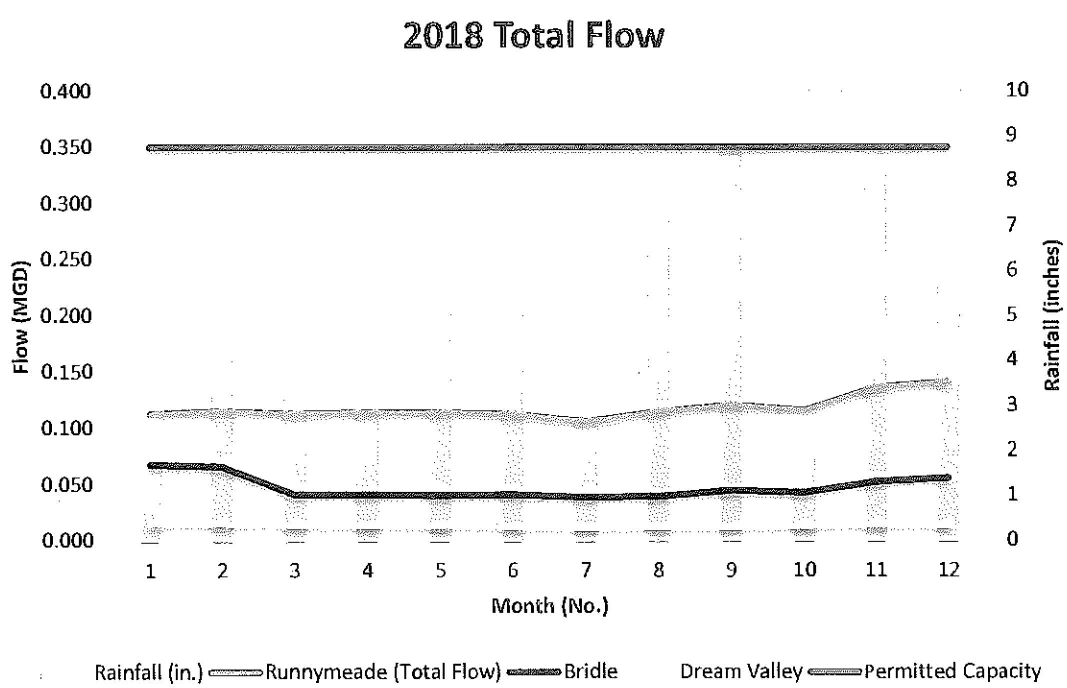
ATTACHMENT A

Current Hydraulic Loading

Table 1 indicates the current hydraulic loading in the system. A line graph depicting the monthly average monthly flows is shown in Chart 1. The monthly rainfall is also shown for reference. Rainfall was taken from the National Weather Service rain gauge at the Brandywine River. The permitted capacity of the Crum Creek System is 0.350 MGD:

TABLE 1
Pump Station Hydraulic Loading Average Daily Flow (MGD)

Pump Station	Bridle	Runnymeade	Dream Valley	Total Flow	Permitted Capacity	Rainfall (in.)
January	0.068	0.113	0.014	0.113	0.350	2.36
February	0.066	0.115	0.014	0.115	0.350	4.78
March	0.041	0.113	0.013	0.113	0.350	3.89
April	0.041	0.114	0.013	0.114	0.350	3.11
May	0.040	0.114	0.013	0.114	0.350	5.89
June	0.041	0.113	0.012	0.113	0.350	5.92
July	0.038	0.106	0.011	0.106	0.350	3.03
August	0.039	0.114	0.011	0.114	0.350	7.47
September	0.045	0.120	0.011	0.120	0.350	9.05
October	0.042	0.116	0.012	0.116	0.350	2.63
November	0.052	0.136	0.013	0.136	0.350	8.45
December	0.055	0.141	0.013	0.141	0.350	6.39
Average	0.047	0.118	0.013	0.118	0.350	5.248



5 Year Hydraulic Loading Projections

The following table was developed utilizing the Map in Attachment B of this report. The flow was calculated using an average daily flow of 262.5 gallons per day per EDU. It should be noted that the flow projects shown in Table 2A are not approved flow and are being used as an engineering tool to predict infrastructure capacity.

TABLE 2

Projects that have received Planning Approval

Subdivision Name	Connection Point	Number of EDUs	Number of EDU's Remaining	Estimated ADF Remaining (gpd) *
Crum Creek District A	Bridle PS	100.00	14.00	3,675.00
Crum Creek District B	Bridle PS	162.00	8.00	2,100.00
Crum Creek District C	Bridle PS	105.00	15.00	3,937.50
Crum Creek District C1	Bridle PS	15.00	-	-
Crum Creek District D	Bridle PS	65.00	9.00	2,362.50
Crum Creek District E	Bridle/Runnymeade PS	919.00	97.00	25,462.50
Crum Creek District F	Bridle PS	171.00	171.00	44,887.50
				-
				-
Total		**1537.00**	**314.00**	**82,425.00**

*Based on 262.5 gpd/EDU

TABLE 2A

Projects that may require public sewer

Subdivision Name	Connection Point	Number of EDUs	Number of EDU's Remaining	Estimated ADF Remaining (gpd) *
Runnymeade Phase 7	Runnymeade	249	249	65,362.50
				-
				-
				-
				-
				-
Total		**249**	**249**	**65,363**

*Based on 262.5 gpd/EDU

Note: EDU Projections are for planning purposes. Assignment of EDUs does not guarantee capacity or assignment of capacity to the parcel or project listed.

Adjusted Annual Average Flow

Tables 3 was developed using the PaDEP example for calculating the five-year adjusted annual average flow. Flow projections are a best guess number and largely depend on regional economic conditions.

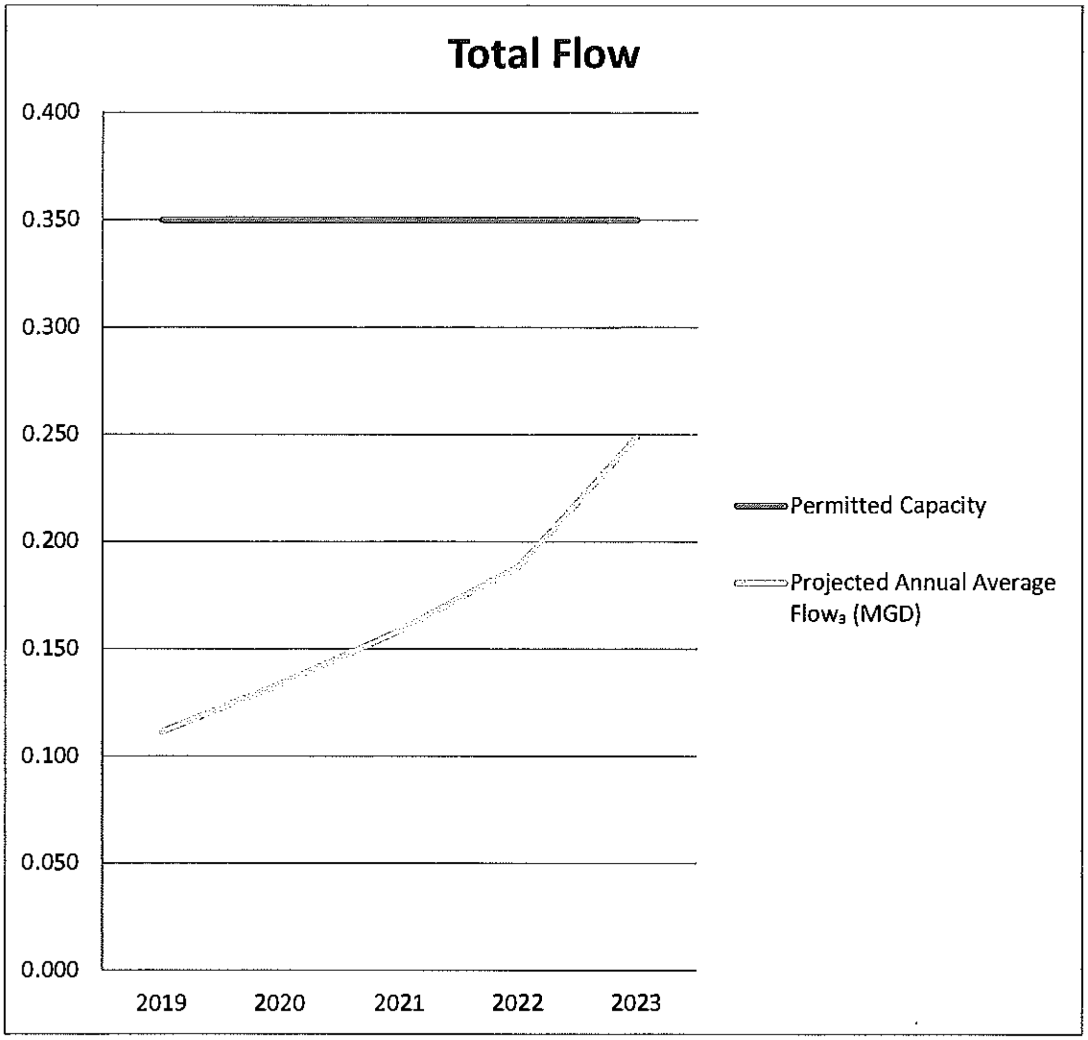
TABLE 3							
Calculation of Adjusted Annual Average Flow							
Year	AA Flow in MGD		All EDUs connected				Adjusted AA Flow
		2014	2015	2016	2017	2018	
2014	0.000		0.000	0.098	0.006	0.001	0.105
2015	0.000			0.098	0.006	0.001	0.105
2016	0.098				0.006	0.001	0.105
2017	0.108					0.001	0.109
2018	0.118						0.118
5 Year Average	0.065					5 Year Average	0.108

Annual Average Flow Projection for the Next 5 Years

The following Table 4 and Chart were developed using the PaDEP example for calculating the five-year adjusted annual average flow. Flow projections are a best guess number and largely depend on regional economic conditions.

TABLE 4					
Adjusted Projections					
Year	Previous Year's Annual Average Flow₁	New EDUs	Increased Flow₂ (MGD)	Projected Annual Average Flow₃ (MGD)	Permitted Capacity
2019	0.108	11	0.003	0.111	0.350
2020	0.111	85	0.022	0.134	0.350
2021	0.134	95	0.025	0.158	0.350
2022	0.158	113	0.030	0.188	0.350
2023	0.188	231	0.061	0.249	0.350

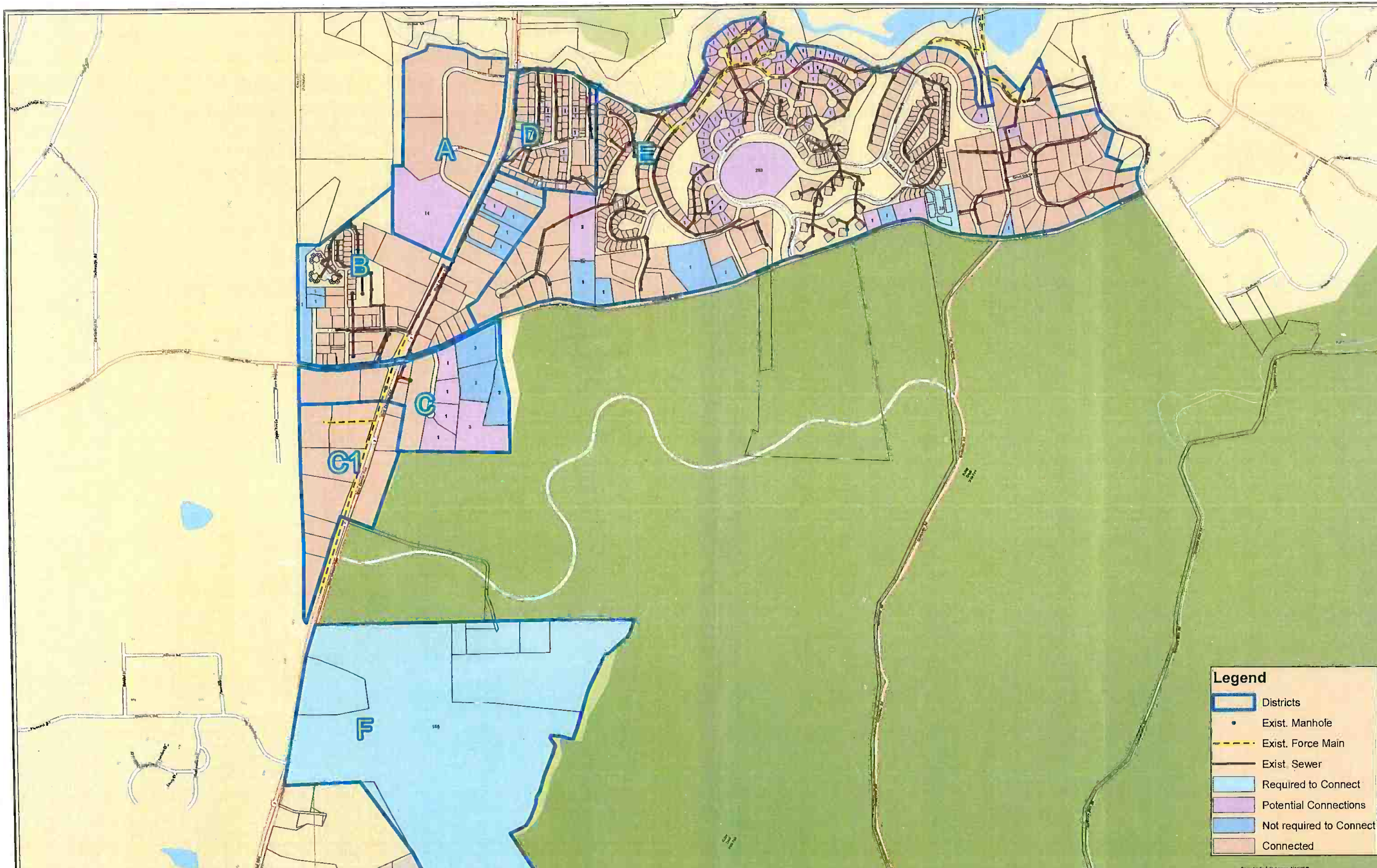
Notes
1. The 2019 projection starts with the 5-year adjusted annual average as calculated in Table 3
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average Flow + Increased Flow
4. Projections include all contemplated projects from Table 2A



Total Flow
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
2019
2020
2021
2022
2023
Permitted Capacity
Projected Annual Average Flow3 (MGD)

ATTACHMENT B

MAP OF THE SEWER SYSTEM



DELCORA
100 E. Fifth Street
Chester, PA 19016
(610) 876-5523

Crum Creek Sewer District
2018 Chapter 94 Report
February 2019

Bradford Engineering Associates, Inc.
2710 Concord Road, Suite 3
Aston, Pa 19014
(610) 497-6200

ATTACHMENT C

MAINTENANCE RECORDS

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

This spreadsheet is protected, thus entry is only allowed in the drop-down boxes & bright green cells.
To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 — Serial #: C155000731 — Tag #: Bridle Way Pump Station

Flow Tube Model #: Enviromag 2000 F — Commission #: — Tested by: William Doleski

	DATA INPUT AREAS (in green)	
INPUT VARIABLES		
Converter	=	IFC 300(GK)
Q Fullscale	=	1000 USGal/min
Select Meter Dia.	=	Inch mm / 6 150
DN	=	150 mm
Diameter	=	6.0 inch (ref only)
$I_{0\%}$	=	4 mA
$I_{100\%}$	=	20 mA
$P_{100\% (Hz)}$	=	1000 Hz
GK	=	3.2181 <use GK
GKL	=	<do not use
K	=	Value automatically chosen from K value table

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{72407.25} = 3.640$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current: I = 12.792 mA

Output Frequency: Freq $_{MAX}$ = 549.484 Hz

Calibrated Flowrate: Q = 549.484 USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	6.20	137.37	137.37	137.500	0.09%
B	8.40	274.74	274.74	275.000	0.09%
C	12.79	549.48	549.48	549.700	0.04%
D					
E					

Version: Rev 1.3.2-USA

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.02.23 14:31:59 -05'00'
Reason: I have reviewed this document

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

This spreadsheet is protected, thus entry is only allowed in the drop-down boxes & bright green cells.
To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 **Serial #:** C155000731 **Tag #:** Bridle Way Pump Station

Flow Tube Model #: Enviromag 2000 F **Commission #:** **Tested by:** W Doleski J Mullins

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1000	USGal/min
Select Meter Dia.	=	Inch mm 6 150	
DN	=	150	mm
Diameter	=	6.0	inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	3.2181	<use GK
GKL	=		<do not use>
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{72407.25} = 3.640$$

$Y_{MAX} =$ 2.0

Max Knob Setting: C

Output Current	I	=	12.792	mA
Output Frequency	Freq $_{MAX}$	=	549.484	Hz
Calibrated Flowrate	Q	=	549.484	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	6.20	137.37	137.37	138.400	0.75%
B	8.40	274.74	274.74	276.000	0.46%
C	12.79	549.48	549.48	549.000	-0.09%
D					
E					

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.07.03 13:10:35 -05'00'
Reason: I have reviewed this document

Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Bridle Way Flowmeter

Instrument Data		Test Results		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Bridle Way Flowmeter	Next Due:	03/07/19	
Manufacturer:	Krohne		**As Found**	**As Left**
Model Number:	IFC 300			
Serial Number:	C15500731	Zero Error	-0.0062%	-0.0062%
Calibrated Range:	0-1000 GPM	Span Error	-0.0062%	-0.0062%
Description:	Bridle Way Flowmeter	Max. Error	0.0447%	0.0447%
Instrument Accuracy:	1.5000%	Min. Error	-0.0062%	-0.0062%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1000.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9990	-0.0062%
13.7370%	137.3700	137.6000	6.1970	6.1970	0.0230%
27.4740%	274.7400	275.0000	8.3950	8.3980	0.0447%
54.9480%	549.4800	549.5000	12.7910	12.7950	0.0270%

As Left Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9990	-0.0062%
13.7300%	137.3700	137.6000	6.1970	6.1970	0.0230%
27.4740%	274.7400	275.0000	8.3950	8.3980	0.0447%
54.9480%	549.4800	549.5000	12.7910	12.7950	0.0270%

Tag Notes

Shutdown:

FT = 0.0 GPM
mA = 3.999
LOI = 0.0 GPM
GK 3.2181

Meter and SCADA scaling do not match.

William Doleski

Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 11:18:26 -05'00'
Reason: I have reviewed this document

Technician Certification: ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Bridle Way Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	09/21/18	
Instrument Tag:	Bridle Way Flowmeter	Next Due:	12/21/18	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500731	Zero Error	0.0000%	0.0000%
Calibrated Range:	0-1000 GPM	Span Error	0.0000%	0.0000%
Description:	Bridle Way Flowmeter	Max. Error	4.5270%	0.0542%
Instrument Accuracy:	1.5000%	Min. Error	0.0000%	-0.0050%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1000.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
13.7370%	137.3700	137.6000	6.1970	6.2020	0.0542%
27.4740%	274.7400	274.8000	8.3950	8.4000	0.0373%
54.9480%	549.4800	594.5000	12.7910	12.7950	4.5270%

As Left Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
13.7300%	137.3700	137.6000	6.1970	6.2020	0.0542%
27.4740%	274.7400	274.8000	8.3950	8.4000	0.0373%
54.9480%	594.8000	594.5000	12.7910	12.7950	-0.0050%

Tag Notes

Shutdown:

FT = 0.0 GPM
mA = 3.999
LOI = 0.0 GPM
GK 3.2181

William Doleski Digitally signed by: William Doleski DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division Date: 2018.10.08 13:01:28 -05'00' Reason: I have reviewed this document

Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

KROHNE

GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

This spreadsheet is protected, thus entry is only allowed in the drop-down boxes & bright green cells.
To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
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Date Recorded: 2/23/18 | Serial #: C15500730 | Tag #: Dream Valley Pump Station

Flow Tube Model #: Enviromag 2000 F | Commission #: | Tested by: William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	750	USGal/min
Select Meter Dia.	=	Inch mm	
		4 100	
DN	=	100	mm
Diameter	=	4.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	2.7266	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{197659.7768}{27266} = 7.249$$

$Y_{MAX} =$ 5.0

Max Knob Setting: D

Output Current	I	=	15.036	mA
Output Frequency	Freq $_{MAX}$	=	689.720	Hz
Calibrated Flowrate	Q	=	517.290	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	5.10	68.97	51.73	52.000	0.52%
B	6.21	137.94	103.46	104.000	0.52%
C	8.41	275.89	206.92	207.110	0.09%
D	15.04	689.72	517.29		
E					

Version: Rev 1.3.2-USA

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.02.28 09:59:55 -05'00'
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GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 Serial #: C15500730 Tag #: Dream Valley Pump Station
Flow Tube Model #: Enviromag 2000 F Commission #: Tested by: W Doleski/J Mullins

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	750	USGal/min
Select Meter Dia.	=	Inch mm	
		4 100	
DN	=	100	mm
Diameter	=	4.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\%\,(Hz)}$	=	1000	Hz
GK	=	2.7266	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{197659.7768}{27266} = \boxed{7.249}$$

$Y_{MAX} =$ 5.0

Max Knob Setting: D

Output Current	I	=	15.036	mA
Output Frequency	Freq $_{MAX}$	=	689.720	Hz
Calibrated Flowrate	Q	=	517.290	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	5.10	68.97	51.73	52.000	0.52%
B	6.21	137.94	103.46	104.000	0.52%
C	8.41	275.89	206.92	207.110	0.09%
D	15.04	689.72	517.29	517.300	0.00%
E					

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bd[illegible] com C = US O = Smith Instrument Company INC, OU = Service Division
Date: 2018.07.03 13:36:11 -05'00'
Reason: I have reviewed this document

Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Dream Valley Flowmeter

Instrument Data		Test Results		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Dream Valley Flowmeter	Next Due:	03/07/19	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500730	Zero Error	-0.0188%	-0.0188%
Calibrated Range:	0-750 GPM	Span Error	-0.0197%	-0.0197%
Description:	Dream Valley Flowmeter	Max. Error	0.0346%	0.0346%
Instrument Accuracy:	1.5000%	Min. Error	-0.0188%	-0.0188%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	750.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	0.0000	0.0000	4.0000	3.9970	-0.0188%
6.8970%	51.7275	51.9400	5.1030	5.1040	0.0346%
13.7900%	103.4250	103.6600	6.2060	6.2060	0.0313%
27.5890%	206.9175	207.1300	8.4140	8.4130	0.0221%
68.9720%	517.2900	517.3300	15.0350	15.0340	-0.0009%

As Left Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	0.0000	0.0000	4.0000	3.9970	-0.0188%
6.8970%	51.7275	51.9400	5.1030	5.1040	0.0346%
13.7900%	103.4250	103.6600	6.2060	6.2060	0.0313%
27.5890%	206.9175	207.1300	8.4140	8.4130	0.0221%
69.9720%	517.2900	517.3300	15.0350	15.0340	-0.0009%

Tag Notes

GK 2.7266

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 09:28:52 -05'00'
Reason: I have reviewed this document

Technician Certification: ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Dream Valley Flowmeter

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	09/21/18	
Instrument Tag:	Dream Valley Flowmeter	Next Due:	12/21/18	
Manufacturer:	Krohne			
Model Number:	IFC 300		**As Found**	**As Left**
Serial Number:	C15500730	Zero Error	0.0000%	0.0000%
Calibrated Range:	0-750 GPM	Span Error	0.0576%	0.0576%
Description:	Dream Valley Flowmeter	Max. Error	0.0893%	0.0893%
Instrument Accuracy:	1.5000%	Min. Error	0.0000%	0.0000%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	750.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
6.8970%	51.7275	51.9600	5.1030	5.1110	0.0810%
13.7900%	103.4250	103.7200	6.2060	6.2140	0.0893%
27.5890%	206.9175	207.1000	8.4140	8.4220	0.0743%
68.9720%	517.2900	517.3000	15.0350	15.0440	0.0576%

As Left Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	4.0000	0.0000%
6.8970%	51.7275	51.9600	5.1030	5.1110	0.0810%
13.7900%	103.4250	103.7200	6.2060	6.2140	0.0893%
27.5890%	206.9175	207.1000	8.4140	8.4220	0.0743%
69.9720%	517.2900	517.3000	15.0350	15.0440	0.0576%

Tag Notes

GK 2.7266

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.10.08 13:07:51 -05'00'
Reason: I have reviewed this document

Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymede Flowmeter

Instrument Data

Customer Name:	Delcora
Instrument Tag:	Runnymede Flowmeter
Manufacturer:	Krohne
Model Number:	IFC 300
Serial Number:	C15501259
Calibrated Range:	0-1500 GPM
Description:	Runnymede Flowmeter
Instrument Accuracy:	1.5000%

