

**Year of 2015 Chapter 94 Annual Report
Buckingham Township
Buckingham Village WWTP
Bucks County**

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INTRODUCTION

The Buckingham Village WWTP serves Central Buckingham Village, connections on Route 202 and 263, part of Spring Valley Village, Redgate and Durham Villages, the Reserve at Holicong, the Central Bucks Holicong School Campus and most of the Village of Lahaska, including the commercial establishments. The service area is all in Buckingham Township and the Township is the sole owner-operator

Buckingham Village Plant major improvements were made in 2000. The influent pump station was replaced in 2013 and the effluent pump station was replaced in 2009. Modifications to the plant to comply with new permit limits were completed in March of 2014. The MCC and generator will be replaced in 2017 – design is under way. The plant consists of a 236,000 gpd ICEAS SBR treatment plant permitted to discharge to stream from November through April and to the treated wastewater sprayfield storage lagoons at the Furlong WWTP or Coles Nursery from May through October.

HYDRAULIC AND ORGANIC LOADINGS

Line graphs showing 5-year past and 5-year projected Hydraulic and Organic loading are inserted between pages 9 and 10.

The permitted and constructed capacities of the Buckingham Village WWTP:
 Annual Average (AA) Capacity = 236,000 gpd
 Organic Capacity = 1060 lb/day

Hydraulic Loading:

- a. The calendar year's AA flow is less than the permitted and constructed AA capacity.
- b. The Buckingham Village WWTP exceeded the single monthly average permitted capacity in July of 2007 by 1.4%, March of 2010 by 6.7% and in September of 2011 by 7.2%. The highest consecutive three month peak average was less than the permitted amount by 7.7%.
- c. Neither a CAP nor CMP is required for this facility but we plan to be addressing sub-basin I & I as needed.
- d. A High Flow Maintenance Plan (HFMP) is established for the Buckingham Village WWTP. The operator takes specific actions in preparation for a high predicted rainfall event or when he or she receives a notice that the plant has entered storm mode. The operator shifts the sequencing of the influent pumps and manually attenuates aeration if the reactor level rises to the decanter's parked position so that supernatant, rather than mixed liquor, goes into the contact tank. This happened several times in 2012-15 with the prevention being successful. Additional automation has been programmed to anticipate these events and the operator does not need to respond every time the plant receives high flows.

- e. Offsite supernatant ($BOD_5 < 20$ mg/l) flow from the Washington Crossing Historical Parks ceased when the plant was reactivated in 2013. The Township's maintenance garage holding tank wastewater is hauled to this plant a few times per year.
- f. Table 1 below, in the DEP recommended format, provides tabular data of the historic 5-year hydraulic loading.

Table 1						
Month	Hydraulic Loading (MGD)					Rainfall (inches)
	2011	2012	2013	2014	2015	2015
January	0.1451	0.1713	0.1581	0.1753	0.1456	3.33
February	0.1888	0.1521	0.1593	0.1856	0.1461	2.24
March	0.2150	0.1525	0.1705	0.1774	0.2055	5.33
April	0.2080	0.1579	0.1686	0.1845	0.1544	2.46
May	0.1807	0.1689	0.1812	0.2004	0.1398	0.83
June	0.1590	0.1581	0.2146	0.1594	0.1449	6.20
July	0.1470	0.1391	0.1637	0.1481	0.1357	4.46
August	0.1882	0.1364	0.1550	0.1257	0.1300	3.51
September	0.2529	0.1465	0.1557	0.1416	0.1470	3.41
October	0.1829	0.1556	0.1536	0.1447	0.1493	4.27
November	0.1973	0.1597	0.1542	0.1494	0.1367	2.19
December	0.2093	0.1846	0.1810	0.1633	0.1588	5.16
Annual Average (AA)	0.1895	0.1569	0.1680	0.1630	0.1495	
3 Month Max. Average	0.2179	0.1666	0.1881	0.1874	0.1687	
Ratio (3 Month Max to AA ratio)	1.15	1.06	1.12	1.15	1.13	
5-Year Average Hydraulic Ratio = 1.12						

Organic loading of the Buckingham Village WWTP:

- g. Organic loadings at the Buckingham Village WWTP are derived from weekly 24-hour time-composited samples. The loading is subject to seasonal and economy-related factors that impact the various restaurants that the plant serves. Just under half the flow and probably more than 65% of the organic load is from the commercial users.

Because the loading varies so much, we traditionally used 5-year averages and peaks to make more reliable predictions for the graphs. Using even more years in the averages would probably allow for better predictions. The DEP SERO method results are also graphed using the SERO only one year base. The 2015 Organic loading in this document is calculated using the day of sample flow as preferred by SERO.

- h. There were no single-month organic overloads at the plant in the period from 2011 through 2015 using either method of calculation.
- i. We have not identified any organic loading data that we would consider to be anomalous.
- j. There is no existing or projected organic overload condition.

A discussion of the influent organic sampling protocol that details:

- j. Sampling frequency, recommended as follows:

Recommended Sampling Frequency for Influent BOD₅	
Annual Average Capacity	Minimum Sampling Frequency
> 1.0 MGD	Once per week
0.050 to 1.0 MGD	Twice per month
<0.050 MGD	Once per month

- k. Type of sample taken – see above – weekly 24-hour time composited samples.
- l. The influent BOD₅ sample is taken before the influent micro-strainer just after being pumped from the plant's influent wet well. This sample point does include a small amount of recycled anoxic digester supernatant. Sampling the plant's interceptor has proven problematic since the adjacent stream often overflows its banks where the sample would be taken. Recycle impact is minimal and actually does need to be counted as part of the plant's loading for treatment calculations.
- m. There is no hauled in septage to this plant except small loads from the Township Highway Garage's holding tank. In 2010 through July 2, 2013, treated wastewater from the Washington Crossing State Park and/or the Wrightstown Elementary School was accepted by manifested procedures. The BOD/TSS loading was < 20 mg/l. The maximum day of this wastewater was <2% of the plant's daily organic loading. In November and December of 2011, treated wastewater from the Cold Spring final lagoon was transferred by truck to the Village plant and that volume (162,500 gallons in November and 414,000 gallons in December) was not included in the loading data for future projections since it was a one-time event not related to any connections to the Plant.

- n. Daily average loadings after 1/1/12 are calculated using the influent BOD₅ concentration and the flow (including the trucked-in treated wastewater since loading is mass rather than concentration based) on the day in which the sample was taken. The **daily** loadings are then averaged to determine the monthly average organic loading to the WWTP. In 2010-11 the weekly average flow was used to calculate #'s of BOD loading. Our experience is that both methods produce similar results and useable data for projections. Table 2 below, shows the calendar year's organic loading sampling data:

	A	B	C = A x B x 8.34	
Date of sample	BOD5 (mg/l)	Flow (MGD) – on sampled day	Weekly BOD5 (lbs/day)	Monthly Average (lbs/day)
1/7/15	249	0.1395	290	
1/14/15	286	0.1383	330	
1/21/15	311	0.1366	354	
1/28/15	275	0.1376	316	323
2/4/15	285	0.1583	376	
2/11/15	220	0.1333	245	
2/18/15	318	0.1322	351	
2/25/15	291	0.1561	379	338
3/4/15	234	0.2372	463	
3/11/15	142	0.3123	370	
3/18/15	218	0.1965	357	
3/25/15	229	0.1691	323	378
4/1/15	248	0.1603	332	
4/8/15	278	0.1495	347	
4/15/15	366	0.1377	420	
4/22/15	301	0.1772	445	
4/29/15	370	0.1473	455	400
5/6/15	623	0.1322	687	
5/13/15	439	0.1402	513	
5/20/15	277	0.1310	303	
5/27/15	286	0.1426	340	461
6/3/15	322	0.1511	406	
6/10/15	215	0.1447	259	
6/17/15	237	0.1208	239	
6/24/15	451	0.1198	451	339
7/1/15	427	0.1248	444	
7/8/15	355	0.1409	417	
7/15/15	216	0.1501	270	
7/22/15	529	0.1274	562	
7/29/15	218	0.1351	246	400
8/5/15	310	0.1190	308	
8/12/15	279	0.1179	274	
8/19/14	324	0.1240	335	
8/26/14	219	0.1178	215	283

Table 2 (continued)				
Organic Loading Sampling Data				
	A	B	C = A x B x 8.34	
Date of sample	BOD5 (mg/l)	Flow (MGD) – on sampled day	Weekly BOD5 (lbs/day)	Monthly Average (lbs/day)
9/2/15	362	0.1350	408	
9/9/15	238	0.1432	284	
9/16/15	295	0.1465	360	
9/23/15	341	0.1180	336	
9/30/15	238	0.1621	322	342
10/7/15	332	0.1496	414	
10/14/15	435	0.1386	503	
10/21/15	328	0.1373	376	
10/28/15	311	0.1628	422	429
11/4/15	387	0.1211	391	
11/11/15	351	0.1347	394	
11/18/15	496	0.1341	555	
11/24/15	256	0.1231	263	401
12/2/15	365	0.1564	476	
12/9/15	241	0.1483	298	
12/16/15	344	0.1482	425	
12/23/15	174	0.2155	313	
12/30/15	301	0.1674	420	386
Year 2015	311			373

Table 3 below shows the Buckingham Village WWTP's historic 5 year organic loading data:

Table 3					
Organic Loading (lbs/day)					
Month	2011	2012	2013	2014	2015
January	339	380	516	462	323
February	336	348	392	294	338
March	370	336	492	413	378
April	518	397	447	485	400
May	408	427	563	478	461
June	380	530	412	470	339
July	289	338	375	327	400
August	340	278	379	271	283
September	397	312	369	369	342
October	402	374	446	379	429
November	505	445	570	285	401
December	670	467	434	375	386
Annual Average	413	386	450	384	373
Ratio (Max Month to Annual Average Ratio)*	1.62	1.37	1.27	1.26	1.24
5-Year Average Organic Ratio = 1.35					

*While the hydraulic loading “peaking factor” is determined using the 3-Month-Max to AA ratio, the organic loading “peaking factor” is determined using the Maximum Month (i.e., the single highest monthly average in the calendar year) to AA ratio.

5-YEAR HYDRAULIC AND ORGANIC LOADING PROJECTIONS

- b. We are using the DEP SERO method to calculate and project flows and showing the original method on the projection graph also. There is very little difference between the methods’ results. The reserved commercial EDUs are not in the projections.
- c. We are using the DEP SERO method to calculate and project organic loading and show those results alongside our traditional method in the graphs. The difference was very small in 2012, 2014 and 2015 but was 13% larger in the 2013 year report. Using a single year as the projection base year yields wider variations, which may not be realistic, than our original averaging approach.
- d. To project organic loading, we use 0.17 pounds of BOD₅ per person per day and use 4 people per new EDU which is higher than the census data of 2.7 people per EDU. Regardless of methodology, the plant is not expected to exceed its permitted organic capacity.
- e. Neither a 5-year annual average nor peak hydraulic nor organic loading exceedance is projected at the Buckingham Village WWTP.
- f. Table 4 lists the organic projections we calculated using the SERO-recommended method (note due to load from each EDU being 0.68, the math may appear incorrect).

