SSO 700 IWAP
Task 2.3 Watershed Site Conditions

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Section 1.0 - Introduction

Task 2.3 of the SSO 700 Integrated Watershed Action Plan (IWAP) task order involves the execution of a site visit to the SSO 700 IWAP study area to visually identify, characterize, and document the physical, chemical and biological integrity impairments of the watershed and the pollution sources and discharges. Additionally, the site visit is intended to aid in the assessment of the technical feasibility of water quality-based strategies based on the existing and planned site conditions. In fulfillment of this scope, two site visits were held: (1) a site visit to the SSO 700 Storage and Treatment Facility (STF) and (2) a general watershed site visit to several key locations throughout the SSO 700 IWAP study area. These site visits were attended by staff from the Metropolitan Sewer District of Greater Cincinnati (MSDGC), Hamilton County, and CH2M. This technical memorandum is intended to document the observed conditions and impairments and how they may inform the development of the IWAP, including the water quality sampling, water quality modeling, and hydraulic modeling components of the project.

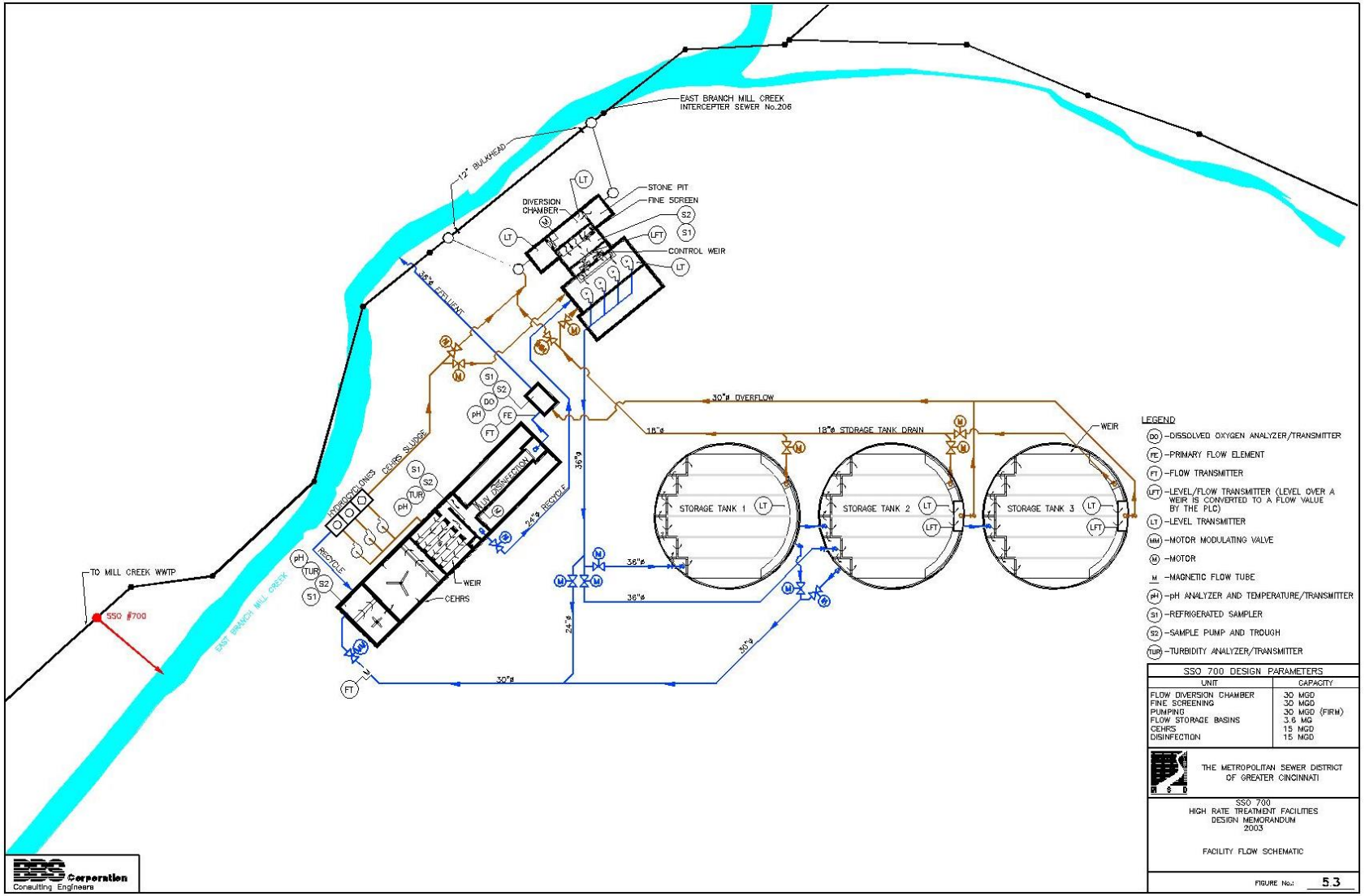
Section 2.0 – SSO 700 Storage and Treatment Facility

