ONEIDA COUNTY DEPARTMENT OF
WATER QUALITY & WATER POLLUTION CONTROL
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Anthony J. Picente, Jr.
County Executive

Steven P. Devan, P.E.
Commissioner

November 16, 2012

Gregg Townsend, P.E.
Regional Engineer
NYS Department of Environmental Conservation
317 Washington Street
Watertown, NY 13601

VIA UPS
AND
ELECTRONIC MAIL

Koon Tang, P.E., Director
Bureau of Water Permits
Division of Water
NYS Department of Environmental Conservation
625 Broadway, 4th Floor
Albany, NY 12233

Re: Oneida County Sewer District
Water Pollution Control Plant and Sauquoit Creek Pump Station Evaluation

Consent Order No. R6-20060823-67

Dear Mr. Townsend and Mr. Tang:

We are pleased to submit herewith three (3) copies of Addendum No. 1 to the Water Pollution Control Plant (WPCP) and Sauquoit Creek Pump Station (SCPS) Evaluation for your Watertown office and one (1) additional copy for your Albany office. This Addendum is being submitted for your review and approval in accordance with NYSDEC Consent Order No. R620060823-67 (Schedule A, Paragraphs 4 and 5).

This Addendum indicates changes to the Water Pollution Control Plant and Sauquoit Creek Pump Station Evaluation dated August 2012. All changes as described in the attached are incorporated into the August 2012 Report. This Addendum incorporates comments provided by the NYSDEC in a letter dated October 23, 2012, as well as feedback from our meeting with Gregg Townsend and Matt Duffany on November 8, 2012.

Please feel free to contact me should you have any questions or need additional information.

Sincerely,

THE ONEIDA COUNTY DEPARTMENT OF
WATER QUALITY & WATER POLLUTION CONTROL

Steven P. Devan, P.E.
Commissioner

ecc: Anthony J. Picente, Jr. – Oneida County Executive
Robert Palmieri – Mayor, City of Utica
Deborah Day – City of Utica
Karl E. Schrantz, P.E. – Shumaker Engineering
Howard B. LaFever, P.E. – GHD
Mark Allenwood, P.E. – Brown & Caldwell
Peter M. Rayhill, Esq. – Martin and Rayhill
Judy Drabicki – NYSDEC
Joseph DiMura, P.E. – NYSDEC
Matthew Duffany, P.E. – NYSDEC
James Stearns, P.E. – NYSEFC

ADDENDUM NO. 1
TO
WATER POLLUTION CONTROL PLANT AND SAUQUOIT CREEK PUMP STATION EVALUATION

Prepared for

Oneida County Department of Water Quality & Water Pollution Control

Steven P. Devan, P.E., Commissioner
51 Leland Avenue
Utica, NY 13502

November 2012

Prepared by

Utica, NY

Cazenovia, NY

Liverpool, NY

ADDENDUM NO. 1 TO
WATER POLLUTION CONTROL PLANT AND
SAUQUOIT CREEK PUMP STATION EVALUATION

Prepared for

ONEIDA COUNTY, NEW YORK

THIS ADDENDUM INDICATES CHANGES TO WATER POLLUTION CONTROL PLANT AND SAUQUOIT CREEK PUMP STATION EVALUATION DATED AUGUST 2012. ALL CHANGES AS DESCRIBED HEREIN ARE INCORPORATED INTO THE AUGUST 2012 REPORT.

NOVEMBER 8, 2012

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& Land Surveying, P.C.
430 Court Street
Utica, NY 13502

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1.0 BACKGROUND OF ADDENDUM

The NYSDEC and Oneida County (County) entered into Consent Order No. R620060823-67 due to SSO at the Sauquoit Creek Pumping Station. The Consent Order has an effective date of December 12, 2011 and requires mitigation of the SSO at the SCPS.

In addition to the Consent Order with the County, the NYSDEC has required a combined sewer overflow long term control plan (LTCP) as part of the City of Utica’s SPDES permit. The LTCP requires the City to increase its percent capture of CSO flows during wet weather.

As a result of the County’s Consent Order to mitigate SSO at the SCPS, and the City’s LTCP to increase the capture of CSO flows, the WPCP will be required to accept and treat flows beyond its existing capacity.

In accordance with the Consent Order, the County submitted a report titled “Water Pollution Control Plant and Sauquoit Creek Pump Station Evaluation” in August 2012. The NYSDEC provided a total of 17 comments on the Report in a letter dated October 23, 2012. A meeting was held on November 8, 2012 with representatives from the NYSDEC, the County, and the County’s engineering team to clarify the comments. This Addendum addresses the 17 NYSDEC comments to bring the Report to an approvable status.

2.0 RESPONSE TO NYSDEC COMMENTS

The following responses provide additional information to be added to or expand discussions presented in the August 2012 Report. For clarity, the responses are presented in the same order as the NYSDEC comment letter, and each response includes the original comment.

NYSDEC Comment No. 1: *Design of the sewer collection, conveyance, and treatment system shall be in accordance with "Recommended Standards for Wastewater Facilities (Ten State Standards), 2004 Edition" (TSS).*

Response to Comment No. 1:

The County and its engineering team acknowledge that all new facilities shall be designed in accordance with the Ten State Standards.

NYSDEC Comment No. 2: *The Department acknowledges the concern expressed in the cover letter, Section 3.7, and Section 9.0 of the Report regarding potential future changes to the Oneida County Sewer District's permitted discharge limits and the effect on process design and construction. The Department is currently performing an updated water quality analysis in order to estimate future permit requirements. The results of this analysis will be forwarded when available. The Department will continue to relay information as it becomes available so the District will be able to effectively manage the implementation of the proposed upgrades and future discharge limit changes, if any.*

Response to Comment No. 2:

The County and its engineering team acknowledge that updated water quality analysis will be necessary to estimate future permit requirements, and the NYSDEC will forward information pertaining to future permit requirements when it becomes available.