Test Results

Cal. Date:	12/07/18	
Next Due:	03/07/19	
	As Found	**As Left**
Zero Error	-0.0250%	-0.0250%
Span Error	-0.0250%	-0.0250%
Max. Error	0.0514%	0.0514%
Min. Error	-0.0552%	-0.0552%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1500.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9960	-0.0250%
20.4200%	306.3100	306.8000		7.2670	7.2700	0.0514%
40.8400%	612.6300	612.8000		10.5340	10.5310	-0.0074%
81.6800%	1225.2600	1224.9000		17.0660	17.0610	-0.0552%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000		4.0000	3.9960	-0.0250%
20.4200%	306.3100	306.8000		7.2670	7.2700	0.0514%
40.8400%	612.6300	612.8000		10.5340	10.5310	-0.0074%
81.6800%	1225.2600	1224.9000		17.0660	17.0610	-0.0552%

Tag Notes

GK 2.486

Shutdown:
Recorder = 3.9 GPM
mA = 3.997
FT = 0.0
LOI = 0.0

William Doleski
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DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 10:27:35 -05'00'
Reason: I have reviewed this document

Technician Signature

Technician Certification ISA Level III

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ISA Certified Control Systems Technician

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymede Flowmeter

Instrument Data

Customer Name:	Delcora
Instrument Tag:	Runnymede Flowmeter
Manufacturer:	Krohne
Model Number:	IFC 300
Serial Number:	C15501259
Calibrated Range:	0-1500 GPM
Description:	Runnymede Flowmeter
Instrument Accuracy:	1.5000%

Test Results

Cal. Date:	09/21/18	
Next Due:	12/21/18	
	As Found	**As Left**
Zero Error	-0.0125%	-0.0125%
Span Error	-0.0125%	-0.0125%
Max. Error	0.1147%	0.1147%
Min. Error	-0.0882%	-0.0882%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	0.0000	1500.0000	GPM	Krohne GS8B	U1127700018808
Output Value	4.0000	20.0000	mA	Martel MC1200	9474060

As Found Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9980	-0.0125%
20.4200%	306.3100	307.0000	7.2670	7.2780	0.1147%
40.8400%	612.6300	612.1900	10.5340	10.5310	-0.0481%
81.6800%	1225.2600	1224.5000	17.0660	17.0600	-0.0882%

As Left Data

Input			Output		
% Value	**Calculated**	**Actual**	**Calculated**	**Actual**	**% Error**
0%	0.0000	0.0000	4.0000	3.9980	-0.0125%
20.4200%	306.3100	307.0000	7.2670	7.2780	0.1147%
40.8400%	612.6300	612.1900	10.5340	10.5310	-0.0481%
81.6800%	1225.2600	1224.5000	17.0660	17.0600	-0.0882%

Tag Notes

GK 2.486

Shutdown:
Recorder = 2.25 GPM
mA = 3.998
FT = 0.0
LOI = 0.0

William Doleski

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Reason: I have reviewed this document

Technician Certification ISA Level III

Technician Signature

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GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 2/23/18 | Serial #: C15501259 | Tag #: Runnymead Pump Station

Flow Tube Model #: Enviromag 2000 F | Commission #: | Tested by: William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1000	USGal/min
Select Meter Dia.	=	Inch 8	mm 200
DN	=	200	mm
Diameter	=	8.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	4.0364	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{263546.369}{161456} = 1.632$$

$Y_{MAX} =$ 1.0

Max Knob Setting: B

Output Current	I	=	13.802	mA
Output Frequency	Freq $_{MAX}$	=	612.628	Hz
Calibrated Flowrate	Q	=	612.628	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	8.90	306.31	306.31	307.000	0.22%
B	13.80	612.63	612.63	613.300	0.11%
C				1225.400	
D					
E					

Version: Rev 1.3.2-USA

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.02.23 14:34:50 -05'00'
Reason: I have reviewed this document

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GS 8 B On-Site Verification Record

GS 8 B STANDARD SETTINGS

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To use this calculator, you will only need to input the requested information in the bright green cells from your data tags.
The Converter type, engineering units, diameter and frequency have drop down boxes, allowing the user to simply choose from the list.
This spreadsheet will automatically choose Inch or metric (depending upon the converter), and state which GK(L) to use.
Printing of the programming results is allowed by simply choosing "Print" through your File menu.

Important: If there is a flowrate value present at the zero setting, you must compensate to obtain proper evaluation values.
You can zero your converter, but this might mean that you would have to redo a zero calibration once you reconnect with your primary head.
If you are unable to redo a zero calibration after reconnecting, then you should use the offset-compensated tables on the second sheet of this spreadsheet (Calculator + Zero Compensation).

Date Recorded: 6/19/18 Serial #: C15501259 Tag #: Runnymead Pump Station

Flow Tube Model #: Enviromag 2000 F Commission #: Tested by: William Doleski

		DATA INPUT AREAS (in green)	
INPUT VARIABLES			
Converter	=	IFC 300(GK)	
Q Fullscale	=	1500	USGal/min
Select Meter Dia.	=	Inch	mm
		8	200
DN	=	200	mm
Diameter	=	8.0	Inch (ref only)
$I_{0\%}$	=	4	mA
$I_{100\%}$	=	20	mA
$P_{100\% (Hz)}$	=	1000	Hz
GK	=	4.0364	<use GK
GKL	=		<do not use
K	=	Value automatically chosen from K value table	

$$X = \frac{Q_{100\%} * K * F}{GK(L) * DN^2} = \frac{395319.5535}{161456} = \boxed{2.448}$$

Y_{MAX} = 2.0

Max Knob Setting: C

Output Current	I	=	17.069	mA
Output Frequency	Freq $_{MAX}$	=	816.838	Hz
Calibrated Flowrate	Q	=	1225.257	USGal/min

GS 8 B Knob Setting	Current Output (mA)	Frequency Output (Hz)	Calculated Flowrate (USGal/min)	Observed Flowrate (USGal/min)	Deviation
0	4.00	0.00	0.00	0.000	
A	7.27	204.21	306.31	307.000	0.22%
B	10.53	408.42	612.63	613.000	0.06%
C	17.07	816.84	1225.26	1225.000	-0.02%
D					
E					

William Doleski Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.07.05 14:15:39 -05'00'
Reason: I have reviewed this document

Version: Rev 1.3.2-USA

Calibration Report

Smith Instrument Co.

ICEA

Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		Test Results		
Customer Name:	Delcora	Cal. Date:	12/07/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	03/07/19	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.2833%	0.2833%
Calibrated Range:	4-20 Ma	Span Error	0.3700%	0.3700%
Description:	Runnymead PS Flow Recorder	Max. Error	0.2833%	0.2833%
Instrument Accuracy:	0.5000%	Min. Error	0.0867%	0.0867%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

As Found Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	4.2500	0.2833%
25%	8.0000	8.0000	375.0000	378.4700	0.2313%
50%	12.0000	12.0000	750.0000	753.2100	0.2140%
75%	16.0000	16.0000	1125.0000	1127.4300	0.1620%
100%	20.0000	20.0000	1500.0000	1501.3000	0.0867%

As Left Data

Input			Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	4.2500	0.2833%
25%	8.0000	8.0000	375.0000	378.4700	0.2313%
50%	12.0000	12.0000	750.0000	753.2100	0.2140%
75%	16.0000	16.0000	1125.0000	1127.4300	0.1620%
100%	20.0000	20.0000	1500.0000	1501.3000	0.0867%

Tag Notes

William Doleski

Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2019.01.04 10:30:09 -05'00'
Reason: I have reviewed this document

Technician Signature

Technician Certification: ISA Level III

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		Test Results		
Customer Name:	Delcora	Cal. Date:	02/23/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	06/23/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.0747%	0.0747%
Calibrated Range:	4-20 Ma	Span Error	-0.7360%	-0.7360%
Description:	Runnymead PS Flow Recorder	Max. Error	0.0747%	0.0747%
Instrument Accuracy:	0.5000%	Min. Error	-0.8107%	-0.8107%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

As Found Data

	Input		Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	1.1200	0.0747%
25%	8.0000	8.0000	375.0000	372.4800	-0.1680%
50%	12.0000	12.0000	750.0000	744.2400	-0.3840%
75%	16.0000	16.0000	1125.0000	1115.8000	-0.6133%
100%	20.0000	20.0000	1500.0000	1487.8400	-0.8107%

As Left Data

	Input		Output		
% Value	Calculated	Actual	Calculated	Actual	% Error
0%	4.0000	4.0000	0.0000	1.1200	0.0747%
25%	8.0000	8.0000	375.0000	372.4800	-0.1680%
50%	12.0000	12.0000	750.0000	744.2400	-0.3840%
75%	16.0000	16.0000	1125.0000	1115.8000	-0.6133%
100%	20.0000	20.0000	1500.0000	1487.8400	-0.8107%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.999
Recorder = 1.12 GPM

Technician Certification: ISA Level III

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.02.26 10:13:00 -05'00'
Reason: I have reviewed this document

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting
and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		**Test Results**		
Customer Name:	Delcora	Cal. Date:	06/19/18	
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	09/19/18	
Manufacturer:	Honeywell			
Model Number:	TMV16R-40		**As Found**	**As Left**
Serial Number:	15W37C000000983463	Zero Error	0.0173%	0.0173%
Calibrated Range:	4-20 Ma	Span Error	-0.9160%	-0.9160%
Description:	Runnymead PS Flow Recorder	Max. Error	0.0173%	0.0173%
Instrument Accuracy:	0.5000%	Min. Error	-0.9333%	-0.9333%

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input			As Found Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	0.2600	0.0173%
25%	8.0000	8.0000		375.0000	371.7000	-0.2200%
50%	12.0000	12.0000		750.0000	744.0000	-0.4000%
75%	16.0000	16.0000		1125.0000	1115.0000	-0.6667%
100%	20.0000	20.0000		1500.0000	1486.0000	-0.9333%

Input			As Left Data	Output		
% Value	**Calculated**	**Actual**		**Calculated**	**Actual**	**% Error**
0%	4.0000	4.0000		0.0000	0.2600	0.0173%
25%	8.0000	8.0000		375.0000	371.7000	-0.2200%
50%	12.0000	12.0000		750.0000	744.0000	-0.4000%
75%	16.0000	16.0000		1125.0000	1115.0000	-0.6667%
100%	20.0000	20.0000		1500.0000	1486.0000	-0.9333%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.997
Recorder = 0.26 GPM

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.07.05 14:18:39 -05'00'
Reason: I have reviewed this document

Technician Certification: ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

Calibration Report

Smith Instrument Co.

ICEA
Instrument Contracting and Engineering Association

Smith Instrument Company, Inc.
P.O. Box 404
Downingtown, PA 19335
Phone: 610-594-6650
Fax: 610-594-6658
e-mail:bdoleski@smithservice.com

Runnymead PS Flow Recorder

Instrument Data		**Test Results**			
Customer Name:	Delcora	Cal. Date:	09/21/18		
Instrument Tag:	Runnymead PS Flow Recorder	Next Due:	12/21/18		
Manufacturer:	Honeywell				
Model Number:	TMV16R-40		**As Found**	**As Left**	
Serial Number:	15W37C000000983463	Zero Error	0.1500%	0.1500%	
Calibrated Range:	4-20 Ma	Span Error	-0.2093%	-0.2093%	
Description:	Runnymead PS Flow Recorder	Max. Error	0.1500%	0.1500%	
Instrument Accuracy:	0.5000%	Min. Error	-0.3593%	-0.3593%	

Calibration Data

	Low	High	Unit	Calibrator	Serial #
Input Value	4.0000	20.0000	mA	Martel MC1200	9474060
Output Value	0.0000	1500.0000	GPM	Visual from LOI	

Input			As Found Data	Output		
% Value	Calculated	Actual		Calculated	Actual	% Error
0%	4.0000	4.0000		0.0000	2.2500	0.1500%
25%	8.0000	8.0000		375.0000	375.4300	0.0287%
50%	12.0000	12.0000		750.0000	749.0400	-0.0640%
75%	16.0000	16.0000		1125.0000	1121.7800	-0.2147%
100%	20.0000	20.0000		1500.0000	1494.6100	-0.3593%

Input			As Left Data	Output		
% Value	Calculated	Actual		Calculated	Actual	% Error
0%	4.0000	4.0000		0.0000	2.2500	0.1500%
25%	8.0000	8.0000		375.0000	375.4300	0.0287%
50%	12.0000	12.0000		750.0000	749.0400	-0.0640%
75%	16.0000	16.0000		1125.0000	1121.7800	-0.2147%
100%	20.0000	20.0000		1500.0000	1494.6100	-0.3593%

Tag Notes

SCADA:

Shutdown
FT = 0.0 MGD
LOI = 0
mA = 3.998
Recorder = 2.25 GPM

William Doleski
Digitally signed by: William Doleski
DN: CN = William Doleski email = bdoleski@smithservice.com C = US O = Smith Instrument Company INC. OU = Service Division
Date: 2018.10.08 11:24:14 -05'00'
Reason: I have reviewed this document

Technician Certification ISA Level III

Technician Signature

Calibrations performed utilizing N.I.S.T. Traceable Standards. Certifications available upon request.

ATTACHMENT D

Sewage Pumping Stations

ATTACHMENT D

Sewage Pumping Stations

The following is a discussion of the Crum Creek Sewer District's 3 pump stations. The tables below are based on discharge meter readings for each. This method does not permit the determination of actual peak flows received by the stations. The tables indicate an estimated peak flow based on the WQM Permits.

Even with the WQM peaking factors, a level considered conservatively safe when reviewing station capacity, the reserve capacity is felt to be adequate for even the most severe wet weather conditions.

The tables also list the five-year estimated growth for each station based on the areas listed in Table 2.

The system is monitored by DELCORA's maintenance staff. A representative is onsite three times per week inspecting the pump stations. Additionally, an advance SCADA monitors pump station performance and operating conditions. This is essentially monitored by DELCORA 24-hrs a day as part of their overall system monitoring program.

Tables 5A, 5B and 5C are summary of the Pump Station Hydraulic Conditions along with the 5-year projections. Following the summaries are the monthly pump station flow data.

TABLE 5A					
Adjusted Projections Bridle Pump Station					
Year	**Previous Year's Annual Average Flow (MGD)[1]**	**New EDUs**	**Increased Flow[2] (MGD)**	**Projected Peak Flow (3.5 Peak factor) (MGD)**	**Max Single Pump Rate (MGD)**
2019	0.055	9	0.002	0.202	0.792
2020	0.058	18	0.005	0.218	0.792
2021	0.062	28	0.007	0.244	0.792
2022	0.070	27	0.007	0.269	0.792
2023	0.077	160	0.042	0.416	0.792

Notes
1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average
4. Projections include all contemplated projects from Table 2A

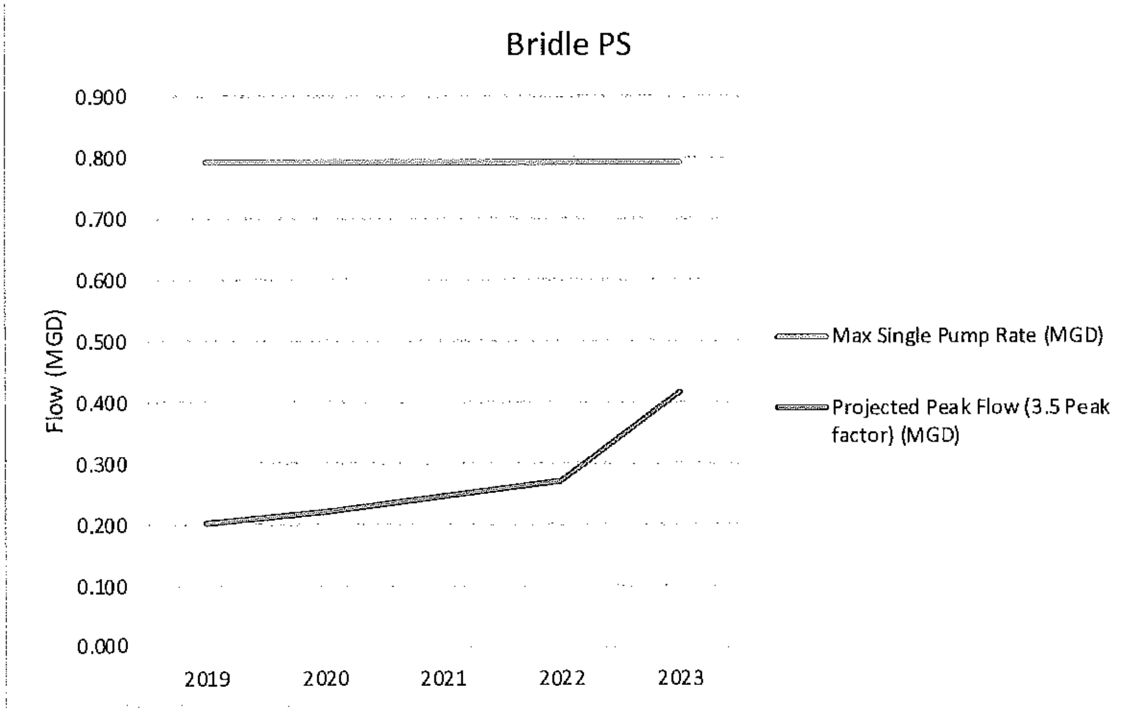


TABLE 5B					
Adjusted Projections Runnymeade Pump Station					
Year	**Previous Year's Annual Average Flow (MGD)[1]**	**New EDUs**	**Increased Flow[2] (MGD)**	**Projected Peak Flow (3.5 Peak factor) (MGD)**	**Max Single Pump Rate (MGD)**
2019	0.141	11	0.003	0.503	1.224
2019	0.144	85	0.022	0.581	1.224
2020	0.166	109	0.029	0.681	1.224
2021	0.195	120	0.032	0.791	1.224
2022	0.226	238	0.062	1.010	1.224

Notes

1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average
4. Projections include all contemplated projects from Table 2A

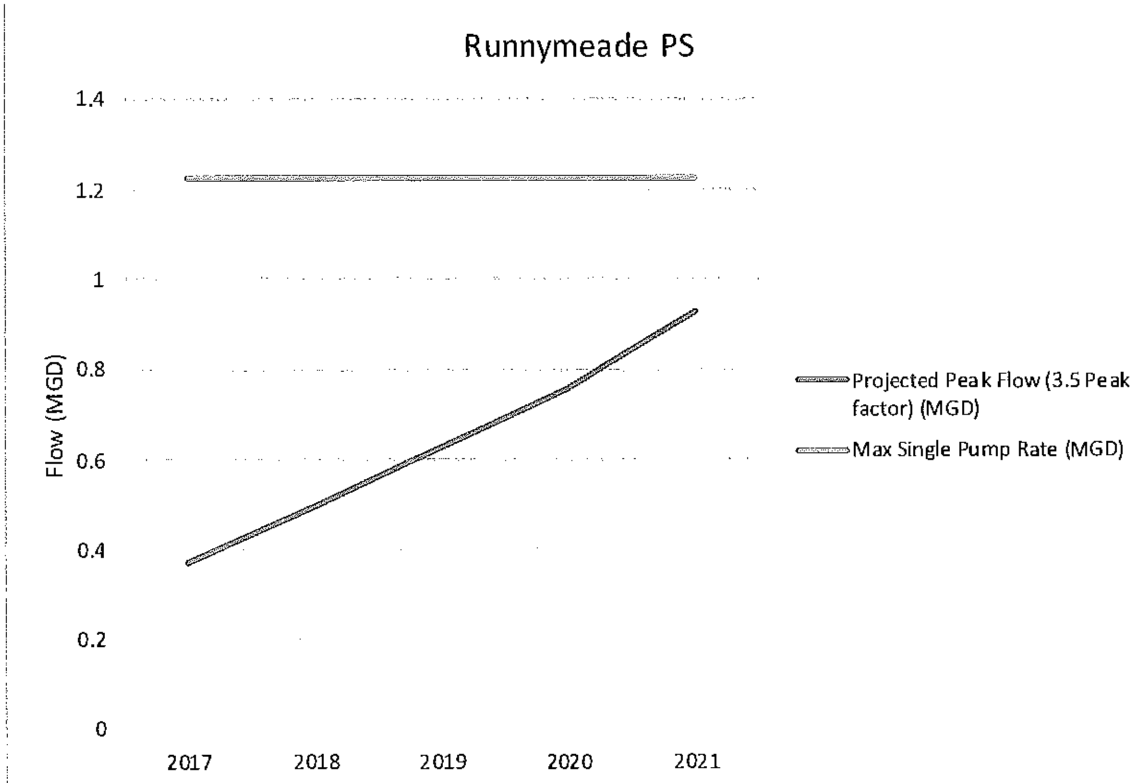
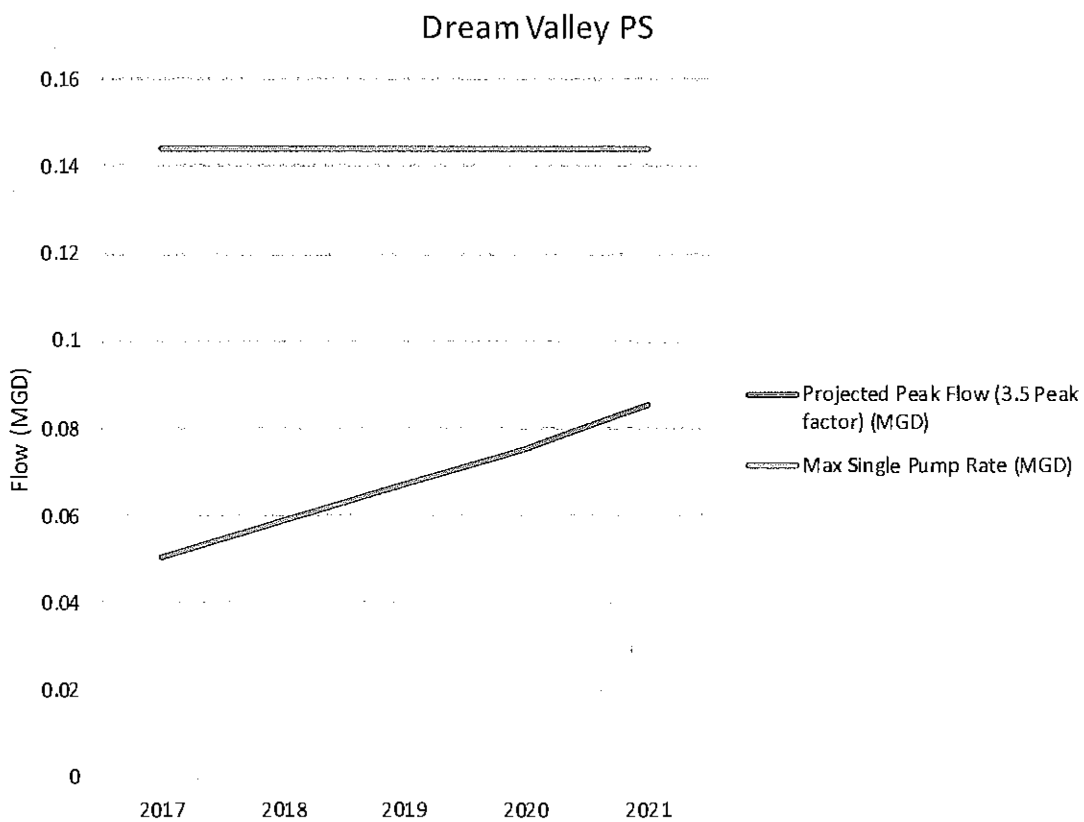
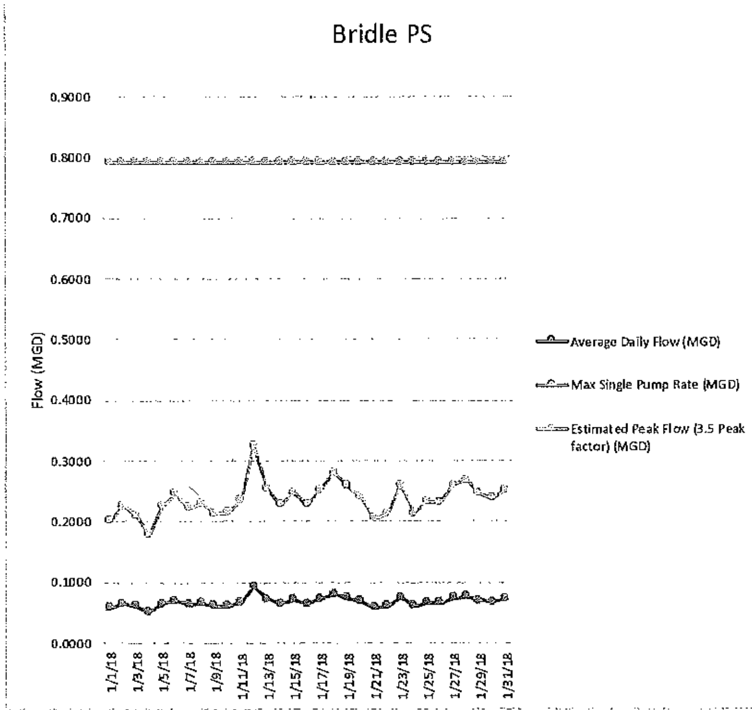


TABLE 5C					
Adjusted Projections Dream Valley Pump Station					
Year	Previous Year's Annual Average Flow (MGD)[1]	New EDUs	Increased Flow[2] (MGD)	Projected Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2019	0.013	0	0.000	0.050	0.144
2019	0.014	7	0.002	0.059	0.144
2020	0.017	7	0.002	0.067	0.144
2021	0.019	7	0.002	0.075	0.144
2022	0.022	7	0.003	0.085	0.144

