LOCAL LIMITS DERIVATION REPORT FOR THE TOWN OF SOUTH KINGSTOWN, RI

PREPARED FOR:

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SECTION 1 DESCRIPTION OF THE PLANT TYPE

The South Kingstown Regional Wastewater Treatment Facility is located on Westmoreland St. in Narragansett. The plant was designed for an average daily flow of 5.0 MGD and a peak wet weather flow of 12.0 MGD. The design loading to the plant for Total Suspended Solids is 10,425 pounds per day (lbs/day) and BOD_5 is 10,425 lbs/day. The activated sludge process provides secondary treatment of wastewater followed by disinfection. The plant can operate in either a conventional complete mix mode of the activated sludge process or in a plug flow mode to achieve removal for the conventional pollutants (BOD_5 and TSS). This process is followed by disinfection with sodium hypochlorite and dechlorination with sodium bisulfite. Figure 1-1 shows the overall plant layout.

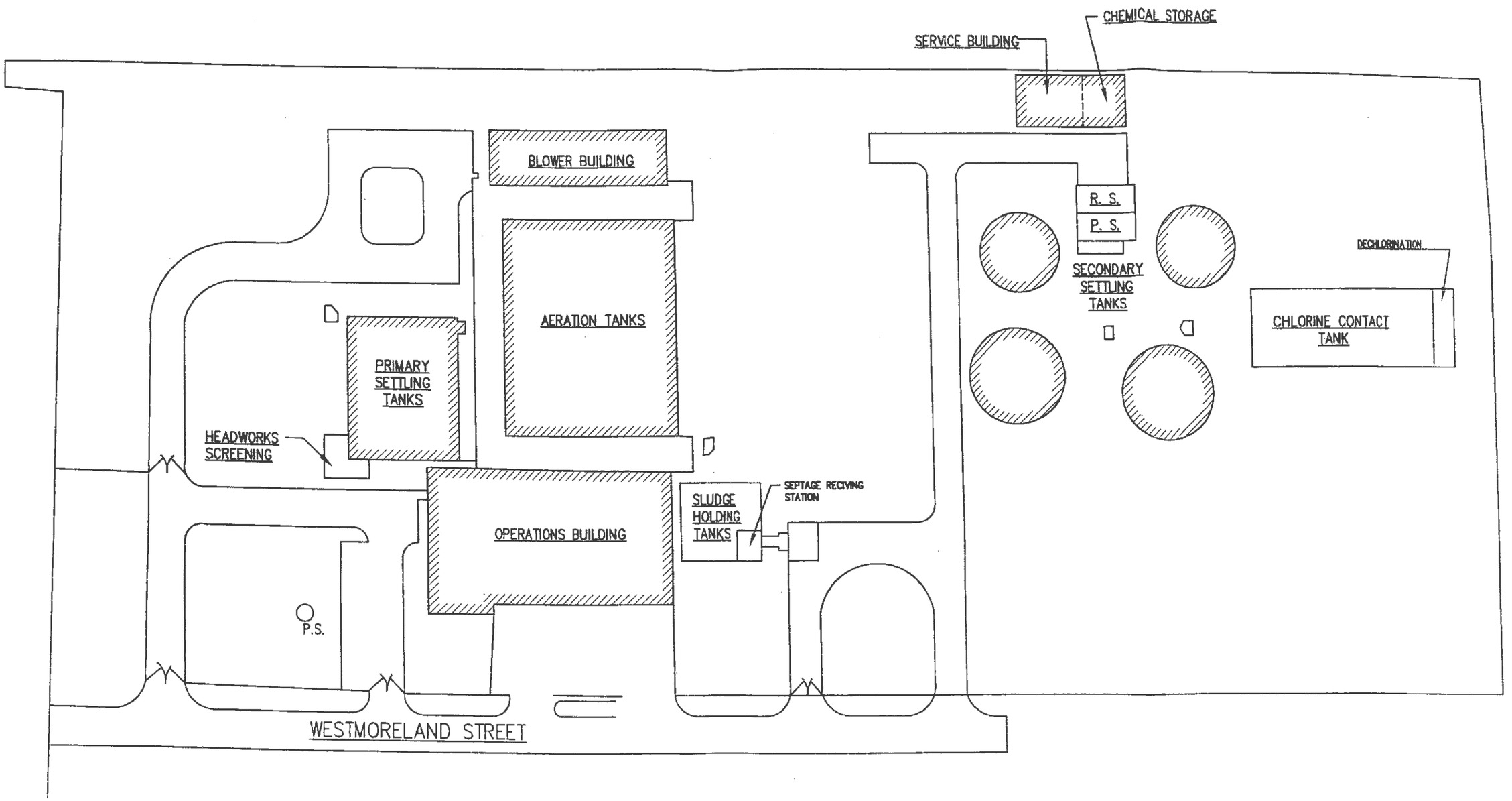
The liquid treatment process consists of headworks screening, primary settling, aeration, return activated sludge pumping, waste activated sludge pumping, secondary settling, disinfection and dechlorination. The solids treatment system consists of scum removal; primary sludge pumping and storage; waste activated sludge (WAS) pumping. Prior to disposal, the blended primary/WAS can either be processed through a rotary drum thickener or dewatered through belt filter press. The thickened sludge, which is between 3-5% solids, is disposed of via off-site incineration, or the dewatered sludge, which is between 18-22% solids, is disposed of at the Resource Recovery Landfill.

The Treatment Plan processes septage waste independent of the activated sludge process. Septage waste is deposited at the plant's septage receiving facility. At this facility, the waste enters a holding tank where it is aerated to allow for the grit to settle out. A screw conveyor transports the grit to a bucket elevator where it then goes through a dewatering process. The grit is hauled off for disposal. The liquid portion of the septage is then combined at the headworks where it is blended with the influent wastewater.

The South Kingstown Regional Wastewater Treatment Facility has undergone a number of upgrades and improvements since its original construction in 1979. This facility was originally designed as a Secondary Activated Sludge Plant with conventional removal limits for BOD_5 and Total Suspended Solids. These conditions still remain in effect today. Table 1-1 presents the current effluent parameters for the South Kingstown facility.

TABLE 1-1
CURRENT DISCHARGE LIMITATIONS

Effluent Characteristics	Average (Monthly)	Maximum (Daily)
Flow	5.0 average / 12.0 MGD peak	
BOD_5	30 mg/l	50 mg/l
Total Suspended Solids	30 mg/l	50 mg/l
Enterococci	35cfu^3 /100 ml	276 cfu^3 / 100 ml
pH	>6.0 - <9.0	
Chlorine Residual	885 µg/l	1,040 µg/l



Town of South Kingstown
Rhode Island

EXISTING REGIONAL WASTEWATER TREATMENT FACILITY
Figure I-1

JAMES J. GEREMIA & ASSOCIATES, INC.

Source: Town of South Kingstown

Date: 2005

Scale: No Scale

In January 1969, the Rhode Island General Assembly passed an enabling act which established a wastewater district, permitting South Kingstown to operate and maintain a publicly owned sewage treatment works. The agreement indicates that the cost disbursement for capital expenses were to be proportioned based on percentages of total design flow. Subsequent to the enabling legislation, the Town of Narragansett, along with the University of Rhode Island, entered into an agreement with South Kingstown for the treatment and disposal of wastewater in November 1972 under Chapters 116 and 171 of the Public Laws of 1969 as amended. This agreement allocates the following flow distribution by participant.

1972 ORIGINAL REGIONAL PARTNER FLOW APPORTIONMENT

South Kingstown	41%	1.693 MGD
University of Rhode Island	40%	1.652 MGD
Narragansett	19%	0.785 MGD
	Total	**4.130 MGD**

In 1997, as a result of process improvements at the Regional Wastewater Treatment Facility, the Rhode Island Department of Environmental Management (RIDEM) granted an increase in the capacity to South Kingstown's permit from 4.13 MGD to 5.0 MGD. This provided an additional flow of 0.87 MGD which could be distributed to each of the participants. Since the University of Rhode Island did not need any additional capacity, South Kingstown and Narragansett were able to increase their capacity equally.

Table 1-2 shows the current flow distribution which the 0.87 MGD plant expansion that was constructed in the 1990s.

TABLE 1-2
CURRENT WWTF REGIONAL PARTNER FLOW ALLOCATION

Partner	Original Capacity 1974 (MGD)	Original Percentage (%)	1992 Expansion (MGD)	Current Available Capacity (MGD)	Current Available Percentage (%)
South Kingstown	1.6933	41.00	0.4350	2.1283	42.57
Narragansett	0.7847	19.00	0.4350	1.2197	24.39
URI	1.6520	40.00	0.0000	1.6520	33.04
Totals	**4.1300**	**100.00**	**0.8700**	**5.0000**	**100.00**

The allocated loadings (Total Suspended Solids and BOD) have been based on an average concentration of 250 mg/l which is presented in Table 1-3.

TABLE 1-3 REGIONAL BREAKDOWN (TSS AND BOD)			
	Flow (MGD)	**BOD (lbs/day)**	**TSS (lbs/day)**
South Kingstown	2.1283	4,438	4,438
Narragansett	1.2197	2,543	2,543
URI	1.6520	3,444	3,444
	5.0000	**10,425**	**10,425**

Table 1-4 provides the average daily flow by regional participant over the past four years. That data reveals that the plant is operating at 53% of its design capacity. When you account for the purchased capacity of the Town of Narragansett and the University of Rhode Island, South Kingstown is operating at 46% of its reserve capacity.

TABLE 1-4 FOUR-YEAR AVERAGE DAILY FLOW (MGD/YEAR)					
	2015-2016	**2016-2017**	**2017-2018**	**2018-2019**	**Avg.**
South Kingstown	0.87	0.87	1.02	1.14	**0.98**
Narragansett	1.10	1.13	1.17	1.36	**1.19**
URI	0.47	0.46	0.46	0.53	**0.48**

Table 1-5 provides a breakdown of actual loading over a four-year period for TSS and BOD by participant.

TABLE 1-5 REGIONAL LOADING (TSS AND BOD) BY REGIONAL PARTICIPANT			
	Flow (MGD)	**BOD (lbs/day)**	**TSS (lbs/day)**
South Kingstown	0.98	1,913	2,133
Narragansett	1.19	2,322	2,590
URI	0.48	937	1,045
	2.65	**5,172**	**5,768**

During that same period of time, the plant received an average of 11,660 gpd of septage waste with a peak volume of 17,357 gals./d which occurred in July of 2016. Table 1-6 provides a breakdown of septage over that five-year period.

Based on the contractual commitment, each of the regional participants (with the exception of Narragansett) have capacity for future connections. Table 1-7 provides the available flow and loading by participant. For the purpose of this Local Limit Study and the corresponding revisions to the South Kingstown Ordinance, the future wasteload allocation will specifically focus on South Kingstown. Available wasteload allocation of the other communities will not be re-allocated to South Kingstown.

TABLE 1-6 FIVE-YEAR SEPTAGE WASTE VOLUME (GAL/DAY)					
	FY '16	**FY '17**	**FY '18**	**FY '19**	**FY '20**
July	17,351	13,241	14,899	16,080	16,770
August	16,041	16,544	15,994	16,350	16,413
September	14,850	14,829	13,025	12,210	15,006
October	11,277	11,108	13,017	13,493	15,641
November	10,496	10,243	13,860	12,722	12,093
December	7,587	6,973	8,556	9,039	6,778
January	5,707	1,025	6,809	5,691	5,965
February	6,946	4,319	7,354	5,129	7,511
March	10,865	5,798	7,295	7,893	8,870
April	13,934	9,813	8,789	15,145	11,920
May	13,447	13,854	15,971	15,045	14,579
June	15,606	15,563	15,500	15,257	15,482
ANNUAL AVERAGE SEPTAGE VOLUME (GAL/DAY)	**12,009**	**10,276**	**11,756**	**12,005**	**12,252**

TABLE 1-7 AVAILABLE FLOW AND LOADING (BY PARTICIPANT)			
	Flow (MGD)	**BOD (lbs/day)**	**TSS (lbs/day)**
South Kingstown	1.14	2,525	2,305
Narragansett	-0.43	-1,055	-787
*URI	0.772	1,673	1,565

Existing Industrial Users

The South Kingstown Regional Wastewater Treatment Facility permits 117 commercial users:

75 restaurants	1 carpet cleaning service	2 laundries
1 apothecary	1 caterer	4 markets
4 bakeries	2 convenience stores	1 movie theater
2 breweries	1 distillery	3 nursing homes
2 candy shops	1 funeral home	1 nutrition center
4 automotive establishments	1 hotel	2 private clubs
2 car washes	2 ice cream-yogurt shops	5 public and private schools

From these 117 permits, there are two (2) SIUs which are monitored by the Program.

	2019 Wastewater Flow
• South County Hospital	50,000 gpd ADF
• Technical Industries	150 gpd ADF

There are three (3) industries that have not been monitored in the past which will be included to future monitoring. These industries have been identified by RIDEM as Significant Industrial Users (SIUs) are to be permitted by the local wastewater treatment facilities as an SIU.

• Whalers Brewing Company	7,760 gpd ADF
• Shaidzon Beer Company	2,290 gpd ADF
• Sons of Liberty Beer & Spirits (brewery & distillery)	1,200 gpd ADF

SECTION 2 REMOVAL EFFICIENCIES

2.1 GENERAL

In order to generate site-specific local limits, a great deal of research, sampling and analyses has been conducted in order to develop data which truly expresses the wastewater process experienced at the Treatment Facility. It is of prime importance that the data to be used in the equations is truly reflective of the actual operating conditions. Historical data over the past five years was combined with data collected specifically for this study as proposed in the Local Limits Monitoring Plan (LLMP) in an effort to achieve a balance and eliminate aberrant statistical figures which do not present an adequate representation of the Treatment Facility.

2.2 AVERAGE DAILY FLOW

The daily flow from January 2015 through December 2019, as reported in the DMRs (a summary of which can be found in Appendix A), reveals that the average daily flow (ADF) was 2.62 MGD; the daily peak flow was 9.99 MGD; and the daily minimum flow was 1.46 MGD.

A flow of 2.62 MGD was used to express average daily flow, where applicable; a design flow of 5.0 MGD shall be used to express design conditions average daily flow.

2.3 INDUSTRIAL FLOW

In order to accurately evaluate industrial pollutant contribution, the daily wastewater flows from industrial sources must be determined or accurately estimated. The Town of South Kingstown's industrial base is limited. The two (2) significant industrial users (SIUs) that are currently monitored (South County Hospital and Technical Industries) have a total flow of 50,150 gpd, and the three micro breweries and distillery have a total flow of approximately 11,250 GPD for a total current flow of 61,400 gpd.

The industrial growth is expected to be in industrial users such as micro breweries and distillers. Currently, there are no other anticipated categorical or significant users anticipated in the future.

2.4 REMOVAL EFFICIENCY

The efficiency in which the treatment facility removes pollutants is an important factor in determining if the industrial local limits are to be altered. To determine both primary treatment and final treatment efficiency, five 24-hour samplings were taken at the plant influent, primary treatment and final effluent (Appendix B summarizes the analytical data and provides calculated removal / the laboratory's Data Analytical Sheets were not included due to the volume of data). The results of this sampling are presented in Table 2-1.

It must be noted that the treatment facility is not required to monitor for metallic constituents in its influent and effluent as part of its RIPDES Permit. The local limit monitoring plan has been instituted and samples have been taken once a year. The Average Daily Removal Efficiency (ADRE) was used due to the limited number of samples collected.

The summary of the removal efficiencies (Table 2-1) shows that in several cases, such testing does not ensure that the proper removal efficiency can be ascertained. For example, the Arsenic, Cadmium, Cyanide and Mercury results show "below detection limit" values for all samples taken. Virtually none of these metals enter the Treatment Facility; a situation completely expected due to the lack of manufacturing in the service area.

This creates an evaluation problem with less than detectable values entering the Facility. By definition, there can be no removal efficiency, as there is nothing to remove. These parameters are indicated in Table 2-1 with an "X" for the removal efficiency indicating that the removal efficiency could not be determined from the data.

TABLE 2-1
SUMMARY OF REMOVAL EFFICIENCY

Parameter	Influent (mg/l)	Post Primary (mg/l)	Effluent (mg/l)	Primary Removal Efficiency %	Final Removal Efficiency %
Arsenic	<0.0224	<0.0224	<0.0134	X	X
Cadmium	<0.002	<0.002	<0.002	X	X
Chromium	0.0068	0.0066	0.0066	29%	29%
Copper	0.0511	0.0381	0.0160	22%	90%
Cyanide	<0.001	<0.001	<0.001	X	X
Lead	0.0079	0.0072	0.0072	29%	29%
Mercury	<0.0003	<0.0003	<0.0003	X	X
Nickel	0.0090	0.0088	0.0086	20%	40%
Silver	<0.0066	<0.0066	<0.0066	X	X
Zinc	0.1442	0.1170	0.0763	18%	42%
Parameter	**Influent (mg/l)**	**Post Primary (mg/l)**	**Effluent (mg/l)**	**Primary Removal Efficiency %**	**Final Removal Efficiency %**
BOD	234.2	161.4	13.28	31%	94%
TSS	167.5	*	8.325	*	95%

X Indicates removal efficiency could not be determined from the data
* Indicates no data

Table 2-2 shows the EPA median removal for Primary ($E_{primary}$) and for Activated Sludge (E_{AS}) which can be found in Appendix R of the 2004 Local Limits Development Guidance prepared by EPA.

TABLE 2-2 EPA REMOVAL EFFICIENCY RATES					
Parameter	$E_{primary}$ Primary Removal (%)	E_{AS} Final Removal (%)	Parameter	Primary Removal (%)	E_{AS} Final Removal (%)
Arsenic	*	45	Mercury	10	60
Cyanide	27	69	Nickel	14	42
Cadmium	15	67	Selenium	*	50
Chromium	27	82	Silver	20	75
Copper	22	86	Zinc	27	79
Lead	57	61			

* Indicates no guidance was found

E_{AS} = published efficiencies though activated sludge

The removal efficiency for Copper, Chromium, Nickel, Zinc and Lead will be taken from the site-specific data generated at the Treatment Facility. The balance for the removal efficiency will be taken from the EPA 2004 Local Limits Development Guidance. Due to the nature of the sludge disposal calculation, the EPA literature ensures a more conservative estimation, and thus the literature values shall be used for sludge disposal. The primary and final removal efficiencies to be utilized in this derivation are those shown in **bold** in Table 2-3.

TABLE 2-3 REMOVAL EFFICIENCY COMPARISON				
	Primary Removal		Total Removal	
Parameter	Site Specific Sampling (%)	EPA[1] Manual (%)	Site Specific Sampling (%)	EPA Manual (%)
Arsenic	X	*	X	**45**
Cyanide	X	**27**	X	**69**
Cadmium	X	**15**	X	**67**
Chromium	**29**	27	**27**	82
Copper	**22**	22	**90**	86
Lead	**29**	57	**29**	61
Mercury	X	**10**	X	**60**
Nickel	**20**	14	**40**	42
Silver	X	**20**	X	**75**
Zinc	**18**	27	**42**	79

[1] This represents EPA median value as published in EPA literature

Bold values represent percent removal used in the headworks loading calculation

* Indicates no guidance was found

X Indicates removal efficiency could not be determined from the data

2.5 RESIDENTIAL POLLUTANT CONCENTRATIONS

In order to accurately and fairly determine local pollutant limitations for industrial users, the concentration of pollutants due to non-industrial discharge must also be considered. Wastewater from residential sources largely represents the quality of the incoming water supply, along with the ambient qualities of the surrounding piping, and of course the small amounts attributable to household products. This is particularly true in South Kingstown where nearly all of the influent originates from non-industrial sources. The pollutants discharged from non-industrial sources, by definition of purpose, are allowable amounts to be expected to be discharged into the collection system.

Residential wastewater contributions were sampled via composite wastewater samples over a twenty-four (24) hour period. The monitoring was done once a year which coincided with the treatment plant local limits sampling.

Table 2-4 represents the residential component of the incoming wastewater. These results were collected over a 5-year period. This was selected as it represents strictly residential wastewater. The testing did not include BOD and TSS for domestic sources. Section 4 discusses the BOD_5 and TSS in more detail.

TABLE 2-4
RESIDENTIAL WASTEWATER POLLUTANT AVERAGES

Pollutant	Concentration (mg/l)	Pollutant	Concentration (µg/l)
Arsenic	<0.005	Nickel	.0.0086
Cadmium	<0.002	Mercury	< 0.0004
Chromium	<0.0078	Cyanide	< 0.010
Copper	0.0441		
Lead	<0.0103		**Concentration**
Silver	<0.0078		**(mg/l)**
Zinc	0.2076	BOD	278
		TSS	167.5

2.6 PREDETERMINED VALUES

2.6.1 INHIBITION LEVELS

Threshold activated sludge minimum inhibition levels were adopted using values established in the PRELIM Version 4.0 Users Guide and the EPA Guidance Manual (Table 3-2 using minimum values) are presented in Table 2-5.

TABLE 2-5 ACTIVATED SLUDGE INHIBITION LEVELS			
Pollutant	**Level (mg/l)**	**Pollutant**	**Level (mg/l)**
Arsenic	0.1	Lead	1-100
Cadmium	1.0-10	Nickel	1.0-5.0
Chromium	1.0-100	Silver	*
Copper	1.0	Zinc	0.30-10
Cyanide	0.1-5	Mercury	0.10-1.0

* Indicates no RIPDES limit

2.6.2 RIPDES LIMITATIONS

As mentioned in Section 2.3, there are no effluent metals limitations except for Copper in the Facility's, RIPDES Permit issued in 2017. The most recent RIPDES permit (July 10, 2017) can be found in Appendix C. The development document for which the RIPDES permit was calculated can be found in Appendix D. In the development process, the Rhode Island Department of Environmental Management calculated the acute and chronic limits based on water quality and human health criteria. Thus, in order to preserve water quality, the Potential Permit Limits were used as these limitations where RIPDES limits were not promulgated. The limitations from the development document are listed in Table 2-6.

TABLE 2-6 PERMIT LIMITATIONS (Maximum Day Values)					
Parameter	**Daily Maximum Concentration (mg/l)**	**Monthly Average Concentration (mg/l)**	**Parameter**	**Daily Maximum Concentration (µg/l)**	**Monthly Average Concentration (µg/l)**
Arsenic	4.416	0.132	Lead	14132.49	0.80404
Cadmium	2.57545	0.83573	Mercury	135.53	0.01416
Chromium	no value	no value	Nickel	4783.84	0.7819
Copper	0.37012	0.35258	Silver	143.05	0.14306
Cyanide	0.064	0.064	Zinc	6088.79	6.08879

2.6.3 SLUDGE QUALITY CRITERIA

The South Kingstown Facility has the flexibility to dispose of its wastewater sludge either by incineration at Synagro's (formerly NETCo) facility in Woonsocket, RI or disposal at the Resource Recovery Facility for land disposal. The sludge transported by tanker truck to Synagro is approximately 2 to 5% solids while the cake sludge hauled via watertight roll-off container to the Landfill is approximately 18 – 22% solids. Currently, the Treatment Facility is upgrading the dewatering operation to allow this facility to haul dewatered (cake) sludge (27 to 30% solids) to either Synagro for incineration of dewatered cake sludge or the Resource Recovery Central Landfill facility for land disposal.

SECTION 3 ALLOWABLE POLLUTANT LOADINGS

3.1 GENERAL

The objective of this chapter is to present the allowable loadings calculated for each criteria (pass-through, inhibition, sludge quality) for each pollutant. In doing so, a calculation of the loading for one pollutant shall be presented for each criteria.

The pollutants discussed in this chapter are as follows: Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Silver, and Zinc. These pollutants have been presented because technical data, in general, exists for these pollutants. They generally fall into the same category and are derived in this chapter. Since the time of the local limits monitoring plan approval EPA added molybdenum and selenium to the pollutants of concern. These metals are only a concern for biosolids and since the treatment facility has no intention of using the sludge for biosolids the evaluation is not required. Other pollutants shall be discussed later in this report.

Ammonia was not reviewed in this report for several reasons. The treatment facility does not have a current industrial contributor. The parameter was not included in the approved local limits monitoring plan and, therefore, no removal data was collected. The treatment facility has not had interference related to ammonia. The parameter was not included in the RIPDES permit indicating the permit writer considered there was no reasonable potential to violate the permit.

It should also be mentioned that pass-through inhibition and sludge quality criteria are not derived for all the pollutants in this chapter.

3.2 RIPDES PASS-THROUGH

The RIPDES based pass-through limitations are presented in Table 3-1. Cyanide is the only conservative pollutant that is regulated by the Permit. The other pollutants listed were found not to have an impact on the receiving waters. The development document states:

"Development of Rhode Island Pollutant Discharge Elimination System (RIPDES) permit limitations is a multi-step process consisting of the following steps: calculating allowable discharge levels based on instream criteria, background data and available dilution; assigning applicable Technology-based limits and appropriate Best Professional Judgement (BPJ) limits; determining if technology based limits apply; comparing existing permit limits to the new allowable discharge levels; and evaluating the ability of the facility to meet the final permit effluent limits.

Water quality criteria are comprised of numeric and narrative criteria. Numeric criteria are scientifically derived ambient concentrations developed by EPA or States for various pollutants of concern to protect human health and aquatic life. Narrative criteria are statements that describe the desired water quality

goal. A technology-based limit is a numeric limit, which is determined by examining the capability of a treatment process to reduce or eliminate pollutants.

Reasonable Potential

In accordance with 40 CFR 122.4(d)(1)(iii), it is only necessary to establish permit limits for those pollutants in the discharge which have the reasonable potential to cause or contribute to the exceedance of instream criteria. In order to evaluate the need for permit limits, the most stringent calculated acute and chronic limits are compared to the Discharge Monitoring Report (DMR) and the Priority Pollutant Scan data. Based on the analysis presented above, permit limits are required for Total Residual Chlorine (TRC) and Cyanide. Although the effluent concentrations for TRC did not have "reasonable potential", this was only because the effluent is de-chlorinated. Therefore, TRC limits have been included in the permit to ensure that the effluent is properly dechlorinated. Priority Pollutant Scan data in 2014 indicated a detection of Cyanide that exceeded calculated acute and chronic limits for Cyanide. Therefore, Cyanide limits have been included in the permit with the same quarterly monitoring to ensure the effluent complies with calculated water quality-based limits. The remainder of the data for the pollutants from the Priority Pollutant Scans and as presented on DMRs clearly demonstrate that there is not reasonable potential for the discharge to exceed water quality criteria. This determination was made based on the fact that the data was well below levels that would be required in order to meet water quality. Although these pollutants did not have "reasonable potential", quarterly monitoring for Total Copper, Total Chromium, Total Cadmium, Total Lead, Total Zinc, Total Nickel and Total Aluminum have been included in the permit as part of the standard list of pollutants monitored as part of the quarterly toxicity testing."

TABLE 3-1
RIPDES PASS-THROUGH LIMITATION

Pollutant of Concern	RIPDES Daily Limit mg/l	Monthly Avg. limit mg/l	Removal Efficiency %	Q MGD	AHL_R (daily) lbs/day	AHL_R (monthly lbs/day
Arsenic□	4.416	0.132	45%	2.62	175.20	5.24
Cadmium□	2.57545	0.83573	67%	2.62	170.29	21.45
Chromium□	No Limit	No Limit	82%	2.62	No Limit	No Limit
Copper	0.37012	0.35258	90%	2.62	77.37	73.70
Cyanide□	0.064	0.064	69%	2.62	4.50	4.50
Lead□	14.132	804.04	29%	2.62	436.515	24.83
Mercury□	0.13553	14.16	60%	2.62	7.39	0.77
Nickel□	4.78384	781.9	42%	2.62	179.97	29.42
Silver□	0.14306	143.06	75%	2.62	3.12	3.12
Zinc□	6.08879	6.08879	42%	2.62	227.18	227.18

□ Based on RIPDES development document
Q = Flow
AHL_R = Allowable Headworks Loading based on RIPDES limits

A MAHL is an estimate of the upper limit of pollutant loading to a POTW intended to prevent pass through or interference. MAHLs are the basis for Local Limits. The MAHL for a single pollutant of concern (POC) is calculated in three steps:

- Calculate plant's removal efficiency for the POC
- Calculate allowable headworks loadings (AHLs) for each environmental criterion
- Designate as the MAHL the most stringent AHL for the POC

The allowable headworks loading based on the RIPES permit and documentation can be found by the following equation:

L_R = Allowable headworks loading based on the RIPDES

C_R = Concentration based on the RIPDES permit

Q = Flow MGD

E = Removal Efficiency

$$L_R = \frac{8.34 * C_R * Q}{(1-E)}$$

3.3 INHIBITION LIMITATIONS ACTIVATED SLUDGE

The inhibition limits presented in Table 3-2 are based on activated sludge.

TABLE 3-2
ACTIVATED SLUDGE INHIBITION LEVELS

Pollutant of Concern	I_{AS} mg/l	Q MGD	E %	AHL_{IAS} lbs/day
Arsenic	0.10	2.62	0%	2.18
Cadmium	1	2.62	15%	25.67
Chromium	1	2.62	27%	29.89
Copper	1	2.62	22%	27.80
Cyanide	0.1	2.62	27%	2.99
Lead	1.0	2.62	29%	30.89
Mercury	0.1	2.62	10%	2.42
Nickel	1	2.62	14%	25.37
Silver	*	2.62	20%	*
Zinc	0.5	2.62	18%	13.34

* No inhibition standard listed

I_{AS} = Inhibition concentration for activated sludge
Q = Flow
E = Removal Efficiency
AHL_{IAS} = Allowable Headworks Loading based on Inhibition in activated sludge
* = No inhibition standard

The allowable headworks loading based on the inhibition for activated sludge can be found by the following equation:

I_{AS} = Inhibition Limit for Activated Sludge

$$L_R = \frac{8.34 * I_{AS} * Q}{(1-E)}$$

3.4 SLUDGE QUALITY CRITERIA

The treatment facility disposes of the sludge by incineration or land disposal. Neither have establish limits for the sludge. However, annually, sludge is treated for Toxicity Characteristic Leaching Procedure (TCLP) to determine whether there are hazardous elements present in the sludge. The tests have shown that no hazardous elements are present in the sludge.

3.5 COMPARISON OF ALLOWABLE POLLUTANT LOADINGS

The results of the calculations presented in Tables 3-1 and Table 3-2 are the allowable headworks loadings for each pollutant, based on the applicable criterion or standard. For each pollutant, these allowable headworks loadings are compared, and the smallest loading for each pollutant will be selected as the most stringent and incorporated in the sewer ordinance. According to the EPA Guidance Manual, if the headworks loading of a particular pollutant is consistently below this loading, compliance with all applicable criteria for the particular pollutant will be ensured. This loading is designated the Maximum Allowable Headworks Loading (MAHL) for each pollutant, which is allocated from domestic/background and industrial sources, thereby deriving local limits.

Table 3-3 presents a summary of all the calculated allowable headworks loadings (AHL) for each pollutant of concern. The smallest loading of each pollutant known as the Maximum Allowable Headworks Loading (MAHL) to be allocated to industrial users is highlighted in **bold**. Table 3-3 shows the most stringent loading for cadmium which are determined by the RIPDES permit conditions (AHL_R). The maximum headworks loading for Arsenic, Chromium, Copper, Cyanide, Lead, Nickel and Zinc are determined by the inhibition for activated sludge (AHL_{IAS}).

The Maximum Allowable Industrial Loading (MAIL) has been determined by the flowing equation:

MAIL = Maximum Allowable Headworks Loading (MAHL) x (1-Safety Factor [SF]) - ($L_{(UNC)}$ + HW + GA)

Where $L_{(UNC)}$ represent the uncontrolled sources, HW represents the load associated with Hauled waste, and GA represent the growth allowance. Table 3-4 shows the loading for the uncontrolled (domestic) sources.

Table 3-5 shows the loading for the septage.

