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sewer system that includes 53 miles of sewer lines, 1200 manholes, 14 pump stations, and a state-of-the-art, activated sludge, Water Pollution Control Facility located along the Penobscot River just north of the Cianbro building. Wastewater is collected from a sewer population of 9,100 users including residents of Brewer, most businesses in the community, and about 20 locations in Orrington.

Storm/sanitary sewer separation. In 2012, the City completed 20 years of sewer separation projects at a cost of approximately \$17 million. The debt to complete the projects is being paid for by the City sewer users in their quarterly sewer bill. Prior to the sewer separation projects, 75% of the City sewer system was combined which means the sanitary and the stormwater flowed in the same pipe. The combined sewers allowed storm water to enter from catch basins, roof and cellar drains, brooks, swales and streams. In 1993 the City completed 48 months of flow monitoring in the sewer system and estimated that 750 million gallons of untreated combined sewer was being discharged through the City's 10 combined sewer overflows (CSO) each year. During peak ground water and wet weather events, total sewer system daily flow could surpass 40 million gallons per day which exceeded the treatment plant's capacity of 5.2 million gallons per day, therefore, excess flows, including untreated sewage, were discharged to the Penobscot River. Untreated CSO discharges were an accepted practice when the treatment plant was constructed in 1975, but by the mid-1980s, federal and state regulations required that storm and sanitary flows be separated. Much of the sewer separation effort involved installing new PVC sanitary lines, and using the old brick and clay sewer lines to convey storm water directly to the Penobscot River. There are currently about 70 storm water dischargers to the Penobscot River.

A 2013 update of the 1994 CSO Master Plan, which is required under the terms of the City's wastewater discharge license from the Maine Department of Environmental Protection, will include an assessment of the impacts that each completed project has had on CSO discharges as well as the status of the City's CSO abatement program. The update will also address remaining problem areas, including any cross-connections and locations where water may still be entering the system.

Storm water management. The City of Brewer is served by a public stormwater collection and conveyance system which consists of 65 miles of pipe, 1650 catch basins and over 70 stormwater discharge locations. The City has taken several significant steps to manage storm water flows, as mandated by federal and state requirements. In 2003, the City was one of 28 communities in Maine to receive a General permit to discharge stormwater to the waters of Maine. The permit required the City to develop, implement and enforce a Stormwater Program Management Plan implementing six minimum control measures (MCM), which are designed to reduce discharge of pollutants from its regulated stormwater system to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality standards of the Clean water Act. The six minimum controls are as follows:

1. Public Education and Outreach on Stormwater Impacts- To raise awareness that polluted stormwater is the most significant source of water quality problems for Maine waters.
2. Public Involvement and Participation- Involve the public in both the planning and implementation process of improving water quality and reducing stormwater pollution via the stormwater program.



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elimination- Develop, implement and enforce a program to
ages and non-stormwater discharges to the City stormwater

collection system.

4. Construction Site Stormwater Run-off Control- Develop, implement and enforce a program, to reduce pollutants in any stormwater runoff to the City's regulated stormwater collection system, from construction activities that result in a land disturbance of greater than or equal to one acre.
5. Post Construction Stormwater Management ó Develop, implement and enforce a program to address stormwater run-off from new development and redevelopment projects that shall ensure that controls are in place that will prevent or minimize water quality impacts.
6. Pollution Prevention/Good Housekeeping for Municipal Activities- Program that has the ultimate goal of preventing or reducing pollutant runoff from municipal activities.

Additionally, the City's Site Plan and Subdivision ordinances require that all development meet Low Impact Development (LID) requirements for managing storm water on-site. In addition, the City facilitates an annual stream clean-up effort undertaken by volunteers. Each year, these volunteers collect 4-6 tons of debris from the City's various stream corridors and waterways.

Water Pollution Control Facility. Brewer's Water Pollution Control Facility came on line in 1975 and, until 2004, treated sanitary waste from the City of Brewer and as well as process wastewater from Eastern Fine Paper. From 1994 to 1998, the treatment plant was upgraded at a cost of \$7 million to meet federal and state requirements and is now a leader in pollution control technology. For example, Brewer installed an innovative selector basin to control bacteria growth because the basin favors microbes that are effective in producing clean water.

The capacity of the treatment plant is 5.2 million gallons a day (MGD), but the average daily flow for 2012 was 1.85 MGD or about 36% of capacity. The excess treatment capability is the result of the closure of Eastern Fine Paper. The City realizes an annual income of about \$250,000 from accepting hauled wastewater specifically septic tank pumpers.

The sludge from the treatment plant is run through a belt filter press and is then loaded and trucked to Soil Prep, a compost facility in Plymouth. After removing 98% of contaminants, treated wastewater is discharged to the Penobscot River. The treatment plant employs seven full-time people and has an total operating budget of \$2,669,454, \$1,347,602 for operation and maintenance of the Brewer water Pollution Control Facility and the 14 pump stations, \$238,558 for the operation and maintenance of the City sewer collection system and \$1,083,294 for debt service. During 2012, the wastewater treatment plant generated about 3,800 cubic yards of sludge (2,655 wet tons).

Awards and recognition. Over the years, the City has received numerous awards for its collection system and waste treatment plant:

Collection system awards

- National CSO Second Place Award in 2001 from the Environmental Protection Agency (EPA) for Combined Sewer Overflow Program Excellence;

2002 from the Maine Wastewater Control Association in Operation and Maintenance of a Wastewater Collection

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- Steve Ranney Award in 2007 from the Maine Department of Environmental Protection for Stormwater Management Program Excellence.

Treatment plant awards

- Richard B. Goodnow Award, received in 1995 from the Maine Wastewater Control Association in Recognition of Excellence in Operation and Maintenance of a Municipal Facility in Maine;
- George W. Burke Facility Safety Award received in 1997 from the New England Water Environmental Association (NEWEA) in recognition of the Excellence of its Active and Effective Safety Program and Safety Record;
- Lee A. Agger Environmental Training Award received in 2001 from JETCC for Meritorious Support and Service in Training Environmental Professionals in the State of Maine.

Challenges. Challenges facing the waste collection and treatment system include:

- Identifying and correcting cross connections and any remaining groundwater/stormwater inflows;
- Upgrading pump stations;
- Educating the public about products that damage pump stations and plug sewer lines (such as reinforced wipes);
- Upgrading the treatment plant as needed (e.g. main electrical entrance, concrete repair, automation);
- Maintaining a high level of citizen interest in voluntary clean-up efforts.
- Continue to identify ways to save on operating costs, specifically energy costs at the facility.
- Complete sewer separation projects identified by the Master Plan Update
- Identify inexpensive methods of treating polluted stormwater prior to discharging to the waters of Maine.