

***Oakland County
Water Resources Commissioner***

***Evergreen Farmington Sewage Disposal System
North Evergreen Interceptor
SRF Project Plan***

**Prepared For:
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Date: July 1, 2014



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HRC JOB NO. 20130714

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List of Abbreviations

ACO	Administrative Consent Order
ac	Acres
cfs	Cubic Feet Per Second
CSO(s)	Combined Sewer Overflow(s)
DWSD	Detroit Water and Sewerage Department
EFSDS	Evergreen Farmington Sewage Disposal System
EPA	Environmental Protection Agency
ft	Feet
gpm	Gallons Per Minute
HGL	Hydraulic Grade Line
I/I	Inflow and Infiltration
in	Inch
in/hr	Inches Per Hour
lbs	Pounds
LTCAP	Long Term Corrective Action Plan
MDEQ	Michigan Department of Environmental Quality
MG	Million Gallons
MGD	Million Gallons Per Day
NWI	National Wetlands Inventory
PPL	Project Priority List
RTB	Retention Treatment Basin
SSO(s)	Sanitary Sewer Overflow(s)
STCAP	Short Term Corrective Action Plan
SWMM	Stormwater Management Model
TMDL	Total Maximum Daily Load
WRC	Oakland County Water Resources Commissioner's office
WWTP	Wastewater Treatment Plant

Changes Made Since Draft Publication

1. The public hearing information was updated in Section VII and Appendix F. Resolution was included in Appendix G.
2. The selected alternatives memorandum was amended to include the correct pipe size for project C4. Pipe size has been updated to 21-inch. All costs estimates were based on a 21-inch pipe so the costs were not affected.

Section I - Introduction

The Evergreen Farmington Sewage Disposal System (EFSDS) is a regional sewer service district that collects sanitary and combined sewage from all or a portion of 15 communities in southern Oakland County. The Oakland County Water Resources Commissioner (WRC) owns, operates, and is responsible for the operation, maintenance, and administration of the system of interceptor sewers that serve this district. At this time, improvements are needed to the EFSDS interceptor system in order to bring the system in compliance with existing Administrative Consent Orders (ACOs) and reduce the frequency of periodic sanitary sewer overflows (SSOs) to less than one per 10 years. This 2014 Project Plan was prepared on behalf of WRC for the purpose of obtaining State Revolving Fund (SRF) loans from the Michigan Department of Environmental Quality (MDEQ) for the construction of improvements to the EFSDS.

WRC completed a previous Project Plan in 2012 which addressed necessary improvements along the Farmington Interceptor on the west side of the system. The County has used SRF loans to fund improvements to the Eight Mile Pump Station and is currently in the design phase for a relief sewer/storage facility along Middlebelt Road. This current project plan will address projects required along the Troy and Quarton Arms of the EFSDS on the east side of the system to address historical, reoccurring, and confirmed SSOs.

The 2014 SRF Project Plan examines the needs of the wastewater facilities within the EFSDS over a planning period of 20 years, with a focus on the projects that are proposed to begin construction within the next five year planning period of 2015 to 2020. These projects have been identified in the Long Term Corrective Action Plan (LTCAP) as Phase 1 projects and are listed below. Phase 1 projects were identified as those projects that meet both of the following criteria:

- Observations have validated the existence of an SSO.
- The need for and sizing of the project can be determined based on available information.

The Phase 2 projects consist of projects identified in the model, with model-predicted SSOs only, or projects that cannot be sized until such time as the Phase 1 projects are complete and the impacts on the system can be determined. The Phase 2 projects identified in the LTCAP will not all necessarily be constructed depending on the performance of the system after Phase 1 projects.

The Phase 1 projects are listed below with their corresponding LTCAP identification number. All locations are shown on Figure 2 following this report.

- Wattles Road Linear Storage (B2/B3)
- NEI Hydraulic Improvements (B4)
- Stonycroft Relief and Amy PS Upgrades (C2)
- Quarton Road Storage (C4)

Section II - Project Background

A. Study Area Characteristics

1. Delineation of the Study Area

The EFSDS provides sanitary sewer service to approximately 130 square miles in Oakland County, and includes all or part of the Cities of Auburn Hills, Birmingham, Bloomfield Hills, Farmington, Farmington Hills, Keego Harbor, Lathrup Village, Orchard Lake Village, Southfield, and Troy; The Townships of Bloomfield and West Bloomfield; and the Villages of Beverly Hills, Bingham Farms, and Franklin. See Figure 1 for an overall map of the EFSDS service area. The service area is also the study area. All figures are located at the end of the report.

The Phase 1 projects identified in this plan are in several locations throughout the EFSDS. The Priority Project locations are identified on Figure 2.

a. Lakes, Rivers, Ponds, and Wetlands

The general locations of wetlands in relation to the proposed project locations according to data from the National Wetlands Inventory (NWI) are shown in Figure 3. A more detailed review would be performed during design of each of the proposed projects to identify any potential wetlands areas that would be regulated under Part 303 of Public Act 451.

b. Existing Treatment Facilities

Sewage from the EFSDS is metered and outlets to the City of Detroit's sewer collection system prior to being treated at the Detroit Water and Sewerage Department (DWSD) Wastewater Treatment Plant (WWTP) and discharged into the Detroit River.

There are three (3) Combined Sewer Overflow (CSO) Retention Treatment Basins (RTBs) located in the EFSDS. These RTBs were constructed in the mid-1990s and began operation in 1997. Together, they have eliminated over 35 CSO outfalls and serve a combined area of 4,326 acres. The RTBs have a capacity of 19.5 million gallons and are located along the Evergreen Interceptor as shown on Figure 4.

c. Effluent Disposal Locations

Under normal operation, all effluent is routed to the City of Detroit's sewage collection system and to the DWSD WWTP for treatment and discharge to the Detroit River.

Each of the three (3) RTBs has a permitted outlet to the Rouge River. These only discharge treated effluent, as necessary, during wet weather. Flow stored during a wet weather event is drained and pumped back to the interceptor once the event has passed and the interceptor system has the capacity to accept the flow.

d. Sludge Disposal Sites

There are no sludge disposal sites located within the EFSDS. Any dewatered solids produced by vactor operations or overflows to the CSO RTBs are taken to a landfill outside of the EFSDS.

e. Existing Interceptors, Collectors, Pumping Stations, and Force Mains

The EFSDS consists of two (2) major interceptors, the Evergreen Interceptor (located in Evergreen Road), and the Farmington Interceptor (located in Middlebelt Road), which serve a

network of smaller interceptors and trunk sewers. Figure 4 shows the EFSDS service area, RTB locations, pump station locations, and interceptor network.

The system consists of approximately 822,000 lineal feet of gravity interceptor sewers, 45,000 lineal feet of forcemain, and 11 pump stations. It services the individual lateral systems of the 15 member communities. These lateral systems are owned by the respective City, Village, or Township.

f. Population Distribution

The total equivalent population of the EFSDS service area in the year 2010 was estimated to be 312,199 per the most recent Census data collection survey. Current projections for the communities within the EFSDS are provided in Table 1. The EFSDS is a well-established district and is primarily built out. Population growth over the planning period is expected to be minimal and primarily occurring in the northern and western communities.

Table 1: Population Data for the EFSDS Communities

CVT	Abbreviation	Residential Equivalent Population	Non Residential Equivalent Population	Total Equivalent Population
Auburn Hills	AHC	2,809	208	3,017
Bingham Farms	BFV	991	674	1,665
Bloomfield Hills	BHC	3,648	2,634	6,282
Village of Beverly Hills	BHV	10,057	428	10,485
Birmingham	BIC	10,939	1,772	12,711
Bloomfield Township	BLT	36,137	3,009	39,146
City of Farmington	FAC	2,352	75	2,427
Farmington Hills	FHC	73,511	14,509	88,020
Franklin	FRV	3,029	422	3,451
Keego Harbor	KHC	2,871	301	3,172
Lathrup Village	LVC	4,015	562	4,577
Orchard Lake Village	OLC	2,300	505	2,805
Southfield	SOC	61,033	13,987	75,020
Troy	TRC	14,100	228	14,328
West Bloomfield Township	WBT	41,317	3,776	45,093
Total =		269,109	43,090	312,199

Source: EFSDS Master Plan 2011

g. Parks and Recreation Areas

See Figure 5 for locations of parks and recreation areas within the EFSDS area.

2. Land Use in the Study Area

a. Summary of Land Cover within the Watershed

The existing land use within the communities in the EFSDS is summarized in Table 2. The land cover within the Study Area is a nearly built-out, densely-urbanized environment. Land use for the entire EFSDS Service Area is primarily residential with limited commercial/industrial and minimal to no agricultural as per SEMCOG. Figure 6 shows a graphical description of the existing zoning and land use in the EFSDS.

b. Future Land Use

The predicted future land use within the service area is expected to be consistent with the existing conditions since much of the service area is fully developed. However, redevelopment in the future may be an option for some locations throughout the EFSDS.

Table 2: Land Use by Community

CVT	Land Area (acres)	Land Use * (%)				
		Residential	Commercial / Industrial	Agriculture	Public	Other
Auburn Hills	10,644	33.3	36.7	0.0	14.5	15.5
Bingham Farms	770	73.1	14.6	0.0	2.8	9.5
Bloomfield Hills	3,221	61.3	11.2	0.0	13.5	14.0
Village of Beverly Hills	2,571	68.3	1.7	0.0	10.8	19.2
Birmingham	3,217	53.3	5.9	0.0	15.3	25.5
Bloomfield Township	16,496	65.5	3.8	0.0	8.2	22.5
City of Farmington	1,695	53.1	12.3	0.0	12.5	22.1
Farmington Hills	21,319	57.4	11.3	0.0	12.6	18.7
Franklin	1,701	80.2	0.8	0.0	2.1	16.9
Keego Harbor	373	48.9	12.0	0.0	5.4	33.7
Lathrup Village	1,686	32.3	2.7	0.0	3.0	62.0
Orchard Lake Village	2,610	33.8	1.0	0.0	17.3	47.9
Southfield	16,204	52.6	16.4	0.0	14.7	16.3
Troy	21,520	49.9	18.0	0.0	13.0	19.1
West Bloomfield Township	19,971	58.4	4.3	0.0	9.2	28.1

*Data provided by SEMCOG, based on 2008 Land use

3. Surface and Ground Waters

a. Lakes, Rivers, Ponds, Wetlands, and Floodplains

The entire EFSDS is located in the Main 1-2 Subwatershed of the Rouge River. Each community, as well as Oakland County, maintains MS4 stormwater permit coverage and participates in collaborative watershed management efforts with the Alliance of Rouge Communities. The Rouge River is an Environmental Protection Agency (EPA) Great Lakes Area of Concern and is covered by a Total Maximum Daily Load (TMDL) for Escherichia Coli (E. Coli) and biota.

The main branch and its tributaries are used for recreational activities, including canoeing, kayaking, fishing, and other passive uses.

b. Drinking Water

The vast majority of the users within the EFSDS utilize drinking water from the extensive distribution system of the DWSD System. There are individual private wells within the service area, primarily located within the Village of Franklin and some parts of Southfield, Farmington Hills, West Bloomfield, and Bloomfield Township. Future dependency on groundwater or other surface waters for water supply is not anticipated.

B. Economic Characteristics

1. Major Employers

The major employers by industry are listed for each of the EFSDS communities in Table 3.

Table 3: Major Employers by Industry for EFSDS Communities

	Community														
	Auburn Hills	Bingham Farms	Bloomfield Hills	Village of Beverly Hills	Birmingham	Bloomfield Township	City of Farmington	Farmington Hills	Franklin	Keego Harbor	Lathrup Village	Orchard Lake Village	Southfield	Troy	West Bloomfield Township
Natural Resources and Mining	-	-	C	-	-	C	-	C	-	-	-	-	C	-	C
Manufacturing	6,948	65	15	41	275	424	383	5,875	-	-	9	-	2,892	10,476	120
Wholesale Trade	3,008	165	88	43	375	634	206	4,598	-	13	27	-	6,186	8,157	286
Retail Trade	3,227	315	30	344	1,584	2,874	908	5,197	37	104	289	122	7,418	13,278	2,075
Transportation and Warehousing	362	C	C	C	210	117	C	617	C	C	C	-	785	3,323	71
Utilities	-	-	-	-	-	-	-	89	-	-	-	-	-	-	-
Information	400	C	42	C	384	52	101	3,297	C	C	25	-	4,719	1,221	153
Financial Activities	2,794	943	1,227	106	2,453	1,984	409	7,951	33	31	207	32	19,094	10,872	1,177
Professional, Scientific, and Technical Services	12,686	1,541	1,980	133	1,695	2,353	228	10,117	95	38	139	26	15,687	17,048	813
Management of Companies and Enterprises	5,684	C	C	-	C	94	C	676	-	-	C	C	2,051	5,774	C
Administrative, Support, & Waste Services	5,760	719	574	123	1,168	1,509	290	7,340	C	C	183	C	13,426	10,807	729
Education Services	3,484	250	C	794	1,039	1,899	611	2,555	-	C	319	317	4,139	2,273	1,773
Health Care and Social Assistance	1,651	589	674	279	769	2,922	497	9,050	26	54	609	30	15,009	7,431	4,126
Leisure and Hospitality	4,644	219	422	425	2,103	2,026	362	4,957	-	122	167	198	8,546	7,684	2,273
Other Services	376	318	258	42	873	1,159	324	1,897	27	67	47	92	1,954	2,235	462
Public Administration	392	C	C	C	C	C	149	C	C	C	C	C	1,263	C	426
Total	51,416	5,806	6,565	2,614	13,286	18,690	4,590	64,962	362	589	2,185	862	103,177	101,583	14,570

Note: "C" indicates data blocked due to confidentiality concerns of ES-202 Files

Source: SEMCOG Community Profiles

2. Household Income

Median annual household income, as well as the percentage of households in poverty, for the EFSDS communities is listed in Table 4. The information was taken from the 2010 Census data.

Table 4: Median Annual Household Income and Percentage of Households in Poverty

Community	Median Household Income	Households in Poverty
Auburn Hills	\$ 52,224.00	13.1%
Bingham Farms	\$ 127,361.00	0.0%
Bloomfield Hills	\$ 136,875.00	2.2%
Village of Beverly Hills	\$ 104,951.00	2.1%
Birmingham	\$ 100,789.00	4.0%
Bloomfield Township	\$ 103,897.00	2.0%
City of Farmington	\$ 55,920.00	9.0%
Farmington Hills	\$ 69,527.00	7.5%
Franklin	\$ 143,393.00	5.6%
Keego Harbor	\$ 38,958.00	25.1%
Lathrup Village	\$ 86,338.00	3.5%
Orchard Lake Village	\$ 153,289.00	1.5%
Southfield	\$ 50,281.00	14.1%
Troy	\$ 86,465.00	6.7%
West Bloomfield Township*	\$ 91,661.00	2.5%

Source: 2010 Census Data

*2010 Data not available, 2000 Census data used

Table 5 lists the jobs forecast for the EFSDS communities for years 2014, 2034 and 2040.

Table 5: Jobs Forecast

Community	Jobs Forecast		
	2010	2034	2040
Auburn Hills	69,674	80,134	82,749
Bingham Farms	8,782	9,867	10,138
Bloomfield Hills	8,183	9,752	10,144
Village of Beverly Hills	3,414	3,776	3,866
Birmingham	16,094	18,516	19,121
Bloomfield Township	23,822	27,545	28,476
City of Farmington	4,676	5,180	5,306
Farmington Hills	82,650	92,054	94,405
Franklin	545	661	690
Keego Harbor	955	1,073	1,103
Lathrup Village	2,963	3,340	3,434
Orchard Lake Village	674	776	802
Southfield	138,475	154,421	158,408
Troy	129,361	147,575	152,129
West Bloomfield Township	18,344	21,420	22,189

Source: SEMCOG 2040 Forecast

3. Economic Climate

The recent economic downturn has resulted in a very slight decrease in water and wastewater usage in the EFSDS. Southeast Michigan Council of Governments' (SEMCOG) current economic forecast, as indicated by the job forecast, shows a steady, very gradual growth through 2030. Therefore, it is anticipated that wastewater needs will remain relatively constant through the planning period.

C. Existing Facilities

1. Method of Wastewater Treatment

Wastewater and combined sewage from the EFSDS is discharged to the DWSD system for conveyance to and treatment at the DWSD WWTP. The WWTP uses an activated sludge treatment process and discharges treated effluent to the Detroit River.

The original EFSDS was constructed in 1958. In 1991 and 1992, major regional facility improvements were constructed to address pollution problems and improve conveyance capacity throughout the EFSDS. The CSO RTBs were constructed in 1997.

2. Method of Sludge Handling and Disposal

The vast majority of solids are transported through the interceptor system to the City of Detroit. After the CSO RTBs have been in use, any solids larger than four (4) inches are taken to a landfill, while the remainder are flushed back to the interceptor. All vector spoils are taken to the WRC septage disposal site in Pontiac (located outside the limits of the EFSDS). Once at the site, they are dried and sent to a landfill for disposal.

3. Type of Collection Facilities

The EFSDS is served by an interceptor system which transports all flow to the City of Detroit combined sewer system. The Farmington Interceptor, located in Middlebelt Road, collects

wastewater from the western half of the District. The flow is transported to the Eight Mile Pumping Station in Southfield (also known as the Murwood Street Pumping Station), where it is pumped, together with the flow from the Southfield-Rouge Arm, to Eight Mile Road and Evergreen Road. At this point, the Evergreen Interceptor, which serves the eastern half of the District, joins with the flow from the Eight Mile Pumping Station. The flow is metered at Eight Mile Road and Evergreen Road and discharged to the City of Detroit's combined sewage system. The System is divided into numerous districts which basically conform to natural drainage districts of the area. Sewer districts are shown in Figure 7.

Local sanitary and combined sewer collector systems are owned and operated by the local communities within the EFSDS.

The WRC maintains the system using a rigorous, seven (7)-year rotating maintenance program that includes sewer televising, cleaning, inspection and repair. Any issues during the inspection process are programmed for maintenance and properly resolved.

4. Facilities Location

Figure 4 show the location of all existing combined sewer overflow retention treatment basins, interceptor sewers, and pumping stations. A list of industrial users, along with their NPDES permit numbers, is included in Appendix A.

5. Design Capacity, Existing Flows, and Waste Characteristics

Per the LTCAP, average and peak dry weather flows for the EFSDS are approximately 48.9 cfs and 71.0 cfs, respectively. The peak wet weather flow for the EFSDS is approximately 232.8 cfs. Wastes discharged to the EFSDS are typical of municipal sewage.

Pipe capacity along the Evergreen branch of the EFSDS, between Maple Road and Adams Road (also referred to as the Troy Arm), is reduced due to hydraulic restrictions in the system. The average conveyance capacity along this reach is approximately 12 cfs whereas the average design flow is between approximately 12 and 14 cfs. During wet weather conditions the hydraulic grade line (HGL) rises rapidly and the pipe cannot convey its design capacity. Furthermore, the peak flows generated throughout this reach exceed pipe capacities during wet weather events due to the presence of infiltration/inflow (I/I). The hydraulic restrictions are compounded by these excess flows causing surcharging and SSOs during high flow events. System evaluations indicate that hydraulic improvements to the sewer reach including system storage will alleviate the surcharging conditions and greatly reduce the frequency of SSOs.

Pipe capacity along the Evergreen branch of the EFSDS, between Quarton Road and Square Lake Road (also referred to as the Quarton Arm), is limited in several areas. These are generally downstream of the convergence of two large branches, where both branches generate significant flows and the pipe downstream of the confluence is the same size as the two upstream discharging pipes. This creates surcharging on upstream lines and the possibility of a SSO. System evaluations indicate that a relief sewer at Stonycroft Golf Course, and a storage facility at the northwest corner of Woodward Avenue and Quarton Road, will alleviate the surcharging condition in the interceptors and greatly reduce the frequency of SSOs.

6. Septage

There is one (1) septage receiving station in the EFSDS. It is located at 22410 West Eight Mile Road in Southfield. This facility is used by the WRC, several municipalities, and licensed septage haulers. This facility will not be impacted by the projects outlined in this project plan.

7. Industrial Discharges

A list of industrial users, and their associated NPDES permit numbers, is located in Appendix A.

8. Average and Peak Dry and Wet Weather Flows

Per the LTCAP, average and peak dry weather flows for the EFSDS are approximately 48.9 cfs and 71 cfs, respectively. The peak wet weather flow for the EFSDS is approximately 232.8 cfs.

9. Infiltration and Inflow Problems

The WRC and the communities have been actively working on excessive I/I removal for a number of years. WRC has a schedule for inspecting all of the interceptors. Grouting and manhole rehabilitation are implemented based on the findings from these inspections. Many communities have been working on I/I removal, partially funded by Federal grants or funded through their local sewer rates. Work has included footing drain removal, manhole rehabilitation, sewer lining, and house-lead rehabilitation.

10. Combined Sewers

Combined sewers serve approximately 6% of the tributary land area and 7% of the population equivalency in the EFSDS. These combined sewers are tributary to the three (3) RTB facilities and therefore, do not negatively impact the collection facilities.

11. System Bypasses and SSOs

A list of all SSOs that have occurred on the EFSDS since 2001 is included in Appendix B. This listing indicates date of occurrence, location, volume of SSO, and cause.

12. Combined Sewage Overflows

There are no untreated combined sewer overflows in the EFSDS. There are three (3) CSO RTB facilities that capture and treat any combined sewer overflows in the EFSDS. These facilities are permitted by the Michigan Department of Environmental Quality (NPDES Permit Nos. MI0025534, MI00480146, and MI0037427) and are operated by WRC. All discharges from the RTBs are primary treated discharges that meet water quality standards.

13. Pump Station Capacities

The EFSDS consists of ten (10) major pump stations. Table 6 includes a summary of the pump stations and their capacities:

Table 6: EFSDS Pump Stations

Pump Station Name	Year Built	Number of Pumps	Capacity
Walnut Lake No. 1	1968 (Rebuilt in 2006)	6	4 x 1575 gpm + 2 x 3150 gpm or 12,600 total/9450 firm
Walnut Lake No. 2	1967	3 operating pumps, 1 emergency pump	3 x 1,750 gpm or 5,250 gpm total/3,500 gpm firm - not including emergency pump
Walnut Lake No. 3	1967	2	2 x 500 gpm, 100 gpm total/500 gpm firm
Eight Mile	1965 (renovated in 1991 and 2013)	5	58,310 gpm (total) 41,710 gpm (firm)
I-696	1977	3	3 x 600 gpm or 1800 gpm total/1200 gpm firm
Biddestone	1977	3	3 x 600 gpm or 1800 gpm total/1200 gpm firm
Drake	1976	3	3 x 1900 gpm or 5700 gpm total/3800 gpm firm
Thornbrook	1977	4	4 x 1400 gpm or 5600 gpm total/4200 gpm firm
Amy	1992	3	3 x 2200 gpm or 6600 gpm total/4400 gpm firm
Morris Lake	1993	2	2 x 900 gpm or 1800 gpm total/900 gpm firm

The EFSDS considers two (2) of the pump stations on the interceptor system to be the main pump stations. These include Walnut Lake No. 1 Pump Station (WLPS1), which is located at Fourteen Mile Road east of Middlebelt Road and the Eight Mile Pumping Station, which is located on Eight Mile Road between Lahser and Berg Roads. WLPS1 pumps the entire flow of the Walnut Lake Arm and the Eight Mile Pump Station pumps the flow of the entire west half of the Evergreen-Farmington District. The remaining pump stations are located on the tributary collector sewers.

Additional pump capacity breakdown of the Eight Mile Pump Station is listed in Table 6a.

Table 6a: 8 Mile Pump Station

Pump No.	Rated Capacity (gpm/cfs)	Rated TDH (feet)
1	6,500/14.5	60
2	8,750/19.5	55
3	9,860/22.0	82
4	16,600/37.0	65
5	16,600/37.0	52
Total	58,310/130.0	N/A

14. Pump Station Adequacy

In general, all of the pump stations have sufficient hydraulic capacity to pump current tributary flows. However, it is recognized that interceptor restrictions limit the conveyance of peak flow thereby potentially affecting the peak discharge to the system's pump stations and resulting in SSOs. It is possible that as these SSOs are eliminated through future relief sewers, higher peak flows may be conveyed to the system's pump stations and it will be important to assess downstream pump station capacities for proposed projects.

15. Operation and Maintenance Problems

The WRC utilizes a perpetual seven (7) year rotating maintenance cycle that includes sewer televising, cleaning, inspection and repair. Problems that are identified through the maintenance program are scheduled for subsequent repair.

Current operation and maintenance problems in the EFSDS are primarily related to capacity restrictions in the interceptor system. This has resulted in surcharged sewers and intermittent SSOs that occur during significant or extended wet weather events. The previous project plan submitted by WRC addressed capacity issues on the Middlebelt arm and operation issues at the Eight Mile Pump Station. This plan focuses primarily on SSO issues on the Evergreen branch.

Capacity restrictions have resulted in extensive operational plans to monitor sewer levels and maximize existing facilities (pipes, basins, pumping stations, regulators, etc.) in order to reduce the frequency SSOs. These plans typically involve manual operation of facilities, which results in additional operation and maintenance cost. In addition, during and after significant or extended wet weather conditions, extensive monitoring is required to evaluate system performance, resulting in further operational costs.

Improvements proposed in this project plan will address hydraulic restrictions along the Troy Arm, and capacity issues along the Quarton Arm. All improvements are on the Evergreen Branch.

D. Need for the Project

1. Compliance Status

The EFSDS does not currently meet the Michigan December 2002 Sanitary Sewer Overflow (SSO) Policy. Periodic SSOs have been experienced throughout the system and the County is currently under an Amended Consent Order (ACO). A number of studies and improvements on the system have been completed since 1982. It is recognized that there are further improvements required and the necessary investigations are currently underway that are expected to provide a Long-Term Corrective Action Plan (LTCAP). The Eight Mile Pump Station Improvements and the Middlebelt Storage Tunnel Project are currently under way to address SSOs along the Farmington branch of the system. The projects identified in this plan are meant to address the identified SSOs along portions of the Evergreen branch of the system.

The WRC has recognized that the EFSDS has experienced capacity issues since the early 1980s. The series of technical analyses and subsequent reports (listed below) have described the deficiencies and proposed solutions.

- 1982: Comprehensive Facilities Plan (approved by MDEQ in September 1988)
- 1997: Pollution Control Facilities Project Performance Certification Program Report
- 1999: EFSDS Phase I Study
- 2007: EFSDS Hydraulic/Hydrologic Modeling Project Technical Report

In the mid-1980s to early 1990s, many capital improvements were made to implement the most critical of the proposed solutions in the 1982 Comprehensive Facilities Plan. The effectiveness of these projects at meeting SSO guidelines at the time were described in the 1997 Pollution Control Facilities Project Performance Certification Report. It was found that additional work may be needed in some portions of the EFSDS. At that time, the range of available hydrologic/hydraulic modeling options had sufficiently expanded to allow a model of the EFSDS to be developed. The model development is described in the 1999 EFSDS Phase 1 Study report. This study identified additional improvements needed in the EFSDS. As the capabilities of hydrologic/hydraulic modeling continued to improve, the EFSDS model was updated. In February 2007, the WRC (then the Oakland County Drain Commissioner) submitted the EFSDS

Hydraulic/Hydrologic Modeling Project Technical Report to the MDEQ. This report described the model development and calibration using storm events that occurred between 2000 and 2003 using the SWMM modeling program. The improvements in this report were made with a new, more stringent SSO policy in mind. The report presented a collection of recommendations that eventually resulted in an ACO extension to allow time for communities to complete Short-Term Corrective Action Programs (STCAPs) and for WRC to implement a dye-dilution testing program for the sewage flow meters to determine and verify meter accuracy.

The 2007 study was performed to address technical requirements of the 2004 ACO. It included a major update of the system's Storm Water Management Model (SWMM) model whereby there were extensive changes to the hydrologic and hydraulic inputs/variables in order to better represent the real-world conditions within the EFSDS. Additional removal of I/I has been implemented by WRC and tributary communities. Dye dilution testing of the meters has also been completed to improve the accuracy of the data.

2. Orders

On December 6, 2004, the EFSDS entered into the Second Amended Administrative Consent Order (ACO) that defines the corrective actions needed to come into compliance. The EFSDS has been actively working on the requirements of the ACO, including implementation of construction projects that have reduced the frequency of SSOs. WRC is currently working on:

- Investigating capacity issues through meter data review, modeling review and field investigations where necessary.
- Designing improvements in areas of known bottlenecks
- Developing the LTCAP
- Improving the Eight Mile Pumping Station
- Constructing of the Middlebelt Storage Tunnel

Based on a recent extension granted by MDEQ, the development of the LTCAP will be completed on or before July 1, 2014 with Phase I improvements to be completed by November 2017 and Phase II improvements identified and completed by 2022 (refer to Appendix H for ACO).

3. Water Quality Problems

Known SSOs typically occur during significant storm events. Appendix B indicates the dates, locations, and overflow volumes that have been estimated since the last major system improvement was implemented in October 2006. The volume and frequency of SSOs have been significantly reduced. WRC and the communities have continued to implement sewer system rehabilitation projects, which are expected to further reduce the frequency of SSOs. However, the analyses indicate that further improvements will be required to meet State standards and to meet the requirements of the WRC ACO.

Water quality problems, such as high bacteria levels, are expected in the Rouge River and its tributaries downstream of the SSO discharge locations. No specific water quality studies have been conducted, since MDEQ considers SSOs containing raw sewage to be *prima facie* evidence of a water quality violation.

4. Projected Needs for the Next 20 Years

Projections of flow for each community in the EFSDS are shown in Table 7. Projections of population are shown in Table 8. Generally, the system is mostly developed and overall increases on the are approximately 7%. The increases are relative to current populations, which are generally down about 5% in comparison to peak values experienced in the past decade. The

projected populations and flows have been utilized in the SWMM model that will be used to size the improvements for the LTCAP.

Table 7: Current Average and Maximum Dry Weather Flows and Projections

CVT	Current Avg. Dry Weather Flow	Current Max. Dry Weather Flow	Projected Avg. Dry Weather Flow	Projected Max. Dry Weather Flow
Auburn Hills	0.326	0.455	0.326	0.455
Bingham Farms	0.253	0.365	0.267	0.385
Bloomfield Hills	2.252	2.925	2.361	3.067
Village of Beverly Hills/Southfield Township	2.098	3.086	2.22	3.266
Birmingham	2.931	3.699	3.143	3.968
Bloomfield Township	7.789	10.29	8.533	11.274
City of Farmington	0.467	0.686	0.486	0.713
Farmington Hills	12.042	17.143	12.754	18.158
Franklin	0.336	0.484	0.384	0.553
Keego Harbor	0.494	0.662	0.532	0.713
Lathrup Village	0.858	1.139	0.926	1.23
Orchard Lake Village	0.504	0.851	0.584	0.986
Southfield	11.927	15.788	12.65	16.746
Troy	2.072	2.847	2.274	3.125
West Bloomfield Township	6.896	9.721	7.623	10.824
Total	51.245	70.141	55.063	75.463

5. Future Environment without the Proposed Project

The projects proposed in this Project Plan will address problems that currently exist in the system and contribute directly to observed SSOs. These are identified as Phase 1 projects in the LTCAP. Phase 1 projects were identified as those projects that meet both of the following criteria:

- Observations have validated the existence of an SSO.
- The need for and sizing of the project can be determined based on available information.

These improvements are expected to reduce the frequency and magnitude of the remaining known SSOs on the system, particularly on the Troy Arm and along the Quarton Arm. The improvements are also expected to provide better data upon which to base the Phase 2 improvements as outlined in the LTCAP so that the system meets the State SSO policy in the most cost effective manner. The Phase 2 projects are those where the model predicts an SSO, or those whose sizing depends on the field performance of the Phase 1 projects. Without the proposed projects, the SSOs will continue unabated. These proposed improvements include providing storage and interceptor improvements on the Troy Arm, and relief sewers and storage on the Quarton Arm.

E. Population Data

1. Existing and Projected Study Area Population

Current population data for the EFSDS study area served by the existing facilities and population projections for the next 5, 10, and 20 years are listed in Table 8.

Table 8: Current Population Data and Projections

Community within the EFSDS Study Area	Current Total Equivalent Population*	5 Year Population Projection**	10 Year Population Projection**	20 Year Population Projection**
Auburn Hills	3,017	3,017	3,017	3,017
Bingham Farms	1,665	1,680	1,696	1,726
Bloomfield Hills	6,282	6,333	6,385	6,487
Village of Beverly Hills/Southfield Township	10,485	10,587	10,688	10,892
Birmingham	12,711	12,869	13,027	13,344
Bloomfield Township	39,146	39,771	40,396	41,646
City of Farmington	2,427	2,444	2,460	2,492
Farmington Hills	88,020	88,891	89,761	91,502
Franklin	3,451	3,533	3,615	3,778
Keego Harbor	3,172	3,213	3,253	3,335
Lathrup Village	4,577	4,639	4,700	4,824
Orchard Lake Village	2,805	2,879	2,954	3,102
Southfield	75,020	75,779	76,357	78,055
Troy	14,328	14,558	14,789	15,250
West Bloomfield Township	45,093	45,883	46,672	48,251
Total	312,199	316,075	319,950	327,701

*Current Population is based on the 2010 Census Data

**Projections are based on SEMCOG regional projection data.

F. Environmental Setting

1. Cultural Resources

There are no State or Nationally registered historical sites located within the proposed project areas in the EFSDS service area according to the Michigan Center for Geographic Information (<http://www.michigan.gov/cgi>) and the National Register of Historic Places (www.nationalregisterofhistoricplaces.com). A completed Section 106 Review Application and submittal to the Michigan State Historic Preservation Office are included in Appendix C. There are no anticipated impacts to the historical properties by the proposed projects.

2. The Natural Environment

Figure 3 shows the natural features (wetlands, floodplains, etc.) within the service area.

a. Climate

Weather conditions are not expected to adversely impact this project. The climate of the service area is moderated by the Great Lakes with the average frost-free season extending from approximately mid-April to mid-November. Winter temperatures average around the freezing point in January and February, but overnight lows are typically between 15 degrees Fahrenheit (°F) and 20°F. Deep freezes will usually occur at least once each winter and last for few days to two weeks.

Summer temperatures average around 72°F in July and August with afternoon highs of 85°F common. The last two weeks in July and the first two weeks in August are typically the hottest weeks of the year. Temperatures above 90°F are not uncommon. In general, summer hot spells last longer than winter deep freezes.

Table 9 lists the average monthly temperature for each month as provided by the Michigan State Climatologist Office.

Table 9: Average Monthly Temperature for Southeast Michigan

Month	Temperature (°F)
January	23.7
February	25.7
March	35.1
April	47.7
May	58.0
June	68.0
July	72.2
August	70.7
September	63.3
October	51.2
November	39.3
December	28.1

Table 10 lists the average precipitation depth for each month. Precipitation is more prevalent during the months of May and June (6.73 inches), averaging more than three inches above that of January and February (3.66 inches). During the months of May, June, July, and August, thunderstorms occur on an average of five (5) to six (6) days per month.

Snowfalls of greater than one (1) inch typically occur three (3) days each month during December, January, and February, two (2) days in March and one day in April. During March and April, and other winter months, these snowstorms alternate with rain, freezing rain, and sleet.

Table 10: Monthly Precipitation Data in Inches (Detroit Metro Airport)

Month	Minimum	Maximum	Monthly Average
January	1.72	3.63	1.96
February	1.23	2.68	2.02
March	1.18	4.48	2.28
April	1.97	5.40	2.90
May	2.87	5.88	3.38
June	2.62	6.60	3.52
July	2.19	6.02	3.37
August	3.21	7.70	3.00
September	2.97	5.83	3.27
October	2.11	4.87	2.52
November	1.52	3.31	2.79
December	3.71	6.00	2.46

b. Air Quality

Air quality in Michigan is monitored by the State through the Michigan Air Quality Monitoring Program. There are monitoring stations scattered throughout Michigan. However, large concentrations of the stations are located in southeast Michigan.

There are seven (7) monitoring stations in southeast Michigan that record ozone levels. These stations are operated by state and local agencies. According to the 2002 Annual Air Quality Report for Michigan, all monitoring sites were above the 0.08 parts per million (ppm) ozone limit in 2002. When averaged over a 3-year period from 2000-2002, only one of the seven (7) sites was in compliance. The EPA initially had a one-hour ozone standard in place. At that time, all Michigan counties were in compliance. In 1997, the EPA adopted more stringent standards thereby requiring counties to meet an eight-hour ozone standard.

The one-hour standards for carbon monoxide (CO) were not exceeded by any of the counties in Southeast Michigan. There was however, one monitoring location in Detroit that exceeded the eight hour standards for CO in 1994. Since then, the CO levels have continually decreased.

All of the monitoring in metro Detroit measured well below the standards for sulfur dioxide, nitrogen dioxide, and lead. None of the proposed projects are anticipated to negatively impact the air quality of the EFSDS service area.

c. Wetlands

Wetlands within the EFSDS service area are mainly located along the Main Branch of the Rouge River and its tributaries.

Few wetlands are present within close proximity of the project area. Regulated wetlands under Part 303, Wetland Protection of the Natural Resources and Environmental Agency (NREPA), include wetlands connected to, or within 500 feet of the Rouge River. If construction is to occur as a result of the EFSDS SRF Project Plan, the WRC shall apply for the appropriate permits.

d. Coastal Zone

There are no coastal zones within the Study Area.

e. Floodplains

The boundaries of the floodplains within the EFSDS service area are fairly consistent with the shoreline of the Rouge River and its associated branches. Floodplains are shown on Figure 3, where the Area of Potential Effects (APE) has been designated for the entire EFSDS service area.

Construction is proposed in or near designated floodplains in many areas. Appropriate permits will be secured prior to any construction in or near a designated floodplain.

f. Natural or Scenic Rivers

The EFSDS Facilities are located in the Rouge River Watershed which is classified as a Natural River. There are no designated Wild and/or Scenic Rivers within the watershed according to the Natural Rivers Unity of the Land and Water Management Division of the MDEQ.

g. Major Surface Waters

The EFSDS service area encompasses a large portion of the Main Branch of the Rouge River.

h. Recreational Facilities

There are no County Parks within the EFSDS service area. However, most of the local communities maintain parks and open space. These areas offer many recreational opportunities for the public. Recreational facilities do not fall under the scope of this Project Plan. None of the projects in this plan are in the vicinity of any local parks. Figure 5 shows the major recreational facilities in the EFSDS.

One of the projects is proposed to take place within the Stonycroft Golf Club, which is a private golf facility located in the City of Bloomfield Hills. This work will be done in the winter months when the club is closed to limit impacts to users.

i. Topography

The topographic features of the study area were formed by glacial lake deposits and glacial till. The study area slopes generally to the southeast and varies in elevation from more than 777 feet in West Bloomfield Township to less than 738 feet in the City of Birmingham along the Troy/Quarton Arm. Elevation at the Quarton/Woodward basin is 764 feet. Elevation at Stonycroft Golf Course is 836 feet.

j. Geology

The geology of the Study Area will not affect the choice of alternatives. Oakland County and the EFSDS service area lies in the southeast edge of the Michigan Basin, and in general, the strata dip to the northwest. Five (5) concentric bands of rock strata underlie the mantle of glacial drift in southeastern Oakland County. In ascending order, and also radially inward toward the center of the Michigan Basin, they are Antrim shale, Bedford shale, Berea sandstone, Sunbury shale, and Coldwater shale.

k. Soils

The soils within the Study Area vary significantly. In general, soils in the northwestern region of the EFSDS service area are typically well-drained compared to those in the southeastern region which are typically less permeable, finer textured soils. Figure 9 shows a soils map of the area.

According to the United States Department of Agriculture (USDA) Soil Survey of Oakland County, the soils vary in the different project areas from loamy poorly drained soils in areas closer to the Rouge River to sandier, more well drained soils in the upland areas.

l. Agricultural Resources

There are no prime or unique farmlands in the Study Area.

m. Fauna and Flora

Table 11: Endangered Species within Oakland County

Common Name	Status	Habitat
Indian Bat	Endangered	Summer habitat includes small to medium river and stream corridors with well developed riparian woods; woodlots within 1 to 3 miles of small to medium rivers and streams; and upland forests. Caves and mines as hibernacula.
Northern Long-Eared Bat	Proposed as Endangered	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roots and forages in upland forests during spring and summer
Eastern Massasauga	Candidate	
Rayed Bean Mussel	Endangered	Clinton River
Snuffbox Mussel	Endangered	Small to medium-sized creeks in areas with a swift current and some larger rivers.
Poweshiek Skipperling	Proposed as Endangered	Wet prairies and fens

n. Unique Features

There are no unique features identified within the Study Area that will be impacted by the proposed improvement project activities.

o. Existing Plant and Animal Communities:

The existing plant and animal species are typical to urbanized areas. No habitat for animals of economic or sport value is within the area. A review of protected species was also made in April 2014, using the U.S. Fish and Wildlife Service's website for Endangered Species Section 7(a)(2) Consultation Process (www.fws.gov/midwest/endangered/section7sppranges//index.html.) Endangered species listed as having a presence in Oakland County include the Indiana bat, Ray Beaned mussel and snuffbox mussel. Candidate species or those that are proposed as endangered include the Eastern Massasauga snake, Poweshiek skipperling butterfly, and Northern Long-eared bat. Table 11 indicates the habitat of the endangered species. The proposed work is to be done primarily in developed areas such as road rights-of-way, golf courses, and the developed Manresa property. Therefore, no impacts to these habitats are anticipated.

The office of the Michigan Natural Features Inventory (MNFI), operated by the Michigan State University Extension, was also contacted and provided a list of Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features that may exist within 1.5 miles of any of the proposed project sites.

It was determined, through review of the information provided by MNFI, that the proposed projects would have no long-term, negative impacts to any species. Since the proposed projects are designed to improve water quality by reducing the frequency of SSOs, the long-term impacts should result in improved habitat for any species present. Refer to the correspondence included in Appendix C for additional information.

Section III - Analysis of Alternatives

This section identifies different alternatives for the proposed sanitary sewer improvements needed within the EFSDS. These improvements include:

- Troy Arm Storage – Wattles Road Linear Storage (B2/B3 in Selected Alternative Memo)
- NEI Hydraulic Improvements (B4 in Selected Alternative Memo)
- Stonycroft Relief and Amy PS Upgrades (C2 in Selected Alternative Memo)
- Quarton Road Storage (C4 in Selected Alternative)

These projects are identified as the Phase 1 projects in WRC's LTCAP. An excerpt from the LTCAP is included in Appendix D in the Selected Alternatives Memorandum. This Section provides additional information regarding the projects. The complete LTCAP can be provided upon request, and will be submitted to the MDEQ District office on or before July 1, 2014. The Phase 1 projects as identified in the LTCAP, including the Middlebelt Storage Tunnel and improvements that were included in a previous project plan and therefore not discussed herein, are the projects necessary to reduce the frequency of known SSOs within the EFSDS. Phase 1 projects were identified as those projects that meet both of the following criteria:

- Observations have validated the existence of an SSO.
- The need for and sizing of the project can be determined based on available information.

The Phase 2 projects are improvements where the model predicts surcharging or potential capacity issues; however, in the Phase 2 areas, either SSOs have been confirmed or reported or the sizing of the project cannot be determined until the Phase 1 projects are constructed and additional review can be done. Therefore, MDEQ has agreed that WRC can implement the Phase 1 projects to comply with the current ACO requirement. WRC will then utilize additional meter data and field investigations to update the model and determine which of Phase 2 projects are necessary.

A. Identification of Potential Alternatives

All projects identified below have several alternatives as identified in the specific sections. In addition to the alternatives identified herein, all projects have the following alternatives.

a. No Action

WRC is concerned about the hydraulic inefficiencies on the Troy and Quarton arms of the EFSDS and the risks of additional potential SSOs during higher wet weather flows. Since no action would not address the potential for SSOs, this is not considered a Principal Alternative.

b. Optimal Performance of Existing Facilities

The WRC utilizes a perpetual 7-year maintenance cycle that includes sewer televising, cleaning, inspection and repair. Problems that are identified through their maintenance program are programmed for repair.

It has been identified that the Troy interceptor has several hydraulic inefficiencies that contribute to flow issues along this line. Hydraulic improvements are proposed along this line in order to improve the performance along this line.

c. Regional Alternatives

The Troy and Quarton arms of the Evergreen interceptor are part of a regional facility that services a number of communities within the EFSDS. No population growth or development is

anticipated with the construction of these facilities. Different routing and storage options to improve the regional facility are described herein.

As part of the regional alternative analysis, WRC looked at the possibility of diverting flow from the Amy Pump Station to the Pontiac WWTP, which was purchased by WRC in 2012. The capital cost associated with this alternative, based on the upgrading pumping needs, installation of a forcemain, and necessary upgrades to the WWTP, were cost prohibitive. Therefore, this is not considered a Principal Alternative.

d. Transport and Treat

The County could consider making improvements to the interceptor system all the way to the outlet at Eight Mile Road so that the peak flow generated by the system can be transported directly to the DWSD system and ultimately treated. However, improvements would have to be made on the existing interceptor throughout the entire 12-mile stretch, which would be cost prohibitive. Also, because the interceptor is located in a completely developed area, the impacts would be very high. This is not considered a Principal Alternative.

In addition to the above options which were considered for all projects, the following alternatives were identified for specific areas. Additional information regarding all projects are included in the technical memoranda included in Appendix D.

1. Identification of Potential Alternatives – Troy Arm Storage

This project will address the SSO issues which occur on the interceptor reach through the City of Troy and Bloomfield Township. The County has identified several areas where overflows occur. In addition, there are three (3) areas within the City of Troy where City staff are required to perform relief pumping from the interceptor in order to prevent basement flooding.

a. Wattles Road Linear Storage

This alternative involves the construction of an offline linear storage tank in the Wattles Road right-of-way (ROW) for the purpose of storing excess flow in the Troy Arm to address surcharging and SSOs. Due to utility conflicts along Adams Road the storage along Wattles Road is required to be divided into two (2) separate offline tanks. Combined, the two (2) offline storage tanks would provide 0.51 million gallons (mgal) of storage and would reduce peak flows by approximately 6.1 cfs thereby reducing the frequency of SSOs within the Troy Arm (refer to Figure 8). Both of these offline storage facilities will be able to dewater by gravity. This alternative is discussed in detail in the Selected Alternatives Memo in Appendix D. This is a Principal Alternative.

b. Harlan Elementary School Storage Tank

This alternative involves the construction of a storage tank at Harlan Elementary School on Adams Road south of Wattles Road. This tank will be constructed to divert approximately 6.1 cfs to reduce the frequency of upstream and downstream SSOs using a 0.51 mgal storage tank. This alternative is discussed in the Technical Memorandum in Appendix D. This is a Principal Alternative.

