



TO: Mayor and Council

FROM: Steven D. Powers, City Administrator

DATE: February 23, 2015

SUBJECT: Wet Weather Projects Overview

As with many communities in the region, and around the country, major wet weather events can impact particular aspects of the City's infrastructure. The response and reaction of the City's sanitary sewer collection system and the stormwater management system throughout the City to these events has been the subject of recent examinations through three separate, but related projects: the Sanitary Sewer Wet Weather Evaluation (SSWWE) Project; the Stormwater Model Calibration and Analysis (SWM) Project; and, the Upper Malletts Stormwater Conveyance Study Project.

As these efforts are at, or near their conclusion, it is appropriate to provide a summary of our findings, including instructions on how to access the detailed documentation for the projects. Attached are summary sheets providing information on the overview, purpose, major findings and next steps for each project. In addition, information on how to access the report documents is included on each project summary sheet.

Another aspect of the interrelationship of these projects is how the tasks included in City Council Resolution R-12-435, *Resolution Directing Staff to Temporarily Suspend the City's Footing Drain Disconnection (FDD) Program Efforts within the Glen Leven and Morehead (Lansdowne Neighborhood) Areas*, approved on September 17, 2012, have been, or are being addressed by staff via these multiple projects. As these efforts are concluding, we want to take this opportunity to provide updates and completion status on these tasks.

Task: "Analyze and/or address existing issues in the local stormwater system to improve stormwater drainage/conveyance and address the existing surface flooding that residents are experiencing in this [Glen Leven and Morehead] area"

Status: Nearly complete. This analysis was performed by the Upper Malletts Stormwater Conveyance Study and SWM projects. The recommendations from the Upper Malletts Stormwater Conveyance Study are listed on that project's summary sheet and are detailed in the report document. The findings from the SWM Project will be included in the draft report when it is completed this April.

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Task: “Clarify the methods and consequences of opting-out of the [FDD] program”

Status: N/A. One of the Major Findings of the SSWWE Project includes “Further mandatory FDDs are NOT recommended in the target areas” rendering this item moot.

Task: “Consider other means for achieving removal of footing drain flows from the sanitary sewers (recognizing that it is essential to remove these flows)”

Status: Completed. As noted above, further FDDs are not recommended in the target areas due to the flow removal already achieved in those areas. Among the Major Findings of the SSWWE Project is that there are five additional potential problem areas affected by wet weather flows and it is recommended that these be further evaluated for future projects. Until further work is done, it is unknown what will be recommended in the additional five areas.

Task: “Review the technical issues related to the equipment quality and configuration associated with the Footing Drain Disconnect program”

Status: Ongoing. Among the Next Steps from the SSWWE Project is to initiate a program to correct locations where installations may not have been performed to the “best practice” standards of the industry. See summary sheet and detailed project report documentation for the SSWWE Project for more detail.

Task: “Investigate subsidizing the cost of equipment associated with improving homeowner confidence in the level of protection afforded by the program”

Status: Completed. This was an item of discussion and consideration by the SSWWE Citizens Advisory Committee (CAC). Details on this item are included in the detailed project report documentation (Vol. 5 - Public Engagement Report) for the SSWWE Project.

Task: “Provide more review and analysis on the air gap feature provided for the sump pumps”

Status: Completed. The air gap feature was reviewed and analyzed as part of the SSWWE project, and it was found to have adequate capacity to convey the average peak flows from a sump pump. The findings can be found on pages 564-566 of Vol. 5 - Public Engagement Report of the project report documentation for the SSWWE Project.

Task: “Conduct a robust survey of Footing Drain Disconnect participants that would yield statistically significant data on homeowner satisfaction and program efficacy”

Status: Completed. This survey was completed as part of the SSWWE Project. The survey and a summary of its results can be found on pages 267-313 of Vol. 5 - Public Engagement Report of the project report documentation for the SSWWE Project.

Sanitary Sewer Wet Weather Evaluation (SSWWE) Project

Overview:

Over the years, various portions of the City's sanitary sewer collection system have been negatively affected by severe wet weather events. Different methods have been employed to deal with these issues, including the construction of relief sewers, adding storage facilities within the collection system, and re-routing sections of the system. Despite these efforts, wet weather impacts remained in the system. In 2001, after extensive citizen engagement, the City Council established the Footing Drain Disconnection (FDD) Program and in 2003 the Developer Offset Mitigation (DOM) Program was implemented to remove wet weather flow from the sanitary system. In the fall of 2010, a need was identified to evaluate the effectiveness of the FDD Program by performing system flow monitoring. A project was included in the FY2012-2017 CIP and programmed for FY2014. On September 17, 2012, City Council passed Resolution R-12-435 which temporarily suspended the FDD program efforts in the Glen Leven and Morehead (Lansdowne Neighborhood) areas while staff engaged the services of the necessary consulting firms to review and identify necessary adjustments to certain aspects of the FDD program. This resulted in the Sanitary Sewer Wet Weather Evaluation (SSWWE) Project which began in early 2013 and concluded at the end of 2014.