Notes
1. The 2018 projection starts with the December Average Daily Flow
2. Increase Flow = New EDUs x 262.5 / 1,000,000.
3. Projected Annual Average Flow = Previous Years Annual Average Flow + Increased Flow
4. Projections include all contemplated projects from Table 2A

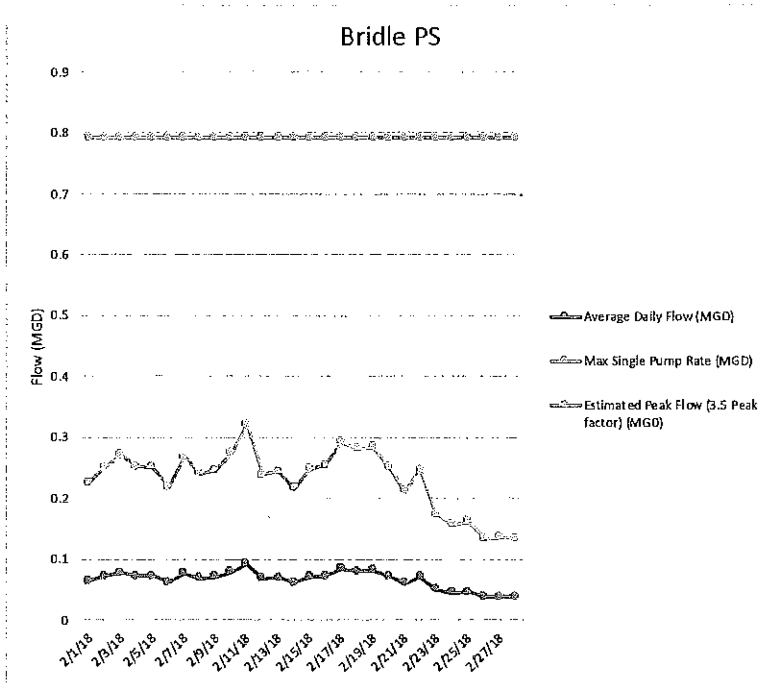


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.0577	0.202	0.792
1/2/18	0.0648	0.227	0.792
1/3/18	0.0603	0.211	0.792
1/4/18	0.0508	0.178	0.792
1/5/18	0.0642	0.225	0.792
1/6/18	0.0701	0.245	0.792
1/7/18	0.0637	0.223	0.792
1/8/18	0.0658	0.230	0.792
1/9/18	0.0610	0.213	0.792
1/10/18	0.0613	0.215	0.792
1/11/18	0.0674	0.236	0.792
1/12/18	0.0926	0.324	0.792
1/13/18	0.0727	0.254	0.792
1/14/18	0.0651	0.228	0.792
1/15/18	0.0706	0.247	0.792
1/16/18	0.0652	0.228	0.792
1/17/18	0.0721	0.252	0.792
1/18/18	0.0804	0.281	0.792
1/19/18	0.0740	0.259	0.792
1/20/18	0.0689	0.241	0.792
1/21/18	0.0582	0.204	0.792
1/22/18	0.0608	0.213	0.792
1/23/18	0.0745	0.261	0.792
1/24/18	0.0609	0.213	0.792
1/25/18	0.0665	0.233	0.792
1/26/18	0.0661	0.231	0.792
1/27/18	0.0742	0.260	0.792
1/28/18	0.0768	0.269	0.792
1/29/18	0.0701	0.245	0.792
1/30/18	0.0679	0.238	0.792
1/31/18	0.0723	0.253	0.792

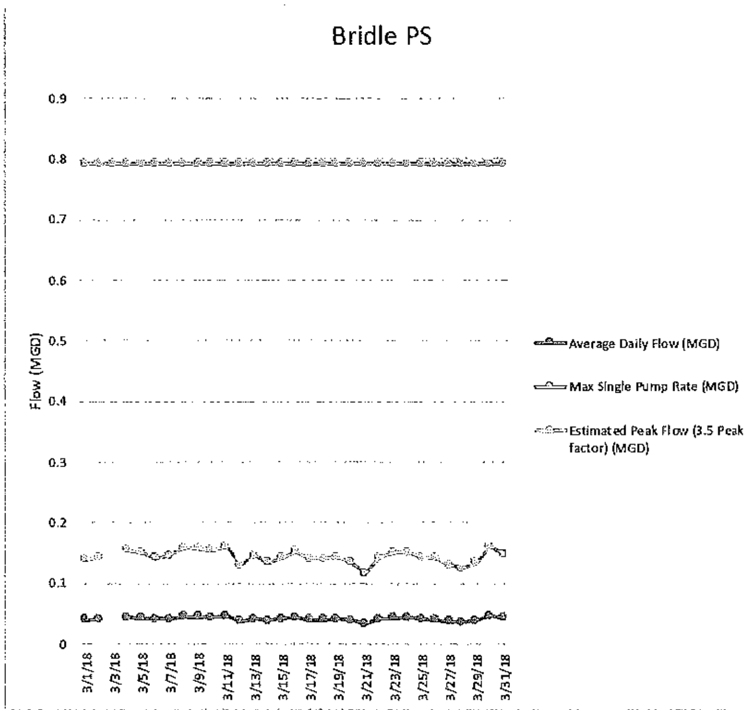


Min	0.051
Max	0.093
Ave	0.068

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.0643536	0.225	0.792
2/2/18	0.0720144	0.252	0.792
2/3/18	0.0773424	0.271	0.792
2/4/18	0.071712	0.251	0.792
2/5/18	0.0716976	0.251	0.792
2/6/18	0.0623808	0.218	0.792
2/7/18	0.0762336	0.267	0.792
2/8/18	0.0686304	0.240	0.792
2/9/18	0.0703152	0.246	0.792
2/10/18	0.078336	0.274	0.792
2/11/18	0.0919296	0.322	0.792
2/12/18	0.0682848	0.239	0.792
2/13/18	0.069696	0.244	0.792
2/14/18	0.0619056	0.217	0.792
2/15/18	0.0708768	0.248	0.792
2/16/18	0.0727344	0.255	0.792
2/17/18	0.0832896	0.292	0.792
2/18/18	0.08028	0.281	0.792
2/19/18	0.081072	0.284	0.792
2/20/18	0.0718128	0.251	0.792
2/21/18	0.0603792	0.211	0.792
2/22/18	0.0704304	0.247	0.792
2/23/18	0.0494928	0.173	0.792
2/24/18	0.0446976	0.156	0.792
2/25/18	0.0461088	0.161	0.792
2/26/18	0.0379872	0.133	0.792
2/27/18	0.0388224	0.136	0.792
2/28/18	0.038448	0.135	0.792

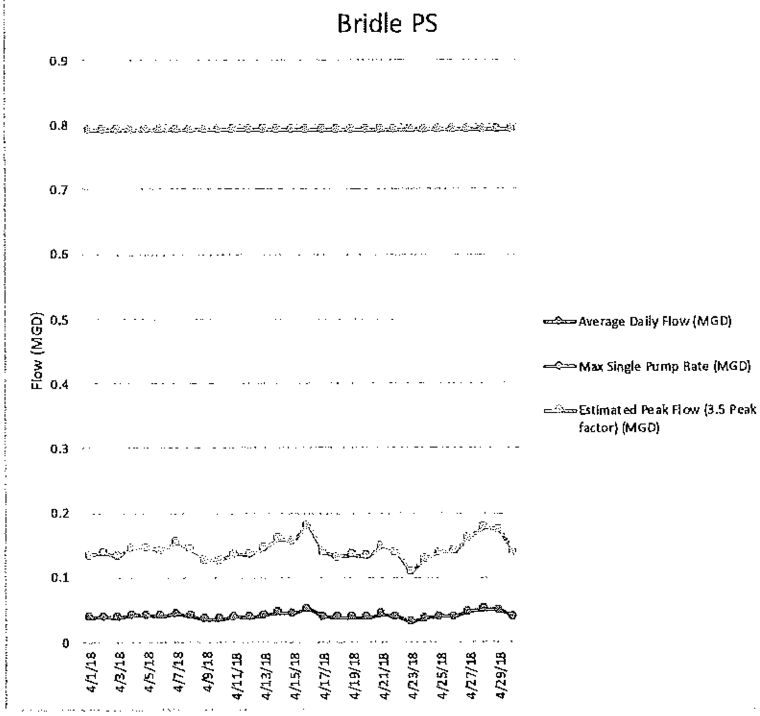


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.0398016	0.139	0.792
3/2/18	0.040824	0.143	0.792
3/3/18			0.792
3/4/18	0.044208	0.155	0.792
3/5/18	0.0430416	0.151	0.792
3/6/18	0.0406512	0.142	0.792
3/7/18	0.0415728	0.146	0.792
3/8/18	0.0453744	0.159	0.792
3/9/18	0.0447552	0.157	0.792
3/10/18	0.0443664	0.155	0.792
3/11/18	0.0459504	0.161	0.792
3/12/18	0.037152	0.130	0.792
3/13/18	0.0416016	0.146	0.792
3/14/18	0.0383616	0.134	0.792
3/15/18	0.0405936	0.142	0.792
3/16/18	0.0435168	0.152	0.792
3/17/18	0.040032	0.140	0.792
3/18/18	0.0402048	0.141	0.792
3/19/18	0.0407808	0.143	0.792
3/20/18	0.0383904	0.134	0.792
3/21/18	0.0335088	0.117	0.792
3/22/18	0.0407952	0.143	0.792
3/23/18	0.042912	0.150	0.792
3/24/18	0.0431712	0.151	0.792
3/25/18	0.0408384	0.143	0.792
3/26/18	0.040392	0.141	0.792
3/27/18	0.0371808	0.130	0.792
3/28/18	0.0355392	0.124	0.792
3/29/18	0.0380448	0.133	0.792
3/30/18	0.045936	0.161	0.792
3/31/18	0.0420912	0.147	0.792



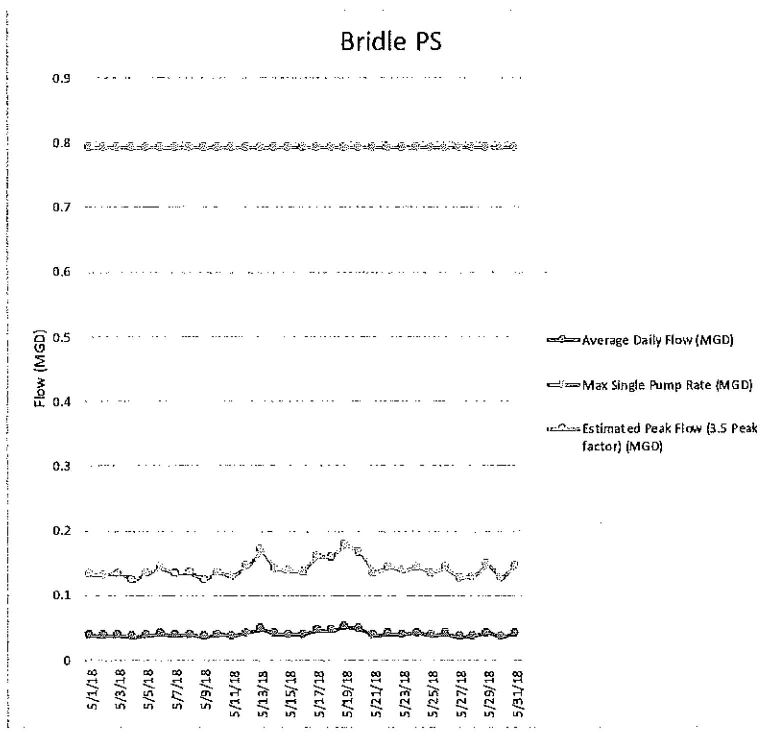
Min	0.034
Max	0.046
Ave	0.041

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.038376	0.134	0.792
4/2/18	0.0395424	0.138	0.792
4/3/18	0.0377856	0.132	0.792
4/4/18	0.0417312	0.146	0.792
4/5/18	0.0416736	0.146	0.792
4/6/18	0.0402768	0.141	0.792
4/7/18	0.0443232	0.155	0.792
4/8/18	0.0409536	0.143	0.792
4/9/18	0.036	0.126	0.792
4/10/18	0.0361296	0.126	0.792
4/11/18	0.0387792	0.136	0.792
4/12/18	0.0384912	0.135	0.792
4/13/18	0.0414144	0.145	0.792
4/14/18	0.0455616	0.159	0.792
4/15/18	0.0446112	0.156	0.792
4/16/18	0.0518256	0.181	0.792
4/17/18	0.0394992	0.138	0.792
4/18/18	0.0374976	0.131	0.792
4/19/18	0.0384048	0.134	0.792
4/20/18	0.0379728	0.133	0.792
4/21/18	0.0425088	0.149	0.792
4/22/18	0.0394704	0.138	0.792
4/23/18	0.0306	0.107	0.792
4/24/18	0.0366768	0.128	0.792
4/25/18	0.039672	0.139	0.792
4/26/18	0.0398016	0.139	0.792
4/27/18	0.04608	0.161	0.792
4/28/18	0.0507888	0.178	0.792
4/29/18	0.0496656	0.174	0.792
4/30/18	0.0397008	0.139	0.792



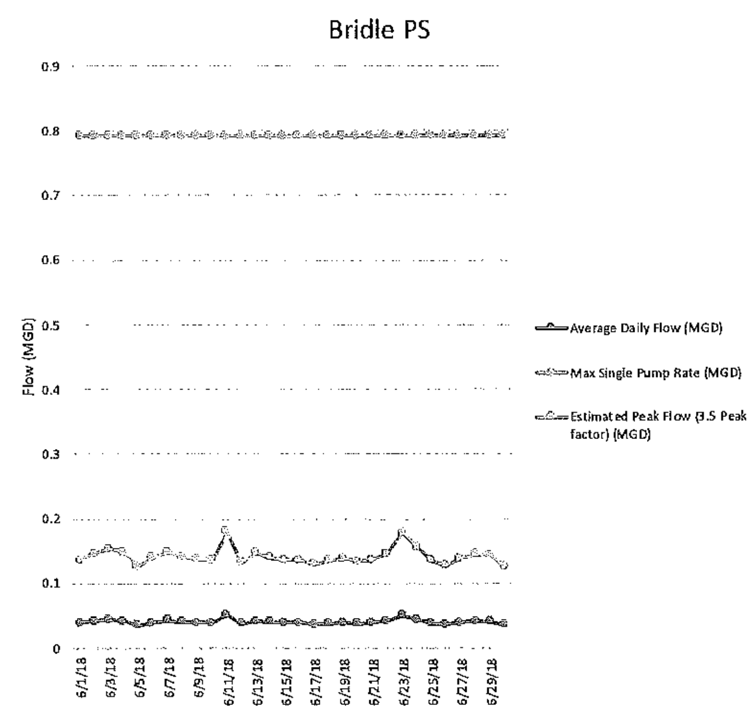
Min	0.031
Max	0.052
Ave	0.041

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.0380016	0.133	0.792
5/2/18	0.0374256	0.131	0.792
5/3/18	0.0382608	0.134	0.792
5/4/18	0.0350064	0.123	0.792
5/5/18	0.0378576	0.133	0.792
5/6/18	0.0407088	0.142	0.792
5/7/18	0.0383184	0.134	0.792
5/8/18	0.0387072	0.135	0.792
5/9/18	0.0353808	0.124	0.792
5/10/18	0.0386352	0.135	0.792
5/11/18	0.0367776	0.129	0.792
5/12/18	0.041256	0.144	0.792
5/13/18	0.0483696	0.169	0.792
5/14/18	0.0402192	0.141	0.792
5/15/18	0.039168	0.137	0.792
5/16/18	0.0389232	0.136	0.792
5/17/18	0.0457488	0.160	0.792
5/18/18	0.0451728	0.158	0.792
5/19/18	0.0509328	0.178	0.792
5/20/18	0.0473616	0.166	0.792
5/21/18	0.038232	0.134	0.792
5/22/18	0.0409536	0.143	0.792
5/23/18	0.0392112	0.137	0.792
5/24/18	0.0412128	0.144	0.792
5/25/18	0.0383328	0.134	0.792
5/26/18	0.040536	0.142	0.792
5/27/18	0.0361008	0.126	0.792
5/28/18	0.0366912	0.128	0.792
5/29/18	0.0419328	0.147	0.792
5/30/18	0.036072	0.126	0.792
5/31/18	0.0418896	0.147	0.792



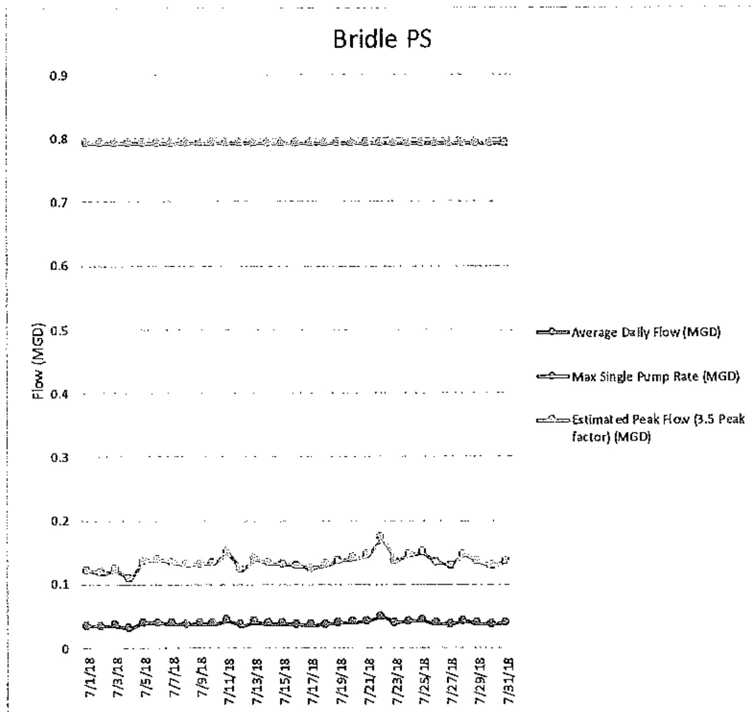
Min	0.035
Max	0.051
Ave	0.040

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.0387648	0.136	0.792
6/2/18	0.0418752	0.147	0.792
6/3/18	0.0439632	0.154	0.792
6/4/18	0.0422928	0.148	0.792
6/5/18	0.0360864	0.126	0.792
6/6/18	0.039816	0.139	0.792
6/7/18	0.0424656	0.149	0.792
6/8/18	0.0404352	0.142	0.792
6/9/18	0.0394416	0.138	0.792
6/10/18	0.0389808	0.136	0.792
6/11/18	0.0513216	0.180	0.792
6/12/18	0.0379008	0.133	0.792
6/13/18	0.0420192	0.147	0.792
6/14/18	0.0400896	0.140	0.792
6/15/18	0.0389088	0.136	0.792
6/16/18	0.0390096	0.137	0.792
6/17/18	0.0372816	0.130	0.792
6/18/18	0.0384912	0.135	0.792
6/19/18	0.0397152	0.139	0.792
6/20/18	0.0381168	0.133	0.792
6/21/18	0.0390672	0.137	0.792
6/22/18	0.0417168	0.146	0.792
6/23/18	0.0509472	0.178	0.792
6/24/18	0.0447552	0.157	0.792
6/25/18	0.0385632	0.135	0.792
6/26/18	0.0365184	0.128	0.792
6/27/18	0.039528	0.138	0.792
6/28/18	0.041256	0.144	0.792
6/29/18	0.0409104	0.143	0.792
6/30/18	0.0357696	0.125	0.792



Min	0.036
Max	0.051
Ave	0.041

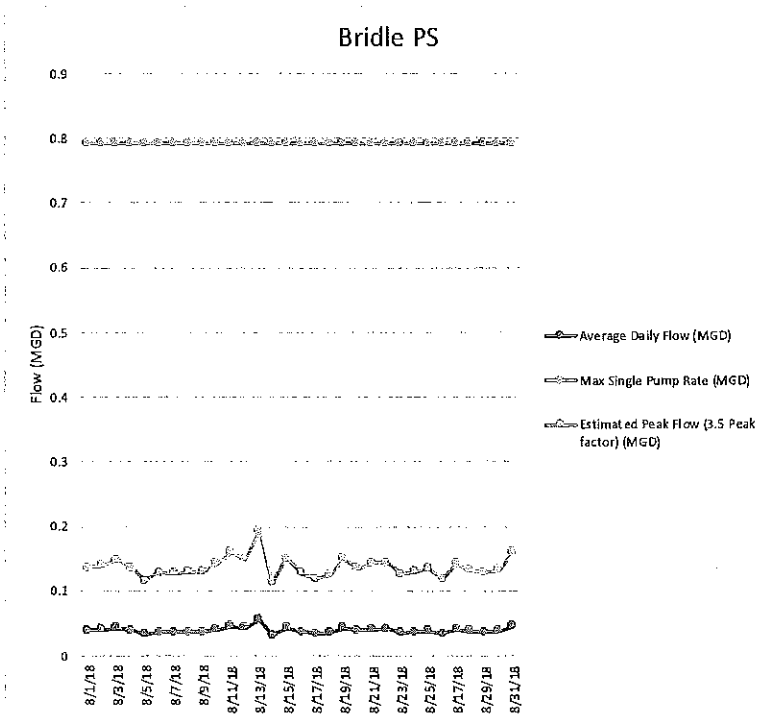
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.03456	0.121	0.792
7/2/18	0.0337248	0.118	0.792
7/3/18	0.035136	0.123	0.792
7/4/18	0.0306144	0.107	0.792
7/5/18	0.0389664	0.136	0.792
7/6/18	0.0395568	0.138	0.792
7/7/18	0.0382608	0.134	0.792
7/8/18	0.037008	0.130	0.792
7/9/18	0.037584	0.132	0.792
7/10/18	0.0379728	0.133	0.792
7/11/18	0.0428976	0.150	0.792
7/12/18	0.035064	0.123	0.792
7/13/18	0.0399456	0.140	0.792
7/14/18	0.0377424	0.132	0.792
7/15/18	0.0374544	0.131	0.792
7/16/18	0.0369216	0.129	0.792
7/17/18	0.0354816	0.124	0.792
7/18/18	0.0371232	0.130	0.792
7/19/18	0.0390096	0.137	0.792
7/20/18	0.0401472	0.141	0.792
7/21/18	0.041544	0.145	0.792
7/22/18	0.0491328	0.172	0.792
7/23/18	0.0389376	0.136	0.792
7/24/18	0.0414288	0.145	0.792
7/25/18	0.0429408	0.150	0.792
7/26/18	0.03816	0.134	0.792
7/27/18	0.0368352	0.129	0.792
7/28/18	0.0417312	0.146	0.792
7/29/18	0.0386064	0.135	0.792
7/30/18	0.0364464	0.128	0.792
7/31/18	0.039024	0.137	0.792



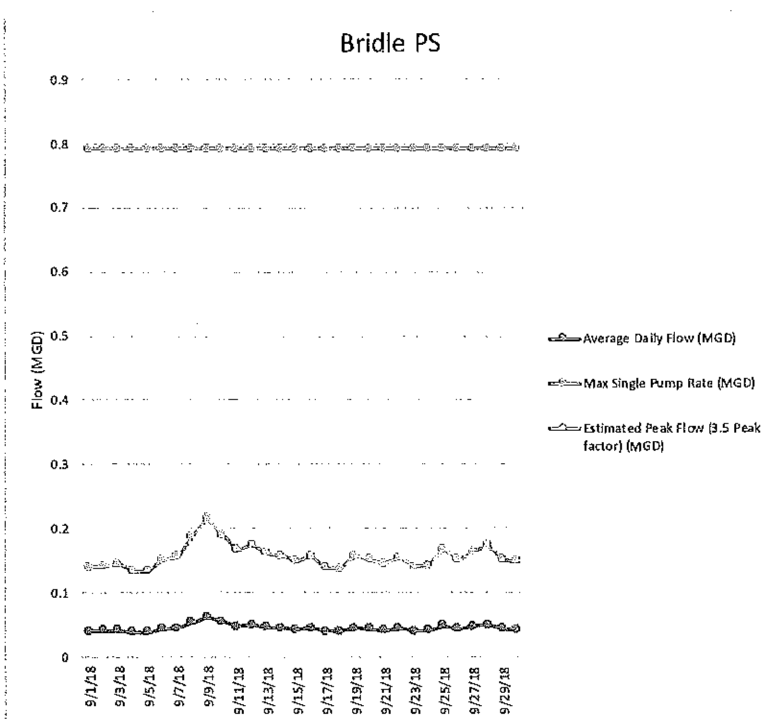
Min	0.031
Max	0.049
Ave	0.038

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.0389952	0.136	0.792
8/2/18	0.0400608	0.140	0.792
8/3/18	0.0426384	0.149	0.792
8/4/18	0.0387504	0.136	0.792
8/5/18	0.0333072	0.117	0.792
8/6/18	0.0368928	0.129	0.792
8/7/18	0.0363312	0.127	0.792
8/8/18	0.0372528	0.130	0.792
8/9/18	0.03708	0.130	0.792
8/10/18	0.0405936	0.142	0.792
8/11/18	0.0454896	0.159	0.792
8/12/18	0.0427824	0.150	0.792
8/13/18	0.055368	0.194	0.792
8/14/18	0.0323136	0.113	0.792
8/15/18	0.0430704	0.151	0.792
8/16/18	0.036432	0.128	0.792
8/17/18	0.0340416	0.119	0.792
8/18/18	0.0356112	0.125	0.792
8/19/18	0.0428976	0.150	0.792
8/20/18	0.0386784	0.135	0.792
8/21/18	0.0409392	0.143	0.792
8/22/18	0.0411984	0.144	0.792
8/23/18	0.0359136	0.126	0.792
8/24/18	0.0371664	0.130	0.792
8/25/18	0.0385488	0.135	0.792
8/26/18	0.0341136	0.119	0.792
8/27/18	0.0407232	0.143	0.792
8/28/18	0.0378	0.132	0.792
8/29/18	0.0368064	0.129	0.792
8/30/18	0.038016	0.133	0.792
8/31/18	0.0456768	0.160	0.792

