MASSENA BOA

APPENDIX C. INFRASTRUCTURE AND UTILITIES ANALYSIS

Massena BOA
Sewer and Water Infrastructure Analysis for Redevelopment Options
November 2016
DRAFT

1.0 Introduction

The following provides a high level analysis of the sewer and water infrastructure necessary to support future redevelopment of the BOA Study Area. The information that follows has been gathered from discussions with knowledgeable local experts, available existing conditions information, best practices, and standards or guidance provided by the NYS Department of Environmental Conservation (DEC). The information is intended to be used for planning purposes in determining the feasibility of extending these critical utilities to the study area. Anticipated sewer flows, water demand, and order of magnitude costs are discussed as well as potential challenges and opportunities. A more detailed analysis and refinement of costs will be required once future redevelopment is known.

2.0 Existing Infrastructure – On-Site and Adjacent Facilities

The buildings and utility systems previously serving the former GM facility within the study area have been demolished. Accordingly, no existing on site water supply or wastewater treatment facilities are available. Further, ground water use restrictions associated with the environmental cleanup may preclude drilling or developing a well on site for a future water supply. The existing soils are also not suitable for sub-surface disposal of treated wastewater effluent.

Alcoa East, located to the west of the US Customs Border Station, is presently served by an on-site water and wastewater treatment plant (WWTP). The WWTP is a package plant with a capacity of 100,000 GPD. No specific data is available on the water treatment plant, however it is assumed water is provided through an intake in the St. Lawrence River, treated, and then distributed throughout the former plant and to the border station. Based on discussions with local experts, it is assumed Alcoa will be discontinuing manufacturing operations at this site and the utility systems will likely be retired. They are, however, both in operation at this time.

The St. Regis Mohawk Reservation (SRMT), located immediately east of the BOA site also maintain an existing water treatment and distribution system. The SMRT water supply system does not extend beyond the Akwesasne border, with the existing distribution system ending approximately a half-mile (0.5 miles) from the BOA project site. An e-mail was recently addressed to Mr. Chris Thompson of the SMRT requesting information on their system and whether or not they would be interested in supplying water to the BOA project site. We are awaiting a response from Mr. Thompson's office.

The Village of Massena, located due west of the site, maintains and operates both water and wastewater treatment systems. The water system has sufficient capacity to address the needs of the proposed redevelopment scenarios, although there are design limitations with the sewerage system.

Both the water distribution system and sewer collection system terminate at a considerable distance from the BOA site. The village water distribution system ends at Haverstock Road, approximately 3.4± miles from the site, while the village sewer collection system ends near NYS Route 131, 5± miles from the site. From discussions with Mr. Hass Fayad, Massena Public Works Superintendent, the village water treatment plant has excess capacity and can comfortably handle the projected system demands from the project site. Rated at 3.5 MGD, the plant is currently only producing 1.5 MGD. The sewage collection system, however, is experiencing considerable inflow and infiltration (I&I) problems. To address this issue the village will require that a developer wishing to interconnect must provide I&I improvements to the village sewer system equal to the proposed sewer flow to negate the impact of any additional flow from the developer's site. This will add a considerable expense to installing a sewer connection with the village system.

The Town of Massena does not at this time operate or maintain a water or sewer collection system within this area of the town.

3.0 Water and Wastewater Supply Requirements

The most intensive redevelopment scenario was examined in more detail as this is likely to require the largest infrastructure investments. The Regional Tourism Destination Scenario was evaluated and the following assumptions were used to determine water and wastewater requirements:

- One two-story hotel with 50,000 SF on each floor (total: 100,000 SF) and 100-150 rooms
- 120,000 SF indoor recreation/entertainment venue w/ 20-30 acres of outdoor recreational facilities
- 100,000 SF for related commercial uses
- Large parking area for patron (20 acres±) plus outdoor space for events

Utilizing design criteria provided in the NYS Department of Environmental Conservations (DEC) "Design Standards for Intermediate Sized Wastewater Treatment Facilities – 2014", average and maximum daily water and wastewater flow projections were developed for the proposed facilities.