Organic Loading Projections		
Year	Annual Average BOD₅ Loading Projections¹ (lbs/day)	Maximum Monthly BOD₅ Loading Projections² (lbs/day)
2016	376	508
2017	377	509
2018	378	510
2019	379	512
2020	380	513

¹AA projections = (Current report year’s AA loadings) + (loadings from proposed EDUs)

² Max Month projections = (AA projection) x (5-year Average Organic Ratio)

Calculating the Five-Year Adjusted Annual Average For Chapter 94 Flow Projections

- A. Determine the new flow in million gallons per day (MGD), which corresponds to the new EDUs connected for each calendar year. Note that there are reserved ultimate EDU’s that may never come on line due to zoning changes. For this exercise, to conform to the SERO method we are using the design EDU of 250 gpd and, if applicable, three-month peak EDU of 300 gpd:

Table 5			
Year	# of EDUs connected	gpd/EDU	New Flow (MGD)
2011	1	250	0.000250
2012	1	250	0.000250
2013	0	250	0
2014	1	250	0.000250
2015	0	250	0

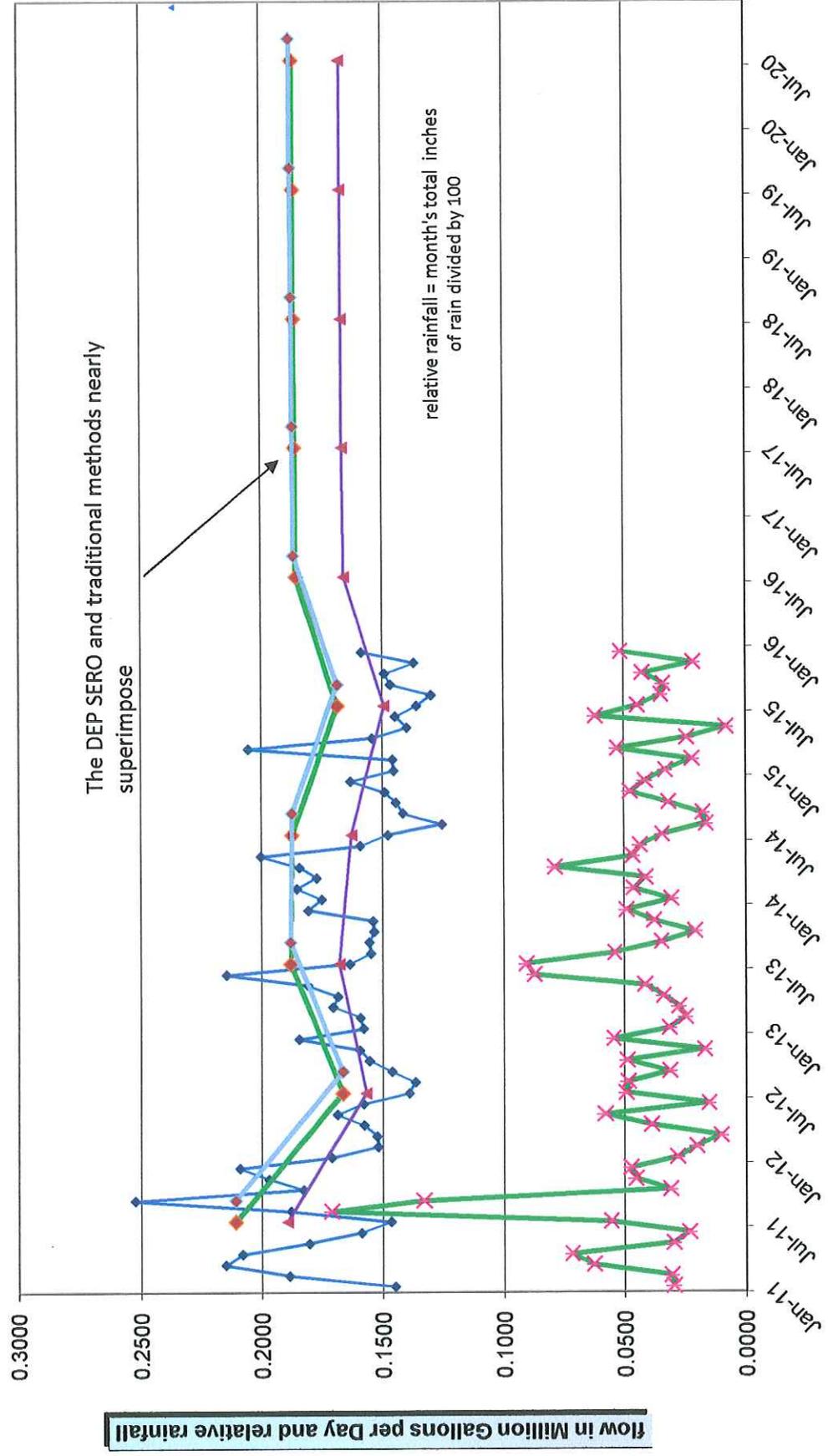
B. Adjust each calendar year by adding the flows from new connections to the annual average flow for each of the previous calendar years.

Table 6								
Year	AA Flow in MGD	All projects connected (provide flows approved in planning modules or exemptions in MGD—include any connected projects that did not require planning)					Adjusted AA Flow	
		2011	2012	2013	2014	2015		
2011	0.1895		.000250	0	.000250	0	0.1900	
2012	0.1569			0	.000250	0	0.1572	
2013	0.1680				.000250	0	0.1683	
2014	0.1630					0	0.1630	
2015	0.1495						0.1495	
Total	0.8269						Total	0.8280
5 Yr Avg	0.1654						5 Yr Adj Avg	0.1656

C. We next calculate the five-year flow projections starting with the five-year adjusted annual average flow. Each year's projection is based on the estimated number of new connections for that calendar year. The flow from the EDUs expected to connect in 2016 are added to the five-year adjusted annual average calculated above. Each year's projected annual average flow was then multiplied by the five-year average hydraulic ratio of 1.12 (or peaking factor) to determine the projected three-month maximum flow.

Table 7					
Adjusted Projections					
Year	Previous Year's Annual Average Flow¹	New EDUs	Increased Flow² (MGD)	Projected Annual Average Flow³ (MGD)	Projected Max 3-Month Flow⁴ (MGD)
2016	0.1656	4	0.0010	0.1666	0.1866
2017	0.1666	1	0.00025	0.1669	0.1869
2018	0.1669	1	0.00025	0.1672	0.1872
2019	0.1672	1	0.00025	0.1675	0.1875
2020	0.1675	1	0.00025	0.1678	0.1879

Buckingham Village WWTP Hydraulic Loading Graph



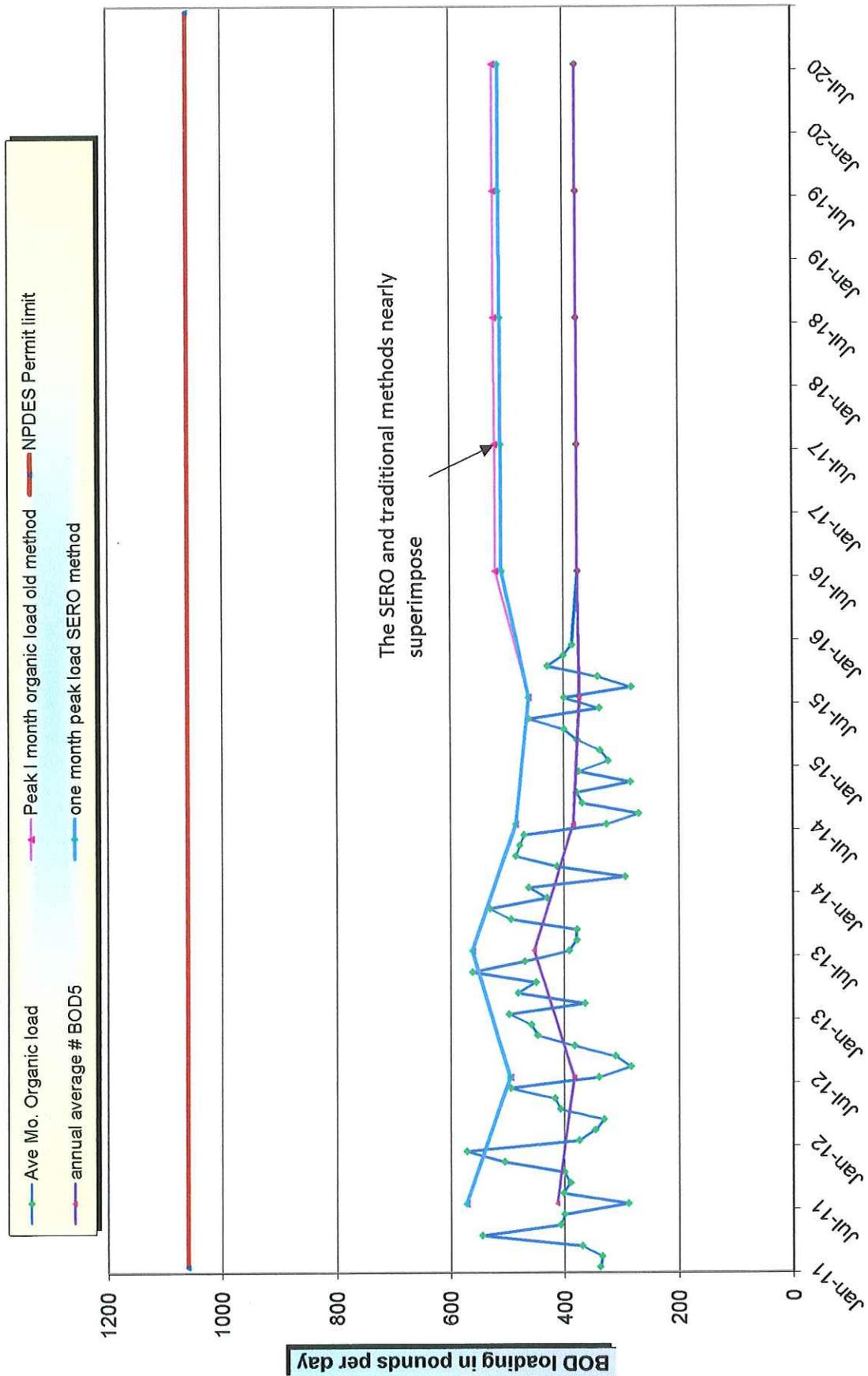
Buckingham Village Wastewater Treatment Plant Hydraulic Loading Data