NYSDEC Comment No. 3: *Page 3-2. Table 3-1, Existing (2005-2011) Influent Flows and Loads – Footnote 1 indicates the data in the table was compiled using a geometric mean. Though the District's permit defines effluent limitations, it does so using an arithmetic mean for the parameters presented. Please clarify why a geometric mean was utilized for the calculation of parameters in Table 3-1.*

Response to Comment No. 3:

The use of a geometric mean, rather than an arithmetic mean, was an oversight. Table 3-1 has been updated for an arithmetic mean rather than a geometric mean. Note that the average daily flow for summer and winter conditions is within 1.0 mgd whether a geometric or arithmetic mean is used.

The estimated future average and maximum 30-day flow conditions, which are based on existing average flows plus flows from the microchip plant and associated spin-off development, have been updated to account for the arithmetic rather than geometric mean. These projections are summarized in updated Tables 3-4 and 3-5 and are within 1.0 mgd of the original projections.

The projected peak flow to the WWTP is not affected by the use of a geometric versus an arithmetic mean. The following updated tables (3-1, 3-4, and 3-5) supersede the tables provided in the August 2012 Report.

UPDATED TABLE 3-1

EXISTING (2005 – 2011) INFLUENT FLOWS AND LOADS

PARAMETER		UNIT	SUMMER (JUNE – OCTOBER)	WINTER (NOVEMBER – MAY)
Flow	Average (1)	mgd	31	43
	Max 30-Day	mgd	48	54
	Peak (3)	mgd	55	55
BOD	Average (1)	mg/L	137	99
		lbs/day	32,700	33,000
	Max 30-Day (2)	mg/L	102	111
		lbs/day	41,000	49,900
COD	Average (1)	mg/L	268	205
		lbs/day	70,000	72,800
	Max 30-Day (2)	mg/L	244	238
		lbs/day	97,700	107,400
TSS	Average (1)	mg/L	99	69
		lbs/day	23,800	23,100
	Max 30-Day (2)	mg/L	71	70
		lbs/day	28,400	31,700
NH_3	Average (1)	mg/L	9	5
		lbs/day	2,000	1,700
	Max 30-Day (2)	mg/L	9	10
		lbs/day	3,600	4,500
TKN	Average (1)	mg/L	16	13
		lbs/day	3,900	3,900
	Max 30-Day (2)	mg/L	5	5
		lbs/day	4,400	5,000

(1) Arithmetic Mean

(2) Maximum 30-Day Concentration Based on Maximum 30-Day Load at Maximum 30-Day Flow

(3) Existing peak flow of 55 mgd is the result of restricting the influent flow due to hydraulic limitations within the WPCP

UPDATED TABLE 3-4

FUTURE DAILY AVERAGE FLOW

	SUMMER (JUNE – OCTOBER)	WINTER (NOVEMBER – MAY)
Existing Average Flow (mgd)	31	43
Microchip Plant Effluent and Spin-Off (mgd)	9	9
Future Average Flow (mgd)	**40**	**40**

UPDATED TABLE 3-5

FUTURE MAXIMUM 30-DAY AVERAGE SANITARY FLOW

	SUMMER (JUNE – OCTOBER)	WINTER (NOVEMBER – MAY)
Future Maximum 30-Day Sanitary Flow (Non-Microchip Plant) (mgd) (1)	37	52
Microchip Plant Effluent and Spin-off Sanitary Flow (mgd)	9	9
Future Maximum 30-Day Average Sanitary Flow (mgd)	**46**	**61**

(1) Calculated as 1.2 times the daily average flow (rounded up).

NYSDEC Comment No. 4: *Page 3-4, Section 3.3, Industrial Growth Projections – It is recognized that microchip manufacturing process is an evolving technology and that potential wastewater effluent flows evolve as well. The Department encourages continual refinement of projected needs so that the District's system and its proposed upgrades can be optimally developed to adequately convey and treat the wastewater of its current and future users.*

Response to Comment No. 4:

The County and its engineering team acknowledge that the microchip manufacturing process is an evolving technology and continual refinement of projected needs will be continuously evaluated. In addition, we will evaluate other potential growth sources which could impact the design of the proposed facilities.

NYSDEC Comment No. 5: *Page 3-7, Section 3.5. Projected WPCP Flow – TSS Articles 11.241 and 11.242 identify the following flows to be used for basis of design: Design Average Flow, Design Maximum Day Flow, Design Peak Hourly Flow, and Design Peak Instantaneous Flow. The Report evaluates design based upon Average Daily Flow, Maximum 30-day Flow, and Peak Hourly Flow. It is understood that the WPCP is hydraulically limited to 55 MGD in wet weather and that represents a ceiling on certain flow data. However, for estimation purposes it is requested that Design Maximum Day Flow and Design Peak Instantaneous Flow be projected utilizing available data and applicable industry standard peaking factors. Methodology and evaluation of accuracy should be included in these projections, similar to projected flows presented in the Report.*

Response to Comment No. 5:

As indicated by the NYSDEC's comment, there is a lack of existing data for flows greater than 55 mgd due to the hydraulic limitations at the WPCP. The peak hourly flow of 111 mgd was developed utilizing the best available data, along with calibrated models of the City of Utica's collection system and the sanitary collection systems in other portions of the District. The peak flow of 111 mgd is the maximum flow which can be practically treated on the existing WPCP site, and therefore represents the peak hourly and peak instantaneous flow rate. Although the Report developed the peak hourly flow rate of 111 mgd, this was meant to represent the peak instantaneous flow rate as well.

Furthermore, the design maximum day flow could also be as high as 111 mgd. If a significant wet weather event occurs for a continuous period of 24-hours or more, it is feasible that 111 MG could be received at the WPCP over the course of 24-hours. It should be noted that during these conditions, the peak flow from the SCPS would be 35 mgd, which is the flow rate estimated to be necessary to abate the SSO. In addition, although there would be CSO discharges in the City of Utica, the annual percent capture is expected to be greater than 85% during the typical year to satisfy regulatory requirements.