The site visit to the SSO 700 STF was held on March 11, 2015. It was attended by Don Cuthbert, Katie Bollmer, and Tori Berry of CH2M and Andrew Spurgeon, Matt Spidare, and Rob Kneip of MSDGC. A tour of the facility was provided by Rob Kneip, which ended in a visit to the facility outfall. See Figure 1 for a schematic of the facility. On the day of the visit, two of the three storage tanks were full and the treatment component was active. Visual inspection of the facility was intended to inform the hydraulic modeling of the facility in the collection system model and provided verification of the written material describing the operational strategy and individual hydraulic components. Additionally, the CH2M team visited the constructed SSO 700 outfall on the west side of Mill Creek.

Section 3.0 – Watershed Site Visit

The general site visit to the SSO 700 IWAP study area was held on March 26th. It was attended, in part or in its entirety, by Andrew Spurgeon, Matt Spidare, and Todd Trabert of MSDGC; Dave Meyer, Karen Ball, Brandon Vatter, and Jeff Proctor of Hamilton County and the County Monitor Team; and Katie Bollmer, Klaus Albertin, and Tori Berry of CH2M. The proposed itinerary can be found as Attachment 1 to this technical memorandum. Several locations throughout the study area were visited over the course of an entire day. The weather on this day was rainy and overcast, allowing for observation of the watershed during wet weather conditions. In the following subsections, the points of interest are categorized and addressed by their type rather than by their chronological place in the itinerary or their location in the watershed.

FIGURE 1
SSO 700 Storage and Treatment Facility Schematic



Potential SSOs

MSDGC Wastewater Collections Division maintains a list of potential sanitary sewer overflows (SSOs). These potential SSOs are being monitored by Collections and may eventually be placed on the enumerated SSO list if their activity meets the criteria established by the Regulators. Two potential SSOs were visited on March 26th, both located in City of Reading at 9701 Reading Road: MSDGC manholes 43309002 and 43309007. See Figures 2 and 3 for images of these potential SSOs.

FIGURE 2
Potential SSO MH 43309007
This potential SSO is adjacent to Cooper Creek in the City of Reading.

FIGURE 3
Potential SSO MH 43309002
This potential SSO is adjacent to the mainstem of the Mill Creek in the City of Reading.

Combined Sewer Overflows

Eleven combined sewer overflows are located within the SSO 700 IWAP study area. All eleven are located either within or adjacent to the City of Reading. Stops were made at six of the eleven CSOs: CSOs 514, 513, 512, 511, 510, and 509. These six were considered to be a representative sample, so no stops were made to the remaining five CSOs.

FIGURE 4
CSO 514
CSO 514 is located on Cavett Drive and outfalls to the west bank of Mill Creek. This figure includes an image of the CSO structure itself (left), the manhole connecting the CSO 514 underflow to the sanitary network (upper right), and the overflow outfall to Mill Creek (lower right).

FIGURE 5
CSO 513
CSO 513, the Bernard & Riesenberg Grating, is located in the park field adjacent to Riesenberg Avenue in Reading. CSO 513 overflows to the east bank of the Mill Creek. The CSO structure is relatively shallow as can be seen in the figure below.

FIGURE 6
CSO 512
CSO 512, Mill & Vine Grating, is located at the intersection of West Vine Street and Mill Street, south of Koenig Park. CSO 512 overflows to an outfall sewer that discharges to the east bank of the Mill Creek. This figure shows the CSO structure (left) and the location of the CSO structure relative to the roadway (right).