Min	0.032
Max	0.055
Ave	0.039



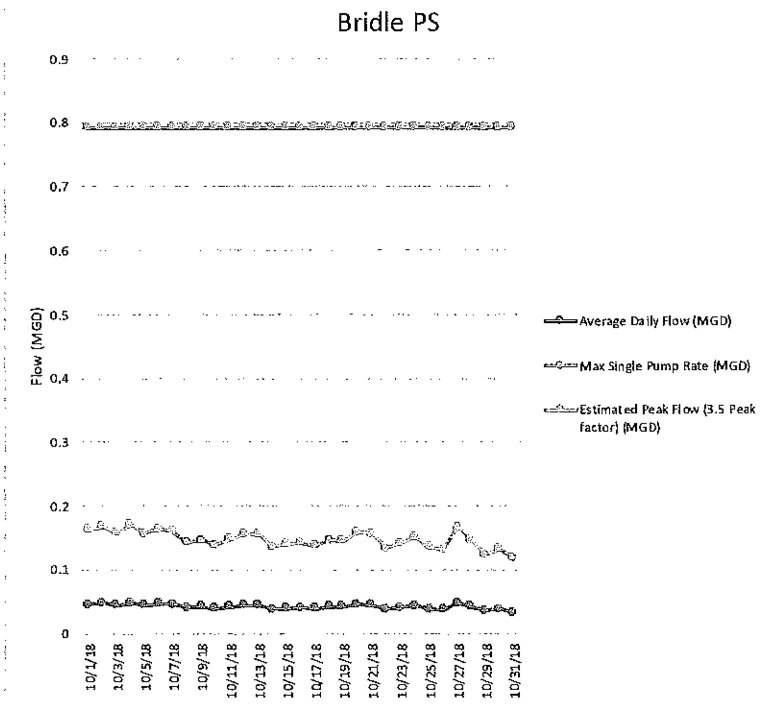
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.0400176	0.140	0.792
9/2/18	0.0404064	0.141	0.792
9/3/18	0.0414432	0.145	0.792
9/4/18	0.038088	0.133	0.792
9/5/18	0.0381744	0.134	0.792
9/6/18	0.043056	0.151	0.792
9/7/18	0.0446688	0.156	0.792
9/8/18	0.053568	0.187	0.792
9/9/18	0.061632	0.216	0.792
9/10/18	0.0541296	0.189	0.792
9/11/18	0.0474336	0.166	0.792
9/12/18	0.0499392	0.175	0.792
9/13/18	0.045936	0.161	0.792
9/14/18	0.0447984	0.157	0.792
9/15/18	0.0424368	0.149	0.792
9/16/18	0.0449856	0.157	0.792
9/17/18	0.0394848	0.138	0.792
9/18/18	0.0394128	0.138	0.792
9/19/18	0.045	0.158	0.792
9/20/18	0.0433152	0.152	0.792
9/21/18	0.0414144	0.145	0.792
9/22/18	0.0441504	0.155	0.792
9/23/18	0.0399024	0.140	0.792
9/24/18	0.0405072	0.142	0.792
9/25/18	0.0478368	0.167	0.792
9/26/18	0.0432576	0.151	0.792
9/27/18	0.0465984	0.163	0.792
9/28/18	0.0495216	0.173	0.792
9/29/18	0.0431568	0.151	0.792
9/30/18	0.0423504	0.148	0.792



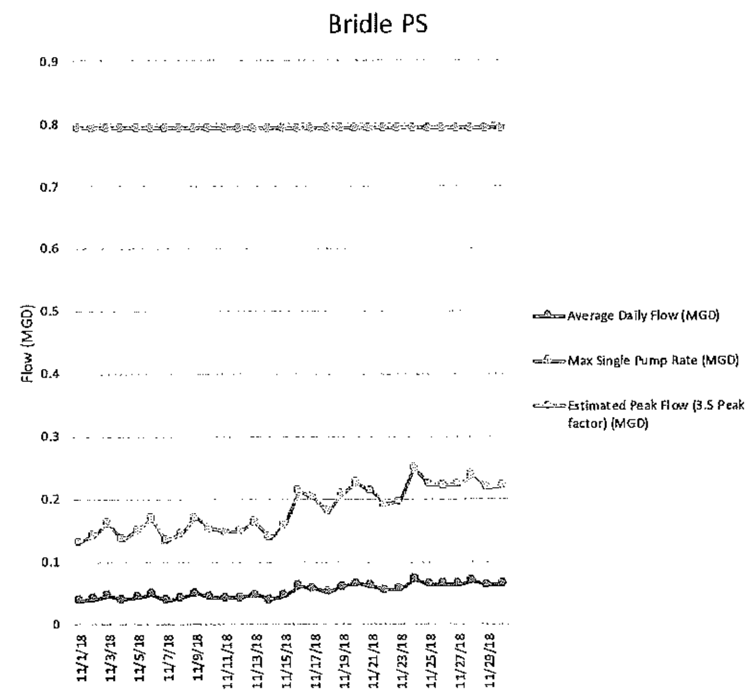
Min	0.038
Max	0.062
Ave	0.045

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.0464112	0.162	0.792
10/2/18	0.0479376	0.168	0.792
10/3/18	0.045216	0.158	0.792
10/4/18	0.0488304	0.171	0.792
10/5/18	0.0448992	0.157	0.792
10/6/18	0.0467568	0.164	0.792
10/7/18	0.0456768	0.160	0.792
10/8/18	0.040968	0.143	0.792
10/9/18	0.0419904	0.147	0.792
10/10/18	0.039744	0.139	0.792
10/11/18	0.0422784	0.148	0.792
10/12/18	0.044856	0.157	0.792
10/13/18	0.0444816	0.156	0.792
10/14/18	0.0388512	0.136	0.792
10/15/18	0.0400896	0.140	0.792
10/16/18	0.0409392	0.143	0.792
10/17/18	0.039528	0.138	0.792
10/18/18	0.0418608	0.147	0.792
10/19/18	0.0416736	0.146	0.792
10/20/18	0.0456192	0.160	0.792
10/21/18	0.044784	0.157	0.792
10/22/18	0.03816	0.134	0.792
10/23/18	0.040536	0.142	0.792
10/24/18	0.0433152	0.152	0.792
10/25/18	0.0386928	0.135	0.792
10/26/18	0.0375696	0.131	0.792
10/27/18	0.0477936	0.167	0.792
10/28/18	0.0417024	0.146	0.792
10/29/18	0.0353808	0.124	0.792
10/30/18	0.038016	0.133	0.792
10/31/18	0.033768	0.118	0.792

Min	0.034
Max	0.049
Ave	0.042

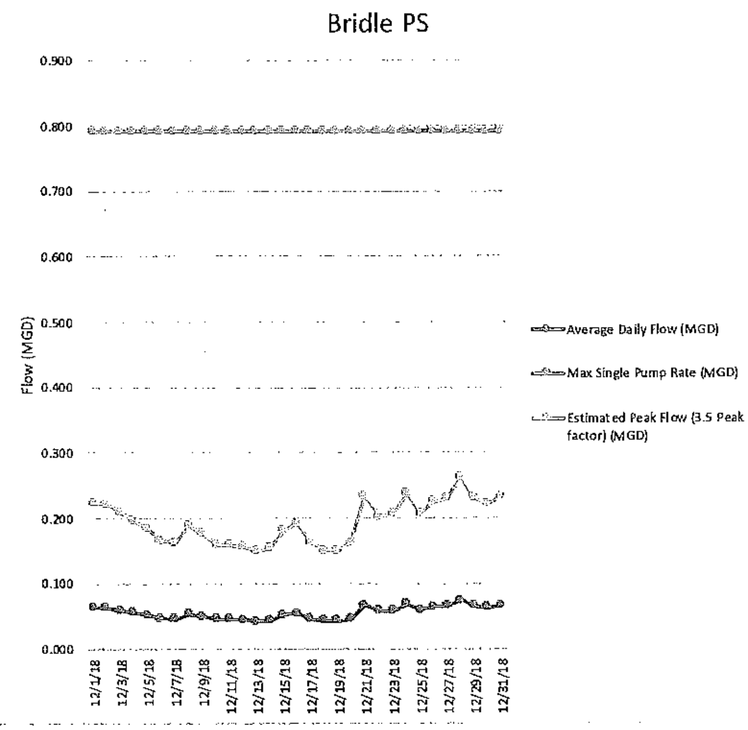


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.0374976	0.1312416	0.792
11/2/18	0.0406512	0.142	0.792
11/3/18	0.0461232	0.161	0.792
11/4/18	0.0385776	0.135	0.792
11/5/18	0.042624	0.149	0.792
11/6/18	0.048096	0.168	0.792
11/7/18	0.0379584	0.133	0.792
11/8/18	0.0413856	0.145	0.792
11/9/18	0.0487296	0.171	0.792
11/10/18	0.0435168	0.152	0.792
11/11/18	0.0418464	0.146	0.792
11/12/18	0.0423072	0.148	0.792
11/13/18	0.0468144	0.164	0.792
11/14/18	0.0393984	0.138	0.792
11/15/18	0.0454464	0.159	0.792
11/16/18	0.0608544	0.213	0.792
11/17/18	0.0576576	0.202	0.792
11/18/18	0.0510624	0.179	0.792
11/19/18	0.0593712	0.208	0.792
11/20/18	0.0644256	0.225	0.792
11/21/18	0.0608688	0.213	0.792
11/22/18	0.054504	0.191	0.792
11/23/18	0.0559728	0.196	0.792
11/24/18	0.0714528	0.250	0.792
11/25/18	0.0634752	0.222	0.792
11/26/18	0.0631008	0.221	0.792
11/27/18	0.0637344	0.223	0.792
11/28/18	0.068112	0.238	0.792
11/29/18	0.0620496	0.217	0.792
11/30/18	0.0629424	0.220	0.792



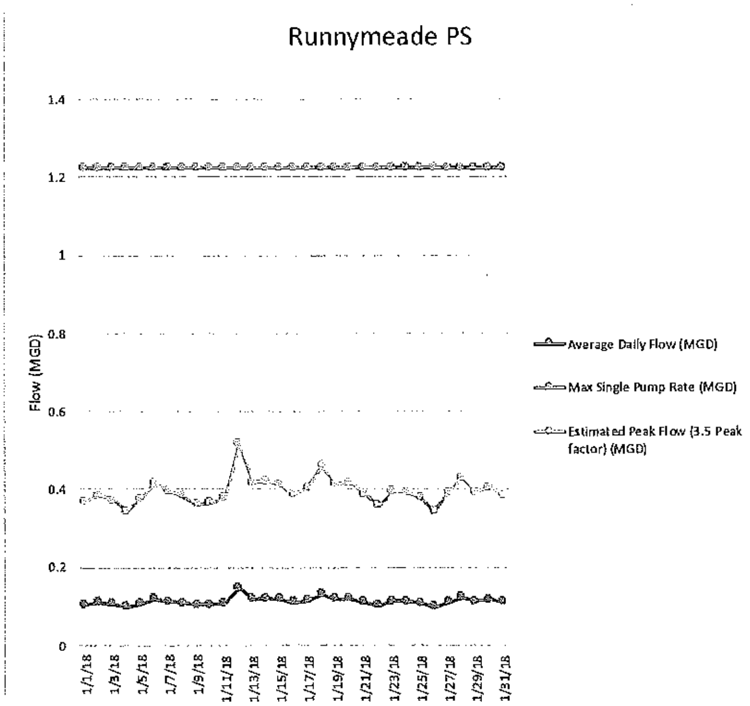
Min	0.037
Max	0.071
Ave	0.052

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.0639072	0.224	0.792
12/2/18	0.0634896	0.222	0.792
12/3/18	0.0599616	0.210	0.792
12/4/18	0.0558576	0.196	0.792
12/5/18	0.0527904	0.185	0.792
12/6/18	0.0472464	0.165	0.792
12/7/18	0.0464112	0.162	0.792
12/8/18	0.0537552	0.188	0.792
12/9/18	0.0502992	0.176	0.792
12/10/18	0.0454752	0.159	0.792
12/11/18	0.0455904	0.160	0.792
12/12/18	0.0446544	0.156	0.792
12/13/18	0.0427392	0.150	0.792
12/14/18	0.044136	0.154	0.792
12/15/18	0.0517824	0.181	0.792
12/16/18	0.0548352	0.192	0.792
12/17/18	0.0464688	0.163	0.792
12/18/18	0.0430704	0.151	0.792
12/19/18	0.0431712	0.151	0.792
12/20/18	0.0463536	0.162	0.792
12/21/18	0.0669312	0.234	0.792
12/22/18	0.0577296	0.202	0.792
12/23/18	0.0586944	0.205	0.792
12/24/18	0.0679248	0.238	0.792
12/25/18	0.0592992	0.208	0.792
12/26/18	0.064512	0.226	0.792
12/27/18	0.0657504	0.230	0.792
12/28/18	0.07488	0.262	0.792
12/29/18	0.0656928	0.230	0.792
12/30/18	0.0633168	0.222	0.792
12/31/18	0.0666288	0.233	0.792



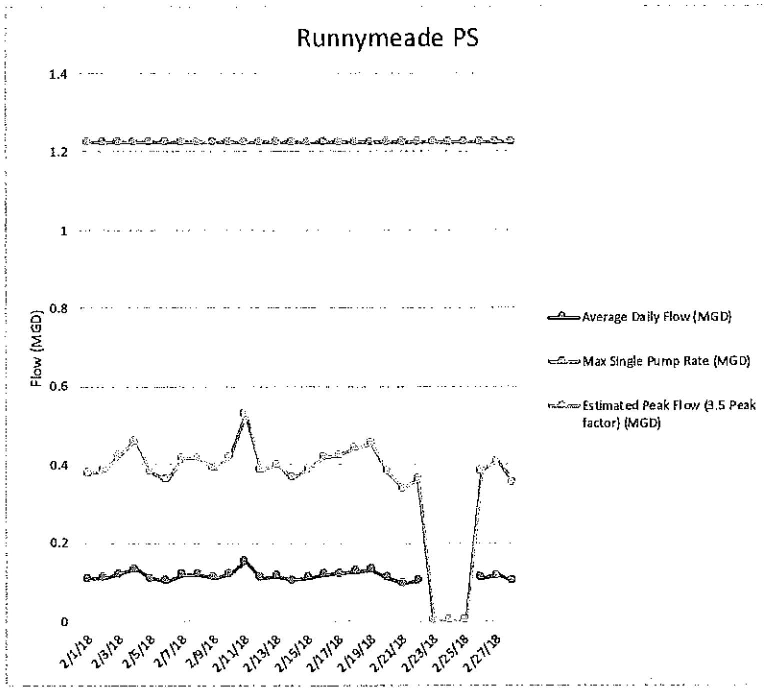
Min	0.043
Max	0.075
Ave	0.055

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.10507248	0.368	1.224
1/2/18	0.10992384	0.385	1.224
1/3/18	0.10662768	0.373	1.224
1/4/18	0.09846288	0.345	1.224
1/5/18	0.10692144	0.374	1.224
1/6/18	0.11871792	0.416	1.224
1/7/18	0.11336256	0.397	1.224
1/8/18	0.10909728	0.382	1.224
1/9/18	0.1037088	0.363	1.224
1/10/18	0.10477728	0.367	1.224
1/11/18	0.10816704	0.379	1.224
1/12/18	0.14831856	0.519	1.224
1/13/18	0.11901888	0.417	1.224
1/14/18	0.12012768	0.420	1.224
1/15/18	0.1179288	0.413	1.224
1/16/18	0.11060928	0.387	1.224
1/17/18	0.11573136	0.405	1.224
1/18/18	0.13133376	0.460	1.224
1/19/18	0.11788272	0.413	1.224
1/20/18	0.11926	0.417	1.224
1/21/18	0.111272	0.389	1.224
1/22/18	0.102541	0.359	1.224
1/23/18	0.113086	0.396	1.224
1/24/18	0.112313	0.393	1.224
1/25/18	0.107992	0.378	1.224
1/26/18	0.098489	0.345	1.224
1/27/18	0.1115	0.390	1.224
1/28/18	0.122549	0.429	1.224
1/29/18	0.112011	0.392	1.224
1/30/18	0.115956	0.406	1.224
1/31/18	0.109905	0.385	1.224

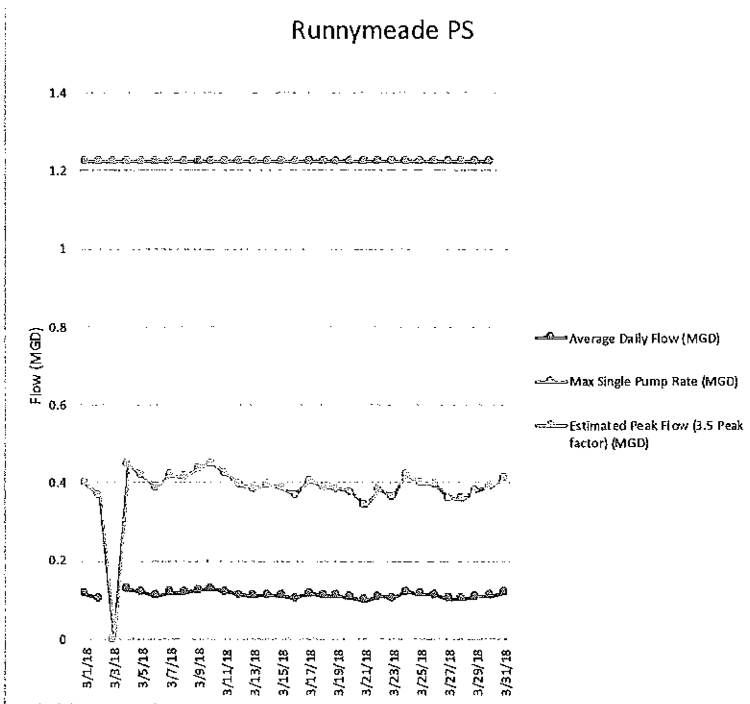


Min	0.098
Max	0.148
Ave	0.113

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.107582	0.377	1.224
2/2/18	0.110088	0.385	1.224
2/3/18	0.12094	0.423	1.224
2/4/18	0.131498	0.460	1.224
2/5/18	0.109008	0.382	1.224
2/6/18	0.103072	0.361	1.224
2/7/18	0.118603	0.415	1.224
2/8/18	0.118487	0.415	1.224
2/9/18	0.111113	0.389	1.224
2/10/18	0.119701	0.419	1.224
2/11/18	0.151233	0.529	1.224
2/12/18	0.110285	0.386	1.224
2/13/18	0.11405	0.399	1.224
2/14/18	0.104338	0.365	1.224
2/15/18	0.110421	0.386	1.224
2/16/18	0.119181	0.417	1.224
2/17/18	0.121116	0.424	1.224
2/18/18	0.126371	0.442	1.224
2/19/18	0.129504	0.453	1.224
2/20/18	0.109209	0.382	1.224
2/21/18	0.09661	0.338	1.224
2/22/18	0.102978	0.360	1.224
2/23/18		0.000	1.224
2/24/18		0.000	1.224
2/25/18		0.000	1.224
2/26/18	0.109477	0.383	1.224
2/27/18	0.116244	0.407	1.224
2/28/18	0.101212	0.354	1.224
			1.224
			1.224

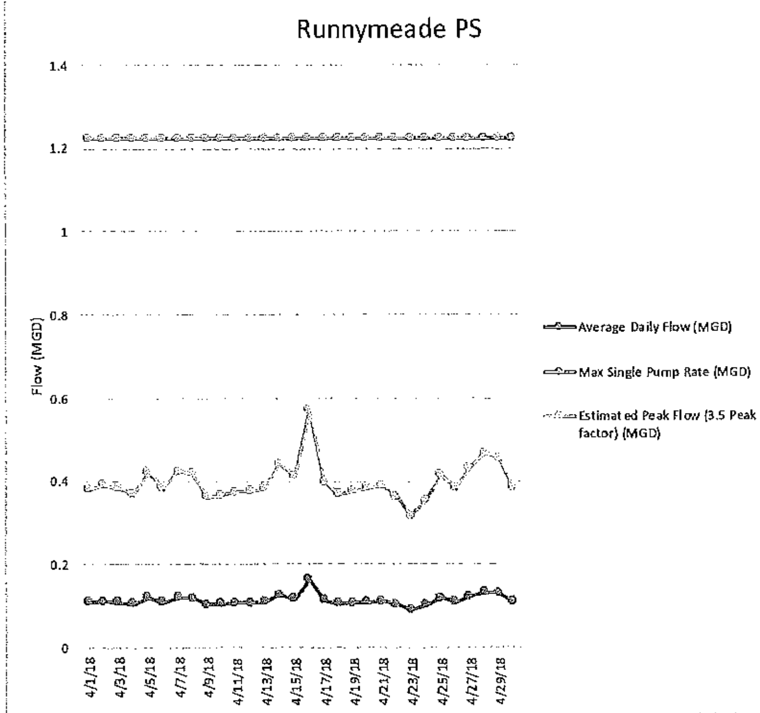


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.113915	0.399	1.224
3/2/18	0.104954	0.367	1.224
3/3/18		0.000	1.224
3/4/18	0.127665	0.447	1.224
3/5/18	0.120226	0.421	1.224
3/6/18	0.110838	0.388	1.224
3/7/18	0.11959	0.419	1.224
3/8/18	0.118856	0.416	1.224
3/9/18	0.124887	0.437	1.224
3/10/18	0.128691	0.450	1.224
3/11/18	0.120709	0.422	1.224
3/12/18	0.112517	0.394	1.224
3/13/18	0.110174	0.386	1.224
3/14/18	0.113485	0.397	1.224
3/15/18	0.110522	0.387	1.224
3/16/18	0.105453	0.369	1.224
3/17/18	0.115974	0.406	1.224
3/18/18	0.11081	0.388	1.224
3/19/18	0.11013	0.385	1.224
3/20/18	0.107593	0.377	1.224
3/21/18	0.097871	0.343	1.224
3/22/18	0.109218	0.382	1.224
3/23/18	0.10393	0.364	1.224
3/24/18	0.120284	0.421	1.224
3/25/18	0.114054	0.399	1.224
3/26/18	0.113113	0.396	1.224
3/27/18	0.103136	0.361	1.224
3/28/18	0.102287	0.358	1.224
3/29/18	0.108601	0.380	1.224
3/30/18	0.111541	0.390	1.224
3/31/18	0.118131	0.413	