TABLE 3-3 MAXIMUM ALLOWABLE HEADWORKS LOADING				
Pollutant of Concern	**$AHL_{R\ (daily)}$ lbs/day**	**$AHL_{R\ (monthly)}$ lbs/day**	**AHL_{IAS} lbs/day**	**MAHL lbs/day**
Arsenic	175.20	5.24	**2.18**	2.18
Cadmium	170.29	**21.45**	25.67	21.45
Chromium	No Limit	No Limit	**29.89**	29.89
Copper	77.3	73.70	**27.80**	27.80
Cyanide	4.50	4.50	**2.99**	2.99
Lead	436.52	**24.83**	30.89	24.83
Mercury	7.39	**0.77**	2.42	0.77
Nickel	179.97	29.42	**25.37**	25.37
Silver	3.12	3.12	*	3.12
Zinc	227.18	227.18	**13.34**	13.34

* No Standard
Bold indicates the most restrictive limit

$AHL_{R\ (daily)}$ = Available Headworks Loading based on RIPDES Daily Max. Limit
$AHL_{R\ (monthly)}$ = Available Headworks Loading based on RIPDES Monthly Avg. Limit
AHL_{IAS} = Average Headworks Loading based on Inhibition of Aeration
MAHL = Maximum Allowable Headworks Loading

TABLE 3-4 LOADING UNCONTROLLED			
Pollutant	**$Q_{(UNC)}$**	**$C_{(UNC)}$**	**$L_{(UNC)}$**
Arsenic	3.97	0.01	0.17
Cadmium	3.97	0.002	0.07
Chromium	3.97	0.008	0.26
Copper	3.97	0.044	1.46
Cyanide	3.97	0.010	0.33
Lead	3.97	0.010	0.34
Mercury	3.97	0.0004	0.01
Nickel	3.97	0.009	0.28
Silver	3.97	0.008	0.26
Zinc	3.97	0.208	6.87

$C_{(UNC)}$ = Concentration for Domestic users
$Q_{(UNC)}$ =Flow related to Domestic users
$L_{(UNC)}$ = Load related to Domestic users

TABLE 3-5 LOADING SEPTAGE			
Pollutant	**$Q_{(sept)}$**	**$C_{(sept)}$**	**$L_{(sept)}$**
Arsenic	0.01	0.01	0.0010
Cadmium	0.01	0.004	0.0004
Chromium	0.01	0.012	0.0011
Copper	0.01	0.72	0.0703
Cyanide	0.01	-	-
Lead	0.01	0.02	0.0024
Mercury	0.01	0.001	0.0001
Nickel	0.01	0.02	0.0024
Silver	0.01	0.004	0.0004
Zinc	0.01	3.38	0.3287

$C_{(sept)}$ = Concentration of the pollutant related to septage
$Q_{(sept)}$ = Flow of septage$L_{(sept)}$ = Load related to septage
$L_{(sept)}$ = Load related to septage
- = no test results

3.6 MAXIMUM ALLOWABLE INDUSTRIAL LOADING

The maximum allowable industrial pollutant loadings (MAIL) are presented in Table 3-6. The current flow is essentially all from domestic sources. In order to provide for an industrial growth, 100,000 gallons per day was allotted to present and future industrial flow. In addition, a 20% safety factor was included in the calculation. The domestic loading was subtracted from 80% of the MAHL to determine the MAIL. The concentrations listed for Arsenic, Cadmium, Chromium, Cyanide and Mercury were based on an average of the method detection limit for the parameter, therefore the value listed is a "less than" value. Table 3-6 shows the Maximum Available Industrial Loading.

TABLE 3-6 MAXIMUM AVAILABLE INDUSTRIAL LOADING (MAIL)					
Pollutant	**AHL**	**80% AHL**	**$L_{(UNC)}$**	**$L_{(sept)}$**	**MAIL**
Arsenic	2.182	1.746	0.17	0.001	1.579
Cadmium	21.45	20.54	0.07	0.0004	20.47
Chromium	29.89	23.91	0.26	0.0011	23.65
Copper	27.80	22.24	1.46	0.070	20.71
Cyanide	2.99	2.39	0.33	-	2.06
Lead	24.83	19.87	0.34	0.0024	19.52
Mercury	0.77	0.62	0.01	0.0001	0.61
Nickel	25.37	20.30	0.28	0.0024	20.01
Silver	3.12	2.50	0.26	0.0004	2.24
Zinc	13.34	6.40	6.87	0.3287	3.47

AHL = Available Headworks Loading
$L_{(UNC)}$ = Load related to Domestic users
- = Not tested
$L_{(sept)}$ = Load related to Septage
MAIL = Maximum Allowable Industrial Loading

The uniform industrial concentration can be found by the following equation:

$C_{(calc)}$ = Maximum Available Industrial Loading (MAIL) / 8.34 / $Q_{(ind)}$ (Flow from Industries)

Table 3-7 shows the calculated uniform concentration limits.

TABLE 3-7
CALCULATED LIMITS

Pollutant	MAIL	$Q_{(ind)}$	$C_{(calc)}$
Arsenic	1.579	0.1	1.893
Cadmium	20.47	0.1	24.545
Chromium	23.65	0.1	28.363
Copper	20.71	0.1	24.835
Cyanide	2.06	0.1	2.470
Lead	19.52	0.1	23.405
Mercury	0.61	0.1	0.727
Nickel	20.01	0.1	20.394
Silver	2.24	0.1	2.687
Zinc	3.47	0.1	4.157

MAIL = Maximum Allowable Industrial Loading
$Q_{(ind)}$ = Industrial Flow
$C_{(calc)}$ = Calculated Limits

3.7 PROPOSED INDUSTRIAL LIMITATIONS

The final limit calculation is presented in Table 3-8. This table presents EPA's Metal Finishing Point Source Category (as presented in 40 CFR Part 433), Federal requirements and the Town's Sewer Ordinance for comparison in order to guarantee the preservation of the treatment facility. Table 3-8 provides the comparison of the three criteria (Calculated Limits ($C_{(calc)}$) presented in Table 3-7, the Metal Finishing Best Available Technology (BAT) standards outlined in 40 CFR part 433, the Current Limits ($C_{(current)}$) along with the values found in the domestic background to determine the allowable concentration.

TABLE 3-8 COMPARISON OF LIMITS					
Pollutant	**$C_{(calc)}$**	**Metal Finish Limit mg/l**	**$C_{(current)}$ Monthly**	**$C_{(current)}$ Daily**	**C Domestic**
Arsenic	1.893	*	0.1	0.1	<0.005
Cadmium	24.545	0.260	0.07	0.09	<.002
Chromium	28.363	1.710	1.71	2.77	<0.006
Copper	24.835	2.070	2.07	3.38	0.044
Cyanide	2.470	0.650	0.465	0.465	<0.01
Lead	23.409	0.430	0.43	0.44	<0.0103
Mercury	0.727	*	0.013	0.047	<0.0004
Nickel	20.394	2.380	1.0	1.0	<0.0086
Silver	2.687	0.240	0.24	0.43	<0.0078
Zinc	4.157	1.480	0.65	0.65	0.2076

* No standard

SECTION 4 DISCUSSIONS OF NON-CONSERVATIVE POLLUTANTS

4.1 NON- CONSERVATIVE POLLUTANTS

Non-conservative pollutants are presumed to be destroyed biodegraded, chemically transformed, or volatilized within the POTW to some degree.

4.2 LOCAL LIMITS MONITORING PLAN

The groundwork necessary to undertake this report has been defined by the facility's Local Limit Monitoring Plan to sample the influent, primary effluent, effluent and a domestic source annually. This sampling has been conducted by the Pretreatment Staff.

4.3 CONVENTIONAL POLLUTION REVIEW

Organic loading refers to conventional Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) loadings received at the treatment facility. In addition to the local limits monitoring, BOD and TSS are sampled routinely for compliance monitoring.

Daily BOD and TSS analyses for January 2015 through December 2019 as reported in the DMRs are presented in Appendix F.

The total WWTF flow data for BOD indicates an average removal of 95% and an average discharge concentration of 11mg/l. The ninth percentile for discharge concentration was 22 mg/l. The total WWTF average influent was 234 mg/l.

The total WWTF average BOD loading was 5,095 lbs/day during the local limits testing days and 4,471 lbs/day average during the 5-year period. After reviewing the data, the average total WWTF flow for the five-year period was used to reflect the plant loading, as the greater number of data sets better reflected the actual conditions. This data is only used to compare the current conditions to the design loading. The calculation to establish the local limits are based on future flow and the design BOD concentration of 250 mg/l.

The total WWTF TSS summary showed an average influent concentration of 244 mg/l and an average effluent of 8 mg/l. The average removal for TSS was 97%. The ninth percentile for effluent concentration was 13 mg/l.

The average total WWTF TSS loading equated to 3,157 lbs/day during the local limits testing, and 5,053 lbs/day average for the five-year period. Similar to BOD, the design loading of 250 mg/l was used for TSS to reflect the loading.

The effluent results indicate that pass-through does not occur, and the facility's treatment efficiency clearly reveals that inhibition does not occur.

The design capacity of the plant (based on 5.0 MGD) is 10,425 lbs/day (250 mg/l) for both BOD and TSS.

4.4 FUTURE REGIONAL WASTEWATER FLOWS

The future wastewater flow for the Town of Narragansett will be based on its purchased capacity since the Town's current flows are at or close to their purchased capacity. The University of Rhode Island will also be based on their purchased capacity. URI's wastewater loadings will be based on 1.652 MGD, and Narragansett will be based on 1.22 MGD. As the host community, the Town of South Kingstown's future flows will be based on the existing future residential areas within the sewer district (Figure 4-1). The Town does not anticipate any expansion outside of the current infrastructure. Table 4-1 provides the available residential parcels within the current sewer infrastructure. There are no major expansions projected in the next five years. At this time, the future residential flows over the next five years will focus on the parcels presented in Table 4-1. A review of the Sewer Department records finds that between 16 and 30 requests for sewer tie-ins occur annually. Based on the data for the projected domestic flow, this report will assume thirty single-family homes per year will connect to the sewers over this five-year period. That will total 150 residential units generating 345 gpd per unit for a total projected flow of 51,750 gpd.

TABLE 4-1
AVAILABLE RESIDENTIAL PARCELS

# Parcels	Zone	Infill Vacant Lot Potential	Tax Acres
12	CD	Existing Connection Available	2.98
5	CH	Existing Connection Available	1.11
1	CN	Existing Connection Available	1.30
4	MU	Existing Connection Available	3.27
52	R10	Existing Connection Available	21.85
32	R20	Existing Connection Available	18.86
2	R30	Existing Connection Available	2.13
3	R40	Existing Connection Available	20.68
2	R80	Existing Connection Available	1.62
1	RM	Existing Connection Available	0.50
3	SMD	Existing Connection Available	6.23
117		**Total Acres**	**79.53**

In the same manner, this report examined Commercial, Industrial and Government/ Institutional Zones and the properties that connect and those potential properties that can connect to the sewers (Figure 4-2). There are 65.84 acres connected and 57.11 acres that can connect (Table 4-2). The Town has indicated that there are no major non-residential projects identified over the next several years. Based on the available acreage and using 1,000 gal/acre/day potential, this area can generate 57,110 gals/day in new, non-residential users during that period.

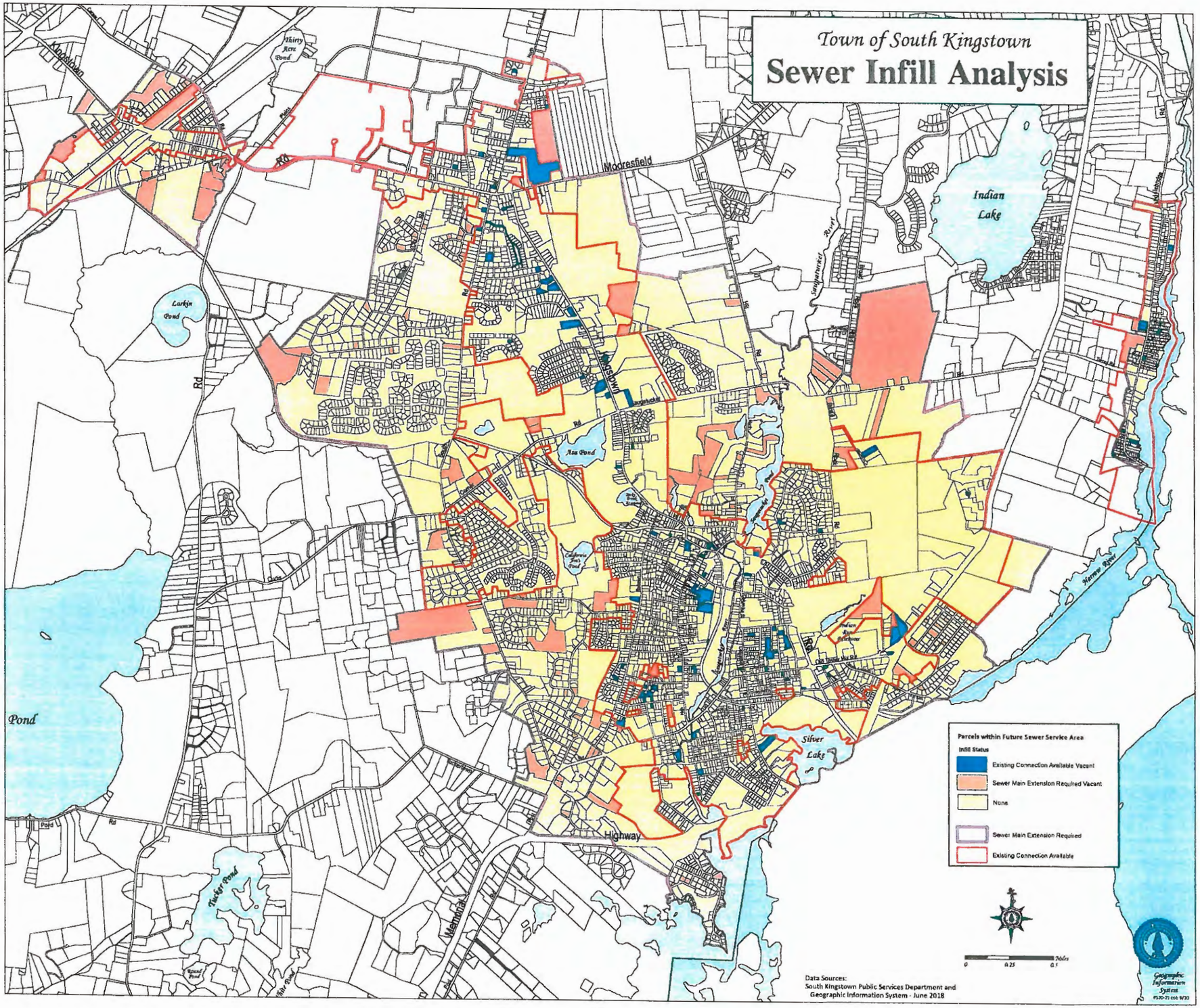

Town of South Kingstown
Sewer Infill Analysis
Madresfield
Indian Lake
Larkin Pond
Rd
Highway
Pond
Tucker Pond
Silver Lake
Parcels within Future Sewer Service Area
Infill Status
Existing Connection Available Vacant
Sewer Main Extension Required Vacant
None
Sewer Main Extension Required
Existing Connection Available
Data Sources:
South Kingstown Public Services Department and
Geographic Information System - June 2018

FIGURE 4-1

Town of South Kingstown

West Kingston Parcels Zoned IND-1

Sewer Account

No Sewer Account

Sewer Account		
Plat:Lot	**Acres**	**Property Address**
21-3:3	11.18	604 LIBERTY LANE
21-3:4	1.56	550 LIBERTY LANE
21-3:7	5.02	45 FAIRGROUNDS ROAD
21-3:8	5.40	141 FAIRGROUNDS ROAD
21-3:9	20.36	132 FAIRGROUNDS ROAD
21-3:11	6.48	512 LIBERTY LANE
21-3:18	0.92	20 FAIRGROUNDS ROAD
21-3:19	1.10	521 LIBERTY LANE
21-3:20	0.91	535 LIBERTY LANE
22-1:10	3.45	251 FAIRGROUNDS ROAD
22-1:38	2.07	32A FRANK AVENUE
22-1:88	3.25	64 FRANK AVENUE
22-4:63	4.15	207 FAIRGROUNDS ROAD
Total	**65.84**	

No Sewer Account		
Plat:Lot	**Acres**	**Property Address**
21-3:5	2.49	530 LIBERTY LANE
21-3:6	2.20	427 LIBERTY LANE
21-3:10	9.35	52 FAIRGROUNDS ROAD
21-3:21	6.38	551 LIBERTY LANE
21-3:22	0.94	567 LIBERTY LANE
21-3:23	1.53	LIBERTY LANE
21-3:24	1.76	401 LIBERTY LANE
22-1:39	0.46	192 WAITES CORNER ROAD
22-1:40	13.79	FAIRGROUNDS ROAD
22-1:44	2.26	506 FAIRGROUNDS ROAD
22-4:8	3.09	325 LIBERTY LANE
22-4:9	2.09	351 LIBERTY LANE
22-4:10	4.28	305 LIBERTY LANE
22-4:65	1.60	RAILROAD AVENUE
22-4:68	1.80	379 LIBERTY LANE
22-4:76	3.08	239 LIBERTY LANE
Total	**57.11**	

Sewer Pipes

Gravity

Forced Main

Sewer Manholes

N W E S

0 250 500 750 Feet

Aerial Photo RIGIS April 2020
Parcels and Sewers: SKGIS

Geographic Information System

PS20-1S cpb 06/20

FIGURE 4-2.

Over the next five years, the new, residential and non-residential (Industrial/Commercial) wastewater flows attributed to South Kingstown is 108,860 gpd (51,750 + 57,110). Taking into account the unexpected projects, a safety factor of 10% will be added to the 108,860 gpd to a total five-year projection of 119,746 gpd is calculated for new, residential and non-residential users. The 119,746 gpd will be added to South Kingstown's current flows for a future flow of 1.1 MGD.

TABLE 4-2
INDUSTRIAL/COMMERCIAL ACREAGE

Sewer Account			No Sewer Account		
Plat/Lot	**Acres**	**Property Address**	**Plat/Lot**	**Acres**	**Property Address**
21-3:3	11.18	604 Liberty Lane	21-3:5	2.49	530 Liberty Lane
21-3:4	1.56	550 Liberty Lane	21-3:6	2.20	427 Liberty Lane
21-3:7	5.02	45 Fairgrounds Road	21-3:10	9.35	52 Fairgrounds Road
21-3:8	5.40	141 Fairgrounds Road	21-3:21	6.38	551 Liberty Lane
21-3:9	20.36	132 Fairgrounds Road	21-3:22	0.94	567 Liberty Lane
21-3:11	6.48	512 Liberty Lane	21-3:23	1.53	Liberty Lane
21-3:18	0.92	20 Fairgrounds Road	21-3:24	1.76	401 Liberty Lane
21-3:19	1.10	521 Liberty Lane	22-1:39	0.46	192 Waites Corner Road
21-3:20	0.91	535 Liberty Lane	22-1:40	13.79	Fairgrounds Road
22-1:10	3.45	251 Fairgrounds Road	22-1:44	2.26	506 Fairgrounds Road
22-1:38	2.07	32A Frank Avenue	22-4:8	3.09	325 Liberty Lane
22-1:88	3.25	64 Frank Avenue	22-4:9	2.09	351 Liberty Lane
22-4:63	4.15	207 Fairgrounds Road	22-4:10	4.28	305 Liberty Lane
			22-4:65	1.60	Railroad Avenue
			22-4:68	1.80	379 Liberty Lane
			22-4:76	3.08	239 Liberty Lane
TOTAL	**65.84**		**TOTAL**	**57.11**	

The projected septage contribution in the loading will be based on the highest summer volume over the last five years which occurred in July of 2016 which averaged 17,330 gals/day. A safety factor of 10% is used to adjust for future loads. For the purpose of determining the allowable BOD_5 and TSS loads, an average daily flow of 19,000 gpd will be used for septage. For the existing industrial users, a future flow of 100,000 gpd will be used when determining the allowable concentration from those sources.

In the case of the Town of Narragansett and the University of Rhode Island, the future flow will be based on 100% of their purchased capacity. Table 4-3 presents a summary of the regional future flows by participants.

TABLE 4-3 REGIONAL FUTURE FLOWS BY PARTICIPANT			
	Current Flow (mgd)*	**Current Purchased Capacity (mgd)**	**Future Anticipated Needed Capacity (mgd)**
South Kingstown	0.98	2.1283	1.1 [1]
Narragansett	1.19	1.2197	1.22 [2]
URI	0.48	1.652	1.652 [2]
Total	**2.65**	**5.00**	**3.97**

***Note: Current flow is based on a four-year average from FY16 to FY19.**

[1] SK future flow is based on the projection identified in Section 4-4

[2] For URI and Narragansett, the future wastewater needs are based on 100% of their purchased capacity.

4.5 CALCULATIONS FOR MAXIMUM ALLOWABLE HEADWORKS LOADING FOR CONVENTIONAL POLLUTANTS (BOD AND TSS)

This section of the report will focus on establishing a uniform concentration for BOD and TSS that can be set for the Significant Industrial Users. The following assumptions have been used to establish these limits.

1) $MAIL = MAHL\ (1\text{-}SF) - L_{(uncontrolled)} - L_{(sept)} - L_{(existing\ industry)}$

2) Where SF = 10% will be used for BOD and 10% for TSS. At the recommendation of EPA, a safety factor has been established to provide for variance in the conditions. The factors are based on the variation.

3) For the general industries classifications other than Micro Breweries, Wineries and Distillers (MBW&D), the current concentration of 519 mg/l will be allocated to the current and future industrials which is projected to be 0.1 MGD.

4) The following formula will be used to determine the mass loading that will be allocated for the Micro Breweries, Wineries and Distillers (MBW&D).

The future uncontrolled users for each community can be found in Table 4-4. The loading for future BOD and TSS mass loading in lbs/day is calculated based on the design value of 250 mg/l for both BOD and TSS.

TABLE 4-4 FUTURE UNCONTROLLED USERS FOR EACH COMMUNITY			
	Future Anticipated Needed Capacity (mgd)	**Future BOD mass lbs/day**	**Future TSS mass lbs/day**
South Kingstown (SK)	1.1	2,294	2,294
Narragansett (Narr)	1.22	2,544	2,544
University of Rhode Island (URI)	1.652	3,444	3,444

To calculate the Mass Available Industrial Loading (MAIL) for BOD, the future loading is subtracted from the design load of 10,425 lbs/day x 90% (to account for 10% safety factor).

MAIL for MBW&D = 90% of Future Design Loading – L_{SK} – L_{NAR} – L_{URI} – L_{SEPT}* (Septage) – $L_{(existing\ \&\ future\ industrial)}$

MAIL for MBW&D = 9,383 lbs/day $_{BOD}$ - 2,294 lbs/day $_{SK\ BOD}$ - 2,544 lbs/day $_{NARR\ BOD}$ - 3,444 lbs/day $_{URI\ BOD}$ - 127 lbs/day $_{SEPT\ BOD}$ - 433 lbs/day $_{EXISTING\ AND\ FUTURE\ INDUSTRIAL\ BOD}$ = 541 lbs/day $_{BOD}$

This report has re-affirmed this limit be set for all non-MBW&D and will remain at its current limit of 519 mg/l.

Based on MAIL for MBW&D, the BOD loading can be 541 lbs/day. For the purpose of future growth in this user class, 50% of the available load (or 271 lbs $_{BOD}$) will be distributed to the existing MBW&D industries based on their current flow. The remainder of the available load will be reserved for future users within this class.

In the same manner, the MAIL limit for TSS is as follows:

MAIL for MBW&D for TSS = 90% Future Design Load – L_{SK} -L_{NARR} - L_{URI} – $L_{(Sept)}$ – $L_{(existing\ \&\ future\ industries)}$

MAIL = 9,383 lbs/day – 2,294 lbs/day $_{SK\ TSS}$ – 2,544 lbs/day $_{NARR\ TSS}$ – 3,444 lbs/day $_{URI\ TSS}$ – 340 lbs/day $_{SEPTAGE\ TSS}$ – 433 lbs/day $_{INDUSTRIAL\ TSS}$ = 328 lbs/day

Based on MAIL for TSS, the MBW&D loading can be 328 lbs/day for the purpose of future growth within this user class 50% of the reserved TSS will be allocated to the MBW&D industries; therefore, 164 lbs/day TSS will be allocated to the MBW&D industries based on their current flow. The remainder of the available load will be reserved for future users within this class.

5.1 REVIEW OF PROPOSED AND CURRENT LIMITATIONS

Table 5-1 shows the comparison of the calculated limits and the current local limits. In addition, the best practical control technology currently available and the results of the domestic background sampling.

TABLE 5-1
LOCAL LIMITS COMPARISON

Pollutant of Concern	C_{lim} Calculated (mg/l)	C_{lim} Current Monthly (mg/l)	C_{lim} Current Daily (mg/l)	Metal Finishing Limit (mg/l) Monthly Average	Metal Finishing Limit Daily (mg/l)	Domestic (mg/l)
Arsenic	1.893	0.1	0.1	*	*	<0.005
Cadmium	24.545	0.07	0.09	0.260	*	<0.002
Chromium	28.363	1.71	2.77	1.71	2.77	<0.008
Copper	24.835	2.07	3.38	2.07	3.38	0.044
Cyanide	2.470	0.465	0.465	0.65	1.20	<0.01
Lead	23.409	0.07	0.09	0.43	0.69	<0.01
Mercury	0.727	0.013	0.047	*	*	<0.0004
Nickel	20.394	1.00	1.00	3.98	2.38	<0.009
Silver	2.687	0.24	0.43	0.43	0.24	<0.008
Zinc	4.157	0.65	0.65	2.61	1.48	0.076

* indicates no guidance

5.2 COMPARISON OF LIMITS TO OTHER RHODE ISLAND WASTEWATER TREATMENT FACILITIES

Table 5-2 shows the current limits and the limits of the other wastewater treatment facilities.

5.3 DISCUSSION OF PROPOSED LIMITS

As a result of this report the following modifications are recommended to be made to the Sewer Ordinance:

The Sewer Ordinance shall maintain its maximum day limit for BOD and TSS at 519 mg/l. Any discharges that exceed this concentration will be issued a Notice of Violation (NOV) by the Industrial Pretreatment Program. This NOV may be accompanied by a monetary penalty based on the Program's review of the frequency of the violations.

TABLE 5-2
COMPARISON OF MAXIMUN DAILY LIMITS TO OTHER WASTEWATER TREATMENT FACILITIES

Community	BOD (mg/l)	TSS (mg/l)	[1]O&G (mg/l)	As Mg/l	Cd (mg/l)	Cr (mg/l)	Cu (mg/l)	Pb (mg/l)	Ni (mg/l)	Ag (mg/l)	Zn (mg/l)	CN (mg/l)	HG (mg/l)	pH
Bristol	4,000	4,000			0.040	2.770	3.380	0.69	3.98	0.430	1.05	1.2		
Cranston	*	*	100	0.22	0.0063	2.600	0.570	0.300	0.770	0.120	0.710	0.260	0.0009	5.5 - 9.5
East Greenwich	300+	375+	100		0.024	0.719	0.95	0.22	0.137	0.159	1.21	0.112	0.073	5.5 - 9.5
E. Providence					0.110	2.770	3.380	0.690	1.940	0.430	1.480	1.200		6 - 10
NBC Bucklin Pt	300+	300+	125	0.200	0.110	2.770	1.20	0.600	1.620	0.400	1.670	0.500	0.060	5 - 11
NBC Fields Pt.	300+	300+	125		0.110	2.770	1.200	0.600	1.620	0.430	2.610	0.580	0.005	5 - 11
Newport	300	300	100		0.040	1.710	1.00	0.100	2.00	0.240	1.200	0.650	0.060	5.5 - 10.5
QDC	300	300	100		0.260	1.710	2.070	0.270	2.380	0.240	0.760	0.200	0.003	5 - 12.5
Smithfield	350	400	100		0.053	1.204	0.513	0.159	2.834	0.118	2.072	0.172	0.016	5 - 11.5
Current S. Kingstown	**519**	**519**	**100**	**0.100**	**0.09**	**2.77**	**3.38**	**0.43**	**1.0**	**0.430**	**0.65**	**0.465**	**0.047**	**5.5 - 9.5**
Proposed S. Kingstown	**519****	**519**	**100**	**0.100**	**0.26**	**2.77**	**3.38**	**0.69**	**3.98**	**0.430**	**2.610**	**1.200**	**0.047**	**5.5 - 9.5**
Warren	4,000	1,000		1.14	0.110	2.770	3.380	0.69	3.98	0.430	2.610	0.970	1.040	5 - 12.5
Warwick	2,500 α	1,000	300	0.1	0.05	2.77	0.70	0.15	3.98	0.32	1.000	0.16	0.001	6 - 10
West Warwick	2,000	2,000	100		0.02	0.07	0.80	0.15	0.15	0.24	0.60	0.19	1.0	6 - 10
Westerly			100		0.110	2.77	2.8	0.300	2.80	0.430	2.610	0.800	0.050	
Woonsocket	500+	300+	100	0.381	0.055	2.77	3.380	0.690	3.980	0.186	2.61	1.200	0.002	5 - 11

* = Mass load for CBOD to specific SIC industries
+ = surcharge limit only
α = regulated as CBOD
[1] = O&G means Oil & Grease
** = SIC Code 2082, 2084 and 2085 based on Mass Loading

It is further recommended that industrial users who exceed the design loads of 250 mg/l for BOD and TSS will be surcharged for concentrations in excess of 250 mg/l for either (or both) parameters. For those facilities classified under the following SIC codes 2082, 2084, and 2085 it is recommended that the Sewer Ordinance be modified to allow this SIC class to be based on a mass loading in lbs/day.

This report proposes that for this user class 271 lbs/day BOD and 164 lbs/day TSS be allocated as a mass limit under the condition that each user is implementing the best management practices in place for:

2082 Malt Beverages
2084 Wines, Brandy, and Brandy spirits
2085 Distilled and Blended Liquors

This will allow for micro-breweries and/or distillers which is defined as micro breweries that produce less than 15,000 barrels of product per year (1 barrel = 31 gals.) to discharge with economical best management practices. However, larger breweries and/ or distillers that exceed 15,000 barrels per year will be required to install more sophisticated pretreatment equipment.

For these SIC industries 2082, 2084 & 2085 to be allowed a mass-based limit, they must establish Best Management Practices which includes equalization, neutralization, and solids capture as outlined in the Fact Sheet (Appendix G). Further, these industries will be required to provide the following as a minimum:

1. Pretreatment monitoring manhole that is accessible 24 hours per day and reflects only the brewery/distiller flow, with no domestic waste
2. A dedicated wastewater flow meter with continuous flow data storage
3. A comprehensive piping schematic that depicts supply and waste for the subject brewery/ distillery

Based on the maximum mass loading for BOD of 271 lbs/day, the allocation for the current users will be based on their current wastewater flow. Therefore, for the existing micro breweries, wineries and distillers that are current connected to the Town's wastewater system, the following figures represent the amount of BOD that will be allowed to be discharged by each industry per day:

Whalers Breweries	70%	189 lbs/day
Shaidzon Beer Co.	20%	54 lbs/day
Sons of Liberty Beer & Spirits	10%	27 lbs/day

Based on the maximum mass loading for TSS of 164 lbs/day, the allocation for the current users will be based on their current wastewater flow. Therefore:

Whalers Breweries	70%	115 lbs/day
Shaidzon Beer Co.	20%	33 lbs/day
Sons of Liberty Beer & Spirits	10%	16 lbs/day

ARSENIC

Arsenic was used in many applications including insecticides for fruit tree, wood preservatives and rat poison. In 2004 a ban on chromated copper arsenate removed arsenic from wood preservatives. The use of arsenic was phased out in all agricultural activities except cotton farming. The main uses for arsenic in the United States is a feed additive for the poultry and swine industries and for medical treatments. This parameter may be eliminated in the future due to the rarity of the use of arsenic. No amount of arsenic was detected in any of the samples taken. None of the current or proposed users has arsenic as a raw material of by-product. The calculated limit was found to be 1.893 mg/l. This report proposes to maintain the current daily limits of 0.1 mg/l and eliminate the monthly limit of the same value as it is redundant.

CADMIUM

Cadmium is another parameter that has seen a dramatic decline in the common uses. The main uses of Cadmium are for the plating industry and the manufacturing of batteries. These industries are covered under the Federal categorical standard for effluent discharge. The calculated limit for Cadmium is 24.545 mg/l. The current limit is 0.09 mg/l for the daily maximum and 0.07 mg/l for the monthly average. The Best Available Technology Economically Achievable (BAT) for metal finishing is 0.69 mg/l for a daily maximum and 0.26 mg/l for the monthly average. The report proposes to change the limit to 0.26 mg/l as a daily maximum and eliminate the monthly average.

CHROMIUM (TOTAL)

Chromium has been widely used in plating, textile dye, and anti-corrosion solutions. Chromium (VI) has received the most attention as it has been linked to cancer clusters related to drinking water. Prior to stringent regulation, Cr(VI) was commonly used in cooling towers.

The testing done to support this study tested for total chromium. Future testing should consider evaluation of Cr(VI).

The calculated concentration was found to be 28.363 mg/l based on inhibition. The current limit is 2.77 mg/l for a daily maximum and 1.77 mg/l for a monthly average. The BAT is also 2.77 mg/l for a daily maximum and 1.77 mg/l for a monthly average. The proposed limit is 2.77 mg/l as a daily maximum.

COPPER

The local limit for Copper requires a more detailed review. The calculated limit of 24.835 mg/l is significantly higher than the current limit of 3.38 mg/l for the daily maximum and 2.07 mg/l for the

monthly average. For reference, the USEPA has a great deal of experience with the metal finishing industry and in 40CFR433 the USEPA has provided the effluent reduction attainable by applying the Best Available Technology Economically Achievable (BAT) which has been found to be 3.38 mg/l for any one day and 2.07 mg/l for the monthly average. The report proposes to simplify the monitoring process by establishing the copper limit at 3.38 mg/l as a daily maximum and eliminate the monthly average limit. This represents the most common limit in Rhode Island and is justifiable given that the there is adequate capacity.