NYSDEC Comment No. 6: *TSS Article 72.232 specifies a peak surface overflow rate for the final settling tanks at the WPCP. The District has undertaken stress testing of the final settling tanks to verify actual peak flow capacity. Results indicate that 56 mgd at an MLSS concentration of 3,000 mg/L can be effectively treated with one tank offline. A current design flow of 62 mgd is proposed. Please expand on the operational aspects that will be required to ensure the final settling tanks can process all sanitary flow during all flow conditions. Also, consideration should be given to construction of an additional tank to accommodate future growth as well as providing potential relief of any operational pressures associated with wet weather secondary treatment.*

Response to Comment No. 6:

Routine maintenance is performed on the final settling tanks on an annual basis, and scheduled during periods of low flow with no more than one tank taken off-line at a time. The Ten States Standards do not require redundant final settling tanks. With all settling tanks online, the facility has capacity to treat 65 MGD. We would not recommended the construction of new tankage and/or modifications to the secondary treatment system until such time as future permit limits are known (refer to comment No. 2). Available land area for the construction of new secondary treatment tankage is very limited.

The split flow concept, as presented in Section 7, will require that all eight tanks be in service to treat a peak flow of 65 mgd in the secondary treatment process. In order to perform repairs and maintenance, final settling tanks are taken off-line each year. Every effort is made to ensure that no more than one tank is out of service at one time, and that the work is performed during historically dry periods. Should a peak flow event occur with one final settling tank out of service, standard operating procedure will require that all equipment tools etc. be removed from the out of service tank and that tank then be placed online. Construction of additional final settling tanks may be required in the future, but until future permit limits are known, it would not be recommended that additional tanks be constructed for the split flow concept. Available land area is very limited, and construction of new tanks must be based on an overall WPCP master plan which would include an evaluation of treatment options for potentially more restrictive future permit limits.

NYSDEC Comment No. 7: *Page 5-24, Table 5-9, Summary of Existing Process Hydraulic Capacity – Please add a column to Table 5-9 with the average hydraulic capacity for each treatment unit. A table similar to Table 5-9 should be included which summarizes average and maximum pollutant loading capacities for the each treatment unit.*

Response to Comment No. 7:

Table 5-9 includes the peak hydraulic capacity for the grit tanks, primary settling tanks, aeration basins, final settling tanks, and chlorine contact tank. Of these processes, only primary settling tanks and aeration basins have standards associated with average hydraulic flow.

The recommended average flow for primary settling tanks is based on a surface overflow rate of 1,000 gpd/ft^2. The existing tanks have a combined surface area of approximately 34,600 ft^2, which results in an average hydraulic capacity of approximately 34.6 mgd.

In 2008, the County's engineering team prepared a capacity study for the WPCP. In this study, the average capacity of the aeration basins was reported as:

- 28 mgd at 6-hours retention time when the tanks are utilized for single-stage nitrification (summer months). This flow assumes one smaller tank is out of service for maintenance. With all three tanks in service, the average hydraulic capacity during summer months is 39 mgd.

- 58 mgd at 4-hours retention time when the tanks are utilized for conventional BOD reduction (winter months) with all three basins online. The WPCP does not schedule maintenance of the aeration basins during winter months.

Table 5-9 has been updated. The following updated Table 5-9 supersedes original Table 5-9 in the August 2012 Report

UPDATED TABLE 5-9

SUMMARY OF EXISTING PROCESS HYDRAULIC CAPACITY

<table>
<tr><th>PROCESS</th><th>MAX. FLOW (MGD)</th><th>LIMITATION</th><th>COMMENTS</th></tr>
<tr><td>Grit Tanks</td><td>80</td><td>Weir Submergence</td><td rowspan="5">Weir submergence limitation is due to downstream restrictions at maximum flow.

There are no hydraulic limitations with average flows of 40 and 52 mgd for summer and winter conditions respectively.</td></tr>
<tr><td>Primary Settling Tanks</td><td>70</td><td>Weir Submergence</td></tr>
<tr><td>Aeration Tanks</td><td>85</td><td>Weir Submergence; Influent channel freeboard</td></tr>
<tr><td>Final Settling Tanks</td><td>70</td><td>Weir Submergence</td></tr>
<tr><td>Chlorine Contact Tanks</td><td>60</td><td>Weir Submergence</td></tr>
</table>

It should be noted that an average hydraulic capacity for each treatment unit is not a quantifiable value for the grit tanks, the final settling tanks, and the chlorine contact tanks.

NYSDEC Comment No. 8: *Page 6-1, Section 6.0, Alternatives to Alleviate Hydraulic Restrictions – It is recommended that the alternatives which alleviate hydraulic restrictions be implemented in a timely manner to improve wastewater treatment as an interim measure as well as to refine parameters prior to final design.*

Response to Comment No. 8:

The County and its engineering team acknowledge the benefit of constructing components of the project associated with alleviating hydraulic restrictions early in the schedule. Specifically, the split flow control box will likely be constructed concurrently with the SCPS upgrades and new forcemain. The control box could also act as a flow distribution box to the aeration basins, and alleviate the existing hydraulic restriction between the primary settling tanks and the aeration basins.

NYSDEC Comment No. 9: *Page 7-1. Section 7.0, Alternatives to Increase WPCP Capacity – The average treatment capacity of the selected alternative should be provided. When a more detailed design is submitted, data similar to that requested in Comment 7 will be necessary to* *determine design acceptability and SPDES permit flow limits.*

Response to Comment No. 9:

The selected alternative involves the construction of new bar screens, a new sanitary pump station, new grit removal tanks, new primary settling tanks, and new high rate disinfection facilities. Per the Ten States Standards, the basis of design for all of these types of wastewater treatment facilities is peak flow. For this reason, these facilities have been preliminary sized for the peak flows presented in this report. During the final design process, the average flow per unit will be evaluated to ensure design acceptability and compliance with SPDES permit limits. In general, the average design flow will be similar to the average flows presented in Chapter 3.

The selected alternative also involves modifications to the solids handling and disposal facilities. The basis of design for these facilities is typically maximum 30-day flows. The maximum 30-day flows and loads were developed by preparing solids mass balances for various alternatives and are presented in Section 7.7. The average flows to solids handling facilities were also developed with solids mass balances and are also presented in Section 7.7.

NYSDEC Comment No. 10: *Page 7-8, Section 7.3.3, Split Flow Concept Permanent Solution – The second paragraph indicates that the purpose of the split flow solution is to reduce sanitary sewer overflows at the SCPS. Per the Order, Section1:11A.: "The goal of this Order shall be to eliminate all SSO discharges from the Pump Station. " Please correct accordingly.*

Response to Comment No. 10:

Section 7.3.3 has been updated to reflect that the goal of the split flow solution is to eliminate SSO discharges. Updated Section 7.3.3 is included at the end of this Addendum and supersedes the text in the August 2012 Report.

