

**SEWER SYSTEM MASTER PLAN UPDATE
FOR
CSO ABATEMENT**

TOWN OF SKOWHEGAN, MAINE

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EXECUTIVE SUMMARY

The Town of Skowhegan operates a wastewater collection and treatment system that serves about 1500 connected sewer users representing a sewered population of just under 5,000 people. Wastewater is collected by a complex network of sewers and pump stations and conveyed to the central treatment plant site on Joyce Street. The plant has an average daily design flow capacity of 1.65 MGD and a peak hourly capacity of 7.5 MGD. The sewer system consists of over 161,000 LF, or over thirty miles, of pipe and eleven pump stations and consists of two major districts, North and South, as separated by the Kennebec River. A siphon carries flows under the river from the North District to the South District in order to reach the treatment plant.

A large portion of the Town's sewer system has historically been combined, meaning that both sanitary sewage and stormwater flows from street catchbasins are carried in the same pipes. Eighty percent of the sewer system was originally combined, but this number has decreased to about forty-five percent as a result of previous sewer improvements. Prior to the construction of the wastewater treatment plant in 1973, all flows were discharged to the Kennebec River, so it made no difference if stormwater and sewage were mixed together in the same pipes. In fact, the presence of peak stormwater flows was considered beneficial since they provided periodic flushing of the sewer lines. With the construction of the downstream treatment plant, excess flows in the sewer system are now problematic since they can overload the facility and hinder its ability to treat the sanitary sewage for which it was designed.

Excess flows from groundwater infiltration, stormwater inflow and inflow induced infiltration periodically allow high flows to enter the sewer system and overwhelm its hydraulic capacity. As a result, when the wastewater treatment plant was constructed in 1973, ten combined sewer overflow (CSO) relief points were added to the system to allow excess flows to be discharged untreated to the Kennebec River. Evolving environmental regulations over the last five decades require communities with CSO discharges to implement a Master Plan for CSO abatement as a condition of their wastewater discharge licenses. The Master Plan must present a pathway moving forward for the eventual elimination of all CSO activity up to a reasonable threshold storm. CSO Master Plans must be updated every five years. The Town of Skowhegan's current CSO Master Plan was approved by DEP back in May, 2012. It listed a series of excess flow remediation projects that the Town proposed to complete over a twenty-year period from 2012 to 2032. The Town has chosen to move ahead faster than the approved schedule due to the availability of favorable interest rates and to avoid the escalation of construction costs from normal construction inflation. The Town's wastewater discharge license required that a CSO Master Plan Update be submitted to DEP by December 31, 2019. The update must show the current status of the Town's sewer system with regard to CSO activity, must describe the efforts that the Town has implemented to-date to reduce CSO discharges, and must provide an updated schedule for further CSO abatement projects in the future.

Of the original ten CSO locations in the Skowhegan sewer system, only six remain licensed at the present time. The six CSO points that remain are the North Side Footbridge (No. 003), Joyce Street/Treatment Plant (No. 004), Elm Street Pump Station (No. 005), Bush Street (No. 007), South Side Footbridge (No. 008), and the Water Street/North Street CSO storage tank and pump station (No. 010). The CSO at Bush Street is inactive, but has been kept licensed until some additional upstream work can be completed.

Table 1 reviews total CSO activity and volume losses in Skowhegan over the last nineteen years:

TABLE 1: SKOWHEGAN’S OBSERVED CSO ACTIVITY SINCE 2001

YEAR	DAYS WITH ACTIVE CSO	VOLUME LOST (MG)	AVERAGE LOSS PER EVENT (MG/INCH)
2001	95	12.32	0.130
2002	115	10.88	0.095
2003	77	22.77	0.296
2004	53	12.08	0.228
2005	81	47.87	0.591
2006	81	31.31	0.387
2007	55	21.60	0.393
2008	58	61.96	1.068
2009	17	6.07	0.357
2010	23	7.55	0.328
2011	21	4.76	0.227
2012	25	4.24	0.170
2013	36	4.75	0.132
2014	28	3.07	0.110
2015	24	6.79	0.283
2016	23	4.17	0.181
2017	23	0.74	0.032
2018	21	4.38	0.209
2019	21	1.63	0.078

The data presented above in Table 1 shows that CSO activity and volume loss are trending in the right direction as a result of the Town’s ongoing CSO abatement efforts. In the initial years of the Town’s CSO program, it was common to average just under 80 active CSO days per year. In the years since the last Master Plan Update, the number of CSO days has been reduced to about 21 per year. This represents a reduction of almost 74 percent. Similarly, the volume of untreated sewage lost out the CSO points originally averaged about 27.6 MG/YR. In the last five years since the previous CSO Master Plan

Update, volumes losses have been reduced by about 87 percent to only 3.54 MG/YR. The typical volume of sewage loss from each CSO event has decreased from an average of 0.303 MG/event at the beginning of the CSO abatement program to an average of 0.157 MG/event over the last five years since the most recent Master Plan Update. While the Table 1 data shows annual fluctuations as the result of changes in storm magnitude and intensity, the trend shows favorable results.

The Town submitted its last Master Plan Update to DEP in 2012. While the approved CSO project schedule was based upon a twenty-year implementation period up through 2032, the Town decided to proactively move ahead at an accelerated pace. This allowed the Town to take advantage of the lower interest rates and the construction prices that were available in the then current economy. Table 2 lists the CSO abatement projects that have been completed by the Town during the seven years that have passed since the completion of the 2012 CSO Master Plan Update:

TABLE 2: RECENTLY COMPLETED CSO ABATEMENT PROJECTS

<u>YEAR COMPLETED</u>	<u>PROJECT AREA</u>	<u>SEWER LENGTH</u>
2014	Hesselton Street sewers	1,200 LF
	Island Avenue pump station	300 LF
2015	Winter Street sewers	1,000 LF
	Summer Street sewers	1,650 LF
	Bennet Street sewers	1,450 LF
	Chandler Street sewers	1,200 LF
	Dane Street sewers	500 LF
	East Maple Street sewers	900 LF
	Main Street sewers	3,000 LF
	Alder Street sewers	2,100 LF
	Willow Street sewers	850 LF
	Bailey Street sewers	600 LF
	Green Street sewers	200 LF
	Bloomfield Street sewers	1,100 LF
2016	Joyce Street sewers	2,400 LF
	Mount Pleasant Street sewers	1,600 LF
	Olive Street sewers	400 LF
	Center Street sewers	500 LF
	Ash Street sewers	350 LF
	Pleasant Street sewers	150 LF
2018	North Avenue sewers	4,000 LF
<u>TOTAL SEWER LENGTH</u>		<u>25,500 LF</u>

As shown above in Table 2, the Town has completed 25,500 LF of sewer separation and remediation work since the completion of the last Master Plan Update. This represents over 4.85 miles of sewer work, or about 16 percent of the entire Skowhegan sewer system.

The Town was required to assess the status of its CSO abatement program and submitted this updated plan in December, 2019. As part of the current CSO Master Plan Update, the Town conducted system wide flow gauging in 2019 to determine areas of the sewer system with the most significant remaining excess flows. The flow monitoring work identified the following areas of the sewer system where remaining large areas of excess flow were noted:

- Sewer system areas that have recently been rehabilitated showed good excess flow reduction results. Areas that had not yet been rehabilitated showed similar excess flow levels as those reported in the previous 2012 Master Plan.
- As high flows were removed from some areas of the system, other adjacent flows that had been masked by the high flows were identified in the recent work. These areas are discussed below.
- The Dickie subdivision was identified in the previous Master Plan as an area of interest for future evaluation. During the current Master Plan Update, additional television inspection and monitoring in this area showed all sewers and manholes to be in extremely poor condition with large amounts of excess flow entering. This includes leaking sewers, brick and block manholes that are leaking and connected catchbasins on some streets in the subdivision including Procelly Drive, Dominic Street, Patrick Street, Edwards Street, Dennis Street and Michael Street. Total flows above 350,000 GPD per inch of rain were measured. These flows impact the Joyce Street CSO (No. 004) which is downstream and nearby. This entire sewer system is in extremely poor condition and should be replaced to reduce excess flows, but also because of its poor structural condition. There are four connected catchbasins in this system which could be removed as part of a separate, smaller project if sufficient funds are not available to do a complete project at the present time.
- The Mary Street sewer is part of a former State Correctional Facility and was found to have elevated levels of inflow. This area was found to contribute about 60,000 GPD of excess flow per inch of rainfall. Some of the excess flows may originate in old building sewers versus the main line. The manholes in this area are in poor condition and should be replaced. There is also a connected storm drain system which could easily be separated. This area flows into Elm Street CSO No. 005.

- Connected catchbasins in the downtown Water Street area that impact the river siphon and the North Side Footbridge CSO No. 003 appear to be readily removable with a fairly small project. There is a nearby storm drain to the river into which these basins might be connected.
- The Maple Street sewer is still combined and contributes excess flow to the North Avenue sewer where it currently impacts the Storage Tank CSO. 010. Peak flows above 300,000 MGD per inch of rainfall were measured.
- Excess flows from a private housing development off Bloomfield Street were found to be contributing large amounts of flow on two streets, namely Sesame Street and Big Bird Street. Peak flows up to 0.30 MGD were measured. These flows impact the Southside Footbridge CSO No. 008. Because these sewers are part of a private mobile home park, additional discussions and negotiations will be needed to remove these flows. It would be beneficial for the Town to have those sewer lines inspected by television camera so that the full extent of the problem can be assessed.
- As part of a previous project in the Joyce Valley sewer area, a separation project on Milburn Street was designed and bid as an alternate. It was deleted from the project due to cost issues. That work could be completed at this time if funds allow.

Preliminary planning level cost estimates for each of these projects are presented below in Table 3. No construction costs are provided for the likely required work on Sesame Street and Big Bird Street since these are private sewers in a mobile home park.

TABLE 3: PRELIMINARY COST ESTIMATES FOR IDENTIFIED EXCESS FLOW REMOVAL PROJECTS

LOCATION	ESTIMATE
Dickie Subdivision sewer rehabilitation*	\$ 1,965,000
Mary Street sewer separation	335,000
Water Street sewer separation	245,000
Maple Street sewer rehabilitation	620,000
Big Bird Street/Sesame Street (TV inspect)	15,000
Milburn Street sewer separation	295,000
TOTAL	\$ 3,475,000

**NOTE: The listed cost estimate for the Dickie Subdivision is for a complete rebuild of the system. A smaller project to separate four connected catch basins could be conducted for about \$185,000.*

As shown above, the preliminary cost estimate for work in the identified sewer system areas is \$3,475,000. This represents a significant investment beyond the level which the Town may feel ready to commit to at the present time. The Town's last DEP approved

2012 CSO Master Plan Update committed the Town to expending \$2,674,000 on CSO abatement projects between 2012 and the present Master Plan Update. As discussed, the Town previously made the decision to borrow \$11.88 million dollars in order to accelerate the implementation of its CSO program. To-date, the Town has expended \$10.80 million dollars to complete projects well ahead of schedule. Some of the completed projects were not scheduled to be completed until 2032. The Town presently has about \$1.08 million dollars in left over funds from the previous sewer work. In order to keep sewer operating costs stable, and due to the fact that the Town has proactively completed many sewer projects ahead of the required schedule, the Town should consider using the remaining \$1.08 million dollars in funds to complete projects identified in this Master Plan Update without the need to borrow additional funds.

Table 3 provided a list of additional CSO abatement projects that were identified during flow gauging work conducted as part of the present CSO Master Plan Update. The Town could propose to address those areas of its sewer system to the extent that costs for the next planning period through 2024 can remain within the available \$1.08 million dollars in funds that remain from past sewer work. Projects that can be completed within this budget are shown below in Table 4:

TABLE 4: PROPOSED 2019 CSO MASTER PLAN UPDATE PROJECTS

<u>PROJECT</u>	<u>COST ESTIMATE</u>
Dickie Subdivision catchbasin separation	\$ 185,000
Mary Street sewer separation	335,000
Water Street sewer separation	245,000
Milburn Street sewer separation	295,000
Big Bird Street/Sesame Street sewer TV inspection	15,000
<u>TOTAL</u>	<u>\$ 1,075,000</u>

The estimated cost of implementing the projects listed in Table 4 is about \$1,075,000 which essentially represents the fund balance of \$1.08 million dollars left over from previous CSO abatement projects. These projects will remove excess flows from many areas of the sewer system and will be beneficial at multiple CSO discharge points.

The Town could implement this added sewer work as part of a single large construction project as shown below in Table 5:

TABLE 5: PROPOSED CSO ABATEMENT PROJECT IMPLEMENTATION
SCHEDULE

<u>DATE</u>	<u>PROJECT</u>
December, 2019	Complete CSO Master Plan Update
December, 2020	Complete sewer system improvements design
March, 2021	Place sewer project out to bid
April, 2021	Award project to general contractor
May, 2021	Begin construction
December, 2022	Complete construction
January – February, 2023	Conduct additional sewer flow gauging
December, 2024	Complete CSO Master Plan Update

1. SKOWHEGAN'S SEWER SYSTEM CSO ISSUES

1.1 OVERVIEW

Skowhegan's municipal sewerage system was designed to convey and treat sanitary wastewater from residential, commercial, and institutional sewer users. However, excess flows from groundwater infiltration, stormwater inflow and inflow induced infiltration periodically allow high flows to enter the system and overwhelm its hydraulic capacity. As a result, when the wastewater treatment plant was constructed in 1973, ten combined sewer overflow (CSO) relief points were added to the system to allow excess flows to be discharged untreated to the Kennebec River. Evolving environmental regulations over the last five decades require communities with CSO discharges to implement a Master Plan for CSO abatement as a condition of their wastewater discharge licenses. The Master Plan must present a pathway moving forward for the eventual elimination of all CSO activity up to a reasonable threshold storm. CSO Master Plans must be updated every five years. The Town of Skowhegan's current CSO Master Plan was approved by DEP back in May, 2012. It listed a series of excess flow remediation projects that the Town proposed to complete over a twenty-year period from 2012 to 2032. The Town has chosen to move ahead faster than the approved schedule due to the availability of favorable interest rates and to avoid the escalation of construction costs from normal construction inflation. The Town's wastewater discharge license requires that a CSO Master Plan Update be submitted to DEP by December 31, 2019. This document fulfills that requirement. It shows the current status of the Town's sewer system with regard to CSO activity, it describes the efforts that the Town has implemented to-date to reduce CSO discharges, and it provides an updated schedule for further CSO abatement projects in the future.

1.2 SKOWHEGAN'S MUNICIPAL SEWERAGE SYSTEM

The Town of Skowhegan operates a wastewater collection and treatment system that serves about 1500 connected sewer users (1800 equivalent residential and commercial users) representing a sewered population of just under 5,000 people. Wastewater is collected by a complex network of sewers and pump stations and conveyed to the central treatment plant site on Joyce Street. The plant has an average daily flow capacity of 1.65 MGD and a peak hourly capacity of 7.5 MGD. The sewer system consists of over 161,000 LF, or over thirty miles, of pipe and eleven pump stations and consists of two major districts, North and South, as separated by the Kennebec River. A siphon carries flows under the river from the North District to the South District in order to reach the treatment plant. The general configuration of the Town's municipal sewer system is shown on Figure 1.

A large portion of the Town's sewer system has historically been combined, meaning that both sanitary sewage and stormwater flows from street catchbasins are carried in the same pipes. Eighty percent of the sewer system was originally combined, but this

number has decreased to about forty-five percent as a result of previous sewer improvements. Prior to the construction of the wastewater treatment plant in 1973, all flows were discharged to the Kennebec River, so it made no difference if stormwater and sewage were mixed together in the same pipes. In fact, the presence of peak stormwater flows was considered beneficial since they provided periodic flushing of the sewer lines. With the construction of the downstream treatment plant, excess flows in the sewer system are now problematic since they can overload the facility and hinder its ability to treat the sanitary sewage for which it was designed.

Typical sizes of the Town's gravity collector and interceptor sewers range from 8" Ø to 72" Ø. These sewers are constructed of a variety of different pipe materials including vitrified clay (VCP), asbestos cement (ACP), polyvinyl chloride (PVC), and reinforced concrete (RCP). Almost forty-four percent of the sewer system is constructed of vitrified clay and asbestos cement pipe, both of which are considered to be substandard by current design practices. Many of the Town's clay pipe sections are likely fifty to one-hundred years old. Clay pipes were often laid with open, leaking joints at three foot intervals. This pipe material is also brittle and prone to cracking which allows groundwater to enter the sewer. Asbestos cement pipe was likely used fifty to sixty years ago, but has fallen out of favor due to safety issues related to the asbestos fibers. In addition, the cement that holds the fibers together is prone to deterioration in the presence of moisture and hydrogen sulfide sewer gas. This has led to the failure of ACP sewers and this material is no longer used. The remaining sewer lines, representing just over fifty-six percent of the system, are constructed of newer pipe materials such as PVC, HPDE, and RCP. These lines are in good condition and likely installed within the last fifty years.

The presence of such a large percentage of clay and asbestos cement pipes, representing about thirteen miles of the total sewer system, makes the Skowhegan system prone to excess flows from groundwater infiltration. In addition, the fact that about forty-six percent, or almost fourteen miles, of the system is combined with connected catchbasins makes the system prone to excess flows from peak stormwater events. During periods of heavy precipitation from rainfall and snowmelt events, the volume of peak stormwater inflow from street catchbasins, roof drains and cellar drains can exceed the capacity of both the sewer system and the downstream wastewater treatment plant. Peak flows can also overwhelm the pumping stations that are used to lift flows over elevation changes in the system. When the capacities of the sewer pipes, pump stations or treatment plant are exceeded, the excess flows backup and are discharged untreated to the Kennebec River through combined sewer overflow (CSO) points.

The natural topography of the Skowhegan area allows the majority of the sewer system’s flows to reach the treatment plant site by gravity. With the exception of the siphon structure which uses differential elevation head to convey flows below the Kennebec River from the North District to the South District, all of the Town’s major sewer lines and interceptors utilize gravity flow. Eleven pump stations are located at various points throughout the system to lift flows up over topographical elevation differences to the nearest gravity sewer. These pump stations are shown on Figure 1 and listed in Table 1. Nine of the pump stations are located on the North side of the river with the remaining two on the South side.

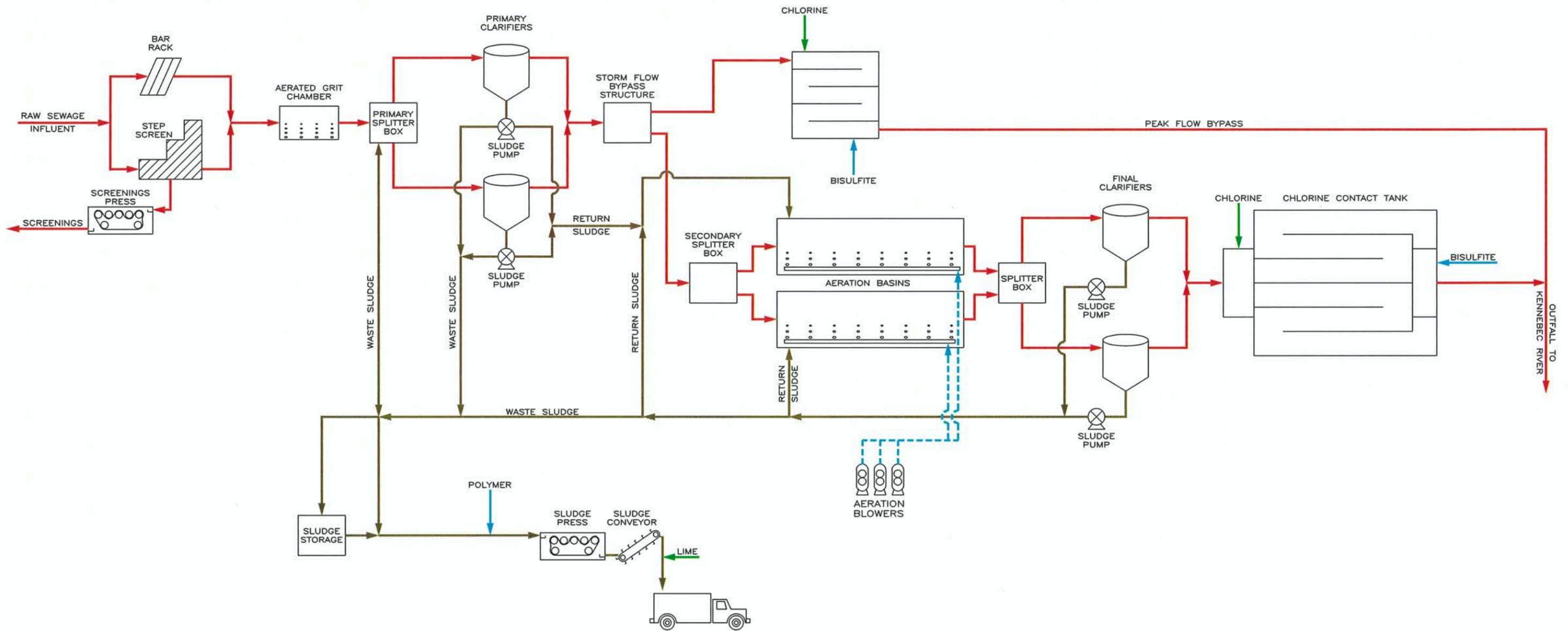
TABLE 1: SKOWHEGAN’S WASTEWATER PUMPING STATIONS

<u>PUMP STATION</u>	<u>GENERAL SERVICE AREA</u>
Dinsmore Street PS	Dinsmore Street area
Dr. Mann PS	Upper North Avenue area
Elm Street PS	Coburn/Summer/Bennett St./Norridgewock Ave. areas
Heselton Street PS	Heselton/Lower Malbons Mills/Dr. Mann areas
Island Avenue PS	Island Avenue area
Malbons Mills PS	Upper Malbons Mills area
Norridgewock Avenue PS	Mary Street area
Merrithew Drive PS	Merrithew Drive/Waterville Road areas
Shopping Center PS	Lakewood Road area
Wallace Farms PS	Wallace Farms Road area
CSO Storage Tank	Downtown Stormwater Storage

All flows from both the North and South sides of the sewer system eventually reach a 2600 LF long interceptor sewer along the south bank of the Kennebec River between the siphon outlet near Cedar Street and the treatment plant off Joyce Street. The majority of the interceptor sewer is constructed of 24” Ø RCP pipe, but some initial sections just after the siphon discharge were designed as 16” Ø and 20” Ø sections in order to regulate peak flow volumes to the plant.