The MAHL for Copper was calculated, based on the inhibition limit, to be 27.80 lbs/day. Currently, the headworks loading is 1.072 lbs/day, or less than 4% of the available loading limit. Therefore, at this time, it is recommended that the current daily maximum limit (3.38 mg/l) be preserved and the Pretreatment Program carefully evaluate any new users which would contribute to the increase in Copper levels at the plant.

CYANIDE

Cyanide has been used for photographic development however digital photography has all but eliminated the use. Mining and metal plating are currently the main users. As with other metals, the industries have categorical standards for pretreatment. The calculated limit for Cyanide was found to be 2.470 mg/l and the current limit is 0.465 mg/l. The Best Available Technology Economically Achievable (BAT) is 1.2 mg/l for a maximum daily and 0.65 mg/l for a monthly average.

The recommendation is to establish a daily maximum of 1.2 mg/l.

LEAD

Much of the lead found in the wastewater was directly influenced by the water supply. The use of lead is primarily in paints and solder. Lead use in paint has been banned since 1978. The presence of lead in drinking water has been reduced with a series of regulations. On September 1, 2020, the final rule was published which required all products associated with drinking water to be lead-free.

The calculated limit of 23.405 mg/l for Lead is based on RIPDES limits. The current limit for Lead is 0.44 mg/l for a daily maximum and 0.43 mg/l for a monthly average. The BAT for lead is 0.69 mg/l for a daily maximum and 0.43 mg/l for a monthly average. This report proposes to regulate the parameter of Lead on a daily maximum basis of 0.69 mg/l.

MERCURY

The use of mercury also has significantly declined. The majority of applications, such as thermometers, switches and cosmetics, have been replaced with alternatives. Some studies have shown up to 50% of the mercury in wastewater comes from dental practices. The Dental Amalgam Rule 40CFR 441 required all dental practices to install an amalgam separator by July 14, 2020. This rule will significantly reduce the mass of Mercury contributed to wastewater.

The calculated limits for Mercury was found to be 0.727 mg/l, and the current limit of 0.047 mg/l for a daily maximum and 0.013 mg/l for a monthly average. There are no Federal standards for the removal of Mercury. The current daily maximum of 0.047 mg/l is proposed to be maintained and the monthly limit discontinued.

NICKEL

Nickel has a long history of use as an alloy with other metals and plating of metals for corrosion resistance. Stainless steel is a common alloy used widely in many fabrication operations. Nickel is an essential nutrient for many plants. The calculated limit for Nickel was based on inhibition and was found to be 20.394 mg/l. The current limit is 1.0 mg/l (both for the maximum daily and monthly average). The BAT was found to be 3.98 mg/l for a maximum daily and 2.38 mg/l for a monthly average. This report proposes a daily maximum limit of 3.98mg/l and elimination of the monthly limit.

SILVER

Silver is used in electronic contacts, conductors, solar panels, photographic and x-ray processing as well as tableware and jewelry. Silver also has a number of medical uses. The use in photo and x-ray processing has declined significantly due to digital imaging. The calculated limit of 2.687 mg/l for silver is based on the development document limit of 0.14306 mg/l, both for the daily maximum and the monthly average. The currently limits are 0.43 mg/l for the daily maximum and 0.24 mg/l for the monthly average. These limits are the same as the BAT limits. The report proposes the limit of 0.43 mg/l as a daily maximum be retained and the monthly average be eliminated.

ZINC

Zinc is a commonly uses in plating, paint, dyes and pigments. The mineral is found in foods and dietary supplements. The calculated concentration was found to be 4.157 mg/l based in activated sludge inhibition. The current limit is 0.65 mg/l for both the daily maximum and monthly average. The BAT is 2.61 mg/l for a daily maximum and 1.48 mg/l for a monthly average. The report proposes to establish a daily maximum of 2.61 mg/l and eliminate the monthly average limit.

SULFIDE (TOTAL)

Sulfide Total is based on experience with odors in the collection system. The limit for the parameter (3.107 mg/l max daily) is proposed to remain.

SULFIDE (DISSOLVED)

Sulfide (Dissolved) is also based on experience with odors in the collection system. The limit for the parameter (1.0 mg/l max daily) is proposed to remain.

OIL AND GREASE

Oil and Grease limit (100 mg/l) is based on the collection system. The limit is proposed to be preserved.

TOTAL TOXIC ORGANICS (TTO)

The parameters for TTO are established in 40 CFR 433.11. The limits are proposed to be preserved.

TOXIC ORGANIC

Represents any single toxic organic defined in 40CFR 433.11. The limit of 1.0 mg/l will be preserved; however, each proposed discharge must be individually evaluated.

pH

The current pH limits for South Kingstown is 5.5 to 9.5. The limitation has been protective, and the limits are proposed to be preserved.

CONCLUSIONS

The report proposes THAT THE Sewer Ordinance shall maintain its maximum daily limits for BOD_5 and TSS at 519 mg/l. Any discharges that exceed this concentration will be issued a Notice of Violation (NOV) by the Industrial Pretreatment Program. This NOV may be accompanied by a monetary penalty based on the Program's review of the frequency of the violations. It is further recommended that industrial users who exceed the design loads of 250 mg/l for BOD and TSS will be surcharged for concentrations in excess of 250 mg/l for either (or both) parameters. For those facilities classified under the following SIC codes 2082, 2084, and 2085 it is recommended that the Sewer Ordinance be modified to allow this SIC class to be based on a mass loading in lbs/day.

This report proposes that for this user class 271 lbs/day BOD and 164 lbs/day TSS be allocated as a mass limit under the condition that each user is implementing the best management practices in place for:

2082 Malt Beverages
2084 Wines, Brandy, and Brandy spirits
2085 Distilled and Blended Liquors

It is recommended that a financial surcharge be imposed for BOD and TSS levels above a concentration of 250 mg/l. The financial surcharge system will recover addition WWTF expenditures associated with processing wastewater flow with a very high organic load.

Based upon the three-year average operating budget of $4,265,502 and a Total BOD treated for that period of 1,632,008 lbs/year, the cost per pound to treat translates to $0.87 lb. of BOD. The Total TSS treated for that period averaged 1,844,193 lbs/year, the cost per pound to treat translates to $0.77 lb. of TSS.

It is recommended that the Pretreatment Program adopt minimum Best Management Requirements for breweries, distilleries, and wineries to ensure all facilities in the SIC codes 2082, 2084 and 2085 provide the following:

1. A detailed process flow diagram of the distilling process and the pretreatment system.

2. No solids from the production waste stream can be discharged into the wastewater collection system. All solids, such as mash, fermenting solids, etc. are to be hauled off-site for disposal.

3. The process wastewater must be separate from all domestic waste stream(s). There are to be no direct connections into the collection system from the process drain. The facility will be required to install a sampling manhole at the exterior of the building after the pretreatment process, but before it combines with the domestic waste.

4. The process wastewater must be discharged into an equalization tank (or basin) where the pH levels can be adjusted to the permitting range of between 5.5 and 9.5 s.u. (standard units). Once an acceptable pH level has been achieved, the wastewater can be discharged to the collection system. The maximum loading BOD and TSS (lbs/day), respectively, shall be based on allocating 271 lbs/day to each of the industries within those SIC codes as a percentage of their annual wastewater discharge. The wastewater flow and pH must be recorded daily during the discharge and submitted to the Town monthly.

5. Monthly composite sampling must be taken during a representative wastewater discharge. The samples must be analyzed by a certified laboratory for BOD, CBOD, Total Suspended Solids, pH, Nitrates and Nitrites. These results are to be submitted by the 15th day of the following month to the Town.

Substance	Current Monthly Average Limit (mg/l)	Current Max. Daily Limit (mg/l)	Proposed Max. Daily Limit (mg/l)
Arsenic	0.1	0.1	0.1
Cadmium	0.07	0.09	0.26
Chromium (Total)	1.71	2.77	2.77
Copper	2.07	3.38	3.38
Lead	0.43	0.44	0.69
Mercury	0.013	0047	0.047
Nickel	1.0	1.0	3.98
Silver	0.24	0.43	0.43
Zinc	0.65	0.65	2.61
Cyanide	0.465	0.465	1.20
Sulfide (Total)	3.107	3.107	3.107
Sulfide (Dissolved)	1.0	1.0	1.0
Oil and Grease	100	100	100
BOD*	519.0	519.0	519
TSS**	-	-	519
TTO***	2.13	2.13	2.13
TO****	1.0	1.0	1.0
pH	High 9.5	Low 5.5	5.5 – 9.5

* BOD (Biological Oxygen Demand) - Surcharge applies above 250 mg/l
** TSS (Total Suspended Solids) - Surcharge applies above 250 mg/l
*** TTO (Total Toxic Organics) - As defined in 40 CFR 433.11
**** TO (Toxic Organics)
Total Toxic Organics (daily maximum value)
The following SIC codes with Best Management Practices in place and the allowable loading distributed based on their annual wastewater discharge:
2082 MALT BEVERAGES
2084 WINES, BRANDY AND BRANDY SPIRITS
2085 DISTILLED AND BLENDED LIQUORS
Hazardous or Toxic Organic Compounds shall be set on a case-by-case basis using priority pollutants standards (LC_{50}, NOAEL, or other established limits) as guidelines.

This report proposes to eliminate the monthly average limits in order to simplify the testing process. Monthly averages would require at least two - (2) days of testing for the month that are representative of the wastewater flow discharge in order to obtain an average. Considering the small industrial base and the makeup of the current industries having only daily limits reduces the burden on the industries while protecting the Regional WWTF treatment process and performance. Categorical industries that have a federal standard would still have to meet the monthly average for that industry.

APPENDIX A

FLOW DATA (2015 – 2019)

Date	Flow
1/1/2015	2.37
1/2/2015	2.28
1/3/2015	2.21
1/4/2015	2.32
1/5/2015	2.99
1/6/2015	2.73
1/7/2015	2.56
1/8/2015	2.51
1/9/2015	2.49
1/10/2015	2.14
1/11/2015	2.32
1/12/2015	2.27
1/13/2015	2.50
1/14/2015	3.33
1/15/2015	2.32
1/16/2015	2.25
1/17/2015	2.24
1/18/2015	2.23
1/19/2015	2.30
1/20/2015	2.42
1/21/2015	2.45
1/22/2015	2.47
1/23/2015	2.45
1/24/2015	2.42
1/25/2015	3.00
1/26/2015	2.74
1/27/2015	2.75
1/28/2015	2.44
1/29/2015	2.54
1/30/2015	2.54
1/31/2015	2.59
2/1/2015	2.50
2/2/2015	2.42
2/3/2015	2.45
2/4/2015	2.47
2/5/2015	2.54
2/6/2015	2.46
2/7/2015	2.47
2/8/2015	2.16
2/9/2015	2.34
2/10/2015	2.29
2/11/2015	2.36
2/12/2015	2.31
2/13/2015	2.34
2/14/2015	2.28
2/15/2015	2.18
2/16/2015	2.09
2/17/2015	2.26
2/18/2015	2.26
2/19/2015	2.35
2/20/2015	2.28
2/21/2015	2.31
2/22/2015	2.28
2/23/2015	2.82
2/24/2015	2.42
2/25/2015	2.43
2/26/2015	2.42
2/27/2015	2.33
2/28/2015	2.34
3/1/2015	2.27
3/2/2015	2.24
3/3/2015	2.34
3/4/2015	2.33
3/5/2015	3.35
3/6/2015	2.77
3/7/2015	2.66
3/8/2015	2.66
3/9/2015	2.66
3/10/2015	2.86
3/11/2015	3.11
3/12/2015	4.15
3/13/2015	3.84
3/14/2015	3.35
3/15/2015	4.13
3/16/2015	4.73
3/17/2015	4.16
3/18/2015	4.07
3/19/2015	3.82
3/20/2015	3.41
3/21/2015	3.22
3/22/2015	3.28
3/23/2015	3.27
3/24/2015	3.38
3/25/2015	3.25
3/26/2015	3.17
3/27/2015	3.67
3/28/2015	4.11
3/29/2015	4.11
3/30/2015	3.95
3/31/2015	3.85
4/1/2015	3.67
4/2/2015	3.54

Date	Flow
4/3/2015	3.40
4/4/2015	3.37
4/5/2015	3.20
4/6/2015	3.02
4/7/2015	3.18
4/8/2015	3.16
4/9/2015	3.13
4/10/2015	3.14
4/11/2015	3.14
4/12/2015	3.12
4/13/2015	2.92
4/14/2015	2.97
4/15/2015	2.93
4/16/2015	2.87
4/17/2015	2.81
4/18/2015	2.97
4/19/2015	2.79
4/20/2015	2.66
4/21/2015	2.87
4/22/2015	2.93
4/23/2015	2.81
4/24/2015	2.77
4/25/2015	2.72
4/26/2015	2.63
4/27/2015	2.64
4/28/2015	2.65
4/29/2015	2.69
4/30/2015	2.59
5/1/2015	2.53
5/2/2015	2.47
5/3/2015	2.44
5/4/2015	2.43
5/5/2015	2.36
5/6/2015	2.42
5/7/2015	2.38
5/8/2015	2.37
5/9/2015	2.37
5/10/2015	2.27
5/11/2015	2.21
5/12/2015	2.46
5/13/2015	2.20
5/14/2015	2.12
5/15/2015	2.10
5/16/2015	2.08
5/17/2015	2.08
5/16/2015	2.09
5/19/2015	2.06
5/20/2015	2.15
5/21/2015	2.04
5/22/2015	2.21
5/23/2015	2.01
5/24/2015	1.99
5/25/2015	1.97
5/26/2015	2.01
5/27/2015	1.98
5/28/2015	1.99
5/29/2015	1.98
5/30/2015	1.95
5/31/2015	1.97
6/1/2015	1.96
6/2/2015	2.09
6/3/2015	2.13
6/4/2015	1.99
6/5/2015	1.99
6/6/2015	2.00
6/7/2015	1.99
6/8/2015	1.96
6/9/2015	2.00
6/10/2015	2.02
6/11/2015	1.98
6/12/2015	1.98
6/13/2015	1.98
6/14/2015	1.95
6/15/2015	1.92
6/16/2015	2.37
6/17/2015	2.61
6/18/2015	2.18
6/19/2015	2.03
6/20/2015	2.03
6/21/2015	1.99
6/22/2015	2.26
6/23/2015	2.13
6/24/2015	2.13
6/25/2015	2.06
6/26/2015	2.01
6/27/2015	1.96
6/28/2015	2.01
6/29/2015	2.58
6/30/2015	2.28
7/1/2015	2.73
7/2/2015	2.43
7/3/2015	2.28
7/4/2015	2.25

Date	Flow
7/5/2015	2.34
7/6/2015	2.33
7/7/2015	2.39
7/8/2015	2.32
7/9/2015	2.25
7/10/2015	2.15
7/11/2015	2.15
7/12/2015	2.53
7/13/2015	2.35
7/14/2015	2.30
7/15/2015	2.25
7/16/2015	2.19
7/17/2015	2.56
7/18/2015	2.41
7/19/2015	2.33
7/20/2015	2.27
7/21/2015	2.13
7/22/2015	2.05
7/23/2015	2.05
7/24/2015	2.15
7/25/2015	1.88
7/26/2015	2.02
7/27/2015	2.06
7/28/2015	1.97
7/29/2015	2.30
7/30/2015	2.17
7/31/2015	2.18
8/1/2015	2.22
8/2/2015	2.21
8/3/2015	2.08
8/4/2015	2.11
8/5/2015	2.20
8/6/2015	2.02
8/7/2015	2.00
8/8/2015	2.21
8/9/2015	1.98
8/10/2015	1.99
8/11/2015	1.94
8/12/2015	2.74
8/13/2015	2.33
8/14/2015	2.19
8/15/2015	2.18
8/16/2015	2.17
8/17/2015	2.13
8/18/2015	2.13
8/19/2015	2.29
8/20/2015	2.07
8/21/2015	2.06
8/22/2015	2.08
8/23/2015	2.04
8/24/2015	2.04
8/25/2015	2.10
8/26/2015	2.00
8/27/2015	1.95
8/28/2015	2.14
8/29/2015	1.87
8/30/2015	1.91
8/31/2015	1.94
9/1/2015	1.98
9/2/2015	1.88
9/3/2015	1.64
9/4/2015	1.89
9/5/2015	1.88
9/6/2015	1.96
9/7/2015	1.96
9/8/2015	2.09
9/9/2015	2.14
9/10/2015	1.80
9/11/2015	2.93
9/12/2015	2.48
9/13/2015	2.27
9/14/2015	2.32
9/15/2015	2.27
9/16/2015	2.20
9/17/2015	2.19
9/18/2015	2.28
9/19/2015	2.17
9/20/2015	2.12
9/21/2015	2.09
9/22/2015	2.14
9/23/2015	2.10
9/24/2015	2.09
9/25/2015	2.08
9/26/2015	2.06
9/27/2015	1.96
9/28/2015	1.97
9/29/2015	2.11
9/30/2015	2.15
10/1/2015	2.34
10/2/2015	2.25
10/3/2015	2.68
10/4/2015	2.42
10/5/2015	2.30

Date	Flow
10/6/2015	2.34
10/7/2015	2.50
10/8/2015	2.49
10/9/2015	2.24
10/10/2015	2.33
10/11/2015	2.12
10/12/2015	2.08
10/13/2015	2.25
10/14/2015	2.36
10/15/2015	2.22
10/16/2015	2.20
10/17/2015	2.18
10/18/2015	2.11
10/19/2015	2.11
10/20/2015	2.16
10/21/2015	2.14
10/22/2015	2.11
10/23/2015	2.11
10/24/2015	2.02
10/25/2015	1.94
10/26/2015	2.02
10/27/2015	2.05
10/28/2015	2.08
10/29/2015	2.23
10/30/2015	2.33
10/31/2015	2.08
11/1/2015	2.01
11/2/2015	2.02
11/3/2015	2.13
11/4/2015	2.10
11/5/2015	2.10
11/6/2015	2.14
11/7/2015	2.09
11/8/2015	2.00
11/9/2015	1.99
11/10/2015	2.04
11/11/2015	2.17
11/12/2015	2.11
11/13/2015	2.15
11/14/2015	2.12
11/15/2015	1.99
11/16/2015	2.00
11/17/2015	2.08
11/18/2015	2.05
11/19/2015	2.08
11/20/2015	2.09
11/21/2015	2.35
11/22/2015	2.08
11/23/2015	2.35
11/24/2015	2.40
11/25/2015	2.25
11/26/2015	2.06
11/27/2015	1.85
11/28/2015	1.86
11/29/2015	1.89
11/30/2015	2.00
12/1/2015	2.19
12/2/2015	2.29
12/3/2015	2.23
12/4/2015	2.25
12/5/2015	2.14
12/6/2015	2.12
12/7/2015	2.14
12/8/2015	2.18
12/9/2015	2.16
12/10/2015	2.14
12/11/2015	2.17
12/12/2015	2.10
12/13/2015	2.05
12/14/2015	2.04
12/15/2015	2.32
12/16/2015	2.38
12/17/2015	2.19
12/18/2015	2.81
12/19/2015	2.67
12/20/2015	2.38
12/21/2015	2.23
12/22/2015	2.20
12/23/2015	2.22
12/24/2015	2.88
12/25/2015	3.89
12/26/2015	2.71
12/27/2015	2.62
12/28/2015	2.68
12/29/2015	2.50
12/30/2015	2.92
12/31/2015	2.72
1/1/2016	2.64
1/2/2016	2.56
1/3/2016	2.53
1/4/2016	2.49
1/5/2016	2.42
1/6/2016	2.39

Date	Flow
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1/8/2016	2.34
1/9/2016	2.28
1/10/2016	2.25
1/11/2016	2.95
1/12/2016	2.67
1/13/2016	2.58
1/14/2016	2.52
1/15/2016	2.53
1/16/2016	2.43
1/17/2016	3.95
1/18/2016	2.73
1/19/2016	2.93
1/20/2016	2.98
1/21/2016	2.51
1/22/2016	2.44
1/23/2016	2.42
1/24/2016	2.38
1/25/2016	2.47
1/26/2016	2.56
1/27/2016	2.73
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1/29/2016	2.70
1/30/2016	2.69
1/31/2016	2.59
2/1/2016	2.60
2/2/2016	2.63
2/3/2016	2.54
2/4/2016	2.82
2/5/2016	3.10
2/6/2016	4.01
2/7/2016	3.59
2/8/2016	3.48
2/9/2016	3.54
2/10/2016	3.54
2/11/2016	3.40
2/12/2016	3.30
2/13/2016	3.10
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2/15/2016	3.04
2/16/2016	3.18
2/17/2016	4.22
2/18/2016	3.66
2/19/2016	3.47
2/20/2016	3.37
2/21/2016	3.25
2/22/2016	3.22
2/23/2016	3.20
2/24/2016	3.15
2/25/2016	3.51
2/26/2016	3.94
2/27/2016	3.45
2/28/2016	3.21
2/29/2016	3.15
3/1/2016	3.19
3/2/2016	3.04
3/3/2016	3.11
3/4/2016	2.97
3/5/2016	2.94
3/6/2016	2.86
3/7/2016	2.88
3/8/2016	2.91
3/9/2016	2.78
3/10/2016	2.80
3/11/2016	2.74
3/12/2016	2.72
3/13/2016	2.57
3/14/2016	2.57
3/15/2016	2.87
3/16/2016	4.58
3/17/2016	3.67
3/18/2016	3.47
3/19/2016	3.18
3/20/2016	2.90
3/21/2016	2.90
3/22/2016	2.76
3/23/2016	2.71
3/24/2016	2.52
3/25/2016	2.56
3/26/2016	2.59
3/27/2016	2.51
3/28/2016	2.49
3/29/2016	2.91
3/30/2016	2.81
3/31/2016	2.75
4/1/2016	2.80
4/2/2016	2.77
4/3/2016	2.96
4/4/2016	3.24
4/5/2016	3.37
4/6/2016	3.31
4/7/2016	3.25
4/8/2016	4.30

Date	Flow
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4/10/2016	3.59
4/11/2016	3.39
4/12/2016	3.56
4/13/2016	3.53
4/14/2016	3.34
4/15/2016	3.23
4/16/2016	3.10
4/17/2016	2.99
4/18/2016	2.95
4/19/2016	3.00
4/20/2016	2.89
4/21/2016	2.79
4/22/2016	2.30
4/23/2016	2.78
4/24/2016	2.73
4/25/2016	2.71
4/26/2016	2.75
4/27/2016	2.81
4/28/2016	2.67
4/29/2016	2.63
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5/2/2016	2.52
5/3/2016	2.57
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5/7/2016	2.78
5/8/2016	2.63
5/9/2016	2.58
5/10/2016	2.62
5/11/2016	2.53
5/12/2016	2.45
5/13/2016	2.40
5/14/2016	2.38
5/15/2016	2.30
5/16/2016	2.22
5/17/2016	2.21
5/18/2016	2.19
5/19/2016	2.20
5/20/2016	2.16
5/21/2016	2.17
5/22/2016	2.17
5/23/2016	2.25
5/24/2016	2.49
5/25/2016	2.39
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5/31/2016	2.58
6/1/2016	2.16
6/2/2016	2.04
6/3/2016	2.08
6/4/2016	2.13
6/5/2016	2.13
6/6/2016	2.13
6/7/2016	2.05
6/8/2016	1.97
6/9/2016	1.95
6/10/2016	1.97
6/11/2016	2.19
6/12/2016	2.01
6/13/2016	2.06
6/14/2016	1.92
6/15/2016	1.83
6/16/2016	1.91
6/17/2016	1.82
6/18/2016	1.82
6/19/2016	1.89
6/20/2016	1.71
6/21/2016	1.84
6/22/2016	1.91
6/23/2016	1.92
6/24/2016	1.89
6/25/2016	1.85
6/26/2016	1.88
6/27/2016	1.95
6/28/2016	1.97
6/29/2016	1.98
6/30/2016	2.04
7/1/2016	2.26
7/2/2016	2.00
7/3/2016	1.94
7/4/2016	1.93
7/5/2016	2.31
7/6/2016	2.01
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7/8/2016	2.04
7/9/2016	2.00
7/10/2016	2.14

Date	Flow
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7/16/2016	1.93
7/17/2016	1.94
7/18/2016	1.98
7/19/2016	2.09
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8/2/2016	1.96
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8/9/2016	1.81
8/10/2016	1.96
8/11/2016	1.97
8/12/2016	1.97
8/13/2016	1.95
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9/12/2016	9.99
9/13/2016	1.84
9/14/2016	2.02
9/15/2016	1.88
9/16/2016	2.13
9/17/2016	1.88
9/18/2016	1.95
9/19/2016	2.28
9/20/2016	2.11
9/21/2016	1.99
9/22/2016	1.89
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10/6/2016	1.93
10/7/2016	1.96
10/8/2016	1.81
10/9/2016	2.48
10/10/2016	1.99
10/11/2016	2.10

Date	Flow
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10/13/2016	2.07
10/14/2016	1.98
10/15/2016	1.92
10/16/2016	1.96
10/17/2016	2.04
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10/26/2016	2.15
10/27/2016	2.21
10/28/2016	2.23
10/29/2016	1.97
10/30/2016	2.20
10/31/2016	2.13
11/1/2016	2.13
11/2/2016	2.12
11/3/2016	2.11
11/4/2016	2.02
11/5/2016	1.92
11/6/2016	1.97
11/7/2016	2.00
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11/9/2016	2.01
11/10/2016	1.95
11/11/2016	1.87
11/12/2016	1.78
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11/30/2016	2.57
12/1/2016	2.73
12/2/2016	2.43
12/3/2016	2.28
12/4/2016	2.25
12/5/2016	2.34
12/6/2016	2.33
12/7/2016	2.39
12/8/2016	2.32
12/9/2016	2.25
12/10/2016	2.16
12/11/2016	2.16
12/12/2016	2.53
12/13/2016	2.35
12/14/2016	2.30
12/15/2016	2.25
12/16/2016	2.19
12/17/2016	2.56
12/18/2016	2.41
12/19/2016	2.33
12/20/2016	2.27
12/21/2016	2.13
12/22/2016	2.05
12/23/2016	2.05
12/24/2016	2.15
12/25/2016	1.88
12/26/2016	2.02
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1/7/2017	2.28
1/8/2017	2.31
1/9/2017	2.29
1/10/2017	2.36
1/11/2017	3.10
1/12/2017	3.38

Date	Flow
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1/14/2017	2.71
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1/18/2017	2.64
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1/24/2017	4.43
1/25/2017	3.90
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1/28/2017	3.13
1/29/2017	3.08
1/30/2017	3.01
1/31/2017	2.89
2/1/2017	2.89
2/2/2017	2.96
2/3/2017	2.97
2/4/2017	2.79
2/5/2017	2.72
2/6/2017	2.69
2/7/2017	2.64
2/8/2017	2.60
2/9/2017	2.64
2/10/2017	2.65
2/11/2017	2.70
2/12/2017	2.94
2/13/2017	3.19
2/14/2017	3.02
2/15/2017	3.02
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2/17/2017	2.86
2/18/2017	2.83
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2/20/2017	2.90
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2/23/2017	2.85
2/24/2017	2.84
2/25/2017	2.76
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2/27/2017	2.75
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3/7/2017	2.52
3/8/2017	2.62
3/9/2017	2.51
3/10/2017	2.49
3/11/2017	2.32
3/12/2017	2.27
3/13/2017	2.21
3/14/2017	3.74
3/15/2017	3.36
3/16/2017	2.89
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3/18/2017	2.76
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3/29/2017	2.97
3/30/2017	2.86
3/31/2017	3.23
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4/3/2017	3.75
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4/10/2017	3.97
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4/13/2017	3.40
4/14/2017	3.24
4/15/2017	3.06

Date	Flow
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4/17/2017	3.09
4/18/2017	2.96
4/19/2017	2.91
4/20/2017	2.99
4/21/2017	3.23
4/22/2017	3.14
4/23/2017	3.10
4/24/2017	3.01
4/25/2017	3.89
4/26/2017	5.05
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5/6/2017	4.26
5/7/2017	3.99
5/8/2017	3.72
5/9/2017	3.50
5/10/2017	3.33
5/11/2017	3.40
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6/9/2017	2.59
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6/11/2017	2.53
6/12/2017	2.49
6/13/2017	2.41
6/14/2017	2.29
6/15/2017	2.27
6/16/2017	2.41
6/17/2017	2.36
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6/24/2017	2.48
6/25/2017	2.27
6/26/2017	2.49
6/27/2017	2.25
6/28/2017	2.18
6/29/2017	2.20
6/30/2017	2.26
7/1/2017	2.25
7/2/2017	2.24
7/3/2017	2.26
7/4/2017	2.16
7/5/2017	2.18
7/6/2017	2.07
7/7/2017	2.49
7/8/2017	2.27
7/9/2017	2.10
7/10/2017	2.13
7/11/2017	1.97
7/12/2017	2.16
7/13/2017	2.37
7/14/2017	2.17
7/15/2017	2.18
7/16/2017	2.15
7/17/2017	2.23

Date	Flow
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7/19/2017	2.15
7/20/2017	2.14
7/21/2017	2.15
7/22/2017	2.09
7/23/2017	2.03
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7/27/2017	2.07
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8/5/2017	2.04
8/6/2017	1.90
8/7/2017	1.94
8/8/2017	1.95
8/9/2017	1.89
8/10/2017	1.89
8/11/2017	1.89
8/12/2017	2.04
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9/2/2017	1.85
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9/5/2017	2.06
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9/8/2017	2.02
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9/11/2017	2.26
9/12/2017	2.03
9/13/2017	2.05
9/14/2017	2.10
9/15/2017	2.05
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9/17/2017	1.97
9/18/2017	2.05
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9/24/2017	1.91
9/25/2017	2.00
9/26/2017	2.00
9/27/2017	2.02
9/28/2017	1.97
9/29/2017	1.86
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10/1/2017	1.92
10/2/2017	1.95
10/3/2017	1.95
10/4/2017	1.99
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10/13/2017	1.93
10/14/2017	2.07
10/15/2017	1.96
10/16/2017	2.80
10/17/2017	1.97
10/18/2017	1.94

Date	Flow
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10/20/2017	1.94
10/21/2017	1.87
10/22/2017	1.89
10/23/2017	1.98
10/24/2017	2.10
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10/28/2017	2.05
10/29/2017	2.54
10/30/2017	3.60
10/31/2017	2.24
11/1/2017	2.33
11/2/2017	2.43
11/3/2017	2.25
11/4/2017	2.33
11/5/2017	2.41
11/6/2017	2.36
11/7/2017	2.31
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11/9/2017	2.21
11/10/2017	2.07
11/11/2017	2.05
11/12/2017	2.15
11/13/2017	2.22
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11/15/2017	2.41
11/16/2017	2.34
11/17/2017	2.27
11/18/2017	2.56
11/19/2017	2.38
11/20/2017	2.28
11/21/2017	3.03
11/22/2017	2.40
11/23/2017	2.31
11/24/2017	2.31
11/25/2017	2.31
11/26/2017	2.46
11/27/2017	2.45
11/28/2017	2.43
11/29/2017	2.38
11/30/2017	2.40
12/1/2017	2.40
12/2/2017	2.27
12/3/2017	2.28
12/4/2017	2.33
12/5/2017	2.44
12/6/2017	2.64
12/7/2017	2.48
12/8/2017	2.40
12/9/2017	2.33
12/10/2017	2.42
12/11/2017	2.42
12/12/2017	2.47
12/13/2017	2.46
12/14/2017	2.35
12/15/2017	2.28
12/16/2017	2.27
12/17/2017	2.20
12/18/2017	2.32
12/19/2017	2.29
12/20/2017	2.18
12/21/2017	2.08
12/22/2017	2.02
12/23/2017	2.30
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12/25/2017	2.12
12/26/2017	2.24
12/27/2017	2.17
12/28/2017	2.19
12/29/2017	2.13
12/30/2017	2.09
12/31/2017	2.06
1/1/2018	2.07
1/2/2018	2.07
1/3/2018	2.02
1/4/2018	1.94
1/5/2018	1.97
1/6/2018	2.02
1/7/2018	1.99
1/8/2018	1.97
1/9/2018	1.90
1/10/2018	1.87
1/11/2018	1.96
1/12/2018	3.55
1/13/2018	4.98
1/14/2018	3.17
1/15/2018	2.96
1/16/2018	2.83
1/17/2018	2.75
1/18/2018	2.70
1/19/2018	2.64