NYSDEC Comment No. 11: *Page 7-8, Section 7.3.3, Split Flow Concept Permanent Solution – A statement should be added in this paragraph clarifying the fact that total flow below 62 mgd, regardless of source, will always receive secondary treatment. Also, if applicable, a statement should be added in this paragraph clarifying the fact that sanitary sewer flows will not exceed 62 mgd and subsequently, all sanitary flows will receive secondary treatment. If not applicable, discussion should be added regarding the fate of any sanitary sewer flow in excess of 62 mgd.*

Response to Comment No. 11:

Section 7.3.3 has been updated to clarify that all flows below 62 mgd will receive secondary treatment. In fact, flows up to 65 mgd, regardless of source, will receive secondary treatment. Updated Section 7.3.3 is included at the end of this Addendum and supersedes the text in the August 2012 Report.

NYSDEC Comment No. 12: *Page 7-9, Split Flow Concept Permanent Solution – This section indicates that for total flows greater than 62 mgd, combined sewage from the Mohawk River Interceptor (MRI) will not receive secondary treatment. Please provide predicted MRI secondary treatment rates, i.e. how often will 100% of MRI sewage receive full secondary treatment, 75%, 50%, 25%, 0%?*

Response to Comment No. 12:

Section 7.3.3 has been updated to include the predicted MRI secondary treatment rates as requested**.** Updated Section 7.3.3 is included at the end of this Addendum and supersedes the text in the August 2012 Report.

NYSDEC Comment No. 13: *Page 7-12/13, Section 7.3.3, Split Flow Concept Permanent Solution – Various components of the text do not appear to be in agreement with Figure 7-5. Specifically, the open status of Gates Cl and C2 and the utilization of 62 mgd versus 65 mgd for the design considerations. Please provide clarification.*

Response to Comment No. 13:

Section 7.3.3 has been updated to clarify gate positioning and flow rates. Updated Section 7.3.3 is included at the end of this Addendum and supersedes the text in the August 2012 Report.

NYSDEC Comment No. 14: *Page 7-14, Section 7.3.3, Split Flow Concept Permanent Solution – The disinfection chamber is proposed to be designed for a peak flow of 49 mgd with a 5-minute contact time. TSS Article 102.44 calls for a minimum contact period of 15-minutes at peak flow. A 15-minute contact time must be specified in the Report in lieu of data demonstrating that effluent requirements will be achieved.*

Response to Comment No. 14:

In the forward to the Ten States Standards, it is noted that, "*The design criteria in these standards are intended for the more conventional municipal wastewater collection and treatment*". The proposed application of a high rate disinfection system at the OCSD WPCP is not intended for conventional treatment, but instead is intended to treat CSO flows. If necessary, bench testing can be performed to show that a 5-minute contact time is adequate to achieve disinfection.

NYSDEC Comment No. 15: *8-1, Section 8.0, Evaluation of SCPS – The Order calls for specific criteria regarding the SCPS evaluation and expanding the pumping capacity of the SCPS, per Schedule A., Item A.4. Please review, modify, and add material to this section accordingly to allow for Department review.*

Response to Comment No. 15:

Section 8 of the report has been updated to include the following information in the narrative, as required in Item A.4. of the Order:

a) Brief history of the Pump Station including past upgrades

b) Current effective capacity of the Pump Station and force main

c) Assessment of equipment condition

d) Assessment of operational redundancy

e) Make recommendations for upgrades

Section 8 of the report includes the following information in the narrative, as required in Item A.4. of the Order:

f) Description of proposed upgrades within preliminary basis of design;

g) Details necessary to develop engineering plans and specifications;

h) Preliminary cost estimates for proposed upgrades; and

Section 12 of the report includes the following information, as required in Item A.4. of the Order:

i) Implementation schedule of deadlines for key milestones, including submission of required engineering plans and specifications, and construction start and completion dates for all proposed upgrades.

Updated Section 8 is included at the end of this Addendum and supersedes the text in the August 2012 Report.

NYSDEC Comment No. 16: *Page 8-1, Section 8.1.1, SCPS Pumps – The SCPS currently has three operating pumps to convey 15 mgd of sanitary sewer to the WPCP. The Report calls for the SCPS to convey 35 mgd as part of the SSO elimination and proposes to accomplish this by increasing the Force Main capacity and utilizing the three pumps in operation. TSS Article 42.31 prescribes that "units shall have capacity such that, with any unit out of service, the remaining units will have capacity to handle the design peak hourly flow." Please provide data demonstrating that two pumps in the SCPS can convey 35 mgd to the WPCP. Should this not be possible, please provide an evaluation of providing a fourth pump in the SCPS or some other means to ensure peak flow (35 mgd) will be conveyed to the WPCP with one of the current three units down. Since the SCPS is the location of the current SSO, lack of reliable conveyance* *capacity at this facility is directly opposed to the goal of the Order.*

Response to Comment No. 16:

The wording on page 8-1 has been modified to reflect that there are actually four pumps in the pump station, and that three can be operated concurrently. The fourth pump serves as a redundant backup. Language in this section has also been modified to clarify that two pumps in operation provide the current 15 mgd peak flow from the SCPS. Updated Section 8 is included at the end of this Addendum and supersedes the text in the August 2012 Report.

NYSDEC Comment No. 17: *Page 8-4, Section 8.1.3, SCPS Vaults – The text and Figure 8-3 indicate that the potential will exist for sanitary flow from the SCPS to be diverted to the MRI. That scenario is what currently exists as the sanitary sewage from the SCPS transitions from the force main to the gravity interceptor, comingles with the combined flows from the City of Utica, and provides for wet weather discharges from the City of Utica CSOs. It is understood that the District has no intention of eliminating the SSO by diverting the sanitary sewage out the CSO, and as such, language should be added to clarify the utilization, including how and when, of discharge to the MRI. Sanitary sewage in the MRI will also require clarification in the County's responses to Comment 11 and Comment 12 above.*

Response to Comment No. 17:

Section 8.1.3 has been updated to clarify that discharged to the Mohawk River Interceptor should only occur if the new 54-inch force main is damaged or being cleaned or repaired. Updated Section 8 is included at the end of this Addendum and supersedes the text in the August 2012 Report.