The Town’s wastewater treatment plant was constructed in 1972 to remove pollutants from sewage prior to its discharge into the Kennebec River as clean, treated effluent. The facility utilizes the activated sludge process to provide secondary level treatment to the incoming wastewater. This is accomplished by a series of unit processes that progressively treat the wastewater as it flows through the plant. The facility’s original unit processes were augmented by a peak flow upgrade that was completed in 2004 and an aeration system/clarifier upgrade that was completed in 2013.

Figure 2 shows a schematic presentation of the treatment plant’s unit processes. Influent flows first receive preliminary treatment in the plant’s headworks. Debris is



TOWN OF SKOWHEGAN
 POLLUTION CONTROL FACILITY TREATMENT
 PROCESS SCHEMATIC

FIGURE 2

removed from the influent by screening and sand and gravel are removed in a grit chamber. The influent flow is also measured and sampled. Flows then receive primary treatment in two 40' Ø clarifiers which serve as settling basins to remove pollutants by gravity sedimentation. Raw sludge is pumped from these reactors for subsequent dewatering.

Two aeration basins, each holding about 185,000 gallons of water, are used to grow microbes that biodegrade the organic pollutants in the primary effluent. The incoming pollutants are converted to either microbial cells that can be settled from the water or carbon dioxide gas which is released to the atmosphere. Oxygen to support the microbial activity in the reactors is provided by positive displacement blowers and fine bubble diffusers.

Microbes from the aeration basins are settled in two 50' Ø final clarifiers. The microbes settle to the bottom of the reactors as secondary sludge leaving clean water above the sludge blanket. The clarified effluent is sent to a chlorine contact tank for disinfection while the microbes are pumped back to the aeration basins to treat additional wastewater.

The plant has two effluent disinfection reactors. Normal flow levels are treated in a two cell chlorine contact tank with each cell containing about 25,000 gallons. This reactor provides about 40 minutes of detention time at average flow loadings and just under 15 minutes at peak hourly flows. A second chlorine contact tank was added in 2004 to treat peak flows during storm events. This reactor adds about 30,000 gallons of detention time that is used to disinfect peak stormwater loadings that enter the plant during rainfall and precipitation events.

Raw sludge from the primary clarifiers and excess microbial cells that are periodically wasted from the biological system are cosettled and then dewatered on a two meter belt filter press. The sludge is treated with polymer to enhance dewatering and with lime for odor and pathogen control prior to its final disposal.

Treated effluent from the chlorine contact tank is discharged to the Kennebec River via a 24" Ø RCP outfall pipe. The outfall contains both treated secondary effluent during normal flow periods as well as chlorinated primary effluent that is generated in the peak flow reactor during wet weather events.

The treatment plant is licensed to discharge a monthly average flow of 1.65 MGD through its normal secondary treatment system. When peak hourly flows into the plant exceed its peak flow design capacity, excess flows are diverted to the peak flow disinfection reactor. The plant's normal effluent must meet typical secondary standards of 30 mg/l (milligrams per liter) for both monthly average biochemical oxygen demand (BOD) and total suspended solids (TSS). Between May 15 and September 30, the effluent must be disinfected to an E. coli bacteria level of no more

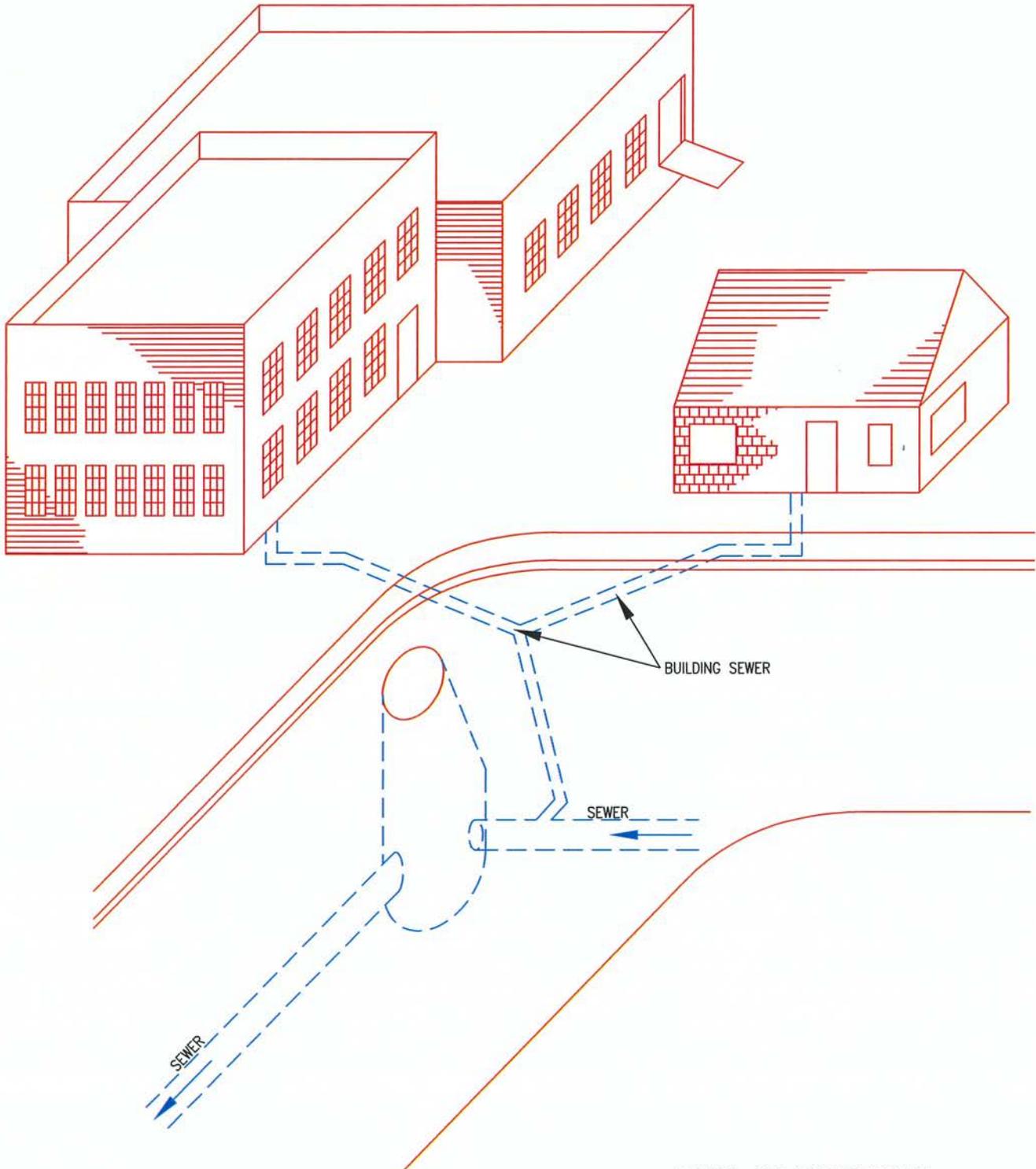
than 64 col/100 ml (colonies per 100 milliliters) on a monthly average basis and 427 col/100 ml on a peak daily basis. E. coli levels during peak stormwater events must also meet the 427 col/100 ml standard through the peak flow disinfection reactor.

1.3 IMPACT OF EXCESS SEWER FLOWS ON SEWERAGE SYSTEM

Skowhegan's wastewater treatment plant was designed in 1972 with an average daily flow capacity of 1.44 MGD and a peak hourly flow capacity of 4.68 MGD. With the addition of the peak flow disinfection system in 2004, the plant's capacity was upgraded to an average daily flow of 1.65 MGD and a peak hourly capacity of 7.5 MGD. These capacities are sometimes exceeded due to the presence of excess groundwater infiltration into old, leaking sewer lines and the entry of stormwater inflow into the system from combined sewers, catchbasins, roof drains and cellar sump pumps. The fact that about forty-four percent of the sewer system is constructed with old clay and asbestos pipes makes it prone to groundwater infiltration entry. In addition, the fact that forty-five percent of the sewer system is still combined makes it susceptible to peak flow variations from stormwater inflow.

The poor condition of large segments of the Skowhegan sewer system, as well as the fact that some areas of the sewer system remain combined with sanitary flow and storm flows that are present together in the same pipes, serves as the basis for the high peak flows that are observed. A review of sewer system flows suggests that far greater volumes of flow are present than would be caused by sanitary sewage flows alone. There are typically several major sources of flow generation into the municipal sewer system as follows:

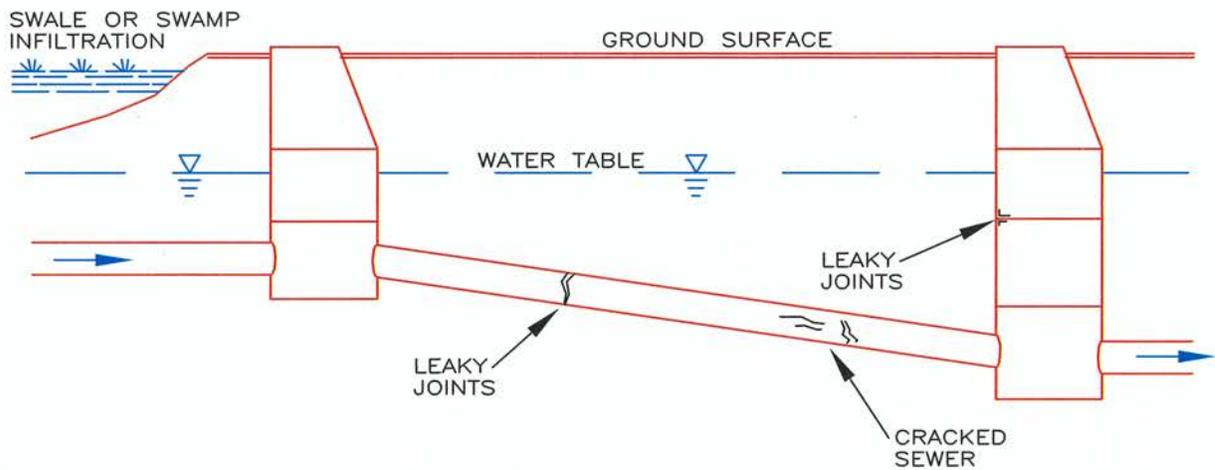
- Base sanitary flow is a measure of the raw sewage generated by homes, businesses, industrial applications, and commercial users throughout the community. Sanitary flows are the flow component for which the construction of wastewater treatment facilities was generally intended. Figure 3 shows the typical route of sanitary flow entering into the sewer system through a series of building sewers, manholes, and sewer pipes.
- Peak hourly sanitary flow is generally estimated by applying a statistical peaking factor to the base sanitary flow. For a community of Skowhegan's size, it is typical to observe a peak sanitary flow rate that is about three to four times the base sanitary flow rate. These peak flow periods occur throughout the day in response to fluctuating water use patterns by the sewer users. It is not uncommon to experience a maximum peak flow in the system early in the morning as sewer users rise and shower and then throughout the day in relation to noon and evening meal periods.



TOWN OF SKOWHEGAN
TYPICAL SANITARY FLOW ORIGINS

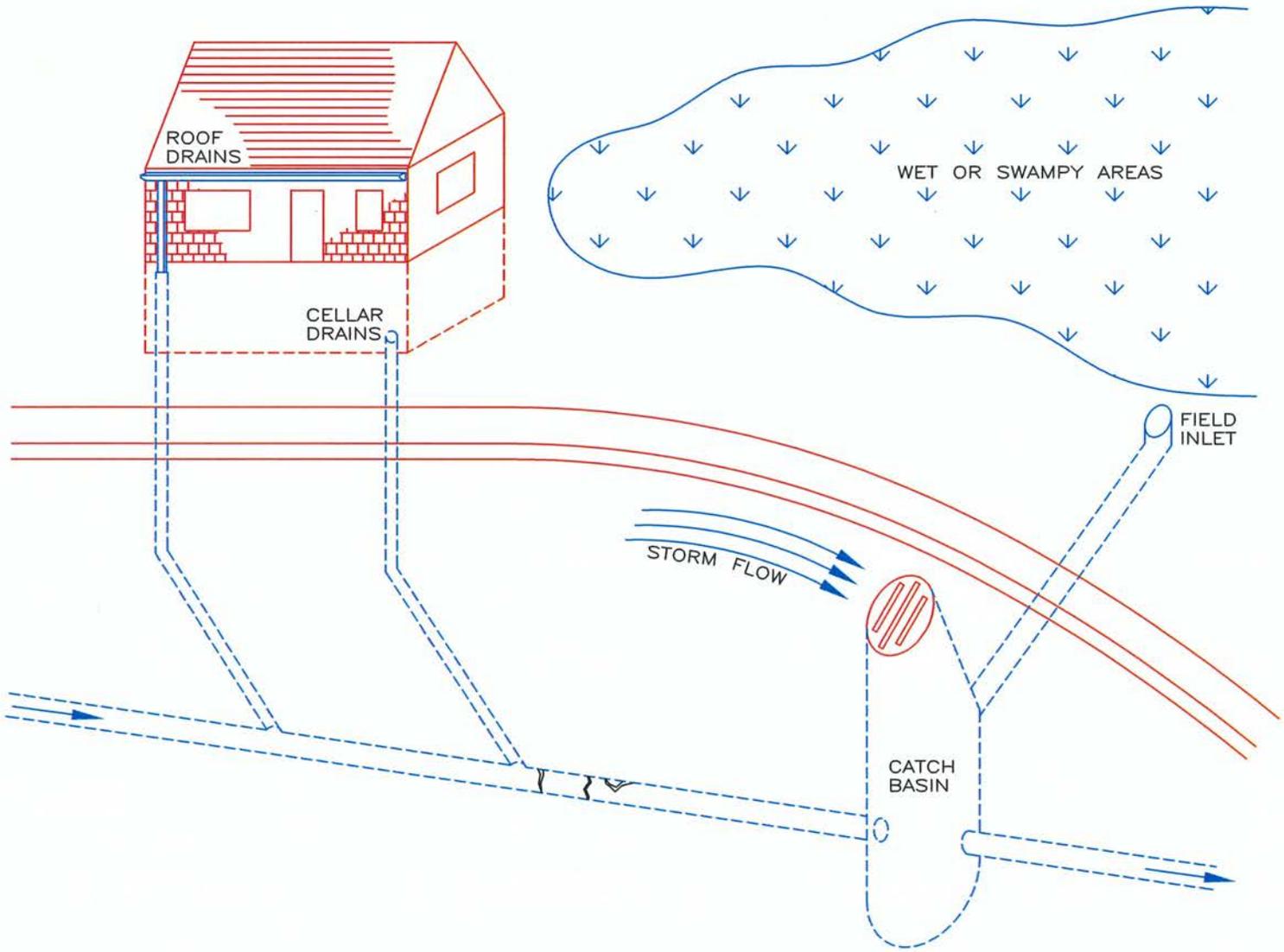
FIGURE 3

- Infiltration is the introduction of extraneous groundwater into sewer systems through defective pipes, pipe joints, service connections, and manhole walls. The rate of infiltration into the system is generally at its annual peak each Spring corresponding to the highest elevation of the groundwater table. Figure 4 shows the typical origins of sewer system groundwater infiltration.
- Stormwater inflow is the largest single source of extraneous water entering the Skowhegan sewerage system. It consists of stormwater which enters through catchbasins in combined sewers, separated storm sewers that reconnect to the sewer system, and roof, cellar, and underdrains from buildings which are connected to the collection system. Inflow can also come from above ground drainage ditches or streams which intersect catchbasins or field inlets and then flow into the sewer system. The magnitude of stormwater inflow into a sewer system depends on the frequency, duration, and rainfall amount during various storm events. It also depends on ground cover conditions, soil conditions, groundwater saturation levels, and frozen ground conditions at the time of the storm. For example, a similar rain event falling on dry soil during Summer conditions may have less of an impact on the sewer system than the same event falling onto frozen Winter ground conditions or saturated Spring groundwater conditions. A two-inch rainfall that occurs gradually over twenty-four hours will have less of an impact on the sewer system than a Summer thunderstorm that causes two inches of rain to fall in a few hours. While the extent of peak inflow into a sewer system can be highly variable, the adverse impact of inflow on a sewer or treatment system can be severe. Inflow represents sudden, peak flow variations that can rapidly enter a sewer system and cause overflows or process washouts. This type of sudden flow impact is in contrast to that of groundwater infiltration which tends to occur more gradually and that represents a background level of flow that varies seasonally. Inflow events show up as peak spiked flows in the sewer system and treatment plant. Figure 5 shows typical sources of sewer system inflow.
- Inflow induced infiltration represents the net effect of inflow and infiltration into a sewer system. Rainfall from inflow events can cause temporary changes in the local groundwater table as precipitation soaks into the soil. This elevation of the groundwater table causes an increase in the static pressure of water over old and leaking sewer pipes and a subsequent increase in groundwater infiltration into the pipes. Inflow induced infiltration is manifested by a gradual rise in background infiltration levels that occurs after a rainfall event and that may take several days to subside after the storm event ends.



TOWN OF SKOWHEGAN
 TYPICAL GROUNDWATER INFILTRATION SOURCES

FIGURE 4



TOWN OF SKOWHEGAN
 TYPICAL STORMWATER INFLOW SOURCES

FIGURE 5

- Snowmelt represents additional wet weather flow that occurs each Spring as elevated ambient temperatures cause a gradual loss of the snowpack. Overland runoff of melting snow may find its way into catchbasins, field inlets, and streams that are the source of inflow into the sewer system. Snowmelt also results in the eventual elevation of the groundwater table under Spring saturation conditions which is often coincident with the onset of peak annual sewer system groundwater infiltration.

In the most recent 2012 CSO Master Plan Update, flows to the wastewater treatment plant were evaluated in terms of their sanitary, infiltration, and inflow components. Since 2012, the Town has completed a large number of CSO abatement projects. This has reduced the amount of flow that the treatment plant receives. From the flow data presented in the Town's monthly DEP reporting forms, the following observations were made with regard to the amount of sewer system loadings that reach the wastewater treatment plant:

- During the 2012 Master Plan, the average daily flow to the plant on all days, including wet weather events, was 1.150 MGD. At the present time, total flow has dropped by 24 percent to 0.88 MGD as a result of recent CSO abatement projects.
- If wet weather days are omitted, the average daily dry weather flow was 0.955 MGD back in 2012, but this has been reduced by about 27 percent to 0.70 MGD now.
- The maximum sustained, thirty-day monthly flow at the plant was 2.082 MGD in 2012. This occurred during April when groundwater infiltration, snowmelt, and Spring rain events were prevalent. Over the last two years, this value has been reduced by 17 percent to about 1.73 MGD.
- In 2012, the maximum recorded daily flow was 3.263 MGD. This occurred in March during a peak flow rainfall event in conjunction with snowmelt. During the last three years, the maximum daily recorded flow was reduced by 6 percent to 3.08 MGD.
- The peak hourly dry weather flow received at the plant was typically about 1.85 MGD in 2012. After the recent CSO reduction efforts, this has been reduced by 12 percent to about 1.63 MGD.
- The base inflow impact on the treatment plant can be significant and varies over the year. The average base inflow impact caused an average daily flow rise of 0.90 MGD per inch of rainfall over the entire year back in 2012.

Currently, this impact has been reduced to about 0.75 MGD per inch of rainfall which represents a 17 percent reduction.

- Peak hourly inflow impacts are the origin of most of the system’s excess flow problems. The impact of inflow on the plant’s peak hourly flow averages 4.25 MGD per inch of rainfall. This impact has remained fairly constant. Even though peak flows sources into the sewer system have been reduced, storm intensities have increased over the last few years.

The data discussed above shows that dry weather average and peak flows to the treatment plant are well within its design capacity. Wet weather events are the primary cause of CSO activity either through direct inflow or indirectly through inflow induced infiltration. The extent of the CSO activity is dependent upon the magnitude, frequency and intensity of the rainfall event. Table 2 lists the typical frequency, magnitude and storm intensity for the Skowhegan area.

TABLE 2: STORM MAGNITUDE FREQUENCY FOR SKOWHEGAN

<u>STORM RETURN FREQUENCY</u>	<u>STORM MAGNITUDE (INCHES/DAY)</u>	<u>STORM INTENSITY (INCHES/HOUR)</u>
3 Month	1.35	0.06
6 Month	1.75	0.07
9 Month	2.00	0.08
1 Year	2.40	0.10
2 Year	2.70	0.11
5 Year	3.50	0.15
10 Year	4.10	0.17
25 Year	4.70	0.20

In previous CSO Master Plans, Skowhegan has used a threshold storm frequency of one-year in evaluating inflow effects. At a one-year storm event of 2.70 inches/day, the average daily flow to the treatment plant will increase by about 2.03 MGD. The plant should be able to process this flow; however, the peak hourly flow could spike up to 12 MGD. This would exceed the treatment plant’s capacity and trigger upstream CSO activity. More severe twenty-five year frequency storms have often been used in CSO assessments. For Skowhegan, that would consist of 4.70 inches/day of rainfall. This would cause the plant’s average daily base flow to increase by about 3.53 MGD and its peak hourly flow to spike at a rate of about 21 MGD. CSO activity would be triggered in both cases since the plant cannot accept such flows.

While the previously discussed flow data shows significant reductions between corresponding data in 2012 versus the present data, wet weather flows into the sewer system still have the potential to trigger CSO activity in Skowhegan.