Date	Flow
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1/21/2018	2.71
1/22/2018	2.78
1/23/2018	3.83
1/24/2018	3.61
1/25/2018	3.30
1/26/2018	3.12
1/27/2018	3.02
1/28/2018	3.09
1/29/2018	3.11
1/30/2018	3.00
1/31/2018	2.96
2/1/2018	3.01
2/2/2018	3.09
2/3/2018	2.90
2/4/2018	3.09
2/5/2018	3.53
2/6/2018	3.18
2/7/2018	3.54
2/8/2018	3.53
2/9/2018	3.29
2/10/2018	3.35
2/11/2018	4.87
2/12/2018	5.13
2/13/2018	4.27
2/14/2018	4.01
2/15/2018	4.08
2/16/2018	3.88
2/17/2018	3.52
2/18/2018	4.07
2/19/2018	3.84
2/20/2018	3.84
2/21/2018	3.66
2/22/2018	3.58
2/23/2018	3.57
2/24/2018	3.59
2/25/2018	4.65
2/26/2018	4.43
2/27/2018	4.00
2/28/2018	3.58
3/1/2018	3.63
3/2/2018	5.59
3/3/2018	5.01
3/4/2018	5.10
3/5/2018	4.65
3/6/2018	4.29
3/7/2018	4.70
3/8/2018	5.60
3/9/2018	4.74
3/10/2018	4.11
3/11/2018	3.76
3/12/2018	3.56
3/13/2018	3.67
3/14/2018	3.92
3/15/2018	3.85
3/16/2018	3.67
3/17/2018	3.54
3/18/2018	3.49
3/19/2018	3.52
3/20/2018	3.41
3/21/2018	3.41
3/22/2018	3.66
3/23/2018	3.49
3/24/2018	3.28
3/25/2018	3.21
3/26/2018	3.23
3/27/2018	3.18
3/28/2018	3.59
3/29/2018	3.19
3/30/2018	3.04
3/31/2018	2.90
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4/2/2018	3.01
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4/5/2018	3.11
4/6/2018	3.08
4/7/2018	2.85
4/8/2018	2.86
4/9/2018	2.89
4/10/2018	2.84
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4/13/2018	2.91
4/14/2018	2.56
4/15/2018	2.52
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4/17/2018	3.31
4/18/2018	3.12
4/19/2018	3.13
4/20/2018	2.97
4/21/2018	2.85
4/22/2018	2.80

Date	Flow
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4/28/2018	3.32
4/29/2018	3.27
4/30/2018	3.20
5/1/2018	3.08
5/2/2018	3.01
5/3/2018	2.95
5/4/2018	2.90
5/5/2018	2.72
5/6/2018	2.73
5/7/2018	2.72
5/8/2018	2.67
5/9/2018	2.59
5/10/2018	2.52
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5/14/2018	2.35
5/15/2018	2.44
5/16/2018	2.37
5/17/2018	2.50
5/18/2018	2.38
5/19/2018	2.20
5/20/2018	2.66
5/21/2018	2.43
5/22/2018	2.43
5/23/2018	2.45
5/24/2018	2.35
5/25/2018	2.35
5/26/2018	2.38
5/27/2018	2.38
5/28/2018	2.38
5/29/2018	2.30
5/30/2018	2.27
5/31/2018	2.19
6/1/2018	2.30
6/2/2018	2.28
6/3/2018	2.14
6/4/2018	2.77
6/5/2018	2.71
6/6/2018	2.41
6/7/2018	2.32
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6/16/2018	2.15
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6/25/2018	2.11
6/26/2018	2.06
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6/30/2018	2.14
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7/2/2018	2.17
7/3/2018	2.18
7/4/2018	2.12
7/5/2018	2.03
7/6/2018	2.22
7/7/2018	2.05
7/8/2018	1.96
7/9/2018	1.99
7/10/2018	1.99
7/11/2018	2.17
7/12/2018	1.88
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7/19/2018	1.88
7/20/2018	1.94
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7/22/2018	2.06
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7/24/2018	1.96

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7/26/2018	1.99
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7/28/2018	2.02
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7/30/2018	1.96
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8/8/2018	1.94
8/9/2018	1.91
8/10/2018	1.89
8/11/2018	2.05
8/12/2018	2.18
8/13/2018	2.08
8/14/2018	2.05
8/15/2018	1.96
8/16/2018	1.95
8/17/2018	1.96
8/18/2018	2.07
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8/23/2018	1.82
8/24/2018	1.82
8/25/2018	1.80
8/26/2018	1.79
8/27/2018	1.83
8/28/2018	1.83
8/29/2018	1.79
8/30/2018	1.79
8/31/2018	1.78
9/1/2018	1.70
9/2/2018	1.79
9/3/2018	1.97
9/4/2018	1.94
9/5/2018	1.96
9/6/2018	2.02
9/7/2018	1.88
9/8/2018	1.74
9/9/2018	1.95
9/10/2018	2.39
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9/19/2018	2.23
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9/23/2018	1.95
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9/26/2018	2.49
9/27/2018	2.27
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9/30/2018	2.31
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10/14/2018	2.72
10/15/2018	2.72
10/16/2018	2.74
10/17/2018	2.62
10/18/2018	2.53
10/19/2018	2.66
10/20/2018	2.35
10/21/2018	2.36
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10/23/2018	2.90
10/24/2018	2.56
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11/8/2018	3.19
11/9/2018	3.97
11/10/2018	4.24
11/11/2018	3.47
11/12/2018	3.27
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11/14/2018	4.76
11/15/2018	4.16
11/16/2018	5.33
11/17/2018	4.66
11/18/2018	4.21
11/19/2018	4.50
11/20/2018	3.95
11/21/2018	3.44
11/22/2018	3.12
11/23/2018	3.04
11/24/2018	3.03
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11/28/2018	4.83
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12/5/2018	4.11
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12/17/2018	3.45
12/18/2018	3.19
12/19/2018	2.99
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12/22/2018	3.38
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12/26/2018	2.73
12/27/2018	3.97
12/28/2018	4.05
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12/31/2018	3.51
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1/4/2019	3.55
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1/7/2019	3.59
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1/9/2019	3.55
1/10/2019	3.32
1/11/2019	3.18
1/12/2019	3.04
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1/21/2019	3.94
1/22/2019	3.64
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1/25/2019	4.35
1/26/2019	3.87

Date	Flow
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2/4/2019	3.10
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2/7/2019	3.21
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2/9/2019	2.99
2/10/2019	2.89
2/11/2019	3.02
2/12/2019	3.03
2/13/2019	4.55
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2/15/2019	3.50
2/16/2019	3.32
2/17/2019	3.20
2/18/2019	3.33
2/19/2019	3.25
2/20/2019	3.10
2/21/2019	4.03
2/22/2019	3.48
2/23/2019	3.28
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2/25/2019	4.04
2/26/2019	3.69
2/27/2019	3.48
2/28/2019	3.38
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3/4/2019	4.04
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3/6/2019	3.51
3/7/2019	3.35
3/8/2019	3.35
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3/19/2019	3.17
3/20/2019	3.12
3/21/2019	3.12
3/22/2019	3.56
3/23/2019	3.44
3/24/2019	3.36
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3/27/2019	3.10
3/28/2019	3.08
3/29/2019	2.99
3/30/2019	2.88
3/31/2019	2.86
4/1/2019	2.90
4/2/2019	2.86
4/2/2019	3.41
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4/5/2019	2.95
4/6/2019	2.99
4/7/2019	2.90
4/8/2019	3.22
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4/12/2019	3.03
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4/15/2019	3.85
4/16/2019	3.48
4/17/2019	3.27
4/18/2019	3.26
4/19/2019	3.23
4/20/2019	3.30
4/21/2019	3.38
4/22/2019	3.60
4/23/2019	3.64
4/24/2019	3.50
4/25/2019	3.33
4/26/2019	3.57
4/27/2019	4.00
4/28/2019	3.62
4/29/2019	3.49

Date	Flow
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5/1/2019	3.22
5/2/2019	3.20
5/3/2019	3.15
5/4/2019	3.21
5/5/2019	3.47
5/6/2019	3.62
5/7/2019	3.42
5/8/2019	3.21
5/9/2019	3.05
5/10/2019	2.95
5/11/2019	2.80
5/12/2019	3.38
5/13/2019	3.51
5/14/2019	3.49
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5/25/2019	2.58
5/26/2019	2.57
5/27/2019	2.50
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5/29/2019	2.43
5/30/2019	2.60
5/31/2019	2.50
6/1/2019	2.44
6/2/2019	2.40
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6/4/2019	2.32
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6/17/2019	2.59
6/18/2019	2.69
6/19/2019	2.72
6/20/2019	2.68
6/21/2019	3.19
6/22/2019	2.75
6/23/2019	2.89
6/24/2019	2.66
6/25/2019	3.39
6/26/2019	3.24
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6/28/2019	2.85
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7/1/2019	2.67
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7/14/2019	2.28
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7/16/2019	2.25
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7/18/2019	2.49
7/19/2019	2.40
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7/21/2019	2.28
7/22/2019	2.58
7/23/2019	3.87
7/24/2019	3.45
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7/26/2019	2.84
7/27/2019	2.70
7/28/2019	2.68
7/29/2019	2.62
7/30/2019	2.55
7/31/2019	2.74

Date	Flow
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8/5/2019	2.35
8/6/2019	2.31
8/7/2019	2.33
8/8/2019	2.40
8/9/2019	2.28
8/10/2019	2.16
8/11/2019	2.13
8/12/2019	2.12
8/13/2019	2.42
8/14/2019	2.31
8/15/2019	2.24
8/16/2019	2.24
8/17/2019	2.58
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8/19/2019	2.28
8/20/2019	2.18
8/21/2019	2.24
8/22/2019	2.17
8/23/2019	2.21
8/24/2019	2.04
8/25/2019	2.01
8/26/2019	1.99
8/27/2019	2.00
8/28/2019	2.24
8/29/2019	2.24
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9/3/2019	2.27
9/4/2019	2.28
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9/22/2019	2.15
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10/21/2019	2.24
10/22/2019	2.44
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10/24/2019	2.49
10/25/2019	2.23
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10/28/2019	3.07
10/29/2019	2.82
10/30/2019	2.84
10/31/2019	2.90
11/1/2019	2.78

Date	Flow
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11/7/2019	2.77
11/8/2019	2.60
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11/16/2019	2.30
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11/25/2019	2.83
11/26/2019	2.64
11/27/2019	2.54
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11/29/2019	2.27
11/30/2019	2.29
12/1/2019	2.62
12/2/2019	3.21
12/3/2019	3.02
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12/5/2019	2.97
12/6/2019	2.90
12/7/2019	2.77
12/8/2019	2.73
12/9/2019	4.31
12/10/2019	4.37
12/11/2019	3.91
12/12/2019	3.61
12/13/2019	3.56
12/14/2019	5.75
12/15/2019	4.46
12/16/2019	3.96
12/17/2019	4.15
12/18/2019	4.01
12/19/2019	3.59
12/20/2019	3.28
12/21/2019	3.11
12/22/2019	3.02
12/23/2019	3.03
12/24/2019	2.88
12/25/2019	2.63
12/26/2019	2.72
12/27/2019	2.72
12/28/2019	2.64
12/29/2019	2.59
12/30/2019	4.34
12/31/2019	4.42

	FLOW
Average	2.62
90 percentile	3.54
80 percentile	3.14
Median	2.39
count	1828.00
count >4	85.00
Count >5	21.00
% above 80 %	5%
% above 5 mgd	1%
Max	9.99
Min	1.46

APPENDIX B

LOCAL LIMITS SUMMARY

SUMMARY OF LOCAL LIMITS SAMPLING FOR BOD

BOD REMOVAL

DATE	AVE.FLOW (mgd)	BOD influent	mg/l primary effl	removal %	effluent	Total removal	residential	MASS lbs/day influent	primary effl	effluent
12/23/2015	2.22	320	250	22%	6.9	98%	280	5,917	4,622	128
12/20/2016	2.27	190	150	21%	7.4	96%	300	3,594	2,837	140
12/5/2017	2.44	301	189	37%	29.3	90%	295	6,133	3,851	597
12/11/2018	3.27	221	116	48%	7.7	97%	243	6,031	3,165	210
12/20/2019	3.28	139	102	27%	15.1	89%	272	3,799	2,788	413
Average	2.70	234.2	161.4	31%	13.28	94%	278	5,095	3,453	297

Selected

Flow	2.62	MGD		
Design Load	10,425	lbs/day		
Aver Mass $_{LL}$	5,095	lbs/day	Calculated load	
Aver Mass $_{Daily}$	4,471	lbs/day	Actual average Load	From five year average

AHL (use calcualted Load)

Mass available	5330.40	lbs/day

SUMMARY OF LOCAL LIMITS SAMPLING FOR LEAD

TSS

DATE	AVE.FLOW (mgd)	TSS mg/l influent	removal % primary effl	Total effluent	Removal	residential	TSS MASS (lb/day) influent	primary effl	effluent
12/23/2015	2.22						0		0
12/20/2016	2.27	200		8	**96%**		3,783		151
12/5/2017	2.44	120		6.8	**94%**		2,445		139
12/11/2018	3.27	240		10.8	**96%**		6,549		295
12/20/2019	3.28	110		7.7	**93%**		3,006		210
Average	2.70	167.5		8.325	**95%**		3,157		159

Selected Flow	2.62	MGD
Design Load	10,425	lbs/day
Aver Mass $_{LL}$	3,157	lbs/day
Aver Mass $_{Daily}$	5,116	lbs/day
Mass available	5,309	lbs/day

SUMMARY OF LOCAL LIMITS SAMPLING FOR OIL & GREASE

O&G

DATE	AVE.FLOW	O&G	mg/l	removal %		Total		O&G	MASS (lb/day)	
	(mgd)	influent	primary effl		effluent	Removal	residential	influent	primary effl	effluent
12/23/2015	2.22									
12/20/2016	2.27	39	17	56%	0.05	100%	74	738	322	1
12/5/2017	2.44	21.1	16.1	24%	10.1	52%	32.6	430	328	206
12/11/2018	3.27	19.6	11.6	41%	22.3	-14%	40.1	535	317	609
12/20/2019	3.28	17.1	7.47	56%	1.33	92%	52.4	467	204	36
Average	2.70	24.2	13.0	44%	8.4	58%	49.8	542	293	213

SUMMARY OF LOCAL LIMITS SAMPLING FOR SULFIDE

SULFIDE

DATE	AVE.FLOW	SULFIDE	mg/l	removal %		Total		SULFIDE	MASS (lb/day)	
	(mgd)	influent	primary effl		effluent	Removal	residential	influent	primary effl	effluent
12/23/2015	2.22	1.2	0.83	31%	0.25	79%	0.025	22	15	5
12/20/2016	2.27	0.025	0.025	0%	0.25		0.025	0	0	5
12/5/2017	2.44	0.050	0.050	0%	0.050	0%	0.125	1	1	1
12/11/2018	3.27	0.139	0.018	87%	0.018	87%	0.05	4	0	0
12/20/2019	3.28	0.030	0.011	63%	0.020	33%	0.02	1	0	1
Average	2.70	0.2888	0.1868	36%	0.1176	50%	0.049	6	4	2

SUMMARY OF LOCAL LIMITS SAMPLING FOR ARSENIC

ARSENIC

DATE	AVE.FLOW (mgd)	ARSENIC influent	mg/l primary effl	removal %	effluent	Total Removal	residential	ARSENIC influent	MASS (lb/day) primary effl	effluent
12/23/2015	2.22	0.002	0.002	0.00%	0.002	0%		0.037	0.037	0.037
12/20/2016	2.27	0.050	0.050	0.00%	0.050			0.946	0.946	0.946
12/5/2017	2.44	0.050	0.050	0.00%	0.005		0.005	1.019	1.019	0.102
12/11/2018	3.27	0.005	0.005	0.00%	0.005		0.005	0.136	0.136	0.136
12/20/2019	3.28	0.005	0.005	0.00%	0.005		0.005	0.137	0.137	0.137
Average	2.70	0.0224	0.0224	0%	0.0134	0%	0.005	0.455	0.455	0.272
EPA standard						45%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR CADMIUM

CADMIUM

DATE	AVE.FLOW (mgd)	CADMIUM mg/l influent	primary effl	removal %	effluent	Total Removal	residential	CADMIUM MASS (lb/day) influent	primary effl	effluent
12/23/2015	2.22	0.002	0.002	0%	0.002	0%	0.002	0.04	0.04	0.04
12/20/2016	2.27	0.002	0.002	0%	0.002		0.002	0.95	0.95	0.95
12/5/2017	2.44	0.002	0.002	0%	0.002		0.002	1.02	1.02	0.10
12/11/2018	3.27	0.002	0.002	0%	0.002		0.002	0.14	0.14	0.14
12/20/2019	3.28	0.002	0.002	0%	0.002		0.002	0.14	0.14	0.14
Average	2.70	0.002	0.002	0%	0.002	0%	0.002	0.45	0.45	0.27
EPA standard				15%		67%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR CHROMIUM

CHROMIUM

DATE	AVE.FLOW (mgd)	CHROMIUM mg/l influent	primary effl	removal %	effluent	Total Removal	residential	CHROMIUM MASS (lb/day) influent	primary effl	effluent
12/23/2015	2.22	0.002	0.002		0.002			0.04	0.04	0.04
12/20/2016	2.27	0.025	0.025		0.025		**0.025**	0.47	0.47	0.47
12/5/2017	2.44	0.002	0.002		0.002		**0.002**	0.04	0.04	0.04
12/11/2018	3.27	0.002	0.002		0.002		**0.002**	0.05	0.05	0.05
12/20/2019	3.28	0.0028	0.002	**29%**	0.002	**29%**	**0.002**	0.08	0.05	0.05
Average	2.70	0.0068	0.0066	**29%**	0.0066	**27%**	0.008	0.14	0	0
EPA standard				**27%**		**82%**				

SUMMARY OF LOCAL LIMITS SAMPLING FOR COPPER

COPPER

DATE	AVE.FLOW	COPPER	mg/l	removal %		Total		COPPER	MASS (lb/day)	
	(mgd)	influent	primary effl		effluent	Removal	residential	influent	primary effl	effluent
12/23/2015	2.22	0.065	0.045	31%	0.012	96%	0.046	1.202	0.832	0.222
12/20/2016	2.27	0.068	0.050	26%	0.025	91%	0.025	1.286	0.946	0.473
12/5/2017	2.44	0.0693	0.0466	33%	0.0119	96%	0.0522	1.412	0.949	0.242
12/11/2018	3.27	0.0258	0.0235	9%	0.0235	74%	0.0494	0.704	0.641	0.641
12/20/2019	3.28	0.0276	0.0252	9%	0.0077	91%	0.0479	0.754	0.689	0.210
Average	2.70	0.0511	0.0381	22%	0.0160	90%	0.044	1.072	0.811	0.358
EPA standard				22%		86%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR CYANIDE

CYANIDE

DATE	AVE.FLOW	CYANIDE	mg/l	removal %		Total		CYANIDE	MASS (lb/day)	
	(mgd)	influent	primary effl		effluent	Removal	residential	influent	primary effl	effluent
12/23/2015	2.22									
12/20/2016	2.27	0.01	0.01		0.01		0.01			
12/5/2017	2.44	0.01	0.01		0.01		0.01			
12/11/2018	3.27	0.01	0.01		0.01		0.01			
12/20/2019	3.28	0.01	0.01		0.01		0.01			
Average	2.70	0.01	0.01		0.01		0.01			
EPA standard				27%		69%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR LEAD

LEAD

DATE	AVE.FLOW (mgd)	LEAD influent	mg/l primary effl	removal %	effluent	Total Removal	residential	LEAD influent	MASS (lb/day) primary effl	effluent
12/23/2015	2.22	0.004	0.002	50%	0.002	50%		0.074	0.037	0.037
12/20/2016	2.27	0.025	0.025		0.025		0.025	0.473	0.473	0.473
12/5/2017	2.44	0.0044	0.003	32%	0.003	32%	0.003	0.090	0.061	0.061
12/11/2018	3.27	0.003	0.003		0.003		0.003	0.082	0.082	0.082
12/20/2019	3.28	0.0032	0.003	6%	0.003	6%		0.087	0.082	0.082
Average	2.70	0.0079	0.0072	29%	0.0072	29%	0.0103	0.161	0.147	0.147
EPA standard				57%		61%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR MERCURY

Mercury

DATE	AVE.FLOW (mgd)	Mercury mg/l influent	removal % primary effl	effluent	Total Removal	residential	Mercury MASS (lb/day) influent	primary effl	effluent
12/23/2015	2.22	0.0005	0.0005	0.0005		0.0005	0.009	0.009	0.009
12/20/2016	2.27	0.0005	0.0005	0.0005		0.0005	0.009	0.009	0.009
12/5/2017	2.44	0.0002	0.0002	0.0002		0.0002	0.004	0.004	0.004
12/11/2018	3.27	0.0002	0.0002	0.0002		0.0002	0.005	0.005	0.005
12/20/2019	3.28	0.0002	0.0002	0.0002			0.005	0.005	0.005
Average	2.70	0.0003	0.0003	0.0003		0.0004	0.007	0.007	0.007
EPA standard			10%		60%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR NICKEL

Nickel

DATE	AVE.FLOW (mgd)	Nickel influent	mg/l primary effl	removal %	effluent	Total Removal	residential	Nickel influent	MASS (lb/day) primary effl	effluent
12/23/2015	2.22	0.005	0.004	20%	0.003	40%	0.003	0.092	0.074	0.055
12/20/2016	2.27	0.025	0.025		0.025		0.025	0.473	0.473	0.473
12/5/2017	2.44	0.005	0.005		0.005		0.005	0.102	0.102	0.102
12/11/2018	3.27	0.005	0.005		0.005		0.005	0.136	0.136	0.136
12/20/2019	3.28	0.005	0.005		0.005		0.005	0.137	0.137	0.137
Average	2.70	0.0090	0.0088	20%	0.0086	40%	0.0086	0.188	0.184	0.181
EPA standard				14%		42%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR SILVER

SILVER

DATE	AVE.FLOW (mgd)	SILVER mg/l influent	primary effl	removal %	effluent	Total Removal	residential	SILVER MASS (lb/day) influent	primary effl	effluent
12/23/2015	2.22	0.002	0.002	0%	0.002		0.002	0.037	0.037	0.037
12/20/2016	2.27	0.025	0.025	0%	0.025		0.025	0.473	0.473	0.473
12/5/2017	2.44	0.002	0.002	0%	0.002		0.002	0.041	0.041	0.041
12/11/2018	3.27	0.002	0.002	0%	0.002		0.002	0.055	0.055	0.055
12/20/2019	3.28	0.002	0.002	0%	0.002			0.055	0.055	0.055
Average	2.70	0.0066	0.0066	0%	0.0066		0.008	0.132	0.132	0.132
EPA standard				20%		75%				

SUMMARY OF LOCAL LIMITS SAMPLING FOR ZINC

ZINC

DATE	AVE.FLOW (mgd)	ZINC influent	mg/l primary effl	removal %	effluent	Total Removal	residential	ZINC influent	MASS (lb/day) primary effl	effluent
12/23/2015	2.22		0.127		0.068		0.256		2.348	1.257
12/20/2016	2.27	0.188	0.152	19%	0.104	45%	0.104	3.556	2.875	1.967
12/5/2017	2.44	0.187	0.125	33%	0.066	65%	0.305	3.810	2.547	1.345
12/11/2018	3.27	0.0977	0.0875	10%	0.0875	10%	0.0309	2.666	2.388	2.388
12/20/2019	3.28	0.104	0.0936	10%	0.0559	46%	0.342	2.842	2.558	1.528
Average	2.70	0.1442	0.1170	18%	0.076	42%	0.2076	3.219	2.543	1.697
EPA standard				27%		79%				

APPENDIX C

RIPDES PERMIT NUMBER RI0100374

AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended, the

Town of South Kingstown
180 High Street
Wakefield, RI 02879

is authorized to discharge from a facility located at the

South Kingstown Regional Wastewater Treatment Plant
275 Westmoreland Street
Narragansett, Rhode Island

to receiving waters named

Rhode Island Sound

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on September 1, 2017.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on January 13, 2012.

This permit consists of twenty-two (22) pages in Part I including effluent limitations, monitoring requirements, etc. and ten (10) pages in Part II including General Conditions.

Signed this 10th day of July, 2017.

Angelo S. Liberti, P.E., Chief of Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. (final discharge after dechlorination).

   Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Flow	5.0 MGD					Continuous	Recorder
BOD_5	1,251	2,085	30 mg/l	45 mg/l	50 mg/l	3/Week	24-Hr. Comp.
BOD_5 - % Removal	85%					1/Month	Calculated
TSS	1,251	2,085	30 mg/l	45 mg/l	50 mg/l	3/Week	24-Hr. Comp.
TSS - % Removal	85%					1/Month	Calculated
Settleable Solids				--- ml/l	--- ml/l	1/Day	Grab

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

Sampling for TSS and BOD_5 shall be performed Tuesday, Thursday and either Saturday or Sunday. All BOD_5 and TSS samples shall be taken on the influent and effluent with appropriate allowances for hydraulic detention (flow-through) time.

Sampling for Flow and Settleable Solids shall be performed Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A. (final discharge after dechlorination).

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

2. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. (final discharge after dechlorination).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Enterococci			35 cfu[1] 100 ml		276 cfu[1] 100 ml	3/Week	Grab
Fecal Coliform			--- MPN[1] 100 ml		--- MPN[1] 100 ml	3/Week	Grab
Total Residual Chlorine (TRC)			885 ug/l[2]		1,040 ug/l[2]	Daily	Grab[2]
pH			(6.0 SU)		(9.0 SU)	2/Day	Grab

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

[1] Two (2) of the three (3) Enterococci samples are to be taken on Tuesday and Thursday. The Fecal Coliform samples shall be taken at the same time as the Enterococci samples. The Geometric Mean shall be used to obtain the "weekly average" and the "monthly average." The facility shall report any fecal coliform sample result that exceeds 400 MPN/100 mL to the RI DEM in accordance with the 24-hour reporting requirements under Part II(I)(5) of the permit.

[2]The use of a continuous TRC recorder after chlorination and prior to dechlorination is required to provide a record that proper disinfection was achieved at all times. Compliance with these limitations shall be determined by taking three grab samples of the final effluent (after dechlorination) per day, Monday - Friday (except holidays), equally spaced over one (1) eight hour working shift with a minimum of three hours between grabs, and on Saturdays, Sundays, and Holidays by taking at least (2) grab samples each day with a minimum of two (2) hours between grabs. The maximum daily and average monthly values are to be computed from the averaged grab sample results for each day. The following methods may be used to analyze the grab samples: (1) DPD Spectrophotometric, EPA No. 330.5 or Standard Methods (18th Edition) No. 4500-Cl G; (2) DPD Titrimetric, EPA No. 330.4 or Standard Methods (18th Edition) No. 4500-Cl F; (3) Amperometric Titration, EPA No. 330.1 or Standard Methods (18th Edition) No. 4500-Cl D or ASTM No. D1253-86(92); (4) Iodometric Direct Titration, EPA No. 330.3 or Standard Methods (18th Edition) No. 4500-Cl B; (5) Iodometric Back Titration (either end-point), EPA No. 330.2 or Standard Methods (18th Edition) No. 4500-Cl C.

*Values in parentheses () are to be reported as Minimum/Maximum for the reporting period rather than Average Monthly/Maximum Daily.

Sampling for pH and Chlorine Residual shall be performed Sunday-Saturday.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A (final discharge after dechlorination).

PART 1

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. (final discharge after dechlorination).

   Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Oil and Grease					--- mg/l	1/Quarter	3 Grabs[1]
TKN (May 1 – October 31)					— mg/l	1/Month	24-Hr. Comp.
Nitrate, Total (as N) (May 1 – October 31)					--- mg/l	1/Month	24-Hr. Comp.
Nitrite, Total (as N) (May 1 – October 31)					--- mg/l	1/Month	24-Hr. Comp.
Nitrogen, Total (TKN+Nitrate+Nitrite, as N) (May 1 – October 31)					— mg/l	1/Month	Calculated

[1]Three (3) grab samples shall be equally spaced over the course of an eight (8) hour shift with a minimum of three (3) hours between grabs. Each grab sample must be analyzed individually and the maximum values reported.

— signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

Samples taken in compliance with the monitoring requirements specified above shall be taken Monday through Friday at the following location: Outfall 001A. (final discharge after dechlorination).

PART I

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

4. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. (final discharge after dechlorination)

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)	Measurement Frequency	Sample Type
Cyanide[1]			64 ug/l		64 ug/l	1/Quarter	Composite[2]
Copper, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Cadmium, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Chromium, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Lead, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Zinc, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Nickel, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.
Aluminum, Total[1]			--- ug/l		--- ug/l	1/Quarter	24-Hr. Comp.

--- Signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

[1]Monitoring data may be obtained in conjunction with bioassay testing.

[2]Monitoring shall be conducted by taking three (3) grab samples per day with a minimum of three (3) hours between grabs and preserved immediately upon collection. All three (3) samples shall be composited then analyzed for available Cyanide.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 001A (final discharge after dechlorination).

PART 1

A. **EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

5. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 001A. (final discharge after dechlorination).

   Such discharges shall be monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - lbs./day		Concentration - specify units				
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
Mysidopsis bahia-LC_{50}[1]					≥100%[2]	1/Quarter	24-Hr. Comp.

[1]LC_{50} is defined as the concentration of wastewater that causes mortality to 50% of the test organisms.

[2]The 100% or greater limit is defined as a sample which is composed of 100% effluent.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfall 001A in accordance with Part I.B. of the permit. (final discharge after dechlorination)

APPENDIX D

DEVELOPMENT DOCUMENT

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY SPECIFIC DATA INPUT SHEET

NOTE: LIMITS BASED ON RI WATER QUALITY CRITERIA DATED JULY 2006

FACILITY NAME: **South Kingstown WWTF 2017**

RIPDES PERMIT #: **RI0100374**

	DISSOLVED BACKGROUND DATA (ug/L)	ACUTE METAL TRANSLATOR	CHRONIC METAL TRANSLATOR
ALUMINUM	NA	NA	NA
ARSENIC	NA	1	1
CADMIUM	NA	0.994	0.994
CHROMIUM III	NA	NA	NA
CHROMIUM VI	NA	0.993	0.993
COPPER	NA	0.83	0.83
LEAD	NA	0.951	0.951
MERCURY	NA	0.85	NA
NICKEL	NA	0.99	0.99
SELENIUM	NA	0.998	0.998
SILVER	NA	0.85	0.85
ZINC	NA	0.946	0.946

USE NA WHEN NO DATA IS AVAILABLE

NOTE 1: BACKGROUND DATA BASED ON AVERAGE CONCENTRATIONS IN ATTACHMENT B.

NOTE 2: METAL TRANSLATORS FROM RI WATER QUALITY REGS.

DILUTION FACTORS		
	ACUTE =	80 x
	CHRONIC =	118 x
	HUMAN HEALTH =	118 x

NOTE: TEST WWTF'S DILUTION FACTORS OBTAINED FROM A DYE STUDY.

TOTAL AMMONIA CRITERIA (ug/L)		
WINTER	ACUTE =	8700
	CHRONIC =	1300
SUMMER	ACUTE =	7300
	CHRONIC =	1100

NOTE 1: LIMITS ARE FROM TABLE 3 IN THE RI WATER QUALITY REGS. USING:
SALINITY = 30 g/Kg
WINTER (NOV-APRIL) pH=8.4 s.u.;
SUMMER (MAY-OCT) pH=8.2 s.u.
WINTER (NOV-APRIL) TEMP=10.0 C;
SUMMER (MAY-OCT) TEMP=20.0 C.