Table 1-1														
month	flow	annual ave	1 month peak	3 month peak	3 month peak	flow limit	relative	max day	Comments	Stoneridge	Reserve	B Green	misc.	
	MGD	MGD	flow MGD	flow MGD	SERO method	MGD	rainfall	rainfall		remain	remain	remain	remain	
Jan-11	0.1451						2.99	0.030	0.1909		0	0	0	14
Feb-11	0.1888						3.08	0.031	0.2905					
Mar-11	0.2150						6.29	0.063	0.4627					
Apr-11	0.2080						7.22	0.072	0.4519	5-year ave flow				
May-11	0.1807						2.99	0.030	0.2108	0.1797				
Jun-11	0.1590						2.36	0.024	0.1924	added 1 EDU - 2895 Snake Hill Rd.				13
Jul-11	0.1470	0.1895	0.2529	0.2110			5.59	0.056	0.2084					
Aug-11	0.1882						17.12	0.171	0.4409	5-year peak 3-month ave				
Sep-11	0.2529				0.2110		13.31	0.133	0.5154	0.2030				
Oct-11	0.1829						3.14	0.031	0.2462	5 year 3-month peak ratio				
Nov-11	0.1973						4.55	0.046	0.3701	1.13				
Dec-11	0.2093						4.76	0.048	0.4083	net of hauled in from Cold Spring	0	0	0	13
Jan-12	0.1713						2.84	0.028	0.2601	6150 ave gpd in Nov				
Feb-12	0.1521						2.05	0.021	0.1894	14371 ave gpd in Dec				
Mar-12	0.1525						1.04	0.010	0.1795	162,500 in nov & 414,000 in dec				
Apr-12	0.1579						3.92	0.039	0.2704	hauled in from WC state park is <1,000 gpd				
May-12	0.1689						5.82	0.058	0.2286					
Jun-12	0.1581						1.54	0.015	0.2637	0 emergency EDUs added				13
Jul-12	0.1391	0.1569	0.1846	0.1666			4.96	0.050	0.1872	1 reserved EDUs added				12
Aug-12	0.1364						4.87	0.049	0.1754					
Sep-12	0.1465				0.1666		3.16	0.032	0.1676					
Oct-12	0.1556						4.90	0.049	0.2134					
Nov-12	0.1597						1.73	0.017	0.1848					
Dec-12	0.1846						5.47	0.055	0.3470		0	0	0	12
Jan-13	0.1581						3.18	0.032	0.2293					
Feb-13	0.1593						2.51	0.025	0.1943					
Mar-13	0.1705						2.77	0.028	0.2402					
Apr-13	0.1686						3.42	0.034	0.2081					
May-13	0.1812						4.18	0.042	0.2423					
Jun-13	0.2146						8.77	0.088	0.4897	0 emergency EDUs added				12
Jul-13	0.1637	0.1680	0.2146	0.1881			9.10	0.091	0.3123	0 reserved EDUs added				12
Aug-13	0.1550						5.44	0.054	0.2470					
Sep-13	0.1557				0.1881		3.50	0.035	0.2019					
Oct-13	0.1536						2.11	0.021	0.2116					
Nov-13	0.1542						3.80	0.038	0.2580					
Dec-13	0.1810						4.92	0.049	0.2522		0	0	0	12
Jan-14	0.1753						3.08	0.031	0.3126					
Feb-14	0.1856						4.64	0.046	0.2947					
Mar-14	0.1774						4.16	0.042	0.3119					
Apr-14	0.1845						7.91	0.079	0.6129					
May-14	0.2004						4.67	0.047	0.3867					
Jun-14	0.1594						4.39	0.044	0.2346	1 EDU added 4530 Foothill				11
Jul-14	0.1481	0.1630	0.2004	0.1874			3.45	0.035	0.1920	0 reserved EDUs added				11
Aug-14	0.1257						1.67	0.017	0.1436					
Sep-14	0.1416				0.1874		1.80	0.018	0.1596					
Oct-14	0.1447						3.20	0.032	0.1590					
Nov-14	0.1494						4.77	0.048	0.1876					
Dec-14	0.1633						4.15	0.042	0.2397		0	0	0	11
Jan-15	0.1456						3.33	0.033	0.2869					
Feb-15	0.1461						2.24	0.022	0.2666					
Mar-15	0.2055						5.33	0.053	0.3645					
Apr-15	0.1544						2.46	0.025	0.2525					
May-15	0.1398						0.83	0.008	0.1546					
Jun-15	0.1449						6.20	0.062	0.1975	0 emergency EDUs added				11
Jul-15	0.1357	0.1495	0.2055	0.1687			4.46	0.045	0.1858	0 reserved EDUs added				11
Aug-15	0.1300						3.51	0.035	0.1633					
Sep-15	0.1470				0.1687		3.41	0.034	0.1803					
Oct-15	0.1493						4.27	0.043	0.2070					
Nov-15	0.1367						2.19	0.022	0.1980					
Dec-15	0.1588						5.16	0.052	0.2448		0	0	0	11
Jan-16														
Feb-16														
Mar-16														
Apr-16														
May-16										using 5-year averages				
Jun-16										2 emergency EDUs to be added				9
Jul-16		0.1659	0.2128	0.1856						2 reserved EDUs to be added				7
Aug-16										using 300 gpd peak for added edus				
Sep-16					0.1866					not including comm. Reservations				
Oct-16														
Nov-16														
Dec-16											0	0	0	7
Jan-17														
Feb-17														
Mar-17														
Apr-17														
May-17														
Jun-17														
Jul-17		0.1665	0.2131	0.1859						1 emergency EDUs to be added				6
Aug-17														
Sep-17					0.1869									
Oct-17														
Nov-17														
Dec-17											0	0	0	6

Buckingham Village Wastewater Treatment Plant Hydraulic Loading Data

Table 1-1														
month	flow	annual ave	1 month peak	3 month peak	3 month peak	flow limit		relative	max day	Comments	Stoneridge	Reserve	B Green	misc.
	MGD	MGD	flow MGD	flow MGD	SERO method	MGD	rainfall	rainfall			remain	remain	remain	remain
Jan-18														
Feb-18														
Mar-18														
Apr-18														
May-18														
Jun-18														
Jul-18		0.1667	0.2134	0.1862						1 emergency EDUs to be added				5
Aug-18														
Sep-18					0.1872									
Oct-18														
Nov-18														
Dec-18											0	0	0	5
Jan-19														
Feb-19														
Mar-19														
Apr-19														
May-19														
Jun-19														
Jul-19		0.1670	0.2137	0.1865						1 emergency EDUs to be added				4
Aug-19														
Sep-19					0.1875									
Oct-19														
Nov-19														
Dec-19											0	0	0	4
Jan-20														
Feb-20														
Mar-20														
Apr-20														
May-20														
Jun-20														
Jul-20		0.1672	0.2140	0.1868						1 emergency EDUs to be added				3
Aug-20														
Sep-20					0.1879									
Oct-20														
Nov-20														
Dec-20						0.236					0	0	0	3

Buckingham Village WWTP Organic Loading Graph



Buckingham Village WWTP Organic Loading Data

Table I-3							
month	using weekley ave flow until 1/12 then using sample day flow			instantaneous	organic limit # BOD/day	peak load day lbs	comments
	organic load # BOD/day	annual average & projected	1 month peak # BOD/day	1 month peak SERO method			
Jan-11	339				1060	424	
Feb-11	335					409	
Mar-11	370					454	
Apr-11	545					1,069	5-year ave organic loading lb/day
May-11	407					468	435
Jun-11	401					497	
Jul-11	289	413	572	572		313	1 new connection in 2011
Aug-11	403					522	5-year peak 1-month ave
Sep-11	390					445	638
Oct-11	401					468	1-month peak ratio
Nov-11	505					685	1.47
Dec-11	572					748	
Jan-12	375					443	
Feb-12	347					370	
Mar-12	332					396	
Apr-12	408					451	5-year ave organic loading lb/day
May-12	417					481	402
Jun-12	495					742	
Jul-12	341	383	495	495		407	1 new connection in 2012
Aug-12	285					332	5-year peak 1-month ave
Sep-12	312					350	563
Oct-12	383					487	1-month peak ratio
Nov-12	447					565	1.40
Dec-12	458					798	
Jan-13	497					758	
Feb-13	365					434	
Mar-13	482					554	
Apr-13	450					513	5-year ave organic loading lb/day
May-13	562					754	410
Jun-13	469					595	
Jul-13	392	453	562	562		566	0 new connection in 2013
Aug-13	379					488	5-year peak 1-month ave
Sep-13	379					418	550
Oct-13	494					776	1-month peak ratio
Nov-13	531					731	1.34
Dec-13	431					613	
Jan-14	462					612	
Feb-14	294					510	
Mar-14	413					460	
Apr-14	485					562	5-year ave organic loading lb/day
May-14	478					741	399
Jun-14	470					448	
Jul-14	327	384	485	485		406	1 new connection in 2014
Aug-14	271					340	5-year peak 1-month ave
Sep-14	369					402	518
Oct-14	379					399	1-month peak ratio
Nov-14	285					389	1.30
Dec-14	375					467	
Jan-15	323					354	
Feb-15	338					379	
Mar-15	378					463	
Apr-15	400					455	5-year ave organic loading lb/day
May-15	461					687	401
Jun-15	339					451	
Jul-15	400	373	461	461		589	new connection in 2015
Aug-15	283					335	5-year peak 1-month ave
Sep-15	342					408	515
Oct-15	429					503	1-month peak ratio
Nov-15	401					555	1.28
Dec-15	386					476	
Jan-16							
Feb-16							

Buckingham Village WWTP Organic Loading Data

Table I-3							
month	using weekley ave flow until 1/12 then using sample day flow			instantaneous		peak load day lbs	comments
	organic load # BOD/day	annual average & projected	1 month peak # BOD/day	1 month peak SERO method	organic limit # BOD/day		
Mar-16							
Apr-16							original method
May-16							2011-2015 5-year average peak + 1.5 x new load
Jun-16							
Jul-16	376	376	519	508			4 new EDUs expected
Aug-16							
Sep-16							
Oct-16							
Nov-16							
Dec-16							
Jan-17							
Feb-17							
Mar-17							
Apr-17							
May-17							
Jun-17							
Jul-17	377	377	520	509			1 new EDU expected
Aug-17							
Sep-17							
Oct-17							
Nov-17							
Dec-17							
Jan-18							
Feb-18							
Mar-18							
Apr-18							
May-18							
Jun-18							
Jul-18	377	377	521	510			1 new EDU expected
Aug-18							
Sep-18							
Oct-18							
Nov-18							
Dec-18							
Jan-19							
Feb-19							
Mar-19							
Apr-19							
May-19							
Jun-19							
Jul-19	378	378	522	512			1 new EDU expected
Aug-19							
Sep-19							
Oct-19							
Nov-19							
Dec-19							
Jan-20							
Feb-20							
Mar-20							
Apr-20							
May-20							
Jun-20							
Jul-20	379	379	523	513			1 new EDU expected
Aug-20							
Sep-20							
Oct-20							
Nov-20							
Dec-20					1060		

¹ The first year's projection (2016 in this example) starts with the 5-year adjusted annual average that was calculated in A through B, above.

² Increased Flow = (New EDUs x 250 gpd/EDU)/1,000,000

³ Projected Annual Average Flow = Previous Year's AA Flow + Increased flow

⁴ Projected Max 3-Month = Projected Annual Avg. Flow x 5-year average hydraulic ratio as calculated in table 1.

D. Considerations on projection figures:

Future emergency connections to the Buckingham Village WWTP are shown in the 5-year planning window with the exception of the EDU's associated with possible commercial expansions in Lahaska. Those are speculative, given zoning changes in the service area and will be considered if planning documents are submitted. The plant would not have capacity for the commercial EDU's reserved if the flow stayed at the very high 2011 level but it dropped in 2012 through 2015. I & I seems to have leveled off with the 5-year average ratio returning to 1.12. Pump station #3 and 2 sub basins have moderate I & I which the Township has attempted to address via customer notifications and education. Since that has failed to show results, diagnostic measures and active remedial measures may be taken as a result of the proposed sub-basin studies. Both pump stations will get a meter in 2016. The SERO method for projecting hydraulic loading generates predicted flows about the same as those predicted using the Buckingham historical method as can be seen on the hydraulic graph. Neither method predicts a hydraulic overload given the current assumptions about commercial EDU's.

SEWER EXTENSIONS

- a. There were no sewer extensions in 2015.
- b. There were no sewer extensions approved or exempted in the past year in accordance with the PA Sewage Facilities Act (35 P.S. §§ 750.1—750.20) and Chapter 71 (relating to administration of the sewage facilities program), but not yet constructed;
- c. There are no known proposed projects in the Buckingham Village or Lahaska area that would require public sewers. Any such project would have to provide for their own wastewater needs on their property pursuant to the Township's act 537 selection hierarchy.

