Combined Sewer Overflow
Long-Term Control Plan
Update Report

Metropolitan St. Louis
Sewer District

Supplement No. 1
September 2013
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Introduction and Purpose
The Metropolitan St. Louis Sewer District (MSD) prepared an update to its Combined Sewer Overflow Long-Term Control Plan, dated February 2011, that described the development and selection of MSD’s plan for controlling combined sewer overflows to area waterways. The plan was approved by the Missouri Department of Natural Resources on June 1, 2011. The CSO Control Measures defined in the plan—including descriptions, design criteria, performance criteria, and critical milestone dates—were subsequently incorporated into a Consent Decree between the United States EPA, the Missouri Coalition for the Environment Foundation, and MSD. The Consent Decree was entered on April 27, 2012.

On March 26, 2013, MSD requested a modification to one of the CSO Control Measures described in the Long-Term Control Plan and Consent Decree. The requested modification pertains to the CSO Treatment Unit at Outfall 063, part of the controls proposed for the CSOs discharging to the Lower and Middle River Des Peres. The location of the treatment unit described in the Long-Term Control Plan is depicted in Figure 1 below, at Outfall 063 at the upstream end of the proposed CSO storage tunnel.

MSD proposed that the location of the CSO treatment unit be changed to a new location near the downstream end of the CSO storage tunnel (i.e., near the tunnel dewatering pump station and Lemay WWTP); see Figure 2. In essence, the flow that would have been treated by the CSO treatment unit at Outfall 063 and discharged to the River Des Peres, will now enter the tunnel,
be transported to the downstream end, and be treated and discharged at that location. The CSO treatment unit would still be an Enhanced High Rate Clarification facility with a 100 MGD capacity providing the equivalent of primary clarification, solids/floatables disposal, and disinfection.

This Supplement No. 1 to the Long-Term Control Plan addresses modifications to the plan to incorporate the modified CSO Control Measure. This Supplement addresses each of the minimum elements of the Long-Term Control Plan, as defined in the CSO Control Policy (59 FR 18688):

- Characterization, Monitoring and Modeling of the Combined Sewer System
- Public Participation
- Consideration of Sensitive Areas
- Evaluation of Alternatives
- Cost/Performance Considerations
- Operational Plan
- Maximizing Treatment at the Existing POTW Treatment Plant
- Implementation Schedule
- Post-Construction Monitoring Program
**Characterization, Monitoring and Modeling of the Combined Sewer System**
Additional system modeling was performed to support analysis of system performance with the new CSO Treatment Unit location, as described below under “Evaluation of Alternatives.” Further characterization, monitoring and modeling of the combined sewer system was not necessary or performed to support the proposed change in location of the CSO Treatment Unit.

**Public Participation**
The parties to the Consent Decree agree that the proposed change in location of the CSO Treatment Unit does not constitute a material change to the Consent Decree and therefore does not require a public comment period under the Consent Decree. This modification to the Long-Term Control Plan does not change the level of control presented during the public participation for the plan. This coupled with the fact that this is not a material change to the Long-Term Control Plan no further public participation was necessary or performed.

**Consideration of Sensitive Areas**
The proposed relocation of the CSO Treatment Unit does not result in CSO discharges to any receiving waters other than those previously described and characterized in the Long-Term Control Plan. Therefore, MSD’s evaluation of Sensitive Areas as presented in the Long-Term Control Plan, and approved by MDNR, remains unchanged as a result of relocating the CSO Treatment Unit.

**Evaluation of Alternatives**
MSD’s preliminary study of the CSO Treatment Unit evaluated two alternative locations:
- The original location proposed in the Long-Term Control Plan at Outfall 063
- A revised location near the downstream end of the CSO Storage Tunnel.
The revised location was considered as a result of additional information becoming available to MSD on property ownership near the original Outfall 063 site, as well as information developed in the course of performing the preliminary design study.

MSD evaluated the two alternative locations and selected the revised location near the downstream end of the CSO Storage Tunnel for the following reasons:
- Location of the CSO treatment unit nine miles farther downstream along the River Des Peres reduces the impact, if any, of the primary treated and disinfected effluent on the River Des Peres. The relocated facility’s discharge point will be at a location where receiving stream flows and stream assimilative capacity are greater.
- Location of the CSO treatment unit near or adjacent to the Lemay Wastewater Treatment Plant will provide for significantly improved operations and maintenance (O&M) support compared to a treatment unit at a remote location. O&M issues can be responded to much quicker, and by personnel who specialize in the operation and upkeep of treatment units. The anticipated result is overall better performance of the CSO treatment unit.
- Location of the CSO treatment unit at the downstream end of the tunnel will enhance the ability of the tunnel system to effectively deal with grit that enters the system from combined sewers. Some older and relatively-ineffective CSO tunnel designs have emphasized the importance of improving grit management in CSO storage systems by proper pump station design and avoiding “dead-ended” tunnels.
• In addition to the water quality and operational issues noted above, a site near the downstream end of the CSO storage tunnel offers several advantages over the site at Outfall 063. The site at Outfall 063 is in close proximity (approximately 500 feet) to Gateway High School. Placing a treatment facility near this school is undesirable from several perspectives: routine chemical deliveries, noise, potential odors, etc. The Outfall 063 site is further complicated by property ownership issues, and room for future expansion is problematic. Relocating the CSO treatment unit to a site near the downstream end of the tunnel has the advantage of additional land availability, which allows more alternative treatment technologies to be considered, and allows for future facility expandability as recommended by the CSO control policy.