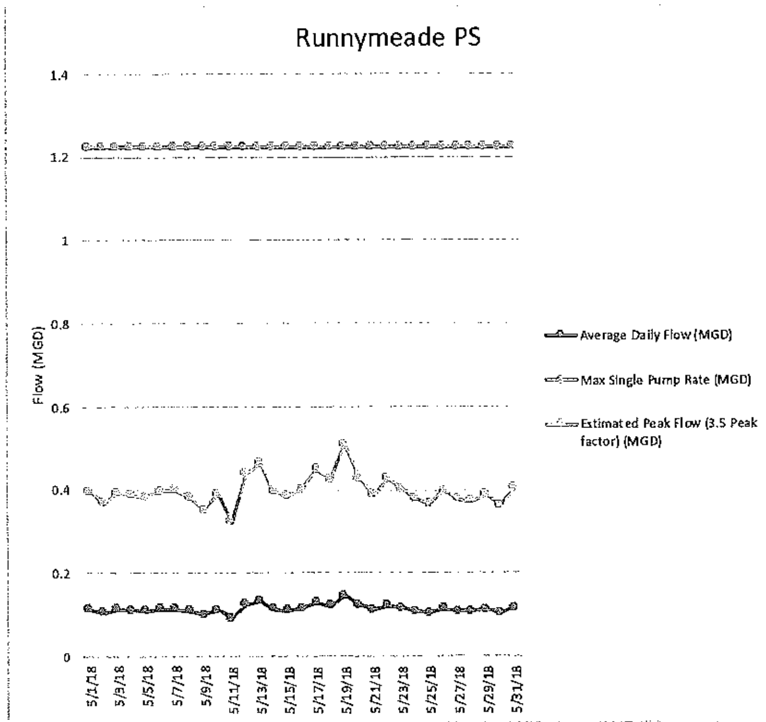
Min	0.098
Max	0.129
Ave	0.113

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.108458	0.380	1.224
4/2/18	0.111929	0.392	1.224
4/3/18	0.109633	0.384	1.224
4/4/18	0.105709	0.370	1.224
4/5/18	0.120495	0.422	1.224
4/6/18	0.109759	0.384	1.224
4/7/18	0.121295	0.425	1.224
4/8/18	0.119427	0.418	1.224
4/9/18	0.102829	0.360	1.224
4/10/18	0.104711	0.366	1.224
4/11/18	0.106656	0.373	1.224
4/12/18	0.107752	0.377	1.224
4/13/18	0.109753	0.384	1.224
4/14/18	0.126259	0.442	1.224
4/15/18	0.117888	0.413	1.224
4/16/18	0.163405	0.572	1.224
4/17/18	0.113748	0.398	1.224
4/18/18	0.10507	0.368	1.224
4/19/18	0.107492	0.376	1.224
4/20/18	0.109849	0.384	1.224
4/21/18	0.111165	0.389	1.224
4/22/18	0.103776	0.363	1.224
4/23/18	0.090621	0.317	1.224
4/24/18	0.100758	0.353	1.224
4/25/18	0.118793	0.416	1.224
4/26/18	0.109789	0.384	1.224
4/27/18	0.123533	0.432	1.224
4/28/18	0.13351	0.467	1.224
4/29/18	0.130192	0.456	1.224
4/30/18	0.109886	0.385	1.224



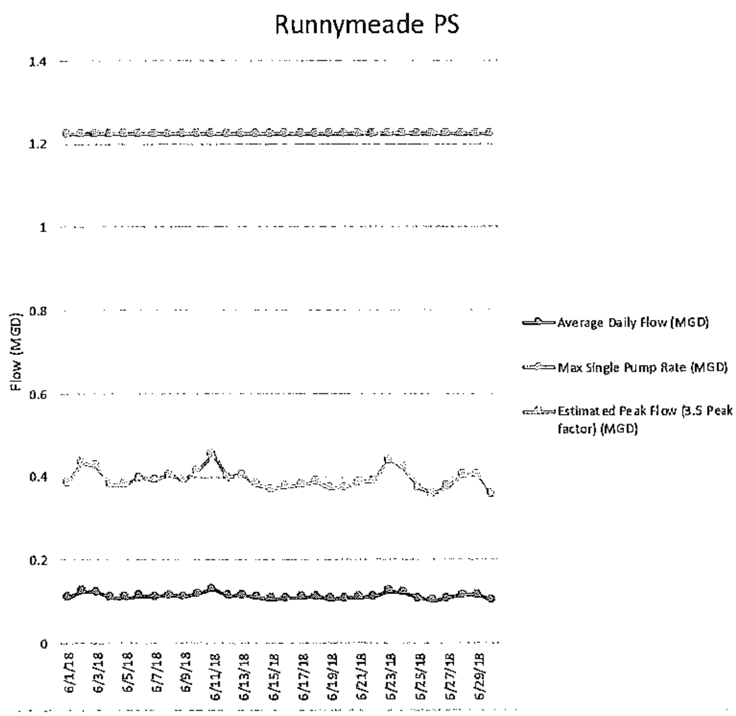
Min	0.091
Max	0.163
Ave	0.114

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.113423	0.397	1.224
5/2/18	0.105211	0.368	1.224
5/3/18	0.112471	0.394	1.224
5/4/18	0.110751	0.388	1.224
5/5/18	0.109201	0.382	1.224
5/6/18	0.113614	0.398	1.224
5/7/18	0.114005	0.399	1.224
5/8/18	0.109213	0.382	1.224
5/9/18	0.100044	0.350	1.224
5/10/18	0.111301	0.390	1.224
5/11/18	0.092278	0.323	1.224
5/12/18	0.125046	0.438	1.224
5/13/18	0.132804	0.465	1.224
5/14/18	0.11374	0.398	1.224
5/15/18	0.109866	0.385	1.224
5/16/18	0.114938	0.402	1.224
5/17/18	0.128258	0.449	1.224
5/18/18	0.121378	0.425	1.224
5/19/18	0.145653	0.510	1.224
5/20/18	0.122507	0.429	1.224
5/21/18	0.110589	0.387	1.224
5/22/18	0.121838	0.426	1.224
5/23/18	0.114675	0.401	1.224
5/24/18	0.108092	0.378	1.224
5/25/18	0.104239	0.365	1.224
5/26/18	0.113824	0.398	1.224
5/27/18	0.107547	0.376	1.224
5/28/18	0.106575	0.373	1.224
5/29/18	0.110913	0.388	1.224
5/30/18	0.103831	0.363	1.224
5/31/18	0.114992	0.402	1.224



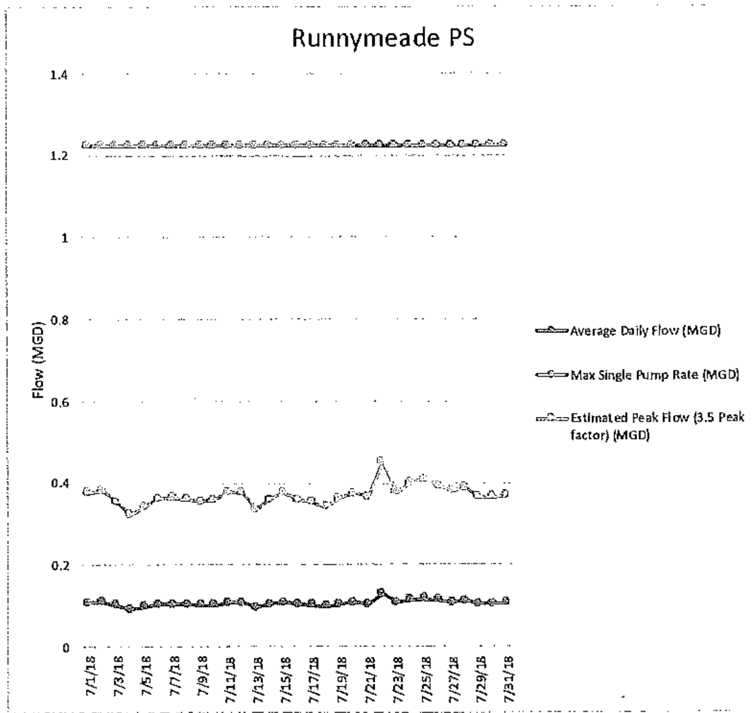
Min	0.092
Max	0.146
Ave	0.114

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.109789	0.384	1.224
6/2/18	0.124086	0.434	1.224
6/3/18	0.122065	0.427	1.224
6/4/18	0.108515	0.380	1.224
6/5/18	0.108863	0.381	1.224
6/6/18	0.11341	0.397	1.224
6/7/18	0.112037	0.392	1.224
6/8/18	0.115672	0.405	1.224
6/9/18	0.112049	0.392	1.224
6/10/18	0.118851	0.416	1.224
6/11/18	0.12943	0.453	1.224
6/12/18	0.11333	0.397	1.224
6/13/18	0.115958	0.406	1.224
6/14/18	0.108796	0.381	1.224
6/15/18	0.1057	0.370	1.224
6/16/18	0.107431	0.376	1.224
6/17/18	0.108487	0.380	1.224
6/18/18	0.110662	0.387	1.224
6/19/18	0.106251	0.372	1.224
6/20/18	0.107197	0.375	1.224
6/21/18	0.110048	0.385	1.224
6/22/18	0.111366	0.390	1.224
6/23/18	0.125599	0.440	1.224
6/24/18	0.120715	0.423	1.224
6/25/18	0.106633	0.373	1.224
6/26/18	0.102303	0.358	1.224
6/27/18	0.107324	0.376	1.224
6/28/18	0.115155	0.403	1.224
6/29/18	0.116018	0.406	1.224
6/30/18	0.101693	0.356	1.224



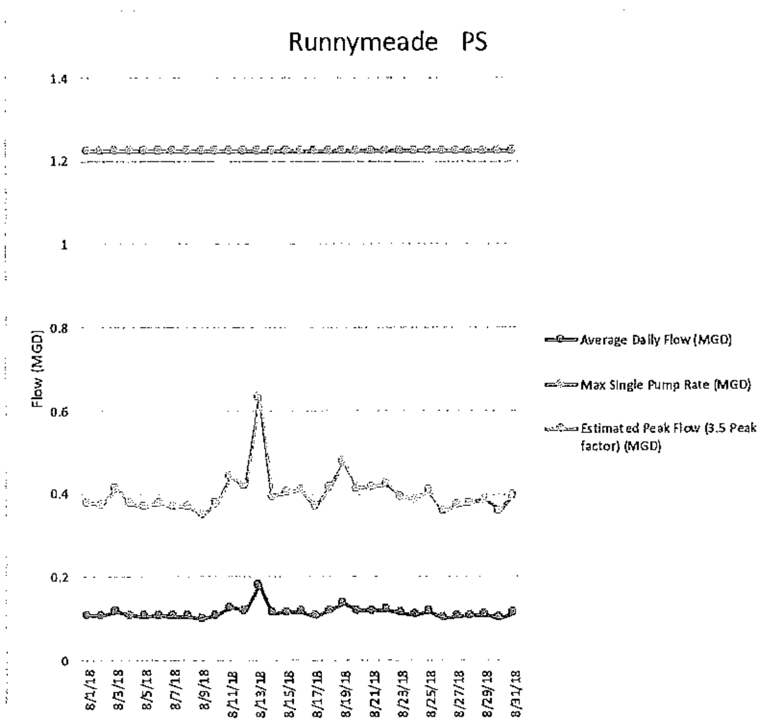
Min	0.102
Max	0.129
Ave	0.113

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.107701	0.377	1.224
7/2/18	0.10913	0.382	1.224
7/3/18	0.100917	0.353	1.224
7/4/18	0.092346	0.323	1.224
7/5/18	0.097365	0.341	1.224
7/6/18	0.103677	0.363	1.224
7/7/18	0.104269	0.365	1.224
7/8/18	0.10322	0.361	1.224
7/9/18	0.101204	0.354	1.224
7/10/18	0.102265	0.358	1.224
7/11/18	0.108181	0.379	1.224
7/12/18	0.107655	0.377	1.224
7/13/18	0.095913	0.336	1.224
7/14/18	0.102758	0.360	1.224
7/15/18	0.10742	0.376	1.224
7/16/18	0.102776	0.360	1.224
7/17/18	0.100956	0.353	1.224
7/18/18	0.097517	0.341	1.224
7/19/18	0.103795	0.363	1.224
7/20/18	0.107018	0.375	1.224
7/21/18	0.10445	0.366	1.224
7/22/18	0.128864	0.451	1.224
7/23/18	0.10732	0.376	1.224
7/24/18	0.114034	0.399	1.224
7/25/18	0.116841	0.409	1.224
7/26/18	0.11265	0.394	1.224
7/27/18	0.108339	0.379	1.224
7/28/18	0.110616	0.387	1.224
7/29/18	0.104237	0.365	1.224
7/30/18	0.104409	0.365	1.224
7/31/18	0.105372	0.369	1.224



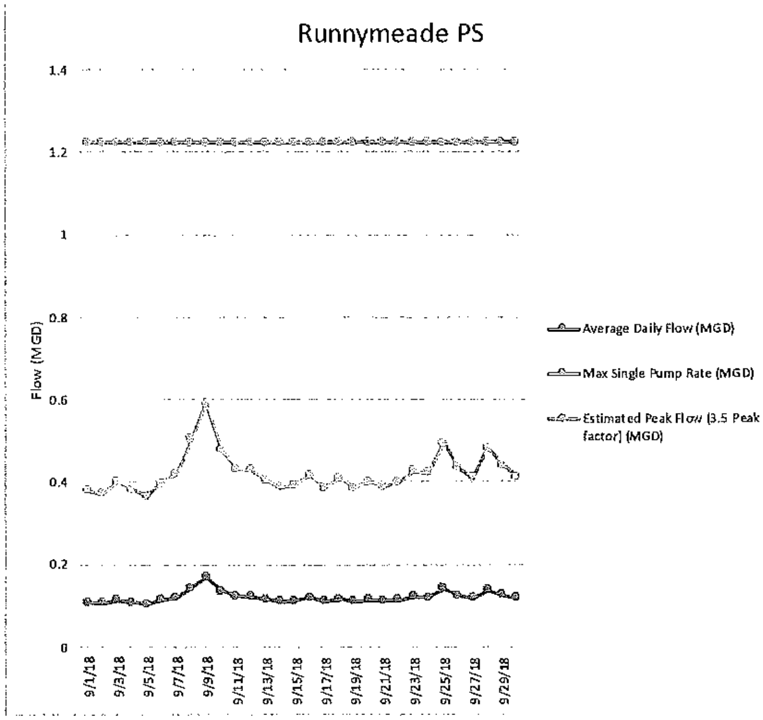
Min		0.092
Max		0.129
Ave		0.106

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.108073	0.378	1.224
8/2/18	0.106986	0.374	1.224
8/3/18	0.118061	0.413	1.224
8/4/18	0.107306	0.376	1.224
8/5/18	0.105302	0.369	1.224
8/6/18	0.107902	0.378	1.224
8/7/18	0.105305	0.369	1.224
8/8/18	0.105874	0.371	1.224
8/9/18	0.099684	0.349	1.224
8/10/18	0.107584	0.377	1.224
8/11/18	0.126335	0.442	1.224
8/12/18	0.119898	0.420	1.224
8/13/18	0.180892	0.633	1.224
8/14/18	0.112387	0.393	1.224
8/15/18	0.115383	0.404	1.224
8/16/18	0.116719	0.409	1.224
8/17/18	0.105274	0.368	1.224
8/18/18	0.118315	0.414	1.224
8/19/18	0.136342	0.477	1.224
8/20/18	0.118216	0.414	1.224
8/21/18	0.119264	0.417	1.224
8/22/18	0.120869	0.423	1.224
8/23/18	0.112313	0.393	1.224
8/24/18	0.110185	0.386	1.224
8/25/18	0.116297	0.407	1.224
8/26/18	0.10196	0.357	1.224
8/27/18	0.106273	0.372	1.224
8/28/18	0.108104	0.378	1.224
8/29/18	0.110178	0.386	1.224
8/30/18	0.102606	0.359	1.224
8/31/18	0.113706	0.398	1.224



Min	0.100
Max	0.181
Ave	0.114

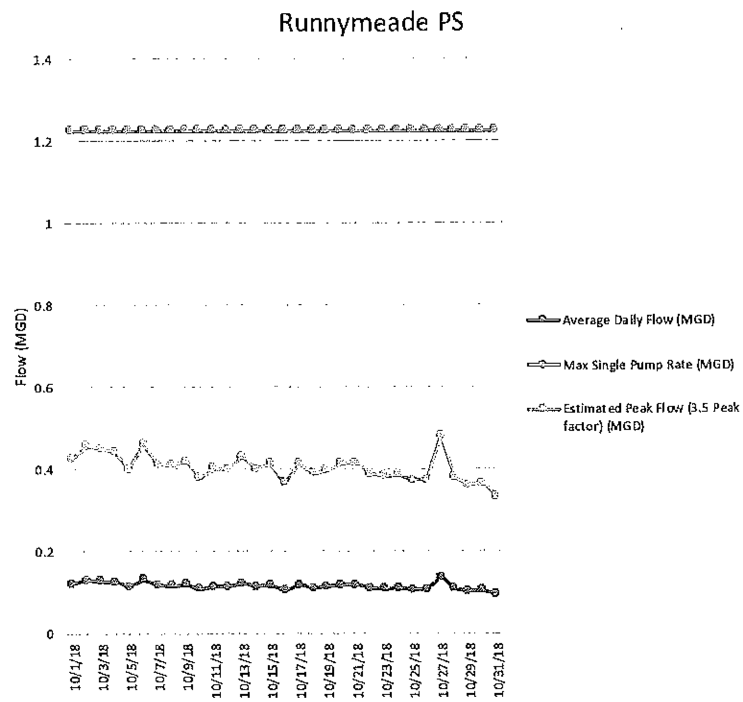
Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.108622	0.380	1.224
9/2/18	0.106215	0.372	1.224
9/3/18	0.114783	0.402	1.224
9/4/18	0.108881	0.381	1.224
9/5/18	0.104719	0.367	1.224
9/6/18	0.113317	0.397	1.224
9/7/18	0.120209	0.421	1.224
9/8/18	0.14397	0.504	1.224
9/9/18	0.169004	0.592	1.224
9/10/18	0.136052	0.476	1.224
9/11/18	0.123479	0.432	1.224
9/12/18	0.122591	0.429	1.224
9/13/18	0.115742	0.405	1.224
9/14/18	0.110406	0.386	1.224
9/15/18	0.112043	0.392	1.224
9/16/18	0.119225	0.417	1.224
9/17/18	0.110263	0.386	1.224
9/18/18	0.116838	0.409	1.224
9/19/18	0.10978	0.384	1.224
9/20/18	0.114694	0.401	1.224
9/21/18	0.111328	0.390	1.224
9/22/18	0.113917	0.399	1.224
9/23/18	0.121945	0.427	1.224
9/24/18	0.120899	0.423	1.224
9/25/18	0.141174	0.494	1.224
9/26/18	0.123716	0.433	1.224
9/27/18	0.117501	0.411	1.224
9/28/18	0.138064	0.483	1.224
9/29/18	0.125665	0.440	1.224
9/30/18	0.11786	0.413	1.224



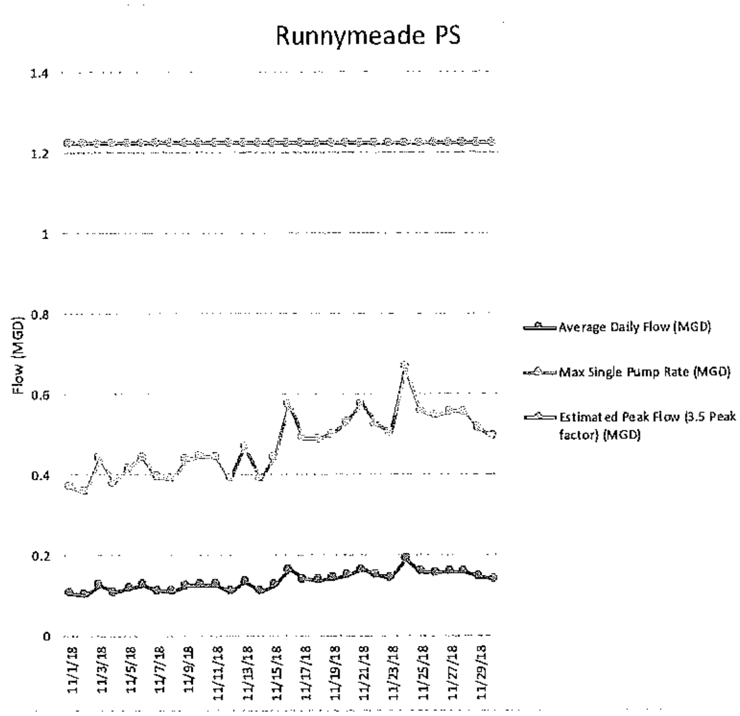
Min	0.105
Max	0.169
Ave	0.120

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.122477	0.429	1.224
10/2/18	0.130324	0.456	1.224
10/3/18	0.128661	0.450	1.224
10/4/18	0.126241	0.442	1.224
10/5/18	0.114239	0.400	1.224
10/6/18	0.131792	0.461	1.224
10/7/18	0.117509	0.411	1.224
10/8/18	0.117281	0.410	1.224
10/9/18	0.120192	0.421	1.224
10/10/18	0.108279	0.379	1.224
10/11/18	0.115045	0.403	1.224
10/12/18	0.11447	0.401	1.224
10/13/18	0.123077	0.431	1.224
10/14/18	0.11462	0.401	1.224
10/15/18	0.11837	0.414	1.224
10/16/18	0.104896	0.367	1.224
10/17/18	0.118395	0.414	1.224
10/18/18	0.111455	0.390	1.224
10/19/18	0.113712	0.398	1.224
10/20/18	0.118419	0.414	1.224
10/21/18	0.118852	0.416	1.224
10/22/18	0.11128	0.389	1.224
10/23/18	0.109441	0.383	1.224
10/24/18	0.110345	0.386	1.224
10/25/18	0.106453	0.373	1.224
10/26/18	0.106687	0.373	1.224
10/27/18	0.137762	0.482	1.224
10/28/18	0.108022	0.378	1.224
10/29/18	0.103171	0.361	1.224
10/30/18	0.104326	0.365	1.224
10/31/18	0.095442	0.334	1.224

Min	0.095
Max	0.138
Ave	0.116

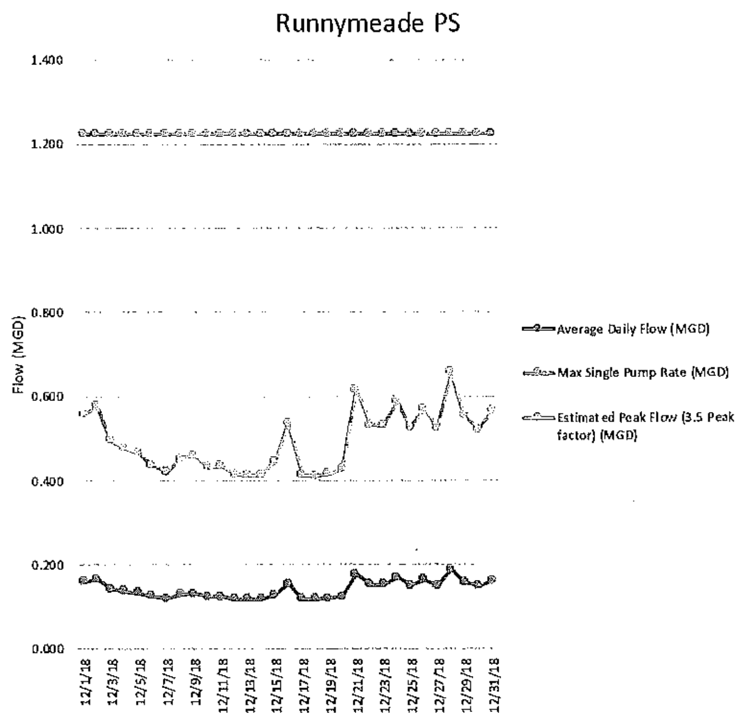


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.105923	0.3707305	1.224
11/2/18	0.102265	0.358	1.224
11/3/18	0.126598	0.443	1.224
11/4/18	0.108393	0.379	1.224
11/5/18	0.118769	0.416	1.224
11/6/18	0.126686	0.443	1.224
11/7/18	0.112532	0.394	1.224
11/8/18	0.111484	0.390	1.224
11/9/18	0.125373	0.439	1.224
11/10/18	0.127407	0.446	1.224
11/11/18	0.12692	0.444	1.224
11/12/18	0.111385	0.390	1.224
11/13/18	0.134357	0.470	1.224
11/14/18	0.111572	0.391	1.224
11/15/18	0.126989	0.444	1.224
11/16/18	0.164718	0.577	1.224
11/17/18	0.140145	0.491	1.224
11/18/18	0.139387	0.488	1.224
11/19/18	0.142675	0.499	1.224
11/20/18	0.151266	0.529	1.224
11/21/18	0.164362	0.575	1.224
11/22/18	0.149734	0.524	1.224
11/23/18	0.144225	0.505	1.224
11/24/18	0.190088	0.665	1.224
11/25/18	0.159194	0.557	1.224
11/26/18	0.155968	0.546	1.224
11/27/18	0.158914	0.556	1.224
11/28/18	0.158984	0.556	1.224
11/29/18	0.146975	0.514	1.224
11/30/18	0.141454	0.495	1.224