The above analysis suggests that the treatment plant is generally very stable and loaded at below its design capacity during dry weather periods. The plant can also process sustained wet weather flows. Peak wet weather events, especially those that occur concurrent with periods of snowmelt or high groundwater, remain the primary cause of CSO activity in Skowhegan. The Town's CSO abatement efforts have substantially reduced the amount of CSO activity from previous levels.

1.4 SKOWHEGAN'S COMBINED SEWER OVERFLOW POINTS

Because excess groundwater infiltration and stormwater inflow contribute to sewer system flows that are periodically greater than the capacity of the sewerage system and downstream wastewater treatment plant, ten combined sewer overflow (CSO) points were originally incorporated into the Skowhegan sewer system. One of these was removed over twenty years ago and three more have been effectively removed in recent years as a result of CSO abatement efforts. The remaining six CSO points have been the focus of recent CSO Master Plans. The locations of each of these overflow points is summarized below in Table 3:

TABLE 3: SKOWHEGAN'S CSO DISCHARGE LOCATIONS

<u>CSO NO.</u>	<u>CSO LOCATION</u>	<u>CURRENT STATUS</u>
003	North Side Footbridge	Active
004	Joyce Street/Treatment Plant	Active
005	Elm Street Pump Station	Active
007	Bush Street	Inactive
008	South Side Footbridge	Active
010	Water Street/North Avenue CSO PS	Active

Of the original ten CSO locations in the Skowhegan sewer system, only six remain licensed at the present time. The six CSO points that remain licensed are the North Side Footbridge (No. 003), Joyce Street/Treatment Plant (No. 004), Elm Street Pump Station (No. 005), Bush Street (No. 007), South Side Footbridge (No. 008), and the Water Street/North Street CSO storage tank and pump station (No. 010). The CSO at Bush Street is inactive, but has been kept licensed until some additional upstream work can be completed.

Table 4 reviews total CSO activity and volume losses in Skowhegan over the last nineteen years:

TABLE 4: SKOWHEGAN'S OBSERVED CSO ACTIVITY SINCE 2001

YEAR	DAYS WITH ACTIVE CSO	VOLUME LOST (MG)	AVERAGE LOSS PER EVENT (MG/INCH)
2001	95	12.32	0.130
2002	115	10.88	0.095
2003	77	22.77	0.296
2004	53	12.08	0.228
2005	81	47.87	0.591
2006	81	31.31	0.387
2007	55	21.60	0.393
2008	58	61.96	1.068
2009	17	6.07	0.357
2010	23	7.55	0.328
2011	21	4.76	0.227
2012	25	4.24	0.170
2013	36	4.75	0.132
2014	28	3.07	0.110
2015	24	6.79	0.283
2016	23	4.17	0.181
2017	23	0.74	0.032
2018	21	4.38	0.209
2019	21	1.63	0.078

The data presented above in Table 4 shows that CSO activity and volume loss are trending in the right direction as a result of the Town's ongoing CSO abatement efforts. In the initial years of the Town's CSO program, it was common to have just under 80 active CSO days per year. In the years since the last Master Plan Update, the number of CSO days has been reduced to about 21 per year. This represents a reduction of almost 74 percent. Similarly, the volume of untreated sewage lost out the CSO points originally averaged about 27.6 MG/YR. In the last five years since the last CSO Master Plan Update, volumes losses have been reduced by about 87 percent to only 3.54 MG/YR. The typical volume of sewage loss from each CSO event has decreased from an average of 0.303 MG/event at the beginning of the CSO abatement program to an average of 0.157 MG/event over the last five years since the most recent Master Plan Update. While the Table 4 data shows annual fluctuations as the result of changes in storm magnitude and intensity, the trend shows favorable results.

CSO activity can also be tracked by reviewing the monitoring results of the six remaining active CSO points as shown below in Table 5. Each of the Town's CSO structures is monitored to identify days when they become active. Detailed CSO discharges records for the nineteen year period between 2001 and 2019 are presented

in Appendix B of this report. The total number of CSO events that occurred each year during this period are summarized in Table 5 for each currently active and inactive CSO structure:

TABLE 5: OBSERVED CSO ACTIVATION EVENTS PER YEAR

CSO	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
002 (HESELTON PS)	24	30	36	11	8	6	0	0	0	0	0	0	0	0	0	0	0	0	0
006 (DINSMORE PS)	34	43	36	26	29	15	0	0	0	0	0	0	0	0	0	0	0	0	0
007 (BUSH ST)	25	26	38	24	36	27	15	0	0	0	0	0	0	0	0	0	0	0	0
010 (NORTH AVE)	34	19	27	27	40	31	19	40	7	11	4	7	3	4	3	6	1	5	2
003 (FOOTBRIDGE NO.)	34	59	40	49	68	72	52	1	2	3	7	11	10	14	18	16	12	6	7
009 (ISLAND PS)	10	52	48	56	65	62	35	20	2	11	12	4	14	0	0	0	0	0	0
005 (ELM ST PS)	15	14	16	12	33	9	5	8	6	13	3	9	8	10	5	2	1	5	5
008 (FOOTBRIDGE SO.)	17	21	13	7	16	13	10	8	7	11	11	12	15	12	10	6	8	1	3
004 (JOYCE ST/POTW)	84	99	63	40	46	17	12	21	11	22	19	22	36	17	24	23	23	21	23
TOTAL	277	363	317	252	341	252	148	98	35	71	56	65	86	57	60	53	45	38	40
TOTAL INCHES RAINFALL/YEAR	32.70	39.97	45.54	35.68	63.38	48.14	49.59	65.72	52.77	49.92	45.57	46.70	46.18	50.46	42.21	38.07	43.91	46.65	41.73
INDIVIDUAL CSO DAYS/YEAR	95	115	77	61	81	81	55	58	17	23	21	25	36	28	23	23	23	21	23

The data presented above in Table 5 shows the positive benefits that the Town’s CSO abatement programs have had on reducing annual CSO activity. This data shows the following:

- Annual CSO events have decreased from a high of 363 per year at the beginning of the program to an average of 41 events per year over the last three years. This represents an 89 percent reduction in CSO discharge frequency.
- Calendar days on which CSO activation occurred has decreased from a high of 115 at the beginning of the program to an average of only 22 days per year over the last three years. This represents a reduction of 81 percent.
- At the beginning of the CSO abatement program, the Town was experiencing a discharge of untreated sewage to the river about every one day in four, or twenty-six percent of all days. This frequency has been reduced to about four percent of the time, or roughly one day in sixteen.
- CSO events are heavily influenced by rainfall events. At the beginning of the CSO program, the Town experienced an average of 8.8 annual CSO events per inch of annual rainfall even though the annual rainfall was relatively low at only an average of 36.35 inch/year at the beginning of the program. As a result of the completed projects, the Town is now averaging only 0.93 CSO events per year per inch of annual rainfall.
- The Town has effectively eliminated four CSO discharge points at Heselton Street (No. 002), at Dinsmore Street (No. 006), Bush Street (No. 007) and Island Avenue (No. 009) as a result of its CSO abatement efforts. This represents a reduction of 44 percent in the number of active CSO locations.
- If the average number of CSO events per year for the first three years of the program are compared to the last three years, the following reductions in CSO activity at each location have occurred:

– CSO No. 002 (Heselton Street PS)	100% reduction
– CSO No. 006 (Dinsmore Street PS)	100% reduction
– CSO No. 007 (Bush Street)	100% reduction
– CSO No. 010 (North Avenue)	90% reduction
– CSO No. 003 (Footbridge North)	81% reduction
– CSO No. 009 (Island Avenue PS)	100% reduction
– CSO No. 005 (Elm Street PS)	53% reduction
– CSO No. 008 (Footbridge South)	77% reduction
– CSO No. 004 (Joyce Street/POTW)	73% reduction

The above data trends demonstrate that the Town is moving in the right direction with the CSO abatement measures that it has implemented to-date.

The Town has accomplished this by focusing on the construction of excess flow storage and treatment infrastructure as well as with sewer system separation and remediation projects. In the earliest versions of the Town's CSO Abatement Facilities Plan, it was determined that the separation and removal of excess flows from the sewer system would not be as cost-effective as storing or treating these flows. This recommendation was carried forward in subsequent Facilities Plan Updates. In the most recent 2012 CSO Master Plan Update, sewer system and remediation were recommended. As a result, the Town has been implementing a phased CSO abatement program which has included the following:

- The treatment plant's flow capacity was increased from 1.44 MGD to 1.65 MGD for average daily flow and from 4.68 MGD to 7.5 MGD for peak hourly flow.
- Several pump stations were upgraded to increase their peak flow capacities and to prevent the loss of excess flows from the CSO points that are located at these pump station sites.
- Modifications to the sewer system were made by adding restrictions or weirs that have increased the system's in-line storage capacity.
- Off-line storage was added that allowed peak hourly flows to be stored and then gradually released back into the sewer system.
- Sewer separation and rehabilitation projects have been constructed upstream in some of the leakiest areas of the sewer system.

To implement these CSO remediation efforts, the Town has expended about \$21.4 million dollars on projects that are directly related to CSO remediation as part of \$23.3 million dollars of total sewer system improvements. These expenditures have resulted in significant CSO activity reductions. The challenge that the Town faces going forward is to cost-effectively further reduce CSO discharges into the River. DEP has instituted a policy of placing CSO abatement schedules into the discharge licenses of the wastewater treatment plants that serve CSO communities. This means that the remediation schedule of future CSO projects will be part of the Town's discharge license. If the Town fails to meet the proposed schedule, this will constitute a discharge license violation that will be subject to potential enforcement action and fines. In addition, much of the previous CSO abatement work in Skowhegan was based on addressing the excess flows that are generated in a one-year frequency storm event of 2.40 inches/day of rainfall. DEP has been advocating the elimination of CSO activity in other communities at storm events of greater frequencies. This suggests

that Skowhegan will likely need to take additional steps in the future to reduce its CSO discharges beyond the levels that have been provided to-date.

1.5 OBJECTIVES OF CSO MASTER PLAN UPDATE

The Town's DEP wastewater discharge license requires Skowhegan's CSO Master Plan to be updated and submitted to the Department no later than December 31, 2019. Olver Associates Inc. was retained by the Town to assist in the preparation of this CSO Master Plan Update. Over the last year, we have reviewed all previous CSO data and reports that the Town provided and have conducted site visits to observe the overall configuration of the sewer system. We have conducted a detailed analysis of the Town's present CSO activity in terms of current wet weather precipitation events and have evaluated how previous CSO abatement projects have altered the sewer system's CSO response to these events. The entire sewer system was flow gauged during a number of high groundwater infiltration and stormwater inflow events in 2019 in order to determine areas of the system that still appear to represent the most significant origins of excess flow. Remediation projects that were recommended for implementation in the last 2012 Master Plan Update were reviewed to determine if they are still appropriate. The excess flow benefits of completed projects was reviewed. Cost estimates for remaining CSO abatement projects were updated. Once approved by the Maine DEP, this CSO Master Plan Update will become a part of Skowhegan's wastewater discharge license and the Town will be required to implement each project on the proposed schedule.

2. REVIEW OF 2012 CSO MASTER PLAN RECOMMENDATIONS

2.1 OVERVIEW

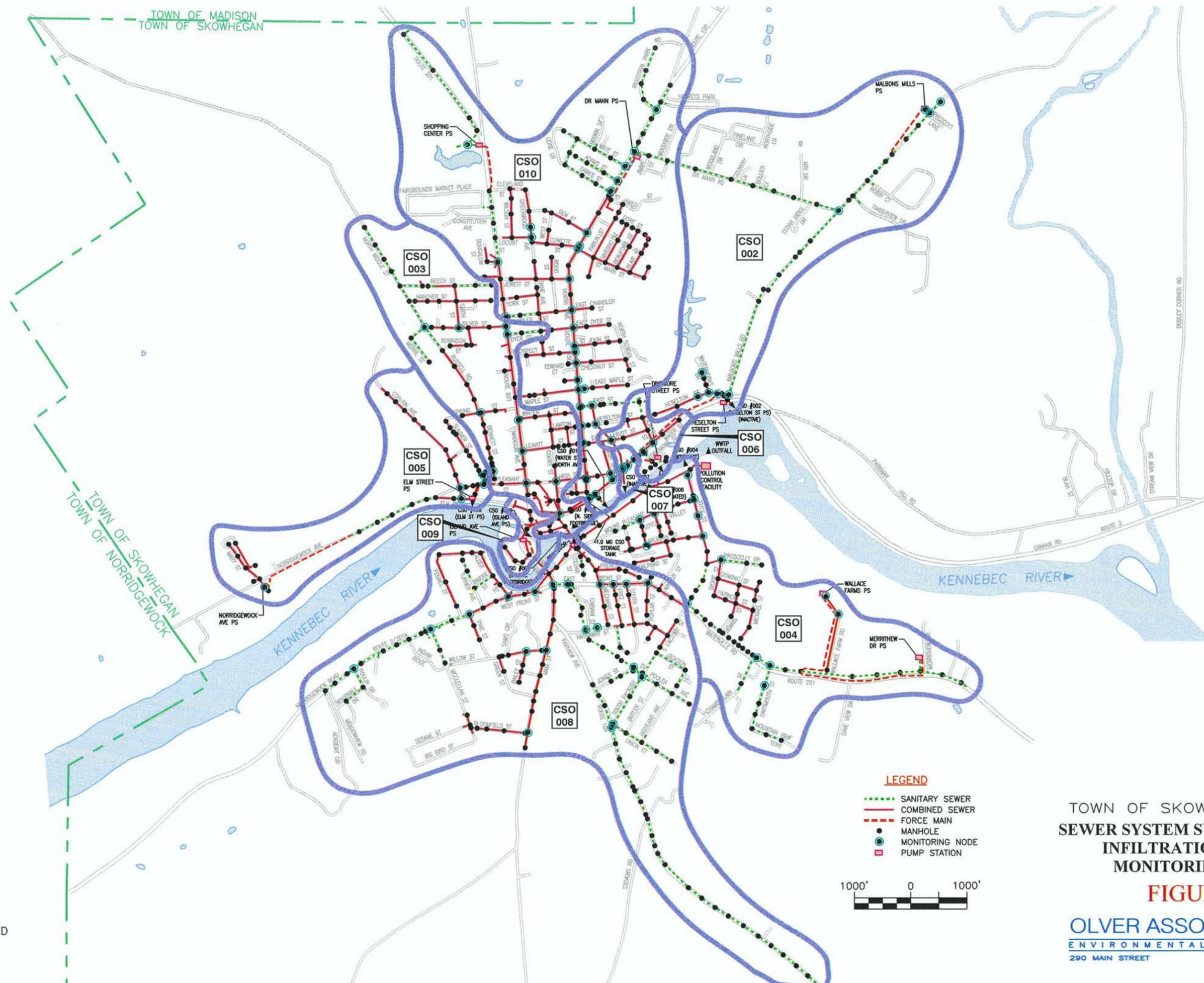
The Town completed its last CSO Master Plan Upgrade in 2012. Since then, the Town has been implementing the recommendations of that plan. While the former plan had a twenty-year implementation schedule leading all the way out to 2032, the Town unilaterally chose to accelerate the schedule and has already completed a majority of the identified projects. In this section of the current plant update, the recommendations from the previous Master Plan will be reviewed and the status of the implementation schedule considered.

2.2 INFILTRATION/INFLOW (I/I) EVALUATION

As part of the 2012 CSO Master Plan Update, an evaluation of excess infiltration and inflow (I/I) sources was conducted. The purpose of the I/I study was to assess areas of the sewer system that are subject to high flows. The sewer system was divided into twelve subsystems as shown in Figure 6. These subsystems correspond to the drainage areas of the Town's interceptor pumping stations and CSO areas. Flow measurements were made at various key manhole nodes throughout the sewer system to determine how the system responded to different groundwater infiltration and stormwater inflow conditions.

To the extent possible, flow gauging was scheduled in the evening or at night when sanitary flows in the sewer system were at a minimum. Flows were estimated by taking sewer flow depth measurements at steady-state groundwater and rainfall conditions. These flow depths were then converted into flow volume measurements using Manning's equation for full pipe flow as modified by a hydraulic elements analysis. Manhole inspections were conducted in conjunction with this work to trace sewer system peak flow locations, to observe pipe and manhole conditions, and to determine the types and sizes of sewer lines in order to calculate pipe capacity.

The total groundwater infiltration into the sewer system was found to reach a Spring peak of about 0.80 MGD. This value was consistent with the results reflected in the flow records of the downstream wastewater treatment plant. The overall groundwater leakage rate into the Skowhegan sewer system was about 4500 GPD/inch-mile throughout the whole sewer system and was not too excessive for the size and age of the system. However, individual streets were found to have much higher rates as shown below on Table 6:



SOURCE:
TOWN OF SKOWHEGAN AND
MAINE OFFICE OF GIS

TOWN OF SKOWHEGAN, MAINE
SEWER SYSTEM SUBSYSTEMS AND
INFILTRATION/INFLOW
MONITORING NODES

FIGURE 6

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

**TABLE 6: UNITIZED GROUNDWATER INFILTRATION BY SEWER
SUBSYSTEM (2012)**

<u>SUBSYSTEM</u>	<u>STREET</u>	<u>INFILTRATION (GPD)</u>	<u>RATE (GPD/INCH-MILE)</u>
<u>JOYCE STREET AREA</u>			
	Joyce Street	41,000	8,500
	Mount Pleasant Avenue	10,000	3,500
	Joyce Valley Sewer	84,000	17,000
	Milburn Street	5,000	2,500
	Cross-country to Waterville Rd.	18,000	7,000
	Dickie Street	25,000	4,500
	Prescelly Drive	5,000	4,500
	Waterville Road	4,000	2,500
	Dartmouth Street	8,000	2,500
<u>NORRIDGEWOCK ROAD AREA</u>			
	Norridgewock Road	35,000	6,500
	Alder Street	6,000	1,500
	Pine Street	3,000	4,000
	McClellan Street	1,000	1,000
	Poulin Drive	1,000	1,000
<u>MAIN STREET AREA</u>			
	Main Street	61,000	10,000
	Willow Street	10,000	6,500
	Bailey Street	48,000	53,000
	Bloomfield Street	6,000	3,000
<u>CURRIER BROOK AREA</u>			
	Pooler Avenue	1,000	500
	South Factory Street	1,500	1,000
	Fairview Avenue	1,500	200
	Union Street	200	200
<u>EAST FRONT STREET AREA</u>			
	East Front Street	3,000	500
	Mechanic Street	10,000	8,500
	Free Street	2,000	1,000
	South Street	1,000	800
	Poplar Street	1,000	1,000
	South Factory Street	1,000	1,500
<u>MARY STREET AREA</u>			
	Mary Street	15,000	7,000
<u>ELM STREET AREA</u>			
	Coburn Avenue	2,000	500
	Summer Street	34,000	2,000
	Bennett Street	1,500	1,000
	Russell Road	500	200
	Spring Street	1,500	1,000
	Silver Street Ext.	500	500

North Middle Street	500	200
<u>MADISON AVENUE AREA</u>		
Madison Avenue	80,000	9,000
Leavitt Street	2,000	1,000
Winter Street	30,000	15,000
Dyer Street	500	500
Silver Street	500	300
Smith Street	500	500
<u>COURT STREET AREA</u>		
Court Street	15,000	7,000
<u>NORTH AVENUE AREA</u>		
Lower North Avenue	22,000	3,000
Middle North Avenue	25,000	4,000
Upper North Avenue	2,500	300
East Leavitt Street	20,000	10,000
East Maple Street	5,000	3,000
Prospect Street	500	500
Chestnut Street	4,000	3,000
Chandler/Dane Street	40,000	11,000
Jewett Street	500	500
Cowette Street	7,000	2,000
East Dyer Street	500	500
Industrial Park Road	4,000	2,000
Greenwood Avenue	4,000	3,000
<u>WATER STREET AREA</u>		
Water Street	89,000	35,000
Bush Street	32,000	40,000
Leavitt Cross-country	19,000	10,000
<u>HESELTON STREET AREA</u>		
Heselton Street	10,000	2,000
TOTAL GROUNDWATER INFILTRATION	807,000	4,500

Flow gauging in sewer systems is not an exact science due to the variability in the data and the many factors that can influence the methods that were used. The purpose of the nighttime flow gauging was not to develop exact flow measurements of each sewer. Instead, the goal was to develop a general, comparative balance of the entire system in order to identify the worst areas of the system relative to each other. The flow data developed at each node was balanced proportionately to obtain a relative estimate of various groundwater infiltration flows at each street during Spring high conditions.

For a sewer system of this size, EPA guidelines suggest that leakage rates greater than 3,000 GPD/inch-mile would be considered excessive. This threshold is often difficult to meet in older sewer systems because many old, clay pipes typically leak at these rates or higher. As discussed, the overall leakage rate of 4,500 GPD/inch-mile for the

sewerage system at large exceeds EPA guidelines, but it is not unusual given the fact that forty-four percent of the system consists of old, substandard clay and asbestos pipe. While it is not practical to upgrade the entire system, selective projects were considered in areas that had leakage rates higher than 3,000 to 5,000 GPD/inch-mile. In addition, lines that were associated with a rate closer to 3,000 GPD/inch-mile, but that were associated with other factors were given a higher priority for remediation. These factors included maintenance problems on the line, overall poor structural condition of the pipes, its location upstream of a CSO or pump station, and whether or not the sewer pipe was also the source of peak stormwater inflow or inflow induced infiltration.

Peak wet weather inflow in the Skowhegan sewer system was estimated to be about 4.23 MGD of inflow per inch of daily rainfall. This determination was made by reviewing treatment plant flow records and conducting an analysis of the plant's response to peak flows on days when no overflow occurred. This response was then extrapolated to a database that included a range of storm events including a one-year and a twenty-five year design storm. Flow data was unitized to MGD per inch of rainfall in order to allow inflow volumes for various storm sizes to be determined.