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: South Kingstown WWTF 2017 RIPDES PERMIT #: RI0100374

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS							
TOXIC METALS AND CYANIDE							
ANTIMONY	7440360			No Criteria		640	60416
ARSENIC (limits are total recoverable)	7440382	NA	69	4416	36	1.4	132.16
ASBESTOS	1332214			No Criteria			No Criteria
BERYLLIUM	7440417			No Criteria			No Criteria
CADMIUM (limits are total recoverable)	7440439	NA	40	2575.452716	8.8		835.7344064
CHROMIUM III (limits are total recoverable)	16065831	NA		No Criteria			No Criteria
CHROMIUM VI (limits are total recoverable)	18540299	NA	1100	70896.27392	50		4753.27291
COPPER (limits are total recoverable)	7440508	NA	4.8	370.1204819	3.1		352.5783133
CYANIDE	57125		1	64.00	1	140	94.4
LEAD (limits are total recoverable)	7439921	NA	210	14132.49211	8.1		804.0378549
MERCURY (limits are total recoverable)	7439976	NA	1.8	135.5294118	0.94	0.15	14.16
NICKEL (limits are total recoverable)	7440020	NA	74	4783.838384	8.2	4600	781.8989899
SELENIUM (limits are total recoverable)	7782492	NA	290	18597.19439	71	4200	6715.831663
SILVER (limits are total recoverable)	7440224	NA	1.9	143.0588235			No Criteria
THALLIUM	7440280			No Criteria		0.47	44.368
ZINC (limits are total recoverable)	7440666	NA	90	6088.794926	81	26000	8082.875264
VOLATILE ORGANIC COMPOUNDS							
ACROLEIN	107028			No Criteria		290	27376
ACRYLONITRILE	107131			No Criteria		2.5	236
BENZENE	71432			No Criteria		510	48144
BROMOFORM	75252			No Criteria		1400	132160
CARBON TETRACHLORIDE	56235			No Criteria		16	1510.4
CHLOROBENZENE	108907			No Criteria		1600	151040
CHLORODIBROMOMETHANE	124481			No Criteria		130	12272
CHLOROFORM	67663			No Criteria		4700	443680
DICHLOROBROMOMETHANE	75274			No Criteria		170	16048
1,2DICHLOROETHANE	107062			No Criteria		370	34928
1,1DICHLOROETHYLENE	75354			No Criteria		7100	670240
1,2DICHLOROPROPANE	78875			No Criteria		150	14160
1,3DICHLOROPROPYLENE	542756			No Criteria		21	1982.4
ETHYLBENZENE	100414			No Criteria		2100	198240
BROMOMETHANE (methyl bromide)	74839			No Criteria		1500	141600
CHLOROMETHANE (methyl chloride)	74873			No Criteria			No Criteria
METHYLENE CHLORIDE	75092			No Criteria		5900	556960

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: South Kingstown WWTF 2017 RIPDES PERMIT #: RI0100374

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,1,2,2TETRACHLOROETHANE	79345			No Criteria		40	3776
TETRACHLOROETHYLENE	127184			No Criteria		33	3115.2
TOLUENE	108883			No Criteria		15000	1416000
1,2TRANSDICHLOROETHYLENE	156605			No Criteria		10000	944000
1,1,1TRICHLOROETHANE	71556			No Criteria			No Criteria
1,1,2TRICHLOROETHANE	79005			No Criteria		160	15104
TRICHLOROETHYLENE	79016			No Criteria		300	28320
VINYL CHLORIDE	75014			No Criteria		2.4	226.56
ACID ORGANIC COMPOUNDS							
2CHLOROPHENOL	95578			No Criteria		150	14160
2,4DICHLOROPHENOL	120832			No Criteria		290	27376
2,4DIMETHYLPHENOL	105679			No Criteria		850	80240
4,6DINITRO2METHYL PHENOL	534521			No Criteria		280	26432
2,4DINITROPHENOL	51285			No Criteria		5300	500320
4NITROPHENOL	88755			No Criteria			No Criteria
PENTACHLOROPHENOL	87865		13	832	7.9	30	745.76
PHENOL	108952			No Criteria		1700000	160480000
2,4,6TRICHLOROPHENOL	88062			No Criteria		24	2265.6
BASE NEUTRAL COMPUNDS							
ACENAPHTHENE	83329			No Criteria		990	93456
ANTHRACENE	120127			No Criteria		40000	3776000
BENZIDINE	92875			No Criteria		0.002	0.1888
POLYCYCLIC AROMATIC HYDROCARBONS				No Criteria		0.18	16.992
BIS(2CHLOROETHYL)ETHER	111444			No Criteria		5.3	500.32
BIS(2CHLOROISOPROPYL)ETHER	108601			No Criteria		65000	6136000
BIS(2ETHYLHEXYL)PHTHALATE	117817			No Criteria		22	2076.8
BUTYL BENZYL PHTHALATE	85687			No Criteria		1900	179360
2CHLORONAPHTHALENE	91587			No Criteria		1600	151040
1,2DICHLOROBENZENE	95501			No Criteria		1300	122720
1,3DICHLOROBENZENE	541731			No Criteria		960	90624
1,4DICHLOROBENZENE	106467			No Criteria		190	17936
3,3DICHLOROBENZIDENE	91941			No Criteria		0.28	26.432
DIETHYL PHTHALATE	84662			No Criteria		44000	4153600
DIMETHYL PHTHALATE	131113			No Criteria		1100000	103840000
DInBUTYL PHTHALATE	84742			No Criteria		4500	424800
2,4DINITROTOLUENE	121142			No Criteria		34	3209.6

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: South Kingstown WWTF 2017 RIPDES PERMIT #: RI0100374

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
1,2DIPHENYLHYDRAZINE	122667			No Criteria		2	188.8
FLUORANTHENE	206440			No Criteria		140	13216
FLUORENE	86737			No Criteria		5300	500320
HEXACHLOROBENZENE	118741			No Criteria		0.0029	0.27376
HEXACHLOROBUTADIENE	87683			No Criteria		180	16992
HEXACHLOROCYCLOPENTADIENE	77474			No Criteria		1100	103840
HEXACHLOROETHANE	67721			No Criteria		33	3115.2
ISOPHORONE	78591			No Criteria		9600	906240
NAPHTHALENE	91203			No Criteria			No Criteria
NITROBENZENE	98953			No Criteria		690	65136
NNITROSODIMETHYLAMINE	62759			No Criteria		30	2832
NNITROSODINPROPYLAMINE	621647			No Criteria		5.1	481.44
NNITROSODIPHENYLAMINE	86306			No Criteria		60	5664
PYRENE	129000			No Criteria		4000	377600
1,2,4trichlorobenzene	120821			No Criteria		70	6608
PESTICIDES/PCBs							
ALDRIN	309002		1.3	83.2		0.0005	0.0472
Alpha BHC	319846			No Criteria		0.049	4.6256
Beta BHC	319857			No Criteria		0.17	16.048
Gamma BHC (Lindane)	58899		0.16	10.24		1.8	169.92
CHLORDANE	57749		0.09	5.76	0.004	0.0081	0.3776
4,4DDT	50293		0.13	8.32	0.001	0.0022	0.0944
4,4DDE	72559			No Criteria		0.0022	0.20768
4,4DDD	72548			No Criteria		0.0031	0.29264
DIELDRIN	60571		0.71	45.44	0.0019	0.00054	0.050976
ENDOSULFAN (alpha)	959988		0.034	2.176	0.0087	89	0.82128
ENDOSULFAN (beta)	33213659		0.034	2.176	0.0087	89	0.82128
ENDOSULFAN (sulfate)	1031078			No Criteria		89	8401.6
ENDRIN	72208		0.037	2.368	0.0023	0.06	0.21712
ENDRIN ALDEHYDE	7421934			No Criteria		0.3	28.32
HEPTACHLOR	76448		0.053	3.392	0.0036	0.00079	0.074576
HEPTACHLOR EPOXIDE	1024573		0.053	3.392	0.0036	0.00039	0.036816
POLYCHLORINATED BIPHENYLS3	1336363			No Criteria	0.03	0.00064	0.060416
2,3,7,8TCDD (Dioxin)	1746016			No Criteria		0.000000051	4.8144E-06
TOXAPHENE	8001352		0.21	13.44	0.0002	0.0028	0.01888
TRIBUTYLTIN			0.42	26.88	0.0074		0.69856

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: South Kingstown WWTF 2017 RIPDES PERMIT #: RI0100374

NOTE: METALS CRITERIA ARE DISSOLVED, METALS LIMITS ARE TOTAL; AMMONIA CRITERIA AND LIMITS HAVE BEEN CONVERTED TO ug/l N.

CHEMICAL NAME	CAS #	BACKGROUND CONCENTRATION (ug/L)	SALTWATER CRITERIA ACUTE (ug/L)	DAILY MAX LIMIT (ug/L)	SALTWATER CRITERIA CHRONIC (ug/L)	HUMAN HEALTH NON-CLASS A CRITERIA (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON-PRIORITY POLLUTANTS							
OTHER SUBSTANCES							
ALUMINUM (limits are total recoverable)	7429905	NA		No Criteria			No Criteria
AMMONIA as N (winter/summer)	7664417		7151 | 6000.6	457690 384038	1069 | 904.2		100876 | 85356.5
4BROMOPHENYL PHENYL ETHER				No Criteria			No Criteria
CHLORIDE	16887006			No Criteria			No Criteria
CHLORINE	7782505		13	1040	7.5		885
4CHLORO2METHYLPHENOL				No Criteria			No Criteria
1CHLORONAPHTHALENE				No Criteria			No Criteria
4CHLOROPHENOL	106489			No Criteria			No Criteria
2,4DICHLORO6METHYLPHENOL				No Criteria			No Criteria
1,1DICHLOROPROPANE				No Criteria			No Criteria
1,3DICHLOROPROPANE	142289			No Criteria			No Criteria
2,3DINITROTOLUENE				No Criteria			No Criteria
2,4DINITRO6METHYL PHENOL				No Criteria			No Criteria
IRON	7439896			No Criteria			No Criteria
pentachlorobenzene	608935			No Criteria			No Criteria
PENTACHLOROETHANE				No Criteria			No Criteria
1,2,3,5tetrachlorobenzene				No Criteria			No Criteria
1,1,1,2TETRACHLOROETHANE	630206			No Criteria			No Criteria
2,3,4,6TETRACHLOROPHENOL	58902			No Criteria			No Criteria
2,3,5,6TETRACHLOROPHENOL				No Criteria			No Criteria
2,4,5TRICHLOROPHENOL	95954			No Criteria			No Criteria
2,4,6TRINITROPHENOL	88062			No Criteria			No Criteria
XYLENE	1330207			No Criteria			No Criteria

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: South Kingstown WWTF 2017 RIPDES PERMIT #: RI0100374

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
PRIORITY POLLUTANTS			
TOXIC METALS AND CYANIDE			
ANTIMONY	7440360	No Criteria	60416.00
ARSENIC, TOTAL	7440382	4416.00	132.16
ASBESTOS	1332214	No Criteria	No Criteria
BERYLLIUM	7440417	No Criteria	No Criteria
CADMIUM, TOTAL	7440439	2575.45	835.73
CHROMIUM III, TOTAL	16065831	No Criteria	No Criteria
CHROMIUM VI, TOTAL	18540299	70896.27	4753.27
COPPER, TOTAL	7440508	370.12	352.58
CYANIDE	57125	64.00	64.00
LEAD, TOTAL	7439921	14132.49	804.04
MERCURY, TOTAL	7439976	135.53	14.16
NICKEL, TOTAL	7440020	4783.84	781.90
SELENIUM, TOTAL	7782492	18597.19	6715.83
SILVER, TOTAL	7440224	143.06	143.06
THALLIUM	7440280	No Criteria	44.37
ZINC, TOTAL	7440666	6088.79	6088.79
VOLATILE ORGANIC COMPOUNDS			
ACROLEIN	107028	No Criteria	27376.00
ACRYLONITRILE	107131	No Criteria	236.00
BENZENE	71432	No Criteria	48144.00
BROMOFORM	75252	No Criteria	132160.00
CARBON TETRACHLORIDE	56235	No Criteria	1510.40
CHLOROBENZENE	108907	No Criteria	151040.00
CHLORODIBROMOMETHANE	124481	No Criteria	12272.00
CHLOROFORM	67663	No Criteria	443680.00
DICHLOROBROMOMETHANE	75274	No Criteria	16048.00
1,2DICHLOROETHANE	107062	No Criteria	34928.00
1,1DICHLOROETHYLENE	75354	No Criteria	670240.00
1,2DICHLOROPROPANE	78875	No Criteria	14160.00
1,3DICHLOROPROPYLENE	542756	No Criteria	1982.40
ETHYLBENZENE	100414	No Criteria	198240.00
BROMOMETHANE (methyl bromide)	74839	No Criteria	141600.00
CHLOROMETHANE (methyl chloride)	74873	No Criteria	No Criteria
METHYLENE CHLORIDE	75092	No Criteria	556960.00
1,1,2,2TETRACHLOROETHANE	79345	No Criteria	3776.00
TETRACHLOROETHYLENE	127184	No Criteria	3115.20
TOLUENE	108883	No Criteria	1416000.00
1,2TRANSDICHLOROETHYLENE	156605	No Criteria	944000.00
1,1,1TRICHLOROETHANE	71556	No Criteria	No Criteria
1,1,2TRICHLOROETHANE	79005	No Criteria	15104.00
TRICHLOROETHYLENE	79016	No Criteria	28320.00
VINYL CHLORIDE	75014	No Criteria	226.56
ACID ORGANIC COMPOUNDS			
2CHLOROPHENOL	95578	No Criteria	14160.00
2,4DICHLOROPHENOL	120832	No Criteria	27376.00
2,4DIMETHYLPHENOL	105679	No Criteria	80240.00
4,6DINITRO2METHYL PHENOL	534521	No Criteria	26432.00
2,4DINITROPHENOL	51285	No Criteria	500320.00
4NITROPHENOL	88755	No Criteria	No Criteria
PENTACHLOROPHENOL	87865	832.00	745.76
PHENOL	108952	No Criteria	160480000.00
2,4,6TRICHLOROPHENOL	88062	No Criteria	2265.60
BASE NEUTRAL COMPUNDS			
ACENAPHTHENE	83329	No Criteria	93456.00
ANTHRACENE	120127	No Criteria	3776000.00
BENZIDINE	92875	No Criteria	0.19
PAHs		No Criteria	16.99
BIS(2CHLOROETHYL)ETHER	111444	No Criteria	500.32
BIS(2CHLOROISOPROPYL)ETHER	108601	No Criteria	6136000.00
BIS(2ETHYLHEXYL)PHTHALATE	117817	No Criteria	2076.80
BUTYL BENZYL PHTHALATE	85687	No Criteria	179360.00
2CHLORONAPHTHALENE	91587	No Criteria	151040.00
1,2DICHLOROBENZENE	95501	No Criteria	122720.00
1,3DICHLOROBENZENE	541731	No Criteria	90624.00
1,4DICHLOROBENZENE	106467	No Criteria	17936.00
3,3DICHLOROBENZIDENE	91941	No Criteria	26.43
DIETHYL PHTHALATE	84662	No Criteria	4153600.00
DIMETHYL PHTHALATE	131113	No Criteria	103840000.00
DI-n-BUTYL PHTHALATE	84742	No Criteria	424800.00
2,4DINITROTOLUENE	121142	No Criteria	3209.60
1,2DIPHENYLHYDRAZINE	122667	No Criteria	188.80
FLUORANTHENE	206440	No Criteria	13216.00

CALCULATION OF WATER QUALITY BASED SALTWATER DISCHARGE LIMITS

FACILITY NAME: South Kingstown WWTF 2017 RIPDES PERMIT #: RI0100374

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
FLUORENE	86737	No Criteria	500320.00
HEXACHLOROBENZENE	118741	No Criteria	0.27
HEXACHLOROBUTADIENE	87683	No Criteria	16992.00
HEXACHLOROCYCLOPENTADIENE	77474	No Criteria	103840.00
HEXACHLOROETHANE	67721	No Criteria	3115.20
ISOPHORONE	78591	No Criteria	906240.00
NAPHTHALENE	91203	No Criteria	No Criteria
NITROBENZENE	98953	No Criteria	65136.00
N-NITROSODIMETHYLAMINE	62759	No Criteria	2832.00
N-NITROSODI-N-PROPYLAMINE	621647	No Criteria	481.44
N-NITROSODIPHENYLAMINE	86306	No Criteria	5664.00
PYRENE	129000	No Criteria	377600.00
1,2,4trichlorobenzene	120821	No Criteria	6608.00
PESTICIDES/PCBs			
ALDRIN	309002	83.20	0.05
Alpha BHC	319846	No Criteria	4.63
Beta BHC	319857	No Criteria	16.05
Gamma BHC (Lindane)	58899	10.24	10.24
CHLORDANE	57749	5.76	0.38
4,4DDT	50293	8.32	0.09
4,4DDE	72559	No Criteria	0.21
4,4DDD	72548	No Criteria	0.29
DIELDRIN	60571	45.44	0.05
ENDOSULFAN (alpha)	959988	2.18	0.82
ENDOSULFAN (beta)	33213659	2.18	0.82
ENDOSULFAN (sulfate)	1031078	No Criteria	8401.60
ENDRIN	72208	2.37	0.22
ENDRIN ALDEHYDE	7421934	No Criteria	28.32
HEPTACHLOR	76448	3.39	0.07
HEPTACHLOR EPOXIDE	1024573	3.39	0.04
POLYCHLORINATED BIPHENYLS3	1336363	No Criteria	0.06
2,3,7,8TCDD (Dioxin)	1746016	No Criteria	0.00
TOXAPHENE	8001352	13.44	0.02
TRIBUTYLTIN		26.88	0.70

CHEMICAL NAME	CAS#	DAILY MAX LIMIT (ug/L)	MONTHLY AVE LIMIT (ug/L)
NON PRIORITY POLLUTANTS			
OTHER SUBSTANCES			
ALUMINUM, TOTAL	7429905	No Criteria	No Criteria
AMMONIA (as N), WINTER (NOV-APR	7664417	457689.60	100875.84
AMMONIA (as N), SUMMER (MAY-OC	7664417	384038.40	85356.48
4BROMOPHENYL PHENYL ETHER		No Criteria	No Criteria
CHLORIDE	16887006	No Criteria	No Criteria
CHLORINE	7782505	1040.00	885.00
4CHLORO2METHYLPHENOL		No Criteria	No Criteria
1CHLORONAPHTHALENE		No Criteria	No Criteria
4CHLOROPHENOL	106489	No Criteria	No Criteria
2,4DICHLORO6METHYLPHENOL		No Criteria	No Criteria
1,1DICHLOROPROPANE		No Criteria	No Criteria
1,3DICHLOROPROPANE	142289	No Criteria	No Criteria
2,3DINITROTOLUENE		No Criteria	No Criteria
2,4DINITRO6METHYL PHENOL		No Criteria	No Criteria
IRON	7439896	No Criteria	No Criteria
pentachlorobenzene	608935	No Criteria	No Criteria
PENTACHLOROETHANE		No Criteria	No Criteria
1,2,3,5tetrachlorobenzene		No Criteria	No Criteria
1,1,1,2TETRACHLOROETHANE	630206	No Criteria	No Criteria
2,3,4,6TETRACHLOROPHENOL	58902	No Criteria	No Criteria
2,3,5,6TETRACHLOROPHENOL		No Criteria	No Criteria
2,4,5TRICHLOROPHENOL	95954	No Criteria	No Criteria
2,4,6TRINITROPHENOL	88062	No Criteria	No Criteria
XYLENE	1330207	No Criteria	No Criteria

APPENDIX E

METAL FINISHING LIMITS

the final effluent, if the plant limitations are adjusted based on the dilution ratio of the cyanide waste stream flow to the effluent flow.

(Approved by the Office of Management and Budget under control number 2040–0074)

[48 FR 32485, July 15, 1983; 48 FR 43682, Sept. 26, 1983, as amended at 49 FR 34823, Sept. 4, 1984]

§ 433.13 Effluent limitations representing the degree of effluent reduction attainable by applying the best practicable control technology currently available (BPT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by applying the best practicable control technology currently available (BPT):

BPT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.69	0.26
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	
Oil & Grease	52	26
TSS	60	31
pH	(1)	(1)

[1] Within 6.0 to 9.0.

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

§ 433.14 Effluent limitations representing the degree of effluent reduction attainable by applying the best available technology economically achievable (BAT).

(a) Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this subpart must achieve the following effluent limitations representing the degree of effluent reduction attainable by applying the best available technology economically achievable (BAT):

BAT EFFLUENT LIMITATIONS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.69	0.26
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.65
TTO	2.13	

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and the pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

§ 433.15 Pretreatment standards for existing sources (PSES).

(a) Except as provided in 40 CFR 403.7 and 403.13, any existing source subject

to this subpart that introduces pollutants into a publicly owned treatment works must comply with 40 CFR part 403 and achieve the following pretreatment standards for existing sources (PSES):

PSES FOR ALL PLANTS EXCEPT JOB SHOPS AND INDEPENDENT PRINTED CIRCUIT BOARD MANUFACTURERS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.69	0.26
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.85
TTO	2.13	

(b) Alternatively, for industrial facilities with cyanide treatment, upon agreement between a source subject to those limits and the pollution control authority. The following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user introducing wastewater pollutants into a publicly owned treatment works under the provisions of this subpart shall augment the use of process wastewater as a partial or total substitute for adequate treatment to achieve compliance with this standard.

(d) An existing source submitting a certification in lieu of monitoring pursuant to § 433.12 (a) and (b) of this regulation must implement the toxic organic management plan approved by the control authority.

(e) An existing source subject to this subpart shall comply with a daily maximum pretreatment standard for TTO of 4.57 mg/l.

(f) Compliance with the provisions of paragraph (c), (d), and (e) of this section shall be achieved as soon as possible, but not later than June 30, 1984, however metal finishing facilities which are also covered by part 420 (iron and steel) need not comply before July 10, 1985. Compliance with the provisions of paragraphs (a) and (b) of this section shall be achieved as soon as possible, but not later than February 15, 1986.

[48 FR 32485, July 15, 1983, as amended at 48 FR 41410, Sept. 15, 1983; 48 FR 43682, Sept. 26, 1983]

§ 433.16 New source performance standards (NSPS).

(a) Any new source subject to this subpart must achieve the following performance standards:

NSPS

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cadmium (T)	0.11	0.07
Chromium (T)	2.77	1.71
Copper (T)	3.38	2.07
Lead (T)	0.69	0.43
Nickel (T)	3.98	2.38
Silver (T)	0.43	0.24
Zinc (T)	2.61	1.48
Cyanide (T)	1.20	0.85
TTO	2.13	
Oil and Grease	52	26
TSS	60	31
pH	(1)	(1)

[1] Within 6.0 to 9.0.

(b) Alternatively, for industrial facilities with cyanide treatment, and upon agreement between a source subject to those limits and ths pollution control authority, the following amenable cyanide limit may apply in place of the total cyanide limit specified in paragraph (a) of this section:

Pollutant or pollutant property	Maximum for any 1 day	Monthly average shall not exceed
	Milligrams per liter (mg/l)	
Cyanide (A)	0.86	0.32

(c) No user subject to the provisions of this subpart shall augment the use of process wastewater or otherwise dilute the wastewater as a partial or total substitute for adequate treatment to achieve compliance with this limitation.

[48 FR 32485, July 15, 1983; 48 FR 43682, Sept. 26, 1983]

APPENDIX F

BOD & TSS ANALYSIS (2015 – 2019)

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
1/1/2015	2.37	206.3	4070.8	5.5	97	187.0	9.0	95
1/2/2015	2.28							
1/3/2015	2.21							
1/4/2015	2.32	192.3	3719.2	9.4	95	197.0	9.0	95
1/5/2015	2.99							
1/6/2015	2.73	165.9	3781.4	8.5	95	178.0	9.0	95
1/7/2015	2.56							
1/8/2015	2.51	220.8	4612.9	9.7	96	170.0	8.0	95
1/9/2015	2.49							
1/10/2015	2.14							
1/11/2015	2.32	201.3	3888.2	8.4	96	136.0	9.0	93
1/12/2015	2.27							
1/13/2015	2.50	185.2	3866.1	7.1	96	175.0	8.0	95
1/14/2015	3.33							
1/15/2015	2.32	187.6	3633.0	9.4	95	174.0	10.0	94
1/16/2015	2.25		0.0					
1/17/2015	2.24		0.0					
1/18/2015	2.23	225.8	4205.1	5.9	97	182.0	7.0	96
1/19/2015	2.30							
1/20/2015	2.42	229.5	4637.7	10.4	95	308.0	12.0	96
1/21/2015	2.45							
1/22/2015	2.47	224.3	4622.4	10.2	95	171.0	4.0	98
1/23/2015	2.45							
1/24/2015	2.42							
1/25/2015	3.00	234.3	5864.1	12.6	95	123.0	6.0	95
1/26/2015	2.74		0.0					
1/27/2015	2.75	239.6	5493.2	9.7	96	123.0	5.0	96
1/28/2015	2.44		0.0					
1/29/2015	2.54	242.3	5124.7	13.3	95	132.0	10.0	92
1/30/2015	2.54							
1/31/2015	2.59							
2/1/2015	2.50	223.3	4646.5	13.3	94	118.0	3.0	97
2/2/2015	2.42							
2/3/2015	2.45	241.3	4938.5	7.2	97	200.0	6.0	97
2/4/2015	2.47							
2/5/2015	2.54	337.3	7153.7	7.7	98	197.0	13.0	93
2/6/2015	2.46		0.0					
2/7/2015	2.47		0.0					
2/8/2015	2.16	248.9	4479.6	11.2	96	128.0	10.0	92
2/9/2015	2.34							
2/10/2015	2.29	255.5	4877.6	2.7	99	151.0	5.0	97
2/11/2015	2.36							
2/12/2015	2.31	424.2	8179.5	8.8	98	440.0	2.0	100
2/13/2015	2.34		0.0					
2/14/2015	2.26		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
2/15/2015	2.18	219.5	3996.3	6.3	97	109.0	9.0	92
2/16/2015	2.09		0.0					
2/17/2015	2.26	279.3	5257.4	9.4	97	145.0	8.0	94
2/18/2015	2.26							
2/19/2015	2.35	355.5	6973.4	5.4	98	203.0	8.0	96
2/20/2015	2.28							
2/21/2015	2.31							
2/22/2015	2.28	741.0	14102.6	9.8	99	231.0	13.0	94
2/23/2015	2.82							
2/24/2015	2.42	849.0	17163.5	4.9	99	255.0	3.0	99
2/25/2015	2.43		0.0					
2/26/2015	2.42	712.5	14362.4	9.1	99	765.0	11.0	99
2/27/2015	2.33							
2/28/2015	2.34							
3/1/2015	2.27	306.5	5812.8	8.7	97	586.0	13.0	98
3/2/2015	2.24							
3/3/2015	2.34	963.0	18769.4	7.7	99	417.0	3.0	99
3/4/2015	2.33							
3/5/2015	3.35	758.3	21186.1	7.3	99	541.0	7.0	99
3/6/2015	2.77							
3/7/2015	2.66							
3/8/2015	2.66	960.0	21265.0	11.4	99	232.0	10.0	96
3/9/2015	2.66							
3/10/2015	2.86	1080.0	25751.6	23.5	98	107.0	4.0	96
3/11/2015	3.11							
3/12/2015	4.15	374.9	12981.9	11.3	97	446.0	7.0	98
3/13/2015	3.84							
3/14/2015	3.35							
3/15/2015	4.13	512.0	17622.6	7.6	99	767.0	10.0	99
3/16/2015	4.73							
3/17/2015	4.16	475.3	16482.3	6.8	99	515.0	3.0	99
3/18/2015	4.07							
3/19/2015	3.82	840.5	26805.4	4.2	100	1978.0	5.0	100
3/20/2015	3.41							
3/21/2015	3.22							
3/22/2015	3.28	260.1	7110.7	10.4	96	927.0	3.0	100
3/23/2015	3.27		0.0					
3/24/2015	3.38	524.3	14779.6	9.6	98	456.0	3.0	99
3/25/2015	3.25		0.0					
3/26/2015	3.17	1584.0	41864.3	17.4	99	2646.0	1.0	100
3/27/2015	3.67		0.0					
3/28/2015	4.11		0.0					
3/29/2015	4.11	276.6	9488.0	7.3	97	208.0	2.0	99
3/30/2015	3.95		0.0					
3/31/2015	3.85	347.0	11147.6	9.1	97	311.0	3.0	99
4/1/2015	3.67							

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
4/2/2015	3.54	496.9	14662.0	11.3	98	333.0	6.0	98
4/3/2015	3.40							
4/4/2015	3.37							
4/5/2015	3.20	302.3	8060.2	15.1	95	433.0	12.0	97
4/6/2015	3.02		0.0					
4/7/2015	3.18	441.6	11719.1	15.4	97	347.0	8.0	98
4/8/2015	3.16		0.0					
4/9/2015	3.13	875.0	22863.1	20.7	98	860.0	15.0	98
4/10/2015	3.14		0.0					
4/11/2015	3.14		0.0					
4/12/2015	3.12	897.0	23303.3	18.4	98	1667.0	9.0	99
4/13/2015	2.92		0.0					
4/14/2015	2.97	396.5	9834.5	15.4	96	353.0	5.0	99
4/15/2015	2.93		0.0					
4/16/2015	2.87	592.5	14186.9	31.3	95	303.0	4.0	99
4/17/2015	2.81		0.0					
4/18/2015	2.97		0.0					
4/19/2015	2.79	342.9	7981.7	18.9	94	712.0	4.0	99
4/20/2015	2.66							
4/21/2015	2.87	327.7	7835.6	21.3	94	105.0	3.0	97
4/22/2015	2.93							
4/23/2015	2.81	1551.0	36400.0	20.1	99	2164.0	4.0	100
4/24/2015	2.77							
4/25/2015	2.72							
4/26/2015	2.63	1224.0	26816.8	20.6	98	2160.0	8.0	100
4/27/2015	2.64							
4/28/2015	2.65	339.4	7492.6	20.4	94	405.0	5.0	99
4/29/2015	2.69							
4/30/2015	2.59	252.1	5435.0	24.9	90	196.0	3.0	98
5/1/2015	2.53							
5/2/2015	2.47							
5/3/2015	2.44	316.0	6430.5	25.1	92	200.0	2.0	99
5/4/2015	2.43							
5/5/2015	2.38	249.1	4942.4	24.2	90	298.0	9.0	97
5/6/2015	2.42							
5/7/2015	2.38	262.1	5206.8	21.0	92	297.0	24.0	92
5/8/2015	2.37							
5/9/2015	2.37							
5/10/2015	2.27	246.9	4678.4	25.5	90	222.0	4.0	98
5/11/2015	2.21							
5/12/2015	2.46	260.7	5353.0	23.9	91	352.0	4.0	99
5/13/2015	2.20		0.0					
5/14/2015	2.12	252.1	4448.9	15.4	94	238.0	6.0	97
5/15/2015	2.10							
5/16/2015	2.08							
5/17/2015	2.08	257.8	4474.3	21.8	92	209.0	9.0	96

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
5/18/2015	2.09							
5/19/2015	2.06	283.6	4870.0	20.4	93	279.0	2.0	99
5/20/2015	2.15		0.0					
5/21/2015	2.04	259.3	4420.3	13.5	95	241.0	6.0	98
5/22/2015	2.21							
5/23/2015	2.01							
5/24/2015	1.99	273.7	4549.3	13.7	95	192.0	2.0	99
5/25/2015	1.97							
5/26/2015	2.01	308.5	5161.2	16.3	95	303.0	4.0	99
5/27/2015	1.98							
5/28/2015	1.99	266.3	4419.7	12.7	95	299	2.0	99
5/29/2015	1.98							
5/30/2015	1.95							
5/31/2015	1.97	305.0	4998.4	46.3	85	288.0	3.0	99
6/1/2015	1.96							
6/2/2015	2.09	263.3	4585.1	29.0	89	325.0	10.0	97
6/3/2015	2.13		0.0					
6/4/2015	1.99	263.2	4357.2	25.6	90	154.0	1.0	99
6/5/2015	1.99		0.0					
6/6/2015	2.00		0.0					
6/7/2015	1.99	296.5	4925.8	29.5	90	233.0	4.0	98
6/8/2015	1.96							
6/9/2015	2.00	323.6	5394.9	31.5	90	351.0	4.0	99
6/10/2015	2.02							
6/11/2015	1.98	294.8	4860.7	29.9	90	340.0	1.0	100
6/12/2015	1.98							
6/13/2015	1.98							
6/14/2015	1.95	286.4	4655.3	17.1	94	292.0	9.0	97
6/15/2015	1.92		0.0					
6/16/2015	2.37	261.7	5161.8	33.0	87	327.0	9.0	97
6/17/2015	2.61		0.0					
6/18/2015	2.18	269.8	4900.8	36.1	87	201.0	8.0	96
6/19/2015	2.03							
6/20/2015	2.03							
6/21/2015	1.99	278.1	4615.5	25.4	91	243.0	6.0	98
6/22/2015	2.26							
6/23/2015	2.13	283.2	5035.5	27.5	90	322.0	6.0	98
6/24/2015	2.13							
6/25/2015	2.06	302.7	5192.9	17.5	94	324.0	4.0	99
6/26/2015	2.01							
6/27/2015	1.96							
6/28/2015	2.01	293.9	4921.9	25.8	91	271	3.0	99
6/29/2015	2.58							
6/30/2015	2.28	276.3	5263.1	25.4	91	294	3.0	99
7/1/2015	2.73							
7/2/2015	2.43	203.6	4121.1	20.2	90	247.0	2.0	99