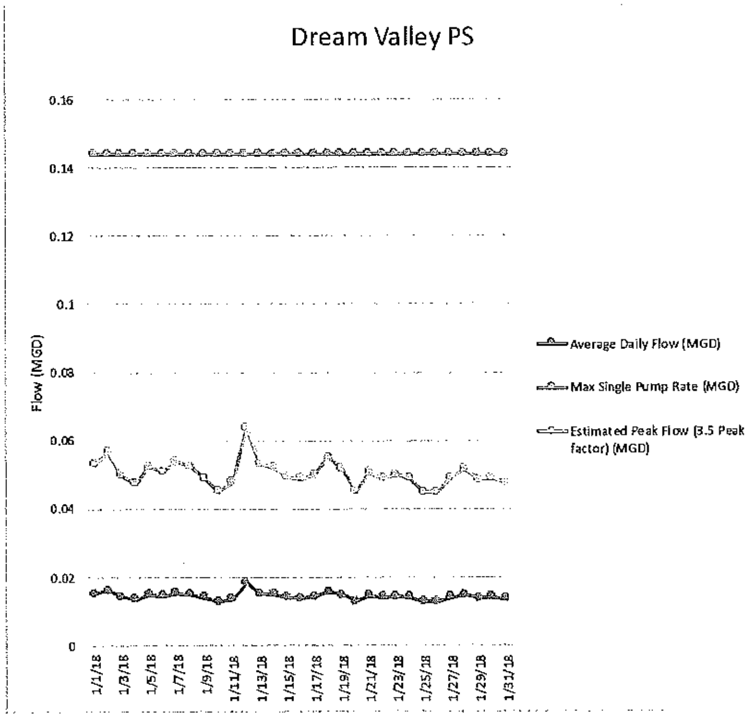
Min	0.102
Max	0.190
Ave	0.136

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.159021	0.557	1.224
12/2/18	0.164697	0.576	1.224
12/3/18	0.142049	0.497	1.224
12/4/18	0.136308	0.477	1.224
12/5/18	0.133295	0.467	1.224
12/6/18	0.12486	0.437	1.224
12/7/18	0.11968	0.419	1.224
12/8/18	0.129252	0.452	1.224
12/9/18	0.131395	0.460	1.224
12/10/18	0.123101	0.431	1.224
12/11/18	0.12415	0.435	1.224
12/12/18	0.118159	0.414	1.224
12/13/18	0.117875	0.413	1.224
12/14/18	0.117622	0.412	1.224
12/15/18	0.126764	0.444	1.224
12/16/18	0.153118	0.536	1.224
12/17/18	0.117895	0.413	1.224
12/18/18	0.117246	0.410	1.224
12/19/18	0.118864	0.416	1.224
12/20/18	0.122356	0.428	1.224
12/21/18	0.176321	0.617	1.224
12/22/18	0.152158	0.533	1.224
12/23/18	0.151745	0.531	1.224
12/24/18	0.168268	0.589	1.224
12/25/18	0.149876	0.525	1.224
12/26/18	0.163109	0.571	1.224
12/27/18	0.149807	0.524	1.224
12/28/18	0.187741	0.657	1.224
12/29/18	0.158322	0.554	1.224
12/30/18	0.148989	0.521	1.224
12/31/18	0.161293	0.565	1.224



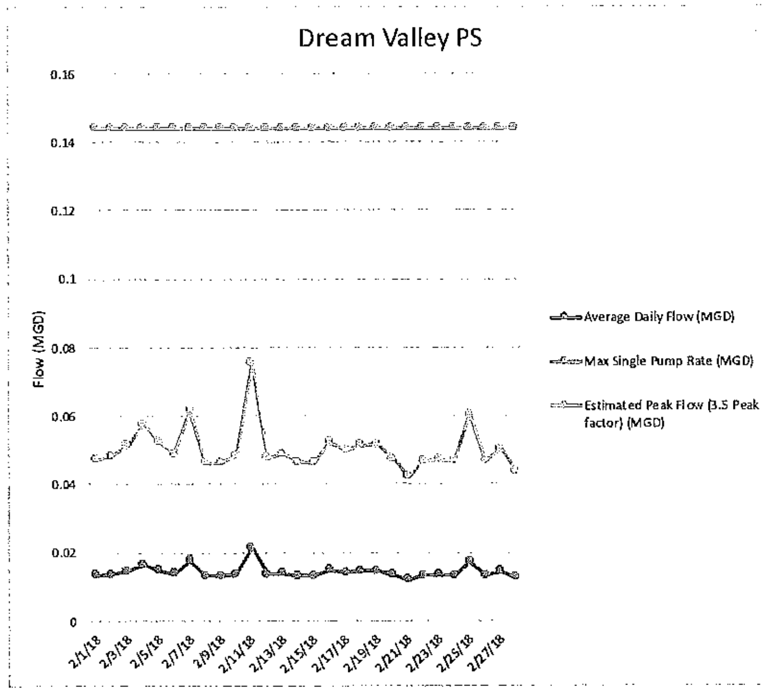
Min	0.117
Max	0.188
Ave	0.141

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
1/1/18	0.0151488	0.053	0.144
1/2/18	0.0162	0.057	0.144
1/3/18	0.0142272	0.050	0.144
1/4/18	0.0135648	0.047	0.144
1/5/18	0.0149472	0.052	0.144
1/6/18	0.0145296	0.051	0.144
1/7/18	0.0154368	0.054	0.144
1/8/18	0.0149184	0.052	0.144
1/9/18	0.0140256	0.049	0.144
1/10/18	0.0128592	0.045	0.144
1/11/18	0.0136656	0.048	0.144
1/12/18	0.0182592	0.064	0.144
1/13/18	0.0152064	0.053	0.144
1/14/18	0.0148608	0.052	0.144
1/15/18	0.0140976	0.049	0.144
1/16/18	0.0139248	0.049	0.144
1/17/18	0.0142848	0.050	0.144
1/18/18	0.0157392	0.055	0.144
1/19/18	0.0147168	0.052	0.144
1/20/18	0.0128736	0.045	0.144
1/21/18	0.0144576	0.051	0.144
1/22/18	0.0139824	0.049	0.144
1/23/18	0.014256	0.050	0.144
1/24/18	0.0139824	0.049	0.144
1/25/18	0.012816	0.045	0.144
1/26/18	0.012816	0.045	0.144
1/27/18	0.01404	0.049	0.144
1/28/18	0.0147168	0.052	0.144
1/29/18	0.0138672	0.049	0.144
1/30/18	0.013968	0.049	0.144
1/31/18	0.0136512	0.048	0.144

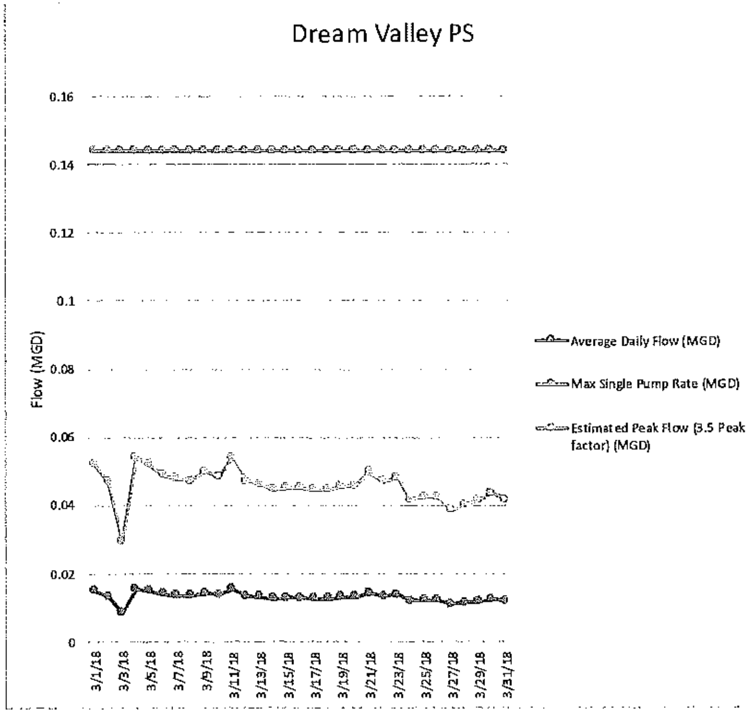


Min	0.013
Max	0.018
Ave	0.014

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
2/1/18	0.0135072	0.047	0.144
2/2/18	0.013824	0.048	0.144
2/3/18	0.0146736	0.051	0.144
2/4/18	0.0164736	0.058	0.144
2/5/18	0.0150192	0.053	0.144
2/6/18	0.013968	0.049	0.144
2/7/18	0.0176112	0.062	0.144
2/8/18	0.0132336	0.046	0.144
2/9/18	0.013248	0.046	0.144
2/10/18	0.0138528	0.048	0.144
2/11/18	0.0216288	0.076	0.144
2/12/18	0.0136512	0.048	0.144
2/13/18	0.0139392	0.049	0.144
2/14/18	0.0132768	0.046	0.144
2/15/18	0.013248	0.046	0.144
2/16/18	0.0149904	0.052	0.144
2/17/18	0.0142704	0.050	0.144
2/18/18	0.0147168	0.052	0.144
2/19/18	0.0147744	0.052	0.144
2/20/18	0.0135504	0.047	0.144
2/21/18	0.012024	0.042	0.144
2/22/18	0.0133488	0.047	0.144
2/23/18	0.0135072	0.047	0.144
2/24/18	0.0133776	0.047	0.144
2/25/18	0.0172656	0.060	0.144
2/26/18	0.0133632	0.047	0.144
2/27/18	0.0143568	0.050	0.144
2/28/18	0.0124848	0.044	0.144

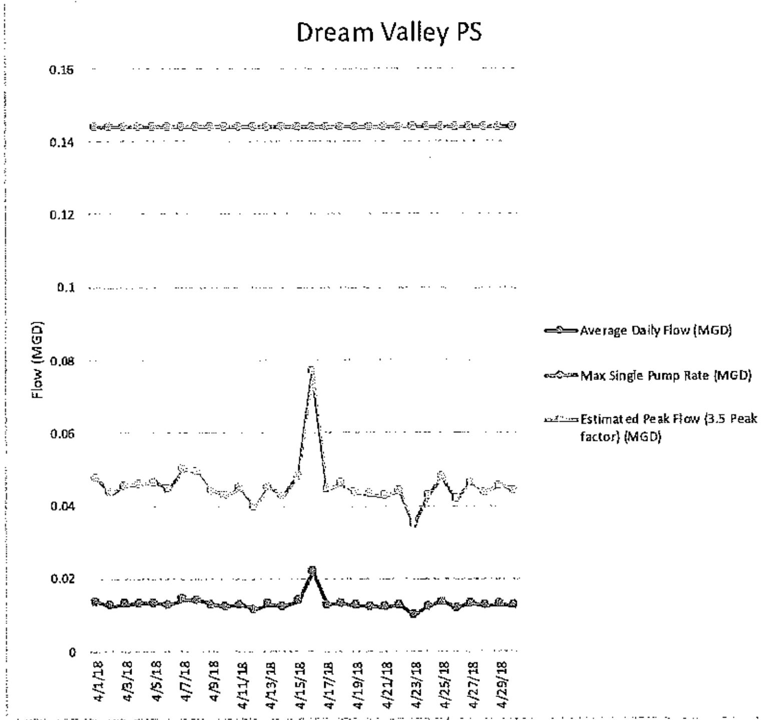


Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
3/1/18	0.0148608	0.052	0.144
3/2/18	0.0134352	0.047	0.144
3/3/18	0.0084096	0.029	0.144
3/4/18	0.0155088	0.054	0.144
3/5/18	0.0148608	0.052	0.144
3/6/18	0.0139392	0.049	0.144
3/7/18	0.01368	0.048	0.144
3/8/18	0.0134928	0.047	0.144
3/9/18	0.014256	0.050	0.144
3/10/18	0.013824	0.048	0.144
3/11/18	0.0154944	0.054	0.144
3/12/18	0.013464	0.047	0.144
3/13/18	0.0132336	0.046	0.144
3/14/18	0.0127584	0.045	0.144
3/15/18	0.012888	0.045	0.144
3/16/18	0.0129024	0.045	0.144
3/17/18	0.012744	0.045	0.144
3/18/18	0.012744	0.045	0.144
3/19/18	0.013032	0.046	0.144
3/20/18	0.013104	0.046	0.144
3/21/18	0.0142128	0.050	0.144
3/22/18	0.0134496	0.047	0.144
3/23/18	0.013752	0.048	0.144
3/24/18	0.01188	0.042	0.144
3/25/18	0.0121536	0.043	0.144
3/26/18	0.0121104	0.042	0.144
3/27/18	0.0110304	0.039	0.144
3/28/18	0.0114912	0.040	0.144
3/29/18	0.011808	0.041	0.144
3/30/18	0.012456	0.044	0.144
3/31/18	0.0119088	0.042	0.144



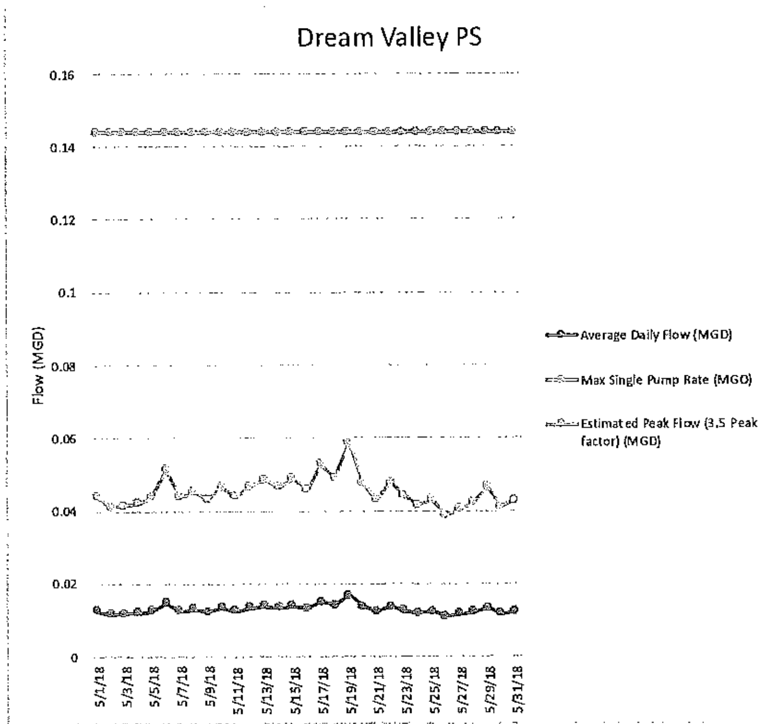
Min	0.008
Max	0.016
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
4/1/18	0.0135792	0.048	0.144
4/2/18	0.0123984	0.043	0.144
4/3/18	0.0129888	0.045	0.144
4/4/18	0.0130752	0.046	0.144
4/5/18	0.013248	0.046	0.144
4/6/18	0.0127152	0.045	0.144
4/7/18	0.0142992	0.050	0.144
4/8/18	0.0141264	0.049	0.144
4/9/18	0.0126144	0.044	0.144
4/10/18	0.01224	0.043	0.144
4/11/18	0.012816	0.045	0.144
4/12/18	0.0113328	0.040	0.144
4/13/18	0.0128592	0.045	0.144
4/14/18	0.0122112	0.043	0.144
4/15/18	0.0137664	0.048	0.144
4/16/18	0.0218592	0.077	0.144
4/17/18	0.0126864	0.044	0.144
4/18/18	0.0131472	0.046	0.144
4/19/18	0.012456	0.044	0.144
4/20/18	0.0122976	0.043	0.144
4/21/18	0.0121392	0.042	0.144
4/22/18	0.0126144	0.044	0.144
4/23/18	0.0099216	0.035	0.144
4/24/18	0.0121824	0.043	0.144
4/25/18	0.01368	0.048	0.144
4/26/18	0.01188	0.042	0.144
4/27/18	0.013248	0.046	0.144
4/28/18	0.0124416	0.044	0.144
4/29/18	0.0129744	0.045	0.144
4/30/18	0.0125856	0.044	0.144



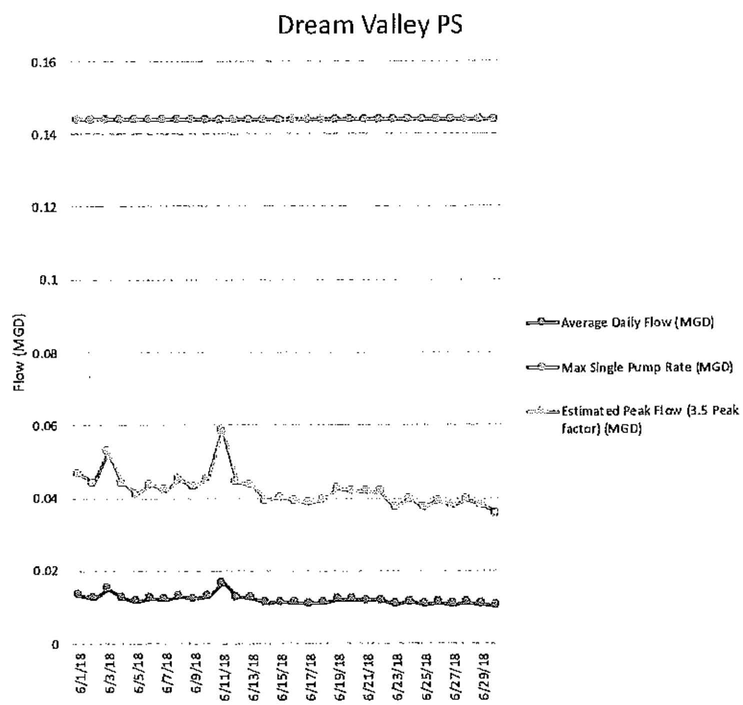
Min	0.010
Max	0.022
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
5/1/18	0.0125568	0.044	0.144
5/2/18	0.0117072	0.041	0.144
5/3/18	0.0118368	0.041	0.144
5/4/18	0.0120384	0.042	0.144
5/5/18	0.012528	0.044	0.144
5/6/18	0.014688	0.051	0.144
5/7/18	0.012528	0.044	0.144
5/8/18	0.012888	0.045	0.144
5/9/18	0.0123696	0.043	0.144
5/10/18	0.0132768	0.046	0.144
5/11/18	0.0125568	0.044	0.144
5/12/18	0.0133344	0.047	0.144
5/13/18	0.0138384	0.048	0.144
5/14/18	0.0132912	0.047	0.144
5/15/18	0.013896	0.049	0.144
5/16/18	0.013104	0.046	0.144
5/17/18	0.0150336	0.053	0.144
5/18/18	0.0139824	0.049	0.144
5/19/18	0.0167904	0.059	0.144
5/20/18	0.013536	0.047	0.144
5/21/18	0.0122832	0.043	0.144
5/22/18	0.0135792	0.048	0.144
5/23/18	0.0125856	0.044	0.144
5/24/18	0.0118224	0.041	0.144
5/25/18	0.0122688	0.043	0.144
5/26/18	0.0110592	0.039	0.144
5/27/18	0.0115344	0.040	0.144
5/28/18	0.0120384	0.042	0.144
5/29/18	0.0132624	0.046	0.144
5/30/18	0.0117216	0.041	0.144
5/31/18	0.0122112	0.043	0.144



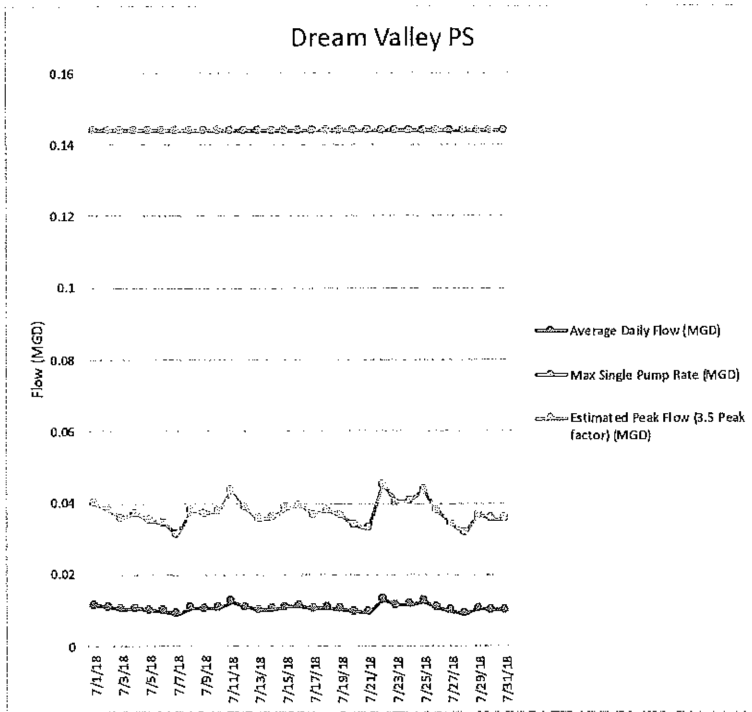
Min	0.011
Max	0.017
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
6/1/18	0.0133632	0.047	0.144
6/2/18	0.0125856	0.044	0.144
6/3/18	0.0150768	0.053	0.144
6/4/18	0.0125712	0.044	0.144
6/5/18	0.0117072	0.041	0.144
6/6/18	0.012456	0.044	0.144
6/7/18	0.0120528	0.042	0.144
6/8/18	0.0129312	0.045	0.144
6/9/18	0.0122976	0.043	0.144
6/10/18	0.0130032	0.046	0.144
6/11/18	0.0167904	0.059	0.144
6/12/18	0.0126432	0.044	0.144
6/13/18	0.0124992	0.044	0.144
6/14/18	0.0112176	0.039	0.144
6/15/18	0.011448	0.040	0.144
6/16/18	0.0111888	0.039	0.144
6/17/18	0.0110448	0.039	0.144
6/18/18	0.0112464	0.039	0.144
6/19/18	0.012168	0.043	0.144
6/20/18	0.0119808	0.042	0.144
6/21/18	0.0119232	0.042	0.144
6/22/18	0.0118944	0.042	0.144
6/23/18	0.0106704	0.037	0.144
6/24/18	0.0113472	0.040	0.144
6/25/18	0.010656	0.037	0.144
6/26/18	0.0112032	0.039	0.144
6/27/18	0.0107856	0.038	0.144
6/28/18	0.0112464	0.039	0.144
6/29/18	0.0108144	0.038	0.144
6/30/18	0.0102096	0.036	0.144



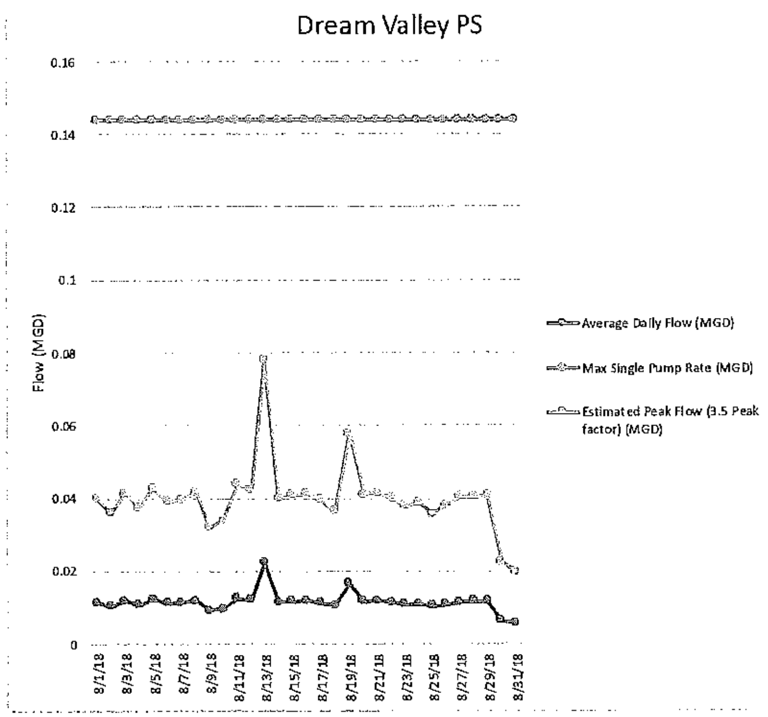
Min	0.010
Max	0.017
Ave	0.012

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
7/1/18	0.0114192	0.040	0.144
7/2/18	0.0109008	0.038	0.144
7/3/18	0.0101952	0.036	0.144
7/4/18	0.0105552	0.037	0.144
7/5/18	0.0100368	0.035	0.144
7/6/18	0.0098496	0.034	0.144
7/7/18	0.0089424	0.031	0.144
7/8/18	0.0108	0.038	0.144
7/9/18	0.0105552	0.037	0.144
7/10/18	0.0107568	0.038	0.144
7/11/18	0.0124992	0.044	0.144
7/12/18	0.0110448	0.039	0.144
7/13/18	0.0101664	0.036	0.144
7/14/18	0.0102672	0.036	0.144
7/15/18	0.0110304	0.039	0.144
7/16/18	0.0111888	0.039	0.144
7/17/18	0.0104832	0.037	0.144
7/18/18	0.0108144	0.038	0.144
7/19/18	0.0103968	0.036	0.144
7/20/18	0.0096336	0.034	0.144
7/21/18	0.0093744	0.033	0.144
7/22/18	0.0128448	0.045	0.144
7/23/18	0.0114336	0.040	0.144
7/24/18	0.0115632	0.040	0.144
7/25/18	0.0124128	0.043	0.144
7/26/18	0.0107424	0.038	0.144
7/27/18	0.0097776	0.034	0.144
7/28/18	0.0089856	0.031	0.144
7/29/18	0.0104256	0.036	0.144
7/30/18	0.0101376	0.035	0.144
7/31/18	0.0101664	0.036	0.144