FIGURE 7
CSO 511
CSO 511 is located in the front yard of 531 Davis Street in Lockland. It overflows to an outfall sewer that discharges to the west bank of the Mill Creek. This figure includes an image of the CSO structure itself (left) and its oufall point to Mill Creek (right). In 2012, MSDGC Collections had submitted a nomination to eliminate CSO 511. However, no immediate solution was identified, so the planning effort was closed, and the CSO remains in Phase II of the Wet Weather Improvement Plan.

FIGURE 8
CSO 510
CSO 510 is located at the end of Southern Avenue and overflows to a outfall pipe that discharges to the east bank of the Mill Creek. This figure includes an image of Mill Creek at CSO 510 (left) and an image of the outfall itself (right).

FIGURE 9
CSO 509
CSO 509 is located at the end of Gebert Street and overflows to an outfall pipe that discharges to the east bank of the Mill Creek. This figure includes an image of Mill Creek at the outfall of CSO 509 (upper left), an image of the outfall itself (lower left), and the CSO structure (right).

Sanitary Sewer Overflows

Nine sanitary sewer overflows are located within the SSO 700 IWAP study area. Stops were made at four of the nine SSOs: 700, 1001, 607, and 1047. These four were considered to be a representative sample, so no stops were made to the remaining five SSOs.

FIGURE 10
SSO 700
The constructed SSO 700 is located in the City of Reading behind the Barrett Paving Materials on Cavett Drive. CSO 700 overflows to an outfall pipe that discharges to the west bank of Mill Creek. This figure includes an image of the inside of the SSO structure itself (left) and an image of the Mill Creek just upstream from the overflow (right).

FIGURE 11
SSO 1001
SSO 1001 is located on Benson Street. The overflow pipe discharges to a tributary to Cooper Creek. This figure includes an image of the SSO structure itself (right) and an image of the tributary to which SSO 1001 outlets (left). MSDGC recently bid the Benson Street Sewer Replacement project that will eliminate SSO 1001. This project will be addressed in the baseline collection system model.

FIGURE 12
SSO 607
SSO 607 is located on O'Leary Avenue in Deer Park. SSO 607 overflows to existing storm sewer rather than to a natural stream, which is a relatively common configuation in MSDGC's service area. This figure includes a picture of the SSO structure.

FIGURE 13
SSO 1047
SSO 1047 is located at the intersection of Park Avenue and Harmony Avenue in Springdale. The structure overflows through the top of its rim, discharging by surface flow to the adjacent stream, which is a tributary to Beaver Run. This figure includes two images of the stream conditions near SSO 1047.

Stream Condition and Potential Sample Locations

The Midwest Biodiversity Institute (MBI) performed water quality and biological surveys of the Mill Creek and its tributaries throughout the SSO 700 IWAP study area. A few of MBI's sampling locations were visited during the March 26th site visit to visually assess the current stream condition and to scout potential sampling locations for the water quality data collection program to be performed for the IWAP.

FIGURE 14
Sharon Creek near Exon Avenue
MBI's sampling location MC13 is on Sharon Creek just upstream of its confluence with the Mill Creek. This site is accessed from Exon Avenue in Sharonville. This figure includes two images from a location along Sharon Creek near the MC13 sampling site: an existing sanitary manhole that showed some evidence of flooding (left) and Sharon Creek in wet weather conditions (right).

FIGURE 15
Tributary to Town Run at Brandywine Drive
MBI's sampling location MC42 is located along a tributary to Town Run at Brandywine Drive in the Village of Glendale. This figure includes two images of the stream conditions (left) and storm infrastructure (right) near the MC42 sampling location.

FIGURE 16

Beaver Run at Glensprings Drive

MBI's sampling location MC41 is located in Beaver Run near Glensprings Drive in the Springdale. This figure includes two images, one of the stream condition near MC41 (left) and another of the wet weather conditions typical of the area tributary to Beaver Run (right). Trash and debris littered the banks of Beaver Run in this location. Oil and grit from parking lot runoff pooled at catchbasins in the adjacent development.