2. Identification of Potential Alternatives – NEI Hydraulic Restrictions

This project will remediate the hydraulic restrictions within the Troy Arm of the EFSDS. WRC has performed several tests and field investigations in the area and determined that a series of hydraulic anomalies in the system cause the hydraulic grade line (HGL) to increase rapidly throughout the reach. These anomalies include an area where the sewer consists of two (2) 120 degree plus bends in a short distance (“zig-zag area”), a blind connection between a 24-inch

round pipe and 36-inch elliptical pipe under Woodward Avenue, and a series of manholes with bench heights less than the pipe diameter that cause hydraulic issues when the depth of flow in the manhole exceeds the bench height. By eliminating these restrictions, and allowing the system to flow as designed, upstream capacity issues will be alleviated.

a. Optimal Performance of Existing Facilities – Troy Arm Hydraulic Improvements

WRC has done many investigation of the sewer and has determined that several of the discrepancies listed above which are causing the HGL to increase at a greater rate than expected can be corrected with several construction projects. This project would include greatly reducing the sewer bend within the “zig-zag” area, making improvements to the Woodward Avenue Crossing, and adjusting manhole benches. The proposed project would result in a removal of 0.38 million gallons of storage needed in the system. This alternative is outlined in detail in the Selected Alternatives Memo (Appendix D). This is considered a Principal Alternative.

b. Upsized Storage at Wattles Road Linear Storage

As an alternative to completing the improvements along the Troy arm as described in part a above, the storage facility in area of Adams and Wattles could be upsized to address this additional flow. The storage at Adams and Wattles is outlined in in detail in Selected Alternatives memo in Appendix D. and the alternative would have the same considerations, but would involve upsizing the structure to provide additional storage. The Selected Alternatives Memo includes technical details. This is considered a Principal Alternative.

3. Identification of Potential Alternatives – Stonycroft Relief and Amy PS Upgrades

This project will address a known SSO north of Stonycroft Golf Club in the City of Bloomfield Hills. Two (2) 15-inch sewers connect to a downstream 15-inch sewer at this point, and an overflow was witnessed during a large rain event.

a. Stonycroft Relief and Amy PS Upgrades

This alternative involves providing a relief sewer through Stonycroft Golf Club. This alternative would consist of a 21-inch gravity sanitary sewer that would divert flows from the confluence of two (2) upstream sewer reaches, and convey excess flows to the Amy Pump Station via a sewer reach parallel to the existing 15-inch sanitary sewer. This 21-inch sewer is sized accordingly to handle all flow from upstream should there be an issue with the existing 15-inch line. Improvements to the Amy Pump Station would be required to convey additional flow downstream. This alternative is discussed in detail in the Selected Alternative Memo in Appendix D. This is a Principal Alternative.

b. Kensington Road Relief Sewer and Amy PS Upgrades

This alternative proposes the installation of an 18-inch relief sewer on Kensington Road. This alternative would divert flow from the eastern branch of the sewer, run a sewer down Kensington Road and cross under the railroad tracks to reconnect upstream of the Amy Pump Station. As this proposed sewer would not allow the fifteen (15”) inch sewer to be abandoned in the future, the costs also include a cost to line the existing fifteen (15”) inch sewer. Improvements to the Amy Pump Station would be required to convey additional flow downstream. This alternative is discussed in the Technical Memorandum in Appendix D. This is a Principal Alternative.

4. Identification of Potential Alternatives – Quarton Road Storage

This project will address a known SSO on Redding Road north of Lakeside Road in the City of Birmingham. Upstream of this location, two (2) branches of the Quarton Arm converge and cause capacity issues on the downstream sewer. In addition, high flows in the Quarton branch to

the west caused the need for a grade protection pump station to eliminate basement backups for nine (9) homes that were directly connected to the interceptor.

a. Storage Tank at Northwest Corner of Quarton and Woodward

This alternate would consist of the construction of a 0.4 mgal storage facility at the northwest corner of Quarton Road and Woodward Avenue to remove approximately 3.0 cfs of peak flow during significant events. This tank would intercept flow from the Amy Pump Station outlet line during wet weather events in order to lessen flow on the interceptor line which runs down Redding Road. This flow will be stored until the wet weather event is over at which point it will dewater by gravity back into the interceptor. This alternative is discussed in detail in the Selected Alternatives Memo in Appendix D. This is a Principal Alternative.

b. Storage Tank at Southwest Corner or Northeast Corner of Quarton and Woodward

Other locations were reviewed for a potential storage basin at the southwest or northeast corner of Quarton Road and Woodward Avenue. However, due to easement acquisition, utility conflicts, and other issues, these were not considered principal alternatives and were not investigated any further.

B. Analysis of Principal Alternatives

1. Troy Arm Storage

a. Wattles Road Linear Storage – Principal Alternative

This alternative involves diverting up to 6.1 cfs of wet weather flow away from the Troy Interceptor near the intersection of Adams Road and Wattles Road. This alternative would consist of 1,900 lft of 5-foot diameter linear storage pipe on Wattles Road east of Adams Road that diverts and stores flow from the existing 21-inch interceptor that runs along the Rouge River in Troy and into Bloomfield Township. In addition, 1,600 lft of 5-foot diameter linear storage pipe on Wattles Road west of Adams Road will be installed to store flow from Bloomfield Township prior to discharging back into the interceptor. The total storage volume would be 0.51 MG. This is included in the Selected Alternatives Memo in Appendix D.

i. Monetary Evaluation

The detailed preliminary cost estimate and present worth analysis for this alternative are included in Appendix E. The total preliminary cost estimate for this alternative is \$4,503,000. The present worth of this alternative is \$3,394,000.

ii. Staging Construction

Staging of this project will not be necessary.

iii. Partitioning the Project

Partitioning of this project will not be necessary.

iv. Environmental Evaluation

Typical construction disturbances such as noise, dust, and traffic disruptions are expected during the construction of the linear storage. Because of the location in the

Wattles Road ROW, it is likely that full or partial lane closures and detours will be required during construction. The proposed route of the linear storage is expected to be in the Wattles Road ROW.

The linear storage route along Wattles Road crosses branches of the Rouge River in several locations. The crossings will occur both on the east and west side of Adams Road. The river will be protected during construction to minimize any impacts. Construction alternatives will be evaluated at the time of permitting and could include alternate means of crossing the area such as tunneling under the creek. Appropriate permits will be secured from the Michigan Department of Environmental Quality (MDEQ).

v. Implementability and Public Participation

The Owner, WRC, will fund the project with money collected from user charges. WRC is able to manage the construction and operation, maintenance, and repair of the proposed linear storage.

User fees associated with this alternative include capital costs and operation and maintenance (O&M) costs. These may be of concern to the public as the construction cost is significant.

The project will take place in an established residential area with paved streets and maintained lawns. It is expected that the residents will have concerns regarding damage to lawns, loss of trees and shrubs close to the linear storage, removal and replacement of roads, traffic detours, road closures, and surface restoration.

When the WRC enters into a contract with a construction company to build this project, public information meetings will be held to inform the public of the anticipated scope of work, construction schedule, project management staff, emergency contact information, and expected traffic disruption.

vi. Technical and Other Considerations

a. Infiltration and Inflow Removal

It has been documented that I/I is a contributing source of excess flows in this area as well as downstream hydraulic restrictions that negatively impact the HGL within this reach. A storage facility, in combination with the elimination of the downstream hydraulic restrictions, is necessary to prevent SSOs. Additional I/I removal beyond that performed as part of the short-term corrective measures was evaluated. The peaking factors observed in the EFSDS communities are low to normal, based on typical separate wastewater system wet weather responses. EFSDS communities that have pursued I/I removal have found that peak wet weather flows and total flow volumes were not measurably impacted by rehabilitation efforts. Therefore, I/I was not considered further as an option for the project plan.

b. Sludge and Residuals

Sludge and residuals will not be generated by this alternative. The relief sewer will be installed in such a way that it would be self-cleaning.

c. Industrial Pretreatment

Wet weather flows being diverted into this storage tank do not include industrial wastewater that would require pretreatment.

d. Growth Capacity

The growth capacity within the service area was evaluated and taken into account in the recommendations. The population was projected based on regional planning estimates for Oakland County over the 20 year planning period.

e. Areas Currently Without Sewers

The area is currently built out. However, there are some areas in which the homes are not currently connected to the sewers. These areas were included in the population projections based on the methodology outlined in Appendix I.

f. Reliability

This alternative demonstrates sound engineering principles and complies with the established requirement as outlined in the “Recommended Standards for Sewage Works” as published by the Great Lakes and Upper Mississippi Board of State Sanitary Engineers.

g. Alternative Sites and Routes

This alternative demonstrates one of several potential sites that are being considered for storage.

h. Combined Sewer Overflows

This section of the EFSDS does not have combined sewers.

i. Contamination of the Project Site

The MDEQ Part 201 site list of contaminated sites at http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846---,00.html was reviewed for areas along the proposed linear storage route. No contaminated sites were listed.

b. Harlan Elementary School Storage Tank

This alternative involves diverting up to 6.1 cfs of wet weather flow away from the Troy Interceptor near the intersection of Adams Road and Wattles Road. This alternative would consist of the construction of a 0.51 mgal storage facility at the Harlan Elementary School. This alternative is discussed in the Technical Memorandum in Appendix D.

i. Monetary Evaluation

The detailed cost estimates and present worth analyses for these alternatives are included in Appendix E. The total preliminary cost estimate for the tank is \$6,408,000. The present worth of this alternative is \$5,484,000.

ii. Staging Construction

Staging of the project will not be necessary.

iii. Partitioning the Project

Partitioning of the project will not be necessary.

iv. Environmental Evaluation

Typical construction disturbances such as noise, dust, and traffic disruptions are expected during the construction of the tank. The tank will be located on private property.

In order to construct the inlet and outlet to the tank, one or more crossings of the Rouge River will be necessary. Due to grades in the area, constructing a connection to the basin would need to go through rear yards and could not be constructed in the road ROW. Construction alternatives will be evaluated at the time of permitting and could include alternate installation methods such as boring or horizontal directional drilling.

v. Implementability and Public Participation

The Owner, WRC, will fund the project with money collected from user charges. The Project Owner is able to manage the construction and operation, maintenance and repair of the proposed storage facility.

User fees associated with this alternate include capital costs and operation and maintenance (O&M) costs. These may be of concern to the public as the construction cost is significant.

The project will take place in rear yards and on private school property. Easements will be required and it is expected that the private property owners will have concerns regarding damage to lawns, loss of trees and shrubs close to the sewer alignment and basin, and surface restoration.

When the WRC enters into a contract with a construction company to build the project, public information meetings should be held to inform the public of the anticipated scope of work, construction schedule, project management staff, emergency contact information, and other disruptions.

vi. Technical and Other Considerations

a. Infiltration and Inflow Removal

It has been documented that I/I is a contributing source of excess flows in this area as well as downstream hydraulic restrictions that negatively impact the HGL within this reach. A storage facility, in combination with the elimination of the downstream hydraulic restrictions, is necessary to prevent SSOs. Additional I/I removal beyond that performed as part of the short-term corrective measures was evaluated. The peaking factors observed in the EFSDS communities are low to normal, based on typical separate wastewater system wet weather responses. EFSDS communities that have pursued I/I removal have found that peak wet weather flows and total flow volumes were not measurably impacted by rehabilitation efforts. Therefore, I/I was not considered further as an option for the project plan.

b. Sludge and Residuals

Sludge or residuals will not be generated by this alternative. A flushing system would be installed to clean the tank.

c. Industrial Pretreatment

Wet weather flows being diverted into this proposed relief sewer does not include industrial wastewater that would require pretreatment.

d. Growth Capacity

The growth capacity within the service area was evaluated and taken into account in the recommendations. The population was projected based on regional planning estimates for Oakland County over the 20 year planning period.

e. Areas Currently Without Sewers

The area is currently fully built out. However, there are some areas that are not currently connected to the sewers. These areas were included in the population projections based on the methodology outlined in Appendix I.

f. Reliability

This alternative demonstrates sound engineering principles and complies with the established requirements as outlined in the “Recommended Standards for Sewage Works” as published by the Great Lake and Upper Mississippi Board of State Sanitary Engineers.

g. Alternative Sites and Routes

This alternative demonstrates one of the several potential locations that are being considered for a storage tank.

h. Combined Sewer Overflows

This section of the EFSDS does not have combined sewers.

i. Contamination at the Project Site

The MDEQ Part 201 site list of contaminated sites at http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846---.00.html was reviewed for areas in the area of the proposed sewer route. No contaminated sites were found.

2. NEI Hydraulic Restrictions

a. Optimal Performance of Existing Facilities – NEI Hydraulic Improvements

This alternative involves implementation of recommendations outlined in the LTCAP which are summarized in the Selected Alternatives Memo in Appendix D. Based on a review of the hydraulics of the system, it was determined that making adjustments to several hydraulic discrepancies in the area, such as repairing the zig-zag, adjusting manhole benches, and correcting the Woodward crossing will lower the HGL and minimize the need for upstream storage.

i. Monetary Evaluation

The detailed preliminary cost estimated and present worth analysis for this alternative are included in Appendix E. The total preliminary cost estimate for this alternative is \$966,000 and the present worth of this alternative is \$735,000.

ii. Staging Construction

Staging of the project will not be necessary.

iii. Partitioning the Project

Partitioning of the project will not be necessary.

iv. Environmental Evaluation

Typical construction disturbances such as noise, dust, and traffic disruptions are expected during the improvements. The location of these improvements will be in existing sewer easements.

The existing sewer follows along the main branch of the Rouge River. Therefore, work on the manholes and sewer will be in completed in close proximity to the Rouge River. Appropriate protection will be put in place prior to construction and all required permits will be secured.

v. Implementability and Public Participation

The Owner, WRC, will fund the project with money collected from user charges. The Owner is able to manage the construction and operation, maintenance, and repair of the proposed improvements.

User fees associated with this alternative include capital costs and operation and maintenance costs. These may be of concern to the public as the construction cost for these projects is significant.

The project will take place along the existing sanitary sewer route and in dedicated sanitary sewer easements. Many of these sewers are located in easements in residential areas and there will be temporary impacts to these property owners during construction. It is expected that residents and business owners will have concerns regarding damage to lawns, loss of trees and shrubs, and other inconveniences associated with construction. There are several manholes located in the Springdale Golf Course, owned and operated by the City of Birmingham. All work on these manholes will take place in the off season.

The correction of the zig-zag area will cause short term disruption to a parking area in a commercial district in the City of Birmingham. Access will be maintained at all times. However, parking will be limited during construction. The construction in this area will take place during winter months to limit the impacts to the City of Birmingham Farmer's Market.

When the WRC enters into a contract with a construction company to build the project, public information meetings should be held to inform the public of the anticipated scope of work, construction schedule, project management staff, emergency contract information, and expected traffic disruption.

vi. Technical and Other Considerations

a. Infiltration and Inflow Removal

It has been demonstrated through the modeling efforts and multiple field investigations that the hydraulic restrictions have a negative impact on the HGL and remediation is necessary to restore the HGL to an acceptable level during significant rain events. Additional I/I removal beyond that performed as part of the short-term corrective measures was evaluated. The peaking factors observed in the EFSDS communities are low to normal, based on typical separate wastewater system wet weather responses. EFSDS communities that have pursued I/I removal have found that peak wet weather flows and total flow volumes were not measurably impacted by rehabilitation efforts. Therefore, I/I was not considered further as an option for the project plan.

b. Sludge and Residuals

Sludge or residuals will not be generated by this alternative.

c. Industrial Pretreatment

Flows in this section of pipe do not include industrial waste water that would require pretreatment.

d. Growth Capacity

The growth capacity within the service area was evaluated and taken into account in the recommendation. The population was projected based on regional planning estimates for Oakland County over the 20 year planning period.

e. Areas Currently Without Sewers

The area is currently fully built out. However, there are some areas that are not currently connected to the sewers. These areas were included in the population projections based on the methodology outlined in Appendix I.

f. Reliability

This alternative demonstrates sound engineering principles and complies with the established requirements as outlined in the “Recommended Standards for Sewage Works” as published by the Great Lakes and Upper Mississippi Board of State Sanitary Engineers.

g. Alternative Sites and Routes

This alternative demonstrates one of the several potential solutions to the hydraulic grade issues as described herein.

h. Combined Sewer Overflows

This section of the EFSDS does not have combined sewers.

i. Contamination of the Project Site

The MDEQ Part 201 site list of contaminated sites at http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846---,00.html was reviewed for areas along the proposed relief sewer route. No contaminated sites were listed.

b. Upsized Storage at Wattles Road Linear Storage

If the hydraulic restrictions described herein are not addressed, the storage basin at Adams Road and Wattles Road will have to be upsized to prevent SSOs.

This option would have the same considerations as the Troy Arm Storage as described in the previous section and the storage is described in detail in the Selected Alternatives Memo in Appendix D. Only the monetary evaluation is different, and therefore that is the only part described herein.

i. Monetary Evaluation

In order for this alternative to be feasible, the Troy Arm storage tank would need to be upsized to 0.89 million gallons, which would be an additional 0.38 million gallons. An additional 380,000 gallons, would increase the cost of the Wattles storage by approximately \$2,189,000, with a present worth value of \$1,993,000. This would likely drive the requirement for a tank at Harlan School as site constraints would make it difficult to construct an additional volume in the linear storage tank proposed along Wattles Road due to grades and depth.

3. Stonycroft Relief Sewer

a. Stonycroft Relief and Amy PS Improvements

This alternative includes the construction of a relief sewer through Stonycroft Golf Course and improvements to the Amy Pump Station to convey the additional flow downstream to be stored in the Quarton Storage Facility. Details of this project are included in the Selected Alternatives Memo, included in Appendix D.

i. Monetary Evaluation

The detailed preliminary cost estimated and present worth analysis for this alternative are included in Appendix E. The total preliminary cost estimate for this alternative is \$1,729,000 and the present worth of this alternative is \$1,422,000.

ii. Staging Construction

Staging of the project will not be necessary.

iii. Partitioning the Project

Partitioning of the project will not be necessary.

iv. Environmental Evaluation

Typical construction disturbances such as noise, dust, and traffic disruptions are expected during the construction of the relief sewer. The route of the sewer is expected to be primarily through the middle of a golf course, parallel to an existing sanitary sewer easement. The path of the sewer will also follow along a branch of the Rouge River.

Due to the proximity of the sewer to the Rouge River, care will be taken to ensure that proper soil erosion control measures are installed. Also, there will be at least one crossing of the stream. During design, alternatives such as horizontal directional drilling or boring will be considered to protect the stream. All necessary permits will be secured.

v. Implementability and Public Participation

The Owner, WRC, will fund the project with money collected from user charges. The Project Owner is also able to manage the construction and operation, maintenance, and repair of the proposed sewer.

User fees associated with this alternative include capital costs and operation and maintenance (O&M) costs. These may of concern to the public as the cost is significant.

The project will take place primarily through an existing golf course, in rear yards, and in a residential road. In order to secure an easement from the golf course, work will need to be done in the winter months to avoid loss of play time. It is expected that the golf course and home owners will have concerns regarding damage to lawns, tree removal, removal and replacement of landscaping features, and surface restoration. These items will all be addressed during design.

When the WRC enters into a contract with a construction company to build the project, public information meetings should be held to inform the public of the anticipated scope of work, construction schedule, project management staff, emergency contact information, and expected disruption.

vi. Technical and Other Considerations

a. Infiltration and Inflow Removal

It has been documented through the modeling efforts and field investigations that there is a capacity issue in the 15-inch pipe that is downstream of the confluence of two (2) 15-inch pipes. A relief sewer is necessary to reduce the occurrence of SSOs within this reach. Additional I/I removal beyond that performed as part of the short-term corrective measures was evaluated. The peaking factors observed in the EFSDS communities are low to normal, based on typical separate wastewater system wet weather responses. EFSDS communities that have pursued I/I removal have found that peak wet weather flows and total flow volumes were not measurably impacted by rehabilitation efforts. Therefore, I/I was not considered further as an option for the project plan.

b. Sludge and Residuals

Sludge or residuals would not be generated by this alternative.

c. Industrial Pretreatment

Wet weather flows being diverted to this proposed relief sewer do not include industrial waste water that would require pretreatment.

d. Growth Capacity

The growth capacity within the service area was evaluated and taken into account in the recommendations. Much of the area is built out with sewer

available. However, there are still some unsewered areas which may connect in the future. Population projections were completed based on regional planning estimates for Oakland County over the 20 year planning period.

e. Areas Currently Without Sewers

The area is currently fully built out. However, there are some areas that are not currently connected to the sewers. These areas were included in the population projections based on the methodology outlined in Appendix I.

f. Reliability

This alternative demonstrates sound engineering principles and complies with the established requirements as outlined in the “Recommended Standards for Sewage Works” as published by the Great Lakes and Upper Mississippi Board of State Sanitary Engineers.

g. Alternative Sites and Routes

This alternative demonstrates one of the several potential solutions to the capacity as described herein and in the LTCAP and Selected Alternatives Memo.

h. Combined Sewer Overflows

This section of the EFSDS does not have combined sewers.

i. Contamination of the Project Site

The MDEQ Part 201 site list of contaminated sites at http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846---,00.html was reviewed for areas along the proposed relief sewer route. No contaminated sites were listed.

b. Kensington Road Relief Sewer and Amy Pump Station Upgrades

This alternative is similar to the Stonycroft Relief and Amy PS Upgrades described above. However, rather than crossing Stonycroft Golf Course, the relief sewer will be located in Kensington Road. This is discussed in detail in the Technical Memorandum titled Proposed Kensington Road Relief Sewer Alternate Site Analysis included in Appendix D.

i. Monetary Evaluation

The detailed preliminary cost estimated and present worth analysis for this alternative are included in Appendix E. The total preliminary cost estimate for this alternative is \$3,169,000 and the present worth of this alternative is \$2,516,000.

ii. Staging Construction

Staging will not be required for this project.

iii. Partitioning the Project

Partitioning will not be required for this project.

iv. Environmental Evaluation

Typical construction disturbances such as noise, dust, and traffic disruptions are expected during the construction of the relief sewer. The route of the sewer is expected to be primarily along the Kensington Road ROW. To reach Kensington Road, two crossings of the CN Railroad are required.

Due to the proximity of the sewer to the Rouge River, care will be taken to ensure that proper soil erosion control measures are installed. Also, there will be at least one crossing of the stream. During design, alternatives such as horizontal directional drilling or boring will be considered to protect the stream. All necessary permits will be secured.

v. Implementability and Public Participation

The Owner, WRC, will fund the project with money collected from user charges. The Project Owner is also able to manage the construction and operation, maintenance, and repair of the proposed sewer.

User fees associated with this alternative include capital costs and operation and maintenance (O&M) costs. These may of concern to the public as the cost is significant.

The project will take place primarily in the public road right-of-way. It is expected that the public will have concerns regarding damage to lawns, tree removal, removal and replacement of landscaping features, and surface restoration. These items will all be addressed during design. In addition, this alternative calls for two crossings of the railroad tracks. This would have to be negotiated with the railroad company.

When the County enters into a contract with a construction company to build the project, public information meetings should be held to inform the public of the anticipated scope of work, construction schedule, project management staff, emergency contact information, and expected disruption.

vi. Technical and Other Considerations

a. Infiltration and Inflow Removal

It has been documented through the modeling efforts and field investigations that there is a capacity issue in the 15-inch pipe that is downstream of the confluence of two (2) 15-inch pipes. A relief sewer is necessary to reduce the occurrence of SSOs within this reach. Additional I/I removal beyond that performed as part of the short-term corrective measures was evaluated. The peaking factors observed in the EFSDS communities are low to normal, based on typical separate wastewater system wet weather responses. EFSDS communities that have pursued I/I removal have found that peak wet weather flows and total flow volumes were not measurably

impacted by rehabilitation efforts. Therefore, I/I was not considered further as an option for the project plan.

b. Sludge and Residuals

Sludge or residuals would not be generated by this alternative.

c. Industrial Pretreatment

Wet weather flows being diverted to this proposed relief sewer do not include industrial waste water that would require pretreatment.

d. Growth Capacity

The growth capacity within the service area was evaluated and taken into account in the recommendations. Much of the area is built out with sewer available. However, there are still some unsewered areas which may connect in the future. Population projections were completed based on regional planning estimates for Oakland County over the 20 year planning period.

e. Areas Currently Without Sewers

The area is currently fully built out. However, there are some areas that are not currently connected to the sewers. These areas were included in the population projections based on the methodology outlined in Appendix I.

f. Reliability

This alternative demonstrates sound engineering principles and complies with the established requirements as outlined in the “Recommended Standards for Sewage Works” as published by the Great Lakes and Upper Mississippi Board of State Sanitary Engineers.

g. Alternative Sites and Routes

This alternative demonstrates one of the several potential solutions to the capacity as described herein and in the Long Term Corrective Action Plan.

h. Combined Sewer Overflows

This section of the EFSDS does not have combined sewers.

i. Contamination of the Project Site

The MDEQ Part 201 site list of contaminated sites at http://www.michigan.gov/deq/0,4561,7-135-3311_4109_9846---,00.html was reviewed for areas along the proposed relief sewer route. No contaminated sites were listed.

4. **Quarton Road Storage**

The primary alternative for this project is the construction of a tank at the northwest corner of Woodward Avenue and Quarton Road. Additional details about this project are included in the Selected Alternatives Memo, as included in Appendix D. Due to utility and grade issues in this area, this is the only feasible location for a tank.

a. Storage at Northwest Corner of Quarton and Woodward

i. Monetary Evaluation

The detailed preliminary cost estimate and present worth analysis for this alternative are included in Appendix E. The total preliminary costs estimate for this alternative is \$6,271,000. The present worth of this alternative is \$6,150,000.

ii. Staging Construction

Staging of the project will not be necessary.

iii. Partitioning the Project

Partitioning of the project will not be necessary.

iv. Environmental Evaluation

Typical construction disturbances such as noise, dust, and traffic disruptions are expected during the pumping station upgrades. The majority of the work will occur within the existing road right-of-way, and in a County easement.

v. Implementability and Public Participation

The Owner, WRC, will fund the project with money collected from user charges. The Project Owner is able to manage the construction and operation, maintenance and repair of the proposed sewer.

The project will take place in the public road ROW, and in a County easement. It is expected that the property owner where the easement is located will have concerns regarding restoration, loss of trees, and the overall appearance of the final project. The WRC will work with the property owner to assure all easement conditions are met.

When the WRC enters into a contract with a construction company to build the project, public information meeting should be held to inform the public of the anticipated scope of work, construction schedule, project management staff, emergency contact information, and expected traffic disruption.

vi. Technical and Other Considerations

a. Infiltration and Inflow Removal

It has been documented through the modeling efforts and field investigations that the HGL exceeds acceptable levels due to limited hydraulic pipe capacity within this reach. Storage is required to prevent future overflows and reduce the HGL to an acceptable level during significant rain events. Additional I/I removal beyond that performed as part of the short-term corrective measures was evaluated. The peaking factors observed in the EFSDS communities are low to normal, based on typical separate wastewater system wet weather responses. EFSDS communities that have pursued I/I removal have found that peak wet weather flows and total flow volumes were not measurably impacted by rehabilitation efforts. Therefore, I/I was not considered further as an option for the project plan.

b. Sludge and Residuals

Sludge or residuals will not be generated by this alternative.

c. Industrial Pretreatment

Wet weather flows being diverted to this proposed storage tank do not include industrial wastewater that would require pretreatment.

d. Growth Capacity

The growth capacity within the service area was evaluated and taken into account in the recommendations. The population was projected based on regional planning estimates for Oakland County over the 20 year planning period.

e. Areas Currently Without Sewers

The study area is primarily built out. There are several areas within the area which are not currently sewered. The proposed flows from these areas were included in the analysis based on the methodology outlined in Appendix I.

f. Reliability

This alternative demonstrates sound engineering principles and complies with the established requirements as outlined in the “Recommended Standards for Sewage Works” as published by the Great Lakes and Upper Mississippi Board of State Sanitary Engineers.

g. Alternative Sites and Routes

This alternative demonstrates the only feasible location for a storage tank. Other sites in the area were evaluated, but were considered infeasible due to grade issues, and locations of high pressure gas lines. Because this is a developed area, the availability of open area for a tank is very limited.

h. Combined Sewer Overflows

This section of the EFSDS does not have combined sewers.

i. Contamination of the Project Site

The MDEQ Part 201 site list of contaminated sites was reviewed for areas near the project site. No contaminated sites were listed.

Section IV - Selected Alternative

A. Description of the Selected Alternative

The selected alternatives are listed below, and include the construction of new storage tanks, relief sewers, and optimization of existing facilities in order to reduce the frequency of SSOs on the system.

- Project B2/B3 – Wattles Road Linear Storage
- Project B4- NEI Hydraulic Improvements
- Project C2 – Stonycroft Relief and Amy PS Upgrades
- Project C4 – Quarton Road Storage

1. Relevant Design Parameters

Wattles Road linear storage as outlined in principal alternative III.B.1 and in the Selected Alternatives Memo (refer to Appendix D) and hydraulic restriction improvements and as outlined in principal alternative III.B.2: Pipe capacity upstream and downstream of this storage is limited due to hydraulic restrictions and excess flow. This pipe surcharges during wet weather flows. This surcharging creates an increased potential for a SSO. SSOs have occurred on the system. Known SSO locations affected by the improvements along this arm include several locations in Troy where the City has been relief pumping to protect basements.

Quarton Arm Improvements as outlined in principal alternative III.B.3 and III.B.4, and in the Selected Alternatives Memo (refer to Appendix D): Pipe capacity upstream and downstream of this storage is limited due to hydraulic restrictions and excess flow. This pipe surcharges during wet weather flows. This surcharging creates an increased potential for a SSO. SSOs have occurred on the system. Known SSO locations affected by the improvements along this arm include upstream of the Amy Pump Station in Bloomfield Hills, and at Redding Road and Lakeside Drive in Birmingham.

2. Controlling Factors

The EFSDS is currently under an ACO that required WRC to develop Short Term and Long Term Corrective Action Plans. The system evaluation indicates that the projects described herein will alleviate the surcharging conditions along the Quarton and Troy arms, and greatly reduce the potential for an SSO.

3. Project Maps

An overall project map is shown in Figure 1. Detailed project maps for the selected alternative are included in the Selected Alternatives Memo in Appendix D.

4. Sensitive Features

As part of the Wattles Road linear storage project, the proposed sewer will cross several branches of the Rouge River. During construction, care will be taken to protect the stream and all permits will be secured.

As part of the Stonycroft Golf Course, there will be impacts to the Quarton Branch of the Rouge River. The work will be completed during the winter months when there are lower flows. All soil erosion control measures will be in place and proper permits will be obtained.

5. Mitigation of Environmental Impacts

During construction, the WRC will follow the required standards for soil erosion and sedimentation control. Environmental impacts will be minimized to the extent possible. WRC will secure all necessary MDEQ permits for the proposed work and adhere to all permit requirements.

6. Schedule for Design and Construction

The Schedule is tentative pending the approval of the SRF Project Plan. Below is a tentative proposed schedule.

Advertise Public Hearing	May 15, 2014
Draft Project Plan on Display	May 15, 2014
Public Hearing	June 17, 2014
Resolution to Adopt the Final Project Plan	June 26, 2014
Final Project Plan Submittal to the MDEQ	July 1, 2014

To construct the selected alternative, the WRC is requesting a SRF loan closing for fourth quarter 2015. Design would start in Winter/Spring of 2014 and 2015 and construction would commence in late Fall/early Winter of 2015.

7. Cost Summary

The cost summary provided in Table IV-1 is the total cost for all of the selected alternatives, including engineering, construction, and contingency fees. As the summary indicates, the total cost for all of the selected alternatives is \$13,469,000. See Appendix E for a detailed cost breakdown of each site.

B. Authority to Implement the Selected Alternative

The Applicant, Oakland County WRC, has the legal authority, capability, and willingness to plan, finance, build, operate and maintain the proposed EFSDS improvements.

C. Users Costs

A user cost analysis was performed for each project. These are summarized in Table 12. The costs will be assigned to the tributary communities in the system. The tributary communities have indicated that they will likely spread these costs over all users. The following communities are tributary to the specific projects. The number of REUs per community is also listed below:

- Wattles Road Storage – Bloomfield Township and Troy
- NEI Hydraulic Improvements – Bloomfield Hills, Bloomfield Township, and Troy
- Stonycroft Relief and Amy PS Upgrades – Bloomfield Hills and Bloomfield Township
- Quarton Road Storage – Auburn Hills, Bloomfield Hills, and Bloomfield Township

- Auburn Hills – 5,666 REUs
- Bloomfield Hills – 6,447 REUs
- Bloomfield Township – 18,200 REUs
- Troy – 27,630 REUs

Project Name	Project Cost	Annual Debt Retirement	Annual O&M Debt	REU/Customers of Tributary Communities	Annual Cost per customer/REU	Annual Cost per customer/REU with O&M
Wattles Road Linear Storage	\$ 4,503,000	\$ 288,855	\$ 3,000	45,830	\$ 6.30	\$ 6.37
NEI Hydraulic Improvements	\$ 966,000	\$ 66,961	\$ 3,000	52,277	\$ 3.74	\$ 3.91
Stonycroft Relief and Amy PS Upgrades	\$ 1,729,000	\$ 110,910	\$ 3,000	24,647	\$ 4.50	\$ 4.62
Quarton Road Storage	\$ 6,271,000	\$ 402,266	\$ 10,000	30,313	\$ 13.27	\$ 13.60
Total	\$ 13,469,000	\$ 868,992	\$ 19,000	NA**	NA**	NA**

*All communities will bill their total number of customers, not just tributary

**Total costs not calculated as different projects have different tributary users.

As several communities are tributary to numerous projects, the cost breakdown per the users in each community are as follows:

	Annual Cost	Monthly Cost
Bloomfield Hills	\$ 22.13	\$ 1.84
Bloomfield Township	\$ 28.50	\$ 2.38
Troy	\$ 6.37	\$ 0.53
Auburn Hills	\$ 13.60	\$ 1.13

Section V - Evaluation of Environmental Impacts

A. General

The WRC plans to provide improvements at several locations within the EFSDS. These improvements consist of constructing a linear storage facility along Wattles Road, hydraulic improvements to the Troy Arm of the EFSDS, construction of a relief sewer and increased pumping capacity at Stonycroft Golf Course and the Amy Pumping Station, constructing a storage tank at Woodward Avenue and Quarton Road, and rehabilitation of the Evergreen Road sewer.

The anticipated environmental impacts resulting from the construction of the selected plan include beneficial and adverse, short term and long term, and irreversible and irretrievable impacts. The following is a discussion of the environmental impacts of the selected plan.

1. Beneficial and Adverse Impacts

Construction activities associated with these projects will take place primarily in existing road rights-of-way or existing easements. Construction and equipment manufacturing related jobs would be generated, and local contractors would have an equal opportunity to bid on the construction contracts.

Implementation of the Project Plan would create temporary disruption due to required construction. This includes noise and dust generated by the work, and possible erosion of spoils from open excavation. The assessment of alternate solutions and sites for the proposed project included identification of any important resources of either historic or environmental value which are protected by law and should be avoided.

2. Short and Long-Term Impacts

The short-term adverse impacts associated with construction activities would be minimal, and mitigated, in comparison to the resulting long-term beneficial impacts. Short-term impacts include traffic disruption, dust and noise. No long-term negative impacts are anticipated. The long-term positive impacts include improved water quality within the watershed.

3. Irreversible Impacts

The investment in non-recoverable resources committed to the Project Plan would be traded off for the improvement of water quality due to the reduction of SSOs in the system. The commitment of resources includes public capital, energy, labor, and unsalvageable materials. These non-recoverable resources would be foregone for the provision of the proposed improvements.

Construction accidents associated with this project may cause irreversible bodily injuries or death. Accidents may also cause damage to or destruction of equipment and other resources.

B. Analysis of Impacts – Wattles Road Linear Storage and NEI Hydraulic Improvements

The main benefits of this project will be to improve hydraulic capacity along the Troy arm by removing 6.1 cfs of peak flow and reducing the frequency of an SSO.

Adverse environmental impacts are generally limited to short term construction impacts, such as temporary noise, dust, and traffic disruptions. The following is a detailed analysis of the environmental impacts.

1. Direct Impacts

a. Construction Impacts

Construction of the proposed Wattles Road linear storage will be contained within the existing Wattles Road right-of-way. Due to the proximity of other utilities, it is anticipated that the proposed linear storage construction will require the removal of portions of Wattles Road. Any pavement removed will be replaced in kind.

A sensitive feature impacted by this alternative involves several crossings of Rouge River tributaries. This alternative will include placement of appropriate soil erosion control measures and flow control in the creek in order to protect upstream and downstream properties. Required permits through the MDEQ for this crossing will be secured during design.

Construction methods are proposed to be open cut.

A review of the U.S. Fish and Wildlife Service “County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species” for Oakland County has identified the following rare, threatened, endangered, or special concern species known to occur within the EFSDS Service Area: Indiana Bat, Eastern Massasauga, Rayed Bean Mussel, and Snuffbox Mussel. Candidate species include the Poweshiek Skipperling Butterfly and Northern Long-Eared Bat. A biological field survey of the proposed construction area will be performed by a competent biologist during engineering design and appropriate mitigation (if needed) will be employed to eliminate adverse impacts.

Archaeological, Historical, or Cultural Resources are expected to be unaffected by the relief sewer construction. There are no impacts to historic neighborhoods, buildings, or streetscapes proposed with this alternative. A section 106 review application has been submitted to the State Historic Preservation Office and is included in Appendix C. Letters regarding the proposed project have been sent to the required Tribal Historic Preservation Officers and copies are included in Appendix C.

Traffic impacts are expected with the construction of this alternative. Throughout the project, lane or road closures are expected on Wattles Road. Complete road closures with posted detours may be required on Wattles Road during the operations. All work will occur within the existing Oakland County rights-of-way.

Impacts on surface waters and ground waters are expected with this alternative but will be minimized using a number of methods. Soil erosion and sedimentation control will be performed following county and state regulations. The use of silt fence, inlet filters, and check dams throughout the project is anticipated. Dewatering activities may be required within the work area. There will be no impacts to groundwater users as all water users within the project area are on public water supply systems.

b. Operational Impacts

There will be no adverse impacts operational impacts associated with this linear storage tank installation. The City of Troy will no longer be required to mobilize staff to manhole locations and pump to protect basements.

c. Social Impacts

Increased user costs are anticipated with this project. Table 12 in Section IV outlines the project cost, annual debt retirement, and annual cost per REU.

Construction will increase the number of temporary construction related jobs and will help to retain existing positions.

Local traffic patterns will be affected by temporary lane shifts and closures, and the potential detour routes. Detour routes will be developed with input from Troy, Bloomfield Township, and Road Commissioner for Oakland County (RCOC) and will attempt to minimize traffic delays. Access to residential and commercial facilities will be maintained throughout the construction process. Access and routes for emergency services will be coordinated with both the City of Troy and Bloomfield Township police and fire departments.

2. Indirect Impacts

a. Changes in the rate, density, or type of residential, commercial, or industrial development, and the associated transportation changes

There will be no changes regarding the above due to this project.

b. Changes in Land Use

There will be no changes in land use due to this project.

c. Changes in air or water quality due to facilitated development

There will be no changes to air or water quality due to this project. There is no direct correlation to development as a result of this project.

d. Changes to the natural setting or sensitive features resulting from secondary growth

There are no anticipated changes to the natural setting or sensitive features resulting from secondary growth.

e. Impacts on cultural, human, social, and economic resources

There will be no long term impacts on the above resources due to this project.

f. Impacts on areas of aesthetics

There will be temporary aesthetic impacts during construction of the storage facility. The diversion chambers may have a minimal aesthetic impacts. This impact can be mitigated through the use of natural screening.

g. Resources consumption over the useful life of the treatment works, especially the generation of solid wastes

There will be no additional resource consumption or generation of solid wastes over the useful life of this project.

3. Cumulative Impacts

a. Siltation

Siltation will only occur during the construction of this project and proper soil erosion and sedimentation control measures will be implemented.

b. Water Quality Impacts

There will be no water quality impacts from direct discharges and nonpoint sources with this project.

c. Indirect Impacts from Development

There will be no additional development as a result of this storage facility project.

d. Impact of Multiple Public Works Projects occurring in the same vicinity

Traffic impacts are anticipated during the construction of this project. Detour routes will be coordinated with Bloomfield Township, the City of Troy, and the RCOC. Other public works projects occurring near the same vicinity will be coordinated with the City of Troy and Bloomfield Township.

e. Fiscal impacts on the municipality resulting from multiple public works projects occurring in the same time frame

User costs have been evaluated and an analysis is provided in Table 12 in Section IV. Loan repayment is proposed through the use of the WRC sewer fund.

C. Analysis of Impacts – Stonycroft Relief and Amy PS Upgrades

The main benefits of this project will be to provide additional capacity along the Quarton Arm to address a bottleneck and known SSO area.

Adverse environmental impacts are generally limited to short term construction impacts, such as temporary noise, dust, and traffic disruptions. The following is a detailed analysis of the environmental impacts.

1. Direct Impacts

a. Construction Impacts

Construction of the proposed Stonycroft Relief Sewer and Amy PS Upgrades will be contained within the Stonycroft Golf Course and Stonycroft Road right-of-way. Some construction will also take place on the existing Amy PS property which is owned by the WRC. All construction will take place in the winter months to minimize disruption to the golf course.

A sensitive feature impacted by this alternative involves work in close proximity to the Rouge River. This alternative will include placement of appropriate soil erosion control measures and flow control in the creek in order to protect upstream and downstream properties. Required permits through the MDEQ for this crossing will be secured during design.

Construction methods are proposed to be open cut.

A review of the U.S. Fish and Wildlife Service “County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species” for

Oakland County has identified the following rare, threatened, endangered, or special concern species known to occur within the EFSDS Service Area: Indiana Bat, Eastern Massasauga, Rayed Bean Mussel, and Snuffbox Mussel. Candidate species include the Poweshiek Skipperling Butterfly and Northern Long-Eared Bat. A biological field survey of the proposed construction area will be performed by a competent biologist during engineering design and appropriate mitigation (if needed) will be employed to eliminate adverse impacts.

Archaeological, Historical, or Cultural Resources are expected to be unaffected by the relief sewer construction. There are no impacts to historic neighborhoods, buildings, or streetscapes proposed with this alternative. A section 106 review application has been submitted to the State Historic Preservation Office and is included in Appendix C. Letters regarding the propose project have been sent to the required Tribal Historic Preservation Officers and copies are included in Appendix C.

Traffic impacts are expected to be very minimal with the construction of this alternative as the majority of the work will take place on a golf course during the winter months. Limited impacts to traffic on Stonycroft Road may also occur.

Impacts on surface waters and ground waters are expected with this alternative but will be minimized using a number of methods. Soil erosion and sedimentation control will be performed following county and state regulations. The use of silt fence, inlet filters, and check dams throughout the project is anticipated. Dewatering activities may be required within the work area. There will be no impacts to groundwater users as all water users within the project area are on public water supply systems.

An easement will be required for this work. The County will negotiate with the property owner regarding this easement.

b. Operational Impacts

There will be no adverse impacts operational impacts associated with this linear storage tank installation. Improvements to the Amy Pump Station will improve the operations at that facility.

c. Social Impacts

Increased user costs are anticipated with this project. Table 12 in Section IV outlines the project cost, annual debt retirement, and annual cost per REU.

Construction will increase the number of temporary construction related jobs and will help to retain existing positions.

Local traffic patterns will be affected by temporary lane shifts and closures, and the potential detour routes. Detour routes will be developed with input from RCOC and will attempt to minimize traffic delays. Access to residential and commercial facilities will be maintained throughout the construction process. Access and routes for emergency services will be coordinated with the City of Bloomfield Hills Police and Fire Departments.

2. Indirect Impacts

- a. Changes in the rate, density, or type of residential, commercial, or industrial development, and the associated transportation changes

There will be no changes regarding the above due to this project.

- b. Changes in Land Use

There will be no changes in land use due to this project.

- c. Changes in air or water quality due to facilitated development

There will be no changes to air or water quality due to this project. There is no direct correlation to development as a result of this project.

- d. Changes to the natural setting or sensitive features resulting from secondary growth

There are no anticipated changes to the natural setting or sensitive features resulting from secondary growth.

- e. Impacts on cultural, human, social, and economic resources

There will be no long term impacts on the above resources due to this project.

- f. Impacts on areas of aesthetics

There will be temporary aesthetic impacts during construction of the relief sewer. The diversion chambers may have a minimal aesthetic impacts. This impact can be mitigated through the use of natural screening.

- g. Resources consumption over the useful life of the treatment works, especially the generation of solid wastes

There will be no additional resource consumption or generation of solid wastes over the useful life of this project.

3. Cumulative Impacts

- a. Siltation

Siltation will only occur during the construction of this project and proper soil erosion and sedimentation control measures will be implemented.

- b. Water Quality Impacts

There will be no water quality impacts from direct discharges and nonpoint sources with this project.

- c. Indirect Impacts from Development

There will be no additional development as a result of this relief sewer project.

- d. Impact of Multiple Public Works Projects occurring in the same vicinity

Traffic impacts are anticipated during the construction of this project. Detour routes are not expected, but if necessary, will be coordinated with the City of Bloomfield Hills and the RCOC. Other public works projects occurring near the same vicinity will be coordinated with the City of Bloomfield Hills.

e. Fiscal impacts on the municipality resulting from multiple public works projects occurring in the same time frame

User costs have been evaluated and an analysis is provided in Table 12 in Section IV. Loan repayment is proposed through the use of the WRC sewer fund.

D. Analysis of Impacts – Woodward/Quarton Storage Facility

The main benefits of this project will be to provide storage along the Quarton Arm to address a bottleneck and known SSO area by removing 3.0 cfs of peak flow.

Adverse environmental impacts are generally limited to short term construction impacts, such as temporary noise, dust, and traffic disruptions. The following is a detailed analysis of the environmental impacts.

1. Direct Impacts

a. Construction Impacts

Construction of the proposed Woodward/Quarton storage tank will be contained within an easement on the Manresa Retreat House property and in the Woodward Avenue right-of-way.

Construction methods are proposed to be open cut across the Manresa property and jack case and bore under Woodward Avenue. Lane closures will be required for the Woodward Avenue crossing.

The tank will be located on the property in such a way to minimize tree removal to the extent possible. However, some tree removal will be required for the construction of this basin.

A review of the U.S. Fish and Wildlife Service “County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species” for Oakland County has identified the following rare, threatened, endangered, or special concern species known to occur within the EFSDS Service Area: Indiana Bat, Eastern Massasauga, Rayed Bean Mussel, and Snuffbox Mussel. Candidate species include the Poweshiek Skipperling Butterfly and Northern Long-Eared Bat. A biological field survey of the proposed construction area will be performed by a competent biologist during engineering design and appropriate mitigation (if needed) will be employed to eliminate adverse impacts.

Archaeological, Historical, or Cultural Resources are expected to be unaffected by the relief sewer construction. There are no impacts to historic neighborhoods, buildings, or streetscapes proposed with this alternative. A section 106 review application has been submitted to the State Historic Preservation Office and is included in Appendix C. Letters regarding the propose project have been sent to the required Tribal Historic Preservation Officers and copies are included in Appendix C.

Traffic impacts are expected to be very minimal with the construction of this alternative as the majority of the work will take place the Manresa property. Impacts to traffic on Woodward Avenue will occur on a limited basis during jack case and bore operations.