The final report can be found at:

www.a2gov.org/SSWWE

Purpose:

1. To evaluate the effectiveness of the Footing Drain Disconnection (FDD) Program in removing groundwater from the sanitary sewer system - At the onset of this study, the FDD Program was nearing the end of the original 5 target areas. The need to determine the effectiveness of the program prior to making a decision on whether or not to continue the program was identified in the City's Capital Improvement Plan (CIP).
2. To assess the future risk of sanitary sewer backups into basements - Now that the FDD Program had been in effect for over 10 years, determine what the risk currently is in the original 5 target areas. Evaluate what other portions of the City are potentially at risk for sewer backups and determine the extent of that risk.
3. To evaluate alternatives and set direction for addressing basement backup risks in the future - Make recommendations regarding whether or not to continue the FDD program and look at other options for reducing wet weather impacts in the sanitary sewer system.
4. To conduct a robust public outreach program during the course of the project - This included several public meetings and the formation of a Citizens Advisory Committee (CAC) for the project to review the materials and data produced by the project team and make recommendations. A summary of the CAC's recommendations can be found in the full report.

Major Findings:

1. The FDD Program has significantly reduced the risk of basement backups in the target areas. Data from the consultant's monitoring of the sanitary sewer system demonstrated that the risk of the sanitary sewer surcharging and backing up into residential basements has been dramatically reduced.
2. Further mandatory FDDs are NOT recommended in the original target areas. With the measured reduction in basement backup risks, further FDDs in these areas would likely not yield a significant return on investment.

3. Five additional potential problem areas were identified outside of the original five target areas. These are areas where the modeling shows a higher potential for surcharging in the sanitary sewer system. These five problem areas will be evaluated in more detail for future projects to reduce future backup risk. Maps showing these locations can be found in the full report.
4. The Ann Arbor Wastewater Treatment Plant has sufficient capacity to serve existing and future system needs.
5. A comprehensive survey was conducted of all property owners that had an FDD performed. A total of 2,350 surveys were mailed, and approximately 850 responses were received. In summary, there was a broad level of satisfaction with the FDD Program. However, there were many individual reports of dissatisfaction. Though upon further investigation, most reports of dissatisfaction were found to be non-FDD related.

Next Steps:

1. Initiate a program to correct some installations performed through the City's FDD Program. Based on the follow-up investigations performed in response to the survey described above, a handful of locations were identified where sump pump installations may not have been performed to the "best practice" standards of the industry. Starting in 2015, the City will conduct a program to further identify and examine these locations and facilitate the necessary repairs or reinstallations.
2. Initiate modifications to the Developer Offset Mitigation (DOM) Program. The DOM program exists to mitigate the effects of new development on the sanitary sewer system by requiring developers to remove flow from the system before any new flow from the proposed development is added. Proposed revisions are outlined in detail in the full report.
3. Perform a detailed analysis and develop proposed capital improvements to the sanitary system in the additional five potential problem areas identified by the study. Funding for the next steps on these five areas is currently programmed in the CIP for fiscal year 2016.
4. Examine modifying rates for properties that do not have footing drains connected to the sanitary sewer. This recommendation came from the CAC as a means of addressing the perceived inequity of some properties having completed footing drain disconnections and others not. When the City next undertakes a Rate Study, the feasibility of a separate rate for properties with connected footing drains will be evaluated. Presently, such a rate study is programmed in the CIP for FY2017.

Stormwater Model Calibration and Analysis Project

Overview:

In 2007-2008, the City completed the inventory of the stormwater system for integration with the City's Geographic Information System (GIS) and then established a base hydraulic model that when fully developed could be used for analyzing the stormwater system. In mid-2012, when funding became available to complete the model development, the Stormwater Model Calibration and Analysis (SWM) Project began with an anticipated 2½ - 3 year timeline. Preliminary model calibration was performed in 2012, data collection in 2013, and final model calibration and analysis in 2014.