UPDATED Section 7.3.3 Split Flow Concept Permanent Solution

For simplicity, this section assumes the peak flow to the WPCP will be 111 mgd. However, the split flow operational strategy would be the same if the total flow were 91 mgd. The design flow of 111 mgd has a composition of 62 mgd sanitary flow and 49 mgd combined sewer flow. These flow rates were derived through flow monitoring and modeling as described in Chapter 3.

The purpose of the permanent flow split solution at the WPCP is to increase the flow from the SCPS from a peak of 15 mgd to a peak of 35 mgd in order to eliminate sanitary sewer overflows at the SCPS, and to separate the combined sewer flows of the MRI to adequately treat wet weather flows from the MRI in separate treatment facilities. A distinct treatment train for the MRI combined sewer flows allows for appropriate treatment of combined sewer flows during wet weather and maximizes the use of the existing secondary treatment facilities (aeration basins and final settling tanks) for sanitary sewer flows, so that new secondary treatment facilities are not required. However, regardless of source, up to 65 mgd will be treated through secondary treatment facilities.

During a typical year, no more than 62 mgd of sanitary flow (with infiltration and inflow) is expected from the SCPS, the North of Utica Interceptor (including the microchip plant and spin-off), and the Starch Factory Creek Interceptor. Therefore, a minimum of 3 mgd of secondary treatment capacity is available at all times for the combined flows from the City of Utica during the typical year. The actual percentage of sewer flow that receives secondary treatment is a function of the secondary treatment capacity (i.e. 65 mgd) and the quantity of infiltration and inflow. Based on the calibrated models, it is expected that 100 percent of the flow conveyed in the Mohawk River Interceptor (i.e. combined flow from the City of Utica) will receive secondary treatment 84.5 percent of the time. It is important to note that these scenarios occur only during significant wet weather events and that the combined sewage flows that do not receive secondary treatment will receive primary treatment and disinfection, thus meeting the City's 85 percent capture requirement.

Based on the calibrated models, the amount of combined sewer flow from the Mohawk River Interceptor which will receive secondary treatment is summarized in Table 7-2A. The numbers presented in this table are estimates for the typical design year only. Due to the existing hydraulic restrictions at the WPCP, the peak flow in the system is not currently known and can only be estimated through the calibrated model.

TABLE 7-2A

MOHAWK RIVER INTERCEPTOR FLOWS RECEIVING SECONDARY TREATMENT

PERCENTAGE OF MRI FLOWS RECEIVING SECONDARY TREATMENT	PERCENTAGE OF TIME DURING TYPICAL YEAR
100%	94.5%
≥ 75%	97.6%
≥ 50%	98.9%
≥ 25%	99.8%
> 0%	100% (1)

(1) A minimum of 3 mgd is available for secondary treatment of MRI flows during typical year

The permanent solution will incorporate the new forcemain from the SCPS and junction boxes that are part of the proposed interim solution. Refer to Figure 7-5 for a schematic of the permanent split flow solution.

The permanent solution requires modifications to the existing WPCP. New construction will include a new below grade influent pump station, sized to pump approximately 27 mgd. All flow from the North Utica Interceptor and Starch Factory Interceptor will be redirected to the new influent pump station. A screening structure, sized for all flow from North of Utica and Starch Factory will be constructed upstream of the pump station. The screening structure will include two bar screens, each with a capacity of passing 27 mgd. A screenings washer/compactor will also be installed in the screening structure. All screening-related equipment will be on emergency power. Similar, separate screening facilities will be included at the SCPS with a capacity for 35 mgd. The total flows of 62 mgd from the North of Utica, Starch Factory, and SCPS will be conveyed to the new grit removal system.

Flow from the MRI (combined flow) will enter the existing WPCP screening structure and then flow to the existing influent pump station. These systems may be upgraded as part of a rehabilitation project. Screened effluent will discharge to the new combined sewer grit removal system.

Two (2) new grit removal systems (one (1) for combined flows and one (1) for sanitary flows) will be constructed adjacent to the existing grit building. Each grit system will include two (2) vortex type grit removal tanks each sized at half the peak flow, with provisions for bypassing if one unit is out of service. Combined flow from the MRI will be directed to two (2) units each sized for approximately 25 mgd, and sanitary flow from the new pump station and SCPS will be directed to two (2) units each sized for approximately 31 mgd. There will be no comingling of combined and sanitary flow at this point. Flow splitting structures (automated weir gates), downstream of primary settling tanks, will divert combined flow to the sanitary flow stream to maximized secondary treatment, when sanitary flow is less than 65 mgd. A schematic of the automated weir gates after primary settling tanks is provided on Figure 7-6A, and the hydraulic profile through the WPCP with the split flow alternative is provided on Figure 7-6B. Upstream of the primary settling tanks, valves or gates could be installed for isolation and taking banks of settling tanks out of service during low flow conditions for scheduled maintenance.