FIGURE 17

Butler County Boundary Conditions

A stop was made at the mainstem of the Mill Creek as it crosses from Butler County into Hamilton County at East Crescentville Road in Sharonville. This figure includes images of the Mill Creek at the East Crescentville Road Bridge (left) and upstream of the bridge (right). This location is also MBI's sampling location MC10. Sampling at this location will be used to develop the boundary conditions for the SSO 700 IWAP water quality modeling.

FIGURE 18

Twin Creek Preserve

Twin Creek Preserve is a wetland construction and stream restoration project located at the confluence of the East Fork Mill Creek and the Mill Creek mainstem. This figure includes images of the condition of the stream network both at the confluence itself (left) and the East Fork Mill Creek upstream of the confluence (right). The Twin Creek Preserve project may ultimately inspire projects identified for consideration in the SSO 700 IWAP.

FIGURE 19

Sharon Lake at Sharon Woods Park

Sharon Lake is an impoundment of Sharon Creek and located in Sharon Woods, a Hamilton County Park. This figure includes two images, one of the Sharon Lake Dam, located at Buckeye Falls Drive (left) and one directly downstream of the dam (right). The dam itself appears to be passive, with little opportunity for modification; however, discussion with the Army Corps of Engineers will be necessary to confirm the dam controls.

FIGURE 20
Tributary to Sharon Creek Upstream of Sharon Lake
A few tributaries feed into Sharon Lake. This figure includes two images of a tributary that enters Sharon Lake from the north. This location is bridge crossing of the Sharon Woods bike path, accessed from Londonberry Drive in Sharonville, and is also MBI's sampling location MC29. At the bridge crossing, a hydraulic structure was noticed (left), but could not be identified by the engineers present. The project team may ask the Army Corps of Engineers for more information on this structure in conjunction with discussions on other issues.

Miscellaneous Observations

A few additional observations were made during the March 26th site visit that are worth noting and may play a role in future phases of the IWAP development. These observations are described below.

FIGURE 21
McGrew Street Pump Station
The project team visited the McGrew Street Pump Station in Sharonville and encountered a temporary force main laid on the ground from the pump station to the manhole to which it discharges. The manhole lid was ajar to allow for the force main to drop into it. This figure includes images of the McGrew Street Pump Station (left) and the open manhole to which the force main from the pump station discharges (right). MSDGC staff have been working to confirm the status of the pump station and have taken steps to improve the safety of the current site conditions. Operation of the pump station will be reviewed and may be incorporated into the collection system model during model calibration.

FIGURE 22
Hunt Road Sidewalk Issue
Early in the site visit, Kevin Knizner of the City of Reading, met the SSO 700 IWAP team in Reading to take the project team to a few locations where the City of Reading experiences problems due to wet weather. Of particular issue to Reading is a location on Hunt Road where high water flow through a tributary to Cooper Creek has resulted in the undermining of adjacent hillsides, including the failure of a sidewalk. This figure includes images of the failing sidewalk at Hunt Road which requires a permanent solution.

Section 4.0 - Findings

From the site visits, the conditions evident from the mapping provided in the Task 2.4 *Inventory and Gap Analysis Technical Memorandum* were generally confirmed by visual inspection. For example, the watershed is divided into three distinct areas of topography: flat areas adjacent to the Mill Creek floodplain, steep wooded hillsides to the east of Reading Road, and moderately flat areas in the far west and east extents of the study area. The study area is also divided into zones of relatively uniform land use, which informs the sizing of subcatchments in the water quality models to be developed for the IWAP.

In addition to general observations, a few more detailed conclusions were drawn. First, habitat conditions were observed as poor in numerous places throughout the study area. It can be concluded that improvement in water quality alone may not be enough to support a healthy biological community in some areas. Habitat improvements may also be necessary. Second, the upper reaches of some of the smaller tributaries appear likely to go dry during the summer months. Therefore, these tributaries will not be included in the EFDC model as previously considered. Third, the hydraulic controls at the dam on Sharon Lake appear to be static, limiting potential for modification to control of releases from the lake as one proposed infrastructure opportunity.

Finally, with respect to the system hydraulics, visits to several CSOs and SSOs in the study area confirmed the functionality of these hydraulic elements as modeled in MSDGC's collection system model.