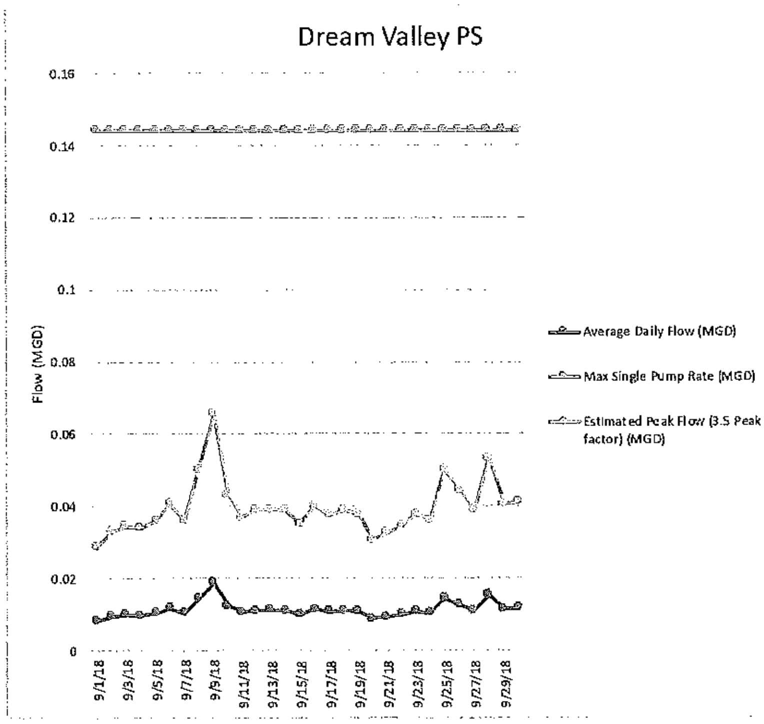
Min	0.009
Max	0.013
Ave	0.011

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
8/1/18	0.0113904	0.040	0.144
8/2/18	0.0102816	0.036	0.144
8/3/18	0.0118224	0.041	0.144
8/4/18	0.0106848	0.037	0.144
8/5/18	0.0121968	0.043	0.144
8/6/18	0.0111168	0.039	0.144
8/7/18	0.0113184	0.040	0.144
8/8/18	0.0119088	0.042	0.144
8/9/18	0.0091152	0.032	0.144
8/10/18	0.0096768	0.034	0.144
8/11/18	0.0125424	0.044	0.144
8/12/18	0.0121104	0.042	0.144
8/13/18	0.022248	0.078	0.144
8/14/18	0.0114192	0.040	0.144
8/15/18	0.0116352	0.041	0.144
8/16/18	0.011808	0.041	0.144
8/17/18	0.0112464	0.039	0.144
8/18/18	0.0104112	0.036	0.144
8/19/18	0.0165168	0.058	0.144
8/20/18	0.0116928	0.041	0.144
8/21/18	0.0118368	0.041	0.144
8/22/18	0.0114048	0.040	0.144
8/23/18	0.0107424	0.038	0.144
8/24/18	0.0110592	0.039	0.144
8/25/18	0.010224	0.036	0.144
8/26/18	0.0108	0.038	0.144
8/27/18	0.0115056	0.040	0.144
8/28/18	0.01152	0.040	0.144
8/29/18	0.0116496	0.041	0.144
8/30/18	0.0064224	0.022	0.144
8/31/18	0.0055872	0.020	0.144



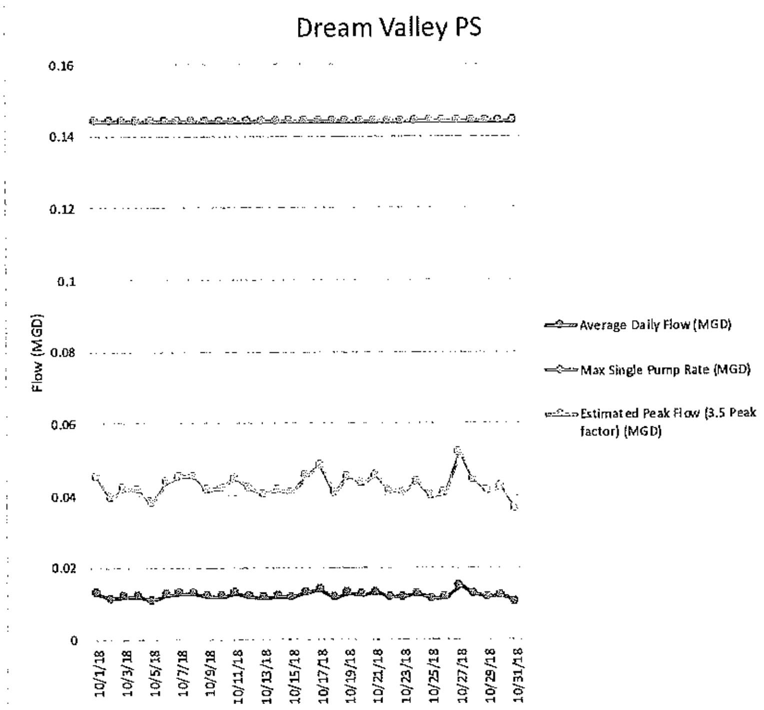
Min	0.006
Max	0.022
Ave	0.011

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
9/1/18	0.0082656	0.029	0.144
9/2/18	0.0094896	0.033	0.144
9/3/18	0.009864	0.035	0.144
9/4/18	0.0096912	0.034	0.144
9/5/18	0.0103104	0.036	0.144
9/6/18	0.0116064	0.041	0.144
9/7/18	0.0102816	0.036	0.144
9/8/18	0.0142848	0.050	0.144
9/9/18	0.0187344	0.066	0.144
9/10/18	0.0123264	0.043	0.144
9/11/18	0.0105552	0.037	0.144
9/12/18	0.0111456	0.039	0.144
9/13/18	0.0111744	0.039	0.144
9/14/18	0.011088	0.039	0.144
9/15/18	0.0100224	0.035	0.144
9/16/18	0.0114192	0.040	0.144
9/17/18	0.0107568	0.038	0.144
9/18/18	0.011088	0.039	0.144
9/19/18	0.0108	0.038	0.144
9/20/18	0.0087552	0.031	0.144
9/21/18	0.0093024	0.033	0.144
9/22/18	0.0098352	0.034	0.144
9/23/18	0.0107712	0.038	0.144
9/24/18	0.0102672	0.036	0.144
9/25/18	0.0143136	0.050	0.144
9/26/18	0.0127008	0.044	0.144
9/27/18	0.0111168	0.039	0.144
9/28/18	0.0152352	0.053	0.144
9/29/18	0.0115776	0.041	0.144
9/30/18	0.0117216	0.041	0.144



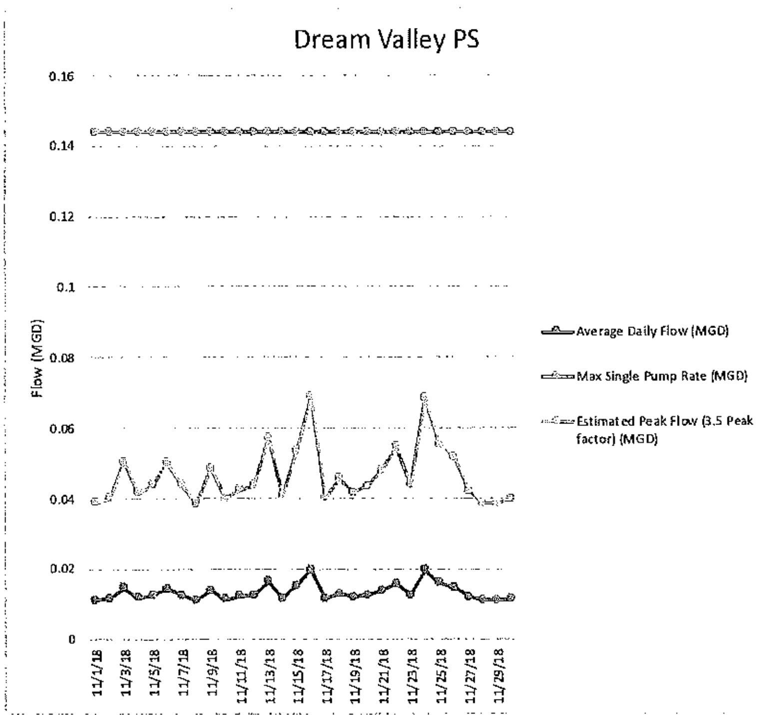
Min	0.008
Max	0.019
Ave	0.011

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
10/1/18	0.0129312	0.045	0.144
10/2/18	0.011232	0.039	0.144
10/3/18	0.0119664	0.042	0.144
10/4/18	0.0118944	0.042	0.144
10/5/18	0.0108144	0.038	0.144
10/6/18	0.0124704	0.044	0.144
10/7/18	0.01296	0.045	0.144
10/8/18	0.0129168	0.045	0.144
10/9/18	0.01188	0.042	0.144
10/10/18	0.0120384	0.042	0.144
10/11/18	0.0127872	0.045	0.144
10/12/18	0.0119664	0.042	0.144
10/13/18	0.0115632	0.040	0.144
10/14/18	0.0118656	0.042	0.144
10/15/18	0.0116928	0.041	0.144
10/16/18	0.0130176	0.046	0.144
10/17/18	0.013824	0.048	0.144
10/18/18	0.0115776	0.041	0.144
10/19/18	0.0129456	0.045	0.144
10/20/18	0.0123696	0.043	0.144
10/21/18	0.0130752	0.046	0.144
10/22/18	0.0117936	0.041	0.144
10/23/18	0.011664	0.041	0.144
10/24/18	0.0125568	0.044	0.144
10/25/18	0.0113184	0.040	0.144
10/26/18	0.0116208	0.041	0.144
10/27/18	0.0148752	0.052	0.144
10/28/18	0.0127152	0.045	0.144
10/29/18	0.011736	0.041	0.144
10/30/18	0.012096	0.042	0.144
10/31/18	0.0103824	0.036	0.144



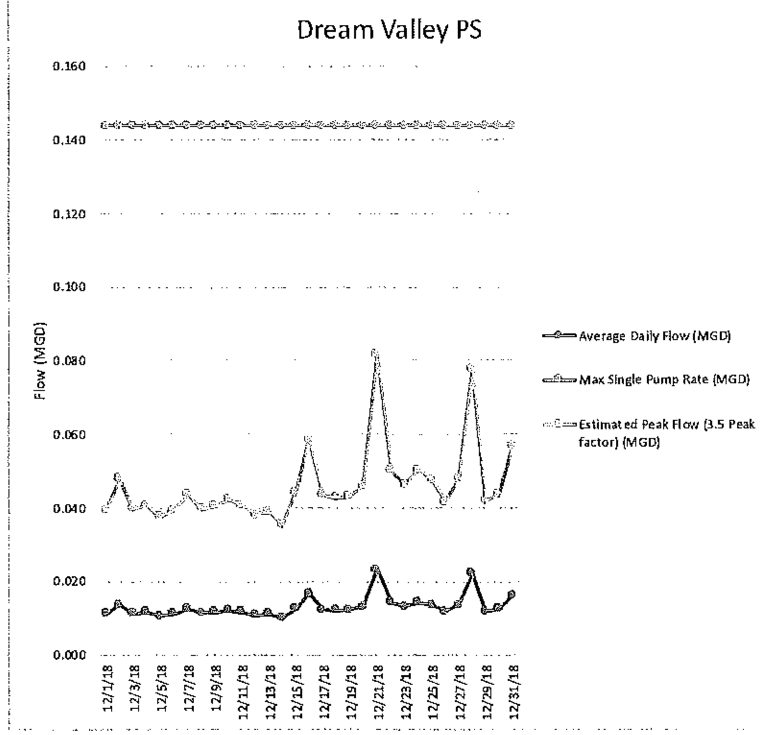
Min	0.010
Max	0.015
Ave	0.012

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
11/1/18	0.0110304	0.0386064	0.144
11/2/18	0.0114624	0.040	0.144
11/3/18	0.0144	0.050	0.144
11/4/18	0.011808	0.041	0.144
11/5/18	0.0125136	0.044	0.144
11/6/18	0.0142848	0.050	0.144
11/7/18	0.012456	0.044	0.144
11/8/18	0.0109728	0.038	0.144
11/9/18	0.0138672	0.049	0.144
11/10/18	0.0113616	0.040	0.144
11/11/18	0.0121104	0.042	0.144
11/12/18	0.0124848	0.044	0.144
11/13/18	0.016344	0.057	0.144
11/14/18	0.0116064	0.041	0.144
11/15/18	0.0152496	0.053	0.144
11/16/18	0.0196848	0.069	0.144
11/17/18	0.0114336	0.040	0.144
11/18/18	0.0129744	0.045	0.144
11/19/18	0.01188	0.042	0.144
11/20/18	0.0124272	0.043	0.144
11/21/18	0.0136944	0.048	0.144
11/22/18	0.0156096	0.055	0.144
11/23/18	0.0124848	0.044	0.144
11/24/18	0.0195264	0.068	0.144
11/25/18	0.0157968	0.055	0.144
11/26/18	0.0147888	0.052	0.144
11/27/18	0.0120096	0.042	0.144
11/28/18	0.0110016	0.039	0.144
11/29/18	0.011016	0.039	0.144
11/30/18	0.0113904	0.040	0.144



Min	0.011
Max	0.020
Ave	0.013

Date	Average Daily Flow (MGD)	Estimated Peak Flow (3.5 Peak factor) (MGD)	Max Single Pump Rate (MGD)
12/1/18	0.0112896	0.040	0.144
12/2/18	0.01368	0.048	0.144
12/3/18	0.0113328	0.040	0.144
12/4/18	0.0116208	0.041	0.144
12/5/18	0.0106848	0.037	0.144
12/6/18	0.0112752	0.039	0.144
12/7/18	0.012456	0.044	0.144
12/8/18	0.0113616	0.040	0.144
12/9/18	0.0116064	0.041	0.144
12/10/18	0.0120528	0.042	0.144
12/11/18	0.0116208	0.041	0.144
12/12/18	0.010872	0.038	0.144
12/13/18	0.0111744	0.039	0.144
12/14/18	0.0100656	0.035	0.144
12/15/18	0.0126144	0.044	0.144
12/16/18	0.0167472	0.059	0.144
12/17/18	0.0124416	0.044	0.144
12/18/18	0.0121824	0.043	0.144
12/19/18	0.0123264	0.043	0.144
12/20/18	0.0131328	0.046	0.144
12/21/18	0.0233712	0.082	0.144
12/22/18	0.0142992	0.050	0.144
12/23/18	0.0132768	0.046	0.144
12/24/18	0.0143712	0.050	0.144
12/25/18	0.0136656	0.048	0.144
12/26/18	0.0118944	0.042	0.144
12/27/18	0.01368	0.048	0.144
12/28/18	0.0221904	0.078	0.144
12/29/18	0.0119664	0.042	0.144
12/30/18	0.0125424	0.044	0.144
12/31/18	0.0162	0.057	0.144



Min	0.010
Max	0.023
Ave	0.013

Prospect Park Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION

Permittee Name:	**Borough of Prospect Park**	Permit No.:	**PAN/A**
Mailing Address:	**720 Maryland Ave**	Effective Date:	**N/A**
City, State, Zip:	**Prospect Park, PA 19076**	Expiration Date:	**N/A**
Contact Person:	**Deborah A. Hurst**	Renewal Due Date:	**N/A**
Title:	**Borough Secretary**	Municipality:	**Prospect Park Borough**
Phone:	**610-532-1007**	County:	**Delaware**
Email:	**dhurst@prospectparkborough.com**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

Check the appropriate boxes:

☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)

☐ List summarizing each extension or project attached (**Attachment**)

☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

Comments:

No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is attached.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

Borough personnel and equipment and outside contractors are utilized for sewer system operation and maintenance on an as-needed basis.

Prospect Park, in coordination with DELCORA, has flow metering equipment to monitor flows through the sanitary system. CSL Services, Inc. was contracted by DELCORA to calibrate and maintain the flow monitoring equipment throughout 2018. Calibration reports are maintained by DELCORA. Prospect Park utilizes flow data to assist in the identification of areas that require attention.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

No SSOs were reported for the 2018 calendar year.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Deborah A. Hurst	Deborah A. Hurst
Name of Responsible Official	Signature
610-532-1007	2-21-2019
Telephone No.	Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Elizabeth A. Catania	Elizabeth A Catania
Name of Preparer	Signature
610-532-2884	2/21/19
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment P

Reporting Year: 2018

Facility Name: Prospect Park Borough - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	1.15803	1.09747	0.82466	0.82466	0.77381
February	1.57221	0.97901	1.17092	1.17092	1.0764
March	1.3104	1.35713	0.95968	0.95968	1.15895
April	1.41543	1.03937	0.87683	0.87683	0.8715
May	1.28858	0.74754	1.09906	1.09906	0.90401
June	0.97335	0.89789	0.79768	0.79768	0.82415
July	0.85512	0.79123	0.76977	0.76977	0.65529
August	0.80649	0.60719	0.63984	0.63984	0.71257
September	0.76855	0.60953	0.67396	0.67396	0.85397
October	0.74641	0.691	0.64077	0.64077	0.82906
November	0.88797	0.64289	0.65597	0.65597	1.22856
December	0.96198	0.89046	0.79908	0.79908	1.15834
Annual Avg	1.06204343	0.86255895	0.82568555	0.82568555	0.92055037
Max 3-Mo Avg	1.43268104	1.14453697	1.00247735	1.00247735	1.07198786
Max : Avg Ratio	1.35	1.33	1.21	1.21	1.16
Existing EDUs	4,138.0	4,138.0	4,138.0	4,138.0	4,138.0
Flow/EDU (GPD)	256.7	208.4	199.5	199.5	222.5
Flow/Capita (GPD)	73.3	59.6	57.0	57.0	63.6
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	4,138	4,138	4,138	4,138	4,138
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0002	0.0002	0.0002	0.0002	0.0002
Proj. Annual Avg	0.8995	0.8997	0.8999	0.9001	0.9003
Proj. Max 3-Mo Avg	1.12773	1.12798	1.12823	1.12849	1.12874
Proj. Overload?					

Projected BOD5 Loads for Next Five Years (lbs/day)

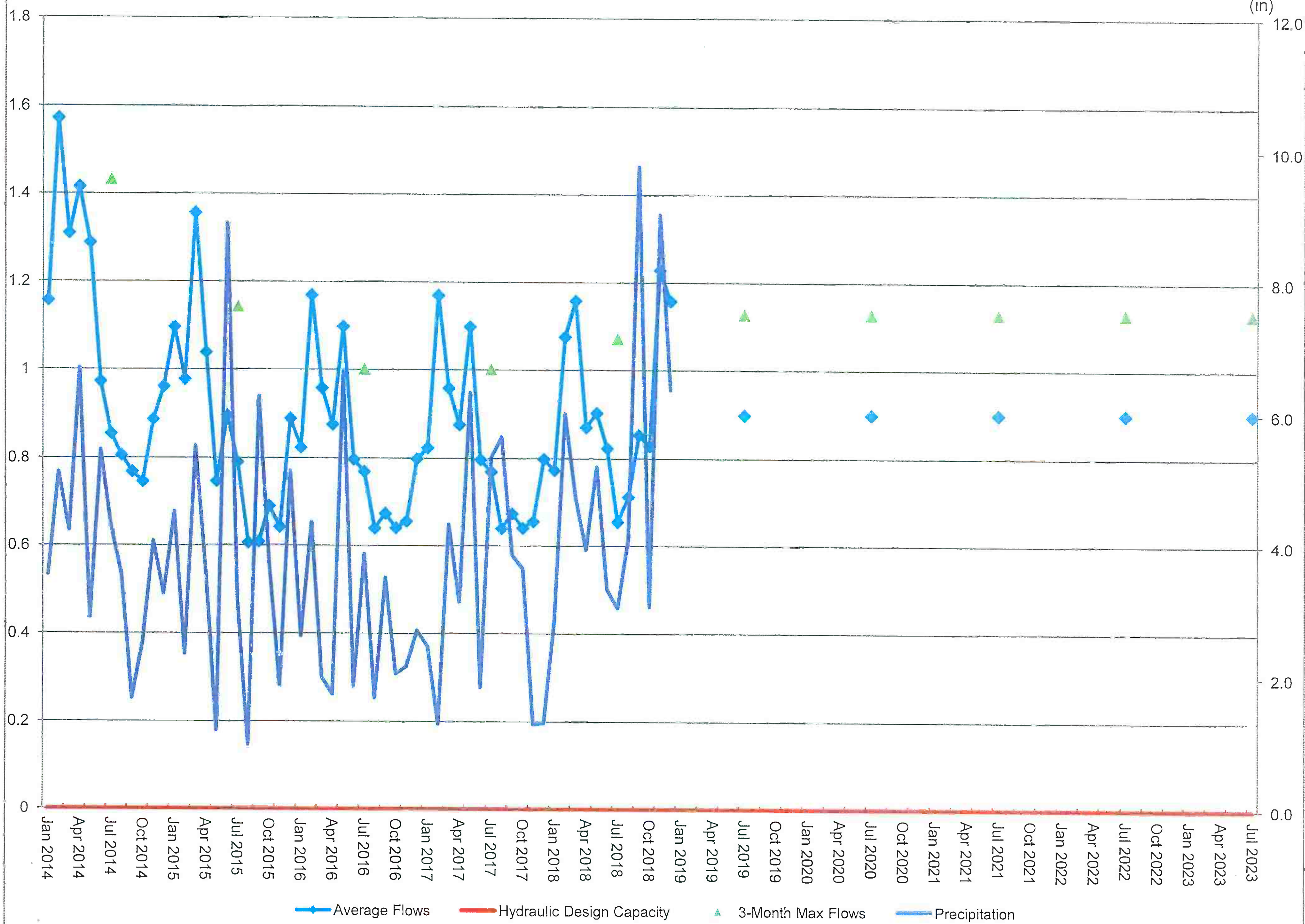
	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38

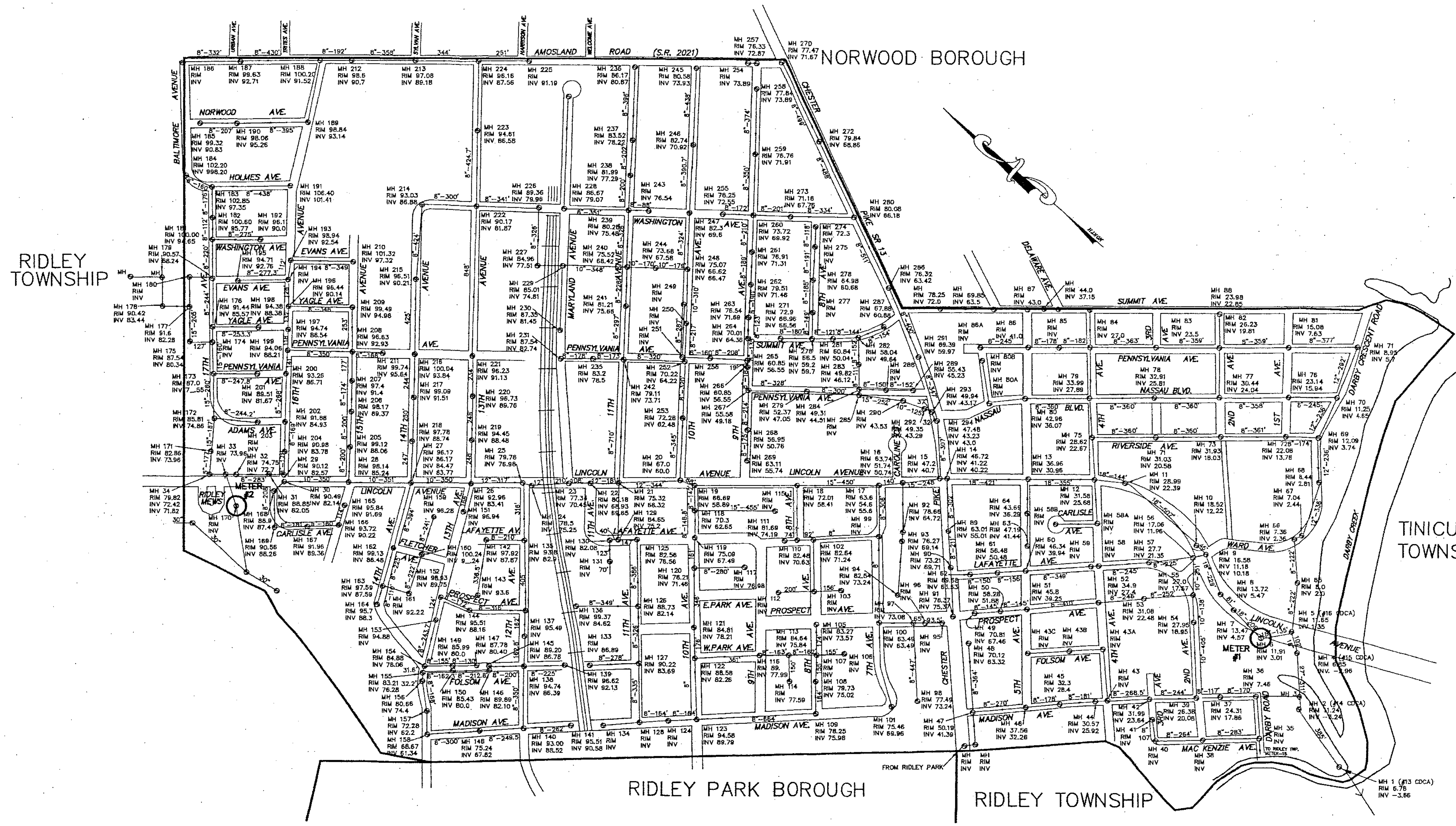
5-Year Measured and Projected Hydraulic Loads



PROSPECT PARK BOROUGH MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	Outside EDUs	January			February			March			April			May			June			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Off Lincoln Avenue (SR-420, near Darby Creek)	2,601	306	16,022,197	200	*-1,792,722*	19,787,203	273	*-2,276,042*	23,137,515	290	*-2,488,989*	17,459,864	225	*-1,993,283*	18,951,742	238	*-1,989,047*	16,941,569	221	*-1,704,111*	Outside flow from Ridley Park Borough's Meter No.: 11
2	Off Lincoln Avenue (SR-420, near 16th Avenue)	715	283	6428072	314	*-2,225,453*	9,227,944	535	*-2,753,560*	10,322,264	520	*-3,364,582*	7,399,424	357	*-2,776,623*	7,553,992	341	*-2,983,292*	6,201,008	290	*-2,440,542*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	822		5,555,989	218		7,229,966	314		8,321,343	327		6,055,545	246		6,490,814	255		5,726,547	232		Use average EDU from all Propsect meters for estimate
	TOTAL	**4,138**	**589**	**23,988,083**			**31,215,511**			**35,927,551**			**26,144,927**			**28,024,209**			**24,724,471**			

Meter No.	Meter Location	Total EDUs	Outside EDUs	July			August			September			October			November			December			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Off Lincoln Avenue (SR-420, near Darby Creek)	2,601	306	14,066,073	175	*-1,593,580*	14,711,588	*185*	-1,576,696	16,556,660	217	-1,614,414	17,135,971	218	*-1,649,664*	22,763,598	300	*-2,112,508*	22,442,867	288	*-1,983,090*	Outside flow from Ridley Park Borough's Meter No.: 11
2	Off Lincoln Avenue (SR-420, near 16th Avenue)	715	283	5,091,727	234	*-1,955,167*	5,900,829	*287*	-2,062,353	7,017,838	366	-2,274,844	6,454,499	318	*-2,192,657*	10,716,257	592	*-3,047,116*	10,084,752	533	*-2,952,827*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	822		4,705,039	185		5,116,285	*201*		5,933,725	241		5,952,687	234		8,536,571	346		8,316,971	326		Use average EDU from all Propsect meters for estimate
	TOTAL	**4,138**	**589**	**20,314,092**			**22,089,653**			**25,618,965**			**25,700,836**			**36,856,802**			**35,908,673**			



GRAPHIC SCALE

(IN FEET)
1 inch = 300 ft.