PROGRAM FOR SANITARY SEWER MONITORING, MAINTENANCE, AND REPAIR

- a. Monitoring – Routine inspections for surcharging in known problem areas started in 2012 and continued through 2015.
- b. Maintenance – checking and cleaning of PS #7 gravity interceptor, Penns Purchase on-site sewers and gravity lines serving Baci Restaurant in Buckingham Village and the main trunk entering the treatment plant.
- c. Repairs – a leak at a manhole near pump station #3 was discovered and repaired in March of 2016
- d. Rehabilitation - none

- e. Routine and special activities - none
- f. Personnel and equipment used – three certified wastewater operators inspect.
- g. Sampling frequency - none
- h. Quality assurance - none
- i. Data analyses – none except pump stations
- j. Infiltration/inflow (I/I) monitoring – one attempt identified a possible stream leak along route 202 but report was not received and repeat inspection was not possible in 2015 – we are hoping to do this in 2016.
- k. Maintenance and control of combined sewer regulators during the past year: not applicable

The sewer system was constructed between 1989 and 2000. I & I is moderate in some sub-basins and minor in the others. Sub-basin studies have been discussed and will be further considered after the pump stations can be better monitored. The WWTP influent flow ratio of 1.13 in 2015 is not excessive but we still wish to better characterize sub-basin flows. See also pump station proposals.

CONDITION OF THE SEWER SYSTEM

- l. Bypassing - none
- m. Combined sewer overflows – not applicable
- n. Sanitary sewer overflows – two in 2015 related to pump station failure or pipe blockage – see attached SSO reports sent to the SERO office. We have asked the owners of facilities that generate FOG to do a better job with grease removal and it seems to be working as long as we constantly monitor and remind. Additionally, sanitary wipes caused the problem at PS 5 – we have sent notices about these items to area nursing homes and health care facilities but the problem is national and perhaps something will be done to regulate the manufacturers of these products.
- o. Excessive infiltration – some in the PS #2 & 3 sub-basins. Some is probable in the route 202 gravity interceptor feeding PS #8. More sub-basins are likely to become problematical as the collection system ages.
- p. Other system problems – Hurricane Sandy in 2012 proved that when massive and long power outages occur, our operators can address all pump station power outages with pump & haul and emergency generators.

Discussion of available existing and future capacity.

- q. The age of the sewer system is 16 to 27 years
- r. 100% PVC pipe is used
- s. All sewer capacities were analyzed for peaking during the design and permitting stages with a minimum peak factor of 4.
- t. No repairs or rehabilitations are scheduled. As I & I studies are completed, any repairs will be addressed as needs are identified.

Discuss any portions of the sewer system in which surcharging occurs:

- u. There is no known system surcharging caused by lack of conveyance capacity.
- v. There were no collection system SSO's in 2015 other than caused by pumping failures or blockages.

- w. Flows to the WWTP are monitored on the forcemain of the main pump station that transfers all flow from the collection system to the WWTP.
- x. All sewers were designed with high peak-conveyance capacity with room for moderate I & I that would occur in this system. More severe I & I, if it is identified, will be addressed through the normal repair techniques used in other systems.

SEWAGE PUMPING STATIONS

- y. “Maximum pump rate” is the permitted hydraulic design capacity of the station, which excludes the capacity of the backup pump.
- z. “Present maximum flows” are estimated by hour meters - PS 1, 2, 3, 6, 7, 8 (part of the year) & 9 - or metered (PS 4, 5 & 8 after September 2015) - peak instantaneous flow data is not available for the pump stations. The stations were all designed to handle peaks as dictated by DEP design criteria with only one pump in service. The second pump is redundant but may also operate in tandem (“lag”) with the lead pump if the lead pump is partly blocked or in extreme high flow conditions. Because of the desire to keep the 2-hour fill time for the station, the lag pump is set to start at a point far below where it would need to come on to pump extra to keep the station from potentially overflowing. Partly blocked pumps evidence themselves when pumping hours are analyzed and are immediately serviced. If both pumps at a pump station fail, the station is designed to hold at least two hours of flow with no pumping. An alarm notifies the operators of high wet well level – set a few inches above the station’s normal HWL. The Township’s pump stations are all listed with Sanders Power Equipment who can supply a temporary generator or pump within an hour or two from notification of the need. Gary’s Septic, Clemens Septic Service and Norbill Disposal are on-call to provide transient emergency pumping and hauling if the station is completely out of service. Response time has been adequate to avoid station overflows in nearly every imaginable situation, including multiple stations being completely out of service. This response system was sorely re-tested during Hurricane Sandy – the main problem not being precipitation but very long power outages. Pending staffing enhancements, a sub-basin flow study is envisioned. The need is not urgent given the low peak ratios. We have moved pump station replacement/rehabilitation to a fast track for the system’s older stations. Included may be a way to time the hours that the second pump comes on. In the next few years, meters and back-up generators will be installed at all stations possible. In the Buckingham Village section scheduling is: PS 8 completed in 2015, PS 2, 3, and 5 in 2016 (contracts awarded), PS 1, 7 and 9 are complicated by easement requirements and may occur between 2017 and 2019. PS 4 & 6 will go last since they were rehabilitated in 2000-2002 We have a mini-program to install ultra high level floats in all pump stations wired directly to the stations autodialer. In 2015 several stations were so-equipped with a second phase anticipated for 2016 to protect stations that have a high float but not wired to the dialer.
- aa. Verizon – service declined between 2000 and 2014 so we call the stations weekly to be sure there is a dial tone and have tried without success yet to get a programmer to suggest a way we can automatically call each station at night

and produce a connection success log. It now appears that this may not be feasible. Long term plans have now embraced radio/cellphone/SCADA technology as a way to deal with this problem but it seems that SCADA systems are often successfully hacked which could lead to real problems in the water and wastewater applications.

- bb. A graph for each pump station showing the precipitation plotted against the average calculated or measured daily flow and average monthly flow is attached at the end of this report.

Pump Station Name	Number of Pumps	Permitted Capacities		Present Flows - 2015		Projected Flows
		AA Permitted Capacity (gpd)	Hydraulic Design Capacity (w/o backup pump) (min gpm)	Annual Average Flows (gpd)	Peak 3-Day Flow (gpd)	2-Year Projected Maximum ¹ Flow (gpd)
PS No. 1	2	13,500	70	6,030	10,800	11,330
PS No. 2	2	25,650	85	25,104	74,160	139,330
PS No. 3	2	9,000	40	4,379	13,950	15,480
PS No. 4	2	122,850	475	82,857	159,000	262,000
PS No. 5	2	26,675	100	13,411	18,750	28,000
PS No. 6	2	114,075	355	54,981	86,360	133,280
PS No. 7	2	10,800	30	5,865	7,547	9,790
PS No. 8	2	253,000	440	90,520	156,000	376,000
PS No. 9	2	7,125	36	2,744	10,425	19,860

¹PS-1: 0 new 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2010-2012 flow of 11,330 gpd.

PS-2: 1 new 300 gpd (1.2 x 250 gpd ave EDU) connection was added to the 3-day peak 2011 flow of 139,060 gpd. Two reserved and one emergency connection (in 2014) come or would come to this station. Peak 2011 flow was due to storm Lee & next highest recent peak was 99,960 gpd in May of 2014.

PS-3: 0 new 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2011 flow of 15,480 gpd. Peak 2011 flow was due to storm Lee & next highest peak was 13,815 gpd in August of 2012.

PS-4: 0 new projected 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2011 flow of 262,000 gpd. Peak 2011 flow was due to storm Lee & next highest peak was 212,250 gpd in April of 2010.

PS-5: 0 new projected 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2010 flow of 28,000 gpd. Next highest peak was 25,325 gpd in September of 2011.

PS-6: 0 new projected 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2011 flow of 133,280 gpd. Peak 2011 flow was due to storm Lee & next highest peak was 116,280 gpd in June of 2013.

PS-7: 0 new projected 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2014 flow of 9,790 gpd. PS 7 was originally constructed to serve more EDU's than eventually were connected. Since flow is timer-estimated – the increase we see may simply be pumps wearing as they age. Next highest peak was 6,741 gpd in December of 2010.

PS-8: 0 new projected 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2011 flow of 376,000 gpd. Peak 2011 flow was due to storm Lee. The station replacement is finished with flow meter on line in September 2015 – 2015 flows are a blend of estimate and metered. Next highest peak was 305,400 gpd in June of 2013.

PS-9: 0 new projected 300 gpd (1.2 x 250 gpd ave EDU) connections were added to the 3-day peak 2011 flow of 19,860 gpd for PS 9. Peak 2011 flow was due to storm Lee. Next highest peak was 16,757 gpd in May of 2014.

INDUSTRIAL WASTES

There are no industrial wastes. The various restaurants in the service area, as a whole, are considered significant users. They are surcharged for BOD₅ loading and we monitor and clean their discharge sewers as needed and send them the invoice. They have tried to get their kitchen people to better maintain their grease traps with mixed success. Grease build-up in the PS 6 wet well is cleaned periodically and billed to Peddlers Village as provided for in their wastewater services agreement.

CORRECTIVE ACTION PLAN

A Corrective Action Plan is not needed. We would like to better characterize and address I & I. All decisions made to address I & I will look to data gathered over several years since a repeat of 2011 extremely high precipitation is highly unlikely. Of the 9 pump stations contributing to the Buckingham Village WWTP, 6 experienced their highest peak loading during Hurricane Lee in 2011. A more formal I & I study plan is hoped to be formulated in 2016.

CALIBRATION REPORTS

Calibration of the Buckingham Village Influent, effluent, PS 4 and PS5 meters was completed November of 2015 and the report is attached after page 14.

TRIBUTARY MUNICIPALITY REPORTS

Not applicable

ATTACHMENTS

Meter Calibration reports

BVWWTP current flows & reserved capacity as of 12-31-2015

Pump Station graphs showing 5-year history. Since so few new EDU's are projected, the pump station graphs do not show any loading projections

SSO Reports filed in 2015

ESSEX SERVICE CORPORATION
82 DOE RUN DRIVE
HOLLAND, PA 18966
T/A TREATMENT INSTRUMENTATION SPECIALIST

FIELD SERVICE REPORT

November 24-25,28 2015

Township of Buckingham
P.O. Box 413
Buckingham, PA 18912

Attention: Graham Orton

Trip required for verification of calibration of influent flow meter located at BVWWTP.

Influent Flow Meter

1. Endress Hauser model ProMag P; Serial No. 4600DB16000.
 - a. Calibration 0 - 800 gpm. Primary Element 4" Mag Meter.

The following parameters are programmed as follows:

Forward - Normal, 0 Return Off, System dampening 5 second, Integration 16.7 MS, Low cutoff 256 gpm, Empty pipe detection ON, Failsafe Low.

Unit checked and calibrated at the following:

As found settings:

0% in - out = 4.010 Madc

50% in - out = 11.967 Madc

100% in - out = 20.01 Madc

Adjusted settings:

None

None

None

Note: All units checked and calibrated in accordance with manufacturers' specifications as set forth in their instruction manuals.

Next calibration due December 2016

If you have any questions or comments please feel free to call.

ESSEX SERVICE CORPORATION



William K. Weissman

ESSEX SERVICE CORPORATION
82 DOE RUN DRIVE
HOLLAND, PA 18966
T/A TREATMENT INSTRUMENTATION SPECIALIST

FIELD SERVICE REPORT

November 24-25,28 2015

Township of Buckingham
P.O. Box 413
Buckingham, PA 18912

Attention: Graham Orton

Trip required for verification of calibration of effluent flow meter located at BVWWTP.

Effluent Flow Meter

1. Endress Hauser model ProMag P; Serial No. C2004B16000.
 - a. Calibration 0 - 1000 gpm. Primary Element 6" Mag Meter.

The following parameters are programmed as follows:

Forward - Normal, 0 Return Off, System dampening 5 second, Integration 16.7 MS, Low cutoff 256 gpm, Empty pipe detection ON, Failsafe Low K Factor 1.8363.

