

SAINTE-AGATHE-DES-MONTS

Combined Sewer - Stormwater Detention System



Ville de Sainte-Agathe-des-Monts (Sainte Agathe) is a popular four-season tourist destination in the province of Quebec, within the Laurentian Mountains. Sainte Agathe was first settled in 1849 and saw rapid development in the early 1900s. As a historic city, the town's sewer system is a Combined Sewer System that conveys both sanitary sewer and stormwater discharge to its municipal wastewater treatment facility.

Combined Sewer was a common approach to municipal sewer design in the first half of the twentieth century, when there was little focus upon environmental impact. The primary challenge with a Combined Sewer System is that municipal wastewater treatment facilities are not typically designed to treat the higher discharge rates and volumes associated with most rainfall events. The discharge of untreated combined sewer to streams and rivers is known as a Combined Sewer Overflow (CSO) event and has come under increased environmental regulation over the past 20 years.

On February 17, 2009, the Canadian Council of Ministers of the Environment (CCME) adopted the Canada-wide Strategy for the Management of Municipal Wastewater Effluent. Although Québec has not yet formally signed on to the strategy, it has declared its support of the strategy's technical content and wishes to ensure that the criteria for land development or redevelopment projects minimally integrate the Canada-wide overflow standards established by the Strategy.

Ref: <http://www.mddelcc.gouv.qc.ca>

Owner: Sainte-Agathe-des-Monts
Engineer: Group SMi
Contractor: Excavation Inter-Chantiers
Sub-Contractor: ProFusion, Inc.
Distributor: ISCO

System Details

260,000 Gallon Detention System

CSO Wet Weather Facility

17 Prefabricated Barrel Sections

480 LF of 5' Diameter

433 LF 6' Diameter

360 LF 7' Diameter

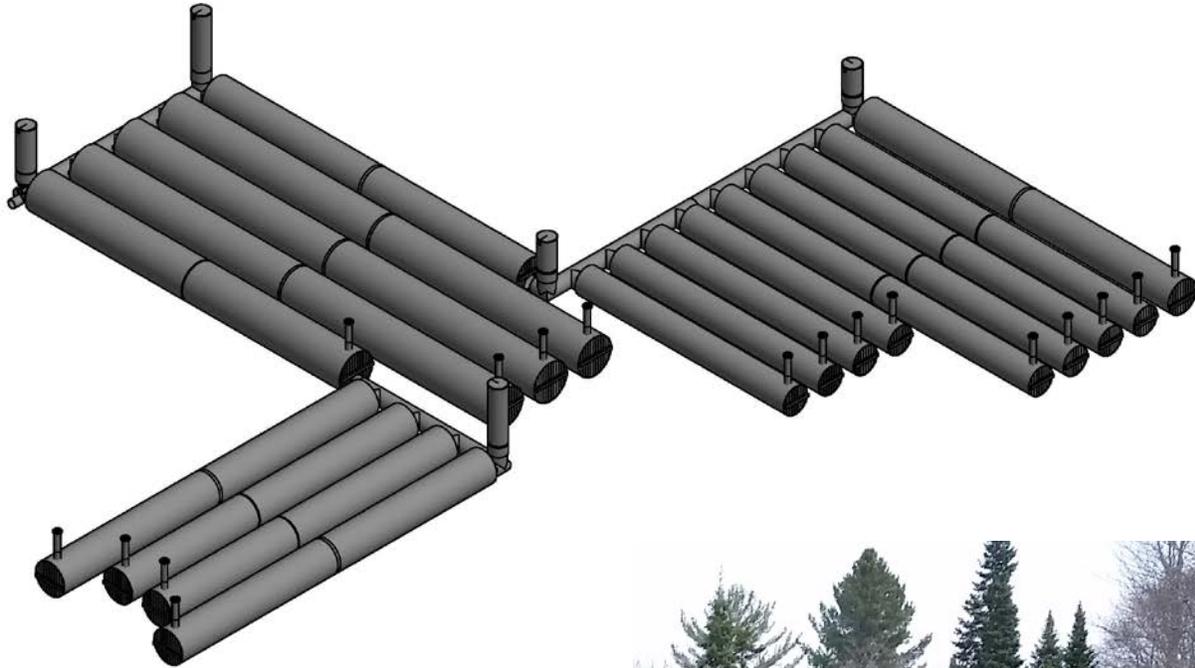
3 Prefabricated Manifolds with Access Risers