Impacts on surface waters and ground waters are expected with this alternative but will be minimized using a number of methods. Soil erosion and sedimentation control will be performed following county and state regulations. The use of silt fence, inlet filters, and check dams throughout the project is anticipated. Dewatering activities may be required within the work area. There will be no impacts to groundwater users as all water users within the project area are on public water supply systems.

b. Operational Impacts

There will be no adverse impacts operational impacts associated with this storage tank installation.

c. Social Impacts

Increased user costs are anticipated with this project. Table 12 in Section IV outlines the project cost, annual debt retirement, and annual cost per REU.

Construction will increase the number of temporary construction related jobs and will help to retain existing positions.

Local traffic patterns will be affected by temporary lane shifts and closures, and the potential detour routes. Detour routes will be developed with input from RCOC and will attempt to minimize traffic delays. Access to residential and commercial facilities will be maintained throughout the construction process. Access and routes for emergency services will be coordinated with both the City of Bloomfield Hills, City of Birmingham, and Bloomfield Township police and fire departments.

2. Indirect Impacts

a. Changes in the rate, density, or type of residential, commercial, or industrial development, and the associated transportation changes

There will be no changes regarding the above due to this project.

b. Changes in Land Use

There will be no changes in land use due to this project.

c. Changes in air or water quality due to facilitated development

There will be no changes to air or water quality due to this project. There is no direct correlation to development as a result of this project.

d. Changes to the natural setting or sensitive features resulting from secondary growth

There are no anticipated changes to the natural setting or sensitive features resulting from secondary growth.

e. Impacts on cultural, human, social, and economic resources

There will be no long term impacts on the above resources due to this project.

f. Impacts on areas of aesthetics

There will be temporary aesthetic impacts during construction of the storage facility. The control building may have minimal aesthetic impacts. This impact can be mitigated through the use of architectural features and natural screening.

g. Resources consumption over the useful life of the treatment works, especially the generation of solid wastes

There will be no additional resource consumption or generation of solid wastes over the useful life of this project.

3. Cumulative Impacts

a. Siltation

Siltation will only occur during the construction of this project and proper soil erosion and sedimentation control measures will be implemented.

b. Water Quality Impacts

There will be no water quality impacts from direct discharges and nonpoint sources with this project.

c. Indirect Impacts from Development

There will be no additional development as a result of this storage facility project.

d. Impact of Multiple Public Works Projects occurring in the same vicinity

Traffic impacts are anticipated during the construction of this project. Detour routes will be coordinated with the City of Bloomfield Hills, the City of Birmingham, and Bloomfield Township, and the RCOC. Other public works projects occurring near the same vicinity will be coordinated with all jurisdictions.

e. Fiscal impacts on the municipality resulting from multiple public works projects occurring in the same time frame

User costs have been evaluated and an analysis is provided in Table 12 in Section IV. Loan repayment is proposed through the use of the WRC sewer fund.

Section VI - Mitigation

A. Short-Term, Construction-Related Mitigation

Traffic control will be necessary for the work proposed along or near cross roads of project sites. Proper signage, barricades, and lighting will be placed for the duration of the construction projects. Soil erosion and sedimentation control measures as well as local permits will be required and followed during all construction activities. An MDEQ /Army Corps Joint Permit will be required for all work within, adjacent to, or nearby an inland lake or stream, wetland, or floodplain/floodway.

Disturbed roads, sidewalks, driveways, vegetation, and adjacent utilities will be restored to pre-disturbed conditions or better.

- Wattles Road Linear Storage and Troy Arm Hydraulic Improvements – Wattles Road will likely be completely closed during the construction of the storage facility. WRC will work with RCOC and local communities to determine a detour route. Advance notice and signage will be provided. Access to local residential properties will be maintained. Work within the floodplain and limits of the Rouge River will be limited.
- Stonycroft Golf Course Improvements – The proposed improvements will greatly impact the golf course, and will thus be scheduled in the winter months to avoid impacts to the course. There will be limited impacts to Stonycroft Road, which may include occasional restrictions to access for residents. The Contractor and WRC will work with the residents regarding notification. Work within the floodplain will be limited.
- Woodward/Quarton Storage Facility – The proposed improvements will affect traffic along Woodward Avenue, which will result in lane closures. This will be permitted and appropriate signage will be placed.

B. Mitigation of Long Term Impacts

No adverse or long-term impacts are expected with this Project Plan. Where work may be within a regulated sensitive habitat, such as a wetland, stream, or floodplain, there will be mitigation as part of the design and permit process per the requirements of Act 452 of 1994, as amended.

1. General Construction

- Wattles Road Linear Storage and Troy Arm Hydraulic Improvements – Crossings for the Rouge River will require a permit through the MDEQ. Federal and State environmental laws and regulations will be followed.
- Stonycroft Golf Course Improvements – Crossings for the Rouge River will require a permit through the MDEQ. Federal and State environmental laws and regulations will be followed.
- Woodward/Quarton Storage Tank – The Woodward/Quarton Storage Tank will be constructed in an upland area and will not occur near sensitive features.

2. Siting Decisions

- Wattles Road Linear Storage and Troy Arm Hydraulic Improvements – A number of potential storage locations were identified. The Wattles Road Linear storage is in the road right-of-way, and therefore will have the least disruption to previously undisturbed areas.
- Stonycroft Golf Course Improvements – Numerous routing options were considered. It was determined that the route through the golf course was the shortest construction length and the least amount of disruption. In addition, no impacts to the railroad are necessary with this option.

- Woodward/Quarton Storage Tank – The preliminary review looked at tanks on the northeast, northwest, and southwest corners of Woodward and Quarton. Ultimately, the northwest corner was the only viable option due to grade issues, utility issues, and property acquisition needs.

3. Operational Impacts

- Wattles Road Linear Storage and Troy Arm Hydraulic Improvements – Limited operational impacts may occur due to this installation. The storage facility is expected to fill and dewater by gravity. However, occasional cleaning may be necessary.
- Stonycroft Golf Course Improvements – The project includes improvements to the Amy Pumping Station which will improve the operational capabilities at the facility. There will be no operational impacts for the construction of the gravity flow relief sewer.
- Woodward/Quarton Storage Tank – WRC will have to consider the additional operational expenses for the construction of this tank, including cleaning and flushing operations. O&M costs were considered in the present worth analysis.

C. Mitigation of Indirect Impacts

Indirect impacts are expected to be negligible as no new development is anticipated as a result of these projects.

1. Master Planning and Zoning

There will be no changes necessary to the local master plan or zoning as a result of these projects.

2. Ordinances

There will be no changes necessary to local ordinances as a result of these projects.

3. Staging of Construction

Staging of construction will not be necessary for installation of these projects.

Section VII - Public Participation

A. Public Meetings on Project Alternatives

Several project meetings were held with WRC and affected communities to review project concepts during the early planning phases.

B. The Formal Public Hearing

A formal public hearing was held in the Bloomfield Township Hall auditorium on June 17, 2014 at 6 pm. It was advertised for 30 days prior to the meeting. A formal copy of the affidavit of notification is included in Appendix F. The Project Plan was available for review by interested parties at the Clerk's offices of Birmingham, Troy, Bloomfield Hills, Bloomfield Township, and Auburn Hills for the full 30 days. In addition, the plan was available at the offices of the WRC. No public comment was received.

C. Adoption of the Project Plan

The Water Resources Commissioner's resolution adopting the final project plan for wastewater system improvements and designating an authorized project representative is included in Appendix G.

Appendix A

Industrial Users and Permit Numbers

EFSDS INDUSTRIAL USER LIST

Mr. Raymond Hoermann
 Caparo Vehicle Components (f.k.a. Voestalpine Polynorm)
 44550 W.Grand River Ave. P.O. Box 7022
 Novi, MI 48376-7022
 Facility Phone No. (248) 348-0400
 Permit No. 15993381IU

Mr. Carl R. Redner
 General Filters, Inc.
 43800 Grand River
 Novi, MI 48376-8025
 Facility Phone No. (248) 476-5100
 Permit No. 00927664IU

Mr. David Chor
 Chor Industries Inc.
 500 Robbins
 Troy, MI 48083
 Facility Phone No. (248) 585-3323
 Permit No. 15727566IU

Mr. Devin Kaufman
 HHI Formtech
 690 W. Maple Rd
 Troy, MI 48084
 Facility Phone No. (248) 362-8505
 Permit No. 15793991IU

Mr. Craig Marshall
 Controlled Power Company
 1955 Stephenson Hwy.
 Troy, MI 48084-2134
 Facility Phone No. (248) 528-3700
 Permit No. 15727547IU

Mr. Keith Honhart
 Honhart Mid-Nite Black Co.
 501 Stephenson Highway
 Troy, MI 48083-1118
 Facility Phone No. (248) 588-1515
 Permit No. 157727581IU

Mr. Dennis Bradly
 Depor Industries Inc. - Troy
 1902 Northwood
 Troy, MI 48084
 Facility Phone No. (248) 362-3900
 Permit No. 15727558IU

Mr. Issac Ben-Ezera
 IDP Inc.
 21300 West Eight Mile Road
 Southfield, MI 48075-5638
 Facility Phone No. (248) 352-0222
 Permit No. 15992314IU

Electrical Research Corporation
 1903 Barrett Drive
 Troy, MI 48084
 Facility Phone No. (248) 362-6135
 Permit No. 00727577IU

Kim Frazier
 ND Industries, Inc
 1893 Barrett Drive
 Troy, MI 48084
 Facility Phone No. (248) 655-2587
 Permit No. 00727578IU

Mr. Allen Thompson
 Film Craft Laboratory - Division of Grace & Wild, Inc.
 23815 Industrial Park Drive
 Farmington Hills, MI 48335
 Facility Phone No. (248) 474-3900
 Permit No. 00927735IU

Mr. Avi Zallen
 Ovonic Battery Company - Combermere
 1414 Combermere St.
 Troy, MI 48084
 Facility Phone No. (248) 844-4600
 Permit No. 22727554IU

Mr. Larry Beddow
Palmer Paint Products Inc.
1291 Rochester Road
Troy, MI 48083
Facility Phone No. (248) 588-4500
Permit No. 00727551IU

Ms. Jessica M. Owens
United Solar Ovonic LLC - Troy
1100 West Maple Road
Troy, MI 48084-5352
Facility Phone No. (248) 519-5319
Permit No. 15791175IU

Mr. David Janks
Power Vac of Michigan, Inc.
44300 Grand River
Novi, MI 48375
Facility Phone No. (248) 345-3993
Permit No. 00991936IU

Mr. Tim Rowlett
William Beaumont Hospital - Troy
44201 Dequindre
Troy, MI 48098
Facility Phone No. (248) 828-5834
Permit No. 00727568IU

Mr. Bob Kalepo
Production Spring LLC
1151 Allen Rd
Troy, MI 48083
Facility Phone No. (248) 583-0036
Permit No. 00794054IU

Mr. Theodosi Hundich
X-Cel Industries, Inc.
21121 Telegraph Road
Southfield, MI 48034
Facility Phone No. (248) 226-6001
Permit No. 15991939IU

Ms. Carol Glick
Providence Park Hospital
47601 Grand River Ave.
Novi, MI 48374
Facility Phone No. (248) 465-4173
Permit No. 00993165IU

Mr. Richard Kline
XRI Testing
1961 Thunderbird
Troy, MI 48084
Facility Phone No. (248) 244-1533
Permit No. 15792937IU

Mr. Robert Scott
St. John Health Providence Hospital
16001 W. Nine Mile Road
Southfield, MI 48075
Facility Phone No. (248) 849-3053
Permit No. 00927723IU

Mr. Brad Radke
Surface Activation Technologies, LLC
1837 Thunderbird Street
Troy, MI 48084
Facility Phone No. (248) 273-0037
Permit No. 15792616IU

Appendix B

SSO Summary

EFSDS Project Plan
Sanitary Sewer Overflow Summary

Fiscal Year	Date of SSO	Location	Volume (MG)	Cause
2000	07/03/00	Walnut #1 pump station	0.4550	wet weather surcharging
	07/30/00	Walnut #1 pump station	0.0404	wet weather surcharging
	08/02/00	Walnut #1 pump station	0.0101	wet weather surcharging
	09/10/00	Walnut #1 pump station	0.0016	wet weather surcharging
	09/10/00	Walnut #1 pump station	0.1072	wet weather surcharging
	09/11/00	Walnut #1 pump station	0.0163	wet weather surcharging
2001	12/24/00	Walnut #1 pump station	0.1261	wet weather surcharging
	02/09/01	Walnut #1 pump station	3.7659	wet weather surcharging
	02/25/01	Walnut #1 pump station	0.0542	wet weather surcharging
2002	10/12/01	Walnut #1 pump station	0.0718	wet weather surcharging
	10/16/01	Walnut #1 pump station	2.5899	wet weather surcharging
	10/17/01	Walnut #1 pump station	0.1546	wet weather surcharging
	10/17/01	Walnut #1 pump station	4.7760	wet weather surcharging
	11/30/01	Walnut #1 pump station	0.4637	wet weather surcharging
2003	03/16/03	Walnut #1 pump station	0.0909	wet weather surcharging
	04/04/03	Walnut #1 pump station	0.6459	wet weather surcharging
	06/19/03	Walnut #1 pump station	0.5694	wet weather surcharging
2004	03/05/04	Walnut #1 pump station	0.0070	wet weather surcharging
	05/09/04	Walnut #1 pump station	0.0466	wet weather surcharging
	05/21/04	Walnut #1 pump station	0.1213	wet weather surcharging
	05/23/04	8 Mile west of Evergreen	0.0036	inflow from third party
	05/23/04	Walnut #1 pump station	0.9608	wet weather surcharging
2005	12/07/04	Walnut #1 pump station	0.0885	wet weather surcharging
	01/13/05	Walnut #1 pump station	1.5639	wet weather surcharging
	01/22/05	Walnut #1 pump station	0.0010	wet weather surcharging
	01/31/05	Farmington retention basin	0.0001	overpumping at retention basin
	02/15/05	Walnut #1 pump station	1.3062	wet weather surcharging
	02/15/05	Kent/Binbrook and Adams/Wattles	0.1470	heavy rain
2006	07/16/05	Walnut #1 pump station	0.3686	wet weather surcharging
	02/16/06	Walnut #1 pump station	1.6447	wet weather surcharging
	02/17/06	Kent/Adams/Beach	0.1300	heavy rain
	03/10/06	Walnut #1 pump station	0.2552	wet weather surcharging
	03/13/06	Walnut #1 pump station	0.8971	wet weather surcharging
	05/11/06	Walnut #1 pump station	1.5522	wet weather surcharging
	07/18/06	Walnut #1 pump station	0.0005	bypass pumping surcharge due to contractor error
	08/12/06	8 Mile pump station	0.0002	failed gasket on forcemain access manhole
2007	12/01/06	Kent/Binbrook, Adams/Wattles, Beach/Tarragona Way	0.1031	heavy rain
	12/01/06	Walnut #1 pump station	0.5552	wet weather surcharging
2008	09/13/08	Walnut #1 pump station	0.3395	wet weather surcharging
	09/13/08	8 Mile west of Evergreen	0.1620	wet weather surcharging
	09/14/08	Adams/Wattles	0.1340	heavy rain
	09/14/08	Kent/Binbrook	0.1390	heavy rain
	09/14/08	Tarragona Way and Beach Road	0.2400	heavy rain
	09/14/08	Walnut #1 pump station	0.9137	wet weather surcharging
	09/14/08	8 Mile west of Evergreen	1.7649	wet weather surcharging
2009	12/01/08	Lahser Road	0.0100	contractor hit 6" force main
	02/12/09	Adams/Wattles	0.3270	heavy rain
	02/12/09	Tarragona Way and Beach Road	0.1440	heavy rain
	02/12/09	Kent/Binbrook	0.1190	heavy rain
	03/07/09	Walnut #1 pump station	0.0223	wet weather surcharging
	03/07/09	Adams/Wattles	0.1980	heavy rain
	03/07/09	Tarragona Way and Beach Road	0.3590	heavy rain
	03/07/09	Kent/Binbrook	0.2200	heavy rain
	03/08/09	Walnut #1 pump station	0.0827	wet weather surcharging
	03/08/09	8 Mile west of Evergreen	unknown	wet weather surcharging
	03/11/09	Kent/Binbrook	0.1190	heavy rain
	03/11/09	Adams/Wattles	0.1450	heavy rain
	03/11/09	Tarragona Way and Beach Road	0.1440	heavy rain
	03/11/09	Walnut #1 pump station	0.0278	wet weather surcharging
	03/11/09	8 Mile west of Evergreen	unknown	wet weather surcharging
	04/20/09	Adams/Wattles	0.6520	heavy rain
	04/20/09	Kent/Binbrook	0.4530	heavy rain
	04/20/09	Tarragona Way and Beach Road	0.6910	heavy rain
	04/20/09	Walnut #1 pump station	1.4000	wet weather surcharging
	05/26/09	Thornbrook lift station	0.0020	bypass pump error during wet well cleaning
07/01/09	Long Lake Road	0.0050	pumps turned off during service at the Amy pump station	

EFSDS Project Plan
Sanitary Sewer Overflow Summary

Fiscal Year	Date of SSO	Location	Volume (MG)	Cause
2010	06/06/10	Walnut #1 pump station	0.2390	wet weather surcharging
	08/24/10	Tarragona Rd	0.0002	temporary bypass pumping improperly installed by contractor
	09/16/10	Middlebelt Rd	0.0900	sinkhole and bypass pumping
	10/08/10	Lincolnshire	0.0002	sewer plugged by grease ball
	11/05/10	4669 Old Orchard Trail	0.0001	failed air relief valve in force main
	11/07/10	Cass Lake Rd	0.0001	bypass pumping equipment improperly dismantled by contractor
2011	01/03/11	West of Hidden Ravines Dr	0.0015	blockage in pipe and suspected damaged pipe downstream
	01/11/11	West of Hidden Ravines Dr	0.0003	blockage in pipe and suspected damaged pipe downstream
	01/25/11	West of Hidden Ravines Dr	0.0002	blockage in pipe and suspected damaged pipe downstream
	02/08/11	West of Hidden Ravines Dr	0.0002	pipe is getting plugged at river crossing - reason unknown
	03/01/11	West of Hidden Ravines Dr	0.0002	pipe is getting plugged at river crossing - reason unknown
	04/28/11	Adams/Wattles	0.0495	heavy rain
	04/28/11	8 Mile west of Evergreen	5.2000	high volume flow caused by rain event
	04/28/11	Beach Rd at Tarragona	0.0495	heavy rain
	04/28/11	9 Mile Retention Basin	4.5200	heavy rains exceeded the capacity of the wet weather basin
	05/03/11	North of Quarton East of Lahser	0.0003	broken service lead. Sewage is coming up from underground into homeowner's yard
	05/15/11	Rainbow Circle	0.0036	overflow is occurring through casting
	05/25/11	Between Opdyke and Kensington	0.0822	sanitary sewer surcharged to grade due to high wet weather flows
	05/25/11	Between Big Beaver and Kensington	0.1861	Sanitary sewer surcharged to grade due to high wet weather flows
	05/25/11	Behind homes west of Middlebelt Rd and south of 13 Mile Rd	0.4784	Sanitary sewer surcharged to grade due to high wet weather flows
	05/25/11	Kent/Binbrook	0.3817	heavy rain
	05/25/11	Adams and Wattles	0.6336	heavy rain
	05/25/11	Beach Rd. at Tarragona Kent at Binbrooke	0.5456	heavy rain
	05/25/11	Walnut#1 - 14 Mile Road and Inkster	2.4200	heavy rains caused surcharging of the sewer system
	05/25/11	8 Mile west of Evergreen	3.8000	heavy rains caused surcharging of the sewer system
	05/25/11	Utley Rd at Middlebelt, between 12 & 13 Mile Rd.	0.0001	heavy rains caused surcharging of the sewer system
	05/25/11	Rainbow Circle	0.6131	overflow at MH25-95 and 26-95 occurred through casting. MH26-95 pumped to prevent basement floodin
	05/25/11	Lakeside Dr and Redding St	0.0889	heavy rains caused surcharging of the sewer system
	05/25/11	9 Mile Retention Basin	10.4000	heavy rains exceeded the capacity of the wet weather basin
	05/26/11	32650 W. 12 Mile Rd, Farmington Hills	0.0050	heavy rains caused surcharging of the sewer system
	08/14/11	11 Mile and Farmington Rd-Thornbrook PS	0.01557	storms caused a power outage at Thornbrook Pump Station. A generator was put in place but the generator failed
	09/12/11	4464 Far Hill Dr	0.0050	blockage in sanitary sewer
	09/29/11	Stout St MH, near Orchard Lake Rd and Beland	0.00002	sewer manhole surcharged to grade due to a greaseball plugging the sewer
10/06/11	Manhole 130 North of 696, behind FH Harrison High School	0.1920	plugged 8" local sanitary sewer causing surcharge of a manhole	
11/29/11	Adams & Wattles	0.5767	heavy rain	
11/29/11	Kent/Binbrook	0.3028	heavy rain	
11/29/11	Beach Rd. at Tarragona Kent at Binbrooke	0.1180	heavy rain	
11/29/11	8 Mile west of Evergreen	4.9000	heavy rain	
11/30/11	9 Mile Retention Basin	2.4120	heavy rain	
12/06/11	N of Maple Rd, W of Drake R, MH WBT116001	0.0001	blockage of grease in sanitary sewer	
12/16/11	1829 & 1827 Stonycroft Lane	0.00001	unknown	
2012	01/17/12	West of Hidden Ravines Dr	0.0018	head of interceptor directly downstream gets too high to allow sufficient sewage from this 8" sanitary to enter during rain events, causing HGL to rise above manhole cover
	01/24/12	32760 Franklin Rd	0.0001	grinder pump outlet pipe was plugged
	01/25/12	32760 Franklin Rd	0.0006	contractor's excavation collapsed and caused 1 1/2" tap to break off the the existing 3" force main
	06/13/12	Old Orchard Trail and Twin Fawn	0.00001	failed air release valve (ARV)
	08/13/12	W ROW Middlebelt Rd, 650 ft N of 8 Mile Rd	0.000005	broken 4" sanitary force main
	08/23/12	32555 Northwestern Hwy, 600 ft E of Clareview	0.00002	plugged sanitary sewer line
	04/12/13	Rummel Drain	0.1650	heavy rain
	04/19/13	Rummel Drain	0.3450	heavy rain
	05/02/13	556 N Saginaw	0.00002	cracked 6" sanitary force main
	08/01/13	38455 Hills Tech Dr	0.00005	plugged sewer
2014	11/17/13	Thornbrook Pump Station, 11 Mile & Farmington Rd	0.0323	loss of power, caused 1 phase loss of the 3 phase generator
	02/09/14	31006 Orchard Lake Rd	0.001425	grease created a back-up in the sanitary sewer
	03/03/14	30823 Lincolnshire Court	0.0012	plugged sewer

Appendix C

Agency Letters



HUBBELL, ROTH & CLARK, INC
Consulting Engineers

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March 12, 2014

Endangered Species Specialist
MDNR Wildlife Division
Natural Heritage Program
P.O. Box 30180
Lansing, MI 48909

Re: Oakland County Water Resources Commissioner
Evergreen-Farmington Sewage Disposal System SRF Project Plan

HRC Job No. 20130714

Dear Endangered Species Specialist:

The Oakland County Water Resources Commissioner is in the process of submitting an SRF project plan for project areas within the Evergreen-Farmington Sewage Disposal System (EFSDS). The proposed work consists of upgrading different aspects of the EFSDS to improve system capacity, optimize the use of existing pumping facilities, and provide primary metering data. The enclosed map and description of project area summarizes the improvements and their respective locations.

The locations of potential impacts are limited to the areas of proposed work, as shown on the attached figure. The proposed projects are located within T02N, R10E, S32 and T02N, R10E, S24 (Bloomfield Township) and also T02N, R10E, S23 and T02N, R10E, S11 (Bloomfield Hills).

The U.S. Fish and Wildlife Service Section 7 Technical Assistance website was reviewed for federally listed threatened and endangered species. According to the website, it appears that six species are listed and may be present in Oakland County. Those are the Indiana Bat, Northern Long-Eared Bat, Eastern Massasauga, Rayed Bean Mussel, Snuffbox Mussel, and Poweshiek Skipperling.

Please review and verify the enclosed information regarding the EFSDS SRF Project Plan. Please review and return comments to this office by May 1, 2014. You may also send comments to my attention via email at kstickel@hrc-engr.com.

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555 Hulet Drive, PO Box 824
Bloomfield Hills, Michigan 48303-0824
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Engineering. Environment. Excellence.

If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

A handwritten signature in blue ink that reads 'Karyn M. Stickel'.

Karyn M. Stickel, P.E.
Senior Project Engineer
KS
Attachment
Enclosure
pc: HRC; File



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
LANSING



KEITH CREAGH
DIRECTOR

March 18, 2014

Ms. Karyn M. Stickel, PE
Hubbell, Roth & Clark, Inc.
PO Box 824
Bloomfield Hills, MI 48303-0824

Dear Ms. Stickel:

The Michigan Department of Natural Resources (DNR) is, unfortunately, no longer able to conduct Environmental Reviews (ER) and ceased acceptance of review requests September 16, 2011. Funding for the program was not included in the state budget for the fiscal year that begins October 1 and issuance of clearance letters will no longer be done. Project review requests can be sent to Michigan Natural Features Inventory (MNFI), a program of Michigan State University Extension.

After Oct. 1, MNFI will review projects for potential impacts to endangered species, but there will now be a cost to the requestor for MNFI's services. For information on environmental reviews or to request environmental reviews after October 1, 2011, go to MNFI website at <http://mnfi.anr.msu.edu/>. Requests will no longer be accepted through the DNR Endangered Species Assessment web site.

Endangered species and wetland laws remain in place. Under Part 365 of Public Act 451 people are not allowed to take or harm any endangered or threatened of fish, plants or wildlife. The DNR will still be responsible for issuing permits and enforcement relative to the take of endangered and threatened species.

If you have any questions, please e-mail me at SargentL@michigan.gov. Thank you.

Sincerely,


Lori G. Sargent
Nongame Wildlife Biologist

Souzan Hanna
Graduate Engineer
Hubbell, Roth & Clark, Inc.
555 Hulet Drive
P.O. Box 824
Bloomfield Hills, MI 48303-0824

March 17, 2014

Re: Rare Species Review #1369 – Oakland County Water Resources Commission Evergreen-Farmington Sewage Disposal System project T2N, R10-11E, Sec. 11, 17, 23, 24 & 32.

Hello:

The location for the proposed project was checked against known localities for rare species and unique natural features, which are recorded in the Michigan Natural Features Inventory (MNFI) natural heritage database. This continuously updated database is a comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features. Records in the database indicate that a qualified observer has documented the presence of special natural features. The absence of records in the database for a particular site may mean that the site has not been surveyed. The only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, ...fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Michigan Department of Natural Resources (MDNR), Wildlife Division. Responsibility to protect endangered and threatened species is not limited to the lists below. Other species may be present that have not been recorded in the database.

According to the natural heritage database several legally protected species have been known to occur near the project site. However, due to the nature of the project and the fact that the occurrences are well away from the project locations, it is **not likely** that negative impacts will occur. Keep in mind that MNFI cannot fully evaluate this project without visiting the project sites. MNFI offers several levels of Rare Species Reviews, including field surveys which I would be happy to discuss with you.

Sincerely,

Michael Sanders
Environmental Review Specialist/Zoologist
Michigan Natural Features Inventory



MSU EXTENSION

Michigan Natural Features Inventory

PO Box 13036
Lansing MI 48901

(517) 373-1552
Fax (517) 373-9566

mnfi.anr.msu.edu

Table 1: Legally protected species within 1.5 miles of #1369

SNAME	SCOMNAME	FIRSTOBS	LASTOBS	USES	SPROT	GRANK	SRANK	ELCAT
<i>Galearis spectabilis</i>	Showy orchis	1916	1916-05-26		T	G5	S2	Plant
<i>Castanea dentata</i>	American chestnut		1976		E	G4	S1S2	Plant
<i>Carex lupuliformis</i>	False hop sedge	1918	1918-07-13		T	G4	S2	Plant
<i>Cryptotis parva</i>	Least shrew	1936	1937-10-02		T	G5	S1S2	Animal
<i>Galearis spectabilis</i>	Showy orchis	1916	1928-06-28		T	G5	S2	Plant
<i>Alasmidonta viridis</i>	Slippershell				T	G4G5	S2S3	Animal

Table 2: Special concern species and rare natural features within 1.5 miles of #1369

SNAME	SCOMNAME	FIRSTOBS	LASTOBS	USES	SPROT	GRANK	SRANK	ELCAT
<i>Microtus pinetorum</i>	Woodland vole	1934	1935-05-31		SC	G5	S3S4	Animal
<i>Scirpus clintonii</i>	Clinton's bulrush	1915	1916-06-04		SC	G4	S3	Plant
<i>Angelica venenosa</i>	Hairy angelica	1880	1880-08-20		SC	G5	S3	Plant
<i>Angelica venenosa</i>	Hairy angelica	1915	1915-08-19		SC	G5	S3	Plant
<i>Sphaerium fabale</i>	River fingernail clam				SC	G5	SNR	Animal

Comments for Rare Species Review #1369: It is important to note that it is the applicant's responsibility to comply with both state and federal threatened and endangered species legislation. Therefore, if a state listed species occurs at a project site, and you think you need an endangered species permit please contact: Lori Sargent, Nongame Wildlife Biologist, Wildlife Division, Michigan Department of Natural Resources, P.O. Box 30444, Lansing, MI 48909, 517-284-6216, or SargentL@michigan.gov. If a federally listed species is involved and, you think a permit is needed, please contact Barb Hosler, Endangered Species Program, U.S. Fish and Wildlife Service, East Lansing office, 517-351-6326, or Barbara_Hosler@fws.gov.

Please consult MNFI's Rare Species Explorer for additional information regarding the above listed species: <http://mnfi.anr.msu.edu/explorer/search.cfm>.

Special concern species and natural communities are not protected under endangered species legislation but efforts should be taken to minimize any or all impacts. Species classified as special concern are species whose numbers are getting smaller in the state. If these species continue to decline they would be recommended for reclassification to threatened or endangered status.

Codes to accompany Tables 1 and 2:

State Protection Status Code Definitions (SPROT)

E: Endangered

T: Threatened

SC: Special concern

Global Heritage Status Rank Definitions (GRANK)

The priority assigned by NatureServe's national office for data collection and protection based upon the element's status throughout its entire world-wide range. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

G1 = critically imperiled globally because of extreme rarity (5 or fewer occurrences range-wide or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 = imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3: Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

G4: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Q: Taxonomy uncertain

State Heritage Status Rank Definitions (SRANK)

The priority assigned by the Michigan Natural Features Inventory for data collection and protection based upon the element's status within the state. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

S1: Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.

S2: Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3: Rare or uncommon in state (on the order of 21 to 100 occurrences).

S4 = apparently secure in state, with many occurrences.

S5 = demonstrably secure in state and essentially ineradicable under present conditions.

SX = apparently extirpated from state.



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March 12, 2014

To: Tribal Historic Preservation Office Contacts

Via Email:

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Re: Oakland County Water Resources Commissioner
Evergreen-Farmington Sewage Disposal System SRF Project Plan

HRC Job No. 20130714

Dear THPO Contacts:

We have been notified by the Michigan Department of Environmental Quality (MDEQ) that information regarding SRF Project Plans should be sent to your attention for comments regarding the proposed project. The Oakland County Water Resources Commissioner (WRC) is in the process of submitting an SRF project plan for project areas within the Evergreen-Farmington Sewage Disposal System (EFSDS). The proposed work consists of upgrading different aspects of the EFSDS to improve system capacity, optimize the use of existing pumping facilities, and provide primary metering data. The enclosed map and description of project area summarizes the improvements and their respective locations.

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There are no known historic properties within the area of potential effects (APE). The Michigan Historic Sites Online (<http://www.mcgi.state.mi.us/hso/findlocation.asp>) was used to confirm the absence of historic sites within the project areas.

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March 17, 2014

Tribal Historic Preservation Office Contact
7845 Odawa Circle
Harbor Springs, MI 49740

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Based on our research of the APE for the proposed sanitary sewer system projects, we anticipate no historic properties will be impacted by the proposed construction activities. The project sites will be restored to their original condition following all construction activities. Any noise impacts from construction traffic will be temporary and discontinued at the end of the project.

Please review and verify the enclosed information regarding the EFSDS SRF Project Plan. Please return comments to the undersigned by May 1, 2014. You may also send comments to my attention via email at kstickel@hrc-engr.com.

If you have any questions or require any additional information, please contact the undersigned.

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Very truly yours,

HUBBELL, ROTH & CLARK, INC.

A handwritten signature in blue ink that reads "Karyn M. Stickel".

Karyn M. Stickel, P.E.
Senior Project Engineer

KS
Attachment
Enclosure
pc: HRC; File



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March 17, 2014

Tribal Historic Preservation Office Contact
14359 Pequaming Road
L'Anse, MI 49946

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HUBBELL, ROTH & CLARK, INC.

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Karyn M. Stickel, P.E.
Senior Project Engineer

KS
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March 17, 2014

Tribal Historic Preservation Office Contact
2605 N. West Bay Shore Drive
Peshawbestown, MI 49682

Re: Oakland County Water Resources Commissioner
Evergreen-Farmington Sewage Disposal System SRF Project Plan

HRC Job No. 20130714

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Bloomfield Hills, Michigan 48303-0824
Telephone 248 454 6300 Fax 248 454 6312
www.hrc-engr.com

Engineering. Environment. Excellence.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

A handwritten signature in blue ink that reads "Karyn M. Stickel".

Karyn M. Stickel, P.E.
Senior Project Engineer

KS
Attachment
Enclosure
pc: HRC; File



HUBBELL, ROTH & CLARK, INC
Consulting Engineers

Principals

George E. Hubbell
Thomas E. Biehl
Walter H. Alix
Peter T. Roth
Keith D. McCormack
Nancy M.D. Faught
Daniel W. Mitchell
Jesse B. VanDeCreek
Roland N. Alix

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Robert F. DeFrain
Marshall J. Grazioli
Thomas D. LaCross
James F. Burton
Jane M. Graham
Donna M. Martin
Charles E. Hart

March 12, 2014

U.S. Fish and Wildlife Service
East Lansing Field Office
2651 Coolidge Road
East Lansing, MI 48823

Re: Section 7 Endangered Species Act Consultation
Oakland County Water Resources Commissioner
Evergreen-Farmington Sewage Disposal System SRF Project Plan

HRC Job No. 20130714

To Whom It May Concern:

We are requesting concurrence from the U.S. Fish and Wildlife Service that the proposed EFSDS improvement projects are “not likely to adversely affect” the Indiana Bat, Northern Long-Eared Bat, Eastern Massasauga, Rayed Bean Mussel, Snuffbox Mussel, and Poweshiek Skipperling. The proposed projects are located within T02N, R10E, S32 and T02N, R10E, S24 (Bloomfield Township), and also T02N, R10E, S23 and T02N, R10E, S11 (Bloomfield Hills). The enclosed map and description of the project area summarizes the improvements and the respective locations.

The Oakland County Water Resources Commissioner is in the process of submitting an SRF project plan for project areas within the Evergreen-Farmington Sewage Disposal System (EFSDS). The proposed work consists of upgrading different aspects of the EFSDS to improve system capacity, optimize the use of existing pumping facilities, and provide primary metering data.

The proposed work more specifically consists of the construction of linear storage in the Wattles Road right-of-way from Charing Cross Road east to Adams Road and from Adams Road west to east of Butternut Hills Drive. Improvements to the existing manholes and several stretches of sewer in the Evergreen Interceptor from Quarton Road south to Birmingham are a part of the upgrades included in this project. The project also contains the construction of a relief sewer in Stonycroft Golf Course upstream of the Amy Pump Station in Bloomfield Hills, the construction of a storage tank at the northwest corner of Quarton and Woodward Avenue, and the construction of a pump station or storage facility near Cathedral and 14 Mile Road.

The U.S. Fish and Wildlife Service Section 7 Technical Assistance website was reviewed for federally listed threatened and endangered species. According to the website, it appears that six species are listed and may be present in Oakland County. Those are the Indiana Bat, Northern Long-Eared Bat, Eastern Massasauga, Rayed Bean Mussel, Snuffbox Mussel, and Poweshiek Skipperling.

\\WH16\Projdocs\201307\20130714\03_Studies\Working\Project Plan\Environmental Clearances\20140201_US Fish and Wildlife Service.docx



The proposed work will be contained within Oakland County property and public road right-of-way, existing sanitary sewer easements, and an existing golf course. Tree removals will be minimized during construction. Periodic noise will be produced during construction that is consistent with typical City noise that surrounds the project area. Soil erosion and sedimentation control measures, as well as local permits, will be required and followed during all construction activities.

Based on our analysis, we anticipate that our action may affect, but is not likely to adversely affect, the listed species. We request your concurrence with our determination. If there are any comments regarding our assessment, please return them to this office by May 1, 2014. You may also send comments to my attention via email at kstickel@hrc-engr.com.

If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

A handwritten signature in blue ink that reads "Karyn M. Stickel".

Karyn M. Stickel, P.E.
Senior Project Engineer

KS
Attachment
Enclosure
pc: HRC; File



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James F. Burton
Jane M. Graham
Donna M. Martin
Charles E. Hart

February 1, 2014

Southeast Michigan Council of Governments
535 Griswold Street, Suite 300
Detroit, MI 48226-3602

Re: Oakland County Water Resources Commissioner
Evergreen-Farmington Sewage Disposal System (EFSDS) SRF Project Plan

HRC Job No. 20130714

To Whom It May Concern:

The Oakland County Water Resources Commissioner is in the process of submitting an SRF project plan for project areas within the Evergreen-Farmington Sewage Disposal System (EFSDS). The proposed work consists of upgrading different aspects of the EFSDS to improve system capacity, optimize the use of existing pumping facilities, and provide primary metering data. The enclosed map and description of project area summarizes the improvements and their respective locations.

The locations of potential impacts are limited to the areas of proposed work, as shown on the attached figure. The proposed projects are located within T02N, R10E, S32 and T02N, R10E, S24 (Bloomfield Township), T02N, R10E, S23 and T02N, R10E, S11 (Bloomfield Hills), and T02N, R11E, S17 (Troy).

Data regarding population was obtained from www.semcog.org as well as the County's GIS database. Enclosed is a draft copy of the State Revolving Fund Project Plan. Please review and confirm the population figures and projections used in the Project Plan.

If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Karyn M. Stickel, P.E.
Senior Project Engineer

KS
Attachment
Enclosure
pc: HRC; File

\\VH16\Projdocs\201307\20130714\03_Studies\Working\Project Plan\Environmental Clearances\20140201_SEMCOG.docx

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Charles E. Hart

March 12, 2014

Brian Grennell, Environmental Review Specialist
State Historic Preservation Office
Environmental Review Office
Michigan Historical Center
P.O. Box 30740
Lansing, MI 48909-8240

Re: Oakland County Water Resources Commissioner
Evergreen-Farmington Sewage Disposal System SRF Project Plan

HRC Job No. 20130714

Dear Mr. Gennell:

The Oakland County Water Resources Commissioner is in the process of submitting an SRF project plan for project areas within the Evergreen-Farmington Sewage Disposal System (EFSDS). The proposed work consists of upgrading different aspects of the EFSDS to improve system capacity, optimize the use of existing pumping facilities, and provide primary metering data. The enclosed map and description of project area summarizes the improvements and their respective locations. Photo logs of the project sites and properties 50 years and older within the area of potential effects (APE) have also been included.

The locations of potential impacts are limited to the areas of proposed work, as shown on the attached figure. The proposed projects are located within T02N, R10E, S32 and T02N, R10E, S24 (Bloomfield Township), and also T02N, R10E, S23 and T02N, R10E, S11 (Bloomfield Hills).

There are no known historic properties within the APE. The Michigan Historic Sites Online (<http://www.mcgi.state.mi.us/hso/findlocation.asp>) was used to confirm the absence of historic sites within the project areas.

Based on our research of the APE for the proposed sanitary sewer system projects, we anticipate no historic properties will be impacted by the proposed construction activities. The project sites will be restored to their original condition following all construction activities. Any noise impacts from construction traffic will be temporary and discontinued at the end of the project.

Please review and verify the enclosed information regarding the EFSDS SRF Project Plan. Please return comments to the undersigned by May 1, 2014.

\\VH16\Projdocs\201307\20130714\03_Studies\Working\Project Plan\Environmental Clearances\20140201_State Historic Preservation.docx

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Bloomfield Hills, Michigan 48303-0824
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If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

A handwritten signature in blue ink that reads 'Karyn M. Stickel'.

Karyn M. Stickel, P.E.
Senior Project Engineer

KS
Attachment
Enclosure
pc: HRC; File

Description of Project Areas

The proposed Project Areas are located within the Oakland County Water Resources Commissioner (WRC) Evergreen-Farmington Sewage Disposal System (EFSDS). The EFSDS provides sanitary sewer service to roughly 130 square miles in Oakland County, including all or part of the Cities of Auburn Hills, Birmingham, Bloomfield Hills, Farmington, Farmington Hills, Keego Harbor, Lathrup Village, Orchard Lake Village, Southfield, and Troy; the Townships of Bloomfield, and West Bloomfield; and the Villages of Beverly Hills, Bingham Farms, and Franklin.

Projects were selected to make improvements within the EFSDS including constructing a storage facility at Wattles and Adams, improvements to Evergreen Interceptor, construction of a storage Facility at Stonycroft GC, construction of a storage facility at Quarton/Woodward, and improvements on Cathedral Arm.

A project area map is enclosed. The proposed improvement projects are planned for submittal to the MDEQ for SRF funding through the EPA.

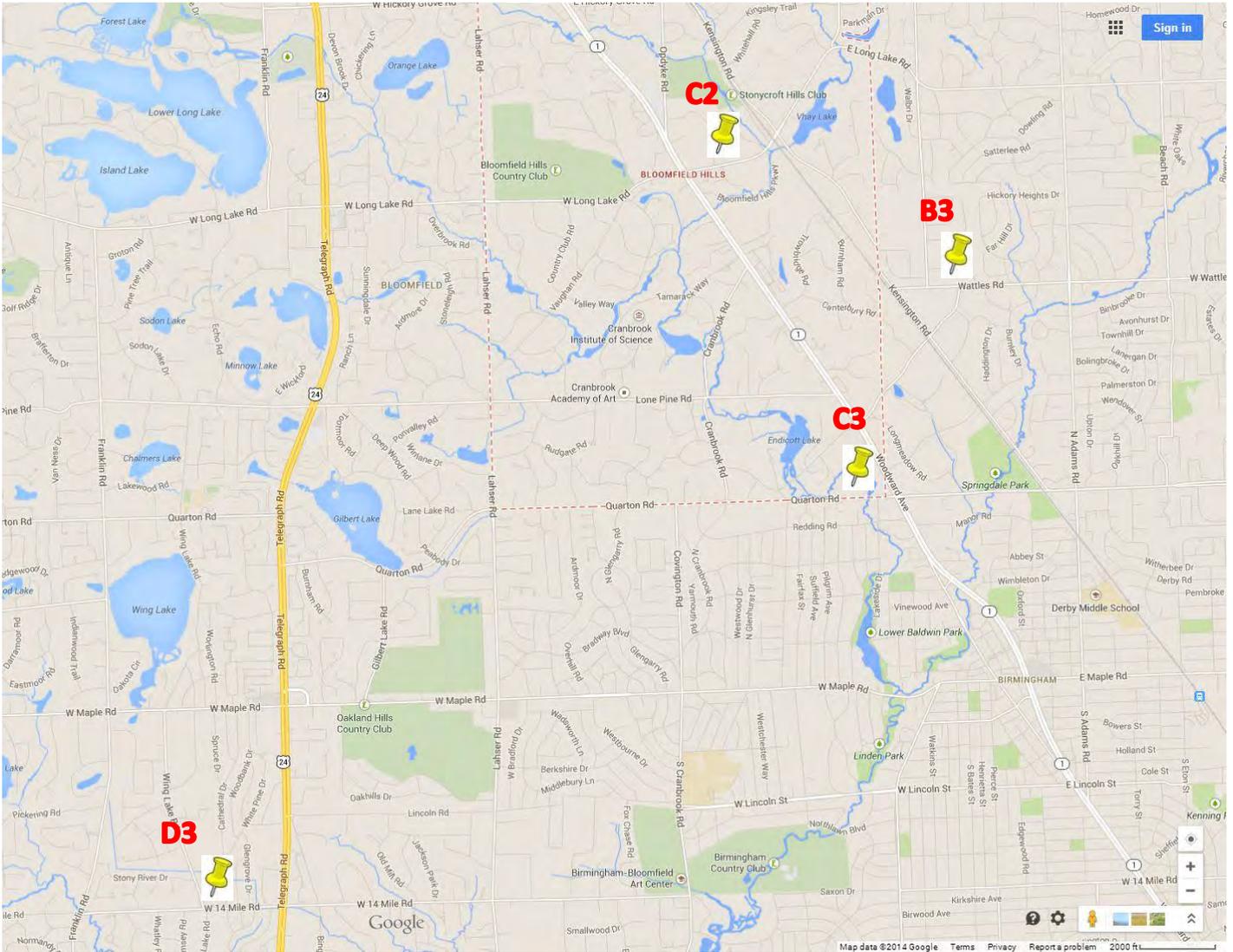
The proposed work more specifically consists of the following:

- The construction of linear storage in the Wattles Road right-of-way from Charing Cross Road east to Adams Road and from Adams Road west to east of Butternut Hills Drive.
- Improvements to the existing manholes and several stretches of sewer in the Evergreen Interceptor from Quarton Road south to Birmingham.
- The construction of a relief sewer in Stonycroft Golf Course upstream of the Amy Pump Station in Bloomfield Hills.
- The construction of a storage tank at the northwest corner of Quarton and Woodward Avenue.
- The construction of a pump station or storage facility near Cathedral and 14 Mile Road.

The linear storage on Wattles will involve a crossing of a branch of the Rouge River at a location west of Adams. The work in Stonycroft Golf Course will include impacts to the branch of the Rouge River through that site. Proper permits will be secured for this work and care will be taken during construction to protect these resources.

Activities associated the proposed construction will occur within public road right-of-way and on County owned property or easements. Typical earthmoving vehicles will be utilized. Attempts to minimize tree removals to the extent possible will be made. Sensitive habitats impacted by construction, along with other disturbed areas, will be restored to their previous condition prior to the construction activities. Soil erosion and sedimentation control measures, as well as local permits, will be required and followed during all construction activities.

Location Map



Project Location



STATE HISTORIC PRESERVATION OFFICE
Application for Section 106 Review

SHPO Use Only					
<input type="checkbox"/>	IN	Received Date	_____ / _____ / _____	Log In Date	_____ / _____ / _____
<input type="checkbox"/>	OUT	Response Date	_____ / _____ / _____	Log Out Date	_____ / _____ / _____
		Sent Date	_____ / _____ / _____		

Submit one copy for each project for which review is requested. This application is required. Please type. Applications must be complete for review to begin. Incomplete applications will be sent back to the applicant without comment. Send only the information and attachments requested on this application. Materials submitted for review cannot be returned. Due to limited resources we are unable to accept this application electronically.