Sewer system flows were also measured during a variety of storms and unitized to similar units of GPD/inch of rainfall. Flows throughout the sewer system were then compared to the modeled value that was predicted at the treatment plant. Minor calibrations and modifications to the sewer system data were made to allow it to mirror the flow response values expected at the treatment plant. Good correlation between the two models was obtained. Once calibrated flow data was determined for each subsystem, upstream sewer flow data was proportioned to allow a mass balance of the system to be conducted. The objective of this procedure was to allow a relative distribution of peak flows to be made based upon field measurements. The goal of this approach was not to obtain absolute measurements of existing flows at each location. Instead, a relative assessment of flow origins was made to allow the major problem areas of the sewer system subject to peak inflow to be identified.

The results of the balanced sewer system inflow data is provided below in Table 7:

TABLE 7: UNITIZED PEAK STORMWATER INFLOW RATES (2012)

<u>SUBSYSTEM</u>	<u>STREET</u>	<u>PEAK INFLOW (GPD/INCH)</u>
<u>JOYCE STREET AREA</u>		
	Joyce Street	136,000
	Mount Pleasant Avenue	50,000
	Joyce Valley Sewer	190,000
	Milburn Street	25,000
	Cross-country to Waterville Rd.	120,000
	Dickie Street	14,000
	Waterville Road	6,000

NORRIDGEWOCK ROAD AREA

Norridgewock Road	128,000
Alder Street	33,000
Pine Street	3,000
McClellan Street	3,000
Poulin Drive	6,000

MAIN STREET AREA

Main Street	650,000
Willow Street	31,000
Bailey Street	72,000
Bloomfield Street	250,000

CURRIER BROOK AREA

Jones Street	3,000
Pooler Avenue	3,000
South Factory Street	8,000
Fairview Avenue	8,000
Union Street	3,000

EAST FRONT STREET AREA

East Front Street	170,000
Poplar Street	6,000
Mechanic Street	28,000

MARY STREET AREA

Mary Street	45,000
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ELM STREET AREA

Summer Street	75,000
Bennett Street	58,000

MADISON AVENUE AREA

Madison Avenue	420,000
Leavitt Street	8,000
Winter Street	89,000
Dyer Street	3,000
Silver Street Ext.	3,000
Smith Street	3,000

COURT STREET AREA

Court Street	110,000
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NORTH AVENUE AREA

Lower North Avenue	320,000
Middle North Avenue	128,000
Upper North Avenue	83,000
East Leavitt Street	22,000
East Maple Street	8,000
Chestnut Street	8,000
St. John Street	65,000
Prospect Street	6,000
East Dyer Street	8,000

Chandler/Dane Street	170,000
Jewett Street	8,000
Waye Street	3,000
<u>WATER STREET AREA</u>	
Water Street	250,000
Bush Street	190,000
Leavitt Cross-country	170,000
<u>HESELTON STREET AREA</u>	
Heselton Street	35,000
<hr/>	
<u>TOTAL STORMWATER INFLOW</u>	<u>4.23 MGD/inch</u>

The data presented in Table 7 was intended to show how the peak inflow rate of 4.23 MGD/inch of rainfall that was observed in the sewer system can be balanced through the system based upon field gauging measurements. The relative ranking of each street in comparison to each other is more useful than assuming that the estimated values reflect actual flows for every storm. This is due to the many factors that influence rainfall events in the sewer system. In addition, the values were viewed as peak hourly rates, not sustained flows. Peak flows are more important than sustained flows in CSO analysis since peak flows trigger CSO activity. These flow estimates were useful to define upstream sewer remediation projects that should be considered based on the relative ranking of specific projects against each other.

Based on the field data obtained during the 2012 infiltration/inflow study and presented in the preceding discussion, each subsystem was summarized as follows:

1. Joyce Street area subsystem is located upstream of CSO No. 004. High groundwater infiltration loadings were noted on Joyce Street itself (8500 GPD/inch-mile), in the Joyce Valley sewer (17,000 GPD/inch-mile), in the cross-country sewer between Joyce Street and Waterville Road (7000 GPD/inch-mile), and in the newer adjacent subdivision streets of Dickie Street and Prescelly Drive (both at 4500 GPD/inch-mile). Many of these sewers are constructed of old clay and asbestos cement pipe and are prone to leakage. The sewers on Joyce Street, Joyce Valley, and the cross-country line to Waterville Road also exhibit a high total rate of inflow (446,000 GPD/inch of rainfall) between the three lines. Since there are few connected catchbasins to these lines, it is likely that the poor condition of the sewers is allowing inflow induced infiltration to occur. CSO No. 004 was active an average of 20 times per year over the then previous years and had lost an average of 22,000 GPD/inch of rainfall. Addressing the excess flows in these sewer lines would have a beneficial impact on CSO No. 004 although the CSO will still be impacted from all other upstream flows in the sewer system due to its location at the head of the treatment plant. In addition to the older sewers noted above, the Town should investigate the inflow rate of 14,000 GPD/inch of rainfall in the Dickie Street and Prescelly Drive subdivision. The subdivision is

supposed to have separated sewers which appear to allow more excess water to reach the Town's sewer system than would be expected.

2. Norridgewock Road area was found to have a measurably high rate of infiltration (6500 GPD/in-mi) as well as inflow (128,000 GPD/inch of rainfall) near the end of the line approaching the High School. This sewer should be checked to determine if roof drains, storm drains, or athletic field drains from the School are tied into the sewer system. The Norridgewock Road sewer system is constructed of clay and could be subject to infiltration and inflow induced infiltration. Alder Street has several connected catchbasins even though the road is next to the river. This is allowing an inflow rate of 33,000 GPD/inch of rainfall to enter. These streets are upstream of CSO No. 008 which overflows an average of 11 times per year at a CSO loss of 43,000 GPD/inch of rainfall. The Norridgewock Road area is currently not as large a factor in activation of CSO No. 008 as is the adjacent Main Street area subsystem.
3. Main Street area subsystem had high groundwater infiltration on Main Street (10,000 GPD/inch-mile) and on Bailey Street (53,000 GPD/inch-mile). Both of these lines are made of clay pipe and likely in poor condition. These two lines also have very high inflow rates with Main Street measured at 650,000 GPD/inch of rainfall and Bailey Street at 72,000 GPD/inch of rainfall. High inflow was observed on the two adjacent streets of Willow Street (31,000 GPD/inch of rainfall) and Bloomfield Street (250,000 GPD/inch of rainfall). All of these streets have combined sewers with connected catchbasins. These streets are a significant contributor to downstream CSO activity at CSO No. 008. There are also trailer parks in this area that could represent private sources of excess flow. The removal, storage or treatment of these peak flows will need to be addressed in order to reduce CSO discharges.
4. Currier Brook area subsystem has had recent sewer improvements done on several streets including the Hospital Valley sewer. No elevated levels of infiltration or inflow were noted in this area.
5. East Front Street area subsystem had elevated groundwater infiltration levels on Mechanic Street (8,500 GPD/inch-mile) even though this sewer was recently separated. Elevated levels of inflow were also recorded on Mechanic Street (28,000 GPD/inch) and on East Front Street (170,000 GPD/inch) even though we understand both areas to have had recent separation work. It may be helpful to inspect these areas by video camera to determine if these flow sources are from the Town's sewer or from private sources. Flows from this area would impact both CSO No. 008 as well as CSO No. 004 on Joyce Street. These flows are not of the same magnitude as those measured in the Joyce Street subsystem which is also upstream of CSO No. 004.

6. Mary Street area subsystem represents a small drainage area that has a disproportionate amount of excess flow. Sewers on the former prison property are leaking at 7,000 GPD/inch-mile with stormwater inflow rates of 45,000 GPD/inch of rainfall. These flows are impacting the downstream Elm Street CSO which was active an average of 8 times per year over the last two years with an average CSO loss of 43,000 GPD/inch of rainfall.
7. Elm Street area subsystem was receiving high flows from the upstream Mary Street area as well as excessive inflow from Summer Street (75,000 GPD/inch) and Bennett Street (58,000 GPD/inch). These sewers had sections of old clay pipe as well as connected catchbasins. Addressing peak flows in these three areas could eventually end CSO activity at the Elm Street pump station (CSO No. 005).
8. Island Avenue pump station subsystem was served by CSO No. 009 which was active an average of 12 times per year with small losses of 4,000 GPD/inch of rainfall. This station receives very little sanitary flow and may be impacted by surcharged catchbasins from the adjacent area. The old pneumatic ejector station was upgraded with a higher capacity submersible system. With minor modifications, it was noted that all CSO discharges at No. 009 could be stopped.
9. Madison Avenue area subsystem had high groundwater infiltration rates on Madison Avenue (9,000 GPD/inch-mile) and on Winter Street (15,000 GPD/inch-mile). These lines are constructed of old clay pipe and likely in poor condition. High stormwater inflow rates were also measured on these streets with Madison Avenue at 420,000 GPD/inch of rainfall and Winter Street at 89,000 GPD/inch. Both streets had combined sewers with connected catchbasins. Some sections of Madison Avenue appeared to have a separate storm drain that ties back into the sanitary sewer downtown. It was not clear if this line could be separated from the system. Flows from Madison Avenue impact the siphon CSO No. 003 and surcharge the Water Street sewer up to the CSO No. 010 storage tank. CSO No. 003 was active an average of five times per year with an average loss of 53,000 GPD/inch of rainfall. CSO No. 010 was active an average of 8 times per year with a loss of 952,000 GPD/inch of rainfall.
10. Court Street area subsystem had high infiltration flows from Court Street (7,000 GPD/inch-mile) as well as high inflow rates (110,000 GPD/inch). These flows impact both the CSO storage tank (No. 010) and the siphon inlet (CSO No. 003).
11. North Avenue area subsystem had high measured infiltration rates of 10,000 GPD/inch-mile on East Leavitt Street. High infiltration still remained on Chandler/Dane Streets with measured levels of 11,000 GPD/inch-mile. A greater excess flow impact is the inflow in this area from multiple sources such as North Avenue (531,000 GPD/inch of rainfall) and Chandler/Dane Street at 170,000

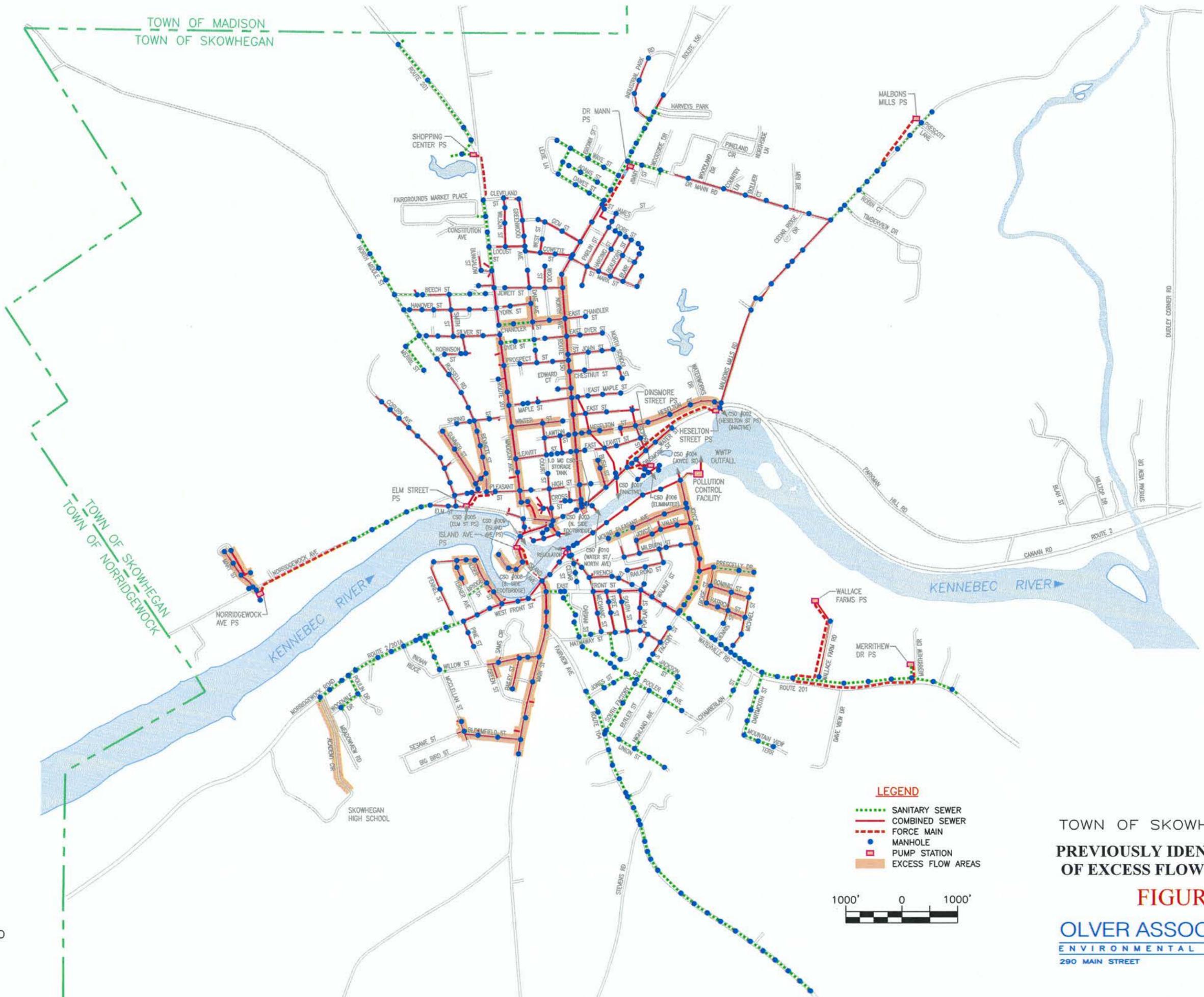
GPD/inch. These streets were the major sources of excess flow into CSO No. 003 and CSO No. 010.

12. Water Street area subsystem has major excess flow sources from Water Street (35,000 GPD/inch-mile of infiltration and 250,000 GPD/inch of inflow), Bush Street (40,000 GPD/inch-mile of infiltration and 190,000 GPD/inch of inflow) and the cross-country sewer from Leavitt Street (10,000 GPD/inch-mile of infiltration and 170,000 GPD/inch of inflow). These flows impact CSO activity at the North Footbridge (No. 003) and at the CSO storage tank (No. 010).

13. Heselton Street area subsystem had high levels of inflow on Heselton Street (35,000 GPD/inch of rainfall). These flows impact downtown CSO points at the North Footbridge (No. 003) and at the CSO storage structure (No. 010). The sewer on Heselton Street was in poor condition and was scheduled to be upgraded in the near future.

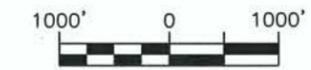
Figure 7 depicts the high excess flow area of the Skowhegan sewer system as noted in the above discussion.

Skowhegan's 2012 CSO Master Plan Update was approved by DEP to include the scheduled sewer separation and remediation projects listed below in Table 8:



LEGEND

- SANITARY SEWER
- COMBINED SEWER
- - - FORCE MAIN
- MANHOLE
- PUMP STATION
- EXCESS FLOW AREAS



SOURCE:
TOWN OF SKOWHEGAN AND
MAINE OFFICE OF GIS

TOWN OF SKOWHEGAN, MAINE
**PREVIOUSLY IDENTIFIED AREAS
OF EXCESS FLOW ORIGIN (2012)**

FIGURE 7

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

**TABLE 8: PROPOSED 2012 MASTER PLAN'S CSO PROJECT IMPLEMENTATION
SCHEDULE**

YEAR(S)	CSO ABATEMENT ACTIVITY	ESTIMATED PROJECT COST*	ESTIMATED BLOCK COSTS
2012	Submit CSO Master Plan	\$ 24,000	
	Heselton/Bush Street sewers	280,000	\$ 304,000
2013	Clean/video Dickie/Mary/High School area	20,000	
2013-2017	East Maple Street sanitary/storm sewers	420,000	
2013-2017	Winter Street sanitary/storm sewers	480,000	
2013-2017	Upgrade Island Avenue PS	510,000	
2013-2017	Mary Street sewer relining	100,000	
2013-2017	Summer Street sanitary sewer	400,000	
2013-2017	Bennett Street sanitary sewer	415,000	
2018	Update CSO Master Plan	25,000	\$ 2,370,000
2018-2022	Main Street sanitary sewer	945,000	
2018-2022	Alder Street storm sewer	365,000	
2018-2022	Willow Street sanitary/storm sewer	430,000	
2018-2022	Bailey Street sanitary/storm sewer	235,000	
2018-2022	Bloomfield Street sanitary/storm sewer	495,000	
2022	Update CSO Master Plan	30,000	\$ 2,500,000
2023-2027	Joyce Street sanitary ewer	360,000	
2023-2027	Joyce Street cross-country to Waterville Road sanitary sewer	295,000	
2023-2027	Joyce Valley sanitary sewer	345,000	
2023-2027	Mount Pleasant Street sanitary/storm sewer	480,000	
2023-2027	Madison Avenue sanitary sewer	1,280,000	
2027	Update CSO Master Plan	35,000	\$ 2,795,000
2028-2032	North Avenue sanitary sewer	1,465,000	
2028-2032	Chandler/Dane Street sanitary/storm sewer	795,000	
2032	Update CSO Master Plan	40,000	\$ 2,300,000

*All costs were presented in 2012 dollars.

3. COMPLETED CSO ABATEMENT PROJECTS SINCE 2012 MASTER PLAN UPDATE

While the approved CSO Abatement project schedule was based upon a twenty-year implementation period up through 2032, the Town decided to proactively move ahead at an accelerated pace. This allowed the Town to take advantage of the lower interest rates and the construction price that were available in the then current economy. Table 9 lists the CSO abatement projects that have been completed by the Town during the seven years that have passed since the completion of the 2012 CSO Master Plan Update.

TABLE 9: RECENTLY COMPLETED CSO ABATEMENT PROJECTS

<u>YEAR COMPLETED</u>	<u>PROJECT AREA</u>	<u>SEWER LENGTH</u>
2014	Hesselton Street sewers	1,200 LF
	Island Avenue pump station	300 LF
2015	Winter Street sewers	1,000 LF
	Summer Street sewers	1,650 LF
	Bennet Street sewers	1,450 LF
	Chandler Street sewers	1,200 LF
	Dane Street sewers	500 LF
	East Maple Street sewers	900 LF
	Main Street sewers	3,000 LF
	Alder Street sewers	2,100 LF
	Willow Street sewers	850 LF
	Bailey Street sewers	600 LF
	Green Street sewers	200 LF
	Bloomfield Street sewers	1,100 LF
2016	Joyce Street sewers	2,400 LF
	Mount Pleasant Street sewers	1,600 LF
	Olive Street sewers	400 LF
	Center Street sewers	500 LF
	Ash Street sewers	350 LF
	Pleasant Street sewers	150 LF
2018	North Avenue sewers	4,000 LF
<u>TOTAL SEWER LENGTH</u>		<u>25,500 LF</u>

NOTE: The projects listed for Olive Street, Center Street, Ash Street and Pleasant Street are part of the sewer area noted as “Joyce Valley” back in Table 8.

As shown above in Table 9, the Town has completed 25,500 LF of sewer separation and remediation work since the completion of the 2012 CSO Master Plan Update. This

represents over 4.85 miles of sewer work, or about 16 percent of the entire Skowhegan sewer system.

4. MOST SIGNIFICANT REMAINING EXCESS FLOW AREAS

As part of the current CSO Master Plan Update, the Town conducted system wide flow gauging in 2019 to determine areas of the sewer system with the most significant remaining excess flows. Spring high groundwater conditions were monitored on April 4, 2019. Stormwater inflow conditions were monitored on November 27, 2019. Several other storm events were also monitored, but the two events listed above have the most reliable data. The flow monitoring work identified the following areas of the sewer system where remaining large area of excess flow were noted.

- Sewer system areas that have recently been rehabilitated showed good excess flow reduction results. Areas that had not yet been rehabilitated showed similar excess flow levels as those reported in the previous Master Plan.
- As high flows were removed from some areas of the system, other adjacent flows that had been masked by the high flows were identified in the recent work. These areas are discussed below.
- The Dickie subdivision was identified in the previous Master Plan as an area of interest for future evaluation. During the current Master Plan Update, additional television inspection and monitoring in this area showed all sewers and manholes to be in extremely poor condition with large amounts of excess flow entering. This includes leaking sewers, brick and block manholes that are leaking and connected catch basins on some streets in the subdivision including Procelly Drive, Dominic Street, Patrick Street, Edwards Street, Dennis Street and Michael Street. Total flows above the 350,000 MGD per inch of rain were measured. These flows impact the Joyce Street CSO (No. 004) which is downstream and nearby. This entire sewer system is in extremely poor condition and should be replaced to reduce excess flows, but also because of its poor structural condition. There are four connected catchbasins in this system which could be removed as part of a separate, smaller project if sufficient funds are not available to do a complete project at the present time.
- The Mary Street sewer is part of a former State Correctional Facility and was found to have elevated levels of inflow. This area was found to contribute about 60,000 GPD of excess flow per inch of rainfall. Some of the excess flows may originate on old building sewers versus the main line. The manholes in this area are in poor condition and should be replaced. There is also a connected storm drain system which could easily be separated. This area flows into Elm Street CSO No. 005.
- Connected catch basins in the downtown Water Street area, that impact the river siphon and the North Side Footbridge CSO No. 003, appear to be readily

removable with a fairly small project. There is a nearby storm drain to the river into which these basins might be connected.

- The Maple Street sewer is still combined and contributes excess flow to the North Avenue sewer where it currently impacts the Storage Tank CSO. 010. Peak flows above 300,000 MGD per inch of rainfall were measured.
- Excess flows from a private housing development off Bloomfield Street were found to be contributing large amounts of flow on two streets, namely Sesame Street and Big Bird Street. Peak flows up to 0.30 MGD were measured. These flows impact the Southside Footbridge CSO No. 008. Because these sewers are part of a private mobile home park, additional discussions and negotiations will be needed to remove these flows. It would be beneficial for the Town to have those sewer lines inspected by television camera so that the full extent of the problem can be assessed.
- As part of a previous project in the Joyce Valley sewer area, a separation project on Milburn Street was designed and bid as an alternate. It was deleted from the project due to cost issues. That work could be completed at this time if funds allow.