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
7/3/2015	2.28							
7/4/2015	2.25							
7/5/2015	2.34	252.5	4925.6	17.8	93	229.0	9.0	96
7/6/2015	2.33		0.0					
7/7/2015	2.39	284.8	5683.9	24.5	91	251.0	3.0	99
7/8/2015	2.32							
7/9/2015	2.25	246.3	4615.7	16.9	93	313.0	4.0	99
7/10/2015	2.16							
7/11/2015	2.16							
7/12/2015	2.53	316.3	6674.0	25.4	92	311.0	10.0	97
7/13/2015	2.35							
7/14/2015	2.30	293.8	5645.5	18.5	94	320.0	12.0	96
7/15/2015	2.25							
7/16/2015	2.19	265.5	4840.4	18.8	93	281.0	11.0	96
7/17/2015	2.56							
7/18/2015	2.41							
7/19/2015	2.33	286.1	5547.6	13.8	95	263.0	2.0	99
7/20/2015	2.27							
7/21/2015	2.13	294.9	5236.2	16.3	94	289.0	6.0	98
7/22/2015	2.05							
7/23/2015	2.05	279.6	4773.3	11.6	96	275.0	9.0	97
7/24/2015	2.15							
7/25/2015	1.88							
7/26/2015	2.02	276.3	4659.4	13.8	95	272.0	3.0	99
7/27/2015	2.06							
7/28/2015	1.97	275.1	4526.7	15.2	94	314	8.0	97
7/29/2015	2.30							
7/30/2015	2.17	262.8	4756.1	10.1	96	250	7.0	97
7/31/2015	2.16							
8/1/2015	2.22							
8/2/2015	2.21	266.3	4901.6	9.5	96	255.0	7.0	97
8/3/2015	2.08							
8/4/2015	2.11	302.6	5325.0	12.0	96	438.0	9.0	98
8/5/2015	2.20							
8/6/2015	2.02	272.6	4594.7	9.2	97	295.0	2.0	99
8/7/2015	2.00							
8/8/2015	2.21							
8/9/2015	1.98	297.8	4920.1	14.5	95	265.0	4.0	98
8/10/2015	1.99							
8/11/2015	1.94	310.6	5028.0	20.8	93	348.0	5.0	99
8/12/2015	2.74							
8/13/2015	2.33	228.3	4432.6	8.9	96	218.0	9.0	96
8/14/2015	2.19							
8/15/2015	2.18							
8/16/2015	2.17	287.8	5206.1	9.8	97	275.0	13.0	95
8/17/2015	2.13							

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
8/18/2015	2.13	268.2	4757.6	10.1	96	317.0	4.0	99
8/19/2015	2.29							
8/20/2015	2.07	246.8	4254.5	8.4	97	269.0	6.0	98
8/21/2015	2.06							
8/22/2015	2.08							
8/23/2015	2.04	262.3	4464.9	9.5	96	375.0	6.0	98
8/24/2015	2.04							
8/25/2015	2.10	285.1	4988.5	9.9	97	366.0	3.0	99
8/26/2015	2.00							
8/27/2015	1.95	255.4	4147.2	13.4	95	306.0	7.0	98
8/28/2015	2.14							
8/29/2015	1.87							
8/30/2015	1.91	273.7	4357.6	13.7	95	248	2.0	99
8/31/2015	1.94							
9/1/2015	1.98	271.5	4485.6	11.2	96	290.0	10.0	97
9/2/2015	1.88							
9/3/2015	1.84	246.2	3776.0	12.1	95	241.0	8.0	97
9/4/2015	1.89							
9/5/2015	1.88							
9/6/2015	1.96	300.2	4894.7	18.8	94	365.0	3.0	99
9/7/2015	1.96							
9/8/2015	2.09	303.6	5297.0	18.8	94	331.0	3.0	99
9/9/2015	2.14		0.0					
9/10/2015	1.80	317.6	4770.5	26.0	92	352.0	3.0	99
9/11/2015	2.93							
9/12/2015	2.46							
9/13/2015	2.27	268.3	5074.9	12.2	95	231.0	3.0	99
9/14/2015	2.32							
9/15/2015	2.27	273.3	5164.9	16.7	94	301.0	4.0	99
9/16/2015	2.20							
9/17/2015	2.19	278.1	5088.7	20.6	93	304.0	2.0	99
9/18/2015	2.28							
9/19/2015	2.17							
9/20/2015	2.12	288.4	5099.1	9.1	97	387.0	8.0	98
9/21/2015	2.09							
9/22/2015	2.14	311.8	5557.1	9.9	97	475.0	5.0	99
9/23/2015	2.10							
9/24/2015	2.09	305.6	5324.2	13.2	96	298.0	5.0	98
9/25/2015	2.08							
9/26/2015	2.06							
9/27/2015	1.96	280.5	4573.5	11.9	96	278.0	1.0	100
9/28/2015	1.97							
9/29/2015	2.11	263.2	4622.9	13.4	95	279.0	4.0	99
9/30/2015	2.15		0.0					
10/1/2015	2.34	274.8	5367.5	17.0	94	274.0	2.0	99
10/2/2015	2.25							

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
10/3/2015	2.88							
10/4/2015	2.42	231.9	4686.2	10.3	96	212.0	9.0	96
10/5/2015	2.30							
10/6/2015	2.34	248.3	4854.0	12.7	95	275.0	12.0	96
10/7/2015	2.50							
10/8/2015	2.49	263.5	5465.4	9.1	97	255.0	4.0	98
10/9/2015	2.24							
10/10/2015	2.33							
10/11/2015	2.12	249.2	4404.0	8.4	97	232.0	17.0	93
10/12/2015	2.08							
10/13/2015	2.25	299.4	5608.3	15.4	95	358.0	5.0	99
10/14/2015	2.36							
10/15/2015	2.22	286.7	5301.0	4.0	99	300.0	5.0	98
10/16/2015	2.20							
10/17/2015	2.18							
10/18/2015	2.11	312.6	5500.9	6.3	98	271.0	7.0	97
10/19/2015	2.11							
10/20/2015	2.16	271.8	4903.1	6.9	97	281.0	4.0	99
10/21/2015	2.14							
10/22/2015	2.11	270.1	4750.8	14.2	95	283.0	6.0	98
10/23/2015	2.11							
10/24/2015	2.02							
10/25/2015	1.94	273.1	4423.2	12.1	96	256.0	14.0	95
10/26/2015	2.02							
10/27/2015	2.05	357.1	6099.4	16.2	95	341.0	13.0	96
10/28/2015	2.06							
10/29/2015	2.23	299.3	5559.0	36.6	88	302.0	10.0	97
10/30/2015	2.33							
10/31/2015	2.08							
11/1/2015	2.01	363.4	6091.8	13.8	96	436.0	11.0	97
11/2/2015	2.02							
11/3/2015	2.13	311.2	5536.0	20.7	93	335.0	12.0	96
11/4/2015	2.10							
11/5/2015	2.10	287.6	5034.6	21.0	93	289.0	2.0	99
11/6/2015	2.14							
11/7/2015	2.09							
11/8/2015	2.00	265.4	4418.0	15.9	94	237.0	17.0	93
11/9/2015	1.99							
11/10/2015	2.04	373.1	6338.4	18.2	95	428.0	11.0	97
11/11/2015	2.17							
11/12/2015	2.11	288.0	5068.1	14.0	95	307.0	8.0	97
11/13/2015	2.15							
11/14/2015	2.12							
11/15/2015	1.99	291.3	4837.0	13.9	95	253.0	16.0	94
11/16/2015	2.00							
11/17/2015	2.08	315.8	5483.5	20.9	93	317.0	11.0	97

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
11/18/2015	2.05		0.0					
11/19/2015	2.08	354.8	6154.8	21.6	94	315.0	1.0	100
11/20/2015	2.09							
11/21/2015	2.35							
11/22/2015	2.08	237.8	4123.2	12.4	95	130.0	13.0	90
11/23/2015	2.35		0.0					
11/24/2015	2.40	230.8	4617.8	12.6	95	236.0	13.0	94
11/25/2015	2.25		0.0					
11/26/2015	2.06	246.6	4232.6	12.9	95	215.0	9.0	96
11/27/2015	1.85		0.0					
11/28/2015	1.86		0.0					
11/29/2015	1.89	297.3	4691.2	13.5	95	283.0	10.0	96
11/30/2015	2.00		0.0					
12/1/2015	2.19	265.2	4850.4	12.1	95	279.0	14.0	95
12/2/2015	2.29		0.0					
12/3/2015	2.23	328.2	6114.9	14.4	96	325.0	1.0	100
12/4/2015	2.25		0.0					
12/5/2015	2.14		0.0					
12/6/2015	2.12	274.4	4840.2	9.4	97	206.0	9.0	96
12/7/2015	2.14		0.0					
12/8/2015	2.18	348.3	6332.5	11.3	97	275.0	13.0	95
12/9/2015	2.16		0.0					
12/10/2015	2.14	299.5	5347.9	10.6	96	270.0	6.0	98
12/11/2015	2.17		0.0					
12/12/2015	2.10		0.0					
12/13/2015	2.05	246.1	4211.7	10.1	96	252.0	7.0	97
12/14/2015	2.04		0.0					
12/15/2015	2.32	331.7	6406.9	11.7	96	355.0	2.0	99
12/16/2015	2.38		0.0					
12/17/2015	2.19	269.8	4921.0	17.8	93	236.0	14.0	94
12/18/2015	2.81		0.0					
12/19/2015	2.67		0.0					
12/20/2015	2.38	215.7	4283.3	9.4	96	168.0	7.0	96
12/21/2015	2.23		0.0					
12/22/2015	2.20	225.0	4122.7	10.7	95	198.0	7.0	96
12/23/2015	2.22		0.0					
12/24/2015	2.86	263.5	6289.5	12.5	95	346.0	11.0	97
12/25/2015	3.89		0.0					
12/26/2015	2.71		0.0					
12/27/2015	2.62	204.0	4455.9	16.1	92	152.0	9.0	94
12/28/2015	2.68		0.0					
12/29/2015	2.50	190.3	3972.5	14.1	93	162.0	18.0	89
12/30/2015	2.92		0.0					
12/31/2015	2.72	174.9	3967.6	13.3	92	153.0	11.0	93
1/1/2016	2.84		0.0					
1/2/2016	2.56		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
1/3/2016	2.53	204.0	4297.6	20.4	90	151.0	18.0	88
1/4/2016	2.49		0.0					
1/5/2016	2.42	202.3	4088.0	20.1	90	198.0	15.0	92
1/6/2016	2.39		0.0					
1/7/2016	2.36	190.8	3760.2	22.5	88	230.0	21.0	91
1/8/2016	2.34		0.0					
1/9/2016	2.28		0.0					
1/10/2016	2.25	257.8	4846.2	20.2	92	280.0	11.0	96
1/11/2016	2.95		0.0					
1/12/2016	2.67	176.7	3940.6	9.5	95	147.0	8.0	95
1/13/2016	2.58		0.0					
1/14/2016	2.52	172.9	3639.6	12.2	93	157.0	19.0	88
1/15/2016	2.53		0.0					
1/16/2016	2.43		0.0					
1/17/2016	3.95	179.3	5909.7	7.0	96	147.0	8.0	95
1/18/2016	2.73		0.0					
1/19/2016	2.93	207.3	5058.7	6.8	97	203.0	12.0	94
1/20/2016	2.98		0.0					
1/21/2016	2.51	194.2	4068.5	5.6	97	219.0	5.0	98
1/22/2016	2.44		0.0					
1/23/2016	2.42		0.0					
1/24/2016	2.38	185.3	3684.2	5.1	97	208.0	5.0	98
1/25/2016	2.47		0.0					
1/26/2016	2.56	227.4	4857.0	5.2	98	250.0	5.0	98
1/27/2016	2.73		0.0					
1/28/2016	2.75	232.7	5329.2	6.4	97	218	11.0	95
1/29/2016	2.70		0.0					
1/30/2016	2.69		0.0					
1/31/2016	2.59	224.4	4850.9	5.8	97	187.0	6.0	97
2/1/2016	2.60		0.0					
2/2/2016	2.63	277.6	6098.2	7.1	97	276.0	7.0	97
2/3/2016	2.54		0.0					
2/4/2016	2.82	236.8	5577.2	10.9	95	217.0	4.0	98
2/5/2016	3.10		0.0					
2/6/2016	4.01		0.0					
2/7/2016	3.59	174.8	5238.0	9.3	95	149.0	16.0	89
2/8/2016	3.48		0.0					
2/9/2016	3.54	188.1	5551.8	9.2	95	161.0	10.0	94
2/10/2016	3.54		0.0					
2/11/2016	3.40	190.7	5402.7	7.7	96	146.0	9.0	94
2/12/2016	3.30		0.0					
2/13/2016	3.10		0.0					
2/14/2016	3.01	203.2	5095.9	9.2	95	150.0	15.0	90
2/15/2016	3.04		0.0					
2/16/2016	3.18	276.3	7318.6	14.1	95	262.0	13.0	95
2/17/2016	4.22		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
2/18/2016	3.66	194.6	5935.2	10.9	94	182.0	11.0	94
2/19/2016	3.47		0.0					
2/20/2016	3.37		0.0					
2/21/2016	3.25	189.8	5142.9	11.3	94	190.0	6.0	97
2/22/2016	3.22		0.0					
2/23/2016	3.20	207.4	5542.0	8.4	96	212.0	10.0	95
2/24/2016	3.15		0.0					
2/25/2016	3.51	201.7	5902.8	11.6	94	156.0	7.0	96
2/26/2016	3.94		0.0					
2/27/2016	3.45		0.0					
2/28/2016	3.21	182.2	4874.7	7.4	96	157.0	12.0	92
2/29/2016	3.15		0.0					
3/1/2016	3.19	240.9	6407.0	8.6	96	261.0	4.0	98
3/2/2016	3.04		0.0					
3/3/2016	3.11	211.4	5479.6	10.8	95	280.0	9.0	97
3/4/2016	2.97		0.0					
3/5/2016	2.94		0.0					
3/6/2016	2.86	224.2	5349.6	8.5	96	197.0	10.0	95
3/7/2016	2.88		0.0					
3/8/2016	2.91	217.8	5285.9	13.3	94	206.0	11.0	95
3/9/2016	2.78		0.0					
3/10/2016	2.80	236.1	5509.5	13.2	94	197.0	3.0	98
3/11/2016	2.74		0.0					
3/12/2016	2.72		0.0					
3/13/2016	2.57	229.6	4925.0	8.5	96	196.0	5.0	97
3/14/2016	2.57		0.0					
3/15/2016	2.87	215.6	5166.0	11.6	95	201.0	4.0	98
3/16/2016	4.58		0.0					
3/17/2016	3.67	185.2	5670.1	11.0	94	154.0	5.0	97
3/18/2016	3.47		0.0					
3/19/2016	3.18		0.0					
3/20/2016	2.90	175.6	4251.5	10.1	94	143.0	8.0	94
3/21/2016	2.90		0.0					
3/22/2016	2.76	171.3	3944.5	10.2	94	165.0	17.0	90
3/23/2016	2.71		0.0					
3/24/2016	2.62	208.2	4540.7	13.5	94	189.0	8.0	96
3/25/2016	2.56		0.0					
3/26/2016	2.59		0.0					
3/27/2016	2.51	216.1	4518.3	21.8	90	183.0	18.0	90
3/28/2016	2.49		0.0					
3/29/2016	2.91	261.9	6356.2	25.8	90	245.0	13.0	95
3/30/2016	2.81		0.0					
3/31/2016	2.75	234.4	5377.9	13.8	94	228.0	11.0	95
4/1/2016	2.80		0.0					
4/2/2016	2.77		0.0					
4/3/2016	2.96	202.0	4985.0	15.1	93	195.0	8.0	96

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
4/4/2016	3.24		0.0					
4/5/2016	3.37	197.8	5561.0	12.8	94	224.0	4.0	98
4/6/2016	3.31		0.0					
4/7/2016	3.25	203.8	5518.9	33.2	84	165.0	6.0	96
4/8/2016	4.30		0.0					
4/9/2016	4.08		0.0					
4/10/2016	3.59	153.0	4580.9	9.5	94	169.0	11.0	93
4/11/2016	3.39		0.0					
4/12/2016	3.56	227.1	6742.7	15.1	93	226.0	3.0	99
4/13/2016	3.53		0.0					
4/14/2016	3.34	200.3	5574.5	21.0	90	285.0	4.0	99
4/15/2016	3.23		0.0					
4/16/2016	3.10		0.0					
4/17/2016	2.99	217.8	5429.4	13.4	94	197.0	7.0	96
4/18/2016	2.95		0.0					
4/19/2016	3.00	237.2	5934.7	16.1	93	230.0	6.0	97
4/20/2016	2.89		0.0					
4/21/2016	2.79	233.6	5431.6	28.9	88	206.0	2.0	99
4/22/2016	2.30		0.0					
4/23/2016	2.78		0.0					
4/24/2016	2.73	190.0	4327.5	8.7	95	230.0	4.7	98
4/25/2016	2.71		0.0					
4/26/2016	2.75	247.2	5671.6	11.8	95	258.0	7.3	97
4/27/2016	2.81		0.0					
4/28/2016	2.67	238.9	5325.8	18.4	92	278	6.9	98
4/29/2016	2.63		0.0					
4/30/2016	2.56		0.0					
5/1/2016	2.45	200.0	4086.6	13.0	94	230.0	5.0	98
5/2/2016	2.52		0.0					
5/3/2016	2.57	260.0	5575.0	22.0	92	240.0	7.0	97
5/4/2016	2.69		0.0					
5/5/2016	2.74	140.0	3203.9	8.7	94	200.0	7.0	97
5/6/2016	2.73		0.0					
5/7/2016	2.78		0.0					
5/8/2016	2.63	230.0	5050.6	16.0	93	220.0	6.3	97
5/9/2016	2.58		0.0					
5/10/2016	2.62	220.0	4814.5	22.0	90	270.0	6.0	98
5/11/2016	2.53		0.0					
5/12/2016	2.45	93.0	1901.0	11.0	88	260.0	2.7	99
5/13/2016	2.40		0.0					
5/14/2016	2.38		0.0					
5/15/2016	2.30	220.0	4227.4	16.0	93	230.0	4.3	98
5/16/2016	2.22		0.0					
5/17/2016	2.21	160.0	2953.0	8.6	95	180.0	4.0	98
5/18/2016	2.19		0.0					
5/19/2016	2.20	200.0	3667.9	4.4	98	550.0	4.7	99

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
5/20/2016	2.16		0.0					
5/21/2016	2.17		0.0					
5/22/2016	2.17	310.0	5618.1	6.8	98	520.0	4.7	99
5/23/2016	2.25		0.0					
5/24/2016	2.49	130.0	2700.7	26.0	80	270.0	6.7	98
5/25/2016	2.39		0.0					
5/26/2016	2.17	200.0	3612.9	11.0	95	260.0	7.7	97
5/27/2016	2.04		0.0					
5/28/2016	2.04		0.0					
5/29/2016	2.09	230.0	4009.0	13.0	94	230.0	7.0	97
5/30/2016	2.06		0.0					
5/31/2016	2.58	310.0	6678.1	20.0	94	532.0	12.0	98
6/1/2016	2.16		0.0					
6/2/2016	2.04	230.0	3920.8	22.0	90	330.0	11.0	97
6/3/2016	2.08		0.0					
6/4/2016	2.13		0.0					
6/5/2016	2.13	240.0	4257.4	14.0	94	270.0	13.0	95
6/6/2016	2.13		0.0					
6/7/2016	2.05	180.0	3077.5	32.0	82	240.0	8.5	96
6/8/2016	1.97		0.0					
6/9/2016	1.95	160.0	2599.4	13.0	92	310.0	12.0	96
6/10/2016	1.97		0.0					
6/11/2016	2.19		0.0					
6/12/2016	2.01	240.0	4017.2	24.0	90	1900.0	13.0	99
6/13/2016	2.06		0.0					
6/14/2016	1.92	460.0	7354.4	26.0	94	260.0	9.0	97
6/15/2016	1.93		0.0					
6/16/2016	1.91	230.0	3667.6	21.0	91	210.0	7.5	96
6/17/2016	1.82		0.0					
6/18/2016	1.82		0.0					
6/19/2016	1.89	220.0	3475.1	21.0	90	240.0	6.0	98
6/20/2016	1.71		0.0					
6/21/2016	1.64	210.0	2870.5	42.0	80	250.0	17.0	93
6/22/2016	1.91		0.0					
6/23/2016	1.92	160.0	2555.4	8.6	95	270.0	11.0	96
6/24/2016	1.89		0.0					
6/25/2016	1.85		0.0					
6/26/2016	1.88	290.0	4549.4	9.0	97	340.0	15.0	96
6/27/2016	1.95		0.0					
6/28/2016	1.97	230.0	3780.8	20.0	91	270.0	19.0	93
6/29/2016	1.98		0.0					
6/30/2016	2.04	290.0	4933.9	18.0	94	420.0	26.0	94
7/1/2016	2.26		0.0					
7/2/2016	2.00		0.0					
7/3/2016	1.94	130.0	2107.7	19.0	85	300.0	22.0	93
7/4/2016	1.93		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
7/5/2016	2.31	380.0	7333.5	30.0	92	380.0	32.0	92
7/6/2016	2.01		0.0					
7/7/2016	2.07	170.0	2927.8	9.7	94	280.0	14.0	95
7/8/2016	2.04		0.0					
7/9/2016	2.00		0.0					
7/10/2016	2.14	320.0	5711.2	11.0	97	320.0	16.0	95
7/11/2016	2.06		0.0					
7/12/2016	1.46	120.0	1464.2	14.0	88	200.0	14.0	93
7/13/2016	2.20		0.0					
7/14/2016	2.05	280.0	4780.2	10.0	96	260.0	14.0	95
7/15/2016	2.02		0.0					
7/16/2016	1.93		0.0					
7/17/2016	1.94	250.0	4049.1	17.0	93	210.0	11.0	95
7/18/2016	1.98		0.0					
7/19/2016	2.09	300.0	5229.2	28.0	91	390.0	6.7	98
7/20/2016	1.86		0.0					
7/21/2016	1.90	120.0	1898.5	12.0	90	410.0	4.0	99
7/22/2016	1.96		0.0					
7/23/2016	1.92		0.0					
7/24/2016	1.85	230.0	3542.9	4.8	98	280.0	7.7	97
7/25/2016	1.92		0.0					
7/26/2016	1.88	170.0	2662.6	17.0	90	300.0	6.0	98
7/27/2016	1.85		0.0					
7/28/2016	1.88	210.0	3297.9	12.0	94	280	8.0	97
7/29/2016	2.08		0.0					
7/30/2016	1.94		0.0					
7/31/2016	1.86	170.0	2641.4	6.2	96	240.0	4.7	98
8/1/2016	1.99		0.0					
8/2/2016	1.96	250.0	4088.7	27.0	89	230.0	7.5	97
8/3/2016	1.85		0.0					
8/4/2016	1.86	220.0	3420.1	9.9	96	360.0	6.7	98
8/5/2016	1.89		0.0					
8/6/2016	1.93		0.0					
8/7/2016	1.84	230.0	3531.4	13.0	94	350.0	4.3	99
8/8/2016	1.83		0.0					
8/9/2016	1.81	200.0	3025.8	17.0	92	280.0	4.5	98
8/10/2016	1.96		0.0					
8/11/2016	1.97	170.0	2790.2	13.2	92	270.0	6.3	98
8/12/2016	1.97		0.0					
8/13/2016	1.95		0.0					
8/14/2016	1.87	180.0	2804.2	12.0	93	270.0	6.0	98
8/15/2016	1.84		0.0					
8/16/2016	1.83	250.0	3817.6	9.9	96	250.0	8.3	97
8/17/2016	1.82		0.0					
8/18/2016	1.78	190.0	2826.9	13.0	93	330.0	5.0	98
8/19/2016	1.68		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
8/20/2016	1.85		0.0					
8/21/2016	1.83	300.0	4588.7	11.0	96	370.0	4.3	99
8/22/2016	1.89		0.0					
8/23/2016	1.75	260.0	3803.4	10.0	96	240.0	5.5	98
8/24/2016	1.74		0.0					
8/25/2016	1.77	90.0	1330.1	15.0	83	260.0	6.0	98
8/26/2016	1.85		0.0					
8/27/2016	1.79		0.0					
8/28/2016	1.79	190.0	2841.2	7.5	96	470	4.3	99
8/29/2016	1.75		0.0					
8/30/2016	1.69	210.0	2961.6	9.2	96	300	4.7	98
8/31/2016	1.81		0.0					
9/1/2016	1.93	130.0	2090.3	13.0	90	350.0	6.0	98
9/2/2016	1.90		0.0					
9/3/2016	1.85		0.0					
9/4/2016	1.87		0.0					
9/5/2016	1.93		0.0					
9/6/2016	2.24	220.0	4115.5	26.0	88	280.0	8.7	97
9/7/2016	2.10	110.0	1923.8	12.0	89	250.0	4.3	98
9/8/2016	2.09	280.0	4873.6	7.8	97	340.0	5.3	98
9/9/2016	2.06		0.0					
9/10/2016	1.98		0.0					
9/11/2016	1.95	170.0	2769.0	11.0	94	280.0	10.0	96
9/12/2016	9.99		0.0					
9/13/2016	1.84	180.0	2762.2	9.6	95	270.0	8.3	97
9/14/2016	2.02		0.0					
9/15/2016	1.88	340.0	5339.4	18.0	95	290.0	2.5	99
9/16/2016	2.13		0.0					
9/17/2016	1.88		0.0					
9/18/2016	1.95	230.0	3748.2	8.0	97	280.0	3.7	99
9/19/2016	2.28		0.0					
9/20/2016	2.11	290.0	5108.1	15.0	95	280.0	4.0	99
9/21/2016	1.99		0.0					
9/22/2016	1.89	250.0	3940.7	11.0	96	300.0	4.0	99
9/23/2016	1.95		0.0					
9/24/2016	1.85		0.0					
9/25/2016	1.83	140.0	2134.4	10.0	93	210.0	10.0	95
9/26/2016	1.96		0.0					
9/27/2016	2.15	250.0	4472.3	17.0	93	320.0	10.0	97
9/28/2016	1.99		0.0					
9/29/2016	1.98	220.0	3640.2	17.0	92	430.0	8.0	98
9/30/2016	2.07		0.0					
10/1/2016	2.19		0.0					
10/2/2016	1.97	190.0	3126.4	5.9	97	300.0	6.0	98
10/3/2016	2.04		0.0					
10/4/2016	2.02	180.0	3032.4	27.0	85	290.0	24.0	92

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
10/5/2016	1.71		0.0					
10/6/2016	1.93	250.0	4028.2	17.0	93	530.0	14.0	97
10/7/2016	1.96		0.0					
10/8/2016	1.81		0.0					
10/9/2016	2.48	88.0	1823.1	13.0	85	240.0	12.0	95
10/10/2016	1.99		0.0					
10/11/2016	2.10	280.0	4892.2	11.0	96	240.0	14.0	94
10/12/2016	2.13		0.0					
10/13/2016	2.07	250.0	4311.8	3.0	99	230.0	9.0	96
10/14/2016	1.98		0.0					
10/15/2016	1.92		0.0					
10/16/2016	1.96	250.0	4086.6	7.5	97	320.0	8.0	98
10/17/2016	2.04		0.0					
10/18/2016	2.04	280.0	4761.5	28.0	90	308.0	7.7	98
10/19/2016	2.04		0.0					
10/20/2016	2.02	240.0	4049.2	8.8	96	390.0	27.0	93
10/21/2016	2.05		0.0					
10/22/2016	2.06		0.0					
10/23/2016	1.94	250.0	4044.9	5.1	98	240.0	10.0	96
10/24/2016	2.04		0.0					
10/25/2016	1.97	220.0	3621.9	6.1	97	290.0	14.0	95
10/26/2016	2.15		0.0					
10/27/2016	2.21	260.0	4790.0	17	93	260.0	14.0	95
10/28/2016	2.23		0.0					
10/29/2016	1.97		0.0					
10/30/2016	2.20	220.0	4029.2	14.0	94	280	27.0	90
10/31/2016	2.13		0.0					
11/1/2016	2.13		0.0					
11/2/2016	2.12	190.0	3365.7	5.9	97	300.0	6.0	98
11/3/2016	2.11		0.0					
11/4/2016	2.02	180.0	3035.4	27.0	85	290.0	24.0	92
11/5/2016	1.92		0.0					
11/6/2016	1.97	250.0	4099.1	17.0	93	530.0	14.0	97
11/7/2016	2.00		0.0					
11/8/2016	1.99		0.0					
11/9/2016	2.01	88.0	1476.6	13.0	85	240.0	12.0	95
11/10/2016	1.95		0.0					
11/11/2016	1.87	280.0	4355.1	11.0	96	240.0	14.0	94
11/12/2016	1.78		0.0					
11/13/2016	1.85	250.0	3855.2	3.0	99	230.0	9.0	96
11/14/2016	1.97		0.0					
11/15/2016	2.28		0.0					
11/16/2016	2.08	250.0	4343.1	7.5	97	320.0	8.0	98
11/17/2016	2.04		0.0					
11/18/2016	2.04	280.0	4754.5	28.0	90	308.0	7.7	98
11/19/2016	1.99		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
11/20/2016	2.03	240.0	4071.3	8.8	96	390.0	27.0	93
11/21/2016	2.04		0.0					
11/22/2016	1.94		0.0					
11/23/2016	1.80	250.0	3761.3	5.1	98	240.0	10.0	96
11/24/2016	1.65		0.0					
11/25/2016	1.67	220.0	3064.1	6.1	97	290.0	14.0	95
11/26/2016	1.68		0.0					
11/27/2016	1.77	260.0	3829.4	17	93	260.0	14.0	95
11/28/2016	1.98		0.0					
11/29/2016	2.77		0.0					
11/30/2016	2.57	220.0	4722.8	14.0	94	280	27.0	90
12/1/2016	2.73	135.0	3069.2	5.5	96	210.0	9.7	95
12/2/2016	2.43		0.0					
12/3/2016	2.28		0.0					
12/4/2016	2.25	200.0	3744.7	5.0	98	220.0	13.0	94
12/5/2016	2.34		0.0					
12/6/2016	2.33	212.0	4117.9	4.8	98	290.0	14.0	95
12/7/2016	2.39		0.0					
12/8/2016	2.32	410.0	7915.9	6.8	98	350.0	15.0	96
12/9/2016	2.25		0.0					
12/10/2016	2.16		0.0					
12/11/2016	2.16	140.0	2517.3	5.1	96	320.0	16.0	95
12/12/2016	2.53		0.0					
12/13/2016	2.35	150.0	2944.9	4.8	97	240.0	13.0	95
12/14/2016	2.30		0.0					
12/15/2016	2.25	140.0	2627.1	6.2	96	250.0	11.0	96
12/16/2016	2.19		0.0					
12/17/2016	2.56		0.0					
12/18/2016	2.41	180.0	3620.9	3.3	98	320.0	9.0	97
12/19/2016	2.33		0.0					
12/20/2016	2.27	120.0	2269.8	4.6	96	200.0	8.0	96
12/21/2016	2.13		0.0					
12/22/2016	2.05	193.0	3291.7	3.3	98	270.0	13.0	95
12/23/2016	2.05		0.0					
12/24/2016	2.15		0.0					
12/25/2016	1.88		0.0					
12/26/2016	2.02		0.0					
12/27/2016	2.06	180.0	3094.0	12	93	170.0	13.0	92
12/28/2016	1.97	160.0	2632.8	8.1	95	190	11.0	94
12/29/2016	2.30	220.0	4210.9	5.6	97	240.0	10.0	96
12/30/2016	2.17		0.0					
12/31/2016	2.16		0.0					
1/1/2017	2.10		0.0					
1/2/2017	2.09	87.0	1519.4	3.0	97	780.0	5.7	99
1/3/2017	2.38	170.0	3367.3	3.8	98	260.0	5.3	98
1/4/2017	2.38		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
1/5/2017	2.48	160.0	3305.3	3.0	98	160.0	6.0	96
1/6/2017	2.35		0.0					
1/7/2017	2.28		0.0					
1/8/2017	2.31	76.0	1463.5	3.0	96	210.0	10.0	95
1/9/2017	2.29		0.0					
1/10/2017	2.36	64.0	1259.1	3.3	95	220.0	8.0	96
1/11/2017	3.10		0.0					
1/12/2017	3.38	110.0	3096.2	3.0	97	140.0	6.0	96
1/13/2017	2.83		0.0					
1/14/2017	2.71		0.0					
1/15/2017	2.68	350.0	7808.3	3.2	99	160.0	7.3	95
1/16/2017	2.59		0.0					
1/17/2017	2.55		0.0					
1/18/2017	2.64	140.0	3080.1	4.4	97	160.0	8.3	95
1/19/2017	2.54	130.0	2755.0	3.8	97	210.0	8.3	96
1/20/2017	2.47		0.0					
1/21/2017	2.49		0.0					
1/22/2017	2.54	66.0	1398.7	10.0	85	190.0	15.0	92
1/23/2017	2.88		0.0					
1/24/2017	4.43	220.0	8120.8	11.0	95	270.0	19.0	93
1/25/2017	3.90		0.0					
1/26/2017	3.55	140.0	4146.1	9.3	93	170.0	18.0	89
1/27/2017	3.32		0.0					
1/28/2017	3.13		0.0					
1/29/2017	3.08	170.0	4366.8	14.0	92	230.0	25.0	89
1/30/2017	3.01		0.0					
1/31/2017	2.89	170.0	4090.4	9.4	94	350.0	19.0	95
2/1/2017	2.89		0.0					
2/2/2017	2.96	240.0	5924.7	14.0	94	320.0	18.0	94
2/3/2017	2.97		0.0					
2/4/2017	2.79		0.0					
2/5/2017	2.72	190.0	4313.3	9.6	95	190.0	23.0	88
2/6/2017	2.69		0.0					
2/7/2017	2.64	220.0	4843.9	10.2	95	230.0	16.0	93
2/8/2017	2.60		0.0					
2/9/2017	2.64	190.0	4189.7	4.5	98	240.0	13.0	95
2/10/2017	2.65		0.0					
2/11/2017	2.70		0.0					
2/12/2017	2.94	170.0	4165.5	7.6	96	230.0	17.0	93
2/13/2017	3.19		0.0					
2/14/2017	3.02	160.0	4024.6	7.8	95	240.0	18.0	93
2/15/2017	3.02		0.0					
2/16/2017	2.95	202.0	4973.2	9.1	95	190.0	19.0	90
2/17/2017	2.88		0.0					
2/18/2017	2.83		0.0					
2/19/2017	2.88	170.0	4084.7	4.5	97	170.0	8.7	95