Unit checked and calibrated at the following:

As found settings:

0% in - out = 4.000 Madc
50% in - out = 12.004 Madc
100% in - out = 20.01 Madc

Adjusted settings:

None
None
None

Note: All units checked and calibrated in accordance with manufacturers' specifications as set forth in their instruction manuals.

Next calibration due December 2016.

If you have any questions or comments please feel free to call.

ESSEX SERVICE CORPORATION



William K. Weissman

ESSEX SERVICE CORPORATION
82 DOE RUN DRIVE
HOLLAND, PA 18966
T/A TREATMENT INSTRUMENTATION SPECIALIST

FIELD SERVICE REPORT

November 24-25,28 2015

Township of Buckingham
P.O. Box 413
Buckingham, PA 18912

Attention: Graham Orton

Trip required for verification of calibration of effluent flow meter located at Pump Station #4.

Effluent Flow Meter

1. Sparling model Tiger Mag; Serial No. MO31380701.

a. Calibration 0 - 1000 gpm. Primary Element 4" Mag Meter.

The following parameters are programmed as follows:

Forward - Normal, 0 Return OFF, System dampening 5 second, K Factor 239.13500, Low cutoff 100 gpm, Empty pipe detection ON, Failsafe Low.

Unit checked and calibrated at the following:

As found settings:

0% in - out = 4.000 Madc

50% in - out = 11.999 Madc

100% in - out = 19.99 Madc

Adjusted settings:

None

None

None

Note: All units checked and calibrated in accordance with manufacturers' specifications as set forth in their instruction manuals.

Next calibration due December 20156

If you have any questions or comments please feel free to call.

ESSEX SERVICE CORPORATION



William K. Weissman

ESSEX SERVICE CORPORATION
82 DOE RUN DRIVE
HOLLAND, PA 18966
T/A TREATMENT INSTRUMENTATION SPECIALIST

FIELD SERVICE REPORT

November 24-25, 28 2015

Township of Buckingham
P.O. Box 413
Buckingham, PA 18912

Attention: Graham Orton

Trip required for verification of calibration of effluent flow meter located at Pump Station #5.

Effluent Flow Meter

1. Polysonics Model MST Doppler; Serial No. Unkown.
 - a. Calibration 0 - 200 gpm. Primary Element 4" Pipe.

The following parameters are programmed as follows:

4-20 Madc = 0-200 GPM Total X 10 Pipe ID @ 4.16" Velocity @ 8fps

Unit checked and calibrated at the following:

As found settings:

0% in - out = 4.000 Madc

50% in - out = 11.999 Madc

100% in - out = 19.99 Madc

Adjusted settings:

None

None

None

Note: All units checked and calibrated in accordance with manufacturers' specifications as set forth in their instruction manuals.

Next calibration due December 2016.

If you have any questions or comments please feel free to call.

ESSEX SERVICE CORPORATION

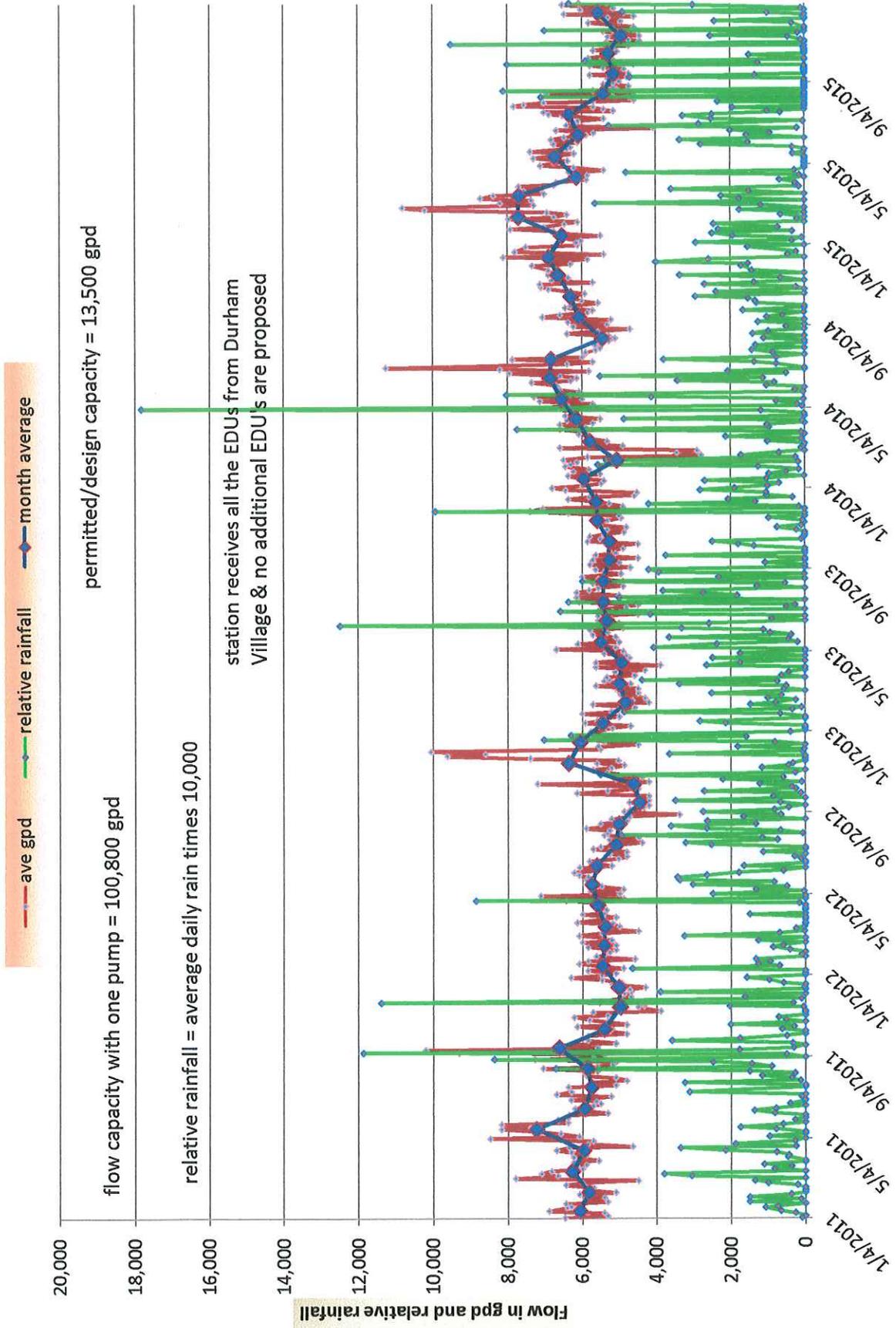


William K. Weissman

Buckingham Village WWTP Current Flows and Reserved Capacity - 12/31/15

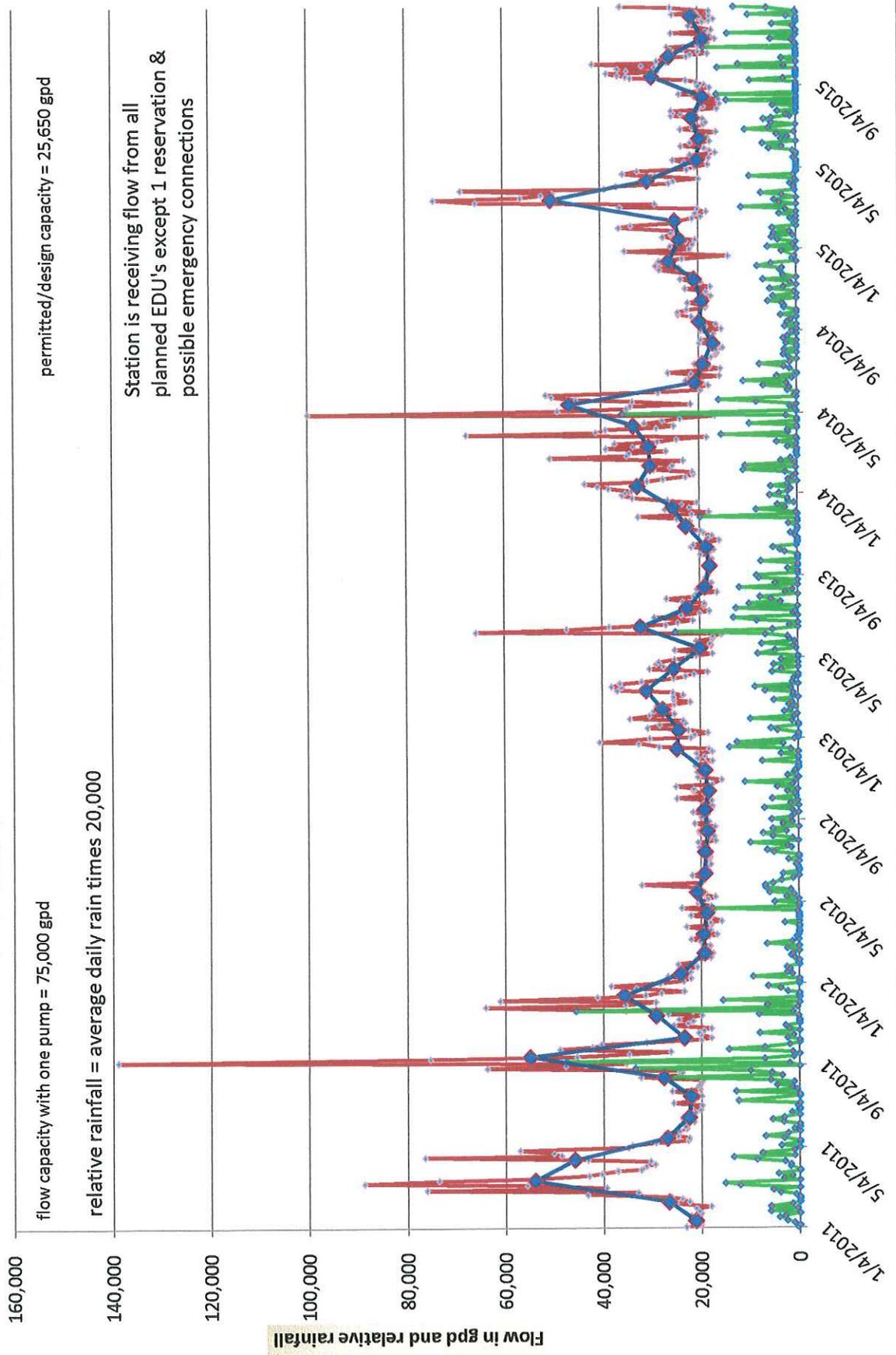
Table I-2							
residential	connected as of 1/1/15	connected new 2015	Reserved or for emergency	total committed	gpd/EDU	gpd flow committed in theory	2,015 actual or estimated
<i>net of 174 homes gpd est from PS 1, 2, 3 & 9 flows of 38,257 gpd</i>						170	
Single family	289	0	5	294	225	66,150	46,807
Stone Ridge	60	0	1	61	250	15,250	13,192
Holicong Reserve	60	0	0	60	265	15,900	13,192
*other residential Reserved	0	0	4	4	225	900	0
residential total	409	0	10	419		98,200	73,191
Commercial & Institutional	<i>small commercial EDU gpd est</i>					125	
minor	88	0	0	88	125	19,800	11,000
major - Candlewyk, Baci, Brewery & WaWa	22	0	1	23	225	3,825	4,947
** Cock and Bull, includes Carousel & Foxbrier farmhouse	89	0	252	341	225	76,725	19,995
** Penns Market I & II	46	0	52	98	225	22,050	10,261
** CB schools (3)	55	0	41	96	225	21,600	12,478
Misc. commercial	2	0	4	6	225	1,350	500
commercial total	302	0	350	652		145,350	59,182
Total all EDUs	711	0	360	1,071		243,550	132,373
ave. into plant							149,550
possible I & I							17,177
Plant rated capacity						236,000	236,000
outstanding reserved EDUs			360		225		80,968
net capacity at 12/15						(7,550)	5,482
513 accts for asset reporting		refer to commercial BOD log workbook for flow details					
*single reservations: 4233 York Drive (Allier - came in to discuss options 9-2010), Holicong Rd. (Wenick now CB Schools), 2712 Rte. 413 (Nuveen), 4212 Sunnyside (Luitweil)							
** Note: connected EDUs determined by meter readings from current year - varies year to year							
yellow indicates part or all estimated			chartreuse = mostly actual with <33% estimated				
orange indicates meter out of service part of year - flow estimated for that period							
yellow/green indicates mix of estimated and actual or estimates with some confidence							