I. GENERAL INFORMATION

THIS IS A NEW SUBMITTAL THIS IS MORE INFORMATION RELATING TO ER#

- a. Project Name: **OCWRC EFSDS SRF Project Plan**
- b. Project Address (if available):
- c. Municipal Unit: **OCWRC** County: **Oakland**
- d. Federal Agency, Contact Name and Mailing Address (If you do not know the federal agency involved in your project please contact the party requiring you to apply for Section 106 review, not the SHPO, for this information.): **Environmental Protection Agency Region 5**
- e. State Agency (if applicable), Contact Name and Mailing Address: **MDEQ Resource Management Division Revolving Loan Section**
- f. Consultant or Applicant Contact Information (if applicable) including mailing address: **Karyn Stickel, P.E., Hubbell, Roth, and Clark, 555 Hulet Drive, Bloomfield Hills, MI 48302, (248) 454 – 6566, kstickel@hrc-engr.com**

II. GROUND DISTURBING ACTIVITY (INCLUDING EXCAVATION, GRADING, TREE REMOVALS, UTILITY INSTALLATION, ETC.)

DOES THIS PROJECT INVOLVE GROUND-DISTURBING ACTIVITY? YES NO (If no, proceed to section III.)

Exact project location must be submitted on a USGS Quad map (portions, photocopies of portions, and electronic USGS maps are acceptable as long as the location is clearly marked).

- a. USGS Quad Map Name: **Pontiac South and Birmingham**
- b. Township: **02N** Range: **10E** Section: **32, 23, 11, 24**
- c. Description of width, length and depth of proposed ground disturbing activity: **See Attached Description**
- d. Previous land use and disturbances: **Public roads rights-of-way, sewer easements, golf courses, and other previously developed/ disturbed land uses**
- e. Current land use and conditions: **Residential, Commercial/Industrial, Agriculture, Public, Other**
- f. Does the landowner know of any archaeological resources found on the property? YES NO
Please describe:

III. PROJECT WORK DESCRIPTION AND AREA OF POTENTIAL EFFECTS (APE)

Note: Every project has an APE.

- a. Provide a detailed written description of the project (plans, specifications, Environmental Impact Statements (EIS), Environmental Assessments (EA), etc. cannot be substituted for the written description): **See Attached Letter**
- b. Provide a localized map indicating the location of the project; road names must be included and legible. **See Attached Figures**
- c. On the above-mentioned map, identify the APE. **See Attachment**
- d. Provide a written description of the APE (physical, visual, auditory, and sociocultural), the steps taken to identify the APE, and the justification for the boundaries chosen. **See Attachment**

IV. IDENTIFICATION OF HISTORIC PROPERTIES

- a. List and date **all** properties 50 years of age or older located in the APE. If the property is located within a National Register eligible, listed or local district it is only necessary to identify the district: **None Present**
 - b. Describe the steps taken to identify whether or not any **historic** properties exist in the APE and include the level of effort made to carry out such steps: **See Attachment**
 - c. Based on the information contained in "b", please choose one:
 Historic Properties Present in the APE
 No Historic Properties Present in the APE
 - d. Describe the condition, previous disturbance to, and history of any historic properties located in the APE: **See Attachment**
-

V. PHOTOGRAPHS

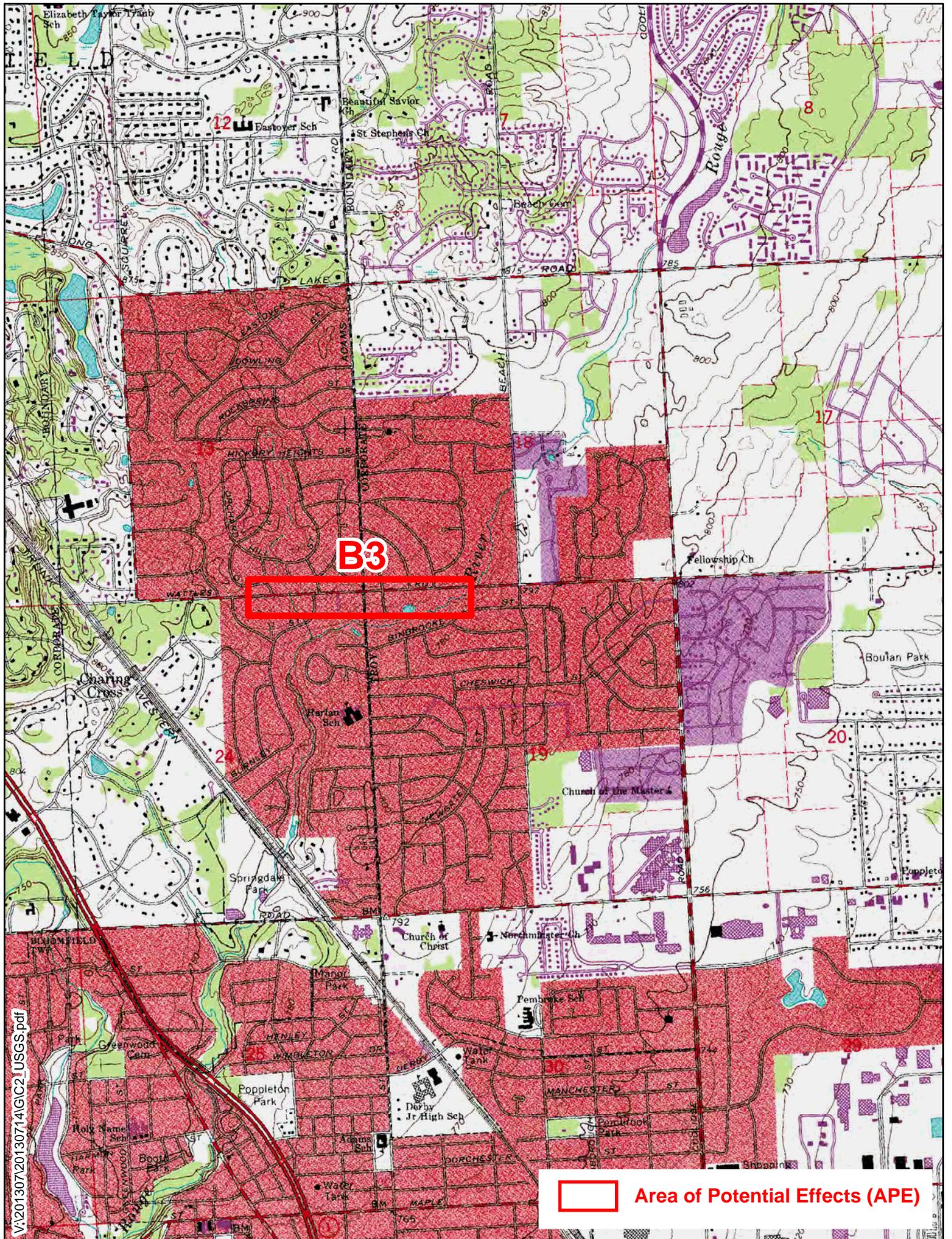
Note: All photographs must be keyed to a localized map.

- a. Provide photographs of the site itself. **See Attachment**
 - b. Provide photographs of all properties 50 years of age or older located in the APE (faxed or photocopied photographs are not acceptable). **None Present**
-

VI. DETERMINATION OF EFFECT

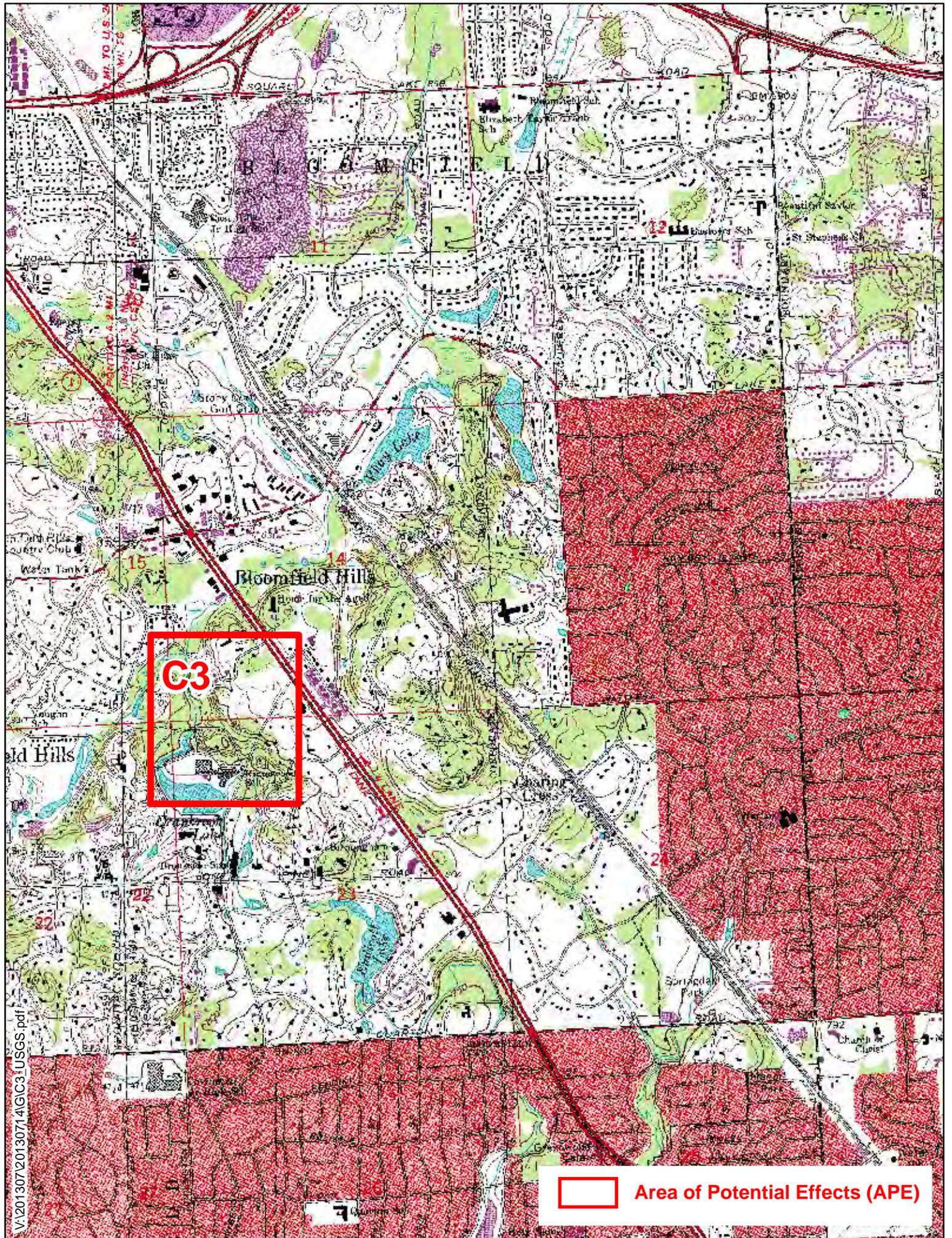
- No historic properties affected based on [36 CFR § 800.4(d)(1)], please provide the basis for this determination.
- No Adverse Effect [36 CFR § 800.5(b)] on historic properties, explain why the criteria of adverse effect, 36 CFR Part 800.5(a)(1), were found not applicable.
- Adverse Effect [36 CFR § 800.5(d)(2)] on historic properties, explain why the criteria of adverse effect, [36 CFR Part 800.5(a)(1)], were found applicable.

***Please print and mail completed form and required information to:
State Historic Preservation Office, Environmental Review Office, Michigan Historical Center, 702
W. Kalamazoo Street, P.O. Box 30740, Lansing, MI 48909-8240***



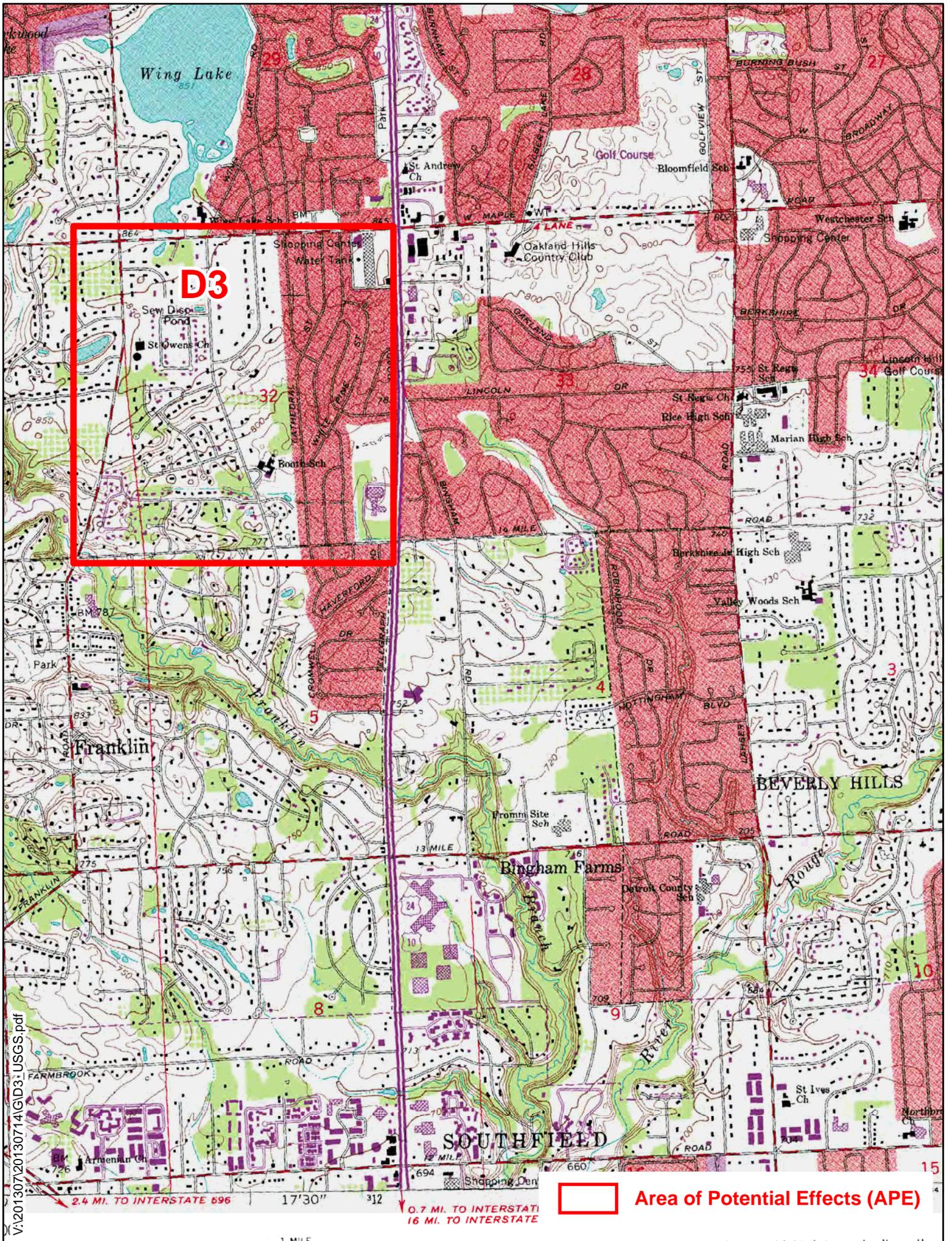
B3

 **Area of Potential Effects (APE)**



C3

 **Area of Potential Effects (APE)**



D3

 **Area of Potential Effects (APE)**

V:\20130720\130714\GID3-USGS.pdf

0.7 MI. TO INTERSTATE
16 MI. TO INTERSTATE

1 MILE



HUBBELL, ROTH & CLARK, INC
Consulting Engineers

Principals
 George E. Hubbell
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Attachment A

Re: Evergreen Farmington Sanitary Disposal System (EFSDS) SRF Project Plan

Ladies and Gentlemen:

Hubbell, Roth & Clark Inc. (HRC) is presently working with the Oakland County Water Resource Commissioner to develop a Project Plan for improvements in mitigating sanitary sewer overflows (SSOs). This will include several projects at various locations throughout the City of Bloomfield Hills and Bloomfield Township. These projects may include improvements to existing manholes and sewers in addition to the construction of linear storage, relief sewer, storage facilities, and pump stations. These projects are being undertaken as part of the City's, the Township's, and the County's ongoing mission to improving surface water quality in the area. Appropriate permitting measures will be taken for all work included in this project.

The proposed projects are intended to improve the integrity of any property's location, design, setting, materials, workmanship, feeling, and association, by eliminating SSOs and improving water quality.

The Project Plan will be submitted to the Michigan Department of Environmental Quality's Environmental Services and Science Division (MDEQ-ESSD) for prioritization of a State Revolving Fund loan. The following additional information is provided as an attachment to the Application for Section 106 Review, in accordance with the National Historic Preservation Act of 1996:

I. GENERAL INFORMATION:

Federal Agency Contact:

Mr. Andrew Lausted, (312) 886-0189
 US EPA Region 5
 77 W. Jackson Blvd.
 Chicago, IL 60604

State Agency Contact:

Ms. Karen Nickols, (517) 284-5414
 MDEQ, Revolving Loan Section
 P.O. Box 30457
 Lansing, Michigan 48909-7957

This Project Plan is being prepared as part of the State Revolving Fund loan program.

\\VH16\Projdocs\201307\20130714\03_Studies\Working\Project Plan\Environmental Clearances\SHPO_Attachment A.docx

II. GROUND DISTURBING ACTIVITY:

Any ground disturbing activities associated with this project will be associated with sanitary sewer improvements. All areas will either be restored to their existing uses or restored from an urban use to a natural feature.

III. PROJECT WORK DESCRIPTION AND AREA OF POTENTIAL EFFECTS (APE)

Project Work Description:

The proposed Project Areas are located within the Oakland County Water Resources Commissioner (WRC) Evergreen-Farmington Sewage Disposal System (EFSDS). The EFSDS provides sanitary sewer service to roughly 130 square miles in Oakland County, including all or part of the Cities of Auburn Hills, Birmingham, Bloomfield Hills, Farmington, Farmington Hills, Keego Harbor, Lathrup Village, Orchard Lake Village, Southfield, and Troy; the Townships of Bloomfield, and West Bloomfield; and the Villages of Beverly Hills, Bingham Farms, and Franklin.

Projects were selected to make improvements within the EFSDS including constructing a storage facility at Wattles and Adams, improvements to Evergreen Interceptor, construction of a storage Facility at Stonycroft GC, construction of a storage facility at Quarton/Woodward, and improvements on Cathedral Arm.

A project area map is enclosed. The proposed improvement projects are planned for submittal to the MDEQ for SRF funding through the EPA.

The proposed work more specifically consists of the following:

- The construction of linear storage in the Wattles Road right-of-way from Charing Cross Road east to Adams Road and from Adams Road west to east of Butternut Hills Drive. The ground disturbance for this is approximately 4,500 ft x 20 ft (2.1 acres).
- Improvements to the existing manholes and several stretches of sewer in the Evergreen Interceptor from Quarton Road south to Birmingham. The ground disturbance for this is 600 ft x 20 ft (0.28 acres)
- The construction of a relief sewer in Stonycroft Golf Course upstream of the Amy Pump Station in Bloomfield Hills. The ground disturbance for this is 3,600 ft x 20 ft (1.4 acres).
- The construction of a storage tank at the northwest corner of Quarton and Woodward Avenue. The ground disturbance for this is 150 ft x 150 ft (0.5 acres)
- The construction of a pump station or storage facility near Cathedral and 14 Mile Road. The ground disturbance for this is 150 ft x 150 ft (0.5 acres)

The linear storage on Wattles will involve a crossing of a branch of the Rouge River at a location west of Adams. The work in Stonycroft Golf Course will include impacts to the branch of the Rouge River through that site. Proper permits will be secured for this work and care will be taken during construction to protect these resources.

Activities associated the proposed construction will occur within public road right-of-way and on County owned property or easements. Typical earthmoving vehicles will be utilized. Attempts to minimize tree removals to the extent possible will be made. Sensitive habitats impacted by construction, along with other disturbed areas, will be restored to their previous condition prior to the construction activities. Soil

erosion and sedimentation control measures, as well as local permits, will be required and followed during all construction activities.

Description of the APE:

The Area of Potential Effects (APE) is limited to the specific areas identified above, and shown on the attached map. All projects are intended to eliminate SSOs and improve the downstream water quality. Visually, the projects are within the right-of-way of City or Township roads or are on City and Township property, and properties adjacent to the work areas are typically zoned residential or commercial. Where work will take place near parks or within surface waters, the proposed work will enhance the natural settings. There will be no additional traffic, noise, or other impacts resulting from implementation of the projects, other than short-term, temporary impacts related to the construction work. Proper signage and traffic controls will be installed prior to any work.

IV. IDENTIFICATION OF HISTORIC PROPERTIES:

Research was performed to determine the location of historical features. This included using the State's website to map all State and Federally-registered sites. The Michigan Historic Sites Online website (<http://www.mcgi.state.mi.us/hso/findlocation.asp>) was verified to determine the absence of historic properties within the Project Area on February 6, 2014.

While there are no historic properties located within the APE, the following are listed sites that are nearby proposed work areas for reference.

These projects are near the following historic properties; but no work will be completed on these properties

- Academy of the Sacred Heart Informational Designation, National and State Register listed, Site ID#P24332
- Trowbridge Road Bridge, National and State Register listed, Site ID#P22259
- Temple Beth El, National and State Register listed, Site ID#P40002

There will be no change to the streetscape view of or from, or any other impacts to any of these nearby historic properties.

V. PHOTOGRAPHS:

See the attached photo sheets.

VI. DETERMINATION OF EFFECT:

This project will not have any adverse effect on the nearby historic properties.

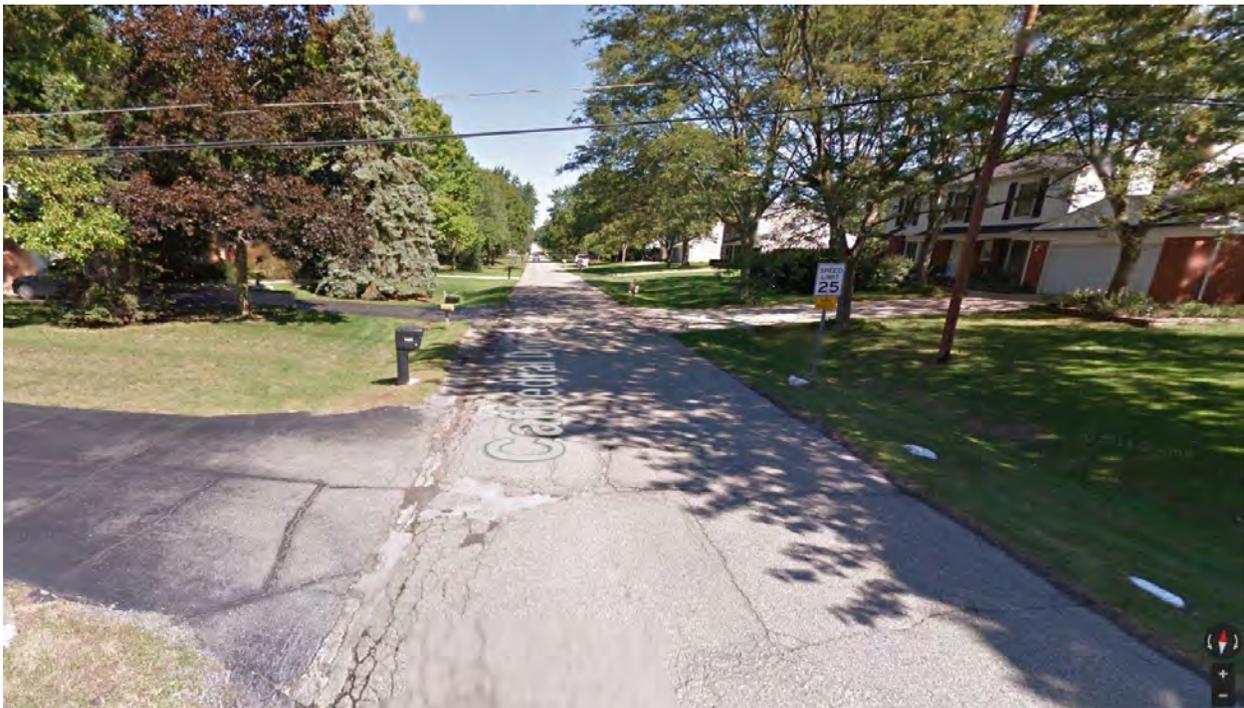
The project **will not** diminish the integrity of any property's location, design, setting, materials, workmanship, feeling, or association. There are **no** foreseeable effects caused by the undertaking that may occur later in time. The proposed project is in keeping with all of the sites' existing uses and context. All sites will be restored to their existing uses and there will be no discernable change to the physical, visual, auditory, and sociocultural climates of the project sites.

There will be minimal ground disturbance and the streetscape view of the site will be improved by the additional natural features and improved stormwater quality. All areas will either be restored to their existing conditions, or include additional natural features. The pre and post-construction climate of the APE therefore will not be negatively impacted.

A temporary impact to the area will be experienced due to the increased noise, traffic, and work activity associated with construction. However, this will be mitigated by limiting construction activity on nights and weekends, requiring periodic cleaning and maintenance of the sites to protect the public and prevent excessive dust or debris, and having all activity comply within the City and Township Codes.



1 – North from W. 14 Mile to Cathedral Drive



2 – North on Cathedral Drive



3 – North on Cathedral Drive



4 – Northeast from Cathedral Drive to White Pine Drive



5 – Northwest on Cathedral towards Spruce Drive



6 – Northwest on Cathedral towards Timber Ridge Drive



7 – North on Cathedral towards Maple



8 – On Telegraph looking west towards 14 Mile Road



9 – East on 14 Mile Road



10 – West along 14 Mile Road



11 – West along 14 Mile Road approaching Wing Lake Road



12 – West along 14 Mile Road approaching Franklin Road



13 – West along 14 Mile Road approaching Franklin Road



14 – West along Wattles Road near Butternut Hill Drive



15 – West along Wattles Road near Chestnut Hill Drive



16 – Intersection of Wattles and Adams looking west



17 – Intersection of Wattles and Adams looking east



18 – West along Wattles



19 – West along Wattles near Charing Cross Road



20 – Northwest corner of Quarton and Woodward



21 – Southeast on Quarton



22 – Northwest corner of Quarton and Woodward



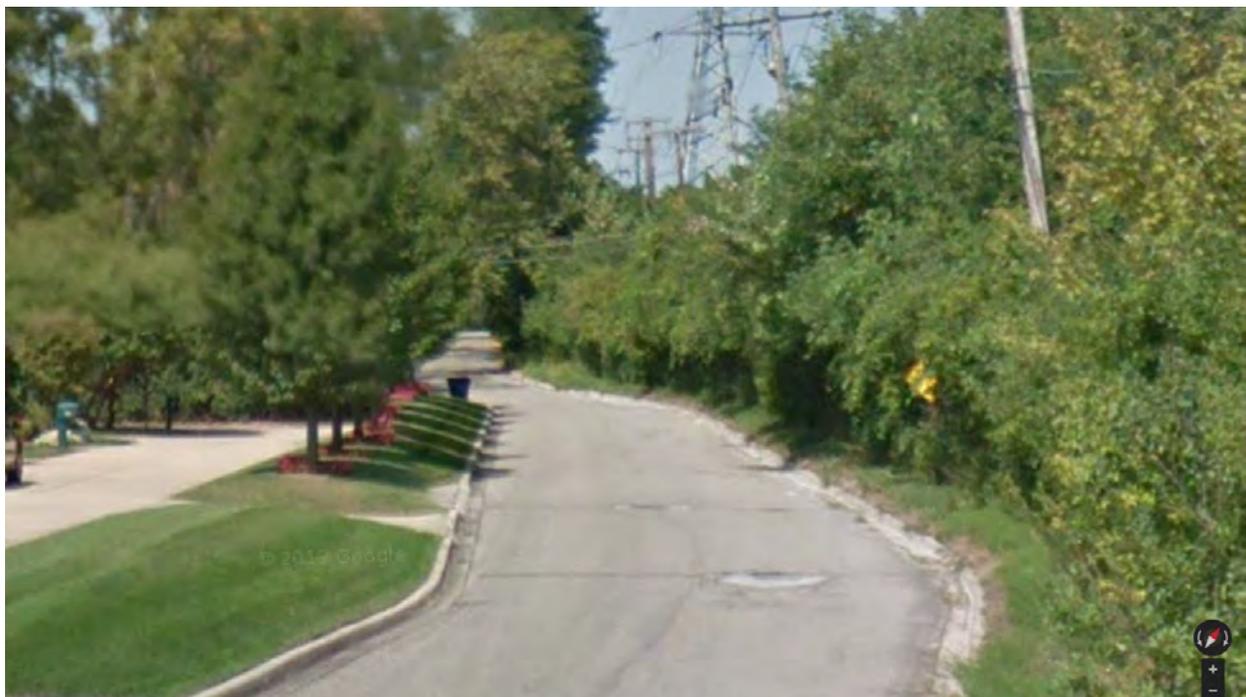
23 – East on Quarton towards Woodward



24 – Northwest corner of Quarton and Woodward on Woodward



25 – Northwest towards Stonycroft Lane

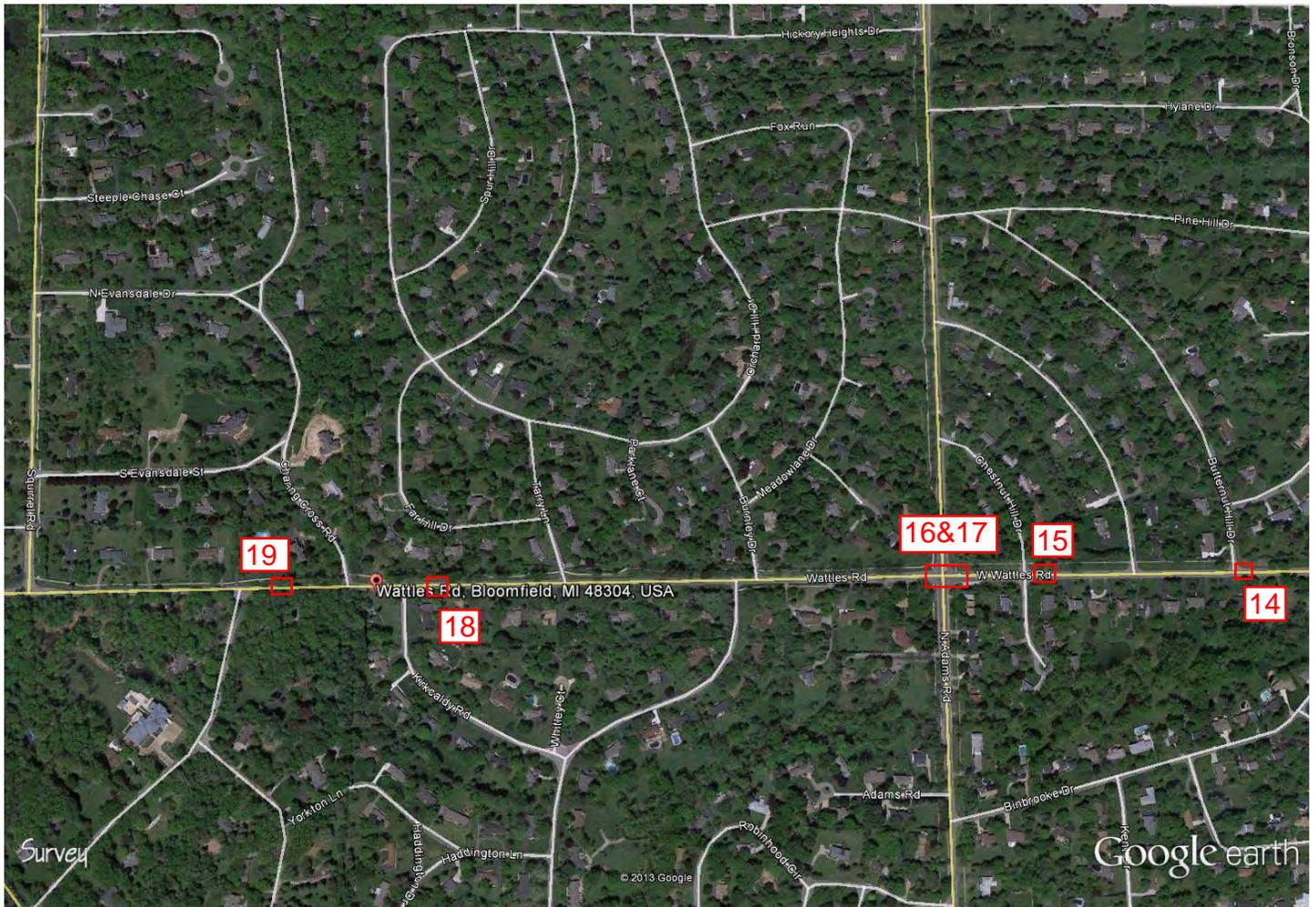


26 – Northwest on Stonycroft Lane



26 – West on Kensington towards Stonycroft Golf Club

Photo Reference Map - Wattles Between Charing Cross Road and Butternut Hill

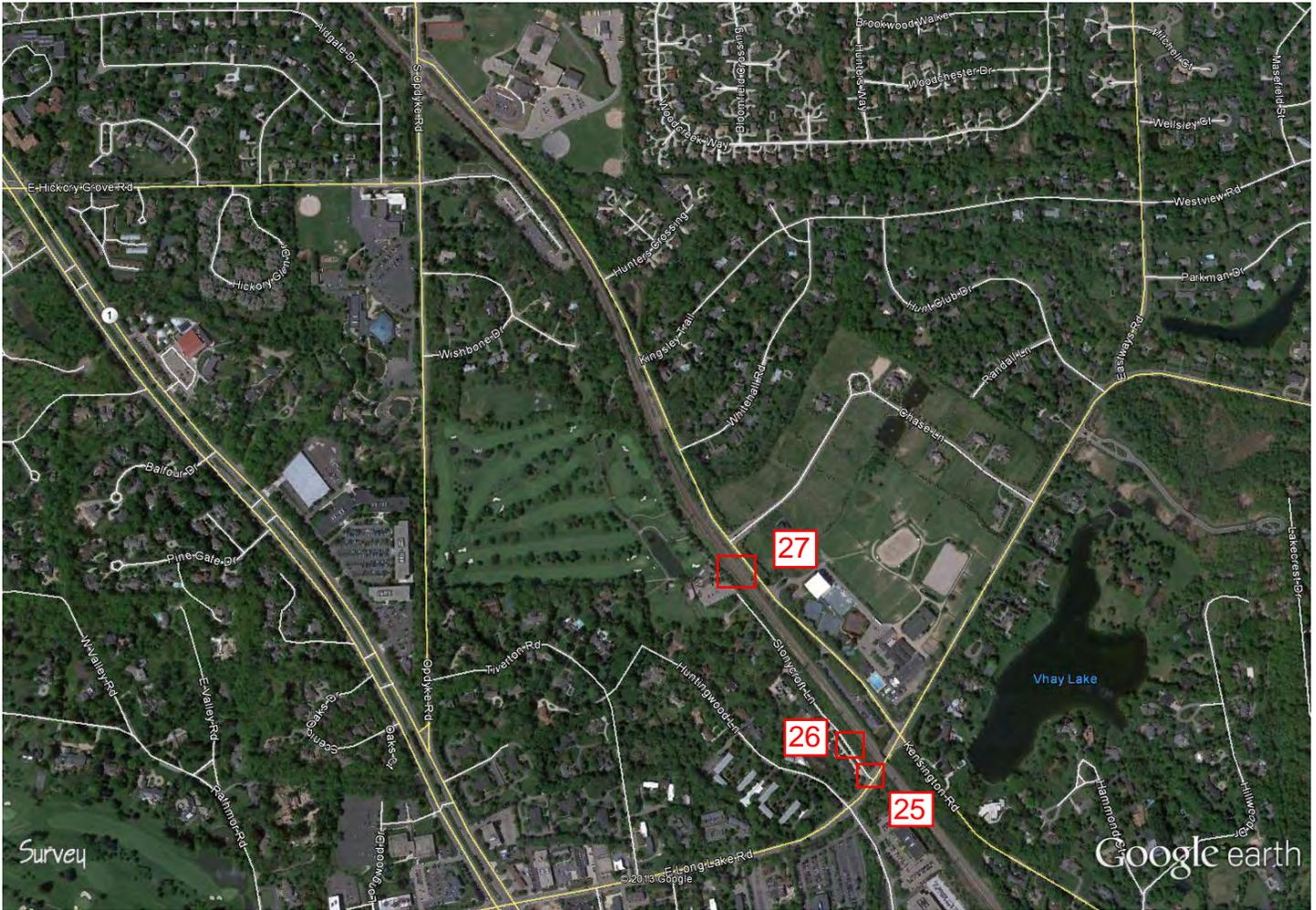


Google earth



 **Photo Location**

Photo Reference Map - Stonycroft Lane along Kensington Road

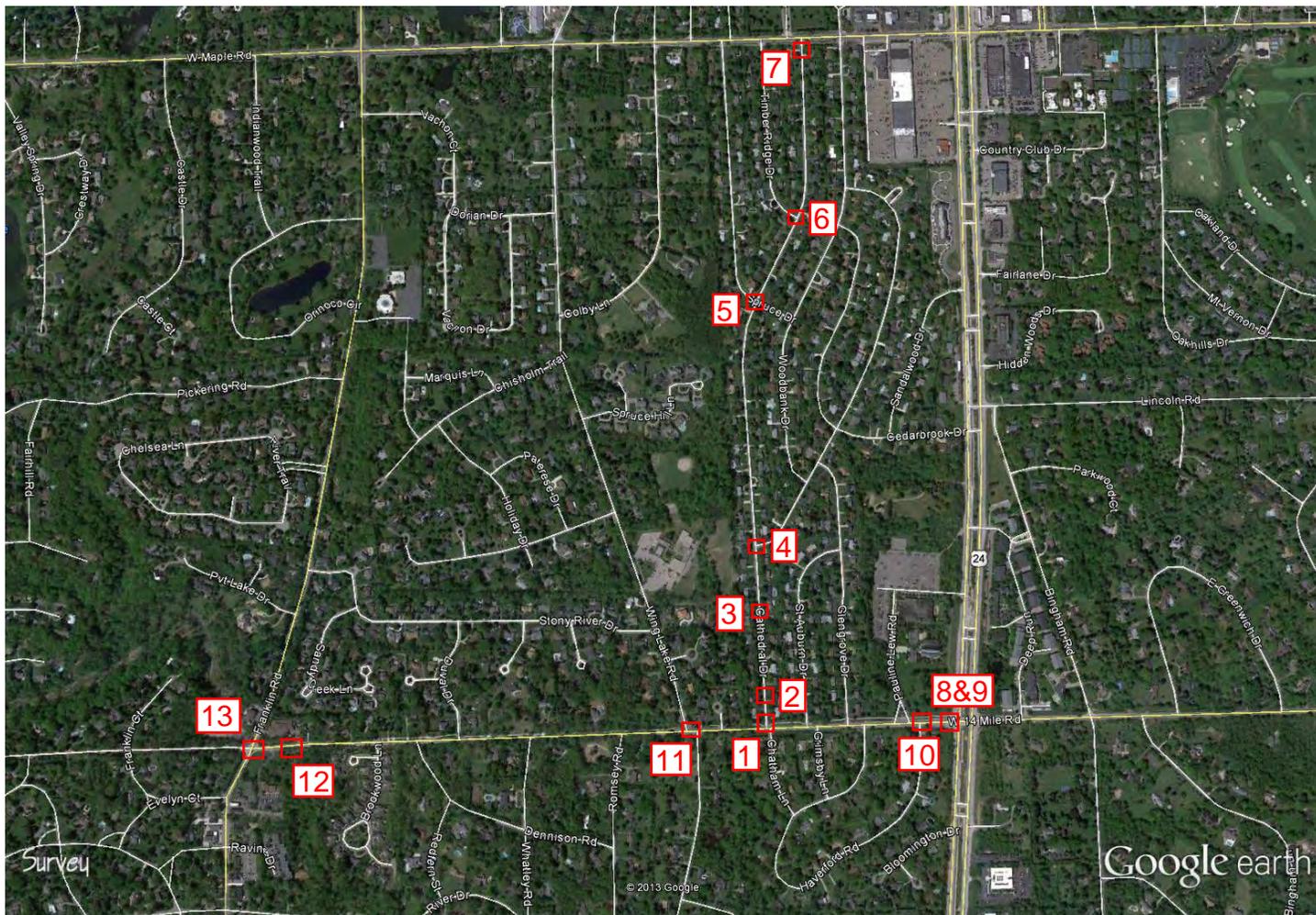


Google earth



 Photo Location

Photo Reference Map - Cathedral Drive and W. 14 Mile between Franklin and Telegraph



Google earth



 Photo Location



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY
STATE HISTORIC PRESERVATION OFFICE

SCOTT WOOSLEY
EXECUTIVE DIRECTOR

April 25, 2014

SONYA T BUTLER
SECTION CHIEF RLOCS
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
P O BOX 30241
LANSING MI 48909

RE: ER14-203 OCWRC Evergreen – Farmington Sewage Disposal System, Sec. 11, 23, 24, & 32, T2N, R10E, Bloomfield Township & Bloomfield Hills, Oakland County (EPA)

Dear Ms. Butler,

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that **no historic properties are affected** within the area of potential effects of this undertaking.

This letter evidences the EPA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of the EPA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." **If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.**

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at (517) 335-2721 or by email at GrennellB@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Brian G. Grennell
Cultural Resource Management Specialist

for Brian D. Conway
State Historic Preservation Officer

SAT:BGG:sb

Copy: Karyn Sticklel, Hubbell, Roth, and Clark





PRINCIPALS

George E. Hubbell
Thomas E. Biehl
Walter H. Alix
Peter T. Roth
Keith D. McCormack
Nancy M. D. Faught
Daniel W. Mitchell
Jesse B. VanDeCreek
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Donna M. Martin
Charles E. Hart

HUBBELL, ROTH & CLARK, INC.

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May 9, 2014

Andrew Hartz
MDEQ – Office of Environmental Assistance
P.O. Box 30457
Lansing, MI 48909-7957

Re: Oakland County Water Resources Commissioner HRC Job No. 20130714
Evergreen-Farmington Sewage Disposal System SRF Project Plan

Dear Mr. Hartz:

The Oakland County Water Resources Commissioner is in the process of submitting an SRF project plan for project areas within the Evergreen-Farmington Sewage Disposal System (EFSDS). The proposed work consists of upgrading different aspects of the EFSDS to improve system capacity, optimize the use of existing pumping facilities, and provide primary metering data. The enclosed map and description of project area summarizes the improvements and their respective locations.

The locations of potential impacts are limited to the areas of proposed work, as shown on the attached figure. The proposed projects are located as follows: Wattles Road Linear Storage (B2/B3) – T02N, R10E, S13 and T02N, R10E, S18; NEI Hydraulic Improvements (B4) – T02N, R10E, S26 and T02N, R11E, S25; Stonycroft Relief and Amy PS Upgrades (C2) – T02N, R10E, S15; and also Quarton Road Storage (C4) – T02N, R10E, S23.

The proposed work at the Wattles Road Linear Storage consists of the construction of an offline linear storage tank in the Wattles Road right-of-way to store excess flow and prevent surcharging and SSOs. NEI Hydraulic Improvements involve reducing sewer bends within the Troy Arm region as to relieve hydraulic restrictions throughout the system. The Stonycroft Relief and Amy PS Upgrades aims to provide a relief sewer at the Stonycroft Golf Club in addition to downstream improvements at the Amy Pump Station for SSO reduction. The Quarton Road Storage includes the construction of a storage facility for the purpose of reducing peak flow.

Floodplain boundaries near the project locations are within proximity of the Rouge River and the River's associated waters. Construction within floodplain regions is limited at the Wattles Road Linear Storage, the Troy Arm Hydraulic Improvements and the Stonycroft Golf Course Improvements. Refer to the enclosed FEMA maps for floodplain delineation at each project site. The proposed Quarton Road Storage Tank is located outside of the boundaries of the 100-year floodplain as shown on the attached site plan. The remaining project sites will have impacts to the 100-year floodplain as the existing interceptor is located in or near the floodplain in areas. Therefore, access to the interceptor will include work within the floodplain. This work will be properly permitted before beginning. There will be no permanent above grade structures constructed within the floodplain.

Wetland areas have been located near the project sites as shown on the attached maps and potential wetland impacts will be regulated through Part 303 of Public Act 451.

Soil erosion and sedimentation control measures, as well as local permits, will be required and followed during all construction activities. An MDEQ/Army Corps Joint Permit will be obtained for all work within, adjacent to, or near-by an inland lake or stream, wetland, or floodplain. Where work may be within the regulated sensitive habitat, such as a wetland, stream, or floodplain, there will be mitigation as part of the design and permit process per the requirements of Act 452 of 1994, as amended.

If you have any questions or require any additional information, please contact the undersigned.

