NC Department of Environment and Natural Resources

Model Mercury Minimization Plan

Background

The North Carolina Department of Environment and Natural Resources, Division of Water Resources (DENR), has issued a statewide total maximum daily load (TMDL) for mercury. The TMDL responds to a statewide fish consumption advisory for mercury. The TMDL calls for a 67% reduction in mercury levels from the year 2002 baseline mercury loading. The ultimate goal of the TMDL is to ensure safe-levels of mercury in fish throughout North Carolina for human consumption.

As explained in the TMDL, 98 percent of mercury in North Carolina waters comes from atmospheric sources – the vast majority of which are located outside of the State. Under the Clean Water Act, atmospheric deposition of mercury into surface waters is regarded as a nonpoint source. Minor amounts of mercury are discharged directly into surface waters by industrial and municipal point sources as a group. Specifically, the TMDL determined that point sources contribute less than two (2) percent of the annual mercury loadings to State waters. The TMDL allocates two percent of the statewide allowable loadings collectively to the point source sector. This does not mean that an individual discharger may not have significant levels of mercury in its discharge in terms of local water quality considerations. While we expect such instances to be rare based upon the Department's review of statewide mercury data, dischargers with higher mercury loadings will be expected to implement more aggressive mercury controls.

Notably, unlike any other source, local governments actually reduce mercury loadings in the environment by first filtering mercury out in the treatment of public drinking water (particularly where the source of raw drinking water is surface water) and then a second time when wastewater is treated.

In order to implement the two percent point source sector wasteload allocation, the Department has developed a point source permitting strategy which is located at http://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/special-studies/mercury-tmdl. The Environmental Management Commission has approved both the TMDL and the Permitting Strategy. The permitting strategy calls for certain point sources to develop and implement mercury minimization plans (MMPs). For POTWs, an MMP will be required if the facility has (1) a permitted design capacity of more than two million gallons per day and (2) mercury at quantifiable levels in their effluent. MMPs feature best management practices and have been implemented successfully in numerous states around the country. The attached document is the City of Lincolnton's MMP.

Typically, MMPs focus on pretreatment controls – a local government's interaction with non-domestic users of its sewer system as well as outreach to the public at large regarding the proper use and disposal of household products containing mercury.

The MMP approach is intended as a reasonable, low-cost approach toward making some progress toward managing the two percent loading statewide from point sources. Mercury treatment and even testing is

very expensive and does not make sense to reduce a small part of the already insignificant two percent overall point source annual loading to State waters.

City of Lincolnton Wastewater Treatment Plant

MERCURY MINIMIZATION PLAN

February 17, 2017

SECTION I - PURPOSE

The purpose of this Mercury Minimization Plan ("MMP") is to describe best management practices through which the City of Lincolnton WWTP will seek to reduce the amount of mercury discharged into its system and, ultimately, to the environment. The MMP compiles mercury reduction-related efforts to-date and potential future action items. It is designed to be a working document to help guide the City of Lincolnton in its efforts to control mercury loadings discharged into its Publicly-Owned Treatment Works (POTW) by users of the sewer system. Such a reduction in loadings to the sewer system should translate to a reduction in the amount of mercury which is discharged from the treatment plant. The management practices summarized below may also help control some of the mercury reaching our storm sewer system as well.

SECTION II – FACILITY DESCRIPTION

The City of Lincolnton operates a publicly owned treatment works (POTW), including a collection system and wastewater treatment plant (WWTP), that serves the City, and Industrial Users inside the County.

This Wastewater system is permitted to treat 6.0 MGD and break/removes organic waste through an Activated Sludge process. Our facility utilizes a three-step removal process inclusive of preliminary, primary and secondary treatment systems.

Our Preliminary Treatment begins when the wastewater enters our plant from various locations throughout the City and County's Industrial Users. The wastewater is received at the Main Lift Station where debris is grind into smaller pieces using a huge grinder. The pumps lift the water from the Main Lift and the wastewater is further processed for additional removal of debris and grit. The grit is removed using a Vortex Removal System and dumped onto a belt for disposal. .

Primary treatment begins when the wastewater travels from preliminary system to the Oxidation Ditch. This begins the first of two biological phases. The Oxidation Ditch has inner and outer rings which aids in breaking down organic matter. The wastewater enters the outer ring and mixes with microorganisms. The mixture of wastewater and microorganisms travels to the inner rings and is further mixed with rotating disc, which are located around the orbital. The microorganism undergoes further breakdown as the wastewater flows to the Aeration Basins. Blowers are used to sustain a comfortable level of oxygen for the survival of the microorganism. The Aeration Basins allows microorganisms to clean the water by consuming the waste and sending less organic matter to the Secondary Clarifiers. This process aids in BOD, COD, Phosphorus, and Ammonia removals.

Our last treatment is called, Secondary Treatment. This occurs when the water travels from the Aeration Basins and splits off into one of two Secondary Clarifiers where additional settling occurs. The solids either returns to the Oxidation Ditch to restart another cycle of organic matter breakdown, or the solids goes to the Diffused Air Flotation Unit for sludge removal. The wastewater leaves the Secondary via notch weirs, prevents bypass of floatables, thus increasing Effluent quality, and travels to the Contact

Chambers for disinfection prior to discharge. After proper disinfection, the water is discharged into the South Fork River.