Buckingham Township Pump Station #1 flow by hour meter vs precipitation



Buckingham Township Pump Station #2 flow by hour meter vs precipitation

gallons/day relative rainfall month average



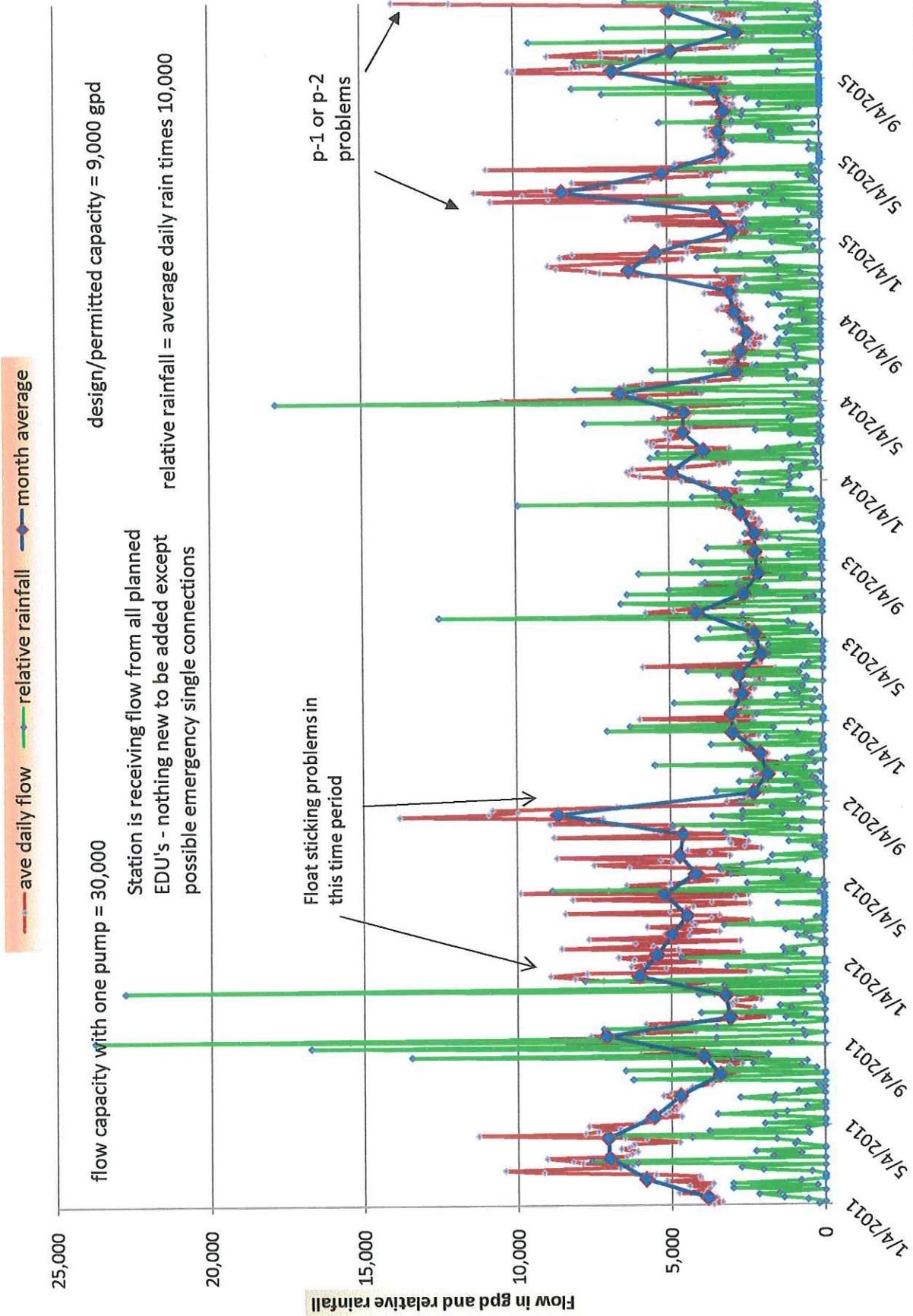
permitted/design capacity = 25,650 gpd

relative rainfall = average daily rain times 20,000

Station is receiving flow from all planned EDU's except 1 reservation & possible emergency connections

Flow in gpd and relative rainfall

Buckingham Township Pump Station #3 flow by hour meter vs precipitation



ave daily flow relative rainfall month average

flow capacity with one pump = 30,000
 Station is receiving flow from all planned EDU's - nothing new to be added except possible emergency single connections

design/permitted capacity = 9,000 gpd
 relative rainfall = average daily rain times 10,000

Float sticking problems in this time period

p-1 or p-2 problems

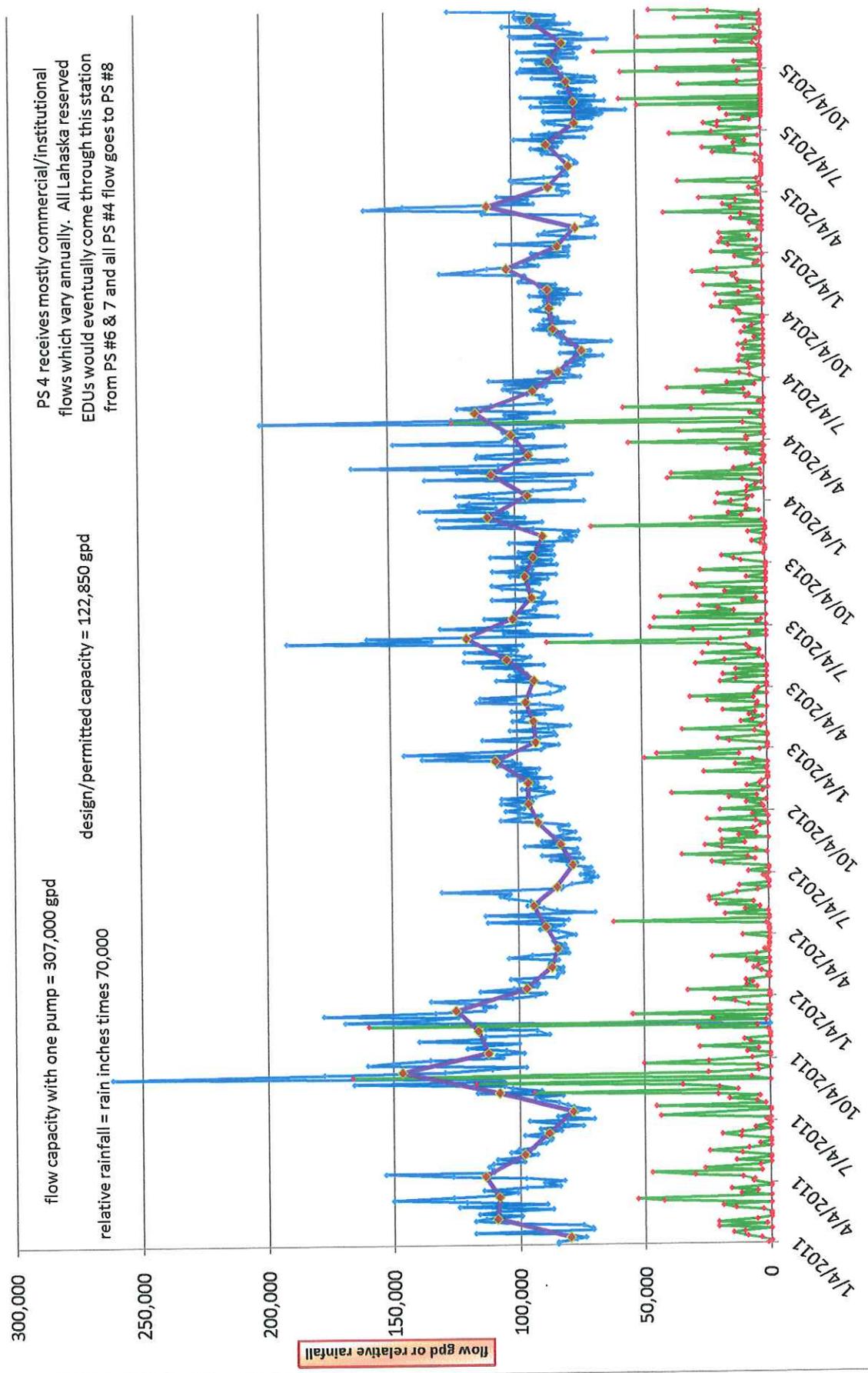
25,000
20,000
15,000
10,000
5,000
0

1/1/2011 5/1/2011 9/1/2011 1/1/2012 5/1/2012 9/1/2012 1/1/2013 5/1/2013 9/1/2013 1/1/2014 5/1/2014 9/1/2014 1/1/2015 5/1/2015 9/1/2015