MAXIMUM DAILY SYSTEM DEMAND – REGIONAL TOURISM DESTINATION

Redevelopment Component	Estimated Gallons Per Day (GPD)*	Unit / Square Footage (SF)	Estimated GPD
Hotel	130 GPD (per sleeping unit)	150 units	19,500
Commercial uses / Shopping Center / Retail	0.1 GPD (per SF)	100,000 SF	10,000
Hotel Restaurant	35 GPD (per seat)	300 seats	10,500
Hotel Banquet Facility	10 GPD (per seat)	300 seats	3,000
Recreation/Entertainment Venue	5 GPD (per person)	3,000 persons for special events	15,000
		TOTAL:	**58,000**

*Per NYS Department of Environmental Conservations (DEC) "Design Standards for Intermediate Sized Wastewater Treatment Facilities – 2014"

The average daily demand is considerably less, assuming the hotel and restaurants are 75% occupied and the recreation complex is being utilized for standard activities, assuming 120 people plus employees, the average daily demand would be as presented in the table below.

AVERAGE DAILY SYSTEM DEMAND – REGIONAL TOURISM DESTINATION

Redevelopment Component	Estimated Gallons Per Day (GPD)*	Unit / Square Footage (SF)	Estimated Maximum Daily GPD	Estimated Average GPD
Hotel	130 GPD (per sleeping unit)	150 units	19,500	14,625 (75% of max)
Commercial uses / Shopping Center / Retail	0.1 GPD (per SF)	100,000 SF	10,000	10,000 (100% of max)
Hotel Restaurant	35 GPD (per seat)	300 seats	10,500	7,875 (75% of max)
Hotel Banquet Facility	10 GPD (per seat)	300 seats	3,000	NA
Recreation/Entertainment Venue	5 GPD (per person)	3,000 persons for special events	15,000	750 (assume 150 persons)
			TOTAL:	**33,250**

*Per NYS Department of Environmental Conservations (DEC) "Design Standards for Intermediate Sized Wastewater Treatment Facilities – 2014"

Recognizing that the US Customs Border Station is located within the BOA study area and is immediately adjacent to the project site, this analysis briefly examined the potential for coordination of infrastructure needs. The US Customs Board Station is currently provided service through the Alcoa, Inc. water supply system and wastewater treatment systems located on the Alcoa East. From information provided through discussions with Alcoa, the water supply provided by Alcoa for the US Customs Board

Station is 13,000 GPD. Together the combined average and maximum daily demands required for the US Customs Board Station and the Regional Tourism Destination redevelopment scenario are as follows:

ANTICIPATED COMBINED MAXIMUM DAILY DEMAND

BOA Redevelopment Scenario	US Customs Border Station	Combined Maximum Daily Demand
59,000 GPD	13,000 GPD	72,000 GPD

ANTICIPATED COMBINED AVERAGE DAILY DEMAND

BOA Redevelopment Scenario	US Customs Border Station	Combined Average Daily Demand
33,250 GPD	13,000 GPD	43,250 GPD

4.0 Water and Wastewater Supply and Treatment Options

There are several options available for providing supply and treatment of water and wastewater. Understanding the costs for each option will be essential in determining the most viable option for this redevelopment. The following identifies the known options based on existing, available information. An assessment of costs associated with each option is also identified. These options reflect the anticipated Regional Tourism Destination redevelopment scenario supply requirements.

Option A: On-Site Supply and Treatment Facilities

Based on design projections water supply and wastewater treatment facilities must have to capability to provide and treat approximately 72,000 GPD. Considering potential expansion of the site and surrounding area, a design figure of 100,000 GPD will be utilized for both systems. Existing site conditions preclude the installation of a well supply or a ground water disposal system. Accordingly, for both systems on-site package treatment systems would be required. For the water system an intake would be required into the St. Lawrence River at the western end of the property with water pumped to a package treatment system. Treated water would then be stored on site and then pumped into the distribution system to address system demand and maintain adequate system pressure. Approximate costs are as follows:

OPTION A: APPROXIMATE WATER SYSTEM COSTS

System Component	Approximate Costs
100,000 GPD Package Treatment Plant	$1,090,000
100,000 Gallon storage Tank	$250,000
Raw Water Pump Station & Intake	$75,000
Contingencies (20%)	$285,000
Estimated Total:	**$1,700,000**

The sewage treatment system could similarly be constructed on site, down gradient of the proposed water plant. This too would be a package treatment process to simplify design and construction and reduce costs. The plant would be designed to process 100,000 GPD with the effluent disinfected and discharged to the river. Approximate costs are as follows:

OPTION A: APPROXIMATE SEWAGE TREATMENT SYSTEM COSTS

System Component	Approximate Costs
100,000 GPD Package Treatment Plant	$1,090,000
Discharge Pipe and Structure	$25,000
Contingencies (20%)	$223,000
Estimated Total:	**$1,338,000**

Option A Operation and Management: A separate transportation corporation would need to be established to own, operate, and maintain the utility systems. The corporation would also be required to retain licensed operators to run both facilities.

Option B: Connection with Village of Massena

The Village of Massena water treatment plant has sufficient excess capacity to address the water supply requirements of the BOA project site. The point of connection is, however, approximately 3.4 miles west of the site at Haverstock Road. Approximately 0.9 miles further west, the village operates a 600,000 gallon elevated storage tank that maintains system pressure at 60 to 70 PSI. Through the installation of a 12" main running from the point of connection to the project site, sufficient pressure and flow can be provided to meet both the domestic and fire demand requirements for the proposed project without the installation of an on-site water tank or booster pump station. The water line, if installed, would be equipped with fire hydrants at 600' intervals to meet NYS Department of Health (DOH) requirements to similarly provide fire protection to town residents along the route. Further, as the water line would pass through the Town of Massena, a town water district would have to be created through the DEC with the water line owned and maintained by the town. Accordingly, town residents along the route could also connect to the line to provide for their water supply requirements. Approximate costs are as follows:

OPTION B: APPROXIMATE WATER SYSTEM COSTS

System Component	Approximate Costs
18,000 Feet of 12" HDPE Water Main (Installed)	$1,000,000
Hydrants, Valves, and Appurtenances	$350,000
Special Construction, Site Restoration, and Extras	$150,000
Contingencies (20%)	$300,000
Estimated Total:	**$1,800,000**

Note: This figure however does not include any costs for rock excavation. If rock is encountered on site the estimated project costs would increase dramatically.

Regarding a connection to the Village of Massena sewage collection system, a five (5) mile run of 4" force main would be required to connect the project site with the village system. A sewage pump station complete with grinder pumps would be constructed on site to convey the waste product to the point of connection adjacent to NYS Route 131. Approximate costs are as follows:

OPTION B: APPROXIMATE CONNECTION TO VILLAGE SEWAGE SYSTEM COSTS

System Component	Approximate Costs
26,400 Feet of 4" HDPE Force Main (Installed)	$1,100,000
10,000 Sewage Holding Tank	$25,000
Pre-Fabricated Sewage Pump Station	$350,000
Special Construction, Site Restoration, and Extras	$100,000
Contingencies (20%)	$315,000
Estimated Total:	**$1,890,000**

Note: This estimate again does not include any costs for rock excavation, nor does it include the associated costs to address I&I repairs to the existing sewage collection system within the Village of Massena. If the village imposes this requirement, the costs for this estimate could conceivably double. Similarly, if rock is encountered the costs would also increase.

Option B Operation and Management: A Town water and sewer district would be required. The principal advantage is that water supply and sewage treatment would be provided by a separate party and the respective water and lines and sanitary force main would be owned by the Town.

Option C: Connection with Existing Alcoa East Water and Wastewater Systems

It is anticipated that Alcoa Inc. will be discontinuing manufacturing operations at the Alcoa East site in the near future. The facility currently has in operation both a water supply and treatment system and a sub-surface wastewater disposal system. With the forthcoming site closure both facilities will be retired. The US Customs Border Station located adjacent to Alcoa East is presently served by the Alcoa facilities and will be immediately impacted once system operations are discontinued.