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
2/20/2017	2.90		0.0					
2/21/2017	2.89	185.0	4463.6	4.8	97	250.0	10.0	96
2/22/2017	2.88		0.0					
2/23/2017	2.85	200.0	4750.5	4.4	98	190.0	5.0	97
2/24/2017	2.84		0.0					
2/25/2017	2.76		0.0					
2/26/2017	2.72	180.0	4087.8	3.3	98	200.0	6.3	97
2/27/2017	2.75		0.0					
2/28/2017	2.68	190.0	4251.5	0.0	100	230	4.0	98
3/1/2017	2.76		0.0					
3/2/2017	2.71	77.0	1739.7	3.3	96	290.0	8.3	97
3/3/2017	2.59		0.0					
3/4/2017	2.51		0.0					
3/5/2017	2.52	200.0	4196.7	0.0	100	280.0	8.7	97
3/6/2017	2.52		0.0					
3/7/2017	2.52	200.0	4198.4	0.0	100	330.0	10.0	97
3/8/2017	2.62		0.0					
3/9/2017	2.51	110.0	2298.1	4.5	96	230.0	7.3	97
3/10/2017	2.49		0.0					
3/11/2017	2.32		0.0					
3/12/2017	2.27	170.0	3214.2	3.2	98	290.0	11.0	96
3/13/2017	2.21		0.0					
3/14/2017	3.74	230.0	7181.7	0.0	100	230.0	12.0	95
3/15/2017	3.36		0.0					
3/16/2017	2.89	47.0	1130.9	4.4	91	280.0	8.3	97
3/17/2017	2.84		0.0					
3/18/2017	2.76		0.0					
3/19/2017	2.84	120.0	2845.3	0.0	100	160.0	5.7	96
3/20/2017	2.98		0.0					
3/21/2017	2.92	150.0	3655.4	3.0	98	200.0	5.0	98
3/22/2017	2.88		0.0					
3/23/2017	2.81	190.0	4455.9	3.0	98	230.0	5.7	98
3/24/2017	2.75		0.0					
3/25/2017	2.66		0.0					
3/26/2017	2.64	220.0	4851.2	3.0	99	200.0	7.3	96
3/27/2017	2.77		0.0					
3/28/2017	2.89	190.0	4579.5	0.0	100	230	6.7	97
3/29/2017	2.97		0.0					
3/30/2017	2.86	190.0	4530.4	6.0	97	230	5.3	98
3/31/2017	3.23		0.0					
4/1/2017	5.05		0.0					
4/2/2017	3.97	120.0	3969.2	3.0	98	140.0	8.3	94
4/3/2017	3.75		0.0					
4/4/2017	5.92	160.0	7905.0	6.0	96	170.0	9.7	94
4/5/2017	5.52		0.0					
4/6/2017	5.58	113.0	5260.6	5.8	95	200.0	8.3	96

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
4/7/2017	5.24		0.0					
4/8/2017	4.48		0.0					
4/9/2017	4.12	150.0	5150.4	4.4	97	160.0	9.0	94
4/10/2017	3.97		0.0					
4/11/2017	3.81	120.0	3809.0	5.2	96	240.0	8.7	96
4/12/2017	3.62		0.0					
4/13/2017	3.40	120.0	3404.7	5.9	95	200.0	5.7	97
4/14/2017	3.24		0.0					
4/15/2017	3.06		0.0					
4/16/2017	2.97	110.0	2721.0	3.2	97	210.0	5.3	97
4/17/2017	3.09		0.0					
4/18/2017	2.96	300.0	7408.4	5.1	98	470.0	7.7	98
4/19/2017	2.91		0.0					
4/20/2017	2.99	160.0	3987.2	5.2	97	250.0	7.0	97
4/21/2017	3.23		0.0					
4/22/2017	3.14		0.0					
4/23/2017	3.10	170.0	4399.4	5.7	97	220.0	11.0	95
4/24/2017	3.01		0.0					
4/25/2017	3.89	260.0	8439.4	43.0	83	370.0	84.0	77
4/26/2017	5.05		0.0					
4/27/2017	4.44	110.0	4076.0	3.8	97	140.0	10.0	93
4/28/2017	4.09		0.0					
4/29/2017	3.85		0.0					
4/30/2017	3.62	150.0	4528.6	0.0	100	180	7.0	96
5/1/2017	3.54		0.0					
5/2/2017	3.88	180.0	5826.2	7.5	96	210.0	22.0	90
5/3/2017	3.56		0.0					
5/4/2017	3.38	150.0	4230.9	0.0	100	210.0	7.0	97
5/5/2017	4.02		0.0					
5/6/2017	4.26		0.0					
5/7/2017	3.99	170.0	5654.2	0.0	100	170.0	7.7	95
5/8/2017	3.72		0.0					
5/9/2017	3.50	120.0	3506.8	0.0	100	180.0	9.3	95
5/10/2017	3.33		0.0					
5/11/2017	3.40	140.0	3968.7	3.9	97	220.0	13.0	94
5/12/2017	3.05		0.0					
5/13/2017	3.04		0.0					
5/14/2017	3.98	180.0	5976.3	3.0	98	180.0	14.0	92
5/15/2017	3.56		0.0					
5/16/2017	3.32	90.0	2492.0	3.8	96	150.0	6.0	96
5/17/2017	3.40		0.0					
5/18/2017	3.08		0.0					
5/19/2017	2.97	160.0	3963.2	3.6	98	160.0	6.0	96
5/20/2017	2.81		0.0					
5/21/2017	2.80	180.0	4204.9	3.8	98	220.0	6.7	97
5/22/2017	2.93		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
5/23/2017	2.87	150.0	3584.1	3.3	98	230.0	6.0	97
5/24/2017	2.73		0.0					
5/25/2017	3.04	200.0	5064.0	3.3	98	280.0	8.0	97
5/26/2017	3.77		0.0					
5/27/2017	3.38		0.0					
5/28/2017	3.15		0.0					
5/29/2017	3.39	150.0	4242.1	4.4	97	250.0	4.7	98
5/30/2017	3.18	150.0	3973.2	3.9	97	180	4.0	98
5/31/2017	3.17		0.0					
6/1/2017	3.11	320.0	8294.6	3.6	99	200.0	5.7	97
6/2/2017	2.96		0.0					
6/3/2017	2.89		0.0					
6/4/2017	2.77	57.0	1317.3	0.0	100	210.0	5.0	98
6/5/2017	2.82		0.0					
6/6/2017	2.70	98.0	2208.4	3.6	96	210.0	5.3	97
6/7/2017	2.72		0.0					
6/8/2017	2.64	150.0	3303.9	5.2	97	190.0	6.3	97
6/9/2017	2.59		0.0					
6/10/2017	2.52		0.0					
6/11/2017	2.53	210.0	4424.0	6.5	97	230.0	5.7	98
6/12/2017	2.49		0.0					
6/13/2017	2.41	130.0	2611.8	8.1	94	210.0	6.3	97
6/14/2017	2.29		0.0					
6/15/2017	2.27	170.0	3215.6	3.3	98	270.0	9.3	97
6/16/2017	2.41		0.0					
6/17/2017	2.36		0.0					
6/18/2017	2.35	220.0	4306.3	3.8	98	230.0	5.0	98
6/19/2017	2.36		0.0					
6/20/2017	2.33	200.0	3893.1	6.8	97	260.0	5.3	98
6/21/2017	2.27		0.0					
6/22/2017	2.18	180.0	3274.1	12.0	93	220.0	5.0	98
6/23/2017	2.25		0.0					
6/24/2017	2.48		0.0					
6/25/2017	2.27	180.0	3401.7	0.0	100	260.0	5.3	98
6/26/2017	2.49		0.0					
6/27/2017	2.25	180.0	3377.7	8	96	300.0	5.7	98
6/28/2017	2.18		0.0					
6/29/2017	2.20	230.0	4210.4	12.0	95	280.0	5.3	98
6/30/2017	2.26		0.0					
7/1/2017	2.25		0.0					
7/2/2017	2.24	197.0	3678.6	3.2	98	229.0	0.0	100
7/3/2017	2.26		0.0					
7/4/2017	2.16	252.0	4543.8	2.4	99	257.0	0.0	100
7/5/2017	2.18		0.0					
7/6/2017	2.07	231.0	3993.7	5.4	98	233.0	0.0	100
7/7/2017	2.49		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
7/8/2017	2.27		0.0					
7/9/2017	2.10	239.0	4193.8	3.2	99	198.0	0.0	100
7/10/2017	2.13		0.0					
7/11/2017	1.97	226.0	3703.7	10.0	96	237.0	8.3	96
7/12/2017	2.16		0.0					
7/13/2017	2.37	255.0	5046.7	4.6	98	241.0	4.2	98
7/14/2017	2.17		0.0					
7/15/2017	2.18		0.0					
7/16/2017	2.15	213.0	3826.4	4.2	98	207.0	3.4	98
7/17/2017	2.23		0.0					
7/18/2017	2.39	234.0	4670.1	8.4	96	238.0	4.4	98
7/19/2017	2.15		0.0					
7/20/2017	2.14	227.0	4043.8	6.0	97	212.0	3.5	98
7/21/2017	2.15		0.0					
7/22/2017	2.09		0.0					
7/23/2017	2.03	293.0	4967.9	8.0	97	283.0	3.5	99
7/24/2017	2.35		0.0					
7/25/2017	2.15	215.0	3855.2	11.8	95	235.0	6.4	97
7/26/2017	2.10		0.0					
7/27/2017	2.07	228.0	3943.8	8.3	96	253.0	6.1	98
7/28/2017	2.16		0.0					
7/29/2017	2.05		0.0					
7/30/2017	1.98	210.0	3467.8	10.3	95	204.0	5.8	97
7/31/2017	2.01		0.0					
8/1/2017	2.05	341.0	5832.9	15.4	95	361.0	6.5	98
8/2/2017	2.02		0.0					
8/3/2017	2.00	219.0	3656.6	22.0	90	180.0	6.6	96
8/4/2017	2.03		0.0					
8/5/2017	2.04		0.0					
8/6/2017	1.90	291.0	4618.5	11.3	96	258.0	5.1	98
8/7/2017	1.94		0.0					
8/8/2017	1.95	282.0	4586.2	15.2	95	224.0	3.9	98
8/9/2017	1.89		0.0					
8/10/2017	1.89	304.0	4796.9	14.2	95	295.0	4.6	98
8/11/2017	1.89		0.0					
8/12/2017	2.04		0.0					
8/13/2017	1.93	305.0	4911.9	15.4	95	264.0	4.2	98
8/14/2017	1.86		0.0					
8/15/2017	1.90	315.0	4983.6	16.2	95	287.0	3.9	99
8/16/2017	1.91		0.0					
8/17/2017	1.79	187.0	2791.6	10.9	94	236.0	0.0	100
8/18/2017	2.16		0.0					
8/19/2017	2.01		0.0					
8/20/2017	1.88	320.0	5012.0	11.4	96	206.0	3.7	98
8/21/2017	1.92		0.0					
8/22/2017	1.94	204.0	3292.1	9.5	95	169.0	2.7	98

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
8/23/2017	1.86		0.0					
8/24/2017	1.82	265.0	4011.3	12.1	95	225.0	3.5	98
8/25/2017	1.84		0.0					
8/26/2017	1.82		0.0					
8/27/2017	1.75	261.0	3815.8	13.7	95	273.0	4.4	98
8/28/2017	1.74		0.0					
8/29/2017	1.80	281.0	4220.7	27.3	90	247.0	4.4	98
8/30/2017	2.01		0.0					
8/31/2017	2.24	183.0	3414.2	28.9	84	174.0	3.4	98
9/1/2017	1.82		0.0					
9/2/2017	1.85		0.0					
9/3/2017	2.08	304.0	5278.6			266.0	0.0	100
9/4/2017	2.11		0.0					
9/5/2017	2.06	304.0	5227.9			276.0	18.2	93
9/6/2017	2.13		0.0					
9/7/2017	2.20	303.0	5567.0	13.7	95	265.0	11.4	96
9/8/2017	2.02		0.0					
9/9/2017	1.94		0.0					
9/10/2017	1.98	264.0	4350.7	11.5	96	258.0	7.4	97
9/11/2017	2.26		0.0					
9/12/2017	2.03	290.0	4897.7	12.8	96	256.0	5.7	98
9/13/2017	2.05		0.0					
9/14/2017	2.10	295.0	5171.6	7.3	98	260.0	9.5	96
9/15/2017	2.05		0.0					
9/16/2017	1.96		0.0					
9/17/2017	1.97	297.0	4874.7	20.0	93	252.0	9.0	96
9/18/2017	2.05		0.0					
9/19/2017	2.09	327.0	5697.1	25.9	92	289.0	13.9	95
9/20/2017	2.06		0.0					
9/21/2017	2.01	323.0	5411.9	20.7	94	304.0	9.9	97
9/22/2017	1.96		0.0					
9/23/2017	1.88		0.0					
9/24/2017	1.91	267.0	4253.1	12.7	95	250.0	7.1	97
9/25/2017	2.00		0.0					
9/26/2017	2.00	331.0	5521.1	15.5	95	331.0	9.1	97
9/27/2017	2.02		0.0					
9/28/2017	1.97	308.0	5050.1	34.0	89	309.0	6.3	98
9/29/2017	1.86		0.0					
9/30/2017	2.10		0.0					
10/1/2017	1.92	221.0	3535.1	12.8	94	183.0	5.6	97
10/2/2017	1.95		0.0					
10/3/2017	1.95	266.0	4321.5	24.1	91	273.0	4.3	98
10/4/2017	1.99		0.0					
10/5/2017	2.07	289.0	4994.1	16.3	94	266.0	7.4	97
10/6/2017	1.90		0.0					
10/7/2017	1.75		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
10/8/2017	1.82	259.0	3929.1	16.2	94	232.0	8.4	96
10/9/2017	1.99		0.0					
10/10/2017	2.03	306.0	5185.7	19.1	94	265.0	9.6	96
10/11/2017	1.98		0.0					
10/12/2017	1.93	302.0	4861.1	18.3	94	252.0	6.8	97
10/13/2017	1.93		0.0					
10/14/2017	2.07		0.0					
10/15/2017	1.96	272.0	4455.3	18.1	93	258.0	11.0	96
10/16/2017	2.00		0.0					
10/17/2017	1.97	274.0	4492.6	24.4	91	272.0	12.8	95
10/18/2017	1.94		0.0					
10/19/2017	1.98	323.0	5344.5	18.1	94	263.0	7.3	97
10/20/2017	1.94		0.0					
10/21/2017	1.87		0.0					
10/22/2017	1.89	314.0	4946.8	17.0	95	230.0	7.9	97
10/23/2017	1.98		0.0					
10/24/2017	2.10	297.0	5196.7	16.7	94	276.0	8.7	97
10/25/2017	2.45		0.0					
10/26/2017	2.61	251.0	5455.2	16.5	93	291.0	9.2	97
10/27/2017	2.15		0.0					
10/28/2017	2.05		0.0					
10/29/2017	2.54	235.0	4972.3	19.0	92	247.0	15.0	94
10/30/2017	3.60		0.0					
10/31/2017	2.24	221.0	4123.1	15.0	93	185.0	8.0	96
11/1/2017	2.33		0.0					
11/2/2017	2.43	169.0	3425.0	19.4	89	190.0	9.9	95
11/3/2017	2.25		0.0					
11/4/2017	2.33		0.0					
11/5/2017	2.41	217.0	4365.2	17.6	92	205.0	6.8	97
11/6/2017	2.36		0.0					
11/7/2017	2.31	262.0	5051.9	24.1	91	251.0	6.0	98
11/8/2017	2.28		0.0					
11/9/2017	2.21	244.0	4489.1	9.3	96	236.0	8.6	96
11/10/2017	2.07		0.0					
11/11/2017	2.05		0.0					
11/12/2017	2.15	235.0	4213.8	15.8	93	214.0	11.7	95
11/13/2017	2.22		0.0					
11/14/2017	2.20	293.0	5376.0	23.9	92	270.0	15.5	94
11/15/2017	2.41		0.0					
11/16/2017	2.34	316.0	6156.4	27.5	91	279.0	13.4	95
11/17/2017	2.27		0.0					
11/18/2017	2.56		0.0					
11/19/2017	2.38	223.0	4417.1	23.7	89	189.0	13.8	93
11/20/2017	2.28	227.0	4322.1	20.1	91	199.0	15.6	92
11/21/2017	3.03	277.0	6999.8	20.7	93	217.0	13.9	94
11/22/2017	2.40		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
11/23/2017	2.31		0.0					
11/24/2017	2.31		0.0					
11/25/2017	2.31		0.0					
11/26/2017	2.46	230.0	4726.4	9.1	96	183.0	7.1	96
11/27/2017	2.45		0.0					
11/28/2017	2.43	218.0	4419.8	25.9	88	183	6.8	96
11/29/2017	2.38		0.0					
11/30/2017	2.40	244.0	4885.9	13.5	94	257.0	13.5	95
12/1/2017	2.40		0.0					
12/2/2017	2.27		0.0					
12/3/2017	2.28	246.0	4679.8	18.8	92	208.0	6.9	97
12/4/2017	2.33		0.0					
12/5/2017	2.44	301.0	6132.8	29.3	90	120.0	6.8	94
12/6/2017	2.64		0.0					
12/7/2017	2.48	269.0	5554.8	12.1	96	274.0	5.2	98
12/8/2017	2.40		0.0					
12/9/2017	2.33		0.0					
12/10/2017	2.42	172.0	3464.3	12.8	93	188.0	7.8	96
12/11/2017	2.42		0.0					
12/12/2017	2.47	284.0	5843.2	21.0	93	267.0	6.7	97
12/13/2017	2.46		0.0					
12/14/2017	2.35	227.0	4449.0	13.7	94	199.0	6.1	97
12/15/2017	2.28		0.0					
12/16/2017	2.27		0.0					
12/17/2017	2.20	256.0	4703.5	10.6	96	210.0	6.0	97
12/18/2017	2.32		0.0					
12/19/2017	2.29	225.0	4300.9	21.5	90	210.0	5.2	98
12/20/2017	2.18		0.0					
12/21/2017	2.06	249.0	4277.9	9.3	96	201.0	5.7	97
12/22/2017	2.02		0.0					
12/23/2017	2.30		0.0					
12/24/2017	2.15		0.0					
12/25/2017	2.12	213.0	3760.7	6.8	97	195.0	3.9	98
12/26/2017	2.24		0.0					
12/27/2017	2.17	222.0	4025.1	10.3	95	180.0	8.0	96
12/28/2017	2.19	202.0	3689.4	7.0	97	170.0	7.2	96
12/29/2017	2.13		0.0					
12/30/2017	2.09		0.0					
12/31/2017	2.06		0.0					
1/1/2018	2.07	493.0	8502.8	7.4	98	177.0	7.8	96
1/2/2018	2.07		0.0					
1/3/2018	2.02		0.0					
1/4/2018	1.94	276.0	4456.4	10.0	96	249.0	9.8	96
1/5/2018	1.97	312.0	5113.1	8.0	97	184.0	12.9	93
1/6/2018	2.02		0.0					
1/7/2018	1.99	236.0	3907.0	6.2	97	209.0	12.1	94

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
1/8/2018	1.97		0.0					
1/9/2018	1.90	235.0	3719.9	6.5	97	205.0	5.7	97
1/10/2018	1.87		0.0					
1/11/2018	1.96	143.0	2338.7	8.7	94	104.0	4.0	96
1/12/2018	3.55		0.0					
1/13/2018	4.98		0.0					
1/14/2018	3.17	128.0	3380.8	0.0	100	103.0	4.5	96
1/15/2018	2.96		0.0					
1/16/2018	2.83	167.0	3943.0	4.2	97	125.0	3.2	97
1/17/2018	2.75		0.0					
1/18/2018	2.70	200.0	4506.9	2.8	99	148.0	6.6	96
1/19/2018	2.64		0.0					
1/20/2018	2.69		0.0					
1/21/2018	2.71	161.0	3641.5	2.5	98	156.0	3.2	98
1/22/2018	2.78		0.0					
1/23/2018	3.83	201.0	6418.7	3.4	98	222.0	4.0	98
1/24/2018	3.61		0.0					
1/25/2018	3.30	138.0	3799.2	4.2	97	162.0	4.5	97
1/26/2018	3.12		0.0					
1/27/2018	3.02		0.0					
1/28/2018	3.09	190.0	4898.0	3.1	98	148	2.7	98
1/29/2018	3.11		0.0					
1/30/2018	3.00	142.0	3552.8		100	110.0	5.0	95
1/31/2018	2.98		0.0					
2/1/2018	3.01	212.0	5314.8	4.0	98	146.0	4.9	97
2/2/2018	3.09		0.0					
2/3/2018	2.90		0.0					
2/4/2018	3.09	183.0	4708.4	0.0	100	189.0	6.9	96
2/5/2018	3.53		0.0					
2/6/2018	3.18	188.0	4981.3	2.9	98	169.0	7.0	96
2/7/2018	3.54		0.0					
2/8/2018	3.53	176.0	5185.9	2.7	98	168.0	2.6	98
2/9/2018	3.29		0.0					
2/10/2018	3.35		0.0					
2/11/2018	4.87	154.0	6251.0	2.0	99	156.0	4.4	97
2/12/2018	5.13		0.0					
2/13/2018	4.27	120.0	4277.4	2.9	98	122.0	5.0	96
2/14/2018	4.01		0.0					
2/15/2018	4.08	126.0	4290.6	3.5	97	116.0	6.9	94
2/16/2018	3.88		0.0					
2/17/2018	3.52		0.0					
2/18/2018	4.07		0.0	11.0		138.0	8.1	94
2/19/2018	3.84		0.0					
2/20/2018	3.84	151.0	4832.1	2.0	99	154.0	5.0	97
2/21/2018	3.66		0.0					
2/22/2018	3.58	115.0	3428.8	0.0	100	22.0	0.0	100

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
2/23/2018	3.57		0.0					
2/24/2018	3.59		0.0					
2/25/2018	4.65	197.0	7636.6	11.8	94	277.0	7.6	97
2/26/2018	4.43		0.0					
2/27/2018	4.00	140.0	4673.9	2.35	98	135.0	3.2	98
2/28/2018	3.58		0.0					
3/1/2018	3.63	175.0	5302.4	0.0	100	181.0	2.9	98
3/2/2018	5.59		0.0					
3/3/2018	5.81		0.0					
3/4/2018	5.10	145.0	6165.0	0.0	100	210.0	4.2	98
3/5/2018	4.65		0.0					
3/6/2018	4.29		0.0			176.0	5.0	97
3/7/2018	4.70		0.0					
3/8/2018	5.60	133.0	6215.0	0.0	100	284.0	3.7	99
3/9/2018	4.74		0.0					
3/10/2018	4.11		0.0					
3/11/2018	3.76	50.8	1593.4	0.0	100	69.0	2.6	96
3/12/2018	3.56		0.0					
3/13/2018	3.67	118.0	3615.7	0.0	100	134.0	4.0	97
3/14/2018	3.92		0.0					
3/15/2018	3.85	141.0	4530.9	2.0	99	217.0	2.3	99
3/16/2018	3.67		0.0					
3/17/2018	3.54		0.0					
3/18/2018	3.49	121.0	3525.9	0.0	100	148.0	3.6	98
3/19/2018	3.52		0.0					
3/20/2018	3.41	270.0	7674.1	3.3	99	175.0	5.1	97
3/21/2018	3.41		0.0					
3/22/2018	3.66	131.0	3994.3	2.5	98	144.0	5.4	96
3/23/2018	3.49		0.0					
3/24/2018	3.28		0.0					
3/25/2018	3.21	182.0	4872.4	2.9	98	189.0	3.7	98
3/26/2018	3.23		0.0					
3/27/2018	3.18	192.0	5093.7	2.4	99	214.0	3.5	98
3/28/2018	3.59		0.0					
3/29/2018	3.19	188.0	5006.4	2.1	99	179.0	3.5	98
3/30/2018	3.04		0.0					
3/31/2018	2.90		0.0					
4/1/2018	2.74	180.0	4114.8	0.0	100	179.0	4.0	98
4/2/2018	3.01		0.0					
4/3/2018	3.21	241.0	6443.9	2.7	99	246.0	6.2	97
4/4/2018	3.29		0.0					
4/5/2018	3.11	160.0	4151.3	2.7	98	150.0	5.3	96
4/6/2018	3.08		0.0					
4/7/2018	2.95		0.0					
4/8/2018	2.88	207.0	4965.1	2.4	99	186.0	4.9	97
4/9/2018	2.89		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
4/10/2018	2.84	256.0	6063.5	3.5	99	202.0	2.8	99
4/11/2018	2.83		0.0					
4/12/2018	2.77	201.0	4635.1	2.6	99	182.0	6.0	97
4/13/2018	2.91		0.0					
4/14/2018	2.56		0.0					
4/15/2018	2.52	141.0	2965.7	2.3	98	124.0	5.0	96
4/16/2018	3.67		0.0					
4/17/2018	3.31	171.0	4713.4	2.7	98	191.0	4.3	98
4/18/2018	3.12		0.0					
4/19/2018	3.13	186.0	4855.4	2.6	99	181.0	6.3	97
4/20/2018	2.97		0.0					
4/21/2018	2.85		0.0					
4/22/2018	2.80	225.0	5258.0	2.3	99	245.0	3.1	99
4/23/2018	2.79		0.0					
4/24/2018	2.72	189.0	4290.6	3.5	98	186.0	7.0	96
4/25/2018	3.15		0.0					
4/26/2018	3.24	197.0	5328.2	2.6	99	264.0	5.0	98
4/27/2018	3.46		0.0					
4/28/2018	3.32		0.0					
4/29/2018	3.27	161.0	4385.4	0.0	100	170.0	4.0	98
4/30/2018	3.20		0.0					
5/1/2018	3.08	202.0	5180.4	0.0	100	261.0	4.6	98
5/2/2018	3.01		0.0					
5/3/2018	2.95	155.0	3814.8	2.2	99	154.0	3.1	98
5/4/2018	2.90		0.0					
5/5/2018	2.72		0.0					
5/6/2018	2.73	142.0	3229.5	3.4	98	145.0	7.6	95
5/7/2018	2.72		0.0					
5/8/2018	2.67	193.0	4294.5	2.3	99	166.0	0.0	100
5/9/2018	2.59		0.0					
5/10/2018	2.52	203.0	4271.5	3.7	98	233.0	10.1	96
5/11/2018	2.40		0.0					
5/12/2018	2.37		0.0					
5/13/2018	2.32	158.0	3050.5	3.4	98	202.0	6.1	97
5/14/2018	2.35		0.0					
5/15/2018	2.44	189.0	3847.7	2.8	99	206.0	3.8	98
5/16/2018	2.37		0.0					
5/17/2018	2.50	226.0	4712.1	2.4	99	299.0	4.1	99
5/18/2018	2.36		0.0					
5/19/2018	2.20		0.0					
5/20/2018	2.66	209.0	4638.3	3.4	98	237.0	4.1	98
5/21/2018	2.43		0.0					
5/22/2018	2.43	163.0	3304.8	0.0	100	178.0	5.2	97
5/23/2018	2.45		0.0					
5/24/2018	2.35	183.0	3586.6	3.5	98	127.0	4.4	97
5/25/2018	2.35		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
5/26/2018	2.38		0.0					
5/27/2018	2.36	273.0	5364.2	3.93	99	270.0	3.7	99
5/28/2018	2.38		0.0					
5/29/2018	2.30	257.0	4929.8	3.5	99	349.0	5.1	99
5/30/2018	2.27		0.0					
5/31/2018	2.19	184.0	3353.0	3.7	98	208.0	6.8	97
6/1/2018	2.30		0.0					
6/2/2018	2.28		0.0					
6/3/2018	2.14	205.0	3657.0	5.9	97	206.0	12.3	94
6/4/2018	2.77		0.0					
6/5/2018	2.71	158.0	3567.1	6.0	96	196.0	11.7	94
6/6/2018	2.41		0.0					
6/7/2018	2.32	210.0	4056.2	6.2	97	433.0	10.4	98
6/8/2018	2.33		0.0					
6/9/2018	2.25		0.0					
6/10/2018	2.20	210.0	3854.8	9.8	95	221.0	12.3	94
6/11/2018	2.19		0.0					
6/12/2018	2.19	205.0	3747.7	9.1	96	215.0	10.9	95
6/13/2018	2.18		0.0					
6/14/2018	2.17	211.0	3822.2	13.1	94	801.0	8.7	99
6/15/2018	2.19		0.0					
6/16/2018	2.15		0.0					
6/17/2018	2.09	162.0	2827.8	5.2	97	207.0	5.3	97
6/18/2018	2.16		0.0					
6/19/2018	2.13	277.0	4929.9	6.2	98	399.0	4.8	99
6/20/2018	2.06		0.0					
6/21/2018	2.11	205.0	3610.9	5.2	97	293.0	3.7	99
6/22/2018	2.04		0.0					
6/23/2018	2.04		0.0					
6/24/2018	2.12	190.0	3359.4	7.0	96	278.0	5.8	98
6/25/2018	2.11		0.0					
6/26/2018	2.06	251.0	4303.9	8.0	97	271.0	4.2	98
6/27/2018	2.03		0.0					
6/28/2018	2.22	204.0	3768.5	9.8	95	265	6.6	98
6/29/2018	2.18		0.0					
6/30/2018	2.14		0.0					
7/1/2018	2.13	204.0	3618.8	7.8	96	243.0	5.6	98
7/2/2018	2.17		0.0					
7/3/2018	2.18	244.0	4440.3	10.1	96	277.0	10.5	96
7/4/2018	2.12		0.0					
7/5/2018	2.03	233.0	3935.0	11.6	95	281.0	9.6	97
7/6/2018	2.22		0.0					
7/7/2018	2.05		0.0					
7/8/2018	1.96	226.0	3698.1	20.4	91	293.0	5.6	98
7/9/2018	1.99		0.0					
7/10/2018	1.99	239.0	3956.6	29.4	88	303.0	5.8	98