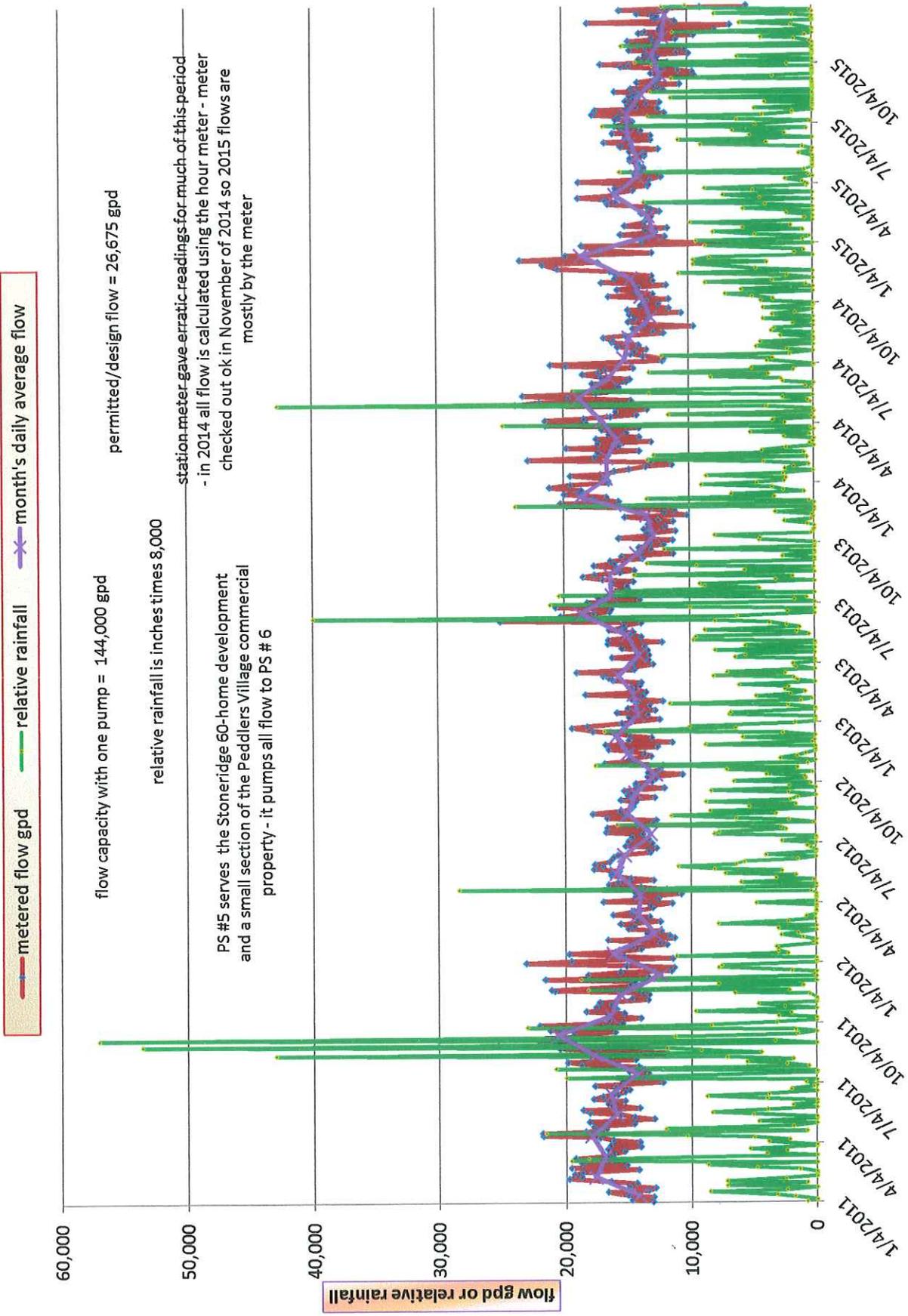
Flow in gpd and relative rainfall

Pump Station #4 metered flow vs precipitation

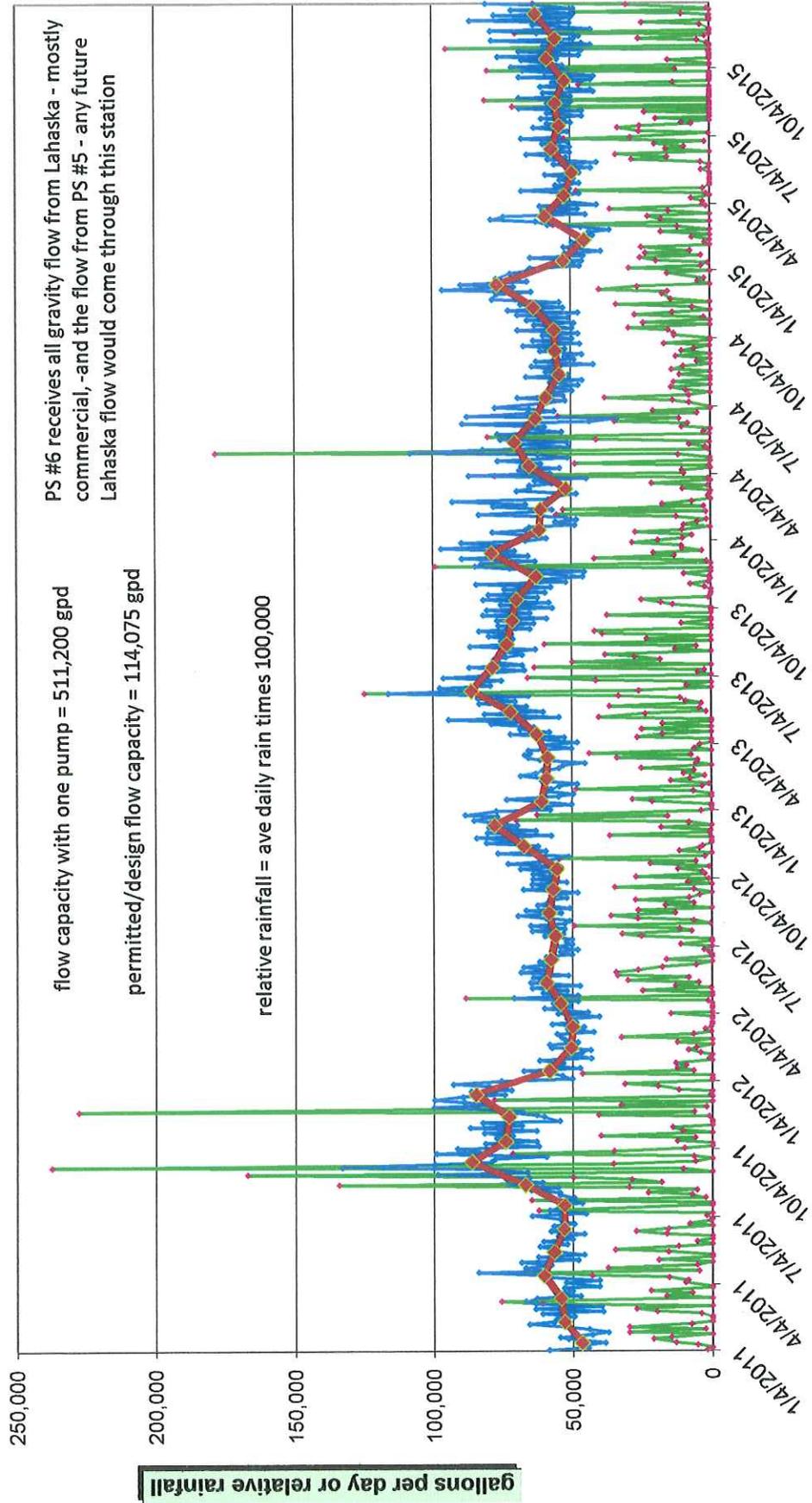
— flow in gallons per day
 — relative rainfall
 — monthly average flow



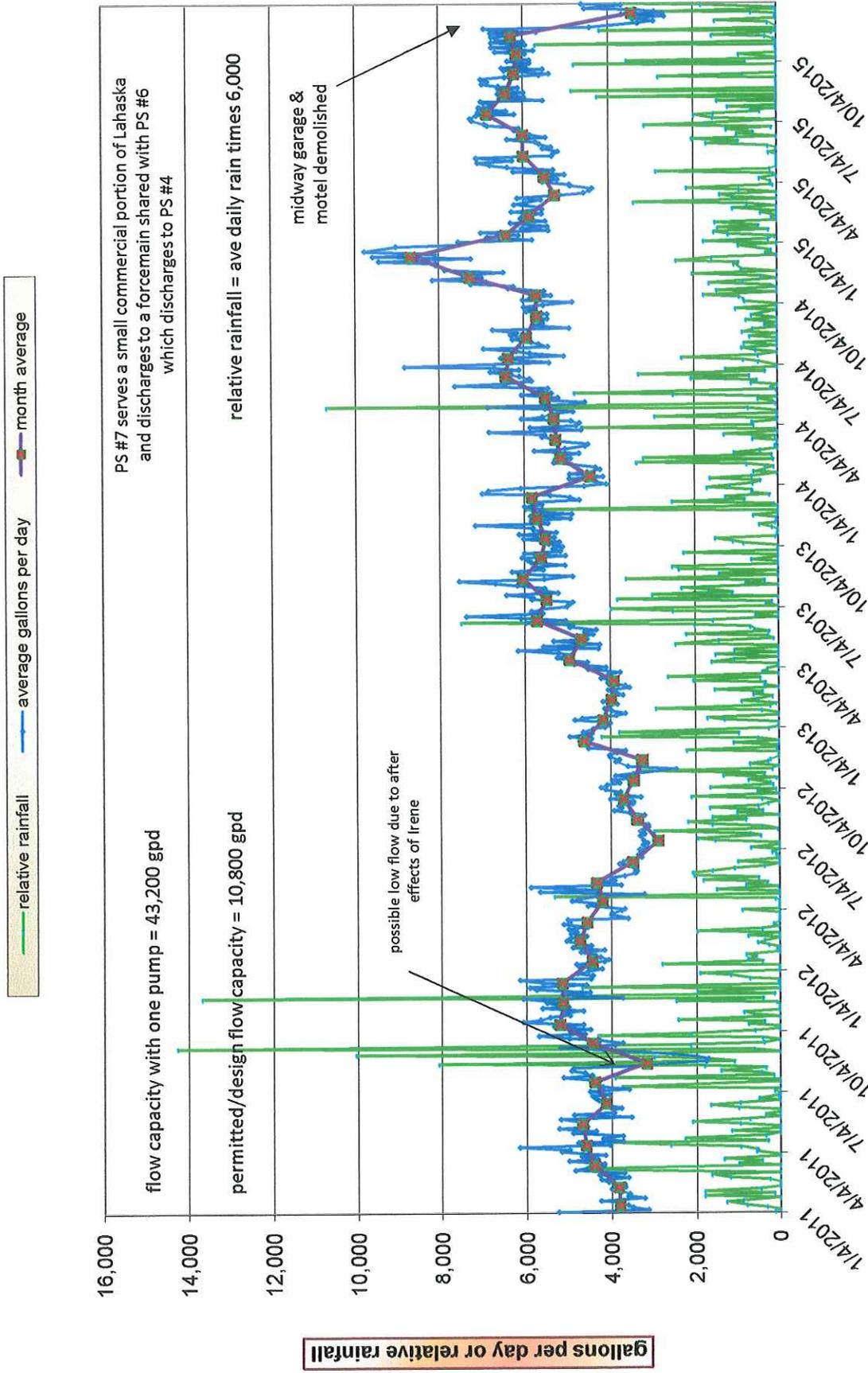
Pump Station #5 calculated and metered flow vs precipitation