The final report can be found at:

<http://www.a2gov.org/departments/systems-planning/water-resources/stormwater-model-project/Pages/default.aspx>

Purpose:

The overall goals of the SWM project were to develop the City's preliminary stormwater model as a stormwater analysis tool and to identify aspects of the stormwater system that would benefit from improvement. Specifically, the project included the following objectives:

1. Provide an accurate stormwater model, calibrated based on collected flow and rainfall data
2. Involve stakeholders and interested citizens in the project
3. Analyze existing stormwater system performance and recommend needed improvements
4. Evaluate the effectiveness of future stormwater management strategies
5. Utilize new model data for comparison with existing FEMA 100-year floodplain delineation

Major Findings:

1. Input received during the public engagement efforts was significant in the calibration of the model. During the overall analysis with the calibrated model, fifteen areas were identified for potential stormwater system improvement opportunities. These were presented in a series of public meetings in November, 2014. The recommended improvements will be considered as part of the City's CIP Programming.
2. Overall, the stormwater system is performing at a consistent design level of service for most areas of the City. The City's current design standard for stormwater sewer system is a 10% annual exceedance probability (AEP) rainfall event. This is an event that has a 10% chance of occurring in any given year. In the Allen Creekshed and in the Malletts Creekshed, there are areas where surface flooding is predicted during the 10% AEP storm and in some cases during the 20% AEP storm.
3. The evaluation of future stormwater management strategies indicated that the City should continue efforts with the Green Streets Policy and with residential rain garden programs. There should also be significant efforts put into encouraging compliance with new development standards during redevelopment of commercial, multi-family, and school or University properties.

4. The FEMA floodplain comparison is ongoing and will include a tabulation of parcels and buildings affected by the different floodplain data sets.

Next Steps:

Remaining project documentation activities and schedule dates are as follows:

1. Draft report: March, 2015
2. City staff model training: March, 2015
3. Public review of draft report: Early April, 2015
4. Final report: End of April, 2015

Upper Mallets Stormwater Conveyance Study Project

Overview:

On March 15, 2012, an extreme storm event resulted in surface flooding and impacts in the area of the City bounded by Ann Arbor-Saline Road, Scio Church Road and I-94 which is a portion of the Upper Malletts Creek watershed. Malletts Creek is a county drain under the jurisdiction of the Washtenaw County Water Resources Commissioner (WCWRC). On August 9, 2012, City Council passed Resolution R-12-373 directing staff to negotiate an agreement with the WCWRC to evaluate and identify opportunities for stormwater improvements in this area. These discussions resulted in the WCWRC commissioning a stormwater conveyance study of the Upper Malletts Creek watershed. The City funded the study as approved by City Council on October 15, 2012 in Resolution R-12-483.

The final report can be found at:

http://www.ewashtenaw.org/government/drain_commissioner/project-status/uppermalletts

Purpose:

The purpose stated in the resolution is to evaluate and identify opportunities for conveyance and storm water improvements in the Churchill Downs and Lansdowne sub-watershed areas that may be necessary or appropriate to provide, improve and restore stormwater management and water quality protection functions within the drainage district.

The study goals, discussed and confirmed during the public engagement process for the study, include:

1. Reduce probability of flooding during an event equal to the March 15, 2012 by improving stormwater management
2. Identify cost of implementation per level of service
3. Avoid adversely impacting downstream interests
4. Maintain and/or enhance water quality
5. Create long-term sustainability

Major Findings:

1. Complete elimination of flooding from all rain events in this area is impossible.
2. The WCWRC and the City completed cleaning and storm sewer inspection of an estimated 65,000 feet of storm sewer ranging in size from 12" to 72" within the watershed. The storm sewer system was found to be in good condition and generally functioning properly.
3. The analysis indicated a blockage of the 42" diameter inlet pipe west of Wiltshire Boulevard was likely a major contributing factor to the flooding experienced on March 15, 2012. Corrective measures were completed for this issue along with the few routine maintenance issues that were found.
4. The County worked with Pittsfield Township to resolve long-standing deficiencies with a large detention basin at the Ann Arbor Ice Cube site on Oak Valley Drive in Pittsfield Township.

5. Recommended projects to mitigate surface flooding in an event similar to the March 15, 2012 storm include:
 - a. *Project A – Eisenhower Park - (\$2.1M)* Construct two detention basins in Eisenhower Park. The two basins together are 2.5 acres in size, and would have a combined storage volume of 10.8 acre-ft.
 - b. *Project B – Pioneer High School - (\$1.17M)* - Construct a detention basin along the north side of Scio Church Road just east of South Seventh Street.
 - c. *Project C – Lawton Park - (\$5.16M)* Construct an underground detention basin along the eastern edge of Lawton Park along with a new storm sewer under Scio Church Road and Mershon Drive.

Next Steps:

1. Projects A, B and C are currently included in the CIP. These recommended projects are prioritized relative to all other stormwater projects across the City. Sufficient funding is presently unavailable for these projects.
2. A project-specific public engagement and design process will allow further input from neighbors on both implementation and restoration. A Public Engagement process was used during the study portion of this project. If any of these recommended projects are moved to the construction phase, a separate public engagement process will ensue.