Andrew Hartz
May 9, 2014
HRC Job Number 20130714
Page 2 of 2

Very truly yours,

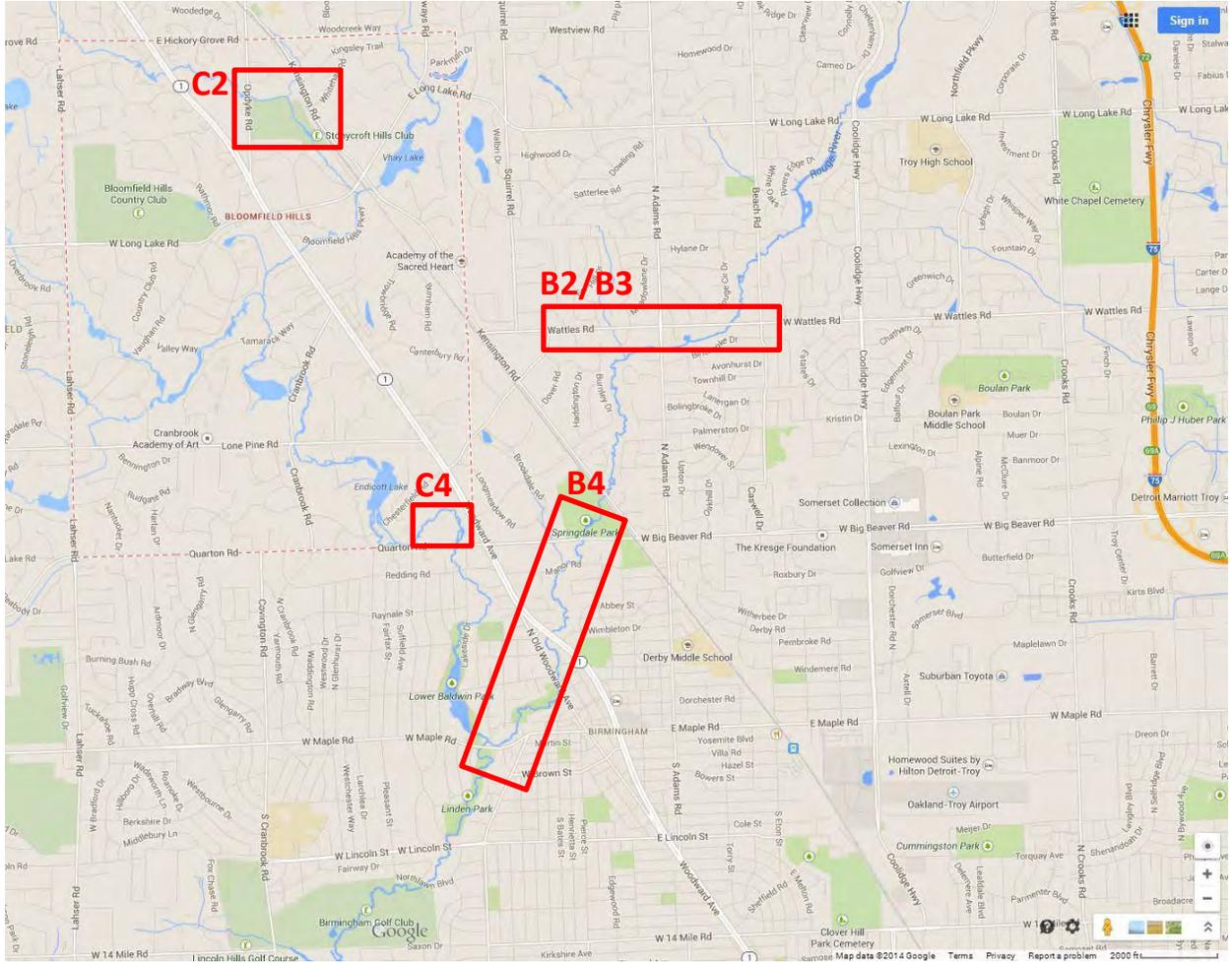
HUBBELL, ROTH & CLARK, INC. •



Karyn M. Stickel, P.E.
Senior Project Engineer

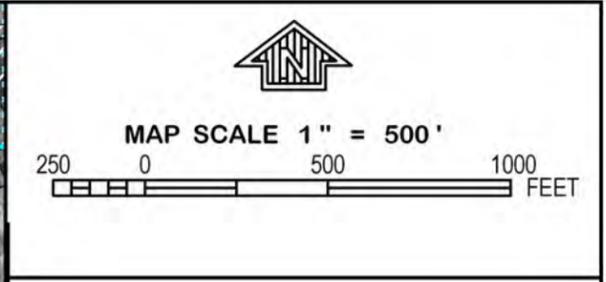
KS
Attachment
Enclosure
pc: HRC; File

Location Map



 Project Location





PANEL 0529F

FIRM
FLOOD INSURANCE RATE MAP

**OAKLAND COUNTY,
MICHIGAN**
(ALL JURISDICTIONS)

PANEL 529 OF 704
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BIRMINGHAM CITY OF	260158	0529	F
BLOOMFIELD TOWNSHIP OF	260169	0529	F
TROY, CITY OF	260180	0529	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

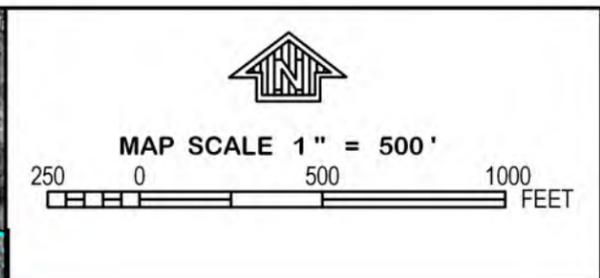
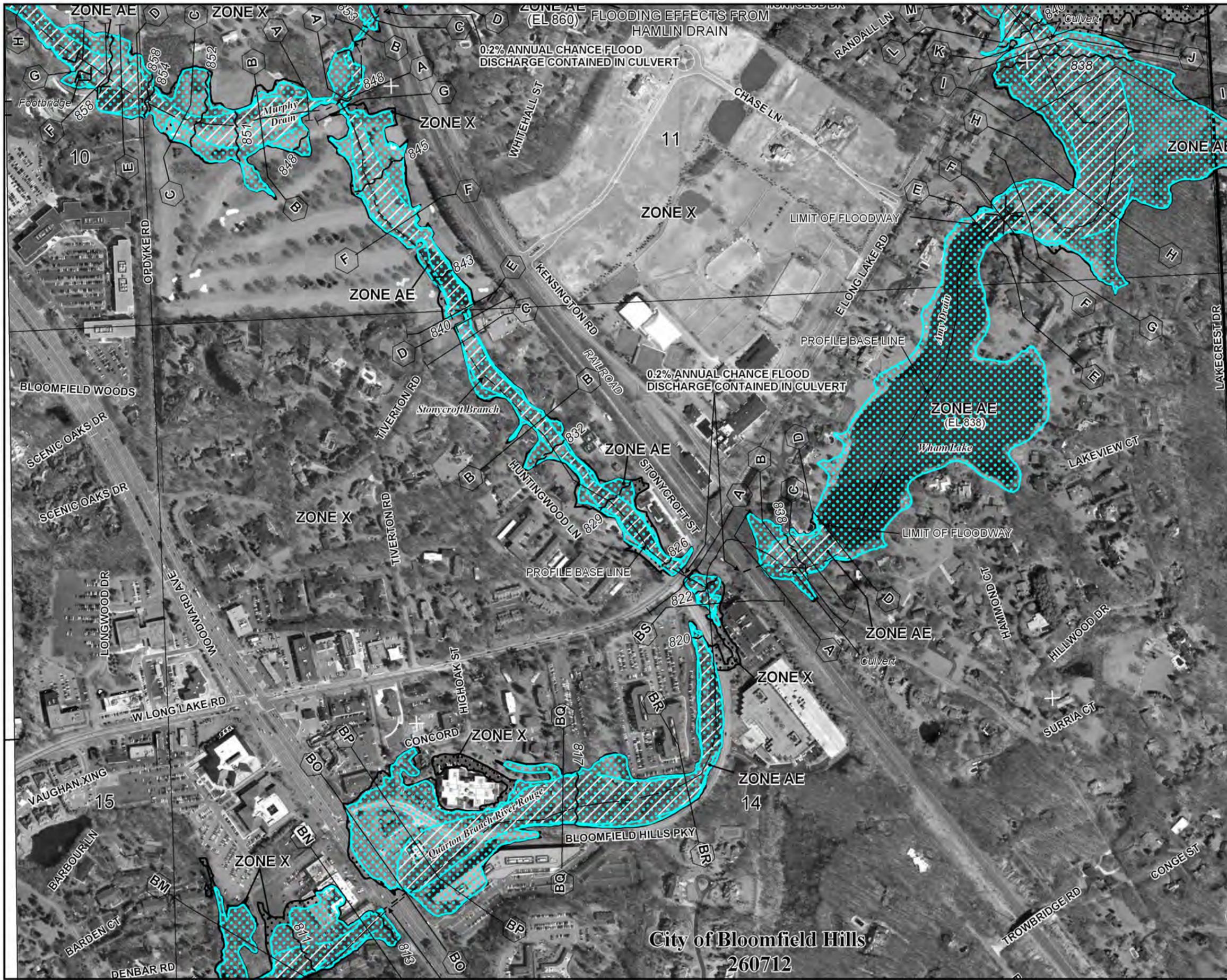
MAP NUMBER
26125C0529F

EFFECTIVE DATE
SEPTEMBER 29, 2006

Federal Emergency Management Agency

Location B2/B3

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



PANEL 0528F

FIRM
FLOOD INSURANCE RATE MAP

**OAKLAND COUNTY,
MICHIGAN**
(ALL JURISDICTIONS)

PANEL 528 OF 704
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BLOOMFIELD, TOWNSHIP OF	260169	0528	F
BLOOMFIELD HILLS, CITY OF	260712	0528	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
26125C0528F

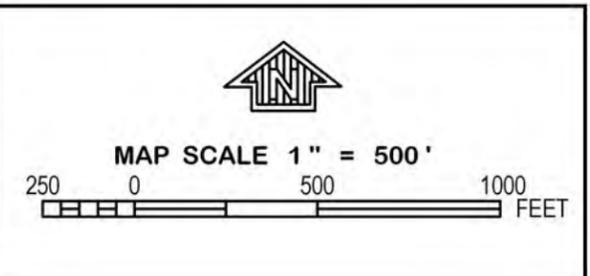
EFFECTIVE DATE
SEPTEMBER 29, 2006

Federal Emergency Management Agency

Location C2

City of Bloomfield Hills
260712

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



NFIP PANEL 0536F

FIRM
FLOOD INSURANCE RATE MAP

OAKLAND COUNTY, MICHIGAN
(ALL JURISDICTIONS)

PANEL 536 OF 704
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEVERLY HILLS, VILLAGE OF	260256	0536	F
BIRMINGHAM, CITY OF	260168	0536	F
BLOOMFIELD, TOWNSHIP OF	260169	0536	F
BLOOMFIELD HILLS, CITY OF	260712	0536	F

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
26125C0536F

EFFECTIVE DATE
SEPTEMBER 29, 2006

Federal Emergency Management Agency

Location C4

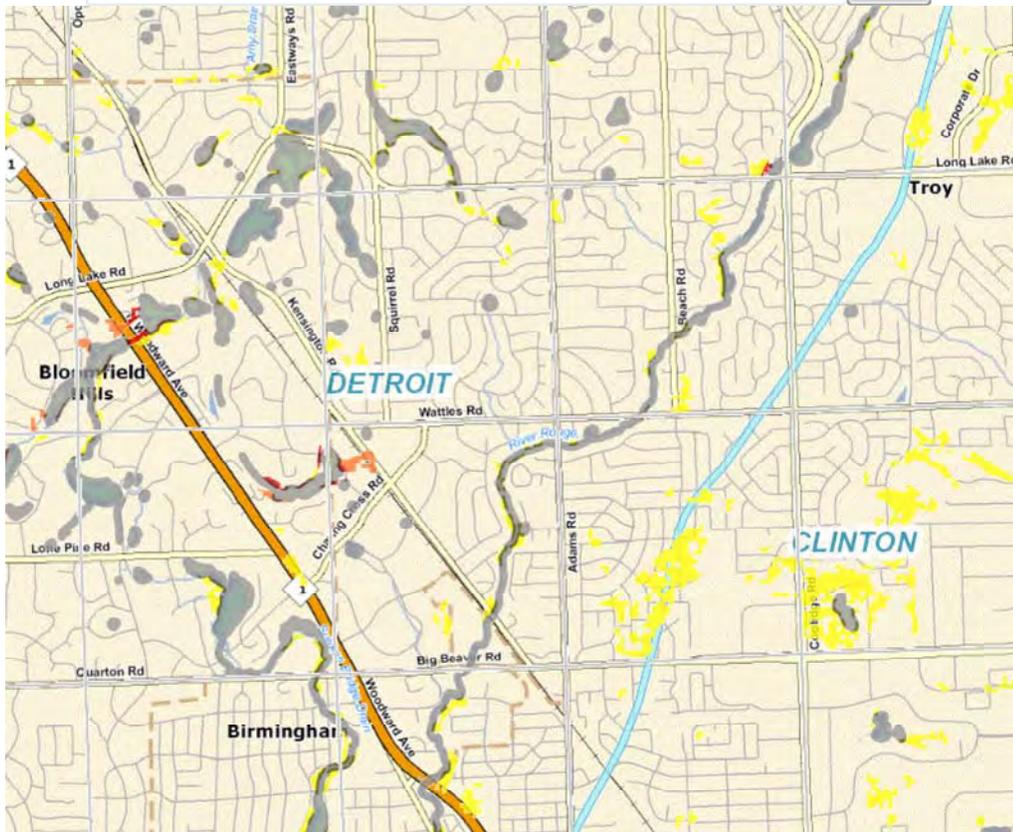
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Wetlands Map Viewer

[Print page](#)

Location B2/B3

[Add Title](#)



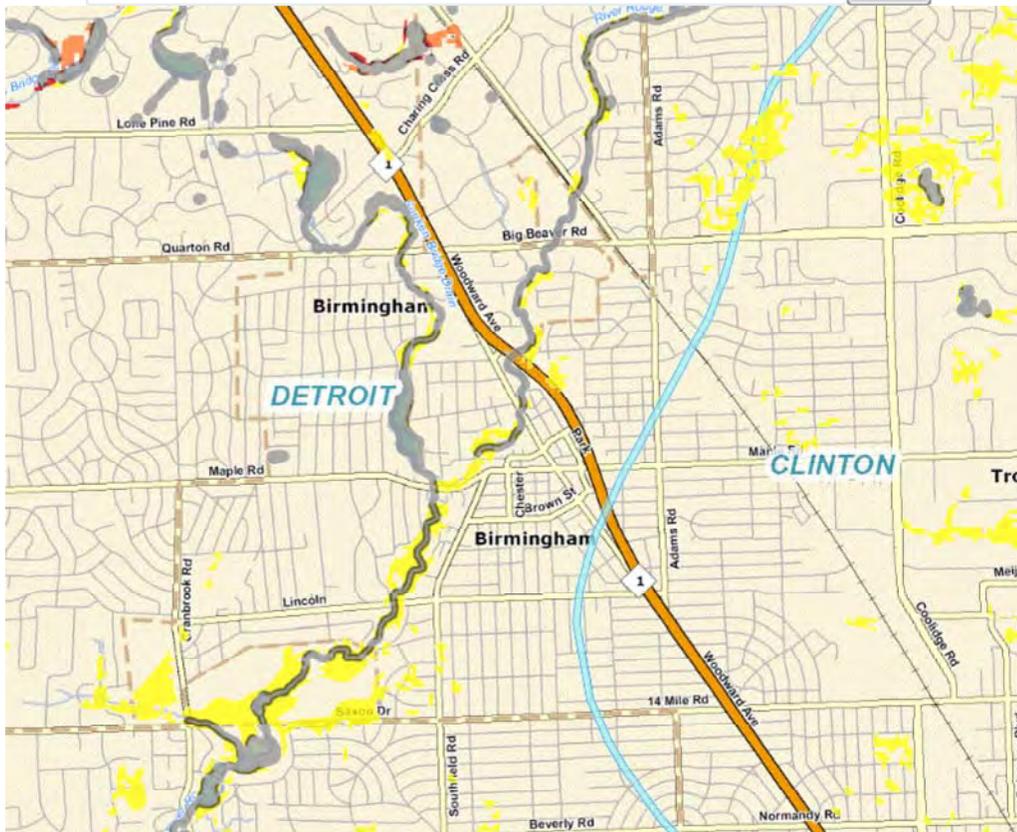
- Unincorporated Places
- Interchanges
- Freeways
- Highways
- Primary Roads
- Local Roads
- Railroads
- Townships
- Lakes
- Rivers
- City, Village, CDP
- County Boundaries
- Sections**
- Public Land Survey System - Sections Extended
- Land and Water**
- National Wetlands Inventory
- Highest Potential - Hydric and Presettlement Wetland Overlay
- High Potential - Hydric Soils Only
- Moderate Potential - Presettlement Wetlands Only
- Watershed Basins

This map is not intended to be used to determine the specific locations and jurisdictional boundaries of wetland areas subject to regulation. More information regarding this map, including how to obtain a copy can be accessed at www.michigan.gov/wetlands
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Wetlands Map Viewer

[Print page](#)

Location B4



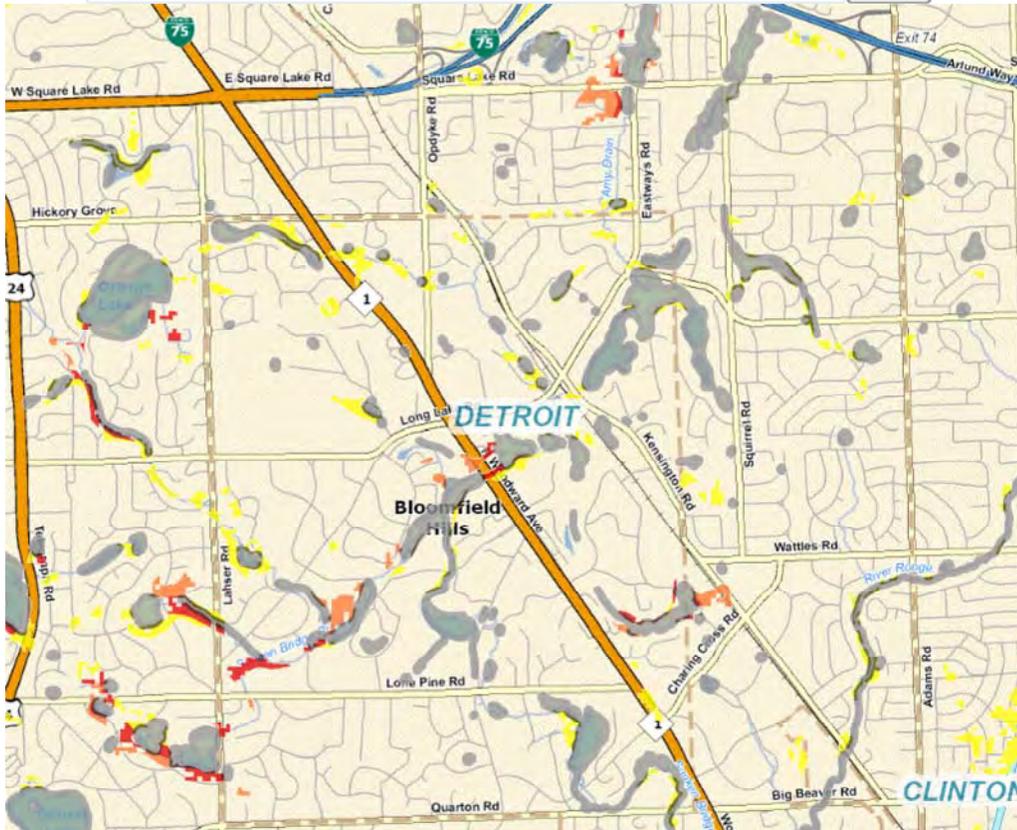
- Unincorporated Places
- Interchanges
- Freeways
- Highways
- Primary Roads
- Local Roads
- + Railroads
- Townships
- Lakes
- Rivers
- City, Village, CDP
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Wetlands Map Viewer

[Print page](#)

Location C2



- Unincorporated Places
- Interchanges
- Freeways
- Highways
- Primary Roads
- Local Roads
- + Railroads
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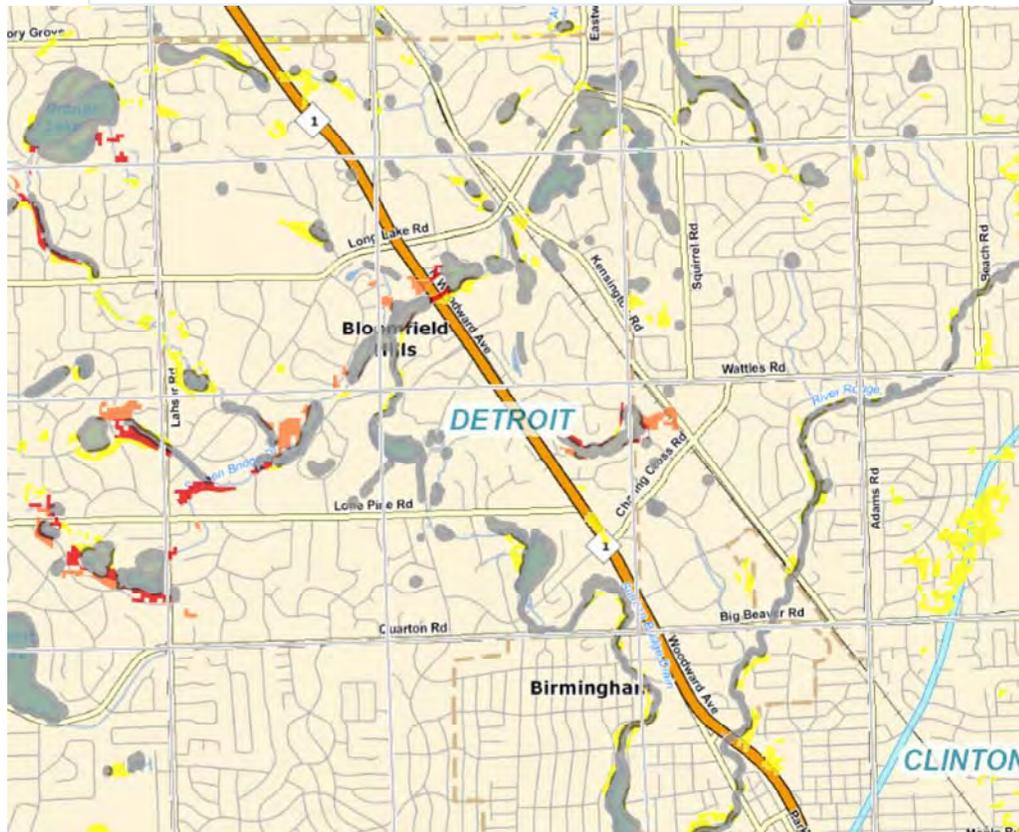
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Wetlands Map Viewer

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Location C4

[Add Title](#)



- Unincorporated Places
- Interchanges
- Freeways
- Highways
- Primary Roads
- Local Roads
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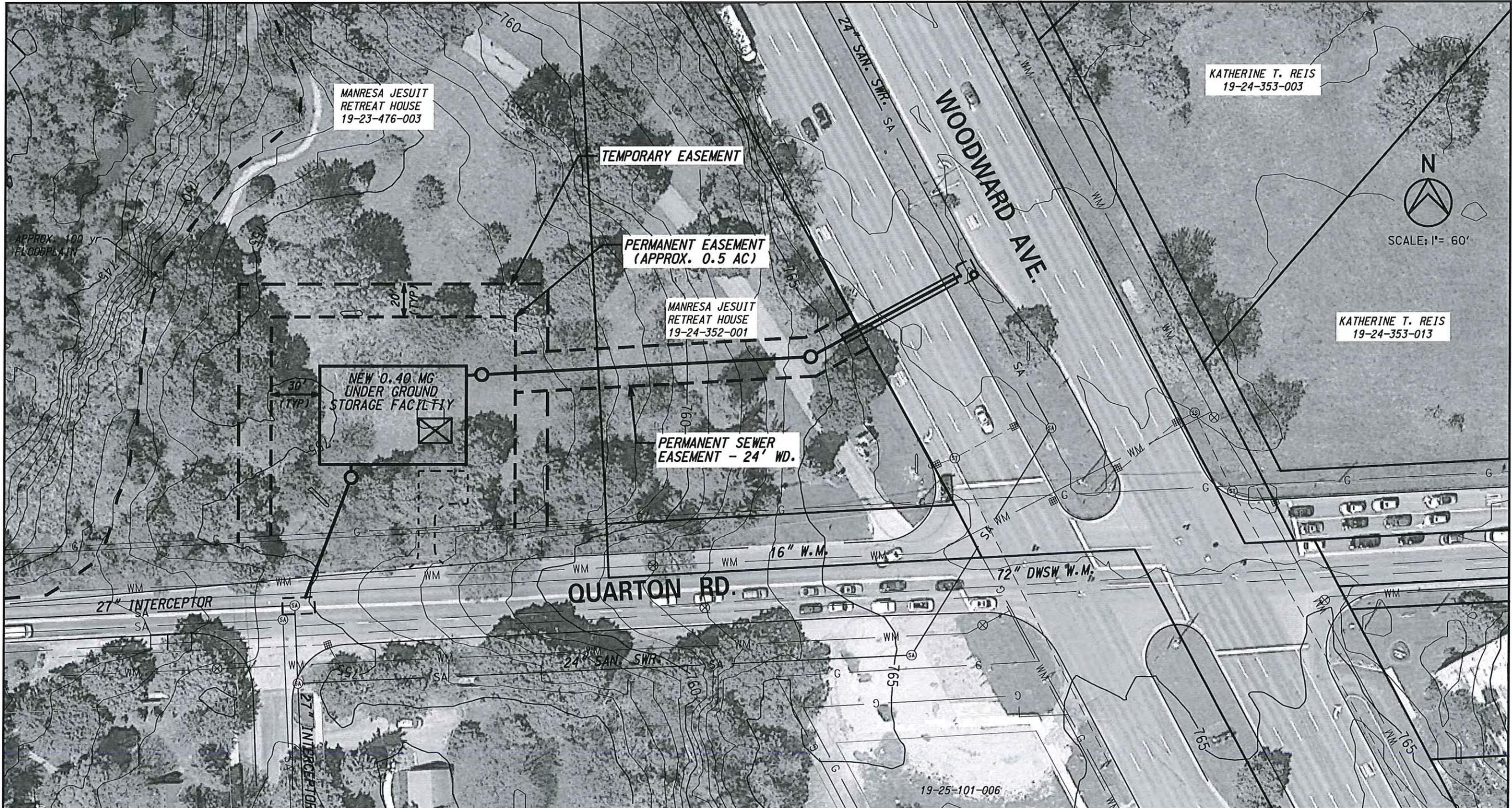
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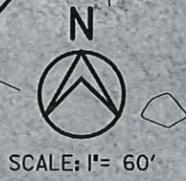
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USER NAME - blunt



KATHERINE T. REIS
19-24-353-003

KATHERINE T. REIS
19-24-353-013



NOTICE:

ALL EXISTING UTILITIES SHOWN ON THIS TOPOGRAPHIC SURVEY HAVE BEEN TAKEN FROM VISUAL OBSERVATION, AND RECORD MAPPING FROM PREVIOUS CITY OF BIRMINGHAM PROJECTS. NO GUARANTEE IS MADE, OR SHOULD BE ASSUMED, AS TO THE COMPLETENESS OR ACCURACY OF THE UTILITIES SHOWN ON THIS DRAWING. PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS PRIOR TO CONSTRUCTION ACTIVITIES.

**OCWRC - NORTH EVERGREEN INTERCEPTOR
PROJECT C4 - QUARTON & WOODWARD**

JOB NO. 20130714	<p>HUBBELL, ROTH & CLARK, INC Consulting Engineers</p>	<p>555 HULET DRIVE BLOOMFIELD HILLS, MICH. 48303 - 0824</p> <p>PHONE: (248) 338-9241 FAX (1st. Floor): (248) 454-6312 FAX (2nd. Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com</p>	FIGURE
DATE JANUARY 2014			C4-1



HUBBELL, ROTH & CLARK, INC
Consulting Engineers

Memorandum

To: Karen Nickols

From: Karyn Stickel, P.E.

Date: March 28, 2014

Subject: MNFI Rare Species Review – EFSDS Project Plan

HRC Job No. 20130714

Per current SRF requirements, the rare species review is now completed through the Michigan State University Extension Michigan Natural Features Inventory (MNFI), rather than the Michigan Department of Natural Resources as of November 1, 2012. The previous mechanism for completing these reviews would identify the potentially affected species and provide a letter from the DNR which could be used by the State Revolving Fund reviewer to prepare the Finding of No Significant Impact (FNSI). The new process only identifies species that may be impacted, but does not provide a clearance letter. We hope that this memorandum will provide the information necessary to prepare the FNSI.

HRC submitted a request to the MNFI in accordance with SRF guidelines, and received the attached letter response (dated March 17, 2014). The letter was prepared by Mr. Michael Sanders, the environmental review specialist. His letter provided a list of all possible species in the vicinity of the project and the comments section of his letter identified the specific species of concern that may potentially be impacted by the proposed project within a 1.5 square mile area.

In the case of the Evergreen-Farmington Sewage Disposal System (EFSDS), the species of concern are the *Woodland Vole*, *Clinton's Bulbrush*, *Hairy Angelica*, and the *River Fingernail Clam*. The legally protected species around the EFSDS sites include the state threatened *Showy Orchis*, *False Hop Sedge*, *Least Shrew*, and the *Slippershell*. The only listed endangered species is the *American Chestnut*. The mentioned plants and small animals tend to thrive in woody deciduous areas, forests, or meadows. Some of these species can also exist in areas that experience aquatic conditions.

The majority of the proposed project locations are along road right-of-ways near wooded areas. There are no aquatic habitats in the vicinity of the project locations. However, since a majority of these sites are near residential properties and sparsely wooded areas, it is not likely that these species will be encountered or disturbed. When the limits of ground-disturbing activities are further refined during the design phases for the various projects, additional review will be made to determine if the habitat for the species will be impacted.

Mr. Sanders indicated that based on their review of the database, these species are NOT LIKELY to be impacted by the proposed construction. The nature and location of the proposed project are not likely to cause adverse impacts to the listed species. He indicated that MNFI was not looking for a response to their letter and a memorandum in the file outlining the steps that will be taken to minimize impacts during design and construction could help the State make a determination of No Significant Impact for project planning purposes.

The future projects will take place on property located in Troy, Birmingham, Bloomfield Hills and Bloomfield Township within Oakland County. Activities associated with the proposed construction will occur within public road right-of-way and on County owned property or easements. Attempts to minimize tree removals to the extent possible will be made. Sensitive habitats impacted by construction, along with other disturbed areas, will be restored to their previous condition prior to the construction activities. If necessary, a biologist will be hired to review the area, determine the limits of potential impacts, and make recommendations for mitigation of any concerns.

Based on this, we do not feel that any of the species of special concern, the threatened species, or the endangered species and their habitat will be adversely affected by the proposed project.



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
MICHIGAN STATE HOUSING DEVELOPMENT AUTHORITY
STATE HISTORIC PRESERVATION OFFICE

SCOTT WOOSLEY
EXECUTIVE DIRECTOR

April 25, 2014

SONYA T BUTLER
SECTION CHIEF RLOCS
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
P O BOX 30241
LANSING MI 48909

RE: ER14-203 OCWRC Evergreen – Farmington Sewage Disposal System, Sec. 11, 23, 24, & 32, T2N, R10E, Bloomfield Township & Bloomfield Hills, Oakland County (EPA)

Dear Ms. Butler,

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, it is the opinion of the State Historic Preservation Officer (SHPO) that **no historic properties are affected** within the area of potential effects of this undertaking.

This letter evidences the EPA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of the EPA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." **If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.**

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Specialist, at (517) 335-2721 or by email at GrennellB@michigan.gov. **Please reference our project number in all communication with this office regarding this undertaking.** Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Brian G. Grennell
Cultural Resource Management Specialist

for Brian D. Conway
State Historic Preservation Officer

SAT:BGG:sb

Copy: Karyn Sticklel, Hubbell, Roth, and Clark



Appendix D

Technical Memoranda

PRINCIPALS

George E. Hubbell
Thomas E. Biehl
Walter H. Alix
Peter T. Roth
Keith D. McCormack
Nancy M. D. Faught
Daniel W. Mitchell
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HUBBELL, ROTH & CLARK, INC.

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WEBSITE: www.hrc-engr.com
EMAIL: info@hrc-engr.com

Evergreen Farmington Sewage Disposal System (EFSDS) Memorandum of Understanding Regarding the North Evergreen Interceptor (NEI) Improvements to Meet the Goals of the Long Term Corrective Action Plan (LTCAP)

May 12, 2014

Introduction

This technical memorandum is intended to accompany the *Evergreen-Farmington Sewage Disposal System North Evergreen Interceptor SRF Project Plan*, prepared for the Oakland County Water Resources Commissioner's Office in 2014 by Hubbell, Roth & Clark, Inc. (hereafter referred to as Project Plan). Refer to the Project Plan for all definitions and further information regarding the projects described herein.

This technical memo includes a description of conceptual projects that have been identified as meeting the goals of the EFSDS LTCAP and have been identified as the selected alternative for the Project Plan. The conceptual projects listed herein were vetted for appropriate location, sizing, cost-effectiveness (relative to other system improvements), and ability to reduce the occurrence of SSOs as defined by MDEQ SSO Policy.

Individual Branch Report Outline

This technical memo is derived from information contained within the LTCAP that addresses SSO/capacity issues throughout the EFSDS. While the LTCAP Team has evaluated system-wide improvements, this technical memo details only those projects within the Quarton and Troy Arms; these are known as "B" and "C" projects. A map of all projects identified in the LTCAP is provided in Figure 1.

The following is a general description of the information presented herein:

A. Location – the location of the system branch addressed by the project grouping, with a location map showing key features and a description of the sewershed, interceptor pipes, and observed SSO locations.

B. Definition of Problem – The extent of known/modeled SSOs/surcharging, with hydraulic profiles illustrating design storm surcharging and observed SSOs.

C. Projects – Type, size, and location of each individual project within a specific grouping. This review only covers the Phase 1 projects along the NEI arm (refer to Section 1 of the Project Plan for more information regarding Phase 1 and 2 projects). Planning-level cost-estimates are included for the Phase 1 projects, as are anticipated frequencies of use. Figures illustrate the location of individual conceptual projects within the project branch grouping.

D. Planning Level Cost-Estimates – Preliminary cost-estimates are provided for each project.

General Conditions

Descriptions, details, planning-level cost-estimates and frequency of use are shown for only Phase 1 projects, as the location, type, and sizing of Phase 2 projects as identified in the LTCAP cannot be confirmed until the impacts of Phase 1 projects can be measured. Phase 1 projects were identified as those projects where observations have validated the existence of an SSO which can be mitigated by a proposed project. Phase 2 projects are illustrated on the overall drawing for future consideration, based on their potential to address other known hydraulic deficiencies which, at this time, have only been identified through modeling efforts. However, these projects are not described herein. These projects may be constructed in the future after further investigation is done.

Troy Branch Preliminary Projects (B Series)

A. Location

The Troy branch of the system is defined from the northeast corner of Bloomfield Township, through the western portion of Troy, and reenters Bloomfield Township before converging with the Quarton Arm in the City of Birmingham as shown on Figure 2. It consists of the main branch of the County Interceptor starting at Adams Road, a half mile north of I-75 (at the border of Bloomfield Township), continuing downstream to Maple Road, where the Troy branch joins with the Quarton branch. Portions of Bloomfield Hills, Bloomfield Township and City of Troy are tributary to this reach. The interceptor sewer ranges in size from 15-inch to 27-inch through this reach and services a 9.5-square mile area.

B. Definition of Problem

The Troy branch experiences high wet weather flows and related surcharging that necessitates the City of Troy to perform relief pumping from the interceptor to the Rouge River during significant events, creating SSOs at three locations. The locations of SSOs are depicted on Figure 2. Examination of historic relief pumping data indicates that Troy performs relief pumping whenever the level in the interceptor exceeds approximately 1-foot above the crown of pipe at the locations shown in Figure 3. The City performs this work in order to protect adjacent properties from basement flooding. Since 2005 there have been 11 events during which the City has implemented relief pumping.

While I/I have been identified as a contributing source of excess flow, the primary cause of relief pumping is due to the interceptor surcharging and elevated hydraulic grade (HG). This was initially identified by Troy staff who indicated that during large rain events the level in the manhole rises much more rapidly than expected. Flow metering data indicated that the system experiences much higher depths and higher levels of surcharging during large rain events than would be expected based on generally-accepted hydraulic modeling parameters. During events where the HG should be within the pipe, the hydraulic discrepancy has been as much as four feet (i.e. the system surcharges by four feet more than is expected from normal hydraulic losses). Original model simulations did not support real-world conditions of high HG

during rain events. This resulted in extensive evaluations of the Troy branch, termed “hydraulic discrepancy investigation”. The following evaluations were conducted:

On May 24, 2012, the system was field tested in an attempt to identify the locations and magnitudes of the discrepancy. Approximately 7 cfs of flow was added to the base flow in the interceptor from fire hydrants upstream of Adams Road and flow meters were monitored to generate a peak flow of 11 cfs, which is in the range which causes the discrepancy. The test confirmed that capacities were restricted, verified the accuracy of the meters in this branch, and suggested that the hydraulic discrepancy begins when flows in the interceptor reached the spring line of the pipes. When county crews checked manholes for unusual characteristics, it was noticed that almost all manholes along the Troy branch are square/rectangular with bench heights less than about half the pipe diameter (spring line of pipe).

Based on the observations and data collected during the May 24, 2012 field investigation, a hypothesis was proposed that losses in manholes were higher than normal and likely due to high entrance and exit losses within each manhole. To test the hypothesis, a model replica of one of the manholes in the Troy branch (square manhole with a bench at the half the pipe diameter) was constructed by the University of Michigan hydraulics professor Dr. Steven Wright, PhD., P.E. The test indicated that manhole losses are higher than normal, once the depth exceeds the half-way point of the pipe and rises over the bench. Furthermore, it was determined that these manhole losses increased an order of magnitude higher when coupled with a horizontal deflection.

The hydraulic losses observed in the lab, combined with literature review, were used to develop additional minor loss coefficients for these structures. Additional hydraulic losses in the model were able to replicate the behavior observed during the May 24, 2012 field test and for other large storm events.

Subsequent evaluations revealed additional sources of high HG through this reach, specifically, the Old Woodward Avenue “zig-zag” and the 36-inch elliptical crossing under Woodward Avenue. The sewer and/or manholes at both of these locations are hydraulically inefficient.

Following the field investigations the model was updated with entrance and exit losses resulting in improved representation of real-world conditions. Figure 3 shows the resultant HG for the 10-year, 1-hour design storm, without any relief pumping, but with system flooding occurring at specific junctions where the computed water level exceeds the ground elevation at the manhole.

Projects

In the initial project vetting/conception, models were created for transport-and-treat only options, and options that included both transport and storage (i.e. a hybrid option). For this preliminary study, transport and treat was found to be 75% more expensive than the hybrid option. Therefore, the projects listed below are a combination of transport and storage. All projects in this branch are Phase 1 projects.

C. Projects

The proposed preliminary projects for this section are illustrated in Figure 4 and preliminary design drawings are also included with this technical memo. The improvements are described as follows:

Project B2/B3: Project B2/B3 consists of a linear storage tank in the form of a 60-inch pipe. A total of approximately 3,500 feet of 60-inch pipe provides a total storage volume of 0.51 MG. This linear storage is provided along Wattles Road east and west of Adams Road. Due to utility conflicts along Adams Road the storage is required to be divided into two sections. The preliminary design information for each storage unit is described as follows:

East of Adams Road: The section east of Adams Road consists of a total of approximately 1,900 feet of 60-inch pipe (providing 0.28 MG of storage) and diverts flow from the interceptor at manhole TRT071001. For the 10-year, 1-hour design event, it is estimated this storage facility will remove approximately 3.5 cfs of peak flow from the interceptor.

The configuration of the storage pipe is approximately 1,410 feet along Wattles Road, west of the interceptor, to the intersection of Chestnut Hill Court, then 490 feet south along Chestnut Hill Court to the intersection of the interceptor at manhole TRT074003.

At manhole TRT071001, flow is diverted from the interceptor into the linear storage via control structure with an adjustable weir set at an elevation greater than the estimated dry weather flow level.

The general operation of the east side storage is such that when flow enters the storage pipe, a motorized sluice gate in a control structure at TRT074003 will be closed thereby resulting in temporary “off-line” storage. The sluice gate will remain in the closed position until the HG in the system is below the critical elevation and can be opened to dewater the storage pipe into the interceptor by gravity at manhole TRT074003. The critical elevation in the interceptor, located at manhole TRT074001, is at an elevation of approximately 754.56. The interceptor level at OCWRC meter 3520 (located in manhole BLT093015, 280 feet downstream from TRT074001) will be monitored by the County’s Supervisory Control and Data Acquisition (SCADA) control system to control operation of the gate.

Several different flushing options have been considered including:

- Periodic cleaning of the 60-inch storage pipe by jetting.
- Flushing with interceptor flow via a removable weir section in diversion structure.
- Spray nozzles.

A final determination of the most appropriate flushing option will be determined during detailed design.

West of Adams Road: The section west of Adams Road consists of a total of approximately 1,600 feet of 60-inch pipe (providing 0.23 MG of storage) and during a significant rain event will capture/detain Bloomfield Township (BLT) flow prior to

discharging to the interceptor at manhole BLT093012. For the 10-year, 1-hour design event, it is estimated this storage facility will remove approximately 2.6 cfs of peak flow from the interceptor.

The configuration of the storage pipe is approximately 1,600 feet along Wattles Road, from the intersection of Burnley Drive west to approximately 235 feet west of Kirkcaldy Road.

At the intersection of Burnley Drive and Wattles, a junction chamber will be constructed that will allow dry weather flow from the local system to continue through a newly constructed, lowered 12-inch pipe that will discharge to the interceptor via manhole BLT093012.

The general operation of the west side storage is such that during significant rain events a motorized sluice gate will close causing the flow in the local system to back up and fill the 60-inch linear storage pipe with a crown of pipe that is lower than the local sewer. The storage facility will fill to an elevation that is below or at the acceptable surcharge level in the local sewer and then overflow a weir to discharge into the 12-inch pipe that discharges to the interceptor. The weir will be sized such that the flow rate into the interceptor is approximately 1.10 cfs. It is anticipated to provide SCADA controls and monitoring at this location and use level information recorded at WRC meter 3520 to control operation of the gate.

The storage facility will dewater to the interceptor by gravity once flows in the interceptor have subsided.

Several different flushing options have been considered for this including:

- Periodic cleaning of the 60-inch storage pipe by jetting.
- Flushing with stored flow when the motorized gate in the control structure is reopened.
- Spray nozzles.

A final determination of the most appropriate flushing option will be determined during detailed design.

The project plan assumes that both of these sections of the project need to be constructed as one project in order to address the subject SSO. Therefore, all costs in the planning document are combined.

Project B4: Project B4 consists of three individual projects to address the items encountered as part of the hydraulic discrepancy investigations. It is difficult to assess the impact of each individual hydraulic discrepancy; however, it is estimated the combined impact of all the discrepancies results in an increase in the HG by at least 2 feet. The B4 projects work in conjunction with the B2/B3 projects and all are required to adequately reduce the HG to an acceptable elevation while minimizing the required storage volume in B2/B3. The B4 projects are described as follows:

Hydraulic Restriction - Zig-Zag: The sewer along Old Woodward between Vinewood and Harmon, consists of two severe bends, approximately 135 degrees each, resulting in two hydraulically inefficient manholes: BLT099014 and BLT099013.

The sewer was constructed with these bends to accommodate right-of-way boundaries around buildings which existed at the time. Since the original 1950's construction of the interceptor, the property boundaries and building locations have changed; currently there is a City-owned parking facility surrounding the zig-zag sewer and therefore realigning the sewer in this area is now feasible.

This project will consist of installing 216 feet of new 24-inch interceptor and realignment of the interceptor to reduce the bend angle to approximately 45 degrees.

Hydraulic Restriction – Woodward Crossing: The existing crossing under Woodward Avenue consists of a 36-inch vertical elliptical sewer that connects 24-inch pipes upstream and downstream of the Woodward crossing. During recent televising investigation, it was determined the upstream invert of the 36-inch sewer and corresponding manhole was causing a flow restriction as the depth of the sewer at this location is much greater than the downstream flow depth. It is estimated the invert at the upstream end is higher than the invert of the discharge pipe thereby creating a hydraulic restriction in the interceptor.

Improvements at this location include construction of a new junction chamber at the upstream end with 24-inch diameter sewer lining of the 36-inch elliptical sewer and grouting of the resultant annular space. In addition, the downstream manhole bench will be rehabilitated to bring the bench up to the top of pipe as described below.

Hydraulic Restriction – Manhole Bench Rehabilitation: There are a total of 51 manholes between manhole BLT09910, just downstream of Woodward Ave, and manhole BLT093015, just downstream of Adams Road. Of these 51 manholes, 50 manholes, at the time of the hydraulic discrepancy field investigation, have a bench height which is less than the pipe diameter (bench invert ratio less than 1.0). Since the field investigation, the benches for 6 manholes were adjusted to full pipe height (the manholes between BLT098009 and BLT097002). Of the remaining 44 manholes with benches less than full height, the field investigations revealed sections of sewer where the HG is rising faster than the slope of the pipe indicating local restrictions within the pipe and/or manholes. There are 19 manholes within the areas causing the restriction. Of these 19 manholes, 3 will be repaired through the Zig-Zag and Woodward Crossing projects described above. Therefore, the benches for the remaining 16 manholes will be rehabilitated to provide a full bench height.

In general, the rehabilitation will involve installing additional concrete to the manhole bench adjacent to the sewer flow channel such that sewer flow will continue through the manhole and remain channelized up to the top of pipe. During larger events it will likely overtop the new bench but at less frequency than currently experienced.

D. Planning-Level Cost-Estimates

Planning-level cost-estimates were prepared for the projects described in this Section. The costs are summarized in Table 1. The cost-estimates were prepared by performing a brief field reconnaissance and investigation of the project area using information visible in the field, on available aerial photography, local and County GIS data, and other readily available information. Detailed field survey, sub-surface investigation, site evaluation, environmental site assessments, route evaluation and easement

acquisition estimates have not been performed, as these are planned to occur during project design.

Table 1
Troy Branch Planning-Level Cost-estimates – Phase 1 Projects

Project	Description	Phase	Phase 1 Conceptual Project Cost
B2/B3	0.51 MG Tank	1	\$4,503,000
B4	Hydraulic Restriction – Zig-Zag, Woodward Crossing, and Manhole Bench Rehab	1	\$966,000
Phase 1 Total:			\$5,469,000

Quarton Branch Conceptual and Preliminary Projects (C Series)

A. Location

The Quarton branch of the system is shown in Figure 5 and consists of the main branch of the EFSDS Interceptor upstream starting at Maple Road near Southfield Road and extends north to South Boulevard and northwest to Telegraph Road. Portions of the City of Auburn Hills, City of Birmingham, Bloomfield Hills and Bloomfield Township are tributary to this reach. The interceptor sewer ranges in size from 15-inch to 27-inch through this reach and services a 15-square mile area.

B. Definition of Problem

The Quarton Branch experiences high wet weather flows and related surcharging that creates observed SSOs near the intersection of Kingsley Trail and Kensington Road and on Lakeside Drive south of Quarton Road near the intersection with Redding Road. The locations of observed SSOs are shown on Figure 5. In addition, the model shows significant surcharging with HGs above the acceptable limit on three arms of this section, shown on the profile in Figure 6.

C. Projects

The proposed preliminary and conceptual projects for this section are illustrated in Figure 7. Projects C2 and C4 are Phase 1 projects; Projects C1 and C3 are Phase 2 projects and not discussed herein. As well, the preliminary design drawings for the C2 and C4 projects are included with this technical memo. The Phase 1 projects in this branch consist of the following components:

Project C2: Project C2 consists of approximately 3,000 feet of 18-inch diameter relief sewer between manholes BLT043005 and BLT054018 (near the intersections of Kensington Road / Kingsley Trail and Huntington Lane / Long Lake Road, respectively). The relief sewer invert will be set slightly higher than the dry weather

flow depth so that base flows are conveyed in the existing sewer and wet weather flows will be split between the relief and existing sewers. Currently, it is estimated that the relief sewer will parallel the existing sewer through the Stonycroft Golf Course. In conjunction with the relief sewer, this project includes upgrading the Amy Relief Pump Station by replacing the existing liquid drive pumps with either constant speed pumps or variable frequency drive (VFD) pumps with improved pumping capacity. The station upgrades are required since additional flow will be passed through the facility as a result of the relief sewer and the existing station is operating close to its maximum firm capacity. In addition, the liquid drive pumps are problematic from a maintenance perspective.