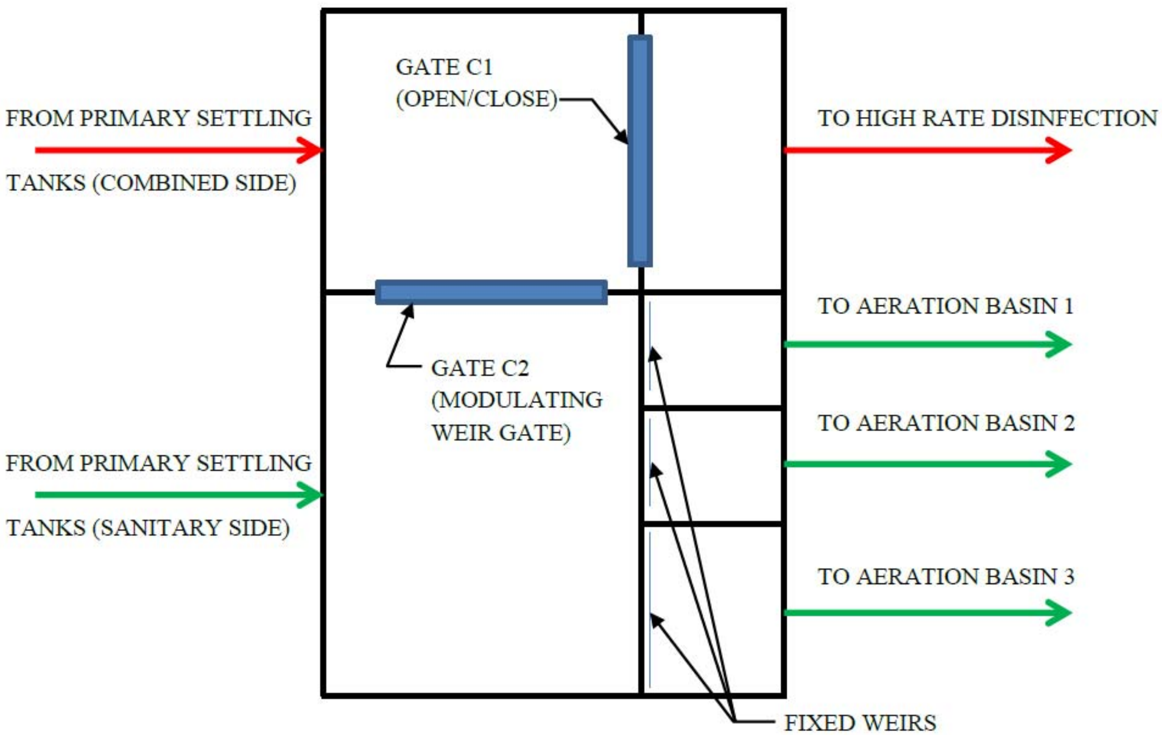

FIGURE 7-6A

SPLIT FLOW DISTRIBUTION BOX

The probable project cost for the new distribution box is shown in Table 7-3.

TABLE 7-3

ENGINEERS OPINION OF PROBABLE COST: SPLIT FLOW DISTRIBUTION BOX

DESCRIPTION	PROBABLE COST (1)
Weirs	$200,000
Excavation	$50,000
Backfill	$50,000
Concrete Walls	$100,000
Concrete Slab	$120,000
Miscellaneous Metals	$80,000
Subtotal	**$600,000**
Electrical, Controls, and Instrumentation (15% of Subtotal)	**$90,000**
General Conditions, Bonds & Insurance (5% of Subtotal)	**$30,000**
Contingency (20%)	**$150,000**
Total Probable Construction Cost	***$870,000***
Engineering, Administrative, and Legal (20%)	**$170,000**
Total Probable Project Cost (Rounded)	***$1,000,000***

(1) Year 2012 dollars

Instrumentation for system controls would be required for the permanent solution as follows and illustrated schematically on Figures 7-5 and 7-6:

- Raw Waste Pump Station Flowmeter (FM 1)
- SCPS Discharge Flowmeter (FM 2)
- Sanitary Pump Station Flowmeter (FM 3)
- Gate C-1 motor operated control weir gate(s)
- Gate C-2 motor operated control weir gate(s)

Flow meters will be installed on the existing raw waste pump station (FM 1), the SCPS discharge forcemain (FM 2), and the new sanitary pump station (FM 3). Flow to the sanitary primary clarifier will be maintained at 65 mgd or less. When total flows to the WPCP (FM 1 + FM 2 + FM 3) are less than 65 mgd, weir Gate C-2 is fully open and weir Gate C-1 is fully closed, and combined and sanitary flows will be discharged to secondary treatment. When flows (FM 1 + FM 2 + FM 3) exceed 65 mgd (Storm Flow Mode), weir gate C-1 will open and gate C-2 will modulate so that a portion of the combined flow will be discharged to high rate disinfection, and the flow to secondary treatment will be held at 65 mgd. Figure 7-5 shows the split flow control box downstream of the primary clarifiers. In this arrangement, the control box could also be utilized to split flow to the aeration basis as shown on Figure 7-6A. However, during final design consideration could be given to constructing the box upstream of the primary clarifiers. In either configuration, the control strategy would involve maximizing all flow to secondary treatment at all times, and only conveying combined flows to the high rate disinfection facilities when total flow to the WPCP is greater than 65 mgd. If the split flow control box were installed downstream of the primary clarifiers as shown on Figures 7-5 and 7-6A, isolation valves would be installed between the grit facilities and the primary clarifiers. The valves would be operated such that all flows from the Raw Waste Pump Station are conveyed to the combined primary settling tanks, and all flows from the sanitary grit tank are conveyed to the sanitary primary settling tank under normal conditions. The isolation valves would provide the flexibility to maintain either set of primary settling tanks during low flow conditions, or convey sanitary flows through the combined primary settling tanks during low flow conditions.

Two (2) new rectangular primary clarifiers will be constructed in the location of the existing circular clarifiers. One (1) set of clarifiers will be sized for approximately 49 mgd for combined flow from the MRI. A second, larger set of primary clarifiers will be sized for 62 mgd, and will handle sanitary flow and a combination of combined and sanitary flows during dry weather events when the combined and sanitary flow is less than 65 mgd. This will maximize flows that receive secondary treatment. Both clarifiers will include a distribution box at the head of the primary clarifier gallery to split flows between six (6) trains of each clarifier.

Flow from the sanitary primary clarifier will be discharged to the existing secondary process. Flow from the combined flow primary clarifier will discharge to the high rate disinfection system and then to the wet weather outfall.

A new wet weather disinfection system will be constructed for high rate disinfection of combined flows during wet weather events. This system will include a contact tank and chemical feed systems. Discharge from this disinfection system will go to a dedicated wet weather outfall. The disinfection system will be a high rate process with chemical added at the discharge of the primary clarifiers.

The disinfection chamber would be designed for a peak flow of 49 mgd. The flow would be dosed at 5-10 mg/L sodium hypochlorite with a 5-minute contact time, assuming pilot test results demonstrate that effluent requirements will be achieved. The chamber would be 240-feet long, 15-feet wide, and 8-feet deep. The discharge from the disinfection chamber would be directed towards an outfall. A pilot test will be performed prior to final design. In the unlikely event the pilot does not demonstrate the effluent requirements can be achieved, the tank would be sized for 15-minutes of contact time at 49 mgd.