Preliminary planning level cost estimates for each of these projects are presented below in Table 10. More detailed cost estimates are included as Appendix A. No construction costs are provided for the likely required work on Sesame Street and Big Bird Street since these are private sewers in a mobile home park.

TABLE 10: PRELIMINARY COST ESTIMATES FOR IDENTIFIED EXCESS FLOW REMOVAL PROJECTS

<u>LOCATION</u>	<u>ESTIMATE</u>
Dickie Subdivision sewer rehabilitation*	\$ 1,965,000
Mary Street sewer separation	335,000
Water Street sewer separation	245,000
Maple Street sewer rehabilitation	620,000
Big Bird Street/Sesame Street (TV inspect)	15,000
Milburn Street sewer separation	295,000
<u>TOTAL</u>	<u>\$ 3,475,000</u>

**NOTE: The listed cost estimate for the Dickie Subdivision is for a complete rebuild of the system. A smaller project to separate four connected catch basins could be conducted for about \$185,000.*

As shown above, the preliminary cost estimate for work in the identified sewer system areas is \$3,475,000. This represents a significant investment beyond the level which the Town feels ready to commit to at the present time. The Town's current DEP approved 2012 CSO Master Plan Update committed the Town to expending \$2,674,000 on CSO

abatement projects between 2012 and the present 2019 Master Plan Update. As discussed, the Town made the decision to borrow \$11.88 million dollars in order to accelerate the implementation of its CSO program. To-date, the Town has expended \$10.80 million dollars to complete projects well ahead of schedule. Some of the completed projects were not scheduled to be completed until 2032. The Town presently has about \$1.08 million dollars in left over funds from the previous sewer work. In order to keep sewer operating costs stable, and due to the fact that the Town has proactively completed many sewer projects ahead of the required schedule, the Town would like to use the remaining \$1.08 million dollars in funds to complete projects identified in this Master Plan Update without the need to borrow additional funds.

5. UPDATED MASTER PLAN FOR CSO ABATEMENT

Table 10 provided a list of additional CSO abatement projects that were identified during flow gauging work conducted as part of the present CSO Master Plan Update. The Town proposes to address those areas of its sewer system to the extent that costs for the next planning period through 2024 can remain within the available \$1.08 million dollars in funds that remain from past sewer work. Projects that can be completed within this budget are shown below in Table 11:

TABLE 11: PROPOSED 2019 CSO MASTER PLAN UPDATE PROJECTS

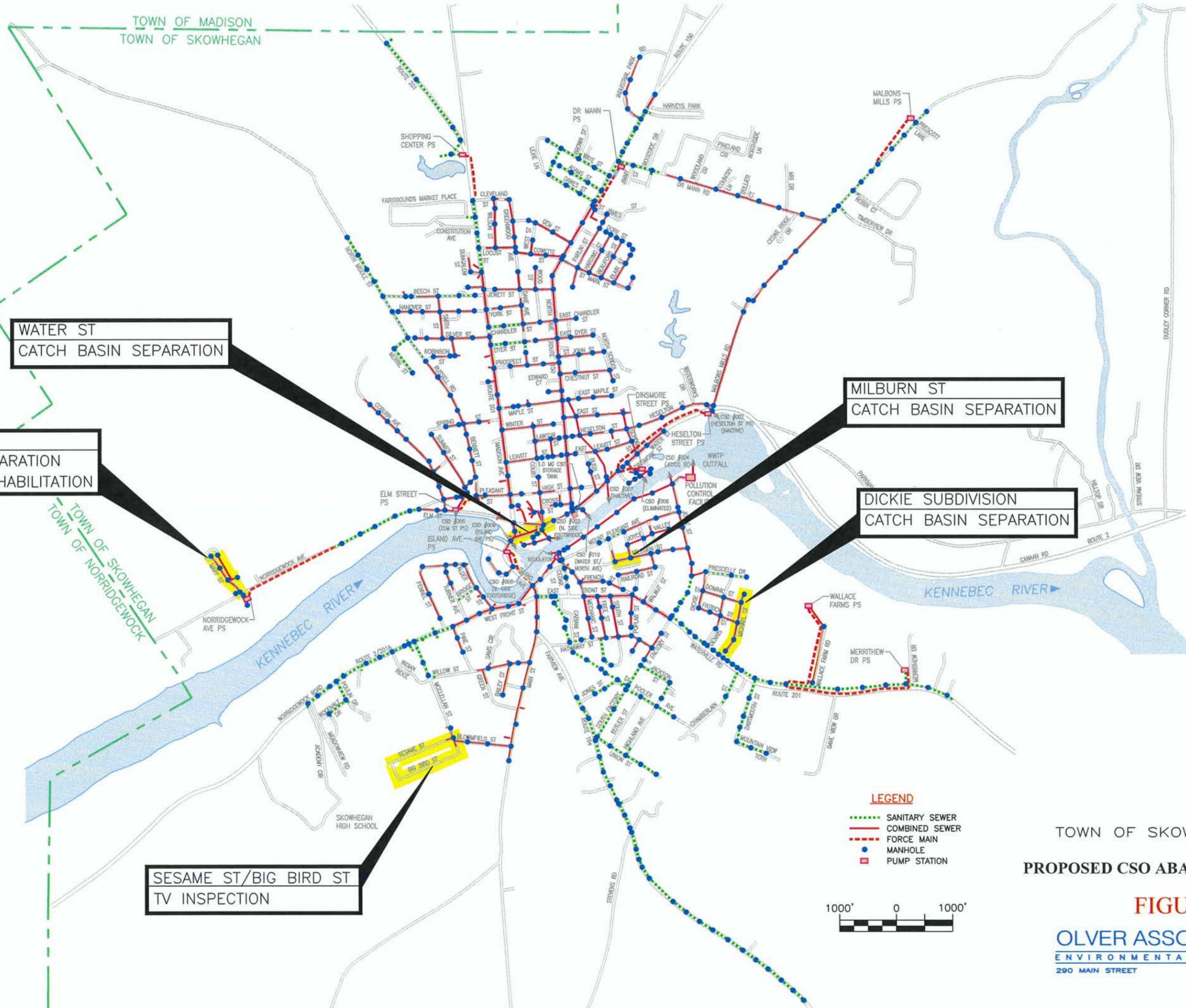
<u>PROJECT</u>	<u>COST ESTIMATE</u>
Dickie Subdivision sewer separation	\$ 185,000
Mary Street sewer separation	335,000
Water Street sewer separation	245,000
Milburn Street sewer separation	295,000
Big Bird Street/Sesame Street sewer TV inspection	15,000
TOTAL	\$ 1,075,000

The estimated cost of implementing the projects listed in Table 11 is about \$1,075,000 which essentially represents the fund balance of \$1.08 million dollars left over from previous CSO abatement projects. These projects will remove excess flows from many areas of the sewer system and will be beneficial at multiple CSO discharge points. Figure 8 shows the proposed location of each of the projects.

The Town proposes to implement this added sewer work as part of a single large construction project as shown below in Table 12:

TABLE 12: PROPOSED CSO ABATEMENT PROJECT IMPLEMENTATION SCHEDULE

<u>DATE</u>	<u>PROJECT</u>
December, 2019	Complete CSO Master Plan Update
December, 2020	Complete sewer system improvements design
March, 2021	Place sewer project out to bid
April, 2021	Award project to general contractor
May, 2021	Begin construction
December, 2022	Complete construction
January – February, 2023	Conduct additional sewer flow gauging
December, 2024	Complete CSO Master Plan Update



WATER ST
CATCH BASIN SEPARATION

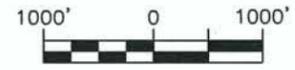
MARY ST
STORM DRAIN SEPARATION
AND MANHOLE REHABILITATION

SESAME ST/BIG BIRD ST
TV INSPECTION

MILBURN ST
CATCH BASIN SEPARATION

DICKIE SUBDIVISION
CATCH BASIN SEPARATION

- LEGEND**
- SANITARY SEWER
 - COMBINED SEWER
 - FORCE MAIN
 - MANHOLE
 - PUMP STATION



SOURCE:
TOWN OF SKOWHEGAN AND
MAINE OFFICE OF GIS

TOWN OF SKOWHEGAN, MAINE
PROPOSED CSO ABATEMENT PROJECTS

FIGURE 8
OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

During the time period over which the proposed Master Plan Update will be implemented, the Town will continue to conduct interim monitoring to assess the ongoing status of its CSO abatement program. The Town proposes to continue evaluating its CSO flow data regularly after precipitation events to assess CSO activity reductions. The purpose of the CSO flow data will be to:

- Assess the results of the completed CSO abatement work in terms of CSO activity predictions.
- Refine the Master Plan's implementation schedule as needed with DEP approval.

Annual reports will be submitted to DEP presenting revised CSO discharge volume and activity data on the basis of the interim monitoring. System wide dry weather checks will be conducted periodically to assure that dry weather CSO flows are not occurring.

As required by EPA and DEP guidelines, the Town will review the progress of its Master Plan every year and will submit an interim report which defines:

- Survey of overall effectiveness of CSO abatement program.
- Work completed since the last report and to-date.
- Benefits of completed work as measured by CSO flow data.
- Comparison of field results with predicted data.
- Compliance with proposed Master Plan schedule.

The Town proposes to maintain public interest and involvement in its CSO abatement program using a three-part approach:

1. The Master Plan Update will be presented at a public hearing upon incorporation of DEP comments.
2. The Master Plan Update will be discussed publicly at meetings of the Skowhegan Board of Selectmen.
3. The local news media will be kept apprised of significant CSO related decisions and activities.

APPENDIX A

**DETAILED PRELIMINARY COST ESTIMATES FOR SEWER
SYSTEM CSO ABATEMENT PROJECTS**

APPENDIX A.1(a)- PRELIMINARY ORDER-OF-MAGNITUDE PLANNING COST ESTIMATE FOR COMPLETE DICKIE SUBDIVISION SEWER IMPROVEMENTS

QUANTITY	DESCRIPTION	ESTIMATE
LS	Traffic control/mobilization @ \$10,000/LS	\$ 10,000
50 EA	Test pits @ \$500/EA	25,000
LS	Temporary erosion control @ \$5,000/LS	5,000
16 EA	Precast structure removal @ \$1,000/EA	16,000
3300 LF	8"Ø PVC sewer @ \$165/LF	545,000
2000 LF	4"Ø PVC building sewer @ \$140/LF	280,000
22 EA	4'Ø precast manholes @ \$6,000/EA	132,000
600 LF	12"Ø SICPE storm drain @ \$125/LF	75,000
10 EA	4'Ø Precast catchbasins @ \$4300/EA	43,000
450 Tons	3" Trench pavement @ \$200/Ton	90,000
800 Tons	1 ¼" Roadway pavement @ \$200/Ton	160,000
6000 SF	Trench insulation @ \$3/SF	18,000
LS	Loam and seed @ \$20,000/LS	20,000
LS	Owner's testing allowance @ \$4,000/LS	4,000
LS	General conditions @ \$142,000/LS	142,000
	Subtotal	\$ 1,563,000
LS	Ledge probing allowance	6,000
LS	Design allowance	110,000
LS	Inspection allowance	125,000
LS	Ledge removal allowance	5,000
LS	Contingency allowance	156,000
	Estimate	\$ 1,965,000

APPENDIX A.1(b) - PRELIMINARY ORDER-OF-MAGNITUDE PLANNING COST
ESTIMATE FOR PARTIAL DICKIE SUBDIVISION SEWER IMPROVEMENTS

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>ESTIMATE</u>
LS	Traffic control/mobilization @ \$5,000/LS	\$ 5,000
LS	Temporary erosion control @ \$2,000/LS	2,000
4 EA	Precast structure removal @ \$1,000/EA	4,000
800 LF	12"Ø SICPE storm drain @ \$125/LF	100,000
4 EA	4'Ø Precast catchbasins @ \$4,300/EA	17,000
LS	Loam and seed @ \$7,000/LS	7,000
LS	General conditions @ \$14,000/LS	14,000
	Subtotal	\$ 149,000
LS	Design allowance	10,000
LS	Inspection allowance	12,000
LS	Contingency allowance	14,000
	Estimate	\$ 185,000

APPENDIX A.2 - PRELIMINARY ORDER-OF-MAGNITUDE PLANNING COST
ESTIMATE MARY STREET EWER IMPROVEMENTS

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>ESTIMATE</u>
LS	Traffic control/mobilization @ \$5,000/LS	\$ 5,000
10 EA	Test pits @ \$500/EA	5,000
7 EA	Precast structure removal @ \$1,000/EA	7,000
300 LF	8"Ø PVC sewer @ \$165/LF	50,000
600 LF	4"Ø PVC building sewer @ \$140/LF	66,000
6 EA	4' Ø precast manholes @ \$6,000/EA	36,000
1 EA	4' Ø precast catchbasin @ \$4,000/EA	4,000
300 LF	12" Ø SICPE storm drain @ \$125/LF	38,000
100 Tons	3" Trench pavement @ \$200/Ton	20,000
LS	Loam and seed @ \$5,000/LS	5,000
LS	Owner's testing allowance @ \$1,000/LS	1,000
LS	General conditions @ \$23,000/LS	23,000
	Subtotal	\$ 260,000
LS	Ledge probing allowance	3,000
LS	Design allowance	20,000
LS	Inspection allowance	21,000
LS	Ledge removal allowance	5,000
LS	Contingency allowance	26,000
	Estimate	\$ 335,000

APPENDIX A.3 - PRELIMINARY ORDER-OF-MAGNITUDE PLANNING COST
ESTIMATE FOR WATER STREET SEWER SEPARATION

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>ESTIMATE</u>
LS	Traffic control/mobilization @ \$25,000/LS	\$ 25,000
LS	Temporary erosion control @ \$5,000/LS	5,000
3 EA	Precast structure removal @ \$1,000/EA	3,000
250 LF	15"Ø SICPE storm drain @ \$180/LF	45,000
LS	Remove/rest guardrail @ \$10,000/LS	10,000
2 EA	4'Ø Precast catchbasins @ \$4300/EA	17,000
2 EA	4'Ø Precast drain manhole @ \$6,000/EA	12,000
100 Tons	6" Trench pavement @ \$200/Ton	20,000
LS	General conditions @ \$17,000/LS	17,000
	Subtotal	\$ 191,000
LS	Design allowance	15,000
LS	Inspection allowance	17,000
LS	Contingency allowance	22,000
	Estimate	\$ 245,000

APPENDIX A.4 - PRELIMINARY ORDER-OF-MAGNITUDE PLANNING COST
ESTIMATE FOR MAPLE STREET SEWER IMPROVEMENTS

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>ESTIMATE</u>
LS	Traffic control/mobilization @ \$10,000/LS	\$ 10,000
30 EA	Test pits @ \$500/EA	15,000
LS	Temporary erosion control @ \$5,000/LS	5,000
5 EA	Precast structure removal @ \$1,000/EA	5,000
1200 LF	8"Ø PVC sewer @ \$165/LF	198,000
800 LF	4"Ø PVC building sewer @ \$140/LF	112,000
4 EA	4'Ø precast manholes @ \$6,000/EA	24,000
150 Tons	3" Trench pavement @ \$200/Ton	30,000
200 Tons	1 ¼" Roadway pavement @ \$200/Ton	40,000
1000 SF	Trench insulation @ \$3/SF	3,000
LS	Loam and seed @ \$5,000/LS	5,000
LS	Owner's testing allowance @ \$3,000/LS	3,000
LS	General conditions @ \$35,000/LS	35,000
	Subtotal	\$ 485,000
LS	Additional television inspection allowance	5,000
LS	Ledge probing allowance	5,000
LS	Design allowance	35,000
LS	Inspection allowance	40,000
LS	Ledge removal allowance	5,000
LS	Contingency allowance	50,000
	Estimate	\$ 620,000

APPENDIX A5 - PRELIMINARY ORDER-OF-MAGNITUDE PLANNING COST
ESTIMATE FOR MILBURN STREET SEWER SEPARATION

<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>ESTIMATE</u>
LS	Traffic control/mobilization @ \$5,000/LS	\$ 5,000
32 EA	Test pits @ \$500/EA	15,500
LS	Temporary erosion control @ \$2,500/LS	2,500
LS	Removal/disposal asbestos pipe @ \$5,000/LS	5,000
LS	Remove/abandon pipes @ \$5,000/LS	5,000
3 EA	Existing MH/CB modification @ \$1,500/EA	4,500
400 LF	8"Ø PVC sewer @ \$165/LF	66,000
300 LF	4"Ø PVC building sewer @ \$140/LF	42,000
4 EA	4'Ø precast manholes @ \$6,000/EA	24,000
85 Tons	3" Trench pavement @ \$200/Ton	17,000
90 Tons	1 1/4" Roadway pavement @ \$200/Ton	18,000
1000 SF	Trench insulation @ \$3/SF	3,000
LS	Loam and seed @ \$5,000/LS	5,000
LS	Owner's testing allowance @ \$5,000/LS	5,000
LS	General conditions @ \$35,000/LS	35,000
	Subtotal	\$ 250,000
LS	Inspection allowance	20,000
LS	Contingency allowance	25,000
	Estimate	\$ 295,000

APPENDIX B

ANNUAL DEP CSO MONITORING REPORTS

MUNICIPALITY OR DISTRICT: **Skowhegan**
 REPORTING YEAR: **2001**

MEPDES / NPDES PERMIT NO. **ME0100625**
 SIGNED BY: **Brent E. Dickey**

DATE: **2/14/02**

EARLY TOTAL PRECIPITATION: **32.7** INCHES

START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")												EVENT OVERFLOW GALLONS	EVENT DURATION HRS		
	TOTAL INCHES	MAX. HR INCHES	LOCATION: Water St NUMBER: 001	LOCATION: Island Ave NUMBER: 002	LOCATION: North 48" NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South 72" NUMBER: 008	LOCATION: MH #5 NUMBER: 010A	LOCATION: NUMBER:	LOCATION: NUMBER:					
1/3/2001			29,695													29,696	7.50	
1/4/2001			23,389													23,389	5.75	
2/11/2001						6,187										6,187	1.25	
2/21/2001						4,057										4,057	0.25	
3/8/2001						8,604										8,604	1.75	
3/14/2001	0.01	0.01				14,957										14,957	0.75	
3/17/2001						44,915										44,915	5.00	
3/18/2001						86,382										86,382	9.00	
3/19/2001						42,585					1,255					43,840	12.50	
3/19/2001						117,069										117,069	24.00	
3/19/2001						41,158										41,158	22.75	
3/22/2001	0.69	0.11				2,522										2,522	1.00	
3/24/2001						11,049										13,977	13.75	
3/24/2001																17,648	24.00	
3/24/2001						3,456										15,852	11.00	
3/24/2001						3,731										9,354	2.00	
3/30/2001	1.03	0.13	5,623			51,868										51,868	11.75	
4/1/2001						6,702										6,702	6.50	
4/1/2001						24,835	1,350			17,153						46,609	15.25	
4/4/2001						158,553				1,029						179,825	17.00	
4/4/2001						73,777										76,689	8.25	
4/7/2001						111,485				14,800						134,226	13.50	
4/7/2001	0.09	0.08				85,135										85,135	14.00	
4/7/2001						345,607										405,590	18.25	
4/7/2001						551										749,498	24.00	
4/7/2001						934				50,479						434,338	24.00	
4/7/2001						6,410				7,667						541,798	24.00	
4/7/2001	0.57	0.16				158,744				5,409						426,263	24.00	
4/7/2001	0.03	0.03	1,346			7,705				2,957						243,295	24.00	
4/7/2001						216,209										262,231	24.00	
4/7/2001						262,231										229,103	24.00	
4/7/2001			2,376			216,071										73,135	24.00	
4/7/2001						73,059										18,477	7.25	
4/7/2001						17,642										2,500	1.50	
4/19/2001						2,500										11,720	7.25	
4/19/2001						11,720										17,634	8.00	
4/28/2001						17,634										37,565	18.75	
4/28/2001						37,565										14,085	7.25	
4/28/2001						14,085										10,750	8.50	
5/2/2001						10,750										7,508	7.50	
5/2/2001						5,338										10,580	3.75	
5/6/2001																13,246	12.75	
5/6/2001																222,960	4.50	
5/12/2001	0.44	0.40	3,036			124,072										16,607	6.75	
5/12/2001																42,994	3.00	
5/18/2001	0.22	0.18				4,426										250,468	24.00	
5/18/2001	0.74	0.18				24,629										9,454	7.00	
5/18/2001						115,613										1,454	2.00	
5/23/2001																		