Factory and Field Extrusion Welded

Leak Free System 24hr Exfiltration Testing

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In order to protect the town's environment and meet the intent of the CSO regulations adopted by the CCME, Sainte Agathe commissioned a large scale combined sewer detention facility adjacent to its municipal plant along the Rivière du Nord. The detention facility is designed to store 260,000-gallons of stormwater discharge during peak flow events. This additional storage capacity effectively eliminates CSO events during all but the largest storms and serves to protect the town's pristine streams and rivers.

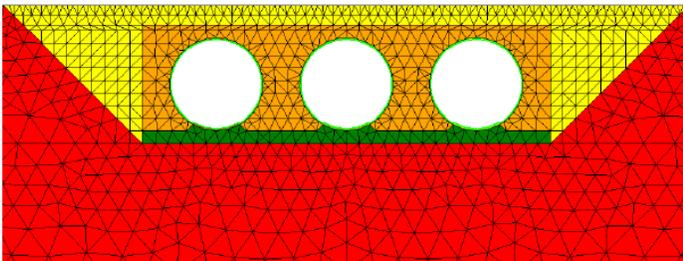
Variable rock table and existing infrastructure constraints required that the system utilize multiple diameter barrels in a three-field approach. Infra Pipe worked with the engineer of record at SMⁱ Consultants to develop a system that would provide the required volume of storage while minimizing rock excavation and impacts to the plant's existing infrastructure.

The detention system was fabricated from Weholite RSC 250 profile wall polyethylene pipe manufactured in accordance ASTM F894. Barrel geometry included 5', 6', and 7' Diameter Barrels connected by a continuous 36" header system with 36" manhole access risers. Bulkheads were manufactured from Wehopanel P120H profile wall panel and reinforced with HDPE encapsulated steel beams.



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Uponor worked with distribution partner ISCO and the general contractor, Inter Chantiers, to coordinate the detention system's fabrication schedule, installation, and field welding details.

All joints, fittings, and fabricated elements were extrusion welded to ensure a leak free system was achieved. The fully assembled system was tested under a 24-hour exfiltration protocol and certified to be leak free. Upon successful completion of the project, the president Inter Chantiers commented:

"Inter Chantiers is proud to successfully achieve this project on schedule and on budget. Our team truly believes that we not only "built an another infrastructure project" but we did so in a durable manner. I am proud to have contributed to my community by participating in this project. My two sons might come back to live here in Sainte-Agathe when they grow up and if they do, I am sure they wont have to pay for the replacement of our project on their taxes ! "

- Alexander Foisy, President Inter Chantiers

Large scale underground detention systems require a comprehensive engineered systems approach to design. Infra Pipe evaluated the Sainte Agathe system using a 2-Dimensional (CANDE) finite element analysis routine that accounts for the soil-structure interaction under the applied loads. Infra Pipe also performed a 3-Dimensional finite element analysis of the system to analyze bulkhead deflection and reinforcement requirements.



Infra Pipe's Weholite ASTM F894 profile wall structural polyethylene system provides a 100-year design life and is resistant to H₂S, pH, corrosion, and abrasion. Weholite has been used throughout the world and North America since 1981.

Infra Pipe's systems are manufactured under strict polyethylene welding standards and can be custom fabricated to meet the needs of any application. All fabricated structures are pressure tested prior to shipment. In-Field extrusion welding is performed by Uponor's certified technicians to ensure that a leak free system is achieved.

Infra Pipe's is able to provide a high quality system with a longer design life and at a reduced total cost of ownership.

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