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
7/11/2018	2.17		0.0					
7/12/2018	1.88	300.0	4706.3	21.4	93	352.0	9.4	97
7/13/2018	1.91		0.0					
7/14/2018	2.09		0.0					
7/15/2018	2.09	276.0	4808.5	32.4	88	359.0	6.4	98
7/16/2018	2.04		0.0					
7/17/2018	2.03	220.0	3721.0	16.6	92	434.0	5.1	99
7/18/2018	1.98		0.0					
7/19/2018	1.88	227.0	3566.8	15.3	93	334.0	4.9	99
7/20/2018	1.94		0.0					
7/21/2018	1.88		0.0					
7/22/2018	2.06	376.0	6463.0	17.5	95	388.0	3.9	99
7/23/2018	2.00		0.0					
7/24/2018	1.96	221.0	3614.4	25.4	89	279.0	4.2	98
7/25/2018	1.97		0.0					
7/26/2018	1.99	246.0	4088.9	24.8	90	262.0	4.9	98
7/27/2018	1.98		0.0					
7/28/2018	2.02		0.0					
7/29/2018	1.94	247.0	4000.5	12.0	95	263.0	4.8	98
7/30/2018	1.96		0.0					
7/31/2018	2.24	222.0	4141.8	11.3	95	324.0	4.5	99
8/1/2018	1.90		0.0					
8/2/2018	1.94	254.0	4107.5	4.5	98	285.0	5.5	98
8/3/2018	1.96		0.0					
8/4/2018	2.26		0.0					
8/5/2018	2.02	259.0	4369.8	4.7	98	389.0	7.0	98
8/6/2018	1.99		0.0					
8/7/2018	1.97	280.0	4605.0	6.5	98	324.0	6.8	98
8/8/2018	1.94		0.0					
8/9/2018	1.91	242.0	3856.9	6.4	97	304.0	5.1	98
8/10/2018	1.89		0.0					
8/11/2018	2.06		0.0					
8/12/2018	2.18	239.0	4347.3	7.3	97	305.0	8.0	97
8/13/2018	2.08		0.0					
8/14/2018	2.05	297.0	5067.9	6.9	98	275.0	7.3	97
8/15/2018	1.96		0.0					
8/16/2018	1.95	219.0	3565.2	7.1	97	252.0	6.2	98
8/17/2018	1.96		0.0					
8/18/2018	2.07		0.0					
8/19/2018	1.87	241.0	3764.6	10.3	96	280.0	4.0	99
8/20/2018	1.87		0.0					
8/21/2018	1.89	237.0	3735.7	13.4	94	257.0	4.7	98
8/22/2018	1.88		0.0					
8/23/2018	1.82	262.0	3970.3	11.1	96	244.0	4.2	98
8/24/2018	1.82		0.0					
8/25/2018	1.80		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
8/26/2018	1.79	234.0	3485.5	18.2	92	246.0	5.6	98
8/27/2018	1.83		0.0					
8/28/2018	1.83	297.0	4532.9	9.1	97	388.0	5.6	99
8/29/2018	1.79		0.0					
8/30/2018	1.79	210.0	3142.0	10.0	95	267.0	6.3	98
8/31/2018	1.78		0.0					
9/1/2018	1.70		0.0					
9/2/2018	1.79	191.0	2851.4	12.9	93	248.0	5.0	98
9/3/2018	1.97		0.0					
9/4/2018	1.94	324.0	5242.2	33.7	90	513.0	4.9	99
9/5/2018	1.96		0.0					
9/6/2018	2.02	289.0	4859.1	33.7	88	349.0	7.6	98
9/7/2018	1.88		0.0					
9/8/2018	1.74		0.0					
9/9/2018	1.95	233.0	3783.4	16.0	93	282.0	9.4	97
9/10/2018	2.39		0.0					
9/11/2018	2.24	301.0	5620.7	20.2	93	340.0	3.7	99
9/12/2018	2.20		0.0					
9/13/2018	2.21	279.0	5149.3	13.3	95	334.0	4.1	99
9/14/2018	2.09		0.0					
9/15/2018	2.00		0.0					
9/16/2018	2.04	274.0	4650.3	15.7	94	365.0	6.0	98
9/17/2018	2.12		0.0					
9/18/2018	2.65	585.0	12904.7	25.6	96	1100.0	6.3	99
9/19/2018	2.23		0.0					
9/20/2018	2.14	258.0	4611.1	14.2	94	246.0	5.4	98
9/21/2018	2.09		0.0					
9/22/2018	1.99		0.0					
9/23/2018	1.95	206.0	3345.0	13.1	94	208.0	4.5	98
9/24/2018	2.03		0.0					
9/25/2018	2.63	241.0	5284.1	15.1	94	209.0	0.0	100
9/26/2018	2.49		0.0					
9/27/2018	2.27	236.0	4471.8	14.6	94	256.0	0.0	100
9/28/2018	2.85		0.0					
9/29/2018	2.34		0.0					
9/30/2018	2.31	236.0	4548.6	18.3	92	297.0	0.0	100
10/1/2018	2.32		0.0					
10/2/2018	2.56	241.0	5145.4	18.8	92	267.0	4.0	99
10/3/2018	2.86		0.0					
10/4/2018	2.64	204.0	4493.3	22.5	89	172.0	0.0	100
10/5/2018	2.41		0.0					
10/6/2018	2.18		0.0					
10/7/2018	2.46	187.0	3839.7	5.4	97	189.0	4.0	98
10/8/2018	2.19		0.0					
10/9/2018	2.38	233.0	4615.1	9.4	96	207.0	2.5	99
10/10/2018	2.38		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
10/11/2018	2.61	467.0	10153.7	12.6	97	255.0	4.8	98
10/12/2018	3.97		0.0					
10/13/2018	2.92		0.0					
10/14/2018	2.72	173.0	3927.4	6.8	96	217.0	3.0	99
10/15/2018	2.72		0.0					
10/16/2018	2.74	203.0	4633.8	15.3	92	210.0	5.1	98
10/17/2018	2.62		0.0					
10/18/2018	2.53	193.0	4065.9	7.6	96	235.0	7.2	97
10/19/2018	2.66		0.0					
10/20/2018	2.35		0.0					
10/21/2018	2.38	198.0	3935.1	8.7	96	195.0	6.0	97
10/22/2018	2.37		0.0					
10/23/2018	2.90	211.0	5099.7	19.4	91	212.0	9.3	96
10/24/2018	2.55		0.0					
10/25/2018	2.34	234.0	4574.5	16.1	93	240.0	7.3	97
10/26/2018	2.60		0.0					
10/27/2018	3.52		0.0					
10/28/2018	3.20	170.0	4531.3	9.3	95	220.0	8.5	96
10/29/2018	3.04		0.0					
10/30/2018	2.87	190.0	4552.6	12.9	93	196.0	6.5	97
10/31/2018	2.24		0.0					
11/1/2018	2.76	226.0	5207.8	28.4	87	225.0	6.8	97
11/2/2018	2.91		0.0					
11/3/2018	3.36		0.0					
11/4/2018	3.08	123.0	3160.6	7.3	94	143.0	5.0	97
11/5/2018	3.06		0.0					
11/6/2018	3.57	183.0	5454.7	24.9	86	190.0	16.4	91
11/7/2018	3.45		0.0					
11/8/2018	3.19	166.0	4413.6	14.8	91	149.0	5.6	96
11/9/2018	3.97		0.0					
11/10/2018	4.24		0.0					
11/11/2018	3.47	122.0	3533.7	5.8	95	125.0	4.6	96
11/12/2018	3.27		0.0					
11/13/2018	5.68	159.0	7528.0	32.9	79	194.0	27.7	86
11/14/2018	4.76		0.0					
11/15/2018	4.16	126.0	4368.3	10.2	92	149.0	4.0	97
11/16/2018	5.33		0.0					
11/17/2018	4.66		0.0					
11/18/2018	4.21	106.0	3719.2	3.8	96	114.0	3.8	97
11/19/2018	4.50	124.0	4652.7	5.9	95	143.0	4.7	97
11/20/2018	3.95	139.0	4581.4	19.3	86	147.0	3.3	98
11/21/2018	3.44		0.0					
11/22/2018	3.12		0.0					
11/23/2018	3.04		0.0					
11/24/2018	3.03		0.0					
11/25/2018	4.81	116.0	4651.5	3.6	97	135.0	4.3	97

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
11/26/2018	4.89		0.0					
11/27/2018	5.68	102.0	4833.6	5.5	95	120.0	3.5	97
11/28/2018	4.83		0.0					
11/29/2018	3.84	124.0	3972.2	5.3	96	117.0	3.5	97
11/30/2018	4.04		0.0					
12/1/2018	3.77		0.0					
12/2/2018	5.04	133.0	5593.8	6.3	95	143.0	4.2	97
12/3/2018	5.07		0.0					
12/4/2018	4.43	125.0	4617.2	2.6	98	130.0	4.6	96
12/5/2018	4.11		0.0					
12/6/2018	3.90	153.0	4971.4	2.6	98	181.0	6.9	96
12/7/2018	3.65		0.0					
12/8/2018	3.49		0.0					
12/9/2018	3.39	148.0	4183.1	2.9	98	134.0	9.1	93
12/10/2018	3.36		0.0					
12/11/2018	3.27	221.0	6030.8	7.7	97	240.0	10.8	96
12/12/2018	3.47		0.0					
12/13/2018	3.28	184.0	5039.5	3.5	98	179.0	8.6	95
12/14/2018	3.06		0.0					
12/15/2018	2.95		0.0					
12/16/2018	3.30	165.0	4541.1	2.2	99	115.0	0.0	100
12/17/2018	3.45		0.0					
12/18/2018	3.19	154.0	4097.1	3.9	97	183.0	9.8	95
12/19/2018	2.99		0.0					
12/20/2018	3.07	175.0	4483.6	3.3	98	183.0	9.8	95
12/21/2018	3.29		0.0					
12/22/2018	3.38		0.0					
12/23/2018	3.07	151.0	3862.4	2.8	98	166.0	8.0	95
12/24/2018	3.01		0.0					
12/25/2018	2.73		0.0					
12/26/2018	2.73	159.0	3617.5	3.9	98	163.0	10.0	94
12/27/2018	3.97	160.0	5298.9	4.8	97	163.0	8.5	95
12/28/2018	4.05		0.0					
12/29/2018	3.67		0.0					
12/30/2018	3.38	104.0	2928.2	2.7	97	97.0	2.7	97
12/31/2018	3.51		0.0					
1/1/2019	5.40	81.8	3686.0	2.1	97	80.4	5.7	93
1/2/2019	4.00		0.0					
1/3/2019	3.76	106.0	3327.5	2.0	98	121.0	4.9	96
1/4/2019	3.55		0.0					
1/5/2019	4.04		0.0					
1/6/2019	3.89	116.0	3765.3	0.0	100	112.0	3.2	97
1/7/2019	3.59		0.0					
1/8/2019	3.55	127.0	3763.3	0.0	100	228.0	0.0	100
1/9/2019	3.55		0.0					
1/10/2019	3.32	139.0	3845.3	2.5	98	124.0	2.9	98

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
1/11/2019	3.18		0.0					
1/12/2019	3.04		0.0					
1/13/2019	3.01	67.3	1686.7	0.0	100	67.2	0.0	100
1/14/2019	2.93		0.0					
1/15/2019	2.83	186.0	4394.7	2.7	99	191.0	3.3	98
1/16/2019	2.78		0.0					
1/17/2019	2.69	137.0	3077.0	0.0	100	160.0	7.4	95
1/18/2019	2.68		0.0					
1/19/2019	2.63		0.0					
1/20/2019	5.17	145.0	6248.5	3.1	98	182.0	6.4	96
1/21/2019	3.94		0.0					
1/22/2019	3.64	122.0	3707.7	2.5	98	106.0	4.2	96
1/23/2019	3.48		0.0					
1/24/2019	4.59	166.0	6347.7	3.8	98	176.0	5.3	97
1/25/2019	4.35		0.0					
1/26/2019	3.87		0.0					
1/27/2019	3.79	121.0	3826.7	2.0	98	111.0	3.4	97
1/28/2019	3.67		0.0					
1/29/2019	3.56	144.0	4279.0	2.8	98	147.0	3.1	98
1/30/2019	3.58		0.0					
1/31/2019	3.39	164.0	4631.2	3.0	98	162.0	6.4	96
2/1/2019	3.30		0.0					
2/2/2019	3.15		0.0					
2/3/2019	3.06	153.0	3900.8	3.7	98	175.0	5.9	97
2/4/2019	3.10		0.0					
2/5/2019	3.05	189.0	4812.3	3.6	98	203.0	4.1	98
2/6/2019	3.00		0.0					
2/7/2019	3.21	199.0	5330.8	2.7	99	176.0	3.3	98
2/8/2019	3.18		0.0					
2/9/2019	2.99		0.0					
2/10/2019	2.89	161.0	3876.5	3.6	98	144.0	5.4	96
2/11/2019	3.02		0.0					
2/12/2019	3.03	197.0	4983.2	5.2	97	184.0	6.7	96
2/13/2019	4.55		0.0					
2/14/2019	3.61	130.0	3914.0	5.2	96	130.0	4.6	96
2/15/2019	3.50		0.0					
2/16/2019	3.32		0.0					
2/17/2019	3.20	136.0	3630.7	4.0	97	131.0	4.5	97
2/18/2019	3.33		0.0					
2/19/2019	3.25	184.0	4985.8	4.5	98	171.0	6.1	96
2/20/2019	3.10		0.0					
2/21/2019	4.03	176.0	5913.9	3.7	98	171.0	4.5	97
2/22/2019	3.48		0.0					
2/23/2019	3.28		0.0					
2/24/2019	4.47	142.0	5296.1	4.0	97	146.0	5.6	96
2/25/2019	4.04		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
2/26/2019	3.69	130.0	3995.3	3.8	97	141.0	6.5	95
2/27/2019	3.48		0.0					
2/28/2019	3.38	156.0	4392.3	2.8	98	157	4.6	97
3/1/2019	3.22		0.0					
3/2/2019	3.20		0.0					
3/3/2019	3.29	174.0	4767.1	2.2	99	182.0	3.8	98
3/4/2019	4.04		0.0					
3/5/2019	3.74	138.0	4307.9	2.9	98	147.0	4.0	97
3/6/2019	3.51		0.0					
3/7/2019	3.35	149.0	4157.9	0.0	100	151.0	3.0	98
3/8/2019	3.35		0.0					
3/9/2019	6.09		0.0					
3/10/2019	4.01	173.0	5781.4	0.0	100	201.0	4.4	98
3/11/2019	4.05		0.0					
3/12/2019	3.70	140.0	4324.8	0.0	100	97.6	2.8	97
3/13/2019	3.45		0.0					
3/14/2019	3.37	144.0	4049.6	0.0	100	121.0	0.0	100
3/15/2019	3.35		0.0					
3/16/2019	3.26		0.0					
3/17/2019	3.21	151.0	4046.3	0.0	100	160.0	0.0	100
3/18/2019	3.28		0.0					
3/19/2019	3.17	182.0	4813.2	2.2	99	270.0	3.6	99
3/20/2019	3.12		0.0					
3/21/2019	3.12	171.0	4452.4	2.3	99	156.0	2.5	98
3/22/2019	3.86		0.0					
3/23/2019	3.44		0.0					
3/24/2019	3.36	131.0	3668.7	0.0	100	140.0	3.2	98
3/25/2019	3.30		0.0					
3/26/2019	3.17	140.0	3700.1	0.0	100	171.0	0.0	100
3/27/2019	3.10		0.0					
3/28/2019	3.08	164.0	4218.2	2.9	98	167.0	3.2	98
3/29/2019	2.99		0.0					
3/30/2019	2.88		0.0					
3/31/2019	2.88	172.0	4131.3	0.0	100	174.0	2.7	98
4/1/2019	2.90		0.0					
4/2/2019	2.86	206.0	4918.7	3.6	98	220.0	3.8	98
4/3/2019	3.41		0.0					
4/4/2019	3.06	167.0	4257.7	3.6	98	166.0	6.2	96
4/5/2019	2.95		0.0					
4/6/2019	2.99		0.0					
4/7/2019	2.90	175.0	4231.1	4.6	97	182.0	10.6	94
4/8/2019	3.22		0.0					
4/9/2019	3.35	181.0	5052.4	2.6	99	260.0	4.3	98
4/10/2019	3.27		0.0					
4/11/2019	3.14	165.0	4322.3	3.9	98	176.0	6.4	96
4/12/2019	3.03		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
4/13/2019	3.50		0.0					
4/14/2019	3.30	158.0	4348.5	2.3	99	178.0	4.5	97
4/15/2019	3.85		0.0					
4/16/2019	3.48	166.0	4817.9	2.3	99	176.0	5.5	97
4/17/2019	3.27		0.0					
4/18/2019	3.26	185.0	5026.8	0.0	100	193.0	0.0	100
4/19/2019	3.23		0.0					
4/20/2019	3.30		0.0					
4/21/2019	3.38	181.0	5103.8	0.0	100	194.0	0.0	100
4/22/2019	3.60		0.0					
4/23/2019	3.64	146.0	4426.1	0.0	100	147.0	0.0	100
4/24/2019	3.50		0.0					
4/25/2019	3.33	183.0	5076.2	2.8	98	204.0	4.1	98
4/26/2019	3.57		0.0					
4/27/2019	4.00		0.0					
4/28/2019	3.62	137.0	4130.4	0.0	100	154.0	2.5	98
4/29/2019	3.49		0.0					
4/30/2019	2.31	212.0	4086.0	0.0	100	168.0	3.7	98
5/1/2019	3.22		0.0					
5/2/2019	3.20	178.0	4746.0	2.1	99	200.0	4.8	98
5/3/2019	3.15		0.0					
5/4/2019	3.21		0.0					
5/5/2019	3.47	104.0	3007.1	0.0	100	107.0	3.6	97
5/6/2019	3.62		0.0					
5/7/2019	3.42	101.0	2878.3	0.0	100	117.0	3.5	97
5/8/2019	3.21		0.0					
5/9/2019	3.05	109.0	2769.0	0.0	100	110.0	3.7	97
5/10/2019	2.95		0.0					
5/11/2019	2.80		0.0					
5/12/2019	3.38	260.0	7333.5	0.0	100	305.0	4.5	99
5/13/2019	3.51		0.0					
5/14/2019	3.49	137.0	3988.7	0.0	100	136.0	0.0	100
5/15/2019	3.31		0.0					
5/16/2019	3.19	163.0	4333.8	0.0	100	180.0	3.5	98
5/17/2019	3.09		0.0					
5/18/2019	3.00		0.0					
5/19/2019	2.96	171.0	4221.4	0.0	100	220.0	6.4	97
5/20/2019	2.90		0.0					
5/21/2019	2.95	163.0	4010.3	0.0	100	154.0	4.8	97
5/22/2019	2.62		0.0					
5/23/2019	2.61	184.0	4008.3	0.0	100	191.0	5.3	97
5/24/2019	2.65		0.0					
5/25/2019	2.58		0.0					
5/26/2019	2.57	228.0	4885.0	2.9	99	247.0	8.9	96
5/27/2019	2.50		0.0					
5/28/2019	2.42	202.0	4073.6	2.2	99	242	4.5	98

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
5/29/2019	2.43		0.0					
5/30/2019	2.60	146.0	3163.4	4.5	97	168.0	7.1	96
5/31/2019	2.50		0.0					
6/1/2019	2.44		0.0					
6/2/2019	2.40	182.0	3644.4	2.5	99	208.0	4.5	98
6/3/2019	2.38		0.0					
6/4/2019	2.32	205.0	3968.2	2.0	99	221.0	3.0	99
6/5/2019	2.32		0.0					
6/6/2019	2.36	225.0	4430.4	3.8	98	259.0	3.8	99
6/7/2019	2.31		0.0					
6/8/2019	2.26		0.0					
6/9/2019	2.19	183.0	3336.3	2.1	99	211.0	3.5	98
6/10/2019	2.31		0.0					
6/11/2019	2.76	222.0	5108.2	4.2	98	246.0	4.9	98
6/12/2019	2.36		0.0					
6/13/2019	3.00	277.0	6921.3	4.0	99	304.0	5.5	98
6/14/2019	2.78		0.0					
6/15/2019	2.68		0.0					
6/16/2019	2.66	155.0	3433.4	2.4	98	183.0	6.0	97
6/17/2019	2.59		0.0					
6/18/2019	2.69	203.0	4557.6	2.4	99	179.0	3.8	98
6/19/2019	2.72		0.0					
6/20/2019	2.88		0.0			191.0	4.7	98
6/21/2019	3.19		0.0					
6/22/2019	2.75		0.0					
6/23/2019	2.89	173.0	4166.9	0.0	100	187.0	4.2	98
6/24/2019	2.66		0.0					
6/25/2019	3.39	160.0	4522.3	8.7	95	168.0	9.5	94
6/26/2019	3.24		0.0					
6/27/2019	2.98	154.0	3824.8	3.0	98	146.0	5.8	96
6/28/2019	2.85		0.0					
6/29/2019	2.80		0.0					
6/30/2019	2.71	171.0	3862.0	4.0	98	169.0	7.7	95
7/1/2019	2.67		0.0					
7/2/2019	2.63	209	4580.8	10.4	95	187	13.1	93
7/3/2019	2.63		0.0					
7/4/2019	2.61	228	4964.9	10.1	96	213	12.6	94
7/5/2019	2.64		0.0					
7/6/2019	2.63		0.0					
7/7/2019	2.40	240	4793.8	4.8	98	243	7.2	97
7/8/2019	2.34		0.0					
7/9/2019	2.32	213	4114.2	9.7	95	220	3.3	99
7/10/2019	2.31		0.0					
7/11/2019	2.54	240	5078.1	6.5	97	239	7.3	97
7/12/2019	2.71		0.0					
7/13/2019	2.36		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
7/14/2019	2.28	230	4367.7	4.7	98	225	6.0	97
7/15/2019	2.32		0.0					
7/16/2019	2.25	184	3458.9	8.9	95	183	8.9	95
7/17/2019	2.31		0.0					
7/18/2019	2.49	231	4802.9	11.8	95	337	8.0	98
7/19/2019	2.40		0.0					
7/20/2019	2.34		0.0					
7/21/2019	2.28	239	4540.6	7.2	97	236	0.0	100
7/22/2019	2.58		0.0					
7/23/2019	3.87	214	6899.9	30.9	86	309	41.6	87
7/24/2019	3.45		0.0					
7/25/2019	2.95	173	4254.9	8.0	95	193	8.7	95
7/26/2019	2.84		0.0					
7/27/2019	2.70		0.0					
7/28/2019	2.68	121	2701.5	8.8	93	134	10.0	93
7/29/2019	2.62		0.0					
7/30/2019	2.55	222	4712.0	8.6	96	218	3.9	98
7/31/2019	2.74		0.0					
8/1/2019	2.49	222.0	4606.5	7.4	97	240.0	0.0	100
8/2/2019	2.43		0.0					
8/3/2019	2.41		0.0					
8/4/2019	2.35	279.0	5463.5	7.0	97	338.0	6.3	98
8/5/2019	2.35		0.0					
8/6/2019	2.31	241.0	4638.9	8.8	96	232.0	0.0	100
8/7/2019	2.33		0.0					
8/8/2019	2.40	233.0	4659.8	11.9	95	270.0	0.0	100
8/9/2019	2.28		0.0					
8/10/2019	2.16		0.0					
8/11/2019	2.13	262.0	4649.9	5.9	98	284.0	4.0	99
8/12/2019	2.12		0.0					
8/13/2019	2.42	265.0	5339.6	32.8	88	318.0	22.4	93
8/14/2019	2.31		0.0					
8/15/2019	2.24	211.0	3947.1	11.3	95	277.0	8.2	97
8/16/2019	2.24		0.0					
8/17/2019	2.58		0.0					
8/18/2019	2.19	246.0	4482.8	10.5	96	341.0	7.4	98
8/19/2019	2.29		0.0					
8/20/2019	2.18	236.0	4298.6	10.8	95	244.0	8.7	96
8/21/2019	2.24		0.0					
8/22/2019	2.17	235.0	4258.9	13.4	94	300.0	9.0	97
8/23/2019	2.21		0.0					
8/24/2019	2.04		0.0					
8/25/2019	2.01	207.0	3475.2	7.7	96	217.0	5.5	97
8/26/2019	1.99		0.0					
8/27/2019	2.00	294.0	4891.7	14.7	95	280.0	6.7	98
8/28/2019	2.24		0.0					

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
8/29/2019	2.34	232.0	4523.7	12.8	94	214.0	5.5	97
8/30/2019	2.13		0.0					
8/31/2019	2.13		0.0					
9/1/2019	2.16		0.0					
9/2/2019	2.31	290.0	5587.0	22.4	92	318	9.6	97
9/3/2019	2.27	303.0	5728.8	17.9	94	367	12.5	97
9/4/2019	2.28		0.0					
9/5/2019	2.28	271.0	5157.6	16.3	94	230	15.2	93
9/6/2019	4.29		0.0					
9/7/2019	2.13		0.0					
9/8/2019	2.15	271.0	4854.8	14.6	95	361	11.0	97
9/9/2019	2.15		0.0					
9/10/2019	2.17	236.0	4263.2	16.6	93	223	9.9	96
9/11/2019	2.22		0.0					
9/12/2019	2.41	248.0	4986.7	18.4	93	267	7.1	97
9/13/2019	2.10		0.0					
9/14/2019	2.10		0.0					
9/15/2019	2.14	230.0	4110.7	22.6	90	255	13.3	95
9/16/2019	2.13		0.0					
9/17/2019	2.09	429.0	7477.7	12.0	97	663	10.2	98
9/18/2019	2.07		0.0					
9/19/2019	2.05	205.0	3496.3	14.2	93	246	13.1	95
9/20/2019	2.01		0.0					
9/21/2019	1.99		0.0					
9/22/2019	2.15	297.0	5323.0	13.3	96	342	10.0	97
9/23/2019	2.08		0.0					
9/24/2019	2.67	294.0	6549.2	36.6	88	376	19.8	95
9/25/2019	2.22		0.0					
9/26/2019	2.23	367.0	6816.4	12.3	97	322	12.3	96
9/27/2019	2.10		0.0					
9/28/2019	2.07		0.0					
9/29/2019	2.07	237.0	4095.5	15.8	93	250	9.8	96
9/30/2019	2.11		0.0					
10/1/2019	2.15	313.0	5602.0	21.1	93	277	11.9	96
10/2/2019	2.16		0.0					
10/3/2019	2.08	269.0	4673.1	13.3	95	300	10.1	97
10/4/2019	2.07		0.0					
10/5/2019	1.95		0.0					
10/6/2019	2.02	328.0	5514.8	13.6	96	296	12.1	96
10/7/2019	2.17		0.0					
10/8/2019	2.06	312.0	5360.3	14	96	278	10.1	96
10/9/2019	2.34		0.0					
10/10/2019	2.22	239.0	4431.0	11.1	95	262	12.1	95
10/11/2019	2.00		0.0					
10/12/2019	1.78		0.0					
10/13/2019	1.72	259.0	3719.6	8.49	97	265	7.4	97

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
10/14/2019	1.84		0.0					
10/15/2019	2.04	296.0	5043.4	10.7	96	374	9.5	97
10/16/2019	2.04		0.0					
10/17/2019	2.32	246.0	4753.6	16.8	93	339	9.1	97
10/18/2019	2.28		0.0					
10/19/2019	2.18		0.0					
10/20/2019	2.18	285.0	5174.5	13.9	95	297	9.1	97
10/21/2019	2.24		0.0					
10/22/2019	2.44	178.0	3617.8	20.4	89	179	9.2	95
10/23/2019	2.30		0.0					
10/24/2019	2.49	224.0	4653.6	14.2	94	237	10.5	96
10/25/2019	2.23		0.0					
10/26/2019	2.15		0.0					
10/27/2019	3.54	213.0	6286.8	49.8	77	245	47.4	81
10/28/2019	3.07		0.0					
10/29/2019	2.82	212.0	4978.9	15.9	93	203.0	11.6	94
10/30/2019	2.84		0.0					
10/31/2019	2.90	176.0	4262.6	13.1	93	176.0	9.6	95
11/1/2019	2.78		0.0					
11/2/2019	2.57		0.0					
11/3/2019	2.54	225.0	4760.7	10.9	95	200.0	6.2	97
11/4/2019	2.55		0.0					
11/5/2019	3.06	253.0	6456.7	31.1	88	232.0	11.3	95
11/6/2019	3.00		0.0					
11/7/2019	2.77	183.0	4221.5	16.7	91	185.0	13.1	93
11/8/2019	2.60		0.0					
11/9/2019	2.44		0.0					
11/10/2019	2.39	178.0	3542.1	12.4	93	218.0	9.6	96
11/11/2019	2.49		0.0					
11/12/2019	2.55	208.0	4425.3	20.5	90	232.0	7.8	97
11/13/2019	2.48		0.0					
11/14/2019	2.47	159.0	3271.4	17.1	89	433.0	9.8	98
11/15/2019	2.39		0.0					
11/16/2019	2.30		0.0					
11/17/2019	2.34	212.0	4142.6	10.8	95	261.0	7.5	97
11/18/2019	2.45		0.0					
11/19/2019	2.50	236.0	4922.6	19.0	92	277.0	8.9	97
11/20/2019	2.40		0.0					
11/21/2019	2.42	208.0	4205.0	20.6	90	230.0	9.4	96
11/22/2019	2.28		0.0					
11/23/2019	2.40		0.0					
11/24/2019	3.26	257.0	6987.4	13.0	95	385.0	8.8	98
11/25/2019	2.83		0.0					
11/26/2019	2.64	138.0	3035.0	17.2	88	144.0	6.5	95
11/27/2019	2.54		0.0					
11/28/2019	2.31	201.0	3875.7	16.5	92	290.0	4.2	99

Date	Flow	Inf BOD		Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
11/29/2019	2.27		0.0					
11/30/2019	2.29		0.0					
12/1/2019	2.62	172.0	3754.0	9.1	95	203.0	7.8	96
12/2/2019	3.21		0.0					
12/3/2019	3.02	174.0	4386.9	19.3	89	207.0	8.6	96
12/4/2019	2.98		0.0					
12/5/2019	2.97	201.0	4972.0	28.5	86	209.0	9.3	96
12/6/2019	2.90		0.0					
12/7/2019	2.77		0.0					
12/8/2019	2.73	168.0	3820.9	11.6	93	215.0	7.0	97
12/9/2019	4.31		0.0					
12/10/2019	4.37	139.0	5060.2	18.2	87	260.0	12.3	95
12/11/2019	3.91		0.0					
12/12/2019	3.61	135.0	4058.9	14.2	89	130.0	9.0	93
12/13/2019	3.56		0.0					
12/14/2019	5.75		0.0					
12/15/2019	4.46	171.0	6360.6	7.5	96	294.0	5.1	98
12/16/2019	3.96		0.0					
12/17/2019	4.15	135.0	4671.4	7.8	94	184.0	7.0	96
12/18/2019	4.01		0.0					
12/19/2019	3.59		0.0					
12/20/2019	3.28	139.0	3798.9	9.5	93	110.0	7.7	93
12/21/2019	3.11		0.0					
12/22/2019	3.02	209.0	5269.3	24.0	89	315.0	9.1	97
12/23/2019	3.03	224.0	5651.2	15.3	93	194.0	9.9	95
12/24/2019	2.88		0.0					
12/25/2019	2.63		0.0					
12/26/2019	2.72	150.0	3401.5	13.6	91	151.0	10.3	93
12/27/2019	2.72							
12/28/2019	2.64							
12/29/2019	2.59	152.0		13.1	91	137.0	10.2	93
12/30/2019	4.34	331.0		17.9	95	579.0	12.6	98
12/31/2019	4.42							

	FLOW	BOD INF		BOD EFF	%	TSS INF	TSS EFF	%
Average	2.62	234	2312	11	95	261	8	97
90 percentile	3.54	306		22	99	349	13	99
80 percentile	3.14	278		17	98	299	10	98
Median	2.39	220		10	96	233	7	97
count	1826.00							
count >4	85.00							
Count >5	21.00							
% above 80 %	5%							
% above 5 mgd	1%							
		5116.263						
Max	9.99							

	Date	Flow	Inf BOD	Eff BOD	% removal	Inf TSS	Eff TSS	% Removal
Min		1.46						

APPENDIX G

FACT SHEET

APPENDIX G

FACT SHEET
MICRO-BREWERIES / DISTILLERIES / WINERIES
REQUIREMENTS

1. Provide a detailed process flow diagram of the distilling process and the pretreatment system.

2. No solids from the wastestream can be discharged into the wastewater collection system. All solids, such as spent hops, trub, diatomaceous earth, spent yeast, mash, fermenting solids, etc. are to be hauled off-site for disposal.

3. The process wastewater must be separate from all domestic wastestream(s). There are to be no direct connections into the collection system from the process drain. The facility will be required to install a sampling manhole outside after the pretreatment process, but before it combines with the domestic waste.

   The process wastewater must be discharged into an equalization tank (or basin) where the pH levels can be adjusted to the permitting range of between 5.5 and 9.5 s.u. (standard units). Once an acceptable pH level has been achieved, the wastewater can be discharged to the collection system. The wastewater flow and pH must be recorded daily during the discharge and submitted to the Town monthly.

   It is the intention of the Town of South Kingstown to limit BOD and TSS for the existing industrial users to remain at a maximum daily limit of 519 mg/l and impose a surcharge in concentrations above 250 mg/l.

   For those facilities classified under the following SIC codes 2082, 2084, and 2085 the Ordinance will be based on a mass loading in lbs/day which will be allocated to specific industries in a mass allocation method. This will allow for controlling the future influent while allowing for some flexibility for small industrial sources-growth is expected to be in small scale micro-breweries, wineries, and distilleries. This report proposes allowing 50% of the available 541 lbs/day BOD (271 lbs/day) and 50% of the 328 lbs/day TSS (164 lbs/day) as a mass limit with the best management practices in place for those industries categorized as follows:

   2082 Malt Beverages
   2084 Wines, Brandy, and Brandy spirits
   2085 Distilled and Blended Liquors

   This will allow for micro-breweries and/or distillers which is defined as micro-breweries that produce less than 15,000 barrels of product per year (1 barrel = 31 gals.) to discharge with economical best management practices while larger breweries and/ or

distillers that exceed 15,000 barrels per year will be required to install more sophisticated pretreatment equipment.

For these industries to be allowed a mass-based limit, they must establish Best Management Practices which includes equalization, neutralization, and solids capture as outlined in the Fact Sheet (Appendix G).

Based on the maximum BOD of 271 lbs/day, the allocation for the current users will be based on their current wastewater flow.

Whalers Breweries	70%	189 lbs/day
Shaidzon Beer Co.	20%	54 lbs/day
Sons of Liberty Beer & Spirits	10%	27 lbs/day

The remaining 50% will be retained for future growth for those SIC codes.

Based on the maximum TSS of 164 lbs/day, the allocation for the current users will be based on their current wastewater flow.

Whalers Breweries	70%	115 lbs/day
Shaidzon Beer Co.	20%	33 lbs/day
Sons of Liberty Beer & Spirits	10%	16 lbs/day

The remaining 50% will be retained for future growth for those SIC codes.

4. Monthly composite sampling must be taken during the wastewater discharge. The samples must be analyzed by a certified laboratory for BOD, Total Suspended Solids, pH, Total Nitrogen and Phosphorus. These results are to be submitted by the 15th day of the following month to the Town.