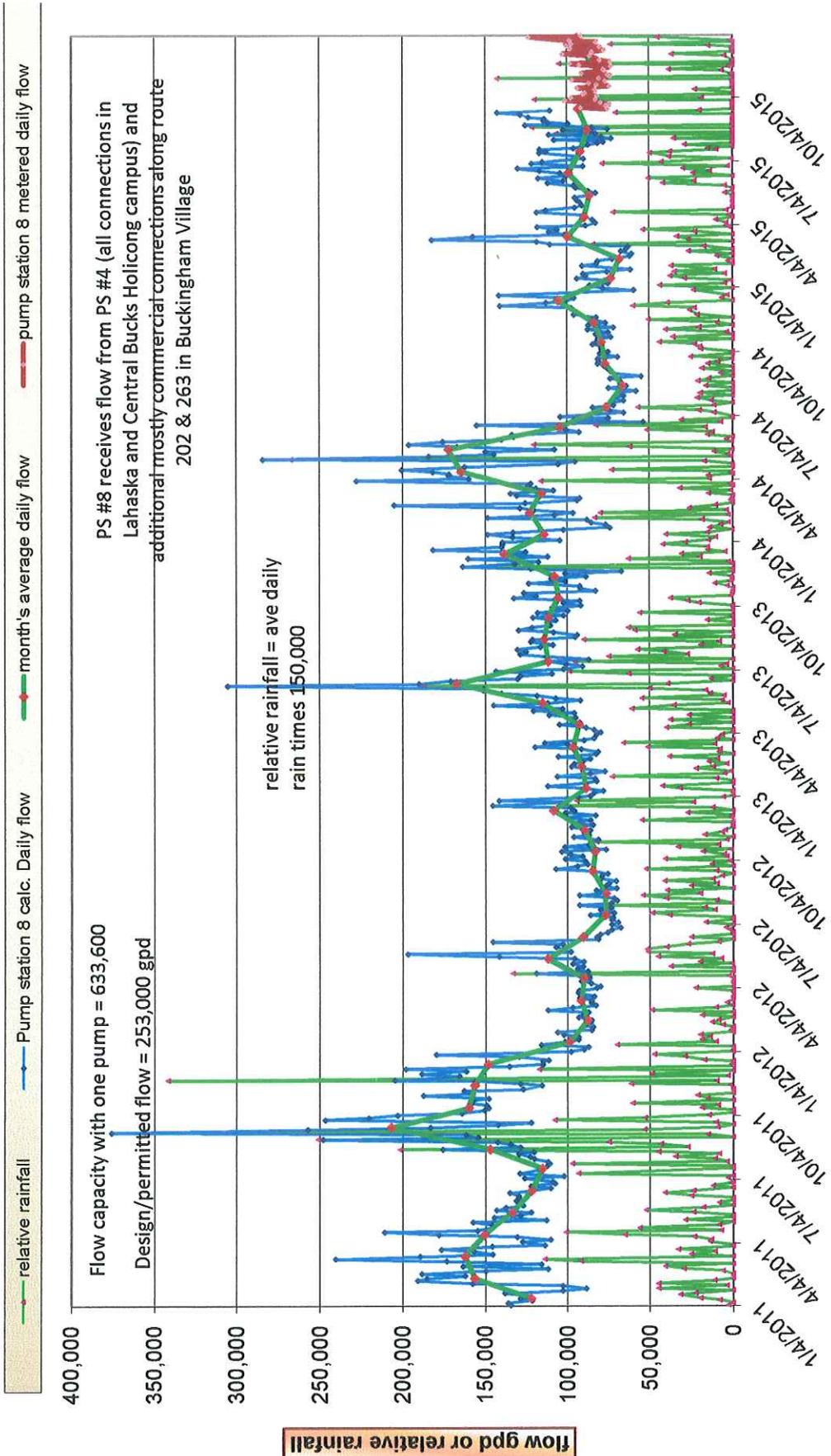
Pump Station # 6 flow by hour meter vs precipitation



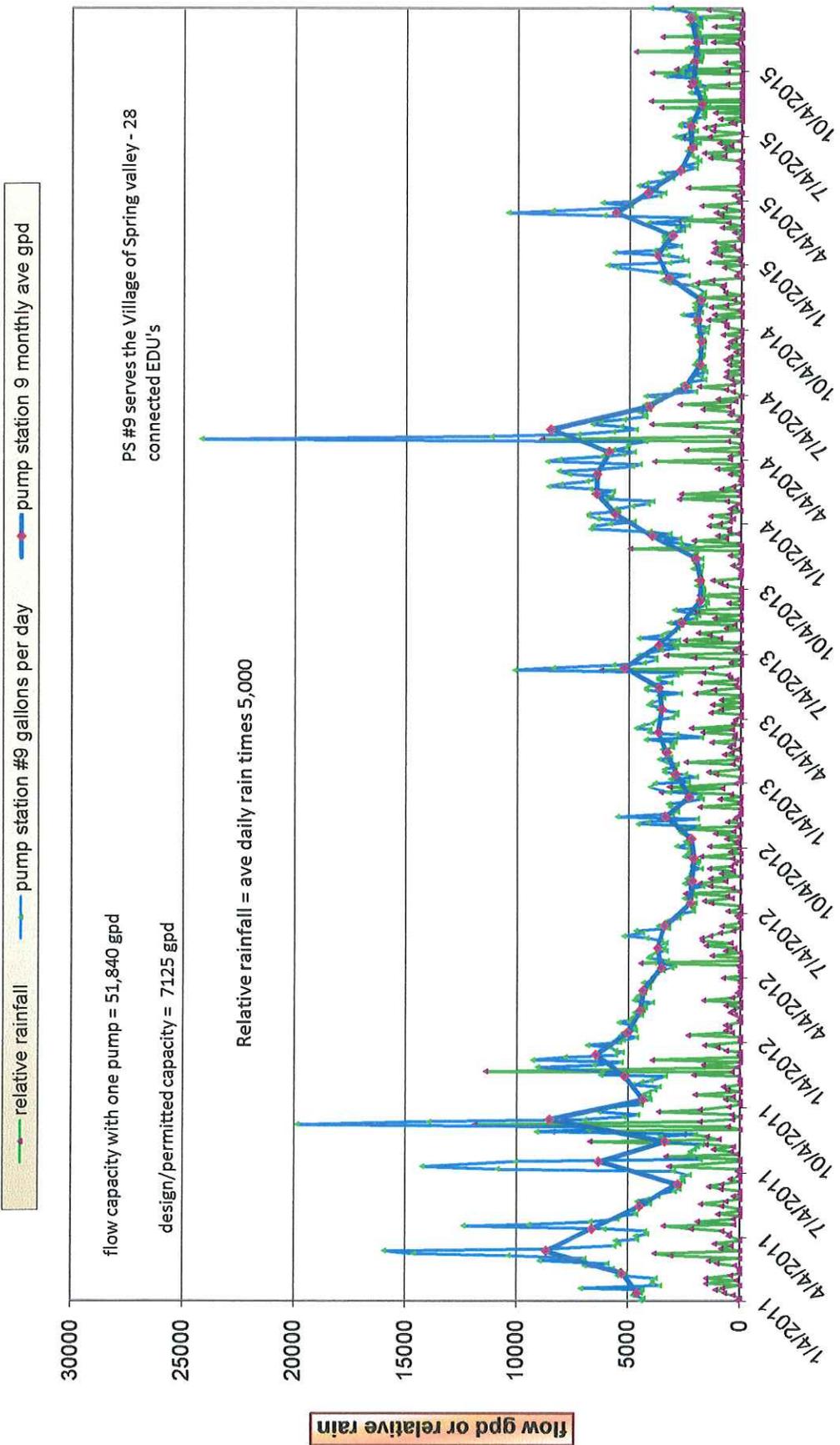
PS #7 flow by hour meter vs precipitation



PS #8 Flow by hour meter (Metered after 9-15-15) vs precipitation



PS #9 flow vs precipitation



	Please check the appropriate box	<input checked="" type="checkbox"/> Dry Weather Overflow	<input type="checkbox"/> Wet Weather Overflow	
1. Date, Name, Phone # of person completing this report	5/5/15 Graham Orton 215-768-6834			
2. Your organization name and address ?	Name: Buckingham Township County: Bucks Address: PO Box 413 Buckingham PA 18912 Township/Municipality: Buckingham Township			
Sewer system owner and permit number	Buckingham Township Central System discharging to Buckingham Village WWTP Permit #PA0052353			
3. Date found and <u>specific</u> location of SSO. Including Municipality/County (if different from #2) ?	Date: 5/5/15 Municipality: Buckingham Township Location(Street & #): 2380 Street Road County: Bucks (location is on Fox valley Drive about 500 feet south of Street Road)			
4. How was SSO discovered? By whom ?	Operator Bill van Horn Discovered at 6 am today			
5. Start and end time of SSO (actual or estimate?)	Start time is not known for sure - the area is highly visible to residents and there was no known police call so we believe it started overnight. SSO stopped at 6:25 am when pump truck arrived.			
6. Date, time and name of person who called PADEP originally to notify of SSO ?	Date : 5/5/5 Time : 6:29 am Name : Graham Orton			
7. Description and actual or estimated volume of SSO	sewage supernate overflowing manhole just before pump station #5 wet well. Volume is unknown but we may be able to estimate once the pump run times are analyzed			
8. Where, <u>precisely</u> , did SSO go ? (land, roadway, basement, swale, storm sewer, creek, etc.) Please include creek name or street location.	flowing from the manhole in grassy area and collecting in what appears to be a stormwater pond within 50 to 100 feet of the station			
9. What caused SSO ? How was it stopped ?	clogged 10 ft. sewer line - probably by sanitary wipes. Jetter truck is on its way to clear the blockage.			
10. Describe extent of contamination and how it was cleaned up	Grassy area will be limed to raise pH to >9. There are no solids to clean up.			
11. What actions will be taken to prevent a re-occurrence ? When ?	the cause of the blockage was a rock, probably left upstream in the sewer during construction many years ago, that caught wipes which wove into a ball of, eventually, impervious material. We will continue to periodically check manhole & pump station. We now require TV inspection of all newly constructed sewers.			
12. Other comments ?	We would hope that the effort under way by numerous wastewater service providers to get sanitary wipes materials and manufacturing changed so they are more degradable and/or that manufacturers are required to address this major problem by changing their package labeling to indicate that the wipes are not "flushable".			
13 Downstream notifications made: (All downstream users such as public water supplies must be notified)	None were necessary - all water apparently was trapped in the grassy area or in the retention pond. Bill can't locate an outlet to the pond.			

	Please check the appropriate box	<input checked="" type="checkbox"/> Dry Weather Overflow	<input type="checkbox"/> Wet Weather Overflow
1. Date, Name, Phone # of person completing this report	8/5/15 Graham Orton 215-768-6834 or 215-794-8834		
2. Your organization name and address ?	Name: Buckingham Township County: Bucks Address: PO Box 413 Buckingham PA 18912 Township/Municipality: Buckingham Township		
Sewer system owner and permit number	Buckingham Township Central System discharging to Buckingham Village WWTP Permit #PA0052353		
3. Date found and <u>specific</u> location of SSO. Including Municipality/County (if different from #2) ?	Date: 8/5/15 Municipality: Buckingham Township Location(Street & #): 5723 Route 202 County: Bucks (location is just off route 202 in Lahaska on the property of a former Motel and junk yard)		
4. How was SSO discovered? By whom ?	Employee Walter Michitsch Discovered at 7:10 am today		
5. Start and end time of SSO (actual or estimate?)	Start time is not known for sure. SSO stopped at 7:12 am when pumps were switched to hand operation.		
6. Date, time and name of person who called PADEP originally to notify of SSO ?	Date : 8/5/5 Time : 7:20 am Name : Graham Orton		
7. Description and actual or estimated volume of SSO	sewage supernate overflowing PS #7 wet well hatch. Volume is unknown but using pump run times we calculate a net reduction in flow of 5,000 to 5,500 gallons and the full wet well above LWL and piping hold about 2,400 gallons - so overflow volume is estimated at 2,600 to 2,900 gallons		
8. Where, <u>precisely</u> , did SSO go ? (land, roadway, basement, swale, storm sewer, creek, etc.) Please include creek name or street location.	flowing from the wet well hatch in the driveway leading down to and along side of the junk yard extending about 125 yards downhill of the pump station where it flattened out and collected in an area about 50 sq. ft that also had standing rainwater from yesterday's storm. From there the flow was lost - perhaps some making its way into an adjacent algae-covered pond.		
9. What caused SSO ? How was it stopped ?	exact cause is unknown but electrical - we know the autodialer is working and we have a dial tone but the alarms (multitrode level controller) did not register on the autodialer. We found the Multitrode controller screen was blank which indicates a PECO power surge problem		
10. Describe extent of contamination and how it was cleaned up	Driveway and flat were limed to raise pH to >9. There are no solids to clean up.		
11. What actions will be taken to prevent a re-occurrence ? When ?	Electrician diagnosed the problem and replaced the Multitrode controller from our stock of parts. A new replacement will be purchased. An additional ultra-high level float was wired directly into the Autodialer. All is now in normal operation.		
12. Other comments ?	None at this time		
13 Downstream notifications made: (All downstream users such as public water supplies must be notified)	None were necessary - all water apparently stayed in the driveway and flat area.		