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NO.	DATE	REVISION	DWN. BY	CKD. BY
1	2/14/13	UPDATE	J.M.D	D.A.

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers

520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL ENGINEER
ELIZABETH A. CATANIA

SANITARY SEWER MAP
BOROUGH OF PROSPECT PARK

BOROUGH OF PROSPECT PARK — DELAWARE COUNTY, PA.

DWN. BY J.M.D.	DSG. BY	FIELD BOOK/PAGE	SCALE 1" = 300'	DRAWING NO. 84300 112-PV-08
CKD. BY E.A.C.			DATE 09-17-08	SHEET 1 OF 1 SHEETS

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging into Prospect Park Borough Sewers. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits for the Borough system.

Ridley Park Borough

Ridley Park Borough

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF POINT AND NON-POINT SOURCE MANAGEMENT

CHAPTER 94 MUNICIPAL WASTELOAD MANAGEMENT ANNUAL REPORT

For Calendar Year: 2018

☐ Permittee is owner and/or operator of a POTW or other sewage treatment facility
☒ Permittee is owner and/or operator of a collection system tributary to a POTW not owned/operated by permittee

GENERAL INFORMATION			
Permittee Name:	**Borough of Ridley Park**	Permit No.:	**PAN/A**
Mailing Address:	**105 East Ward Street**	Effective Date:	**N/A**
City, State, Zip:	**Ridley Park, PA 19078**	Expiration Date:	**N/A**
Contact Person:	**Richard Tutak**	Renewal Due Date:	**N/A**
Title:	**Borough Manager**	Municipality:	**Ridley Park Borough**
Phone:	**610-532-2100**	County:	**Delaware**
Email:	**manager@ridleyparkborough.org**	Consultant Name:	**Catania Engineering Associates, Inc.**

CHAPTER 94 REPORT COMPONENTS

1. Attach to this report a line graph depicting the monthly average flows (expressed in MGD) for each month for the past 5 years and projecting the flows for the next 5 years. The graph must also include a line depicting the hydraulic design capacity per the WQM permit. (25 Pa. Code § 94.12(a)(1))

   Check the appropriate boxes:
   ☐ Line graph for flows attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 1 is not applicable (report is for a collection system).

2. Attach to this report a line graph depicting the monthly average organic loads (express as lbs BOD5/day) for each month for the past 5 years and projecting the organic loads for the next 5 years. The graph must also include a line depicting the organic design capacity of the treatment plant per the WQM permit. (25 Pa. Code § 94.12(a)(2))

   Check the appropriate boxes:
   ☐ Line graph for organic loads attached (**Attachment**)
   ☐ DEP Chapter 94 Spreadsheet used (**Attachment**)
   ☒ Section 2 is not applicable (report is for a collection system).

3. If the DEP Chapter 94 Spreadsheet was not used to determine projections, discuss the basis for the hydraulic and organic projections. In all cases, include a description of the time needed to expand the plant to meet the load projections, if necessary, and data used to support the projections should be included in an appendix to this report. (25 Pa. Code § 94.12(a)(3))

   Please note that the Chapter 94 Spreadsheet was used to show monthly average flows and projections; it is understood that this report is for a collection system only.

4. Attach a map showing all sewer extensions constructed within the past calendar year, sewer extensions approved or exempted in the past year in accordance with Act 537 and Chapter 71, but not yet constructed, and all known proposed projects which require public sewers but are in the preliminary planning stages. The map must be accompanied by a list summarizing each extension or project and the population to be served by the extension or project. If a sewer extension approval or proposed project includes schedules describing how the project will be completed over time, the listing should include that information and the effect this build-out-rate will have on populations served. (25 Pa. Code § 94.12(a)(4))

   Check the appropriate boxes:

   ☐ Map showing sewer extensions constructed, approved/exempted but not yet constructed, and proposed projects attached (**Attachment**)
   ☐ List summarizing each extension or project attached (**Attachment**)
   ☐ Schedules describing how each project will be completed over time and effects attached (**Attachment**)

   Comments:

   No sewer extensions were constructed or approved within the past calendar year. A copy of the sanitary sewer system map is available upon request.

5. Discuss the permittee's program for sewer system monitoring, maintenance, repair and rehabilitation, including routine and special activities, personnel and equipment used, sampling frequency, quality assurance, data analyses, infiltration/inflow monitoring, and, where applicable, maintenance and control of combined sewer regulators during the past year. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(5))

   Borough forces are used for troubleshooting of the sanitary sewer system. Contract forces are used for routine maintenance.

   Ridley Park, in coordination with DELCORA has flow metering equipment to monitor flows through the sanitary system. CSL Services, Inc. was contracted by DELCORA to calibrate and maintain the flow monitoring equipment throughout 2018. Calibration reports are maintained by DELCORA. Ridley Park currently has 9 flow meters installed that monitor approximately 79% of the total flow throughout the Borough.

   Flow data is utilized to assist in the identification of areas that require attention.

6. Discuss the condition of the sewer system including portions of the system where conveyance capacity is being exceeded or will be exceeded in the next 5 years and portions where rehabilitation or cleaning is needed or is underway to maintain the integrity of the system and prevent or eliminate bypassing, CSOs, SSOs, excessive infiltration and other system problems. Attach a separate sheet if necessary. (25 Pa. Code § 94.12(a)(6))

Check the appropriate boxes:

☐ System experienced capacity-related bypassing, SSOs or surcharging during the report year. On a separate sheet, list the date, location, and reason for each bypass, SSO or surcharge event.

☒ System did not experience capacity-related bypassing, SSOs or surcharging during the report year.

Comments:

Based upon previous video inspections, the system is in fair to good condition. There are no known areas of capacity exceedance and no areas of capacity exceedance expected in the next five years.

Ridley Park had no SSOs in 2018.

7. Attach a discussion on the condition of sewage pumping (pump) stations. Include a comparison of the maximum pumping rate with present maximum flows and the projected 2-year maximum flows for each station. (25 Pa. Code § 94.12(a)(7))

Check the appropriate boxes:

☒ The collection system does not contain pump stations

☐ The collection system does contain pump stations (Number –)

☐ Discussion of condition of each pump station attached (**Attachment**)

8. If the sewage collection system receives industrial wastes (i.e., non-sanitary wastes), attach a report with the information listed below. (25 Pa. Code § 94.12(a)(8))

   a. A copy of any ordinance or regulation governing industrial waste discharges to the sewer system or a copy of amendments adopted since the initial submission of the ordinance or regulation under Chapter 94, if it has not previously been submitted.

   b. A discussion of the permittee's or 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 or at the plant, 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.

Check the appropriate boxes:

☒ Industrial waste report as described in 8 a., b. and c. attached (**Attachment**)

☐ Industrial pretreatment report as required in an NPDES permit attached (**Attachment**)

9. Existing or Projected Overload.

Check the appropriate boxes:

☐ This report demonstrates an existing hydraulic overload condition.
☐ This report demonstrates a projected hydraulic overload condition.
☐ This report demonstrates an existing organic overload condition.
☐ This report demonstrates a projected organic overload condition.

If one or more boxes above have been checked, attach a Corrective Action Plan (CAP) to reduce or eliminate present or projected overloaded conditions under §§ 94.21 and/or 94.22 (relating to existing overload and projected overload). (25 Pa. Code § 94.12(a)(9))

☐ Corrective Action Plan attached (**Attachment**)

10. Where required by the NPDES permit, attach a Sewage Sludge Management inventory that demonstrates a mass balance of solids coming in and leaving the facility over the previous calendar year.

☐ Sewage Sludge Management Inventory attached (**Attachment**)

11. For facilities with CSOs and where required by the NPDES permit, attach an Annual CSO Report (including satellite combined sewer systems).

☐ Annual CSO Report attached (**Attachment**)

12. For POTWs, attach a calibration report documenting that flow measuring, indicating and recording equipment has been calibrated annually. (25 Pa. Code § 94.13(b))

☐ Flow calibration report attached (**Attachment**)

RESPONSIBLE OFFICIAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unsworn falsification).

Richard Tutak
Name of Responsible Official

Signature

610-532-2100
Telephone No.

2/19/2019
Date

PREPARER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared by me or otherwise under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowledge of violations. See 18 Pa. C.S. § 4904 (relating to unswom falsification).

Charles Catania Jr.	Charles J Catania Jr
Name of Preparer	Signature
610-532-2884	2/19/19
Telephone No.	Date

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spread
Sewage Treatment Pl

Reporting Year: 2018

Facility Name: Ridley Park Borough - CDCA

Permit No.:

Persons/EDU: 3.5

Existing Hydraulic Design Capacity: MGD
Upgrade Planned in Next 5 Years? Year:
Future Hydraulic Design Capacity: MGD

Existing Organic Design Capacity: lbs BOD5/day
Upgrade Planned in Next 5 Years? Year:
Future Organic Design Capacity: lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2014	2015	2016	2017	2018
January	1.24542	1.1955	1.04015	0.87994	0.93702
February	1.46788	1.10392	1.29622	0.84909	1.2381
March	1.3186	1.56442	1.11378	1.05817	1.39923
April	1.38261	1.19006	0.95855	1.03113	1.21801
May	1.29731	1.04291	1.07091	1.03068	1.17681
June	1.08315	1.21052	0.91202	0.90997	1.0134
July	0.97393	1.12716	0.84291	0.96022	0.89188
August	0.92689	0.91466	0.77686	0.96441	0.91693
September	0.88205	0.90975	0.76382	0.88738	1.00837
October	0.88025	0.97091	0.75011	0.84808	0.97414
November	0.98609	0.86055	0.7531	0.81972	1.34496
December	1.06239	1.06553	0.85661	0.82404	1.27823
Annual Avg	1.12554659	1.09632416	0.92791913	0.92190374	1.11642496
Max 3-Mo Avg	1.38969386	1.28794766	1.15005105	1.0399938	1.28511563
Max : Avg Ratio	1.23	1.17	1.24	1.13	1.15
Existing EDUs	3,803.0	3,803.0	3,803.0	3,803.0	3,803.0
Flow/EDU (GPD)	296.0	288.3	244.0	242.4	293.6
Flow/Capita (GPD)	84.6	82.4	69.7	69.3	83.9
Exist. Overload?					

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2014	2015	2016	2017	2018
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Annual Avg					
Max Mo Avg					
Max : Avg Ratio					
Existing EDUs	3,803	3,803	3,803	3,803	3,803
Load/EDU					
Load/Capita					
Exist. Overload?					

Projected Flows for Next Five Years (MGD)

	2019	2020	2021	2022	2023
New EDUs	1.0	1.0	1.0	1.0	1.0
New EDU Flow	0.0003	0.0003	0.0003	0.0003	0.0003
Proj. Annual Avg	1.03792	1.03822	1.03852	1.03882	1.03912
Proj. Max 3-Mo Avg	1.23057	1.23093	1.23128	1.23164	1.232
Proj. Overload?					

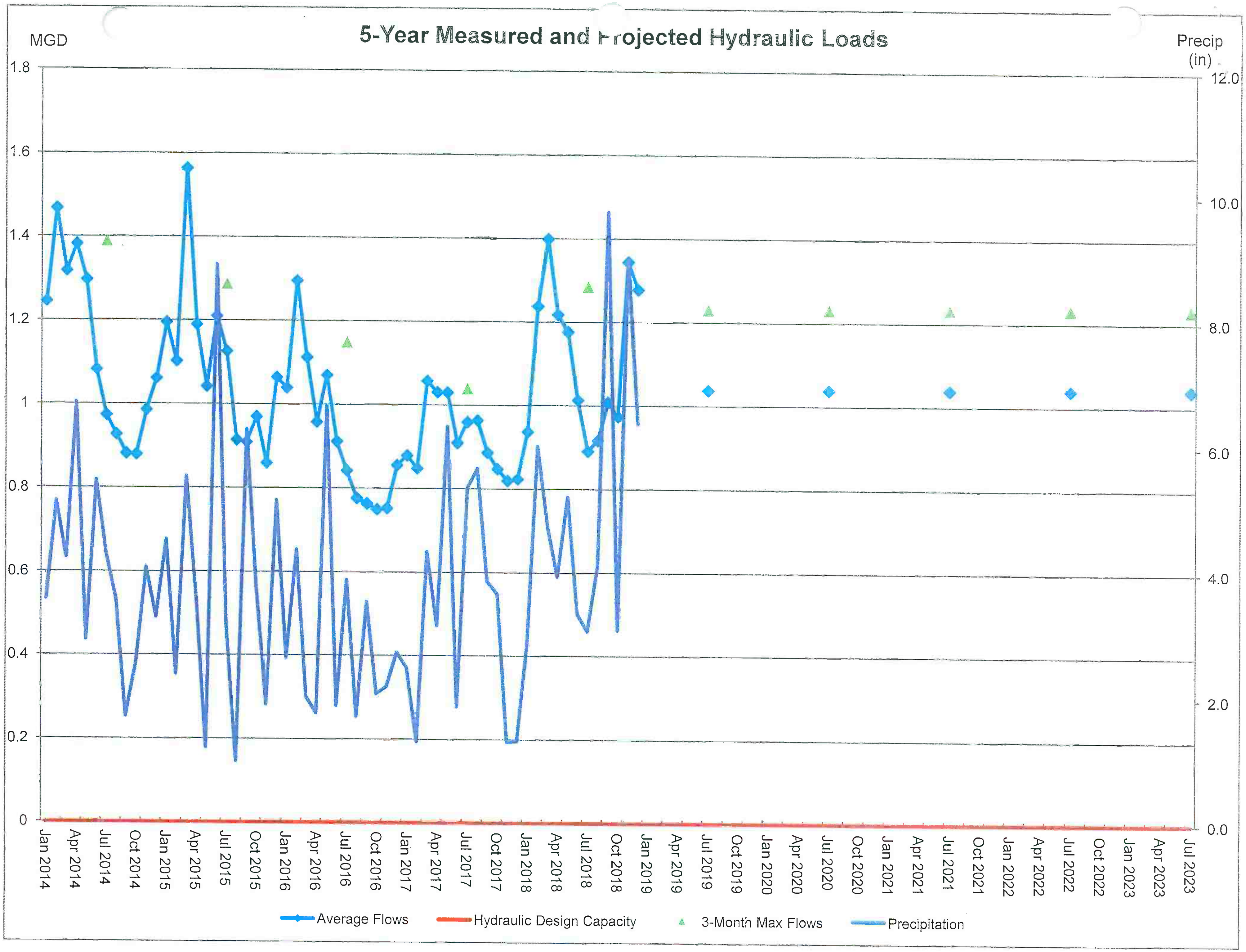
Projected BOD5 Loads for Next Five Years (lbs/day)

	2019	2020	2021	2022	2023
New EDUs	1	1	1	1	1
New EDU Load	0.584	0.584	0.584	0.584	0.584
Proj. Annual Avg	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Proj. Max Avg	#DIV/0!				
Proj. Overload?	#DIV/0!				

Show Precipitation Data on Hydraulic Graph?

Total Monthly Precipitation for Past Five Years (Inches)

Month	2014	2015	2016	2017	2018
January	3.56	4.52	2.63	2.48	2.85
February	5.12	2.36	4.36	1.3	6.02
March	4.23	5.52	2.01	4.33	4.74
April	6.69	3.58	1.75	3.15	3.94
May	2.91	1.2	6.65	6.33	5.21
June	5.46	8.89	1.87	1.86	3.34
July	4.3	3.16	3.88	5.35	3.06
August	3.55	0.98	1.7	5.66	4.11
September	1.69	6.27	3.52	3.86	9.76
October	2.54	3.76	2.06	3.66	3.08
November	4.07	1.89	2.17	1.3	9.03
December	3.27	5.14	2.72	1.31	6.38


5-Year Measured and Projected Hydraulic Loads
MGD
Precip (in)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
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Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Average Flows
Hydraulic Design Capacity
3-Month Max Flows
Precipitation

RIDLEY PARK BOROUGH MONTHLY FLOW METER DATA

Meter No.	Meter Location	Total EDUs	Outside EDUs	January			February			March			April			May			June			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Chester Pike (west of Little Crum Creek)	239	18	2,278,528	312	*-141,548*	2,924,193	444	*-175,138*	3,219,255	439	*-214,002*	2,639,877	372	*-176,605*	2,530,566	342	*-189,750*	2,090,172	292	*-155,229*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
2	Chester Pike (near Myrtle)	226		1,487,051	212		1,812,458	286		2,529,244	361		1,936,055	286		2,084,572	298		1,737,110	256		
3	Hinkley Avenue (near Henderson Avenue)	328		4,350,344	428		5,478,129	596		7,726,048	760		6,224,403	633		5,763,256	567		5,085,843	517		
4	Hillside Road	63		652,173	334		1,193,318	676		1,786,925	915		1,564,619	828		1,619,432	829		1,306,521	691		
5	Ladomus Avenue (at Baldwin)	76		746,697	317		849,231	399		898,397	381		869,219	381		886,560	376		769,455	337		
6	Off Chester Pike (at Morton Avenue)	606		3,921,288	209		3,734,796	220		4,466,451	238		4,166,338	229		4,028,310	214		3,251,697	179		
7	Behind Morton Avenue	727		5,364,375	238		5,744,812	282		6,877,296	305		5,902,984	271		6,306,579	280		5,454,762	250		
11	Chester Pike (near Burk Avenue)	306		1,792,722	189		2,276,042	266		2,488,989	262		1,993,283	217		1,989,047	210		1,704,111	186		Flows thru Prospect Park Borough's Meter No.: 1
12	214 W. Rogers Street (down path, in front)	425	7	2,446,424	185	*-55,047*	3,492,115	293	*-68,109*	4,415,413	334	*-83,223*	3,683,696	288	*-68,680*	3,743,752	283	*-73,792*	2,724,006	212	*-60,367*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	807		6,204,748	248		7,405,019	328		9,265,369	370		7,805,216	322		7,792,543	311		6,494,050	268		Use average EDU from all Propsect meters for estimate
	TOTAL	**3,803**	**25**	**29,047,755**			**34,666,866**			**43,376,162**			**36,540,405**			**36,481,075**			**30,402,131**			

Meter No.	Meter Location	Total EDUs	Outside EDUs	July			August			September			October			November			December			Comments
				Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	Recorded Volume	Gallons EDU/Day	Outside EDUs	
1	Chester Pike (west of Little Crum Creek)	239	18	2,007,613	275	*-124,357*	2,113,161	289	*-131,174*	2,476,658	352	*-144,690*	2,701,599	374	*-139,462*	3,419,711	487	*-193,810*	3,543,242	490	*-187,812*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate)
2	Chester Pike (near Myrtle)	226		1,423,605	203		1,553,334	222		1,744,838	257		1,621,257	231		2,485,664	367		2,332,381	333		
3	Hinkley Avenue (near Henderson Avenue)	328		4,512,996	444		4,562,072	449		4,596,229	467		4,417,750	434		7,870,273	800		7,320,569	720		
4	Hillside Road	63		797,482	408		709,084	363		860,222	455		843,323	432		1,732,890	917		1,815,827	930		
5	Ladomus Avenue (at Baldwin)	76		637,039	270		657,352	279		747,201	328		742,975	315		754,380	331		780,315	331		
6	Off Chester Pike (at Morton Avenue)	606		2,923,814	156		3,155,152	168		3,096,182	170		3,319,754	177		3,584,877	197		3,579,002	191		
7	Behind Morton Avenue	727		5,353,291	238		5,446,087	242		5,802,233	266		5,730,071	254		5,926,066	272		5,998,422	266		
11	Chester Pike (near Burk Avenue)	306		1,593,580	168		1,576,696	166		1,614,414	176		1,649,664	174		2,112,508	230		1,983,090	209		Flows thru Prospect Park Borough's Meter No.: 1
12	214 W. Rogers Street (down path, in front)	425		2,665,699	202	*-48,361*	2,762,478	209	*-51,012*	3,052,355	239	*-56,268*	2,915,192	221	*-54,235*	4,112,874	322	*-75,370*	4,069,003	308	*-73,038*	Outside EDUs from Ridley Township (using average from all Ridley's meters for estimate).
	Unmetered Areas (average volume from all meters)	807		5,905,795	236		6,071,712	243		6,461,806	267		6,450,537	258		8,618,701	356		8,464,129	338		Use average EDU from all Propsect meters for estimate
	TOTAL	**3,803**	**18**	**27,648,196**			**28,424,942**			**30,251,180**			**30,198,425**			**40,348,764**			**39,625,130**			

LEGEND

MH-1 FLOW METER AND NUMBER

RIDLEY TWP 16 FLOW FROM OUTSIDE BOROUGH

NOTE:

1. SEWER DIAMETER IS 8" UNLESS OTHERWISE NOTED.

INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF PROFESSIONAL SERVICES RENDERED BY CATANIA ENGINEERING ASSOCIATES, INC. REPRODUCTION OF THIS PLAN FOR THE PURPOSE OF CREATING ADDITIONAL COPIES OR REVISING PLAN WITHOUT APPROVAL OF CATANIA ENGINEERING ASSOCIATES, INC. IS PROHIBITED. CERTIFICATION FOR THE WORK CONTAINED HEREIN IS LIMITED TO THE ENTITY FOR WHOM THE WORK WAS PERFORMED, AS OF THE DATE SHOWN ON THE PLAN.

NO.	DATE	REVISION	DWN. BY	CKD. BY
5	6-17-15	LAT. CONN. CRESSWELL ST	J.M.D.	
4	11-13-13	KING COURT ADDED	J.A.S.	
3	2-18-13	FLOW METERS ADDED	P.H.M	N.M
2	8/20/09	ADD KEARNEY PLACE	J.M.D.	C.J.C.
1	2/08/07		J.M.D.	C.J.C.

CATANIA ENGINEERING ASSOCIATES, INC.
Consulting Engineers

520 WEST MacDADE BOULEVARD
MILMONT PARK, PA. 19033-3311
TEL. (610) 532-2884
FAX. (610) 532-2923

SANITARY SEWER MAP
BOROUGH OF RIDLEY PARK

DWN. BY M.N.G.	DSG. BY	FIELD BOOK/PAGE	SCALE 1" = 300'	DRAWING NO. 83600
CKD. BY C.J.C.	C.	C.	DATE 03/08/04	SHEET 1 OF 1 SHEETS

Industrial Waste Report

DELCORA is currently responsible for issuance of Industrial Waste Permits to companies discharging into Ridley Park Borough Sewers. The regulation governing discharge of the industrial wastes as well as any program for surveillance and monitoring of industrial waste discharges is maintained by DELCORA.

There are no known industrial permits for the Ridley Park system.