An existing bypass outfall will be evaluated for use as an outfall for the disinfection discharge. This 200-foot outfall will need to be evaluated using a camera for visual inspection. An ultrasonic inspection may need to follow if the visual inspection is inconclusive. The probable cost for the high rate disinfection chamber is presented in Table 7-4.

TABLE 7-4

ENGINEERS OPINION OF PROBABLE COST: HIGH RATE DISINFECTION CHAMBER

DESCRIPTION	PROBABLE COST (1)
Excavation	$50,000
Backfill	$40,000
Concrete Walls	$150,000
Concrete Slab	$170,000
Chemical Storage and Feed System	$1,000,000
High Rate Mixer	$250,000
Miscellaneous Metals	$80,000
Subtotal	**$1,740,000**
Electrical, Controls, and Instrumentation (15% of Subtotal)	**$260,000**
General Conditions, Bonds & Insurance (5% of Subtotal)	**$90,000**
Contingency (20%)	**$420,000**
Total Probable Construction Cost	***$2,510,000***
Engineering, Administrative, and Legal (20%)	**$500,000**
Total Probable Project Cost (Rounded)	***$3,000,000***

(1) Year 2012 dollars

UPDATED 8.0 EVALUATION OF SCPS

8.1 EVALUATION OF SCPS UPGRADE

This Section provides an evaluation of the existing facilities at the SCPS and describes the planned upgrade of the SCPS Force Main (FM) in support of sewer overflow abatement. Previous modeling, as summarized in Section 3, has shown SSO mitigation for the 2008 monitoring period by increasing the existing capacity at SCPS from 15 MGD to 35 MGD, and I/I reduction efforts in the SCPS basin. Previous upgrades at SCPS have increased the capacity of the pumps to keep up with influent flow.

Because the wet-weather flow already being pumped will be diverted from the overflow to the new FM, modifications inside SCPS will be minimal.

The SCPS was originally constructed in the late 1960s. The pump station was designed for four (4) pumps, but only two (2) were installed during the initial construction. In the early 1970s, a third pump was installed and in the 1980s the fourth pump was installed to provide for redundancy during high flow periods should three (3) operating pumps be required. In actual practice, only two (2) pumps are operated concurrently which provides a peak flow of approximately 15 mgd. The headloss associated with the existing force main with three (3) pumps operating results in essentially no net increase in flow from the station.

As previously noted, the upgrades within the pump station will be minimal. The pump rotating assemblies will be replaced as part of routine maintenance. The interior standby generator will be replaced with a larger exterior unit that can run three 250 hp pumps concurrently and the VFD's and electrical subsystems will be replaced.

8.1.1 SCPS Pumps

The four (4) 250 hp non-clog vertical centrifugal Morris pumps located in the pump room at the SCPS pump station with each rated at 10,200 gpm at 82 feet TDH and 665 RPM. Each pump has a 30.25 inch diameter impeller. The motors are inverter duty and the pumps operate on variable frequency drives (VFD) with speed based on wet well level.

The pump motors and volutes are in good condition. The rotating assemblies are slated for replacement in the coming years. Based on our evaluation for future capacity requirements, as presented herein, the pumps and motors will provide the necessary future flow rates to mitigate the SSO's at the SCPS. As part of our evaluation, we have confirmed that Morris pump still manufactures the rotating assemblies for these pumps and will be available as replacement parts in the future.

Hydraulic analyses show that with three (3) of the existing pumps operating the required hydraulic conditions with an increase in FM capacity (see Figure 8-1). The alternatives analysis determined a parallel 36-inch DR 17 high density polyethylene (HDPE) FM will provide the best benefit over costs, as compared to adding pump capacity. Additional information on the forcemains is presented in Section 8.2.

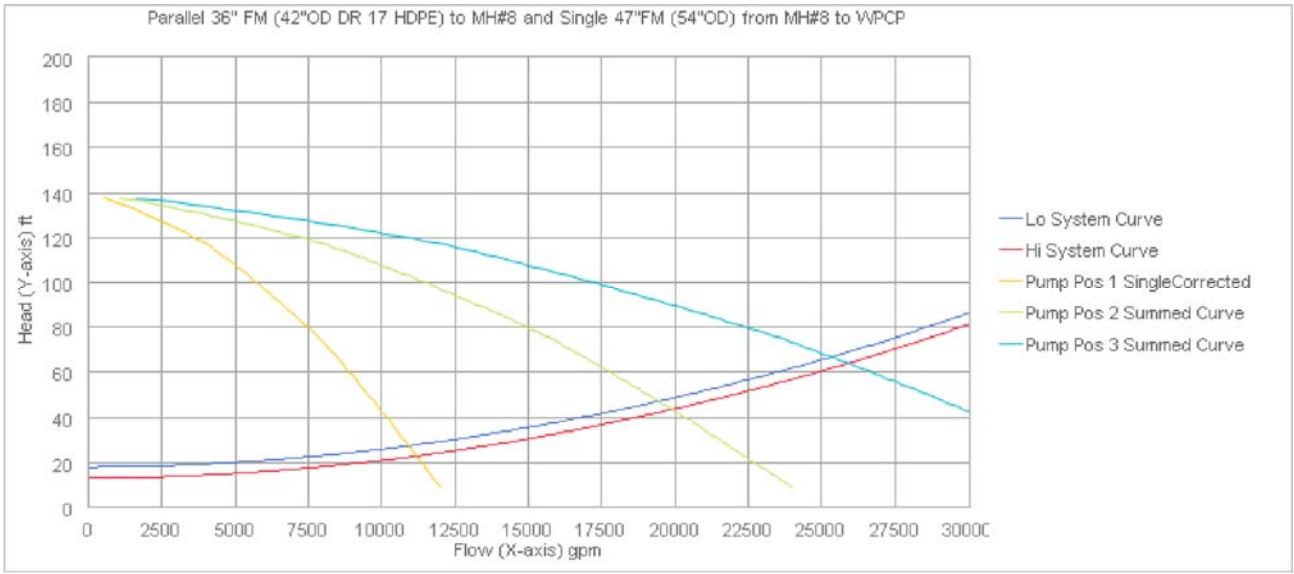

FIGURE 8-1

HYDRAULIC ANALYSIS OF EXISTING SCPS CAPACITY

8.1.2 SCPS Screens

The existing climber screen will be replaced with a new mechanical screen rated for 38 MGD. A second mechanical screen in parallel with the first will also be rated at 38 MGD. It is recommended that the bar spacing be 1/2-inch to protect the pumps and not burden the pump station with screenings removal. To prevent screening SCPS flows twice, the new SCPS forcemain will discharge to the WPCP downstream of screening facilities.