The existing water supply system consists of an intake into the St. Lawrence River with treatment provided thorough a packaged water treatment process. At 100,000 GPD, the design capacity of the existing Alcoa plant meets the anticipated requirements for Regional Tourism Destination development scenario. Another option for consideration may be the possibility securing ownership of the existing plant. Assuming the plant is in reasonably good condition, modifications to the facility plus the installation of a transmission main to the BOA site and the construction of an on-site water storage tank would be considerably less expensive than constructing a new on-site water treatment facility on the BOA site or interconnecting with the Village of Massena. It is understood that this would required

conversations with the US Customs Border Station and Alcoa, which have not yet occurred. Approximate costs for this option are as follows:

OPTION C APPROXIMATE WATER SYSTEM COSTS

System Component	Approximate Costs
5,000 Feet - 8" HDPE Water Transmission Main (Installed)	$250,000
Hydrants, Valves, and Appurtenances	$75,000
Special Construction, Site Restoration, and Extras	$75,000
100,000 Gallon storage Tank	$250,000
Rehabilitation of plant Components (assumed)	$100,000
Contingencies (20%)	$150,000
Estimated Total:	**$900,000**

Note: Assumptions with this estimate include the distance from the site to the existing water treatment facility and the associated costs to rehabilitate the existing plant. If the distance is greater than 5,000 feet and/or required repairs to the facility are greater than anticipated, the estimated costs will increase. Again, the estimate includes no provision for rock excavation. The costs to acquire the existing plant and adjacent lands from Alcoa are not known and accordingly not included within the estimate. This estimate does not include purchase costs of property or the facilities.

Information on the existing Alcoa sewage disposal system is currently not available. Accordingly, discussion of this system is not included with this memo.

Option C Operation and Management: Utilization of this system will require the establishment of a transportation corporation to own and operate the facility. A licensed water treatment plant operator would also have to be retained.

4.0 Assessment of Current Options

Pending information from Chris Thompson of SRMT with respect to a possible water service connection to the Akwesasne water distribution system, the utility options currently available to the site have been reviewed. To summarize, the cost comparison of the various options outlined is provided below. Please note that it is possible that a combination of these options may be the most feasible alternative to providing needed utilities to the project site.

ESTIMATED COST COMPARISON OF WATER AND WASTEWATER OPTIONS

Option	Estimated Water Cost	Estimated Wastewater Cost
Option A: On-Site Supply and Treatment Facilities	$1,700,000	$1,338,000
Option B: Connection with Village of Massena	$1,800,000	$1,890,000
Option C: Connection with Alcoa East Water and Wastewater Systems	$900,000	NA*

* Information on the existing Alcoa wastewater system is currently not available and was not evaluated.

Water Options

Based upon the associated costs for the construction of an on-site water treatment system or an interconnection with the Village of Massena it is recommended to investigate the possibility of acquiring the existing Alcoa water treatment facility. The related costs for this option are approximately one third of the costs of the other two options. This of course does not include the cost for the treatment plant. If the opportunity to acquire the Alcoa plant is not available, connection with the Village of Massena water system would be the preferred option. With the village option, the operation, maintenance, and ownership of the water supply system is through a separate party, accordingly the associated costs, problems, and involvement of running a water treatment facility is not the responsibility of the project developers. The estimate prepared for this option assumes rock will not be an issue with the installation of the 3.4 mile water main. However, if excessive rock is encountered, the installation of an on-site water system may be necessary.

Wastewater Options

With respect to the sewage disposal system, fewer options are available. Connection to the Village of Massena sewage collection system may not be feasible. If the village requires the provision of I&I repairs to their existing collection system to negate any increase in the sewage flow into their plant, the associated costs for this system will become prohibitive. Secondly, with the length of run, if rock is encountered, the installation costs will be excessive. If either of these issues are realized this option may not be feasible. Without additional information at this time pertaining to the on-site sewage disposal system on the Alcoa East site, the one viable option is the installation of an on-site wastewater treatment plant.

The options presented and discussed herein will be reviewed further as additional information is made available.