

The City's LTCP Update Approach

A number of combined sewer control technologies and strategies were evaluated as part of the Long Term Control Plan Update (LTCPU) and, after careful evaluation, the store and treat strategy was selected as the primary strategy for meeting the LTCPU goals, along with other complementary strategies. The store and treat strategy works by building storage (tank or tunnel) to store combined sewer flows and then sending these flows to the wastewater treatment plant after a rain event has ended for a high level of treatment. The overall strategy for the LTCPU is summarized in the pyramid chart below.



Specifically, the LTCPU calls for the following:

- Construction of a 1.6 million gallon storage tunnel in the area of Hooffs Run to store flows from CSO-003 and 004. This tunnel will be 10-feet in diameter and be approximately 1/2 mile in length. Construction activities would be limited to a few tunneling shafts.
- Construction of a 3 million gallon storage tank in the vicinity of the CSO-002 outfall at the south end of Royal Street.
- Green infrastructure as a complementary strategy to be implemented citywide.
- Targeted sewer separation as a complementary strategy to be done as a condition of redevelopment in the Old Town area.
- Other potential opportunities including evaluating incentives for private property owners, including rebates for installation of water-saving fixtures.

A number of potential alignments for the storage tunnels and locations for the storage tanks are currently under consideration. Once the LTCPU is approved by VDEQ, the City will further evaluate each of the site alternatives identified and move forward with detailed design and construction of these facilities.

How Much Will the LTCPU Cost? What Are the Benefits?

Preliminary costs for the LTCPU projects are shown below. All projects must be implemented no later than 2035.

Component	Capital Cost (in millions)
CSO 003/004 Storage Tunnel and Facilities	\$80 - \$120
CSO 002 Storage Tank and Facilities	\$35 - \$53
Green Infrastructure	\$5 - \$7.5
Targeted Sewer Separation	\$5 - \$7.5
Total	\$125 - \$188

Once the LTCPU is fully implemented, there will be significantly less combined sewer discharges into the Hunting Creek embayment. For an average rainfall year, the proposed combined sewer infrastructure will:

- Reduce the number of overflows per year by 96% for CSOs-002, 003 and 004; and
- Reduce the volume of overflows by 91% for CSO-002 and 96% for CSO-003 and 004.

CSO-001

There is currently no permit requirement to address overflows at CSO-001 (Pendleton St.); however, the City will be taking a two-phased approach to address this outfall. Phase I will include continued sewer separation as a condition of redevelopment and implementation of green infrastructure in this area to further reduce overflows. Following the completion of the CSO-002 storage tank and CSO-003/004 storage tunnel, the City will move to Phase II, which will include assessing the effectiveness of Phase I and implementing infrastructure to address the remaining overflows.

For more information about this brochure, the Alexandria combined sewer system, the proposed LTCP Update and how to provide feedback, please visit <http://www.alexandriava.gov/sewers> or contact:

Erin Bevis-Carver, P.E.
Sanitary Section Lead
Erin.BevisCarver@alexandriava.gov
Phone: 703-746-4154



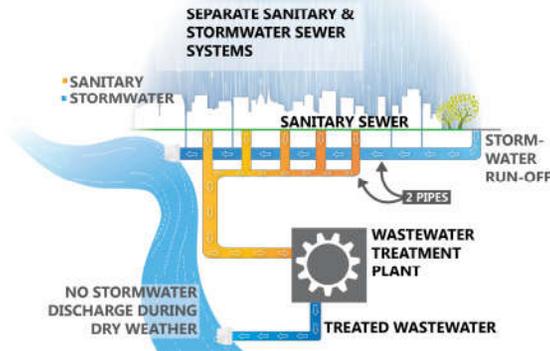
ALEXANDRIA'S PLANS TO IMPROVE COMBINED SEWERS AND WATER QUALITY



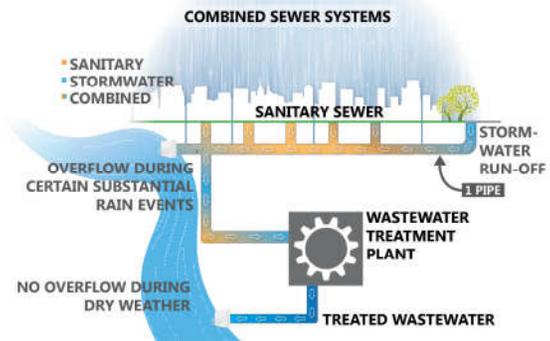
2016 Proposed Long Term Control Plan Update for the Combined Sewer System



What is a Combined Sewer



Under most of the City's streets there are two sewers; one for carrying stormwater to streams and rivers and one for carrying sanitary sewage from homes and businesses to the wastewater treatment plant.



In a small area of the City, in and around Old Town, the City maintains and operates a Combined Sewer System (CSS). A CSS is a sewer system in which there is one pipe that conveys both sanitary sewage and stormwater to a local wastewater treatment plant. Under dry conditions all flow is conveyed to the treatment plant where it is treated, but during rain events the amount of stormwater entering the sewers can overwhelm the system and the combined sewage overflows into the local receiving waters out of Combined Sewer Overflows (CSOs). Along with stormwater discharges, these overflows impact local water quality. These systems are common in older cities throughout the US.

Existing Combined Sewer System



The City has four combined sewer outfalls that are permitted by the Virginia Department of Environmental Quality (VDEQ). These outfalls discharge into Oronoco Bay (CSO-001), Hunting Creek (CSO-002) and Hooffs Run (CSO-003 and 004). Typically, there are 40-70 wet weather events in a year that result in combined sewer discharges into these waterways. A number of factors influence CSOs including the number of rain events, total volume of rainfall, and rainfall intensity. Currently, the City employs a number of best management practices to ensure the proper operation and maintenance of the existing sewer system. The City's goal of the proposed Long Term Control Plan Update is to reduce the number of overflows to no more than 4-6 per year for an average rainfall year.



Water Quality

VDEQ determined that Cameron Run, Holmes Run and Hunting Creek were in need of improvement because these waterbodies did not meet the water quality standards for *E. coli* bacteria and issued the Hunting Creek Bacteria Total Daily Maximum Load (TMDL). A TMDL is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. This allowable load is allocated to the various sources of that pollutant. The VDEQ has allocated allowable bacteria loads to Fairfax County and City of Alexandria stormwater discharges, the Alexandria Renew Enterprises (AlexRenew) Wastewater Treatment Plant, wildlife sources, and the City's CSOs. The Hunting Creek TMDL calls for significant reductions in CSOs that discharge into Hunting Creek (CSOs-002, 003 and 004) with an overall reduction in CSO discharges of 86%.

Regulatory Framework

EPA requires that each city must have a Long Term Control Plan to address its CSS. Alexandria has been operating its CSS under an approved Long Term Control Plan since 1999. The City was issued a new CSS discharge permit in 2013 that requires the City to update its Long Term Control Plan by August 2016 to address the Hunting Creek TMDL no later than 2035. The Long Term Control Plan Update (LTCPU) is a strategic plan that will provide a path for the City to meet the Hunting Creek TMDL for *E. coli* bacteria. It addresses the Hunting Creek TMDL by focusing on decreasing the amount of bacteria discharged into the receiving waters from the combined sewer system.