The City of Lincolnton's Wastewater Treatment Plant is not designed to remove mercury, but does use the 1631 method of collection to monitor mercury levels. Incidental mercury removal occurs through typical municipal treatment with trace levels of mercury (and other metals) ending up in solids removed from the raw wastewater.

Mercury is not used in the treatment processes at the WWTP. Mercury may be introduced into the sewer system through a variety of sources, such as from industrial users, laboratories, and other businesses. Residual deposits of mercury are also possible in the sewer system from historic practices. Finally, trace amounts from household products and atmospheric deposition (both wet and dry) contribute to sewer system mercury loadings.

While there is typically some mercury contributed to public sewer systems statewide, it is usually in minute quantities and comprises a tiny portion of the already insignificant statewide loading for all point sources - just two percent of the annual mercury loadings to all State waters.

SECTION III – PROGRAM PLAN

A. EVALUATION OF POTENTIAL NON-DOMESTIC SOURCES CONTRIBUTING MERCURY TO THE POTW

Within 24 months from the NPDES required 180-day period for development of an MMP, the City of Lincolnton will evaluate available information to assess the potential for non-domestic users of the sewer system to contribute mercury to the system. The information to be reviewed may include: (1) POTW influent and effluent mercury data and trends; (2) industrial user permits and associated mercury monitoring data; (3) Toxics Release Inventory (TRI); (4) state hazardous site registry and the National Priority List relating to mercury contamination; and (5) historical records of industrial sites which have contributed mercury loadings to the sewer system.

The City of Lincolnton will also survey and evaluate the following common sources of mercury in its service area: (1) dentist offices; (2) hospitals; (3) laboratories; (4) auto recyclers; and (5) other potential sources of mercury based on existing information. The City of Lincolnton began surveying dentist offices October 2015, and has identified offices in need of proper disposal of mercury fillings (amalgam).

The City of Lincolnton will request that industrial users review mercury concentrations in high-volume process chemicals and demonstrate that the mercury concentrations are below industry average. The City of Lincolnton will request that alternative sources for chemicals be explored if the mercury levels are determined to be significantly higher than would normally be expected.

The evaluation of potential non-domestic sources of mercury to the sewer system will be updated every five years, as warranted by prior sampling results and any additional new potentially significant sources to the system.

B. ADDITIONAL CONTROL MEASURES

This MMP identifies reasonable and cost-effective control measures to minimize mercury being discharged into the POTW. Below is a listing of initial BMPs for this POTW.

Pollution Prevention

Substances used at the WWTP will be evaluated to determine if they contain mercury or mercury-based compounds. Any such chemicals will be evaluated for substitution with non-mercury-containing substances.

Housekeeping, Spill Control and Collection, and Education

The City of Lincolnton WWTP will develop procedures to minimize the possibility of any spill or release at the WWTP involving mercury containing substances. City of Lincolnton WWTP will add mercury identification and proper disposal to ongoing and future operator training procedures.

Public Outreach

The City of Lincolnton will make available educational information regarding sources of household mercury and appropriate use/disposal practices. This information will be posted on the City of Lincolnton's website and copies will be made available at Public Works. The availability of this information will be ongoing on the website and updated for changes. The City of Lincolnton will also

facilitate public awareness regarding community collection points for mercury-containing products from residents/customers for proper disposal. Periodic reminders of such collection programs will be provided as part of the City of Lincolnton's ongoing public outreach.

Laboratory Practice

The City of Lincolnton WWTP operates a laboratory for purposes of complying with state and federal monitoring and sampling requirements. The laboratory is a potential source of small quantities of mercury-containing compounds. Laboratory employees will be trained in the proper handling and disposal of these materials. The laboratories have also replaced mercury thermometers with non-mercury thermometers, whenever practical.

A Mercury Spill Kit is available on site in the laboratory for incidental mercury spills.

C. TRACKING AND MONITORING

In order to assess the implementation of the control measures, the City of Lincolnton proposes to undertake the following evaluations beginning after the first full year that this MMP is implemented:

1. Survey annually at least ten percent (10%) of any non-domestic users identified as possible significant sources of mercury to the POTW;
2. Track the implementation of the programs outlined above;
3. Monitor influent mercury at least annually. Require significant non-domestic sources of mercury to monitor periodically, as warranted; and
4. Measure effluent mercury as required by the NPDES permit.

These efforts will allow the City of Lincolnton to establish a baseline of influent and effluent mercury levels to assist in identifying any trends in mercury contributions from domestic and non-domestic users of the sewer system. This baseline will be tracked annually.

SECTION IV — IMPLEMENTATION OF CONTROL MEASURES

The City of Lincolnton WWTP monitors mercury levels on all industrial users. Ninety-nine percent of our industrial users, lab results are non- detectable. The other one percent has a minute/trace amount. At this time, the City of Lincolnton does not see a need for implementation of mercury limits for our industrial users. The pretreatment department continues to monitor our Influent mercury levels for potential elevations. The City will remain vigilant towards environmental concerns with regards to increase mercury levels.

The City of Lincolnton will implement the control measures summarized in Section III over the permit term and will update this MMP as warranted.

SECTION V - REPORTING

A summary of the MMP activities will be submitted as part of the NPDES permit renewal process.