Project C4: Project C4 consists of a 0.40 MG storage facility that will receive diverted flows from the interceptor sewer along Woodward Avenue between manholes BLT092009 and BLT095001. For the 10-year, 1-hour design event, it is estimated this storage facility will remove approximately 3.0 cfs of peak flow from the system.

The configuration of the storage facility includes a new junction chamber approximately 110 feet upstream from BLT095001 with an adjustable side weir set to an elevation above the dry weather flow that will divert flow into a new 24-inch sewer that will discharge into the storage facility. Currently the tank is estimated to be 60- x 90- x 10-feet and is proposed to be located at the northwest corner of Woodward Avenue and Quarton Road on property owned by Manresa Jesuit Retreat.

The general operation of the storage facility is such that when flow enters the tank the outlet on the south side of the tank will be closed thereby resulting in temporary “off-line” storage. The tank outlet control will consist of a motorized sluice gate that will be in the closed position until the hydraulic grade in the system is below the critical elevation and can be opened to dewater the tank. The critical HG, located at manhole BLT092005, is approximately 747.30. This is the elevation when the City of Birmingham local grade protection station serving 9 homes becomes isolated from the interceptor and the pumps are activated. It will be imperative to ensure the HG remains below 747.30 for events up to and including the 10-year, 1-hour design event in order to protect against basement flooding and/or SSOs. As part of this project the Birmingham grade projection station ownership is proposed to be transferred to OCWRC. By keeping the HG below 747.30 this will eliminate the other noted SSO location at manhole BLT101012. It is anticipated to provide SCADA controls and monitoring at the basin location and install a level meter at or near BLT092005 to control operation of the dewatering gate.

The storage tank will dewater to the interceptor by gravity via the sluice gate control that will be connected to approximately 100 feet of 24-inch pipe that will discharge into manhole BLT092001.

Flushing provisions will be provided for this facility with flushing options including spray nozzles and tipping buckets. A final determination of the most appropriate flushing option will be determined during detailed design.

D. Planning-Level Cost-Estimates

Planning-level cost-estimates were prepared for Phase 1 projects. Since Phase 2 projects have a high likelihood of changing or being eliminated, no conceptual costs are included as part of this report. The costs are summarized in Table 2. The cost-estimates were prepared by performing a brief field reconnaissance and investigation of the project area using information visible in the field, on available aerial photography, local and County GIS data, and other readily available information. Detailed field survey, sub-surface investigation, site evaluation, environmental site assessments, route evaluation and easement /land acquisition estimates have not been performed, as these are planned to occur during project design.

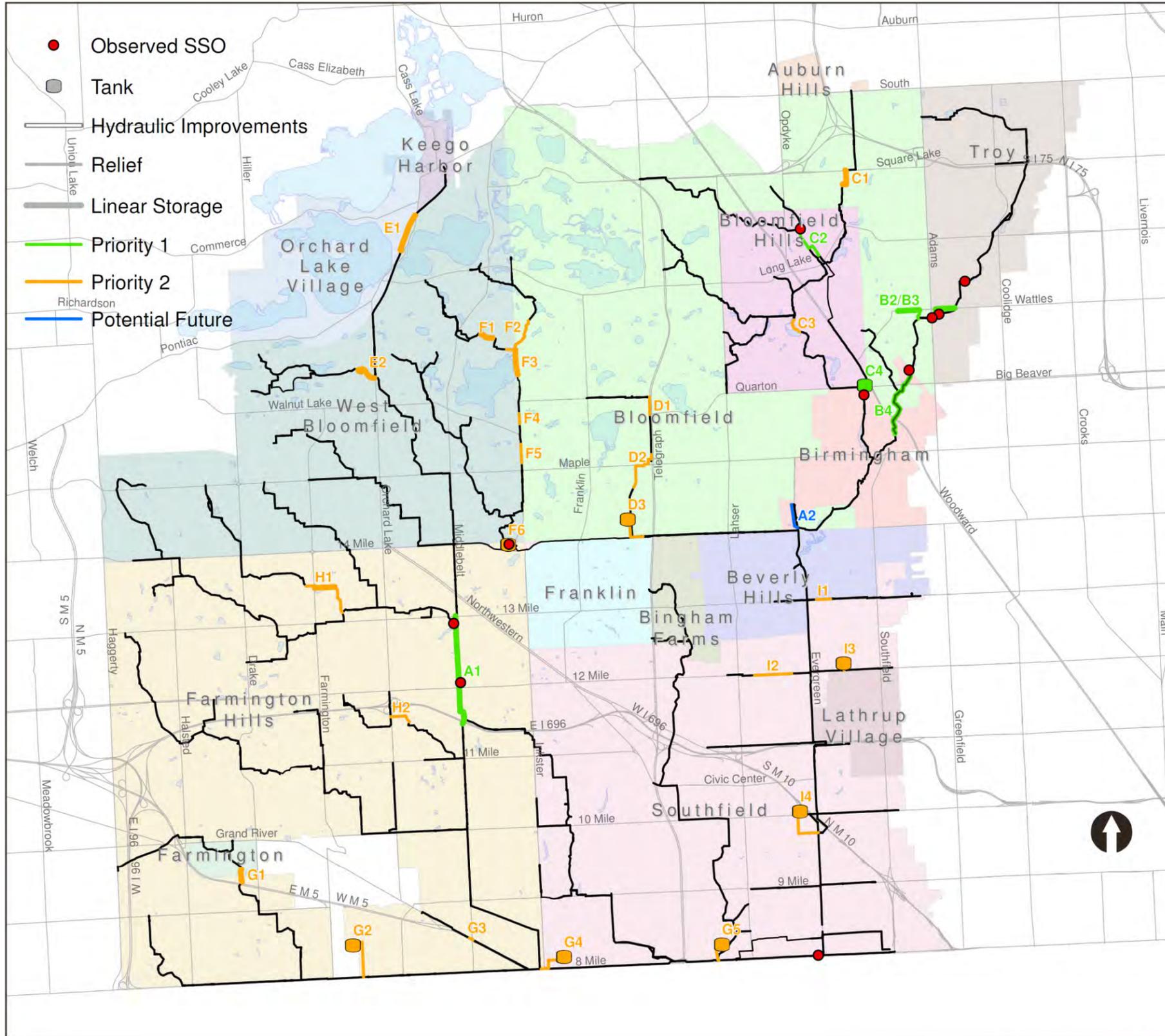
Table 2
Quarton Branch Planning-Level Cost-estimates – Phase 1 Projects

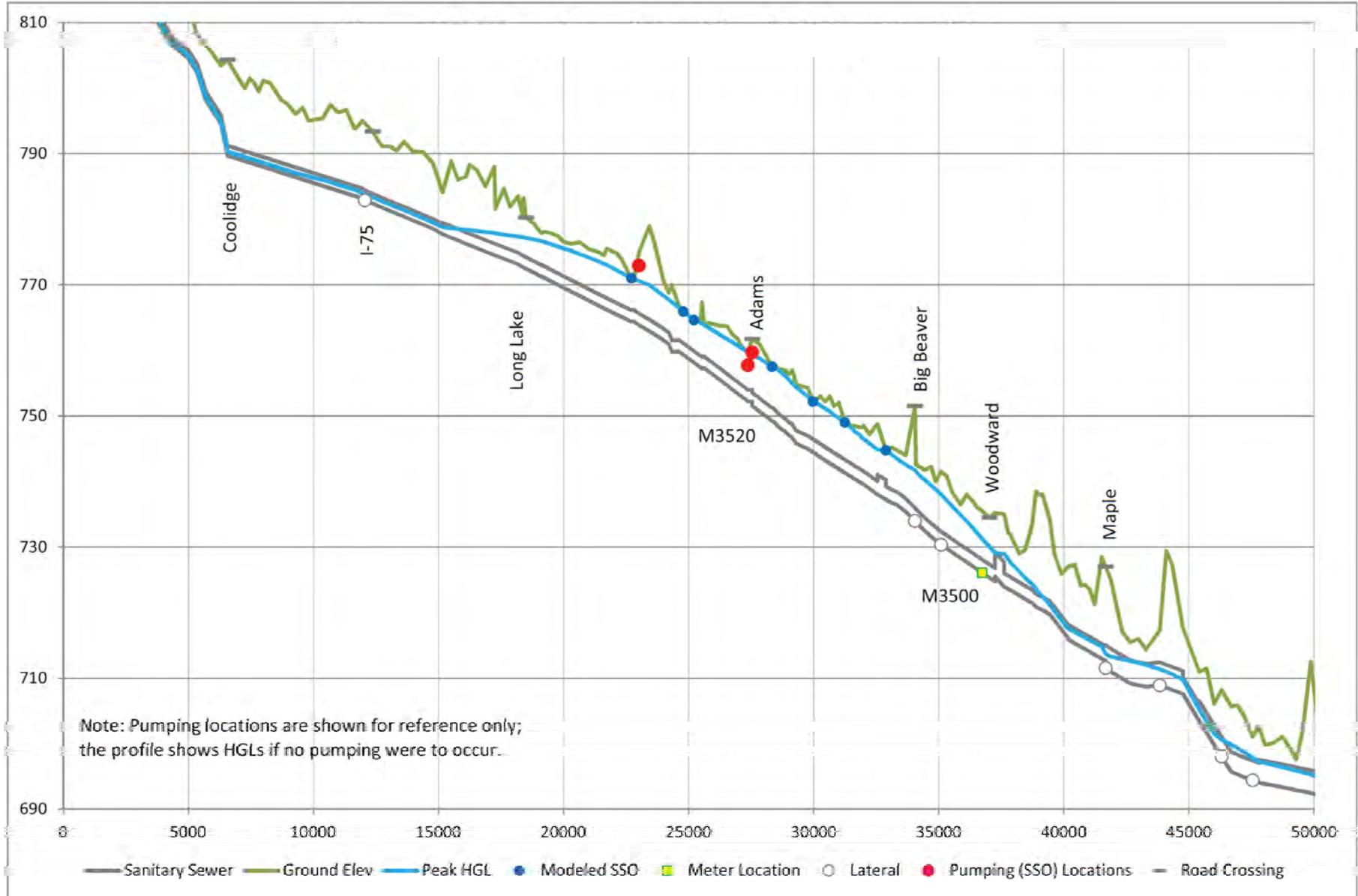
Project	Description	Phase	Phase 1 Conceptual Project Cost
C2	3,000-feet of 18-inch relief	1	\$1,729,000
C4	0.40 MG tank	1	\$6,271,000
Phase 1 Total:			\$8,000,000

Conceptual Project Summary

No.	Description	Phase
A1	Middlebelt Tunnel Storage	1
A2	WLPS RTB Connection	-
B2/B3	Wattles Road Linear Storage	1
B4	NEI Hydraulic Improvements	1
C1	Eastways Linear Storage	2
C2	Stonycroft Relief & Amy PS upgrades	1
C3	Cranbrook Relief	2
C4	Quarton Road Storage	1
D1	Telegraph Relief	2
D2	Maple Relief	2
D3	Cathedral Storage	2
E1	Orchard Lake Linear Storage	2
E2	Morris Lake Arm Linear Storage	2
F1	WLPS2 Relief A and Linear Storage	2
F2	WLPS2 Relief B	2
F3	WLPS2 Linear Storage	2
F4	Inkster Road Relief	2
F5	Inkster Road Relief	2
F6	WLPS1 Storage	2
G1	Tarabusi Arm Linear Storage	2
G2	8 Mile Storage	2
G3	Grand River Arm Relief	2
G4	Rensselaer Storage	2
G5	8 Mile PS Storage	2
H1	13 Mile Road Arm Linear Storage and Relief	2
H2	Kendallwood Arm Relief	2
I1	13 Mile Road Relief	2
I2	12 Mile Road Relief (West of Evergreen)	2
I3	12 Mile Road Storage (East of Evergreen)	2
I4	Evergreen Downstream Storage	2
Total	(30 Projects - 5 Phase 1; 24 Phase 2)	

Notes:





Information presented courtesy of OCWRC's Long-Term Corrective Action Team via Orchard Hiltz & McCliment, Inc.



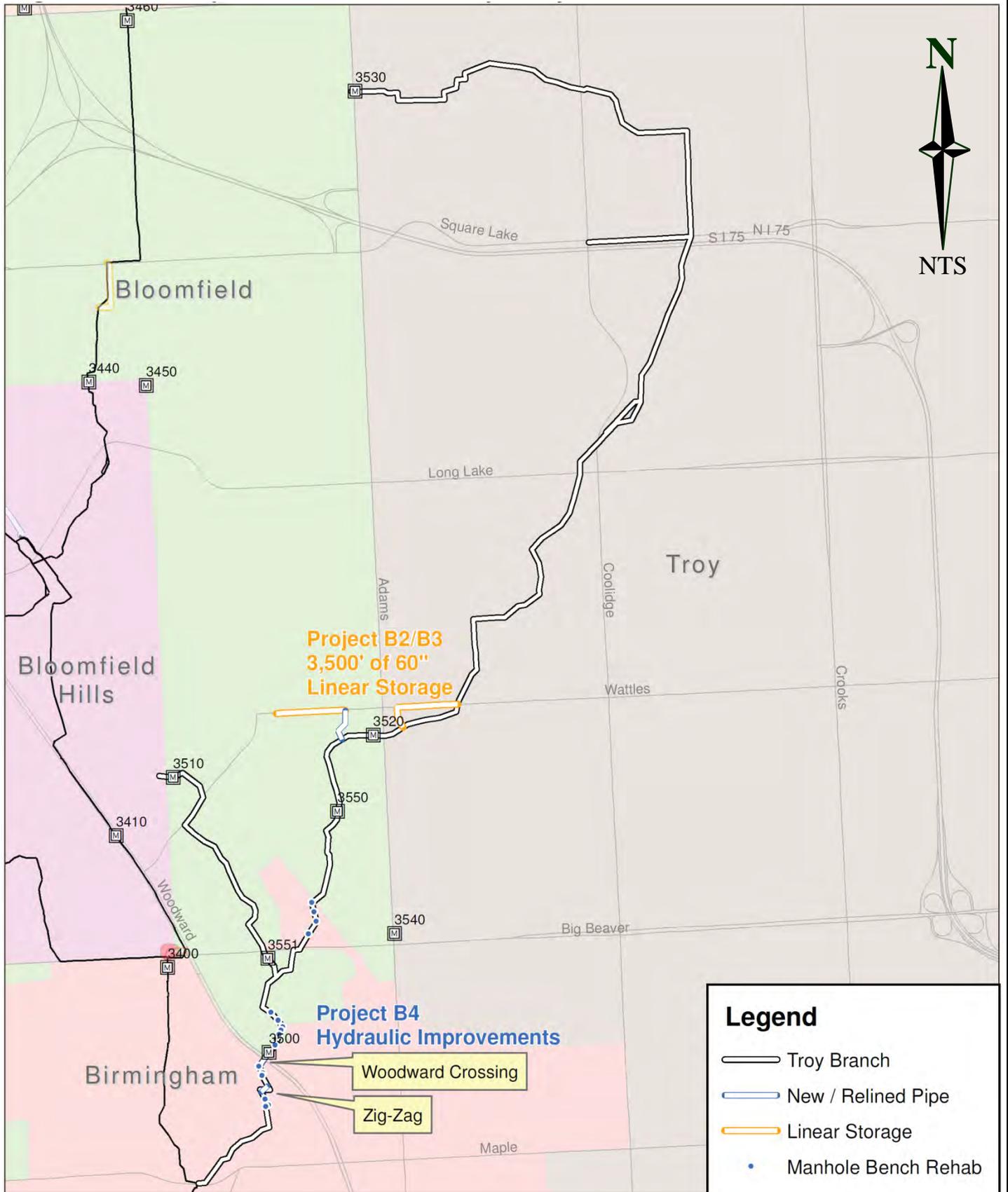
OCWRC - EFSDS North Evergreen Interceptor SRF Project Plan

Troy Branch Hydraulic Grade Profile – Existing Conditions

Job No.
20130714

Date
June, 2014

Figure No.
3



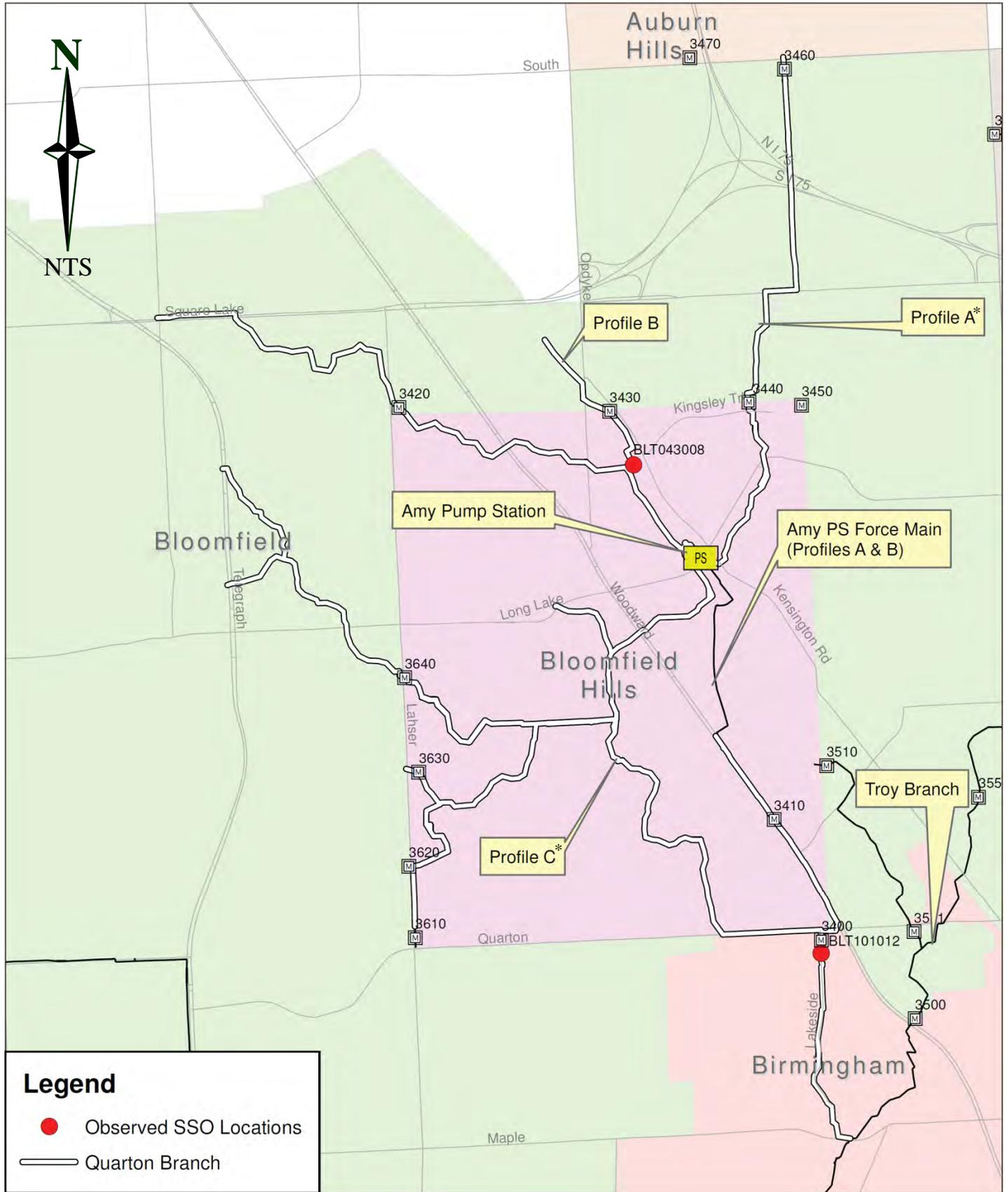
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OCWRC - EFSDS North Evergreen Interceptor SRF Project Plan

Troy Branch Preliminary Projects

Job No. 20130714
Date June, 2014
Figure No. 4



* This information is not shown in this document

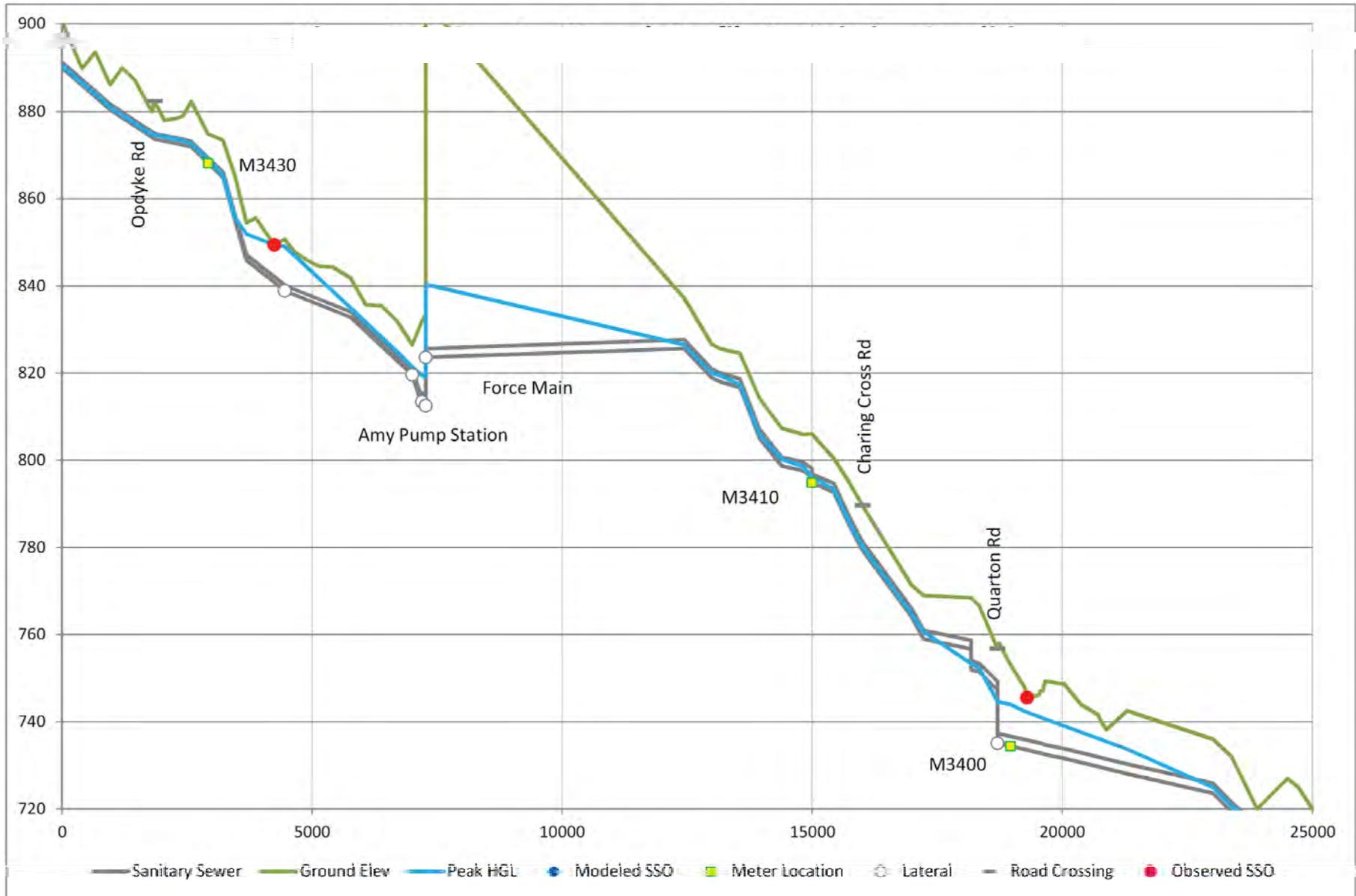
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OCWRC - EFSDS North Evergreen Interceptor SRF Project Plan

Quarton Branch Problem Location

Job No. 20130714
Date June, 2014
Figure No. 5



Information presented courtesy of OCWRC's Long-Term Corrective Action Team via Orchard Hiltz & McCliment, Inc.



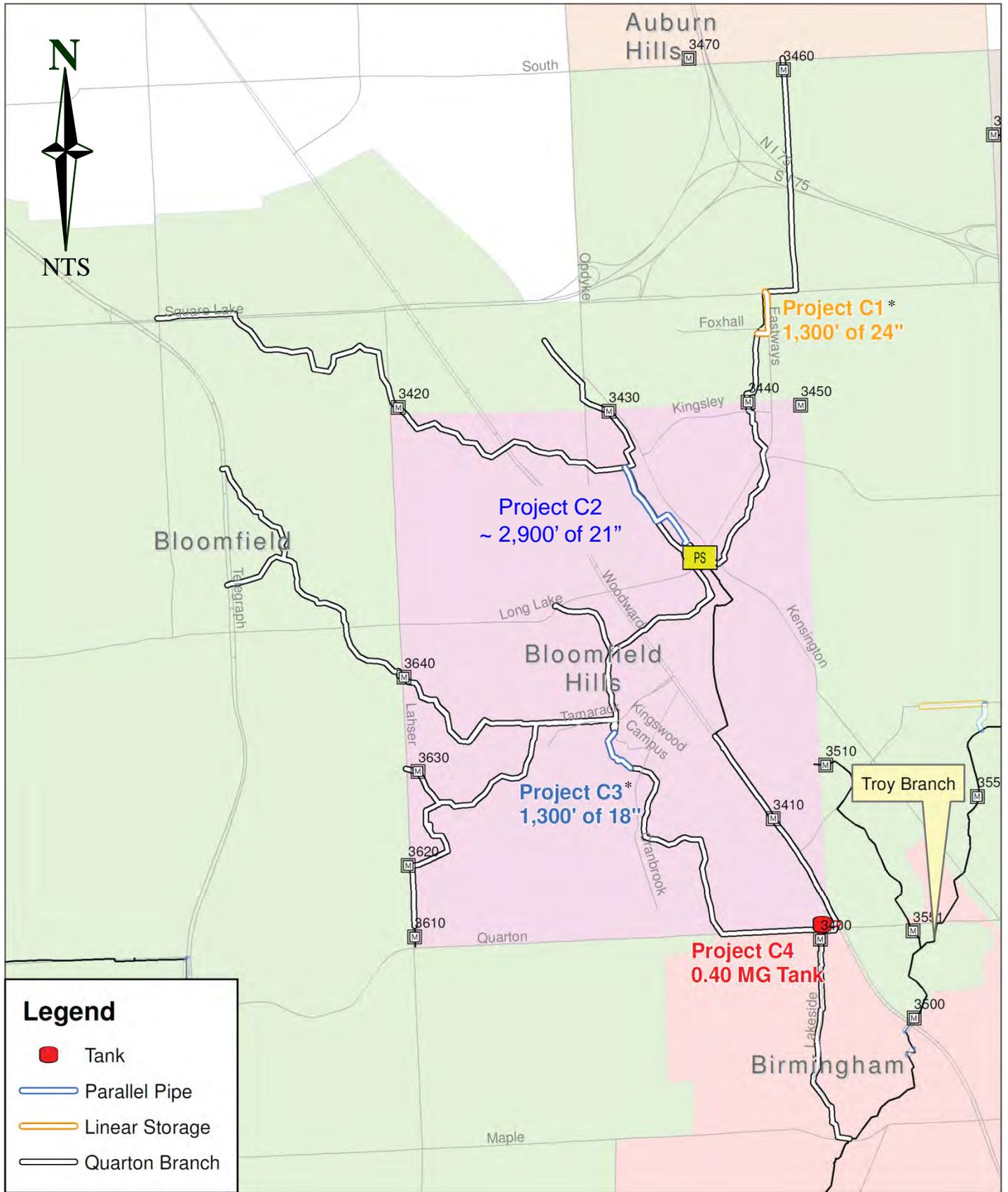
OCWRC - EFSDS North Evergreen Interceptor SRF Project Plan

Quarton Branch Profile B – Existing Conditions

Job No.
20130714

Date
June, 2014

Figure No.
6



* This information is not shown in this document

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OCWRC - EFSDS North Evergreen Interceptor SRF Project Plan

Quarton Branch Preliminary Projects

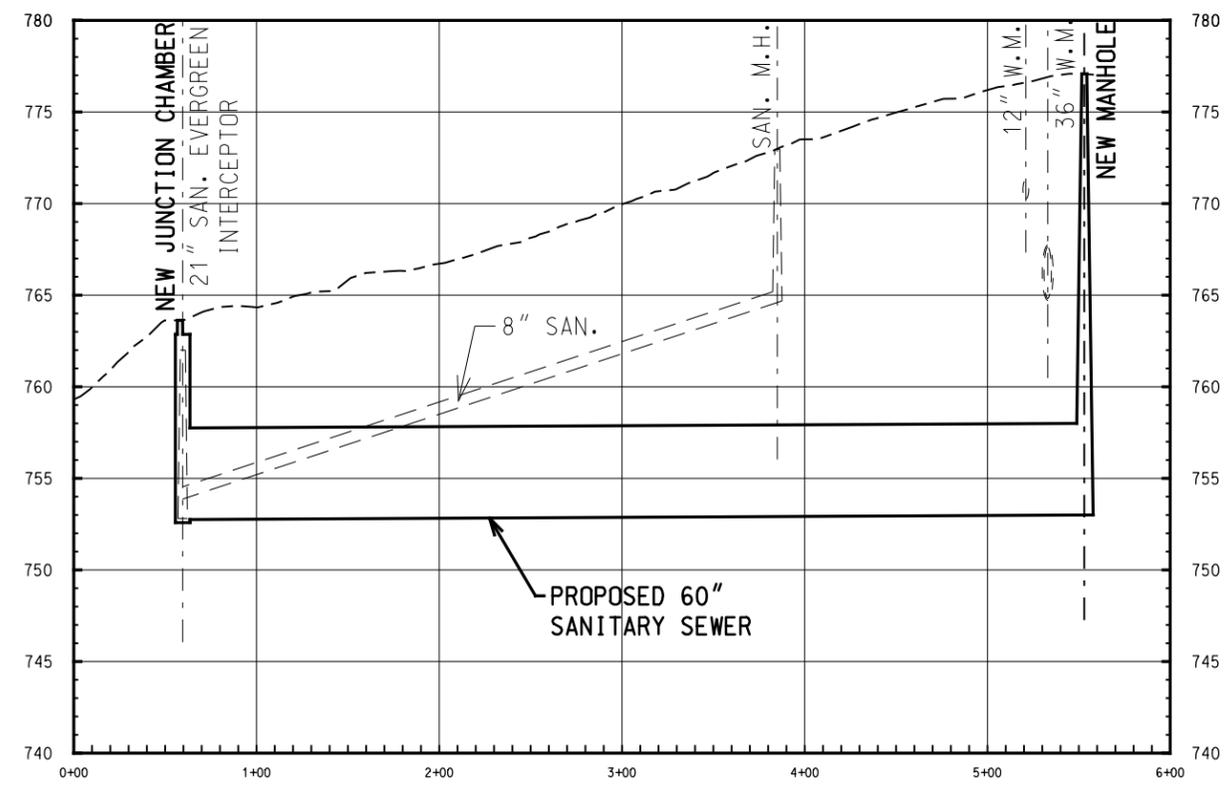
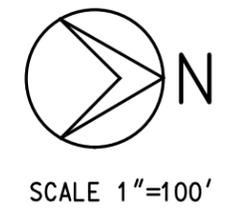
Job No.
20130714

Date
June, 2014

Figure No.

7

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OCWRC - NORTH EVERGREEN INTERCEPTOR PROJECT B3 - WATTLES AND ADAMS AREA			
JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824
DATE NOVEMBER 2013		PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	FIGURE B3-3

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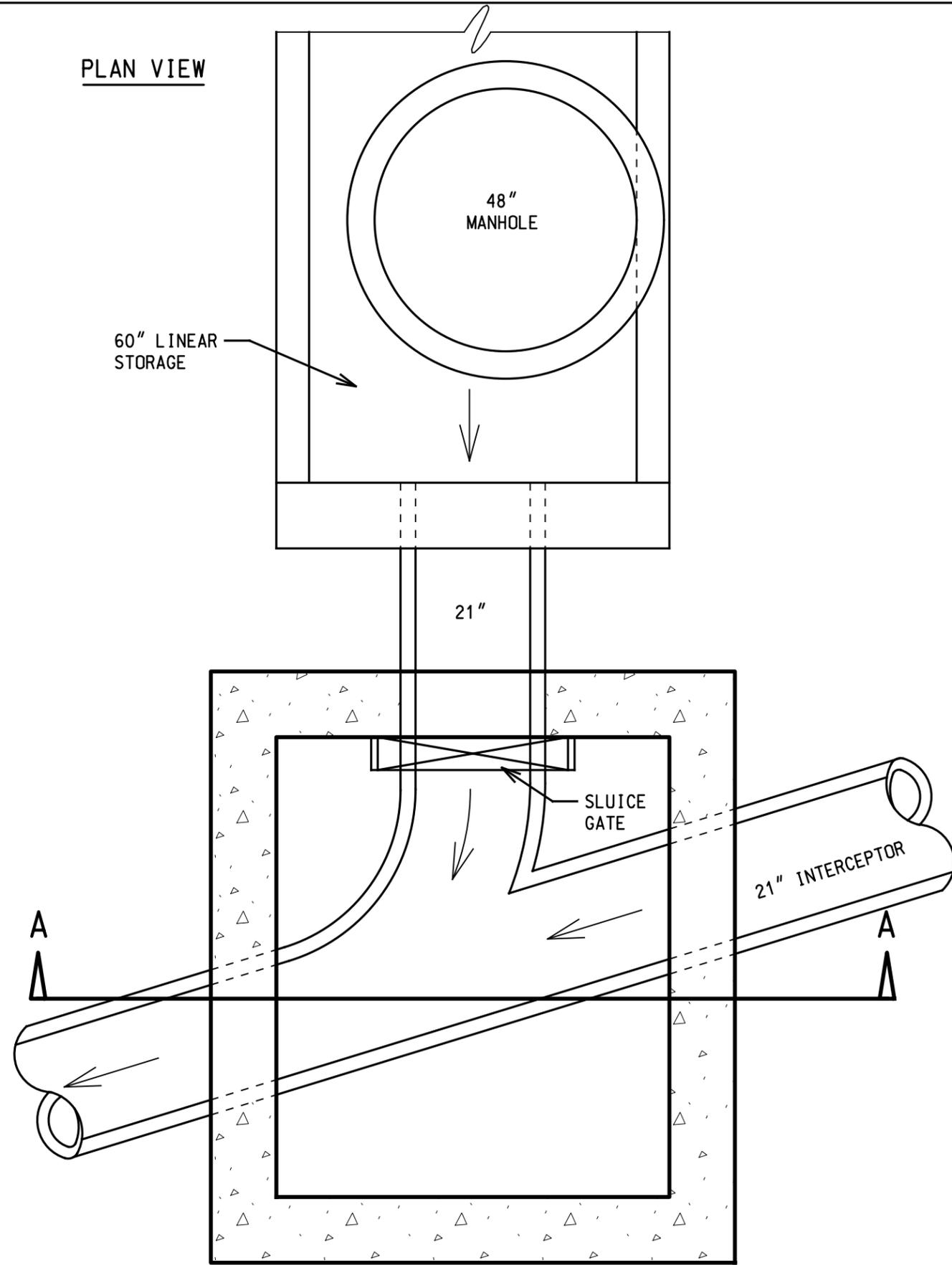
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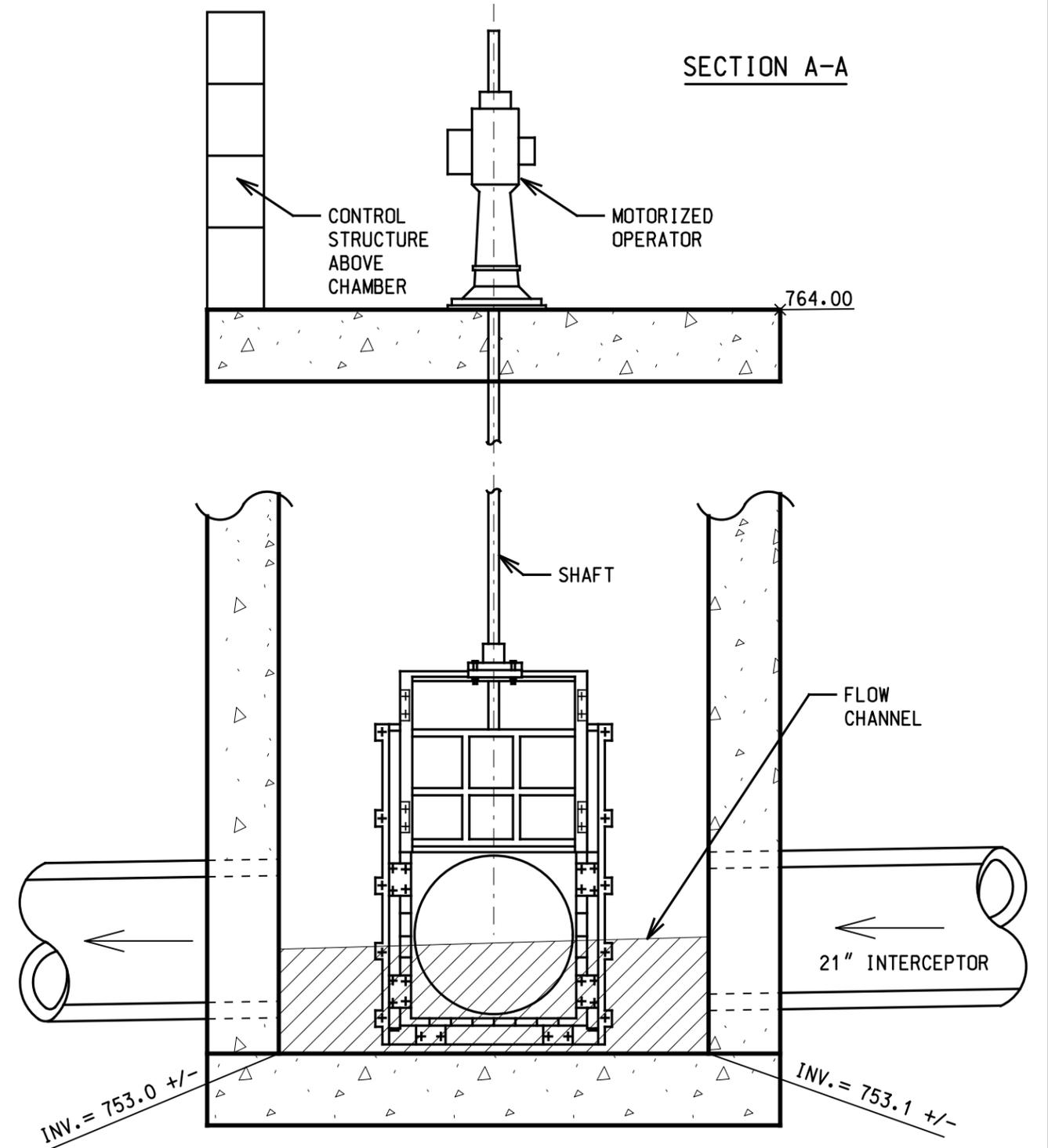
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PLAN VIEW



SECTION A-A



**OCWRC - NORTH EVERGREEN INTERCEPTOR
PROJECT B3 - DEWATERING CHAMBER**

JOB NO.
20130714

DATE
MARCH 2014



HUBBELL, ROTH & CLARK, INC
Consulting Engineers

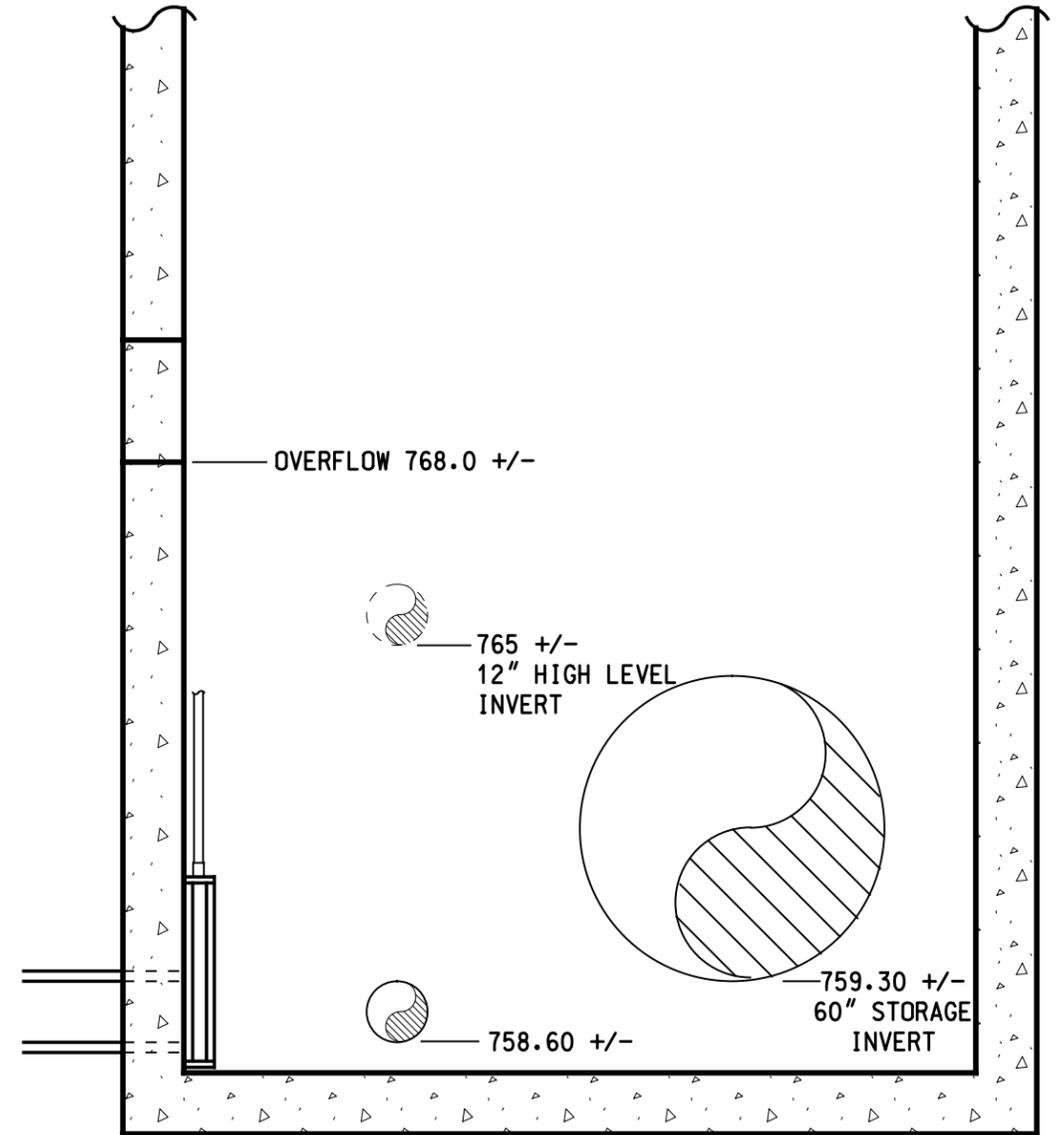
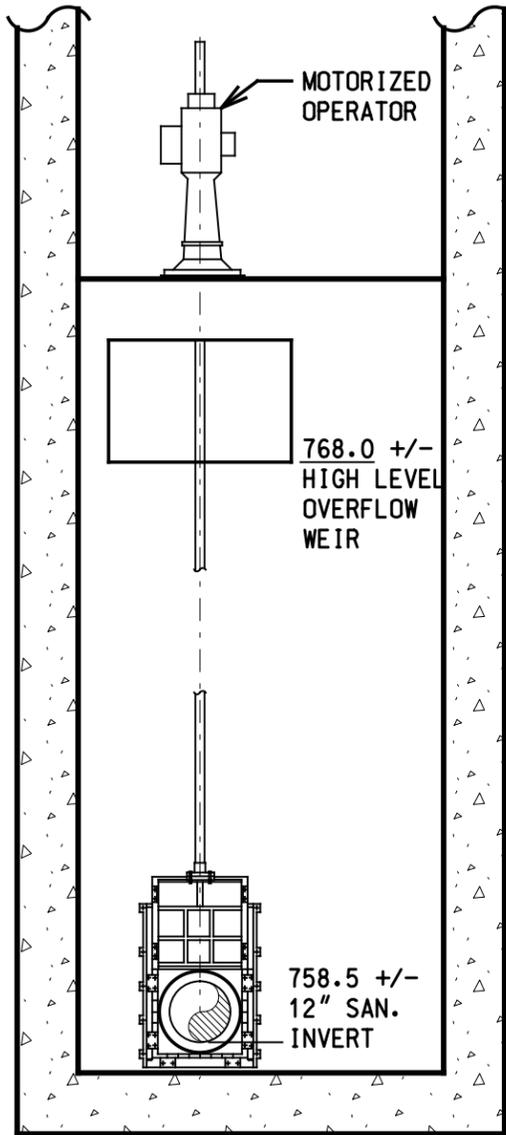
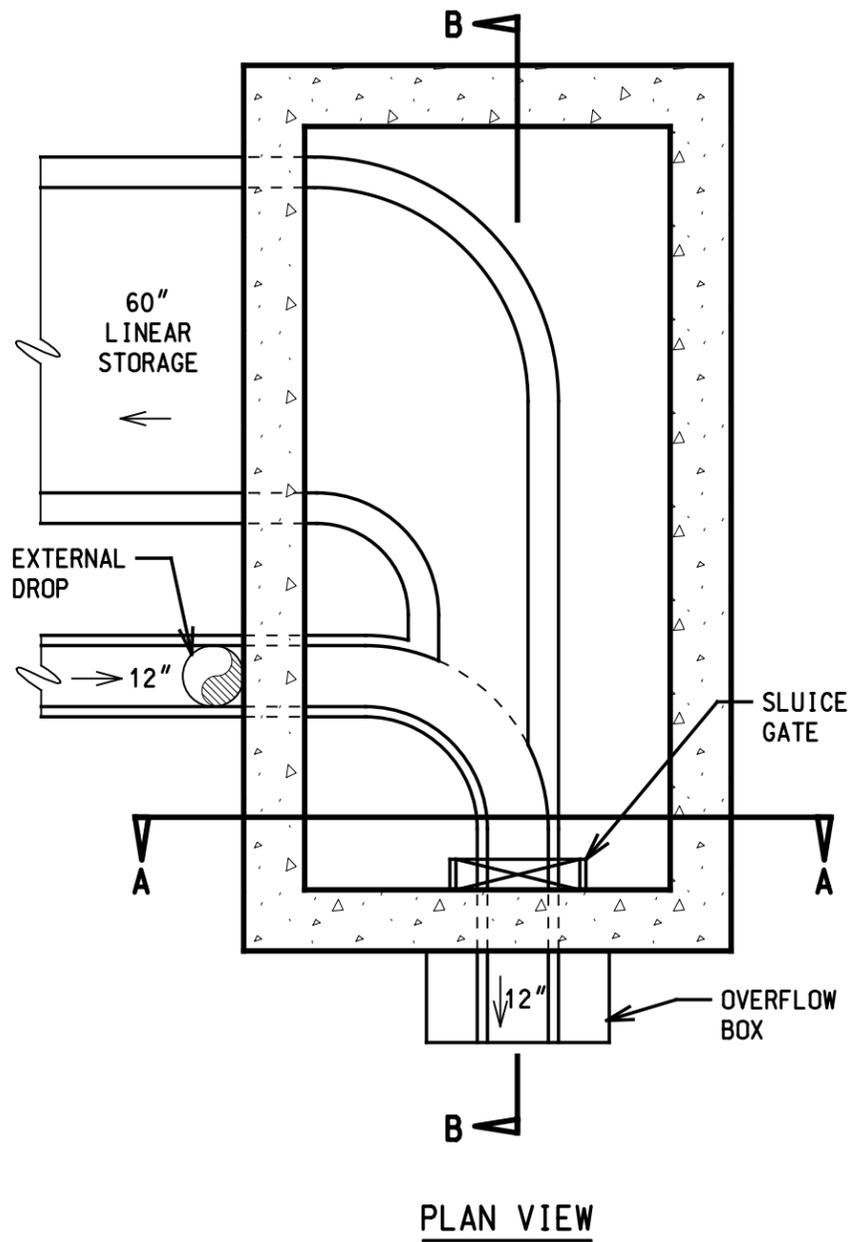
555 HULET DRIVE
BLOOMFIELD HILLS, MICH.