DATE OF STORM	TOTAL INCHES	MAX. HR INCHES	Water St NUMBER: 001	Island Ave NUMBER: 002	North 48" NUMBER: 003	Joyce St NUMBER: 004	Elm St NUMBER: 005	UNSMURG NUMBER: 006	DASH ST NUMBER: 007	NUMBER: 008	NUMBER: 010A	NUMBER:	GALLONS	HRS
5/23/2001								1,994					1,994	7.75
5/27/2001	0.36	0.19		14,796	23,300	11,186							49,282	6.25
5/27/2001	0.50	0.27	12,134	29,599	51,632	48,039		4,725	551		12,456		159,156	13.00
5/27/2001						19,298	901						20,199	7.00
6/2/2001	1.64	0.30	3,323	66,834	232,254	141,870		10,339	10,614		6,671		471,906	11.25
6/2/2001	1.11	0.66	20,800	16,465	175,513	232,303	1,616	26,560	17,003		45,538		535,799	24.00
6/2/2001	0.03	0.03				62,839	2,458						65,297	7.75
6/17/2001	0.35		1,129		48,024	66,839		1,755	9,593		9,032		136,373	11.25
6/17/2001						6,542							6,542	7.75
6/17/2001	0.09					8,750							8,750	2.50
6/23/2001	1.10		40,747		201,221	184,181		21,686	62,766		94,785		605,387	10.25
6/24/2001	2.08		102,477		380,088	401,638	4,498	36,856	168,991		154,653		1,249,202	10.25
7/1/2001	0.41		2,408		89,475	95,484	2,915	3,557	10,932		12,759		217,531	6.25
7/5/2001	0.58	0.39	4,322		118,809	83,592		1,380	11,213				219,316	8.75
7/10/2001	0.49	0.36			115,877	86,488		1,128	9,535				213,029	8.00
7/11/2001	0.60	0.32	5,800		113,978	177,084		4,712	6,070				307,645	7.00
7/11/2001	0.10	0.10			2,187	53,688		568					56,443	7.00
7/14/2001	0.10	0.08			13,392	97,060					7,645		118,097	9.00
7/14/2001						5,660							5,660	1.75
7/24/2001	0.72	0.71	16,835		217,180	163,879	1,292	10,763	8,022		52,954		470,926	6.00
7/24/2001	0.21	0.21			56,030	66,356		3,429	1,202		3,164		130,181	7.50
8/8/2001	0.50	0.50	9,289		96,603	115,696	658	5,275			42,623		270,144	2.50
8/8/2001	0.19	0.17			29,031	123,230		2,157	3,059		151		157,628	9.25
8/10/2001	0.24	0.24	2,452		34,418	10,202		501	675		8,520		56,768	2.50
8/11/2001			15,909					619					16,528	0.50
8/15/2001			44,452					2,507					46,959	1.00
8/20/2001	0.25	0.15				12,782					1,131		13,913	1.00
8/22/2001	0.59	0.59	15,902		84,847	87,700	964	8,460	14,888		52,159		264,920	5.50
8/23/2001	0.01	0.01				3,697							3,697	1.00
8/28/2001	0.36				88,284	33,533			210		5,564		127,591	0.75
9/1/2001	0.36				14,493	74,258					4,804		79,062	7.25
9/21/2001	0.77	0.21			56,989	34,514		2,608					39,026	2.00
9/22/2001	0.08	0.08			8,002	4,137							94,111	4.75
9/25/2001	1.29	0.69	24,296		243,691	241,948	2,121	9,998	13,340		63,091		12,139	1.00
9/25/2001	0.09	0.04				23,105							751,408	6.25
10/15/2001	0.23	0.10				18,750		1,309					23,105	4.75
10/17/2001	0.62	0.15			43,675	72,569		676					20,059	4.00
10/21/2001	0.06	0.04				10,172		582					116,920	6.50
10/22/2001						7,820							10,754	2.25
10/25/2001	0.14	0.06				16,787							7,820	3.25
10/26/2001						1,116							16,787	5.00
10/31/2001	0.30	0.11				14,091							1,116	1.25
10/31/2001	0.08	0.04				5,590							14,091	2.25
11/10/2001	0.05	0.04			3,129								5,590	2.25
11/30/2001	0.10	0.06											3,129	0.25
TOTALS	20.9		403,828	165,994	3,045,893	6,444,018	109,250	198,720	594,497	686,723	666,974		12,315,897	

Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.
Note 2: Block activity should be shown as a "1" if the block floated away.
Note 3: No Data

NO.	OF STORM	MAX. HR. INCHES	TOTAL INCHES	NUMBER: 001	NUMBER: 002	NUMBER: 003	NUMBER: 004	NUMBER: 005	NUMBER: 006	NUMBER: 007	NUMBER: 008	NUMBER: 010A	NUMBER:	GALLONS	HRS
57	5/30	0.10	0.12		1,969	8,363	4,393							14,924	1.25
58	5/31	0.27	0.37	1,796	7,411	90,763	51,724	1,305	1,400	1,854		1		156,253	6.25
59	5/31	0.02	0.02				13,813							13,813	7.25
60	6/5	0.14	0.28		3,080	53,895	4,066							61,041	2.75
61	6/6	0.14	0.34		3,113	18,657	10,847							32,617	3.75
62	6/11	0.11	0.44		2,358	11,349	10,475							24,182	1.25
63	6/11	0.16	0.88		13,787	78,802	52,292							144,881	14.00
64	6/15	0.20	0.54		3,757	47,082	21,527		288	518		1		73,174	6.75
65	6/15	0.04	0.06		1,383		3,661							3,661	2.50
66	6/23	0.09	0.10				2,213							43	0.25
67	6/23						43							96,706	4.50
68	6/26	0.25	0.39	16,482	2,923	52,733	18,632		2,795	3,138	1	1		7,935	7.75
69	6/26	0.06	0.07	1,598	588		5,749							21,832	0.75
70	6/28	0.10	0.12	182	344	19,166	2,140		8,040	3,361	1	1		356,073	6.75
71	7/1	0.28	0.92	24,900	29,475	232,289	58,006		10,693	5,541				173,211	3.50
72	7/2	0.38	0.47	25,160	10,098	97,971	18,350	5,399						299	0.25
73	7/3					299									
74	7/4	0.54	0.55	7,108	1,282	103,047	18,251	1,257	8,348	2,889	8,403	1		150,586	1.50
75	7/15	0.16	0.20		5,884	9,548	10,653			339	1,725			28,148	1.50
76	7/19	0.04	0.06		278									278	0.75
77	7/23	0.40	0.41	2,346	4,894	107,965	14,174		3,645	4,316	4,281	1		141,622	1.50
78	7/29	0.47	0.49	8,920	3,843	104,491	69,671	1,117	8,226	8,392	4,015	24,343		233,019	1.50
79	7/30	0.11	0.11		1,126	455	1,860							3,441	0.50
80	8/6	0.16	0.25		3,741		19,962							23,703	1.50
81	8/20	0.08	0.18		705		639							1,343	0.75
82	8/25	0.10	0.19		3,403		3,300							6,703	2.50
83	9/4	0.05	0.06				681							681	0.75
84	9/11	0.35	0.61	10,283	1	1	158,040	35	6,242	6,603	12,695	21,729		215,629	6.50
85	9/12	0.04	0.09				13,145							13,145	1.75
86	9/15	0.34	0.68	7,300	6,549	1	214,054	580	4,955	10,844		33,153		277,436	12.00
87	9/16	0.17	0.71		15,476		307,914	1,156		602				325,147	9.00
88	9/23	0.78	0.90	25,162	12,154	1	170,687	293	10,065	23,740	64,247	83,748		390,098	4.75
89	9/27	0.22	0.84		10,578					1,232	2,964			14,775	6.25
90	9/27	0.33	0.61	2,807	16,100	1	1	1,178	14,840	5,299	41,669	7,552		89,446	6.50
91	10/5	0.13	0.27		2,481	9,242	1		1,109		992			13,826	3.00
92	10/13	0.63	0.63		9,993	36,320	1		7,100	1	311			53,725	5.50
93	10/13	0.18	0.24		6,950	42,238			5,259		2,220			56,667	1.75
94	10/16	0.57	0.57		8,153	33,134	112,422							153,709	7.25
95	10/16	0.15	0.42		6,348	26,303	239,260							271,912	7.75
96	10/18	0.08	0.17		265									265	1.50
97	10/19	0.10	0.26		3,038	344	29,574							32,956	3.25
98	10/20								1,924					1,924	0.50
99	10/26	0.09	0.55		3,963	2,486	120,241							126,690	12.00
100	10/26	0.01	0.01				4,910							4,910	2.25
101	11/5	0.02	0.02				87,220							87,220	3.25
102	11/5	0.09	0.76				81,182							81,182	4.00
103	11/11	0.07	0.09		19,174	1	2,811							2,811	1.50
104	11/12	0.10	0.41		2,070		133,109							152,284	14.00
105	11/12	0.10	0.39											2,070	1.00
106	11/17	0.13	0.88				8,276							8,276	3.00
107	11/18	0.09	0.33		1,659	1	5,678							7,338	2.75
108	11/21						77,120							85,784	8.75
109	11/22	0.11	0.64		29,101	1	216,222		1,726		8,664			247,051	17.25
110	11/23	0.06	0.10		2,081									2,081	1.50
111	12/2						1							1	
112	12/9						1							1	
113	12/14	0.14	0.77		25,451	1	1	6,378	2,660	1	22,280	794		57,568	12.00
114	12/20	0.21	0.82	2,769	36,490	1	1	10,430	43,001	1	80,012	71,737		244,442	13.50
115	12/20							309	10,355					10,664	2.75
TOTALS			34.30	242,827	383,779	3,648,868	5,683,758	33,774	303,852	78,678	264,811	243,068		10,883,416	

Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.

EVENT NO.	DAYS OF STORM	TOTAL MAX. HR INCHES	11 DAYS OF NUMBER	ADDITIONAL NUMBER	GALLONS	HRS								
			001	002	003	004	005	006	007	008	010A			

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Note 2: Block activity should be shown as "1" if the block floated away.

SO ENT IO.	START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")												EVENT OVERFLOW GALLONS	EVENT DURATION HRS	
		TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: MH #5 NUMBER: 010A						
1	1/4	0.25	0.11	1		1	1	1	1	1	1	1	1	1	1	1	4	
2	1/12																3	
3	3/15	0.07	0.04			1											1	
4	4/2	0.72	0.14		36,060	282,912	126,996					8,690		249	1,071	455,978	9.25	
5	4/4	0.15	0.08		4,733	738	1,684									7,154	2.00	
6	4/13	0.84	0.23		24,955	207,102	37,074					22,896			950	292,976	5.25	
7	4/13	0.79	0.38		33,773	554,952	346,891			60,769		31,380			104,171	1,131,936	17.50	
8	4/13				3,741	67,410	59,857									131,008	9.75	
9	4/26	0.19	0.08		5,511							11,448				16,959	8.50	
10	4/26				5,026	155,519	17,066					25,815			15,549	218,975	18.25	
11	5/3	0.78			12,835	24,996	9,084									46,915	12.00	
12	5/4	0.09	0.08		10,782	139,083	28,192					4,397		2,316	16,083	200,852	5.50	
13	5/9				622											622	0.50	
14	5/10	0.13	0.08		1,386											1,386	0.75	
15	5/15	0.54	0.41		4,839	177,604	7,689					1,003			8,953	200,089	2.50	
16	5/18	0.61	0.56		8,161	251,103	4,844			5,402		5,812			91,412	366,736	2.75	
17	5/21	0.16	0.12		4,349											4,349	1.25	
18	5/23	0.25	0.08		2,101											2,101	1.00	
19	5/24	0.85	0.16		16,133	129,604										145,737	7.75	
20	5/25	0.21	0.08		2,846	4,018										6,864	1.25	
21	5/26	0.16	0.08		2,996	6,615						735				10,346	2.00	
22	6/2	0.52	0.29		10,466	400,892	3,026							1,631	272	416,287	6.75	
23	6/19	0.67	0.33		11,771	Tripped	4,724			2,729		3,056		17,208	6,984	46,695	3.75	
24	6/22	0.15	0.10		1,130											1,130	1.50	
25	7/2	0.70	0.60		7,060	189,585	11,276			1,162		11,380		32,930	48,656	303,673	1.75	
26	7/3	0.09	0.06		1,551	5,754										7,305	0.75	
27	7/8	0.26	0.10		2,098	1,609										3,704	1.50	
28	7/9	0.79	0.29		7,127	77,282	7,026					6,419		5,895	1,207	104,955	4.75	
29	7/17	0.24	0.24		2,424	46,648	942					133		10,723	9,678	70,547	0.75	
30	7/19	0.21	0.17		3,484	9,530										13,013	1.25	
31	7/20	0.31	0.28		3,174	78,952	2,107					2,445		2,581	15,974	106,908	1.25	
32	7/23	0.33	0.22		5,096	39,329										44,425	1.75	
33	7/24	0.18	0.10		577	1,135	4,557									6,269	4.00	
34	7/27	0.06	0.06		2,628											2,628	0.75	
35	7/31	0.08	0.08		1,943											1,943	1.00	
36	8/1	0.62	0.24		14,635	106,591	3,453					10,727		37,333	1,409	175,534	3.00	
37	8/3	0.31	0.27		3,808	81,723	5,322					2,314		9,498	22,367	125,033	4.00	
38	8/13	1.79	0.58		27,364	619,941	90,010			9,306		82,697		82,781	171,132	1,106,647	7.75	
39	8/16	0.16	0.12		11,518	16,991	175									28,683	2.25	
40	8/16	0.25	0.15		2,348	28,200	448									30,996	1.00	
41	8/19	0.16	0.15		1,180	19,150	3,153									23,482	1.00	
42	8/20					2,307	2,307									2,307	2.00	
43	8/21	0.90	0.18		6,375	116,550	3,543							7,443	5,872	139,783	8.50	
44	8/29	0.37	0.29		5,008	45,568	7,563							2,790		60,930	1.50	
45	8/31	0.75	0.60		7,754	172,587	8,271			5,354		10,663		12,103	52,458	271,354	2.00	

SO ENT NO.	START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")														EVENT OVERFLOW GALLONS	EVENT DURATION HRS
		TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: MH #5 NUMBER: 010A							
46	9/9	1.26	0.24	1	12,822	143,420	2,572	17,756								176,886	7.50		
47	9/18	0.92	0.15		88,729	88,581	6,256									183,566	3.75		
48	9/25	0.19	0.19		50,350	50,350	16,191	2,243								119,133	2.25		
49	10/12	0.38	0.11		6,270	4,532										10,802	4.75		
50	10/16	1.08	0.24		11,180	238,792	15,340									268,701	8.50		
51	10/30	0.09	0.06		3,714	12,890	10,380									26,984	1.00		
52	10/31	0.10	0.09		3,702				2,574							6,276	12.00		
53	11/4	0.30	0.21		5,722	56,760										62,481	1.75		
54	11/4	0.58	0.12		4,762	30,023			5,670							40,456	5.75		
55	11/24	0.57	0.16		9,015	76,913										85,928	4.75		
56	11/24	1.12	0.38		19,675	276,700	9,684	36,627	8,631							372,814	6.50		
57	11/28	1.79	0.67	4,431	11,306	662,869	31,513	89,342	29,009							1,013,386	7.00		
58	11/28	0.16	0.15		7,866	130,685	46,983	15,112	7,199							222,115	7.00		
59	12/1	1.56	0.41	8,198	16,449	859,023	93,455	26,689	36,938							1,333,114	13.25		
60	12/23	1.02	0.39	841.	1,715	894,981	57,088	160,871	1.							1,614,715	8.50		
61	12/23	0.03	0.02	27,936	574,643	7,623,431	161,996	7,125	2,427							210,188	7.75		
TOTALS							1,248,740	129,644	332,032	710,761	112,819	1,322,762			12,082,768				

Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.
Note 2: Block activity should be shown as a "1" if the block floated away.

SO ENT O.	START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")														EVENT OVERFLOW GALLONS	EVENT DURATION HRS
		in/60m TOTAL INCHES	in/hr MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: MH #5 NUMBER: 010A							
1	1/14	0.59	0.15	1	215,863	919,313	81,063	42,322	58,151						98,892	1,415,605	10.25		
2	2/16	0.57	0.20		190,507	1	25,328	7,269	1	1	33,433					256,542	5.00		
3	2/16				38,870											38,870	1.25		
4	3/8	1.31	0.15		1,592											1,592	0.75		
5	3/28	1.65	0.22	1	41,865	801,071	1	1	35,687	1	235,075				1,113,702	9.50			
6	3/28	0.16	0.06													408,315	22.75		
7	3/30															66,080	8.50		
8	4/2	1.12	0.21	3,361	30,651	706,277	13,564	1	3,197	1	24,277				782,255	13.75			
9	4/2	1.60	0.27	81,558	2,262	2,703,872	65,705	1	51,191	1	453,413				3,358,677	24.00			
10	4/2	0.05	0.03	26,268		150,823									177,091	23.00			
11	4/20	0.64	0.18		36,155	112,628									148,783	5.25			
12	4/20	0.03	0.02		3,800										3,800	3.75			
13	4/23	0.27	0.13		7,224										7,224	2.00			
14	4/24	1.67	0.58		56,145	1,189,330	31,670	1	37,269	1	265,644				1,580,060	13.00			
15	4/24	0.80	0.42		46,612	774,170	18,599	1	17,881	1	102,023				959,289	24.00			
16	4/24					28,575									28,575	12.00			
17	4/27	0.85	0.19		19,365	1,991,307		1	30,972	1	23,194				461,554	7.75			
18	4/27	1.93	0.18		21,072	418,995									2,313,491	24.00			
19	4/27	0.02	0.02			69,236									69,236	17.50			
20	4/30	0.42	0.11		10,321	149,936									160,257	6.75			
21	5/7	1.00	0.25		27,353	427,402	5,367		2,937	1	70,252				533,312	11.50			
22	5/7	0.12	0.09		1,583	49,077	1,488								52,148	2.75			
23	5/21	0.18	0.07		2,944										2,944	2.75			
24	5/21	0.37	0.05		2,214										2,214	1.50			
25	5/23	0.77	0.16		20,936										169,902	6.75			
26	5/26	2.62	0.37	1	74,161	1,836,489	5,971	127,132	191,242	1	252,898				2,487,896	23.25			
27	5/26	0.01	0.01			118,288		5,510	23,905						147,702	24.00			
28	5/26	0.07	0.03			11,190									11,190	13.25			
29	5/29	0.13	0.07		2,733										2,733	1.50			
30	6/10	0.57	0.57		6,548	151,587	782	18,227	7,280	1	101,624				286,049	2.50			
31	6/14	1.74	0.30		87,342	764,700	17,455		25,634	1	33,073				928,207	16.00			
32	6/14	0.70	0.20		83,278	256,499	197,894								537,671	20.25			
33	6/16	0.19	0.09		2,762	30,620									33,382	1.25			
34	6/17	0.65	0.26		16,519	378,476		878	66,172	1	59,046				521,092	7.50			
35	6/22	0.11	0.07		1,289										1,289	0.50			
36	7/5	0.51	0.48		6,821	224,937	1,428	3,447	9,831	1	176,696				423,162	1.75			
37	7/6	0.15	0.11		1,857	6,089									7,946	0.50			
38	7/8	0.08	0.08		251										251	1.00			
39	7/8	1.49	0.39		17,307	467,816	4,443	2,551	23,860	1	500,251				1,016,229	7.50			
40	7/14	0.26	0.19		2,513	58,711				1	81,162				142,386	1.50			
41	7/19	0.21	0.21		2,751	23,061				1					25,813	0.50			
42	7/22	0.23	0.21		2,462	50,406	655				95,509				149,031	1.00			
43	7/25	0.35	0.29		5,695	65,652	576			1	40,536				112,460	1.75			
44	7/27	1.08	0.93	1	5,756	416,606	10,088	2,831	1	1	665,424				1,100,710	3.00			
45	8/2	0.31	0.15		3,385	84,279	818			1	118,027				206,510	3.50			

NO.	OF STORM	TOTAL INCHES	MAX. HR. INCHES	NUMBER: 002	NUMBER: 009	NUMBER: 003	NUMBER: 004	NUMBER: 005	NUMBER: 006	NUMBER: 007	NUMBER: 008	NUMBER: 010A	GALLONS	HRS	
5	8/12	0.13	0.11		3,308								3,308	0.75	
7	8/14	0.07	0.05		837								837	0.75	
3	8/15	0.16	0.09		6,702		2,712						9,415	8.50	
2	8/21	0.69	0.21		13,407	156,323						9,659	179,389	15.75	
0	8/21	0.15	0.15		7,137	31,001	200						38,339	9.50	
1	8/28	0.03	0.03		2,536								2,536	2.50	
2	8/29	0.27	0.21		3,206	67,175	443		1	1		306,096	376,923	1.00	
3	8/30	0.76	0.29		18,499	160,454	1,059	2,143				177,439	359,595	4.00	
4	8/31	0.79	0.21		10,482	145,782	493		1			149,174	305,933	5.00	
5	9/1	0.31	0.21		6,483	29,140	663						36,286	3.00	
5	9/17	1.30	0.31		21,715	242,782	2,723		1	1		17,872	285,094	9.00	
7	9/29	0.83	0.56			1	3,452		1	1		316,067	319,523	2.75	
8	10/8	2.88	0.51		90,514	808,285	96,935	1	1	1		786,581	1,782,319	20.00	
9	10/8	3.69	0.32		109,960	2,471,768	363,196	94,026	1	1		1,145,652	4,184,605	24.00	
0	10/8	0.06	0.02		1	72,950	832	13,601					87,382	15.25	
1	10/15	3.23	0.55		802	1,952,815	31,695	35,324	1	1		2,276,083	4,295,922	17.75	
2	10/15	0.36	0.09			751,874	37,775	181,257					971,708	24.00	
3	10/15				474								474	1.25	
4	10/23	1.28	0.33		22,617	796,090	14,723	1	1	1		176,187	1,009,621	14.00	
5	10/25	1.88	0.29		33,741	1,348,780	30,665	1	1	1		360,986	2,307,641	17.75	
6	10/25	0.52	0.11			1,068,682	21,616	1	1	1		74,446	1,164,747	24.00	
7	10/25					32,243							32,243	16.00	
8	11/6	0.14	0.12		9,859	194,804	999			1		6,575	212,238	1.75	
9	11/6	0.48	0.24		1,884	121,929	1,122		1			29,645	154,580	1.50	
0	11/9	0.44	0.14		9,129	5,008				1			14,140	3.50	
1	11/9	0.65	0.21		2,426	470,619	2,446					1,122	476,613	5.50	
2	11/15	0.69	0.19		11,073	196,003	1,294					484,125	692,495	7.50	
3	11/15	0.69	0.35		96,228	464,873	16,847	22,553	1	1		488,512	1,089,015	18.00	
4	11/15	0.67	0.24		52,658	496,764	34,273	88,692		1		11,720	684,107	12.75	
5	11/22	1.78	0.18			1,051,686	12,652	87,270		1		16,824	1,168,434	17.75	
6	11/22					16,896							16,896	15.00	
7	11/30	1.71	0.31		8,093	1,210,013	72,278	172,098	1	1		403,332	1,865,817	17.75	
8	11/30	0.09	0.04		8,157	64,439	8,847	191,456					272,898	24.00	
9	12/26	1.12	0.22		3,301	496,325							499,626	10.25	
0	12/29	1.04	0.14			553,361		70,528					623,889	13.75	
1	12/29	0.07	0.03			72,018		23,494					95,512	8.50	
TOTALS				56.54	111,192	1,655,520	31,599,263	1,242,840	598,089	36	437,042	11,036,720	47,873,323		

Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.