The mechanical screens at the SCPS will be on emergency power and therefore operable under all power conditions.

8.1.3 SCPS Vaults

The gate controlling overflow (and hence, flow to the WPCP) is manually set, and therefore difficult to dynamically operate to minimize overflows. Also, the existing flow totalizer does not provide the resolution of data required for the permanent metering plan. To improve operations, provide a means to connect the new forcemain to the pump discharge, and to provide a more robust metering location, a new metering vault is proposed. This vault, shown in Figure 8-2, will contain hydraulically actuated valves to control flow to the parallel forcemains and downstream flow meters to provide flow monitoring.

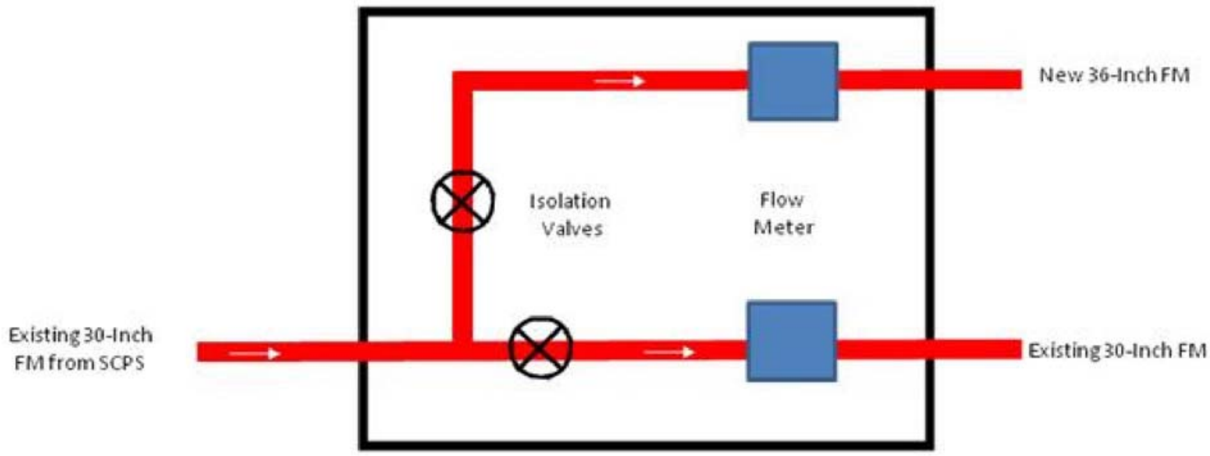

FIGURE 8-2
JUNCTION BOX AT SCPS

The flow meters will be used to regulate flow between the two (2) forcemains via the automated valves and will be programmed to maintain sufficient scouring velocities between the two (2) forcemains, isolating forcemains as required. User overrides will dictate which forcemain remains in operation.

A second vault will be needed along Leland Avenue upstream of the WPCP where the existing SCPS FM discharges into the Mohawk River Interceptor. The SCPS FM diameter will increase to 54-inches at this location. This vault will contain manual valves which will allow discharge to either the Mohawk River Interceptor or the new 54-inch forcemain, as shown in Figure 8-3.

The valve which isolates the Mohawk River Interceptor from the SCPS must remain closed unless the new 54-inch force main is being cleaned or in need of repair. Cleaning should only be done during periods of low flow, when there is no possibility of CSOs occurring along the Mohawk River Interceptor.

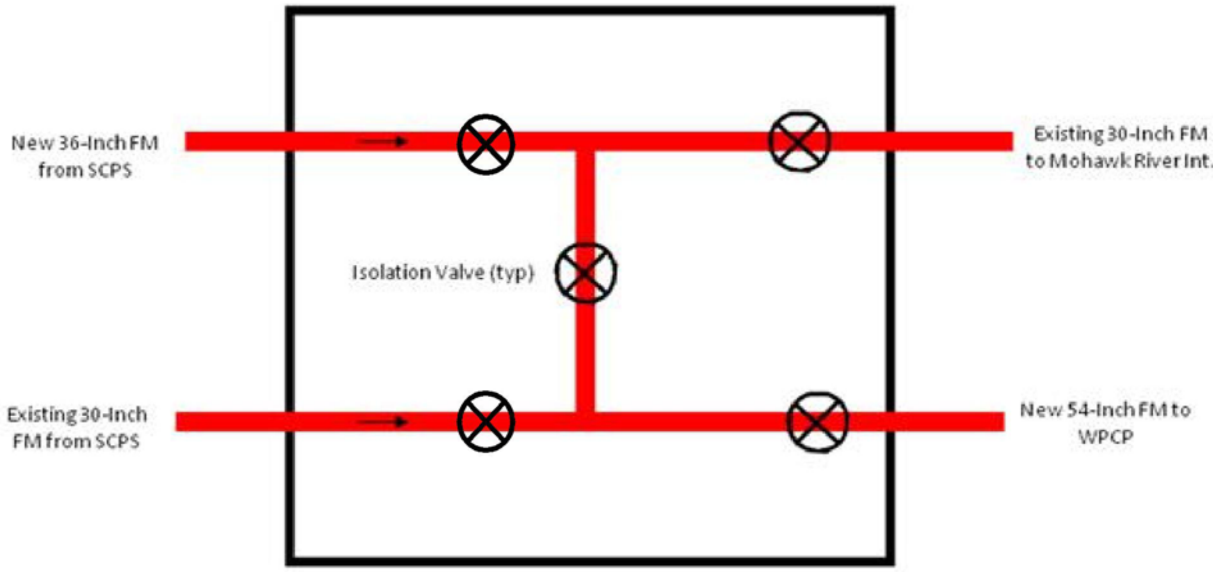

FIGURE 8-3

SCPS FM TERMINUS JUNCTION BOX