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48303 - 0824

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FAX (2nd Floor): (248) 338-2592
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FIGURE

B3-8



**OCWRC - NORTH EVERGREEN INTERCEPTOR
PROJECT B3 - JUNCTION CHAMBER**

JOB NO.
20130714

DATE
MARCH 2014



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Consulting Engineers

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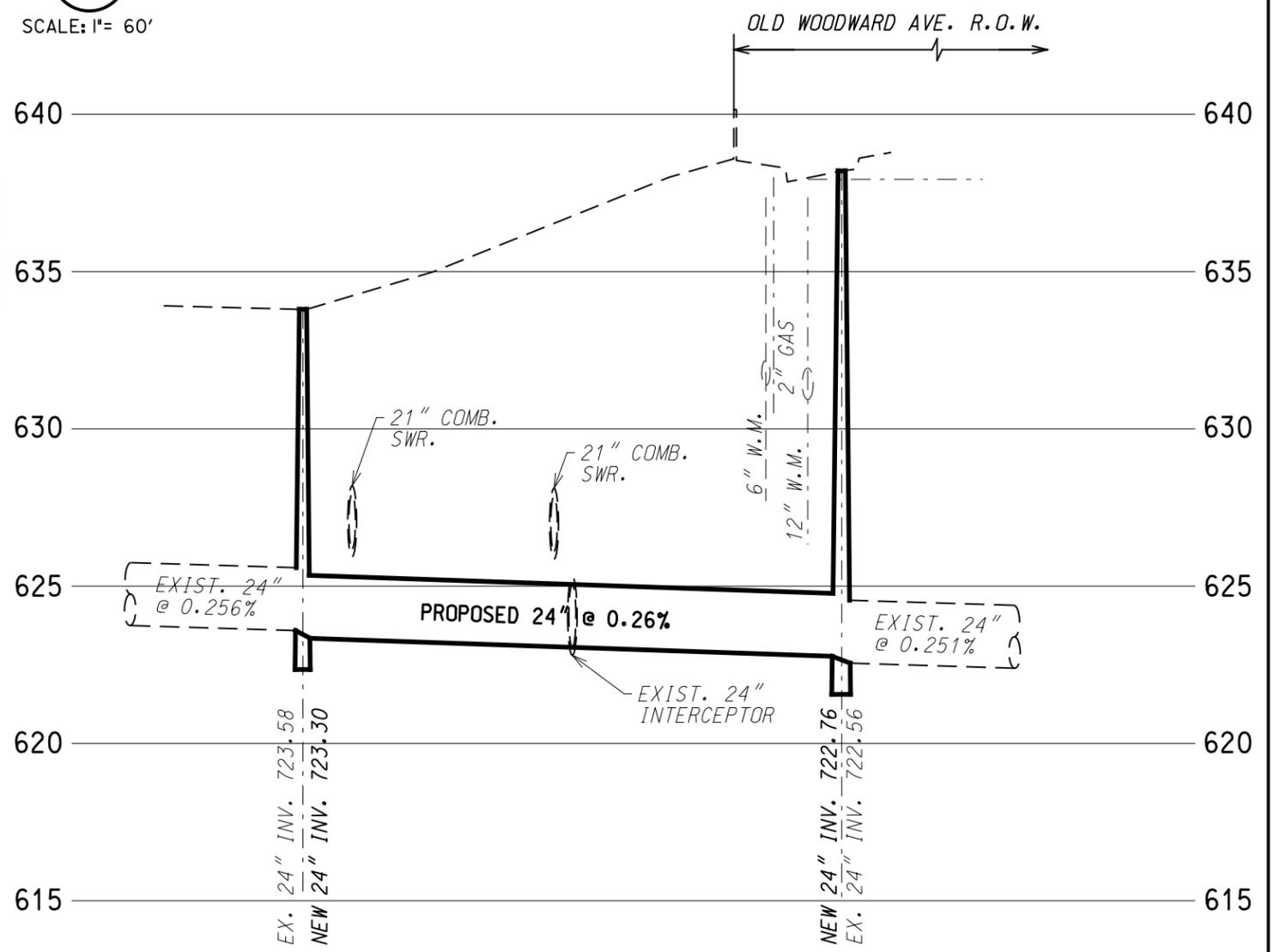
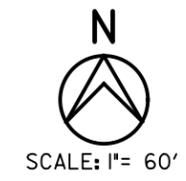
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FAX (2nd Floor): (248) 338-2592
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FIGURE

B3-9

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**OCWRC - NORTH EVERGREEN INTERCEPTOR
 PROJECT B4 - HYDRAULIC DISCREPANCIES**

JOB NO. 20130714	 HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824	FIGURE
DATE DECEMBER 2013		PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	B4-1	

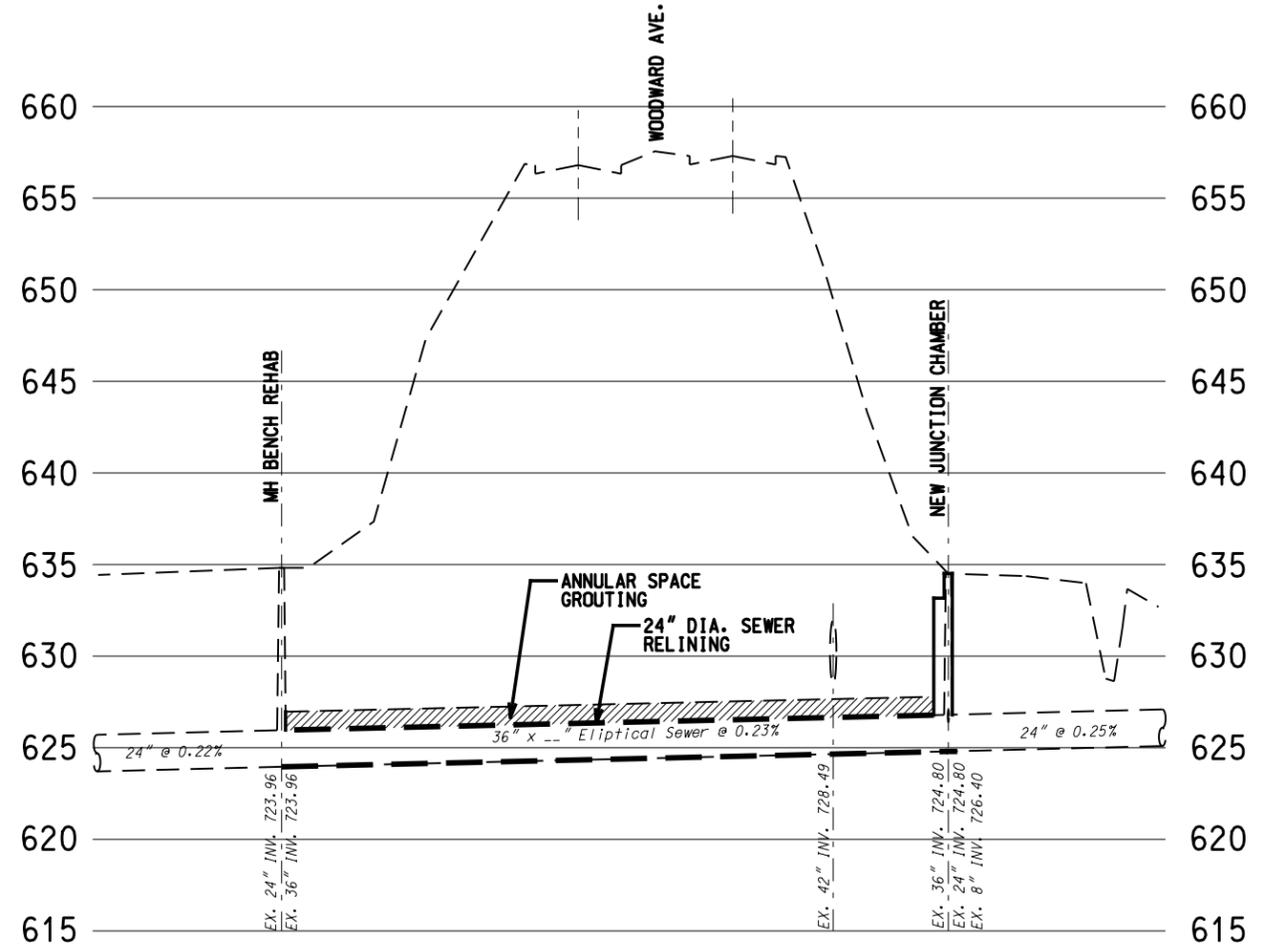
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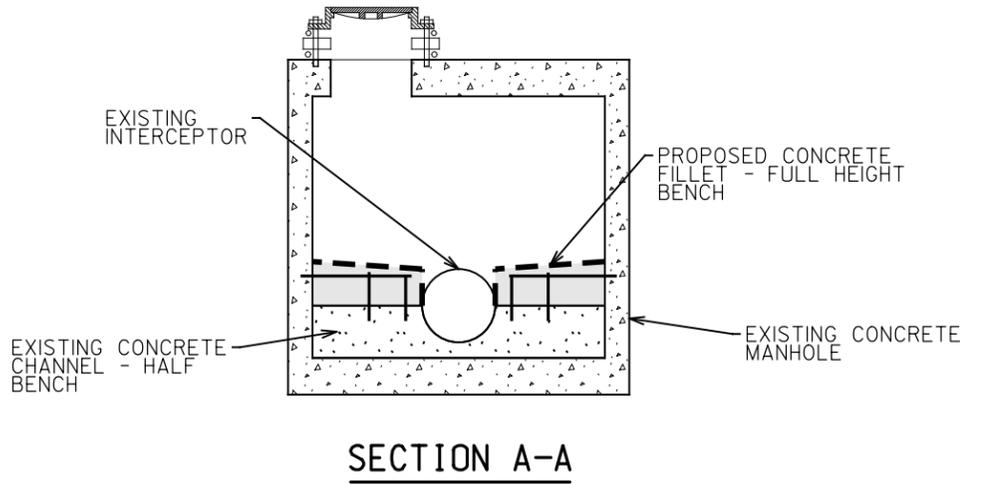
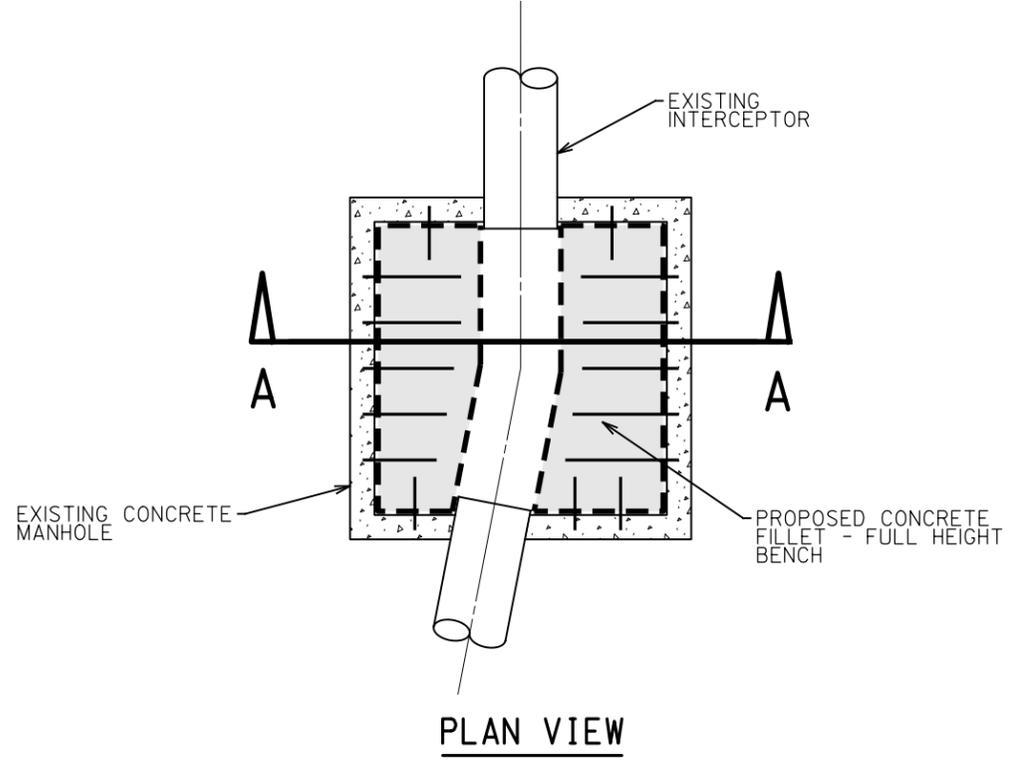
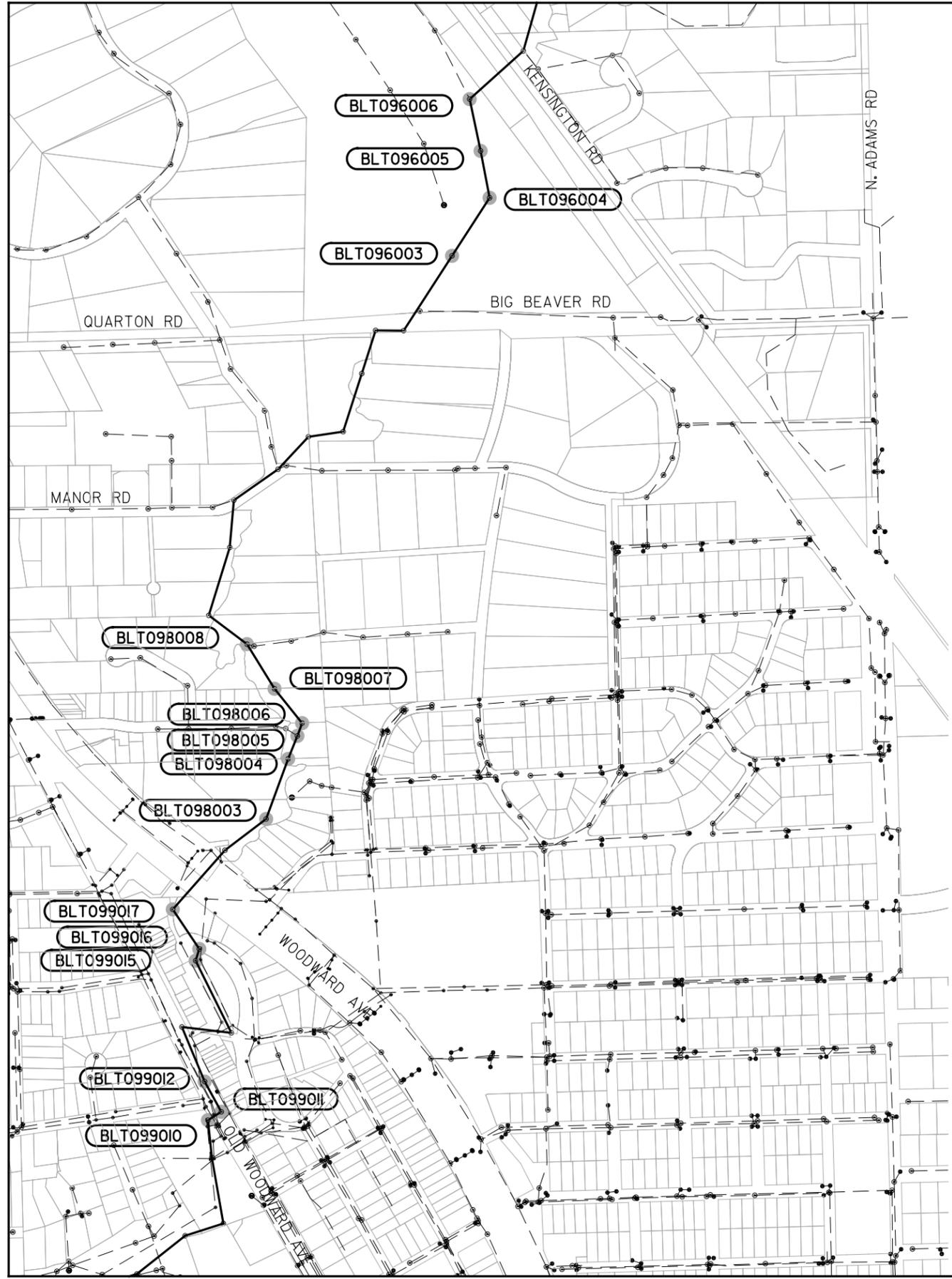


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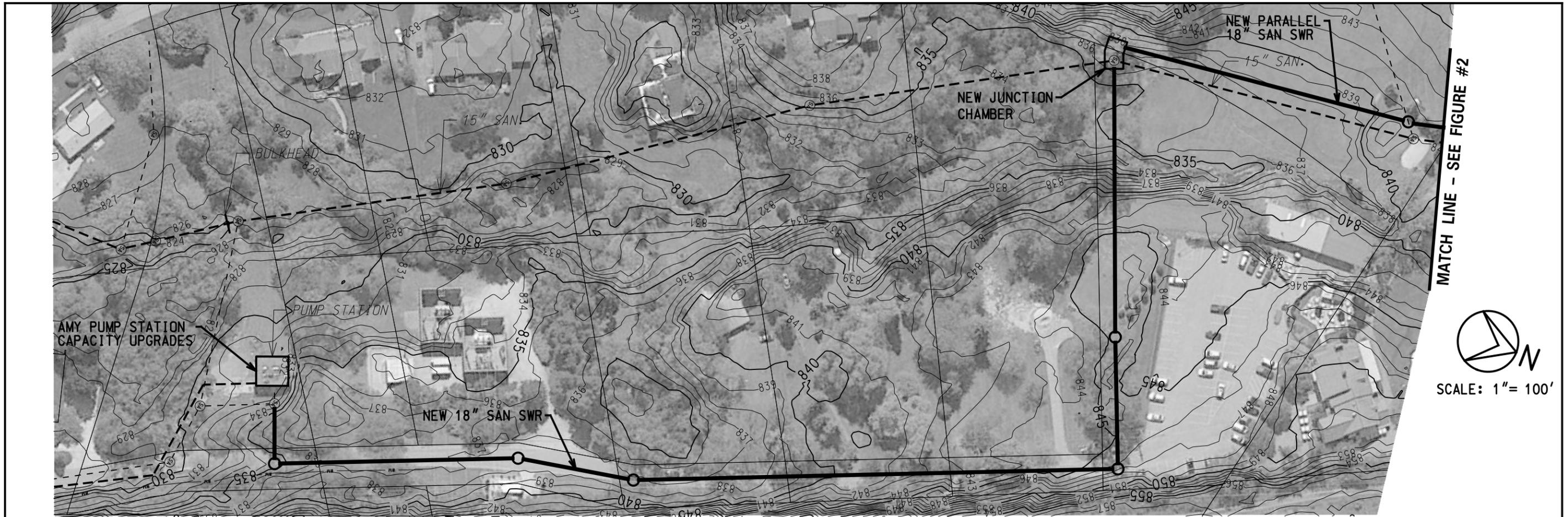
OCWRC - NORTH EVERGREEN INTERCEPTOR PROJECT B4 - HYDRAULIC DISCREPANCIES WOODWARD CROSSING

JOB NO. 20130714 DATE DECEMBER 2013	 HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824 PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	FIGURE <h1 style="font-size: 2em;">B4-2</h1>
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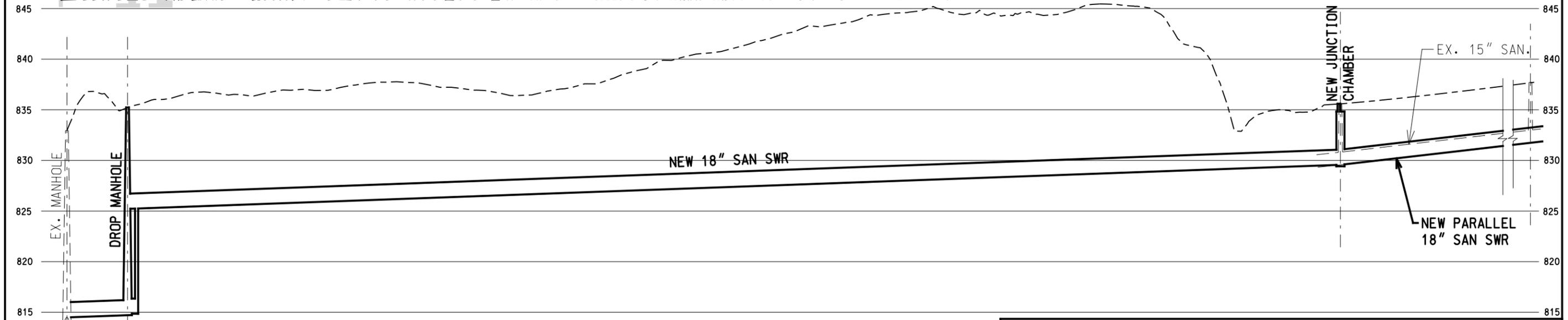
OCWRC - NORTH EVERGREEN INTERCEPTOR PROJECT B4 - HYDRAULIC DISCREPANCIES MANHOLE BENCH REHABILITATION			
JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824
DATE DECEMBER 2013		PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	FIGURE B4-3



MATCH LINE - SEE FIGURE #2

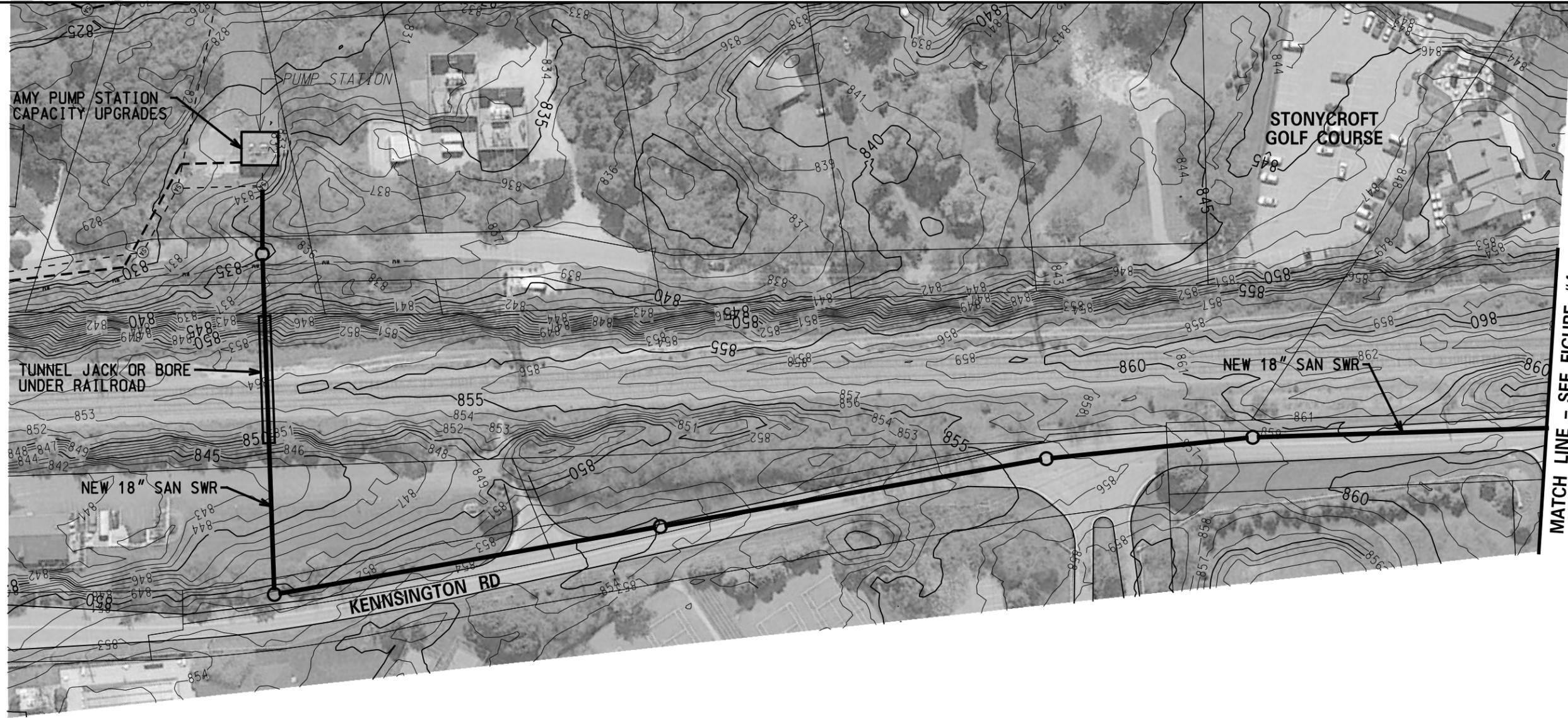


SCALE: 1" = 100'



OCWRC - NORTH EVERGREEN INTERCEPTOR PROJECT C2 - STONEYCROFT RELIEF ALT. #1			
JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824
DATE DECEMBER 2013		PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	FIGURE C2-1

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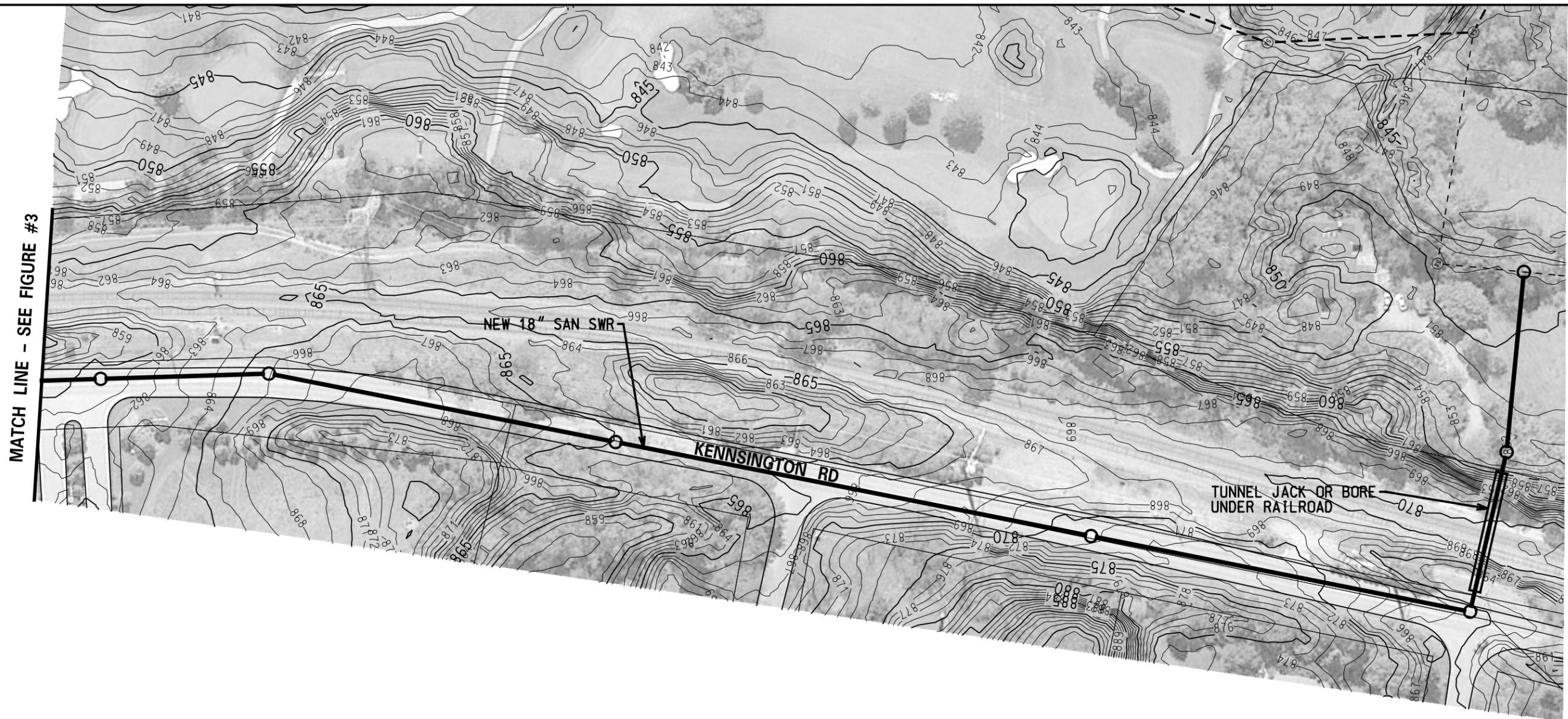


SCALE: 1" = 100'

MATCH LINE - SEE FIGURE #4

OCWRC - NORTH EVERGREEN INTERCEPTOR PROJECT C2 - STONECROFT RELIEF ALT #2			
JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824
DATE DECEMBER 2013		PHONE: (248) 338-9241 FAX (1st. Floor): (248) 454-6312 FAX (2nd. Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	FIGURE C2-3

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MATCH LINE - SEE FIGURE #3

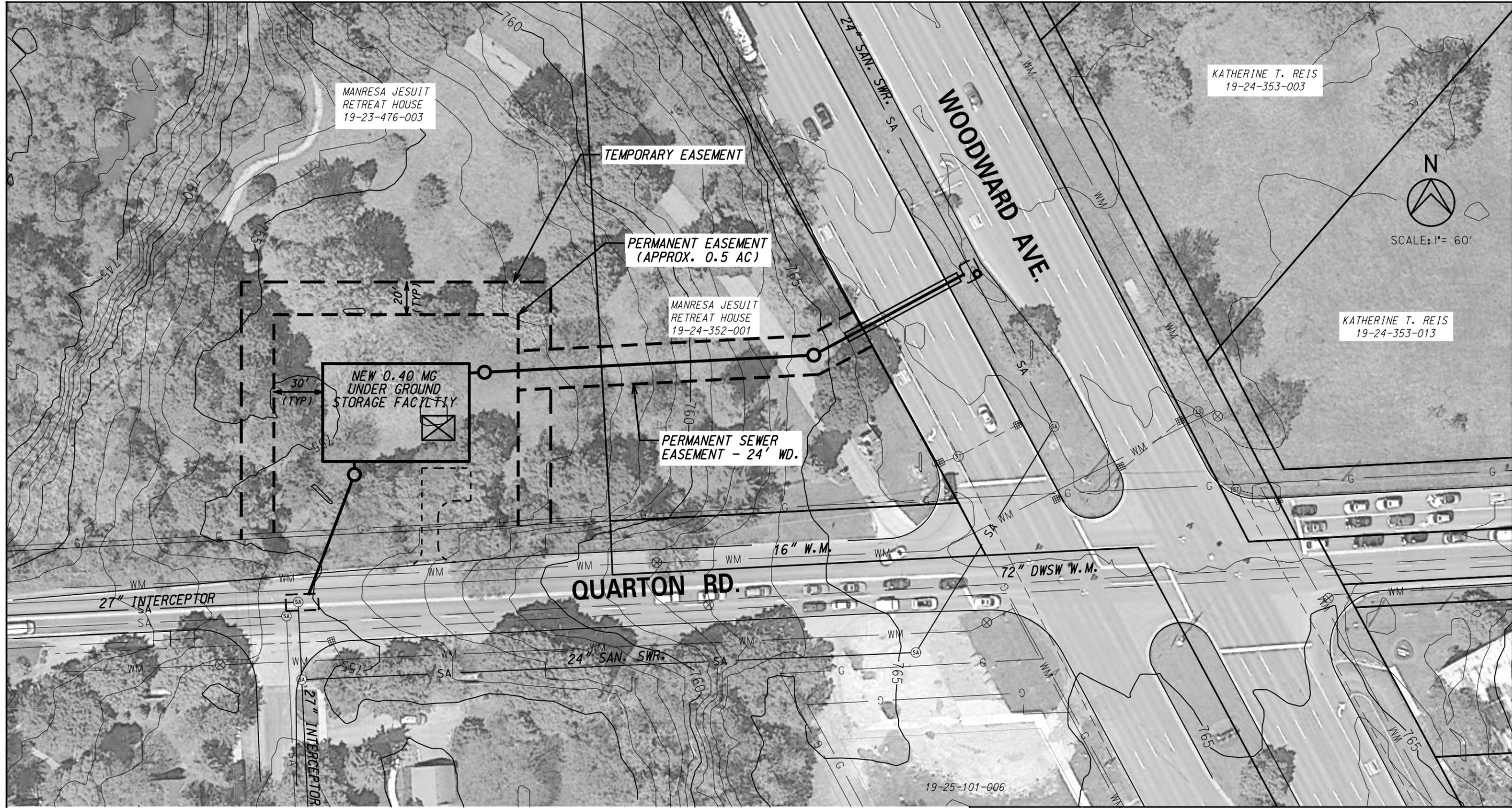


SCALE: 1" = 100'

**OCWRC - NORTH EVERGREEN INTERCEPTOR
 PROJECT C2 - STONECROFT RELIEF ALT #2**

JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824	FIGURE
DATE DECEMBER 2013		PHONE: (248) 338-9241 FAX (1st. Floor): (248) 454-6312 FAX (2nd. Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	C2-4	

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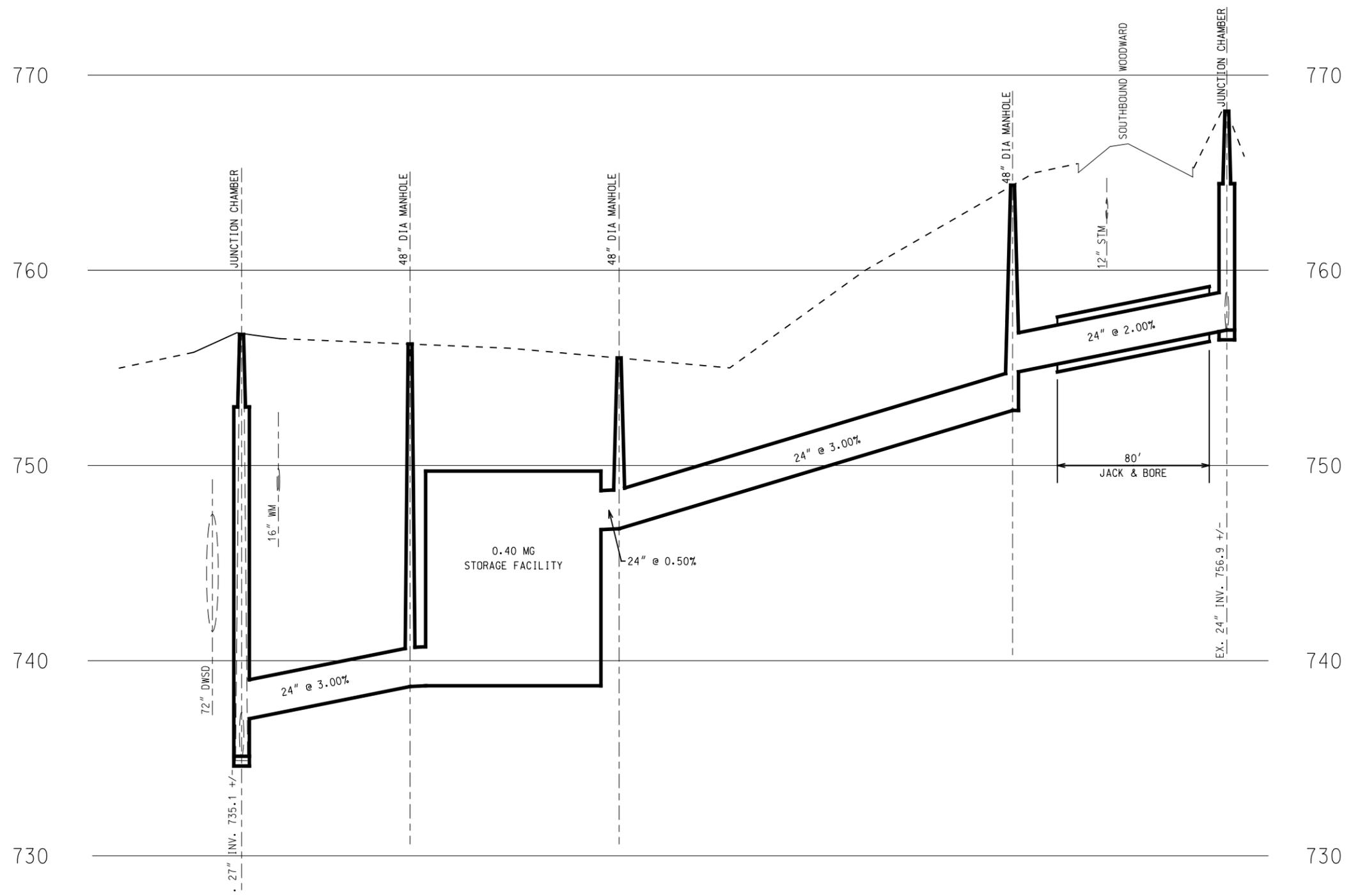


**OCWRC - NORTH EVERGREEN INTERCEPTOR
PROJECT C4 - QUARTON & WOODWARD**

NOTICE:
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JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824	FIGURE C4-1
DATE JANUARY 2014		PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com		

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NOTICE:
 ALL EXISTING UTILITIES SHOWN ON THIS TOPOGRAPHIC SURVEY HAVE BEEN TAKEN FROM VISUAL OBSERVATION, AND RECORD MAPPING FROM PREVIOUS CITY OF BIRMINGHAM PROJECTS. NO GUARANTEE IS MADE, OR SHOULD BE ASSUMED, AS TO THE COMPLETENESS OR ACCURACY OF THE UTILITIES SHOWN ON THIS DRAWING. PARTIES UTILIZING THIS INFORMATION SHALL FIELD VERIFY THE ACCURACY AND COMPLETENESS PRIOR TO CONSTRUCTION ACTIVITIES.

OCWRC - NORTH EVERGREEN INTERCEPTOR PROJECT C4 - QUARTON & WOODWARD			
JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824
DATE JANUARY 2014		PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	FIGURE C4-2

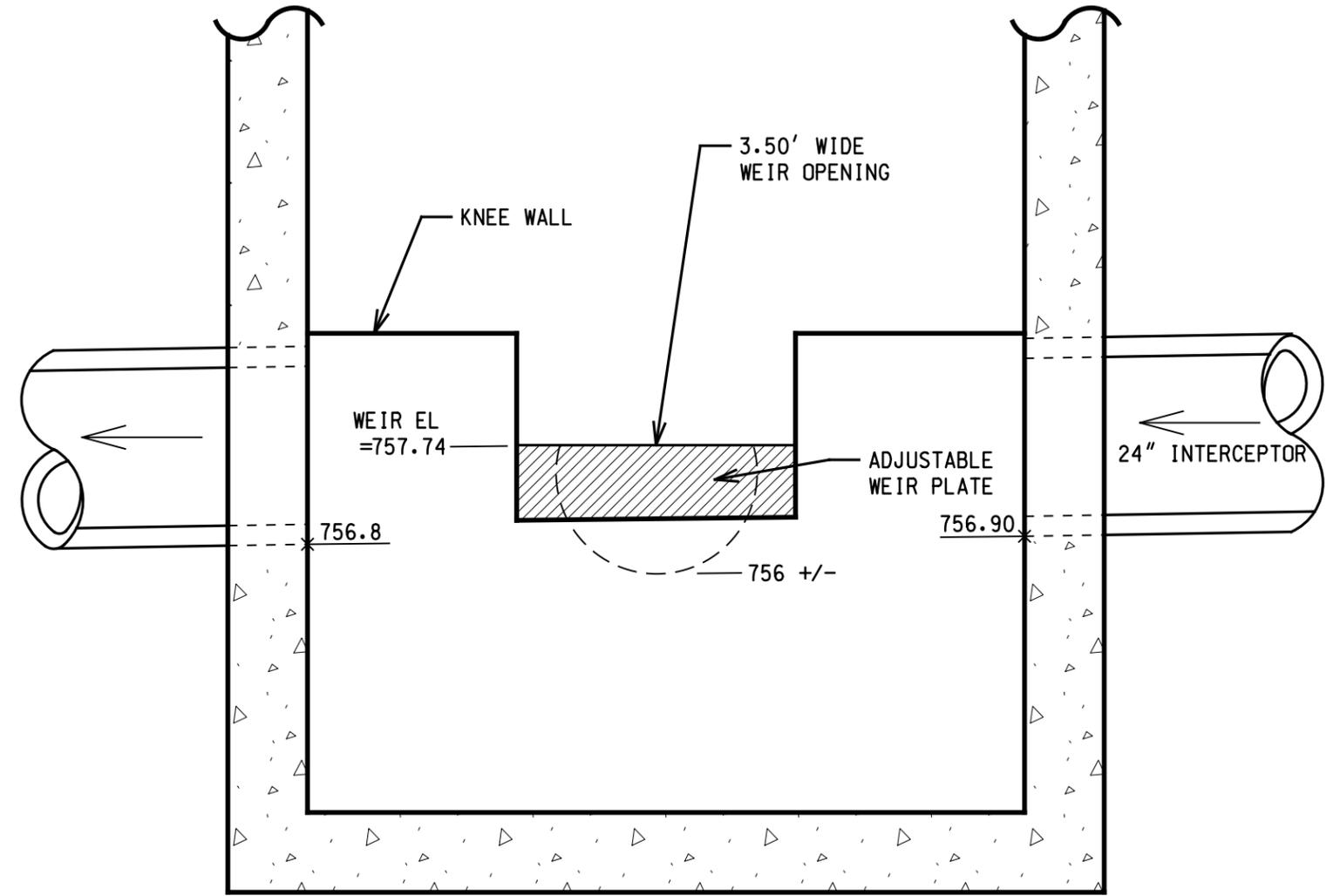
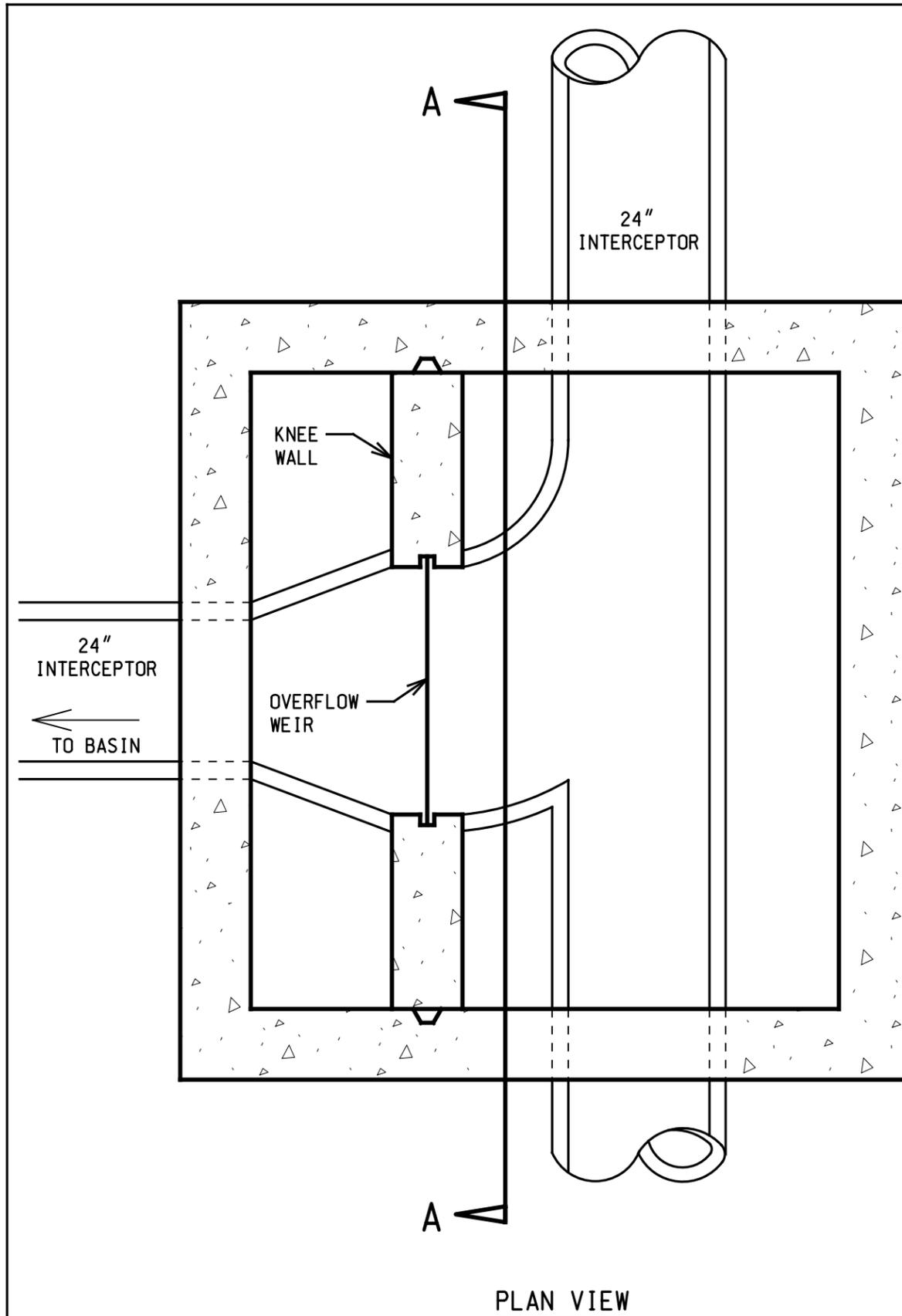
TIME 19-MAR-2014 08:00

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USER NAME - bhvrf



**OCWRC - NORTH EVERGREEN INTERCEPTOR
PROJECT C4 - INLET CHAMBER**

JOB NO. 20130714	<p>HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers</p>	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824	FIGURE C4-3
DATE MARCH 2014		PHONE: (248) 338-9241 FAX (1st Floor): (248) 454-6312 FAX (2nd Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com		

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Thomas D. LaCross
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Evergreen Farmington Sewage Disposal System Proposed Harlan Road Storage Tank Alternative Site Analysis

April 14, 2014

This technical memorandum summarizes preliminary finding regarding the construction of a storage tank for the purpose of holding wet weather flow from the Evergreen-Farmington Sewage Disposal System (EFSDS) Troy Arm Interceptor during storm events until such time as the downstream interceptor can accept additional flow. The items addressed in this memorandum include:

1. Definition of the Problem
2. Harlan School Site Evaluation
3. Recommendation

1. Definition of Problem

The Troy branch experiences high wet weather flows and related surcharging that necessitates the City of Troy to perform relief pumping from the interceptor to the Rouge River during significant events, creating SSOs at three locations. The locations of SSOs are depicted on Figure 1. Examination of historic relief pumping data indicates that Troy performs relief pumping whenever the level in the interceptor exceeds approximately 1-foot above the crown of pipe at the locations shown in Figure 1. The City performs this work in order to protect adjacent properties from basement flooding. Since 2005 there have been 11 events that the City has implemented relief pumping.