Note 2: Block activity should be shown as a "1" if the block floated away.

Doc Num: DEPLW0462

Csoflows.xls (rev. 12/12/01)

START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")										EVENT OVERFLOW GALLONS	EVENT DURATION HRS	
	TOTAL INCHES	MAX HR INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: MH #5 NUMBER: 010A				
1/12	0.25	0.18		3,106	30,519									33,626	2.75
1/14	1.34	0.22	1	4,203	1,571,189	1,466	35,839	360,876	1	1	297,195	3,322,659		5,919,964	16.25
1/14	0.30	0.06												1,466	0.75
1/18	1.28	0.36	1	6,542	1,240,657	24,593	170,867		1	1	1	4,071,276		5,513,938	13.00
2/3	0.90	0.29	1	45,924	791,830	1	1		1	1		3,007,497		3,845,255	11.00
2/3	0.08	0.08	1	24,057	70,381	1	1		1	1		76,892		171,333	9.25
2/3	0.78	0.14	1	18,400	1,031,012	1	1		1	1		1,651,333		2,700,749	20.25
2/3												96,672		96,672	19.25
2/17	0.07	0.07		854	10,684									11,538	1.00
3/14	0.45	0.20	1	8,910	194,326				1			232,167		435,404	4.25
4/1	0.16	0.08		165										165	0.50
4/4	0.70	0.18		17,401	127,258									144,659	5.25
4/4	0.20	0.08			8,215									8,215	3.25
4/7	0.17	0.07		533										533	1.25
4/13	0.11	0.11		1,373	13,032									14,405	0.50
4/15	0.30	0.14		3,335	28,536									31,871	2.25
5/2	0.66	0.15		8,012	37,642									45,654	4.25
5/11	0.38	0.10		1,245										1,245	1.25
5/12	0.57	0.11		969	5,224									6,194	1.25
5/15	0.19	0.12		1,385	3,128									4,513	0.50
5/16	0.66	0.21		4,218	62,365									66,584	3.75
5/18	0.03	0.01		1,646	5,427									7,073	0.50
5/19	0.38	0.09		18,456	115,198				5,441	1		112,538		251,635	2.75
5/20	0.16	0.08			2,090									2,090	0.50
5/21	0.16	0.07		2,364										2,364	1.00
5/21	0.17	0.12		1,215	8,601									9,816	0.25
6/1	0.47	0.38		6,726	109,731		3,260		1,281	1		286,199		407,197	1.50
6/3	1.57	0.34		13,119	314,087		4,050		2,160	1		30,243		363,661	8.50
6/4	0.75	0.21		9,174	88,838		5,510		402	1				103,925	7.00
6/7	1.08	0.26		4,481	18,175					1				22,657	1.00
6/7	0.36	0.10		16,929	261,731					1		18,800		297,461	15.50
6/9	0.48	0.15		8,156	12,752									20,908	3.00
6/10	1.03	0.37		14,180	358,934		30,254	22,217	14,375	1	53,798	248,648		742,408	15.00
6/11	0.41	0.20		8,016	42,547		2,563			1	2,443			55,570	3.50
6/11	0.11	0.06		437	18,335									18,772	1.50
6/14	0.43	0.37		10,644	101,252		6,123	5,991	587	1	1,161	52,935		178,695	1.75
6/19	0.61	0.48		8,769	202,704		2,884		2,366	1	1,587	393,246		611,557	2.25
6/20	0.57	0.33		7,308	196,517		2,687		2,524	1	1,696	104,542		315,275	3.00
6/26	0.38	0.10		1,466	4,857									6,323	3.00
6/28	0.36	0.19		2,546	37,284							1		39,831	2.50
6/30	0.14	0.08			14,371							1		14,372	0.75
7/2	0.32	0.17		2,110	21,808									23,918	2.00
7/10	0.09	0.17			30,761									30,762	1.00
7/13	0.25	0.11		1,540	4,849									6,389	0.50
7/21	0.14	0.13		2,159	10,224									12,383	1.00
7/22	0.48	0.17		1,704	40,073									71,716	3.75

DATE OF STORM	TOTAL INCHES	MAX. HR. INCHES	WATER NUMBER: 002	NUMBER: 009	NUMBER: 003	NUMBER: 004	NUMBER: 005	NUMBER: 006	NUMBER: 007	NUMBER: 008	NUMBER: 010A	GALLONS	HRS
7/26	0.34	0.29		2,825	85,665			1	1	2,179	81,575	172,246	2.00
7/27	0.10	0.09		1,884								1,884	0.50
7/28	0.52	0.18		3,636	60,272							63,907	3.25
8/1				921	21,825			1	1		12,385	35,134	0.50
8/1	0.54	0.26		998	5,452						11,866	6,450	1.50
8/3	0.55	0.28		7,785	41,100							60,752	3.75
8/4	0.05	0.04		215								215	0.50
8/7	0.10	0.10		997								997	1.00
8/10	0.17	0.14		1,477	5,451							6,928	0.75
8/20	1.07	0.20		4,685	36,771							41,456	4.50
8/27	0.56	0.24		845	39,964							40,809	2.75
8/27	0.28	0.10			2,472							2,472	1.25
9/3	0.32	0.11			4,304							4,304	0.50
9/6	0.29	0.16		446	7,049	1						7,496	1.00
9/9	0.22	0.14			4,150							4,150	0.50
9/19	0.55	0.23		1,188	28,480			1	1			29,670	3.00
9/19	0.59	0.38		6,746	138,247						12,203	157,196	9.75
9/23	0.42	0.18			25,525							25,525	1.50
9/29	0.75	0.33		1,026	94,824					3,917	1	99,769	2.50
10/4	0.02	0.02		1,067								1,067	0.75
10/12	2.98	0.75		11,225	985,977	22,403	41,196		1	286,775	1,003,981	2,351,558	13.25
10/18	1.77	0.46		3,902	618,418	16,190	19,793		1	164,916	446,024	1,269,244	21.25
10/20	0.31	0.09			8,202							8,202	12.75
10/28	2.55	0.42			1,403,737		163,866		1	1	1,395,015	2,962,621	14.75
10/28	0.02	0.01			17,395		740		1	1		18,137	12.00
11/2	0.26	0.06			10,505							10,505	11.00
11/8	0.37	0.14			34,675							34,675	3.75
11/8	0.38	0.10			23,194							23,194	14.50
11/12	0.45	0.25		617	154,883						1	155,501	6.50
11/12	0.16	0.11			26,867						1	26,868	19.00
11/12	0.89	0.18		973	224,606						1	225,580	15.00
11/16	0.50	0.17			68,397						1	68,398	3.25
11/17	1.05	0.29		2,144	492,246	780					1	495,171	11.25
12/1	1.08	0.24		1,693	179,047		1		1		347,383	528,125	4.00
TOTALS	41.56		6	351,163	12,159,575	157,140	785,547	29,141	27	815,670	17,016,089	31,314,358	

Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.

Note 2: Block activity should be shown as a "1" if the block floated away.

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

CSO ACTIVITY AND VOLUMES

MUNICIPALITY OR DISTRICT: **Skowhegan Water Pollution Control** MEPDES/NPDES PERMIT NO. **ME0100625** DATE: **01/22/08**
 REPORTING YEAR: **2007** SIGNED BY: **Brent Dickey**

YEARLY TOTAL PRECIPITATION: **49.59** INCHES

START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")												EVENT OVERFLOW GALLONS	EVENT DURATION HRS	
	TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: MH #5 NUMBER: 010A						
1/5	0.11	0.11			27,566										80,399	107,964	1.75
1/5	0.44	0.16			176,167										153,616	329,783	9.25
1/8	0.65	0.12			25,516											25,516	2.25
3/26	0.19	0.13			31,756											31,756	1.00
4/15	0.57	0.10			7,055											7,055	2.00
4/16	2.01	0.18		2,846	2,124,241	1	1	1	1	1	1	1	1	1	2,047,443	5,046,352	24.00
4/16	0.88	0.20			2,338,924	1	1	1	1	1	1	1	1	1	1	2,653,152	24.00
4/16	0.01	0.01			790,138	1	1	1	1	1	1	1	1	1	1	800,877	24.00
4/16					192,410	1	1	1	1	1	1	1	1	1	1	192,413	22.25
4/20					20,814											20,814	9.75
4/27	0.12	0.10			5,410											5,410	0.75
4/29	0.83	0.12			69,408											69,408	6.75
4/30	0.22	0.09			46,521											46,521	3.00
5/16	1.27	0.31		1,452	225,247	1	1	1	1	1	1	1	1	1	1	226,702	7.50
5/18	0.46	0.06			1,331											1,331	0.75
6/4	1.32	0.24		795	194,288											195,085	5.00
6/5	0.23	0.11			17,336											17,336	1.75
6/27	1.90	1.66		5,232	461,316	58,022										668,673	3.50
7/6	0.59	0.58		885	164,112	885										165,885	3.75
7/12	0.25	0.14			15,886											15,886	0.50
7/13	0.26	0.25		369	68,505	369										69,245	0.75
7/18	0.29	0.18		118	28,711											28,829	1.25
7/18	0.38	0.12			14,417											14,417	1.50
7/20	0.58	0.38		1,579	141,048											143,878	2.50
7/27	0.21	0.21		716	96,738											97,456	0.75
7/29	0.08	0.08			26,108											26,108	1.00
8/3	1.50	0.54		4,599	459,439	1										504,602	6.00
8/3	0.13	0.12		38	6,246											6,285	0.50
8/6	1.01	0.75		4,462	285,633	1										317,762	3.00
8/8	0.51	0.34		672	122,115											124,812	6.50
8/16	0.19	0.19		180	20,372											20,552	2.25
8/17	0.49	0.43		1,569	74,804	1,305										77,680	1.75
8/18	0.13	0.13			5,147											5,147	1.00
8/24	0.48	0.15			14,754	1										14,756	2.50
8/25	0.30	0.28		936	61,148											62,086	1.50
8/30	0.32	0.16		1	8,386											8,387	2.75
9/9	0.73	0.21		1	15,947											15,948	2.25
9/10	0.03	0.03		1												1	1.50
9/11	0.46	0.13			8,449											8,450	6.25
9/15	0.36	0.20		1	32,490											32,491	2.25
9/26	0.06	0.05		1												1	0.75
9/28	0.12	0.05		1												1	2.75
TOTAL	0.77	0.15			2,403											2,404	0.75

START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("1")														EVENT OVERFLOW GALLONS	EVENT DURATION HRS
	TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: MH #5 NUMBER: 010A							
10/12	3.56	0.63	1	1	1,145,057	1					69,840	1			1,214,901	17.50		
10/19	0.69	0.41	1	1	147,289										147,290	2.75		
10/19	0.48	0.15	1	1	89,794										89,795	5.25		
10/27	1.01	0.22	1	1	128,934						1,000				129,935	18.25		
10/27	0.01	0.01	1	1	7,656										7,656	6.75		
11/3	1.31	0.20	1	1	448,225										448,226	8.00		
11/3	0.06	0.06	1	1	12,879										12,880	11.75		
11/6	1.24	0.32	1	1	326,413										326,414	10.75		
11/15	2.02	0.29	1	1	522,026										522,027	16.75		
11/15	0.68	0.13	1	1	220,383										220,384	17.25		
11/26	0.40	0.11	1	1	4,310	1									4,312	3.50		
11/26	0.23	0.16	1	1	20,657										20,658	3.50		
TOTALS	32.58		26,467	60,590	11,501,926	5	15	1,483,217	2,281,473	15,353,694	327.50							
			Total block trips															
			19	8	5	5	15	16					325,000					
Historical flow per event ('02 - '07)			11,000	40,500	34,500	22,500					7,481,457							
ESTIMATED FLOW TOTALS			235,448	384,582	172,500	337,500					21,596,631							

Doc Num: DEPLW0462 Csoflows.xls (rev. 12/12/01)

note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.
note 2: Block activity should be shown as a "1" if the block floated away.
note 3: Estimated flow total determined by multiplying number of block trips x historical flow per event and adding measured flow volume

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

CSO ACTIVITY AND VOLUMES

MEPDES/NPDES PERMIT NO. ME0100625
 SIGNED BY: Brent Dickey DATE: 1/26/2009

MUNICIPALITY OR DISTRICT: Skowhegan Water Pollution Control
 REPORTING YEAR: 2008
 ARLY TOTAL PRECIPITATION: 65.72 INCHES

START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("1")										EVENT OVERFLOW GALLONS	EVENT DURATION HRS
	TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: CSO Tank NUMBER: 010			
3/8	1.67	0.38				1,000					1,938,000	1,939,000	11.58	
3/8	0.01	0.01	1								2,429,000	2,429,001	24.00	
3/8			1								163,000	163,001	2.75	
4/8											2,355,000	2,355,000	21.85	
4/8											2,742,000	2,742,000	24.00	
4/8											2,950,000	2,950,000	24.00	
4/8											2,976,000	2,976,000	24.00	
4/8	0.19	0.12				22,000					3,396,000	3,418,001	24.00	
4/8	0.23	0.19	1								3,012,000	3,012,000	24.00	
4/8											2,918,000	2,918,000	24.00	
4/8											2,933,000	2,933,000	24.00	
4/8											2,924,000	2,924,000	24.00	
4/8											2,925,000	2,925,000	24.00	
4/8											2,434,000	2,434,000	24.00	
4/8											2,023,000	2,023,000	24.00	
4/8											1,741,000	1,741,000	24.00	
4/8											1,328,000	1,328,000	24.00	
4/8											1,047,000	1,047,000	24.00	
4/8											7,000	7,001	0.18	
4/8	0.25	0.16									24,000	25,927	0.15	
4/8	1.21	0.22			1,926						1,122,000	2,555,853	24.00	
4/28	2.73	0.38			105,071	666,000			662,781			9,194	2.07	
4/28					194	9,000						1	5.25	
5/3	0.35	0.08										1	0.75	
5/21	1.01	0.38			3,181							3,182	4.00	
5/31	0.07	0.06			2,974						61,000	63,975	1.75	
6/3	0.82	0.45			2,779							1	2.75	
6/3	0.23	0.08										2,771	3.75	
6/10	0.93	0.41										6,037	1.00	
6/19	0.56	0.39				7,000			6,037			17,380	1.75	
6/20	0.47	0.46							10,380			1,543	1.00	
6/29	0.46	0.23			1,543							27,233	1.75	
6/30	0.66	0.66			25,231							1		
7/18	0.64	0.23			8,334							693,336	6.20	
7/20	1.79	0.47										395,000	6.22	
7/20	0.01	0.01			2,766							924,767	9.68	
7/24	1.07	0.50										24,000	0.43	
7/24	0.01	0.01			830							575,830	6.48	
7/27	0.54	0.38										436,000	7.08	
7/27	0.02	0.02										1		
7/27	0.40	0.37			4,130	3,000					942,000	951,131	5.70	
7/27												745,000	5.83	

FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("1")

START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("1")												EVENT OVERFLOW GALLONS	EVENT DURATION HRS
	TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Dinsmore St NUMBER: 006	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: CSO Tank NUMBER: 010					
8/4	0.57	0.51				2,594								1,177,594	14.80	
8/6	1.34	0.20				6,611								6,611	1.50	
8/7	1.07	0.83				7,938	1,000							806,938	4.32	
8/7	0.75	0.25				11,698					22,049			2,949,747	24.00	
8/7	0.02	0.02												1,403,000	24.00	
8/7														31,000	0.63	
8/16	0.80	0.68	1			5,842								5,843	2.25	
9/6	2.25	0.42	1			1,317					8,604			789,922	4.05	
9/6	0.02	0.01												222,000	3.73	
9/27	0.97	0.30				417								417	0.50	
10/25	1.48	0.54				5,111								5,111	2.50	
10/25	0.57	0.25				965	1							965	1.50	
11/25	2.39	0.26												1,575,716	N/A	
11/25														694,048	N/A	
12/12	1.02	0.47												2,012,096	N/A	
TOTALS	31.31		20	20	2,000	203,443	709,001				709,854			61,403,177	578.73	
			Total block trips													
Historical flow per event (2007 - 2008)			20	1							3					
ESTIMATED FLOW TOTALS			1,650	101,300							142,000					
			33,000	810,300							1,135,851					

Doc Num: DEPLW0462 Csoflows.xls (rev. 12/12/01)

Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.

Note 2: Block activity should be shown as "1" if the block floated away.

Note 3: Historical flow estimates based on average of 2007 & 2008 measured flow per event (post-Phase II CSO project completion)

Note 4: Estimated flow total determined by multiplying number of block trips x historical flow per event and adding measured flow volume

Note 5: Note added after submission. Regulator @ MH 1109 opened to "bypass" position on 4/18. CSOT was overflowing and CSO #003 not even close.

Note 6: CSO Tank flow is estimated on 4/29. Block of wood was stuck in bending weir holding the weir open. Block removed 5/20

Note 7: Dinsmore St CSO eliminated 8/29

Note 8: SCADA system off line after 10/27/08. CSO flow duration not available for pump stations and CSO tank. Flow values taken from totalizers.

Note 9: Elm St HMI failed 11/25, can't read CSO flow values

Note 10: Elm St HMI failed 11/25, can't read CSO flow values

Note 11: Elm St HMI failed 11/25, can't read CSO flow values

Note 12: Elm St HMI failed 11/25, can't read CSO flow values

Note 13: Elm St HMI failed 11/25, can't read CSO flow values

Note 14: Elm St HMI failed 11/25, can't read CSO flow values

Note 15: Elm St HMI failed 11/25, can't read CSO flow values

Note 16: Elm St HMI failed 11/25, can't read CSO flow values

Note 17: Elm St HMI failed 11/25, can't read CSO flow values

Note 18: Elm St HMI failed 11/25, can't read CSO flow values

Note 19: Elm St HMI failed 11/25, can't read CSO flow values

Note 20: Elm St HMI failed 11/25, can't read CSO flow values

Note 21: Elm St HMI failed 11/25, can't read CSO flow values

Note 22: Elm St HMI failed 11/25, can't read CSO flow values

Note 23: Elm St HMI failed 11/25, can't read CSO flow values

Note 24: Elm St HMI failed 11/25, can't read CSO flow values

08 event count	20	1	21	8	5	40
measured flow	2,000	203,443	709,001	709,854	59,778,859	
g flow/event:08	2,000	9,688	88,625	#DIV/0!	141,971	1,494,471
g flow/event:07	1,650	N/A	15,150	N/A	148,300	
07/08 average	1,650	2,000	12,400	101,300	142,000	

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

CSO ACTIVITY AND VOLUMES

MEPDES / NPDES PERMIT NO. **ME0100625**
 SIGNED BY: **Brent Dickey** DATE: **1/26/2010**

MUNICIPALITY OR DISTRICT: **Skowhegan Water Pollution Control**
 REPORTING YEAR: **2009**
 PRECIP. DATA: **52.77** INCHES
 YEARLY TOTAL PRECIPITATION: **52.77** INCHES

START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("1")										EVENT OVERFLOW GALLONS	EVENT DURATION HRS
	TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: CSO Tank NUMBER: 010	LOCATION: CSO Tank NUMBER: 010			
2/12	0.71	0.25		174,000									174,000	4.48
3/29	0.65	0.19				1,000							1,000	0.10
4/3	0.67	0.26				1,000							1,000	0.65
4/6	1.40	0.37											1,205,188	8.23
4/6	0.27	0.08											424,000	6.48
6/18	0.53	0.22											8,721	2.25
6/18	2.27	0.46											1,267,786	11.00
6/26	0.36	0.28											95,000	0.97
8/21	0.69	0.55											8,670	0.75
10/3	1.33	0.40											9,550	2.50
10/7	0.83	0.18											37,520	3.25
10/24	2.39	0.47											590,862	11.00
11/14	2.53	0.42											1,629,639	10.50
11/14	0.03	0.02											430,000	9.88
11/20	0.99	0.37											21,347	4.00
12/3	0.82	0.30											54,970	8.25
12/27	1.39	0.32											2	
					180,000	295,298	139,000		294,276	5,044,000			5,959,255	84.29
					6,681									
					3,341	90,000	23,167		49,046	720,571				
					6,681	180,000	139,000		343,321	5,044,000			6,073,919	
					ESTIMATED FLOW TOTALS									

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Total block trips
 Average flow per event 2009
 ESTIMATED FLOW TOTALS

- Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.
- Note 2: Block activity should be shown as a "1" if the block floated away.
- Note 3: ESTIMATED FLOW TOTALS determined by multiplying number of block trips x average measured flow per event and adding measured flow volume
- Note 4: North side event on 2/12 caused by Highway Department opening multiple storm drains downtime in a short timeframe to relieve street flooding
- Note 5: Elm Street PS power failure on 3/29 at approximately 20:15 hrs. CSO event may have been averted if power failure had not occurred
- Note 6: Community Driving School service redirected to Water St November '09, no sanitary flow from downtown crossing N Channel Bridge (CSO 009)
- Note 7: Events 3, 4 & 5 caused by rain and significant snow melt

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
CSO ACTIVITY AND VOLUMES

MEMPHES/NPDES PERMIT NO. ME0100625
SIGNED BY: Brent Dickey DATE: 2/10/2011

MUNICIPALITY OR DISTRICT: Skowhegan Water Pollution Control
REPORTING YEAR: 2010
YEARLY TOTAL PRECIPITATION: 49.92 INCHES