MSD has determined that this proposed revision will not affect the CSO Control Measure’s ability to achieve the Performance Criteria specified in Appendix D of the Consent Decree. Final design of the tunnel system and CSO treatment unit has not yet begun, but preliminary evaluations have been conducted to determine the impacts of relocating the treatment unit on tunnel sizing and CSO control system performance.

Several potential impacts were identified as a result of relocating the CSO treatment unit. The intake structure and drop shaft at Outfall 063 will need to be nominally larger to accept the additional 100 MGD of flow that otherwise would have been treated and discharged to the River Des Peres channel at this location. Because of the large intake and drop shaft capacity already required for this CSO (conceptual peak design flows of approximately 4,000 MGD), the addition of another 100 MGD of flow is not expected to increase the size or cost of these facilities to a measureable extent. The impact of the additional 100 MGD flow within the tunnel (i.e., during tunnel filling) was also considered, and determined, by practical experience and hydraulic modeling, to be negligible.

Finally, impacts on CSO control system performance (i.e., the Performance Criteria) were evaluated. The CSO “control system” is considered as consisting of the storage tunnel and inlet/drop structures, the tunnel dewatering pump station, the CSO treatment unit, and the Lemay WWTP. Because the exact mode of system operation has not yet been determined, pending final design, two hydraulic model runs (using the Long-Term Control Plan’s XP-SWMM model) were conducted to “bracket” the performance of the system with the relocated CSO treatment unit.

Precipitation data for the typical year (Year 2000) were input, and the model results were then compared to the Performance Criteria specified in the Consent Decree. The two scenarios that were evaluated to bracket system performance are as follows:

• The first scenario (Scenario A) considered that the tunnel dewatering pump station would pump whatever volume is available in the tunnel up to a maximum flow rate of 100 MGD. This scenario represents the maximum treatment that the CSO treatment unit would provide.

• The second scenario (Scenario B) only pumped flow to the CSO treatment unit when the tunnel was completely filled. This represents the minimum flow that the treatment unit would see.
The results of the two (2) bracketing scenarios are presented in the table below, and compared to the Consent Decree performance criteria. Either “extreme” scenario meets the Consent Decree requirements. No increases in tunnel size or treatment unit capacity are needed to accommodate the treatment unit relocation.

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Consent Decree</th>
<th>Scenario A</th>
<th>Scenario B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Overflow Events in Typical Year</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total Untreated Overflow Volume (million gallons) in Typical Year</td>
<td>1,412</td>
<td>980</td>
<td>950</td>
</tr>
<tr>
<td>Comply with Missouri State Operating Permit</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

In reality, some intermediate control scheme will likely be designed wherein the tunnel dewatering pump station will deliver flow either to the Lemay WWTP or the CSO treatment unit during portions of the tunnel filling period to assist with grit transfer through the tunnel, and then the CSO treatment unit would be utilized as necessary to optimize system performance. When the optimal operational scheme is finally developed, additional hydraulic modeling will be performed to define the expected system performance, which is expected to fall between the two scenarios presented above.

**Cost/Performance Considerations**

As noted above, the proposed relocation of the CSO Treatment Unit is not expected to impact project costs or system performance from those estimated in the Long-Term Control Plan. The cost/performance analyses presented in Section 8 and Appendices I and J of the Long-Term Control Plan therefore remain unaltered.

**Operational Plan**

Operation of the CSO Treatment Unit is not expected to change as a result of the new location, as described above. Specific O&M manuals will be developed for the CSO Treatment Unit and associated storage/pumping components of the Lower & Middle River Des Peres CSO Controls as those projects are designed and constructed.

**Maximizing Treatment at the Existing POTW Treatment Plant**

The operating strategy for the CSO Treatment Unit remains unchanged as a result of relocating the CSO Treatment Unit; hence flows to the Existing Lemay WWTP should remain unchanged from those proposed in the Long Term Control Plan. The proposed relocation of the CSO Treatment Unit will continue to maximize treatment at the existing Lemay WWTP.

**Implementation Schedule**

The implementation schedule for the CSO Treatment Unit, and the Critical Milestone Dates defined in the Consent Decree and originating from that schedule, do not change as a result of relocating the CSO Treatment Unit.
**Post-Construction Monitoring Program**

The post-construction compliance monitoring program as defined in the February 2011 Long-Term Control Plan and further developed in the *CSO Post-Construction Monitoring Program* plan, dated April 27, 2013 approved by the EPA on June 20, 2013 under the Consent Decree, does not change as a result of relocating the CSO Treatment Unit.