CSO EVENT NO.	START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("1")												EVENT OVERFLOW GALLONS	EVENT DURATION HRS
		TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Busl St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: CSO Tank NUMBER: 010						
1	1/25	1.40	0.37				63,932	10,000								1,148,245	10.50
2	2/25	1.57	0.25				18,945									18,945	8.00
3	3/23	1.79	0.21				31,678	4,000								35,678	13.50
4	3/29	1.74	0.21				27,786	23,000					10,020			60,806	13.75
5	3/29	0.79	0.13				9,924	328								77,252	6.50
6	3/29	0.36	0.12				13,799	63,000								833,799	7.25
7	4/9	1.01	0.16				5,476									5,476	2.50
8	4/23	0.91	0.22				5,252									5,252	3.25
9	6/3	0.38	0.26				2,533									2,533	1.25
10	6/5	0.50	0.18				516									516	1.75
11	6/6	0.89	0.21				1,886									1,886	2.50
12	6/20	1.22	1.17				1	10,000								117,721	1.50
13	8/10	0.41	0.39				6,265	12,000								18,266	0.75
14	8/25	0.94	0.23				1,806									19,369	2.25
15	9/3	1.90	0.69				23,047	1,000								475,821	4.25
16	9/3	0.32	0.30				5,105									489,591	3.38
17	10/14	0.69	0.26				5,006									5,006	2.75
18	10/14	1.73	0.39				2,048									208,540	5.00
19	10/27	0.86	0.40				1,504									52,252	5.00
20	11/7	1.74	0.35				1,583									889,438	7.50
21	11/17	1.69	0.46				71,800									787,390	12.00
22	12/12	2.67	0.40				4,440									1,172,935	7.75
23	12/13	0.59	0.11				14,878	33,000								467,258	8.50
				ESTIMATED FLOW TOTALS													
				Percent of Total Flow													
				2%				7%				6%				78%	
				142,192				23,000				446,328				5,856,000	
				12,927				25,455				538,203				7,550,855	
				2				2									
				116,341				494,224				538,203				7,474,096	
				2													
				26.10													
				Total block trips													
				Average flow per event (current year)													

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- Note 1: Flow data should be listed as gallons per day. Storms lasting more than one day should show total flow for each day.
- Note 2: Block activity should be shown as a "1" if the block floated away.
- Note 3: Estimated flow total determined by multiplying number of block trips x historical flow per event and adding measured flow volume
- Note 4: Event #1 caused by rain and significant snow melt
- Note 5: Flo-Tote battery depleted at Island Ave 6/20 & 8/10. CSO activity assumed for 6/20 due to storm intensity, less certain for storm of 8/10
- Note 6: Flo-Tote battery depleted at Joyce St 10/15 & 11/4. Block tripped.
- Note 7: Flo-Tote velocity readings erratic at Island Ave 11/4

CSO EVENT NO.	START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")											
		TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: CSO Tank NUMBER: 010	EVENT OVERFLOW GALLONS	EVENT DURATION HRS		
				2005	2006	2007	2008	2009	2010						
				65.57	48.14	49.59	65.72	52.77	49.92						
				551,160	606,500	475,030	539,101	440,923	398,844						
				28,281	9,492	15,785	13,079	17,500	27,585						
				47,873	31,314	21,596	61,963	6,074	7,551						
				627,314	547,306	512,411	614,143	484,497	433,980						
				341	252	148	98	17	23						
				50	29	40	45	44	49						
							60,591	5,363	6,325						
							1,339	0,704	1,083						

Total Rainfall
Total Flow, Secondary (MG)
Total Flows, Storm Flow (MG)
Total Flows, Untreated CSOs (MG)
Total Flows (MG)
Total CSO Discharge Days
Total Storm Flow Discharge Days

N Side Discharge (MG) CSO#3, #5, #10
S Side Discharge (MG) CSO#4, #8

CSO EVENT NO.	START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY("1")											
		TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St	LOCATION: Island Ave	LOCATION: North Side	LOCATION: Joyce St	LOCATION: Elm St	LOCATION: Bush St	LOCATION: South Side	LOCATION: CSO Tank	EVENT OVERFLOW GALLONS	EVENT DURATION HRS		
				NUMBER: 002	NUMBER: 009	NUMBER: 003	NUMBER: 004	NUMBER: 005	NUMBER: 007	NUMBER: 008	NUMBER: 010				

	2005	2006	2007	2008	2009	2010	2011	2012
Total Rainfall	65.57	48.14	49.59	65.72	52.77	49.92	45.57	46.70
Total Flow, Secondary (MG)	551.160	506.500	475.030	539.101	440.923	398.844	397.327	351.693
Total Flows, Storm Flow (MG)	28.281	9.492	15.785	13.079	17.500	27.585	15.484	13.354
Total Flows, Untreated CSOs (MG)	47.873	31.314	21.596	61.963	6.074	7.551	4.758	4.239
Total Flow (MG)	627.314	577.308	512.411	614.143	464.467	433.980	417.569	369.286
Total Flow (MG) per inch of Precipitation	9.57	11.98	10.33	9.96	8.83	8.69	9.16	7.9
Total CSO Discharge Days	81	81	55	58	17	23	21	25
Total Storm Flow Discharge Days	50	29	40	45	44	49	46	33
N Side Discharge (MG) CSO#3, #5, #10				60.591	5.363	6.325	4.110	3.296
S Side Discharge (MG) CSO#4, #8				1.339	0.704	1.083	0.621	0.927

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
CSO ACTIVITY AND VOLUMES

MEPDES / NPDES PERMIT NO. ME0100625
SIGNED BY: Brent Dickey DATE: 2/21/2014

Skowhegan Water Pollution Control
2013
46.18 INCHES

MUNICIPALITY OR DISTRICT
REPORTING YEAR
YEARLY TOTAL PRECIPITATION

CSO EVENT NO.	START DATE OF STORM	PRECIP. DATA		FLOW DATA (GALLONS PER DAY) OR BLOCK ACTIVITY ("I")												EVENT OVERFLOW GALLONS	EVENT DURATION HRS	
		TOTAL INCHES	MAX. HR. INCHES	LOCATION: Water St NUMBER: 002	LOCATION: Island Ave NUMBER: 009	LOCATION: North Side NUMBER: 003	LOCATION: Joyce St NUMBER: 004	LOCATION: Elm St NUMBER: 005	LOCATION: Bush St NUMBER: 007	LOCATION: South Side NUMBER: 008	LOCATION: CSO Tank NUMBER: 010							
1	1/30	0.30	0.13														12,001	0.90
2	1/30	0.36	0.21														126,002	6.88
3	2/19	0.84	0.24														1	
4	3/12	0.69	0.15														25,002	3.27
5	4/1	0.25	0.20														2	
6	4/19	0.47	0.22														12,858	3.75
7	5/12	0.72	0.33														3,495	3.25
8	5/21	1.54	0.32														2,127	5.00
9	5/21	0.19	0.08														1	
10	5/24	1.14	0.28														3,368	6.25
11	5/25	0.66	0.17														922	1.75
12	6/3	0.19	0.18														519	1.25
13	6/11	0.97	0.19														1	
14	6/25	0.72	0.44														40,765	5.75
15	6/28	1.52	0.39														23,613	7.00
16	6/29	0.61	0.38														14,722	3.00
17	7/1	0.57	0.33														2,931	2.50
18	7/2	0.49	0.32														42,807	4.50
19	7/4	0.39	0.39														20,902	1.75
20	7/7	1.15	0.67														74,230	5.00
21	7/11	0.35	0.34														6,334	2.00
22	7/17	0.34	0.34														834	1.00
23	7/23	2.26	1.05														904,656	7.00
24	8/1	0.53	0.16														325	0.75
25	8/1	0.85	0.59														19,308	2.25
26	8/8	0.45	0.23														717	1.00
27	8/8	1.75	0.46														316,656	9.75
28	8/13	0.49	0.34														1	
29	9/2	2.44	0.73														1,464,304	5.00
30	9/8	0.38	0.34														1,344	0.75
31	9/12	0.85	0.40														1,757	1.75
32	9/13	0.92	0.26														1,695	2.50
33	10/7	0.68	0.27														1	
34	10/31	0.85	0.13														1	
35	11/18	0.42	0.32														1	
36	11/26	1.98	0.48														5	
				29.31													3,124,208	95.55
				Total block trips														
				Avg flow/ measured event (current year)														
				4,731	33,091	3,193	34,222	62,837 (2012)	567,750						4,746,538			
				ESTIMATED FLOW TOTALS														
				66,229	397,092	159,668	342,223	942,574	2,838,751						4,746,538			
				1%	8%	3%	7%	20%	60%									
				Percent of Total Flow														

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Rainfall	49.59	65.72	52.77	49.92	45.57	46.70	46.18	50.46	42.21
Total Flow, Secondary (MG)	475.030	539,101	440,923	398,844	397,327	351,693	349,267	413,892	353,848
Total Flows, Storm Flow (MG)	15,785	13,079	17,500	27,585	15,484	13,354	14,639	33,303	9,324
Total Flows, Untreated CSOs (MG)	21,596	61,963	6,074	7,551	4,747	4,239	4,747	3,861	6,787
Total Flows (MG)	512,411	614,143	484,497	433,980	417,558	369,286	368,653	501,516	412,169
Total Flow (MG) per inch of Precipitation	10.3	9.3	8.8	8.7	9.2	7.9	8.0	9.9	9.8
Total CSO Discharge Days	148	98	17	23	21	25	36	28	24
Total Storm Flow Discharge Days	40	45	44	49	46	33	50	59	30
N Side Discharge (MG) CSO#3, #5, #10		60,591	5,363	6,325	4,906	3,296	3,578	3,024	6,217
S Side Discharge (MG) CSO#4, #8		1,339	0,704	1,083	1,102	0,927	1,102	0,837	0,570

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
CSO ACTIVITY AND VOLUMES

MUNICIPALITY OR DISTRICT NAME: Skowhegan Water Pollution Control
CONTACT PERSON: Brent Dickey
MEPDES / NPDES PERMIT NO.: ME0100625
REPORTING YEAR: 2016
TOTAL ANNUAL PRECIPITATION: 38.07 INCHES

CSO DISCHARGE EVENT NO.	CSO DISCHARGE START DATE	CSO DISCHARGE END DATE	DISCHARGE VOLUME (GALLONS) OR BLOCK ACTIVITY ("1")										PRECIPITATION EVENT					COMMENTS
			LOCATION: WATER ST CSO NO.	LOCATION: ISLAND AVE CSO NO.	LOCATION: NORTH SIDE CSO NO.	LOCATION: JOYCE ST CSO NO.	LOCATION: ELM ST CSO NO.	LOCATION: BUSH ST CSO NO.	LOCATION: SOUTH SIDE CSO NO.	LOCATION: CSO TANK CSO NO.	DISCHARGE EVENT VOLUME (GALLONS)	EVENT RAINFALL TOTAL (INCHES)	MAXIMUM RAINFALL INTENSITY (INCHES/HR)	IS GROUND FROZEN (YES OR NO)	EST. SNOW MELT (INCHES)	PRECIP. EVENT DURATION (HOURS)		
1	1/10	1/10	002	009	003	004	005	007	008	010	2,235,064	2.23	0.44	YES		9.50		
2	2/16	2/16									211,224	0.75	0.32	YES		6.75		
3	2/20	2/20									9,129	0.25	0.07	YES		4.50		
4	2/24	2/25									784,588	1.63	0.40	YES		19.50		
5	2/24	2/25									118,483	0.16	0.05	UNK		3.50		
6	3/2	3/2									27,081	0.52	0.21	UNK		3.75		
7	3/28	3/28									34,442	1.09	0.22	UNK		9.00		
8	4/1	4/1									446	0.37	0.25	UNK		3.00		
9	4/7	4/7									9,129	0.86	0.19	UNK		9.50		
10	5/2	5/2									20,531	0.77	0.26	NO		6.50		
11	6/5	6/5									37,559	1.22	0.56	NO		7.75		
12	6/7	6/7									15,129	0.73	0.39	NO		5.00		
13	6/28	6/29									61,129	1.01	0.62	NO		4.00		
14	6/28	6/29									24,129	0.43	0.24	NO		2.50		
15	7/17	7/17									35,129	0.79	0.52	NO		4.50		
16	7/18	7/18									196,129	0.84	0.62	NO		1.75		
17	8/12	8/12									24,690	0.86	0.58	NO		4.75		
18	8/21	8/22									64,470	0.87	0.55	NO		3.75		
19	8/21	8/22									4,693	0.13	0.11	NO		1.25		
20	10/21	10/21									227,128	1.89	0.88	NO		9.25		
21	11/16	11/16									10,129	0.39	0.22	NO		4.25		
22	11/29	11/29									9,129	0.77	0.15	UNK		9.00		
23	12/1	12/1									9,129	0.15	0.10	UNK		2.25		
Measured Total Flow											861,000	82,157.4	148,000			3,911,157		
Total Block Trips											14							
Flow/Measured Event (Current Year)											9,129							
Estimated Total Flow											861,000	209,958	148,000			4,168,686		
Percent of Total CSO Flow											21%	5%	4%			68%		

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
CSO ACTIVITY AND VOLUMES

MUNICIPALITY OR DISTRICT NAME: Skowhegan Water Pollution Control
 CONTACT PERSON: Brent Dickey
 MEPPDES / NPDES PERMIT NO.: ME0100625
 REPORTING YEAR: 2017
 TOTAL ANNUAL PRECIPITATION: 43.91 INCHES

CSO DISCHARGE EVENT	DISCHARGE VOLUME (GALLONS) OR BLOCK ACTIVITY ("I")										PRECIPITATION EVENT					COMMENTS
	LOCATION: WATER ST CSO NO.	LOCATION: ISLAND AVE CSO NO.	LOCATION: NORTH SIDE CSO NO.	LOCATION: JOYCE ST CSO NO.	LOCATION: ELM ST CSO NO.	LOCATION: BUSH ST CSO NO.	LOCATION: SOUTH SIDE CSO NO.	LOCATION: CSO TANK CSO NO.	DISCHARGE EVENT VOLUME (GALLONS)	EVENT RAINFALL TOTAL (INCHES)	MAXIMUM RAINFALL INTENSITY (INCHES/HR)	IS GROUND FROZEN (YES OR NO)	EST. SNOW MELT (INCHES)	PRECIP. EVENT DURATION (HOURS)		
1	002	009	003	004	005	007	008	010	3,145	0.37	0.18	YES	12	4.50		
2			13,000	7,000					20,989	0.94	0.22	NO	6	7.75		
3				935					935	0.11	0.04	NO	4	2.75		
4				2,315			6,809		10,124	0.39	0.16	NO	N/A	3.75		
5				2,550					2,550	0.30	0.14	NO	N/A	4.25		
6				1,766					1,766	1.10	0.21	NO	N/A	12.00		
7			57,000	131			23,223		80,353	1.33	0.74	NO	N/A	7.00		
8			45,000	213				278,000	323,213	0.38	0.30	NO	N/A	3.00		
9				500					500	0.46	0.30	NO	N/A	3.25		
10				492					492	0.30	0.25	NO	N/A	1.25		
11			17,000	764			7,857		25,621	0.45	0.41	NO	N/A	1.75		
12				969					969	0.47	0.31	NO	N/A	3.50		
13			31,000	2,319			15,714		49,033	0.90	0.53	NO	N/A	4.50		
14			1,000	6,203			6,633		13,837	0.38	0.37	NO	N/A	1.25		
15				5,514					5,514	0.21	0.20	NO	N/A	1.25		
16			18,000	28,102			12,397		58,499	0.71	0.44	NO	N/A	2.75		
17			9,000	3,900					12,900	0.46	0.45	NO	N/A	1.00		
18			17,000	4,415			9,075		30,499	0.52	0.52	NO	N/A	0.75		
19			26,000	5,269					31,269	0.62	0.51	NO	N/A	1.25		
20			17,000	5,693			11,693		34,392	0.67	0.44	NO	N/A	3.75		
21				14,448					14,448	1.70	0.39	NO	N/A	15.25		
22			1,000	5,435	2,000				8,439	0.64	0.38	NO	N/A	3.50		
23				9,349					9,349	1.10	0.14	YES	N/A	12.50		
Estimated Total Flow									738,844							
Total Block Trips									8							
Percent of Total CSO Flow									13%	0%	34%	15%	38%			

- Note 1: "Discharge Day" is 07:00 - 07:00
- Note 2: Discharge volume data should be reported in gallons. Discharge events lasting more than one day should show total volume discharged each day.
- Note 3: Block activity should be shown as a "1" if the block floated away.
- Note 4: Shaded values are block trips with values calculated from historic data
- Note 5: Calculating S Side #008 flow on 2008-2012 measured flow average of 17,460 gallons per inch of precipitation
- Note 6: Calculating Joyce St #004 block trip estimated flow by multiplying average gallons/ inch of rainfall per measured event x inches of rainfall for each event
- Note 7: Elm St/ Summer St/ Bennett Ave/ Chandler St/ Dane Ave sewer replacement and separation project (CSO Phase 3.2) completed September 2015
- Note 8: Main Street sewer separation project (CSO Phase 3.3) completed November 2015
- Note 9: Mt Pleasant Ave sewer separation project (CSO Phase 3.4) completed November 2016

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total Rainfall	52.77	49.92	45.57	46.70	46.18	50.46	42.21	38.07	43.91
Total Flow, Secondary (MG)	440.923	388.844	397.327	351.693	349.257	413.892	353.848	296.645	333.418
Total Flows, Storm Flow (MG)	17.500	27.585	15.484	13.354	14.639	33.303	9.324	7.495	4.386
Total Flows, Untreated CSOs (MG)	6.074	7.551	4.747	4.239	4.747	3.861	6.787	4.169	0.739
Total Flows (MG)	464.497	433.980	417.558	369.286	368.653	451.056	369.959	308.309	338.543
Flow (MG) per inch of Precipitation	8.8	8.7	9.2	7.9	8.0	9.9	9.8	8.1	7.7
Total CSO Discharge Days	17	23	21	25	36	28	24	23	23
Total Storm Flow Discharge Days	44	49	46	33	50	59	30	27	39
Side Discharge (MG) CSO#3, #5, #10	5.363	6.325	4.906	3.296	3.578	3.024	6.217	3.829	0.532
S Side Discharge (MG) CSO#4, #8	0.704	1.083	1.102	0.927	1.102	0.837	0.570	0.340	0.207

N Side	Joyce	Elm
gal inch	gal inch	gal inch

13,830

1,605
 42,857 98
 118,421 561
 1,087
 1,640
 37,778 1,698
 2,062
 34,444 2,577
 2,632 16,322
 26,257
 25,352 39,580
 19,565
 32,692
 41,935
 25,373

3,125

Average 24,778 8,499

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

CSO ACTIVITY AND VOLUMES

MUNICIPALITY OR DISTRICT NAME: Skowhegan Water Pollution Control

MEPDES / NPDES PERMIT NO.: ME0100625

REPORTING YEAR: 2019

TOTAL ANNUAL PRECIPITATION: INCHES

CONTACT PERSON: Brent Dickey

CSO DISCHARGE EVENT NO.	CSO DISCHARGE START DATE	CSO DISCHARGE END DATE	DISCHARGE VOLUME (GALLONS) OR BLOCK ACTIVITY ("1")				PRECIPITATION EVENT				COMMENTS						
			LOCATION: NORTH SIDE CSO NO.	LOCATION: JOYCE ST CSO NO.	LOCATION: ELM ST CSO NO.	LOCATION: BUSH ST CSO NO.	LOCATION: SOUTH SIDE CSO NO.	LOCATION: CSO TANK CSO NO.	DISCHARGE EVENT VOLUME (GALLONS)	EVENT RAINFALL TOTAL (INCHES)		MAXIMUM RAINFALL INTENSITY (INCHES/HR)	IS GROUND FROZEN (YES OR NO)	EST. SNOW MELT (INCHES)	PRECIP. EVENT DURATION (HOURS)		
1	1/24	1/24	65,000	55,760	142,000							1.64	0.44	YES	10	10.75	
2	3/22	3/22		27,200								0.80	0.10	YES	10	11.25	
3	3/23	3/23		7,000										YES	8	MELT	
4	3/24	3/24		7,000										YES	4	MELT	
5	3/31	3/31		15,300	357,000							0.45	0.13	YES	8	5.50	
6	4/22	4/22		13,600								0.40	0.22	NO		4.00	
7	4/26	4/27		6,460								0.76	0.21	NO		6.75	
8	4/26	4/27	8,000	6,545								0.77	0.40	NO		5.50	
9	5/10	5/10		7,055								0.83	0.15	NO		9.50	
10	6/11	6/11		9,350								1.10	0.40	NO		6.00	
11	6/20	6/20	24,000	15,045								1.77	0.58	NO		8.75	
12	6/25	6/25		6,885								0.81	0.34	NO		5.50	
13	6/30	6/30	15,000	6,205								0.73	0.69	NO		2.00	
14	7/6	7/6	7,000	4,165								0.49	0.48	NO		1.25	
15	8/7	8/7		5,610								0.66	0.43	NO		4.25	
16	8/8	8/8		5,015								0.59	0.37	NO		3.00	
17	8/21	8/21	107,000	17,680	89,000			36,317	200,000			2.08	1.08	NO		4.00	
18	8/28	8/28		13,090								1.54	0.46	NO		7.00	
19	9/4	9/4		2,295								0.27	0.26	NO		1.00	
20	9/23	9/23	50,000	17,850	28,556			36,666	185,000			2.10	0.94	NO		3.50	
21	10/23	10/23		10,625				21,825				1.25	0.41	NO		5.50	
22	11/24	11/24		12,070								1.42	0.30	NO	1	11.75	
23	12/14	12/14		10,540	59,100							1.24	0.25	YES	2	11.25	
24																	
			Measured Total Flow														
			274,000				675,656				385,000						
			Total Block Trips														
			Flow/Measured Event (Current Year)														
			274,000				675,656				385,000						
			Estimated Total Flow														
			16%				39%				6%						
			Percent of Total CSO Flow														
			16%				39%				6%						
			22%														