While I/I have been identified as a contributing source of excess flow, the primary cause of relief pumping is due to the interceptor surcharging and elevated hydraulic grade (HG). This was initially identified by Troy staff who indicated that during large rain events the level in the manhole rises much more rapidly than expected. Flow metering data indicated that the system experiences much higher depths and higher levels of surcharging during large rain events than would be expected based on generally-accepted hydraulic modeling parameters. During events where the hydraulic grade line (HGL) should be within the pipe, the hydraulic discrepancy has been as much as four feet (i.e. the system surcharges by four feet more than is expected from normal hydraulic losses). Original model simulations did not support real-world conditions of high HG during rain events. This resulted in extensive evaluations of the Troy branch, termed "hydraulic discrepancy investigation".

Following the field investigations the model was updated with entrance and exit losses resulting in improved representation of real-world conditions.

2. Harlan School Site Evaluation

Several options were revised to address the issue identified above and in the Long Term Corrective Action Plan, including the construction of a storage tank at Harlan Elementary School. The proposed tank would provide 0.51 MG of

storage on the Harlan School property, as shown on the Figure for this site. Easements are necessary for the construction of this tank, as well as the connections to and from the storage tank.

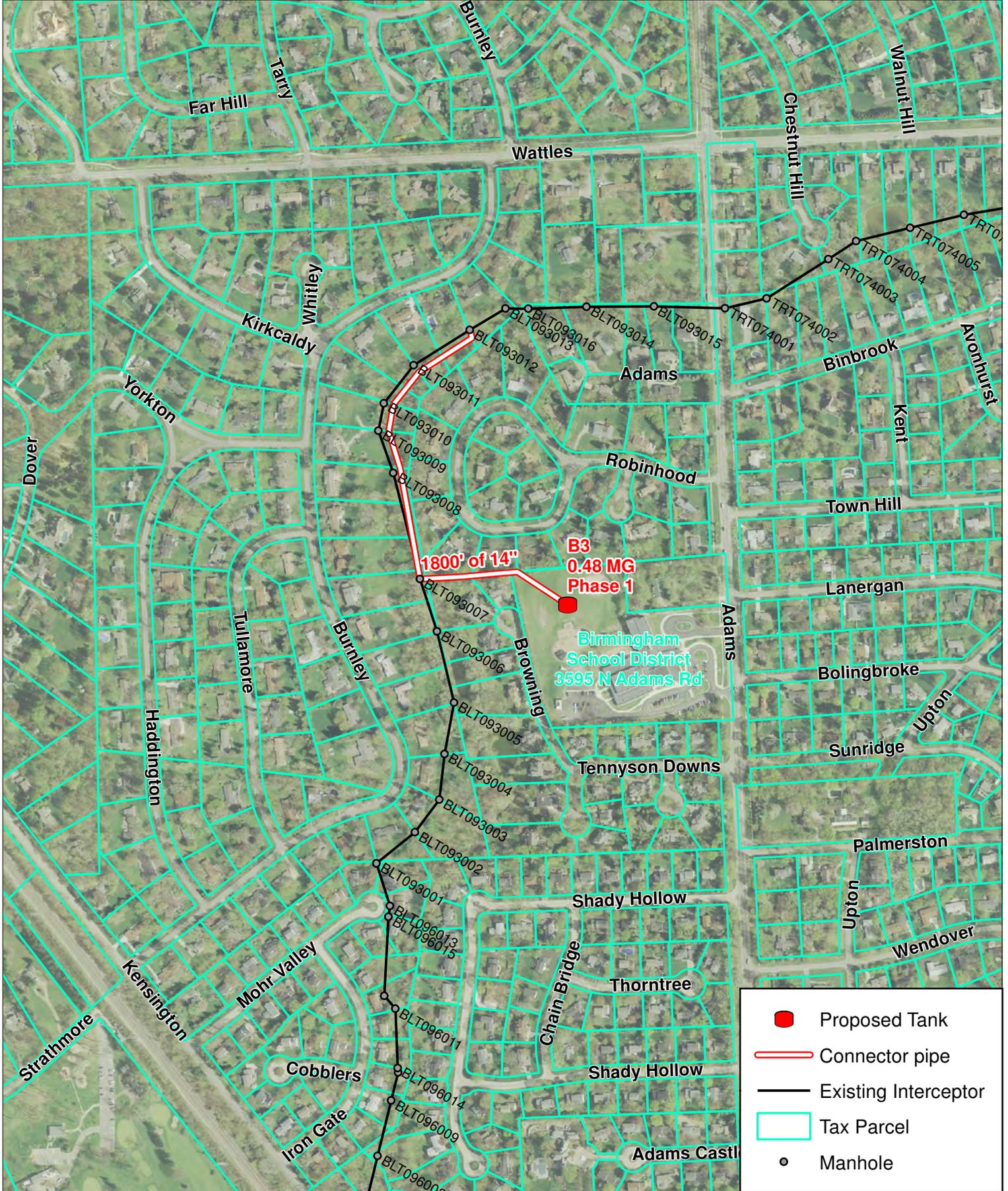
The connections to the tank would need to take place parallel to the Rouge River in rear yards. Therefore, there would be potential for environmental impacts due to the construction along the river.

The cost breakdown for this alternative is included in Appendix D. The total cost for the construction of this project is \$6,408,000.

3. Recommendation

While this alternative was considered as a principal alternative, the capital and long term operation and maintenance costs are much higher than other alternatives. In addition, the project would require an easement from Harlan Elementary School and several property owners.

PROJECT B3 Troy Tank C



	Proposed Tank
	Connector pipe
	Existing Interceptor
	Tax Parcel
	Manhole

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Evergreen Farmington Sewage Disposal System Proposed Kensington Road Relief Sewer Alternative Site Analysis

April 14, 2014

This technical memorandum summarizes preliminary finding regarding the construction of a relief sewer to divert flow from the existing 15-inch sewer during wet weather flow conditions. The preferred alternative of routing this relief sewer through Stonycroft Golf Course is outlined in the LTCAP. This memorandum outlines the option of routing the flow down Kensington Road. The items addressed in this memorandum include:

1. Definition of the Problem
2. General Description of Alternative
3. Route Description
4. Significant Features
5. Major Road Impacts
6. Easement Needs
7. Cost and Recommendation

1. Definition of Problem

The Quarton Branch experiences high wet weather flows and related surcharging that creates observed SSOs near the intersection of Kingsley Trail and Kensington Road. This problem is defined in detail in the LTCAP.

2. General Description of Alternative

This proposed sewer under this option would be approximately 3100 lft of 18" sewer to relieve the excess flow on the Quarton Arm. Some jack case and boring would be used for the railroad crossing. Approximately 11 manholes would need to be constructed.

3. Route Description

The sanitary sewer would cross under the railroad tracks, run south on Kensington Road, and cross back under the railroad tracks before discharging into the Amy Pump Station as shown on the attached figure.

4. Significant Features, Wetlands and Floodplains

The sewer installation would include work in or near the Rouge River and associated floodplains in some areas. The work would also include two crossings of the railroad tracks which would require significant coordination.

5. Major Road Impacts

In addition to crossing the railroad tracks, the sewer would have to be installed in close proximity to Kensington Road, which may cause a partial road closure during construction.

6. Easement Needs

Easements would be required to cross private property to construct the sewer

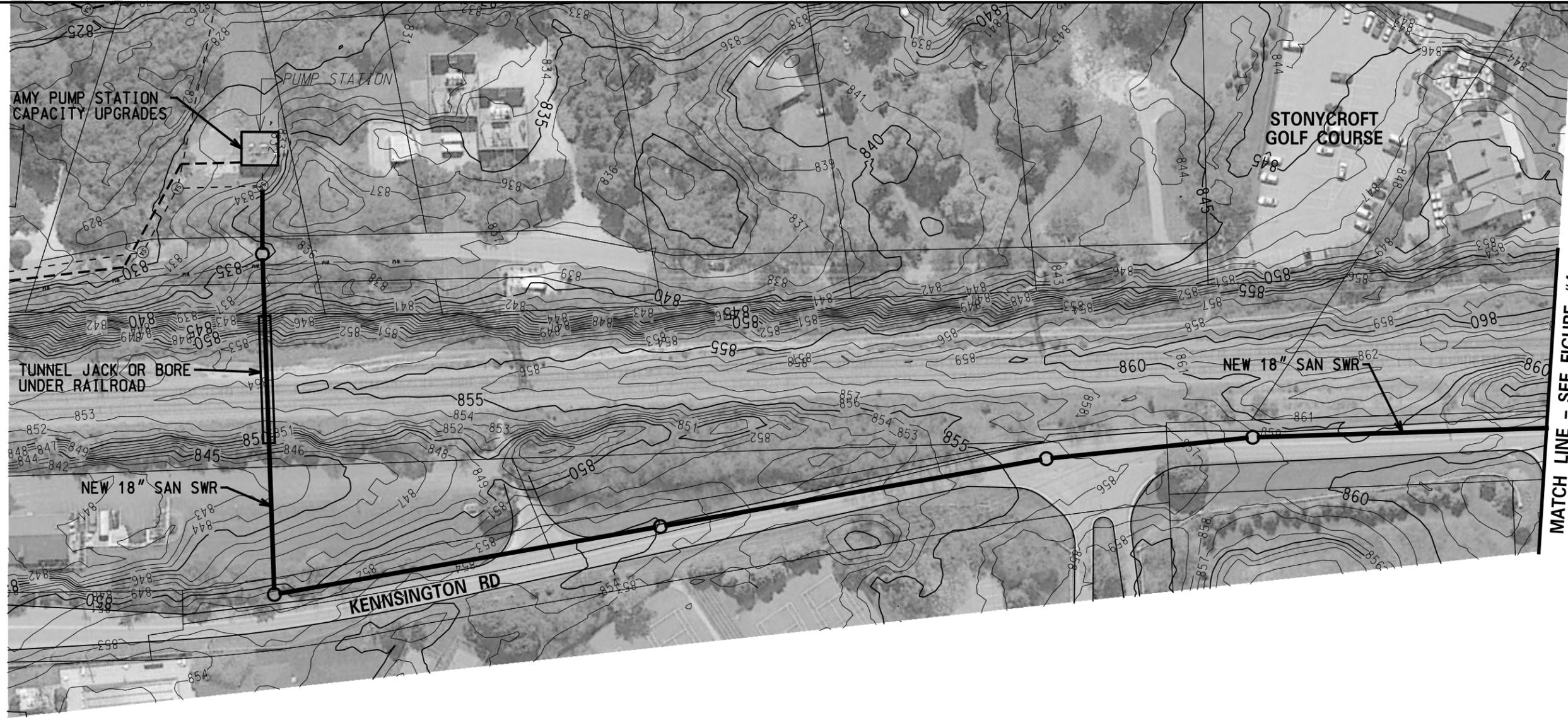
down Kensington Road. This would involve easements from several property owners and permission from the railroad.

7. Cost and Recommendation

The total cost to construct this alternative would be \$3,169,000 as outlined in Appendix D.

While this alternative was considered as a principal alternative, the capital costs are much higher than other alternatives.

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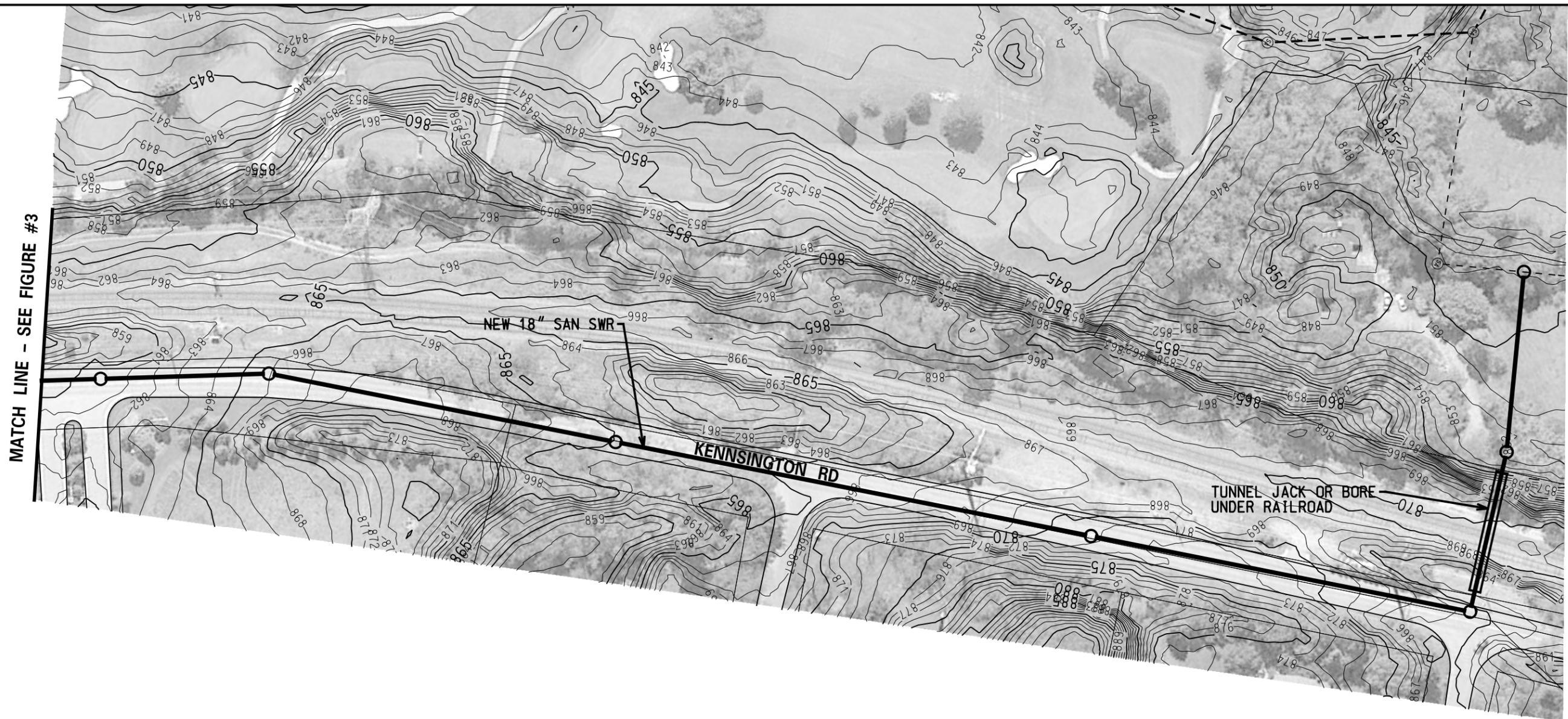


SCALE: 1" = 100'

MATCH LINE - SEE FIGURE #4

OCWRC - NORTH EVERGREEN INTERCEPTOR PROJECT C2 - STONECROFT RELIEF ALT #2			
JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824
DATE DECEMBER 2013		PHONE: (248) 338-9241 FAX (1st. Floor): (248) 454-6312 FAX (2nd. Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	FIGURE C2-3

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MATCH LINE - SEE FIGURE #3



SCALE: 1" = 100'

**OCWRC - NORTH EVERGREEN INTERCEPTOR
 PROJECT C2 - STONECROFT RELIEF ALT #2**

JOB NO. 20130714	 HRC HUBBELL, ROTH & CLARK, INC Consulting Engineers	555 HULET DRIVE BLOOMFIELD HILLS, MICH.	P.O. BOX 824 48303 - 0824	FIGURE
DATE DECEMBER 2013		PHONE: (248) 338-9241 FAX (1st. Floor): (248) 454-6312 FAX (2nd. Floor): (248) 338-2592 WEB SITE: http://www.hrc-engr.com	C2-4	

Appendix E

Detail Cost Estimates and Present Worth Analysis

TABLE B3-1
Project B3: WATTLES AND ADAMS AREA - TOTAL
Concept Level Opinion of Probable Costs

Owner: Oakland County Water Resources Commissioner
 Project: North Evergreen Interceptor
 Work: Troy Branch
 Basis of Estimate:
 Report Design Final
 % % %

Date: 2/6/2014
 Project No.: 20130714
 Prepared By: BH
 Reviewer: MM
 CCI: Time of Est.: 9667
 CCI: Current: 9667

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	Soil Erosion and Sedimentation Control	1	LS	\$20,000.00	\$20,000
2	Audiovisual Coverage	1	LS	\$5,000.00	\$5,000
3	Traffic Maintenance and Control	1	LS	\$65,000.00	\$65,000
4	Geotechnical Investigation	1	LS	\$10,000.00	\$10,000
5	Clearing and Grubbing	1.0	ACRE	\$5,000.00	\$5,000
6	Private Utility Relocation/Support Allowance	1	LS	\$15,000.00	\$15,000
7	36" Water Main Relocation	1	LS	\$50,000.00	\$50,000
8	Dewatering	1	LS	\$50,000.00	\$50,000
9	Junction/Control Chamber	3	EA	\$40,000.00	\$120,000
10	60" Dia Manhole Tee	10	EA	\$2,800.00	\$28,000
11	Gravity Sewer, 60" w/Compacted Sand Backfill	3,810	FT	\$400.00	\$1,524,000
12	Sewer Lining, 12" Dia,	730	FT	\$65.00	\$47,450
13	Wattles Rd, HMA Restoration	8,500	SYD	\$32.00	\$272,000
14	Local Road, HMA Restoration	2,400	SYD	\$28.00	\$67,200
15	Maintain Aggregate	2,000	TON	\$18.00	\$36,000
16	Utility Trench Undercut	600	CYD	\$25.00	\$15,000
17	4' High Property Protection Fence	1,000	FT	\$10.00	\$10,000
18	Turf Restoration	4,260	SYD	\$3.50	\$14,910
19	Landscaping Allowance	1	LS	\$25,000.00	\$25,000
20	General Conditions	10	%		\$238,000
21	General Requirements	5	%		\$119,000
CONSTRUCTION SUBTOTAL					\$2,737,000
Contingencies		20	%		\$547,000
Engineering, Legal, Administration		30	%		\$985,000
2 years	Annual Cost Adjustment	3.5	% / year	7.12%	\$234,000
				Total:	\$4,503,000
Adjustment of Costs from ENR CCI		1.00			\$4,503,000
ENGINEER'S OPINION OF PROJECT COST					\$4,503,000

*Project cost does not include Easement Acquisition

**Oakland County Water Resources Commissioner Evergreen Farmington Sewage Disposal System
SRF Project Plan
EFSDS Improvements**

**Wattles Road Linear Storage
Present Worth Calculations**

<u>CAPITAL COST</u>	CAPITAL COST ⁽¹⁾	SERVICE LIFE (YEARS)	PRESENT WORTH ⁽²⁾
Demolition and Site Preparation	\$ 120,000.00	Inf	\$ 67,000.00
Civil/Site Work	\$ 4,383,000.00	50	\$ 3,211,000.00
Mechanical/Electrical	\$ -	20	\$ -
TOTAL CAPITAL COST	\$ 4,503,000.00		\$ 3,278,000.00
INTEREST DURING CONSTRUCTION			\$ 113,000.00
Assumes 1 year interest at 2.5%			
<u>ANNUAL OPERATION AND MAINTENANCE COST</u>			
ANNUAL O, M & R COST (NON-ENERGY)		\$ 250.00	
PRESENT WORTH OF OM&R COST (NON ENERGY)			\$ 3,000.00
ANNUAL O, M & R COST (ENERGY)		\$ -	
PRESENT WORTH OF OM&R COST (ENERGY)			
PRESENT WORTH			\$ 3,394,000.00
AVERAGE ANNUAL EQUIVALENT COST			\$ 253,000.00

Notes:

⁽¹⁾ April 2014 ENR 20 Cities CCI = 9667

⁽²⁾ Cost is based on a study period of 20 years and a discount rate of 4.125%.

Present Worth Costs are based on Straight Line Depreciation and no inflation.

**TROY ARM STORAGE
ALTERNATE 2 - HARLAN ELEMENTARY SCHOOL STORAGE TANK
Concept Level Opinion of Probable Costs**

Owner: Oakland County Water Resources Commissioner
 Project: EFSDS LTCAP
 Work: Troy Branch

Date: 9/11/2013
 Project No.: 0105-11-0070
 Prepared By: Bryan D
 Reviewer: Greg K
 CCI: Time of Est.: 9689
 CCI: Current: 9689

Basis of Estimate:
 Report Design Final
 % % %

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
Harlan School Storage Tank					
1	Soil Erosion and Sedimentation Control	1	LS	\$20,000.00	\$20,000
2	Traffic Maintenance and Control	1	LS	\$15,000.00	\$15,000
3	Geotechnical Investigation	1	LS	\$50,000.00	\$50,000
4	Clearing and Grubbing	3	ACRE	\$15,000.00	\$45,000
5	Utility Relocation Allowance	1	LS	\$50,000.00	\$50,000
6	Permit Application Allowance	1	LS	\$20,000.00	\$20,000
7	Audiovisual Coverage	1	LS	\$10,000.00	\$10,000
8	Easement Acquisition	1	LS	\$750,000.00	\$750,000
9	Diversion Structure	1	EA	\$100,000.00	\$100,000
10	Pump station, 100 horsepower	1	EA	\$400,000.00	\$400,000
11	Instrumentation and Controls	1	LS	\$150,000.00	\$150,000
12	3-phase Electrical Hookup	1	EA	\$50,000.00	\$50,000
13	Backup power to Pump Station, 100 kilowatt	1	EA	\$75,000.00	\$75,000
14	8" Forcemain	2,640	FT	\$80.00	\$211,200
15	Tank (Excavation/dewatering, structure, backfill)	69,000	Gal	\$3.50	\$241,500
16	Flushing System	1	EA	\$50,000.00	\$50,000
17	Odor Control System	1	LS	\$100,000.00	\$100,000
18	Outlet Control Structure	1	EA	\$100,000.00	\$100,000
19	Gravity Interceptor, 12"	1,320	FT	\$100.00	\$132,000
20	Gravity Interceptor, 12" with pavement restoration	1,320	FT	\$150.00	\$198,000
21	48" Manhole	10	EA	\$4,000.00	\$40,000
22	Restoration	15,000	SYD	\$3.00	\$45,000
23	Landscaping Allowance	1	LS	\$50,000.00	\$50,000
24	General Conditions	10	%		\$290,000
25	General Requirements	5	%		\$145,000
CONSTRUCTION SUBTOTAL					\$3,338,000
Contingencies		40	%		\$1,335,000
Engineering, Legal, Administration		30	%		\$1,402,000
2 years	Annual Cost Adjustment	3.5	% / year	7.12%	\$333,000
Total:					\$6,408,000
Adjustment of Costs from ENR CCI		1.00			\$6,408,000
ENGINEER'S OPINION OF PROJECT COST					\$6,408,000

**Oakland County Water Resources Commissioner Evergreen Farmington Sewage Disposal System
SRF Project Plan
EFSDS Improvements**

**Harlan Road Storage Tank
Present Worth Calculations**

<u>CAPITAL COST</u>	CAPITAL COST ⁽¹⁾	SERVICE LIFE (YEARS)	PRESENT WORTH ⁽²⁾
Demolition and Site Preparation	\$ 1,833,600.00	Inf	\$ 1,017,000.00
Civil/Site Work	\$ 2,774,400.00	50	\$ 2,033,000.00
Mechanical/Electrical	\$ 1,800,000.00	20	\$ 1,800,000.00
TOTAL CAPITAL COST	\$ 6,408,000.00		\$ 4,850,000.00
 INTEREST DURING CONSTRUCTION			 \$ 160,000.00
Assumes 1 year interest at 2.5%			
 <u>ANNUAL OPERATION AND MAINTENANCE COST</u>			
ANNUAL O, M & R COST (NON-ENERGY)		\$ 15,000.00	
PRESENT WORTH OF OM&R COST (NON ENERGY)			\$ 202,000.00
ANNUAL O, M & R COST (ENERGY)		\$ 15,000.00	
PRESENT WORTH OF OM&R COST (ENERGY)			\$ 272,000.00
 PRESENT WORTH			 \$ 5,484,000.00
 AVERAGE ANNUAL EQUIVALENT COST			 \$ 408,000.00

Notes:

⁽¹⁾ April 2014 ENR 20 Cities CCI = 9667

⁽²⁾ Cost is based on a study period of 20 years and a discount rate of 4.125%.

Present Worth Costs are based on Straight Line Depreciation and no inflation.

**TROY ARM HYDRAULIC RESTRICTIONS
ALTERNATE 1 - TROY ARM HYDRAULIC IMPROVEMENTS
Concept Level Opinion of Probable Costs**

Owner: Oakland County Water Resources Commissioner
 Project: North Evergreen Interceptor
 Work: Quarton Branch
 Basis of Estimate: Report Design Final
 % % %

Date: 3/18/2014
 Project No. 20130714
 Prepared By: BH
 Reviewer: MM
 CCI: Time of Est.: 9667
 CCI: Current: 9667

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
Manhole Bench Rehabilitation					
1	Soil Erosion and Sedimentation Control	1	LS	\$10,000.00	\$10,000
2	Audiovisual Coverage	1	LS	\$10,000.00	\$10,000
3	Traffic Maintenance and Control	1	LS	\$10,000.00	\$10,000
4	Site Access	16	EA	\$2,000.00	\$32,000
5	MH Bench Rehabilitation	16	EA	\$5,000.00	\$80,000
6	Landscaping Allowance at each MH	16	EA	\$1,000.00	\$16,000
7	General Conditions	10	%		\$16,000
8	General Requirements	5	%		\$8,000
Woodward Avenue Sewer Crossing Repair					
1	Soil Erosion and Sedimentation Control	1	LS	\$5,000.00	\$5,000
2	Audiovisual Coverage	1	LS	\$2,500.00	\$2,500
3	Traffic Maintenance and Control	1	LS	\$10,000.00	\$10,000
4	Geotechnical Investigation	1	LS	\$10,000.00	\$10,000
5	Private Utility Relocation/Support Allowance	1	LS	\$5,000.00	\$5,000
6	Tree Removal	1	LS	\$3,000.00	\$3,000
7	Clearing & Grubbing	1	LS	\$5,000.00	\$5,000
8	24" Dia. Sewer Relining	365	LFT	\$150.00	\$54,750
9	Annular Space Grouting	365	LFT	\$20.00	\$7,300
10	MH Bench Rehabilitation	1	EA	\$5,000.00	\$5,000
11	Junction Chamber	1	EA	\$40,000.00	\$40,000
12	Landscaping Allowance	1	LS	\$2,000.00	\$2,000
13	General Conditions	10	%		\$15,000
14	General Requirements	5	%		\$7,000
Zig Zag Repair					
1	Soil Erosion and Sedimentation Control	1	LS	\$5,000.00	\$5,000
2	Audiovisual Coverage	1	LS	\$2,500.00	\$2,500
3	Traffic Maintenance and Control	1	LS	\$20,000.00	\$20,000
4	Geotechnical Investigation	1	LS	\$10,000.00	\$10,000
5	Private Utility Relocation/Support Allowance	1	LS	\$15,000.00	\$15,000
6	By-Pass Pumping	1	LS	\$15,000.00	\$15,000
7	60" Dia Manhole Over Exist Swr	2	EA	\$7,500.00	\$15,000
8	Junction Chamber Over Exist Swr	1	EA	\$40,000.00	\$40,000
9	Gravity Sewer, 24" w/Compacted Sand Backfill	216	FT	\$110.00	\$23,760
10	24" Sewer Abandonment w/Flowable Fill	385	FT	\$10.00	\$3,850
11	Parking Lot, HMA Restoration	570	SYD	\$32.00	\$18,240
12	Woodward Ave, HMA Restoration	85	SYD	\$44.00	\$3,740
13	Concrete Sidewalk Restoration	500	SFT	\$10.00	\$5,000
14	Wall Removal, Salvage, Reconstruct	1	LS	\$10,000.00	\$10,000
15	Maintain Aggregate	200	TON	\$18.00	\$3,600
16	Utility Trench Undercut	100	CYD	\$25.00	\$2,500
17	Landscaping Allowance	1	LS	\$10,000.00	\$10,000
18	General Conditions	10	%		\$20,000
19	General Requirements	5	%		\$10,000
CONSTRUCTION SUBTOTAL					\$587,000
Contingencies		20	%		\$117,000
Engineering, Legal, Administration		30	%		\$212,000
2 years	Annual Cost Adjustment	3.5	% / year	7.12%	\$50,000
Total:					\$966,000
Adjustment of Costs from ENR CCI		1.00			\$966,000
ENGINEER'S OPINION OF PROJECT COST					\$966,000

*Project cost does not include Easement Acquisition

Oakland County Water Resources Commissioner Evergreen Farmington Sewage Disposal System
SRF Project Plan
EFSDS Improvements

Troy Arm Hydraulic Improvements
Present Worth Calculations

<u>CAPITAL COST</u>	CAPITAL COST ⁽¹⁾	SERVICE LIFE (YEARS)	PRESENT WORTH ⁽²⁾
Demolition and Site Preparation	\$ -	Inf	\$ -
Civil/Site Work	\$ 966,000.00	50	\$ 708,000.00
Mechanical/Electrical	\$ -	20	\$ -
TOTAL CAPITAL COST	\$ 966,000.00		\$ 708,000.00
 INTEREST DURING CONSTRUCTION Assumes 1 year interest at 2.5%			 \$ 24,000.00
 <u>ANNUAL OPERATION AND MAINTENANCE COST</u>			
ANNUAL O, M & R COST (NON-ENERGY)		\$ 250.00	
PRESENT WORTH OF OM&R COST (NON ENERGY)			\$ 3,000.00
ANNUAL O, M & R COST (ENERGY)		\$ -	
PRESENT WORTH OF OM&R COST (ENERGY)			
 PRESENT WORTH			 \$ 735,000.00
 AVERAGE ANNUAL EQUIVALENT COST			 \$ 55,000.00

Notes:

⁽¹⁾ April 2014 ENR 20 Cities CCI = 9667

⁽²⁾ Cost is based on a study period of 20 years and a discount rate of 4.125%.
Present Worth Costs are based on Straight Line Depreciation and no inflation.

**TROY ARM HYDRAULIC RESTRICTIONS
ALTERNATE 2 - UPSIZE HARLAN ELEMENTARY SCHOOL STORAGE TANK
Concept Level Opinion of Probable Costs**

Owner: Oakland County Water Resources Commissioner
 Project: EFSDS LTCAP
 Work: Troy Branch
 Basis of Estimate:
 Report Design Final
 % % %

Date: 9/11/2013
 Project No.: 0105-11-0070
 Prepared By: Bryan D
 Reviewer: Greg K
 CCI: Time of Est.: 9689
 CCI: Current: 9689

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
	Upsize Harlan Road Tank				
1	Upsize Harlan Road Tank 0.39 Mgal	380,000	Gal	\$3.50	\$1,330,000
			CONSTRUCTION SUBTOTAL		\$1,330,000
	Contingencies	20	%		\$266,000
	Engineering, Legal, Administration	30	%		\$479,000
2 years	Annual Cost Adjustment	3.5	% / year	7.12%	\$114,000
				Total:	\$2,189,000
	Adjustment of Costs from ENR CCI	1.00			\$2,189,000
ENGINEER'S OPINION OF PROJECT COST					\$2,189,000

**Oakland County Water Resources Commissioner Evergreen Farmington Sewage Disposal System
SRF Project Plan
EFSDS Improvements**

**Upsize Troy Arm Storage Tank
Present Worth Calculations**

<u>CAPITAL COST</u>	CAPITAL COST ⁽¹⁾	SERVICE LIFE (YEARS)	PRESENT WORTH ⁽²⁾
Demolition and Site Preparation	\$ -	Inf	\$ -
Civil/Site Work	\$ 1,189,000.00	50	\$ 871,000.00
Mechanical/Electrical	\$ 1,000,000.00	20	\$ 1,000,000.00
TOTAL CAPITAL COST	\$ 2,189,000.00		\$ 1,871,000.00
 INTEREST DURING CONSTRUCTION Assumes 1 year interest at 2.5%			 \$ 55,000.00
 <u>ANNUAL OPERATION AND MAINTENANCE COST</u>			
ANNUAL O, M & R COST (NON-ENERGY)		\$ 5,000.00	
PRESENT WORTH OF OM&R COST (NON ENERGY)			\$ 67,000.00
ANNUAL O, M & R COST (ENERGY)		\$ -	
PRESENT WORTH OF OM&R COST (ENERGY)			
 PRESENT WORTH			 \$ 1,993,000.00
 AVERAGE ANNUAL EQUIVALENT COST			 \$ 148,000.00

Notes:

⁽¹⁾ April 2014 ENR 20 Cities CCI = 9667

⁽²⁾ Cost is based on a study period of 20 years and a discount rate of 4.125%.

Present Worth Costs are based on Straight Line Depreciation and no inflation.

**STONYCROFT RELIEF SEWER
ALTERNATE 1 - STONYCROFT GOLF CLUB RELIEF SEWER
Concept Level Opinion of Probable Costs**

Owner: Oakland County Water Resources Commissioner
 Project: North Evergreen Interceptor
 Work: Quarton Branch
 Basis of Estimate:

<input checked="" type="checkbox"/>	Report	<input type="checkbox"/>	Design	<input type="checkbox"/>	Final
<input type="checkbox"/>	%	<input type="checkbox"/>	%	<input type="checkbox"/>	

Date: 3/19/2014
 Project No. 20130714
 Prepared By: BH
 Reviewer: MM & DM
 CCI: Time of Est.: 9667
 CCI: Current: 9667

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	Soil Erosion and Sedimentation Control	1	LS	\$25,000.00	\$25,000
2	Traffic Maintenance and Control	1	LS	\$15,000.00	\$15,000
3	Geotechnical Investigation	1	LS	\$5,000.00	\$5,000
4	Clearing and Grubbing	3	ACRE	\$15,000.00	\$45,000
5	Utility Relocation Allowance	1	LS	\$5,000.00	\$5,000
6	Audiovisual Coverage	1	LS	\$5,000.00	\$5,000
7	Junction Chamber, Cast in Place	2	EA	\$25,000.00	\$50,000
8	48" Dia Manhole	10	EA	\$1,800.00	\$18,000
9	48" Dia Manhole w/Drop Connection	1	EA	\$3,000.00	\$3,000
10	Tap Existing Manhole, 21"	1	EA	\$500.00	\$500
11	Gravity Interceptor, 21"	2,070	FT	\$90.00	\$186,300
12	Gravity Interceptor, 21" w/Compacted Sand Backfill	870	FT	\$125.00	\$108,750
13	Stonycroft Drive, HMA Restoration	1,960	SYD	\$28.00	\$54,880
14	Golf Course, HMA Pathway Restoration	100	SYD	\$24.00	\$2,400
15	Amy Pump Station Capacity Upgrades	1	LS	\$175,000.00	\$175,000
16	Amy Pump Station SCADA Control	1	LS	\$100,000.00	\$100,000
17	Maintain Aggregate	500	TON	\$18.00	\$9,000
18	Utility Trench Undercut	250	CYD	\$25.00	\$6,250
19	4' High Property Protection Fence	500	FT	\$10.00	\$5,000
20	Turf Restoration	4,800	SYD	\$3.50	\$16,800
21	Golf Course Restoration	9,680	SYD	\$5.00	\$48,400
22	Landscaping Allowance	1	LS	\$30,000.00	\$30,000
23	General Conditions	10	%		\$91,000
24	General Requirements	5	%		\$46,000
CONSTRUCTION SUBTOTAL					\$1,051,000
	Contingencies	20	%		\$210,000
	Engineering, Legal, Administration	30	%		\$378,000
2 years	Annual Cost Adjustment	3.5	% / year	7.12%	\$90,000
				Total:	\$1,729,000
	Adjustment of Costs from ENR CCI	1.00			\$1,729,000
ENGINEER'S OPINION OF PROJECT COST					\$1,729,000

*Project cost does not include Easement Acquisition

**Oakland County Water Resources Commissioner Evergreen Farmington Sewage Disposal System
SRF Project Plan
EFSDS Improvements**

**Stonycroft Golf Course Relief Sewer
Present Worth Calculations**

<u>CAPITAL COST</u>	CAPITAL COST ⁽¹⁾	SERVICE LIFE (YEARS)	PRESENT WORTH ⁽²⁾
Demolition and Site Preparation	\$ 160,000.00	Inf	\$ 89,000.00
Civil/Site Work	\$ 1,090,000.00	50	\$ 799,000.00
Mechanical/Electrical	\$ 479,000.00	20	\$ 479,000.00
TOTAL CAPITAL COST	\$ 1,729,000.00		\$ 1,367,000.00
 INTEREST DURING CONSTRUCTION Assumes 1 year interest at 2.5%			 \$ 43,000.00
 <u>ANNUAL OPERATION AND MAINTENANCE COST</u>			
ANNUAL O, M & R COST (NON-ENERGY)		\$ 250.00	
PRESENT WORTH OF OM&R COST (NON ENERGY)			\$ 3,000.00
ANNUAL O, M & R COST (ENERGY)		\$ 500.00	
PRESENT WORTH OF OM&R COST (ENERGY)			\$ 9,000.00
PRESENT WORTH			\$ 1,422,000.00
 AVERAGE ANNUAL EQUIVALENT COST			 \$ 106,000.00

Notes:

⁽¹⁾ April 2014 ENR 20 Cities CCI = 9667

⁽²⁾ Cost is based on a study period of 20 years and a discount rate of 4.125%.

Present Worth Costs are based on Straight Line Depreciation and no inflation.

**STONYCROFT RELIEF SEWER
ALTERNATE 2 - KENSINGTON ROAD RELIEF SEWER
Concept Level Opinion of Probable Costs**

Owner: Oakland County Water Resources Commissioner
 Project: North Evergreen Interceptor
 Work: Quarton Branch
 Basis of Estimate:

Date: 3/19/2014
 Project No. 20130714
 Prepared By: BH
 Reviewer: MM & DM
 CCI: Time of Est.: 9667
 CCI: Current: 9667

<input checked="" type="checkbox"/>	Report	<input type="checkbox"/>	Design	<input type="checkbox"/>	Final
<input type="checkbox"/>	%	<input type="checkbox"/>	%	<input type="checkbox"/>	

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	Soil Erosion and Sedimentation Control	1	LS	\$10,000.00	\$10,000
2	Audiovisual Coverage	1	LS	\$5,000.00	\$5,000
3	Traffic Maintenance and Control	1	LS	\$50,000.00	\$50,000
4	Geotechnical Investigation	1	LS	\$5,000.00	\$5,000
5	Clearing and Grubbing	1	ACRE	\$15,000.00	\$15,000
6	Private Utility Relocation/Support Allowance	1	LS	\$10,000.00	\$10,000
7	Water Main Relocation	1	LS	\$120,000.00	\$120,000
8	48" Dia Manhole	10	EA	\$1,800.00	\$18,000
9	48" Dia Manhole Over Exist Swr	1	EA	\$3,000.00	\$3,000
10	48" Dia Manhole w/Drop Connection	1	EA	\$3,000.00	\$3,000
11	Tap Existing Manhole, 18"	1	EA	\$500.00	\$500
12	Steel Casing, 36", Tunnel, Jack or Bore	220	FT	\$600.00	\$132,000
13	Gravity Interceptor, 18"	240	FT	\$55.00	\$13,200
14	Gravity Interceptor, 18" w/Compacted Sand Backfill	2,856	FT	\$190.00	\$542,640
15	Relining Existing Sewer, 15"	1,630	FT	\$128.00	\$208,640
16	Amy Pump Station Capacity Upgrades	1	LS	\$175,000.00	\$175,000
17	Amy Pump Station SCADA Control	1	LS	\$100,000.00	\$100,000
18	Kensington Rd, HMA Restoration	6,590	SYD	\$28.00	\$184,520
19	Maintain Aggregate	1,000	TON	\$18.00	\$18,000
20	Utility Trench Undercut	250	CYD	\$25.00	\$6,250
21	4' High Property Protection Fence	500	FT	\$10.00	\$5,000
22	Turf Restoration	2,900	SYD	\$3.50	\$10,150
23	Landscaping Allowance	1	LS	\$15,000.00	\$15,000
24	CN Railroad Review & Inspection/Flagging	1	LS	\$25,000.00	\$25,000
25	General Conditions	10	%		\$167,000
26	General Requirements	5	%		\$84,000
CONSTRUCTION SUBTOTAL					\$1,926,000
	Contingencies	20	%		\$385,000
	Engineering, Legal, Administration	30	%		\$693,000
2 years	Annual Cost Adjustment	3.5	% / year	7.12%	\$165,000
				Total:	\$3,169,000
	Adjustment of Costs from ENR CCI	1.00			\$3,169,000
ENGINEER'S OPINION OF PROJECT COST					\$3,169,000

*Project cost does not include Easement Acquisition

**Oakland County Water Resources Commissioner Evergreen Farmington Sewage Disposal System
SRF Project Plan
EFSDS Improvements**

**Kensington Road Relief Sewer
Present Worth Calculations**

CAPITAL COST

	CAPITAL COST ⁽¹⁾	SERVICE LIFE (YEARS)	PRESENT WORTH ⁽²⁾
Demolition and Site Preparation	\$ 152,000.00	Inf	\$ 84,000.00
Civil/Site Work	\$ 2,528,000.00	50	\$ 1,852,000.00
Mechanical/Electrical	\$ 489,000.00	20	\$ 489,000.00
TOTAL CAPITAL COST	\$ 3,169,000.00		\$ 2,425,000.00

INTEREST DURING CONSTRUCTION \$ 79,000.00
Assumes 1 year interest at 2.5%

ANNUAL OPERATION AND MAINTENANCE COST

ANNUAL O, M & R COST (NON-ENERGY)	\$ 250.00	
PRESENT WORTH OF OM&R COST (NON ENERGY)		\$ 3,000.00
ANNUAL O, M & R COST (ENERGY)	\$ 500.00	
PRESENT WORTH OF OM&R COST (ENERGY)		\$ 9,000.00

PRESENT WORTH \$ 2,516,000.00

AVERAGE ANNUAL EQUIVALENT COST \$ 187,000.00

Notes:

⁽¹⁾ April 2014 ENR 20 Cities CCI = 9667

⁽²⁾ Cost is based on a study period of 20 years and a discount rate of 4.125%.
Present Worth Costs are based on Straight Line Depreciation and no inflation.

**QUARTON AND WOODWARD STORAGE
ALTERNATIVE 1 - STORAGE TANK AT NW CORNER OF QUARTON AND WOODWARD
Concept Level Opinion of Probable Costs**

Owner: Oakland County Water Resources Commissioner
 Project: North Evergreen Interceptor
 Work: Quarton Branch

Date: 3/17/2014
 Project No. 20130714
 Prepared By: BH
 Reviewer: MM
 CCI: Time of Est.: 9667
 CCI: Current: 9667

Basis of Estimate:

X	Report		Design	
	%		%	Final

Item No.	Item Description	Est. Quantity	Unit	Unit Price	Total Cost
1	Soil Erosion and Sedimentation Control	1	LS	\$10,000.00	\$10,000
2	Audiovisual Coverage	1	LS	\$5,000.00	\$5,000
3	Traffic Maintenance and Control	1	LS	\$60,000.00	\$60,000
4	Geotechnical Investigation	1	LS	\$30,000.00	\$30,000
5	Tree, Removal	1	LS	\$20,000.00	\$20,000
6	Clearing and Grubbing	2.5	ACRE	\$5,000.00	\$12,500
7	Private Utility Relocation/Support Allowance	1	LS	\$10,000.00	\$10,000
8	Sheeting & Shoring	3,000	SFT	\$25.00	\$75,000
9	Dewatering	1	LS	\$50,000.00	\$50,000
10	0.40 mg Storage Facility	1	LS	\$2,800,000.00	\$2,800,000
11	Junction/Control Chamber	2	EA	\$40,000.00	\$80,000
12	48" Dia Manhole	3	EA	\$2,800.00	\$8,400
13	Gravity Sewer, 24" w/Compacted Sand Backfill	70	FT	\$175.00	\$12,250
14	Gravity Sewer, 24" w/Native Backfill	265	FT	\$150.00	\$39,750
15	Gravity Sewer, 24" Jack & Bore w/42" Casing Pipe	80	FT	\$350.00	\$28,000
16	Quarton Rd, HMA Restoration	175	SYD	\$32.00	\$5,600
17	Driveway, HMA Restoration	45	SYD	\$28.00	\$1,260
18	Driveway, Grass Paver	125	SYD	\$15.00	\$1,875
19	Maintenance Aggregate	50	TON	\$18.00	\$900
20	Utility Trench Undercut	50	CYD	\$25.00	\$1,250
21	6' High Temporary Chainlink Fence	700	FT	\$10.00	\$7,000
22	Turf Restoration	4,250	SYD	\$3.50	\$14,875
23	Landscaping Allowance	1	LS	\$40,000.00	\$40,000
24	General Conditions	10	%		\$331,000
25	General Requirements	5	%		\$166,000
CONSTRUCTION SUBTOTAL					\$3,811,000
	Contingencies	20	%		\$762,000
	Engineering, Legal, Administration	30	%		\$1,372,000
2 years	Annual Cost Adjustment	3.5	% / year	7.12%	\$326,000
				Total:	\$6,271,000
	Adjustment of Costs from ENR CCI	1.00			\$6,271,000
ENGINEER'S OPINION OF PROJECT COST					\$6,271,000

*Project cost does not include Easement Acquisition

**Oakland County Water Resources Commissioner Evergreen Farmington Sewage Disposal System
SRF Project Plan
EFSDS Improvements**

**Quarton Road Storage Tank
Present Worth Calculations**

<u>CAPITAL COST</u>	CAPITAL COST ⁽¹⁾	SERVICE LIFE (YEARS)	PRESENT WORTH ⁽²⁾
Demolition and Site Preparation	\$ 500,000.00	Inf	\$ 277,000.00
Civil/Site Work	\$ 1,271,000.00	50	\$ 931,000.00
Mechanical/Electrical	\$ 4,500,000.00	20	\$ 4,500,000.00
TOTAL CAPITAL COST	\$ 6,271,000.00		\$ 5,708,000.00
 INTEREST DURING CONSTRUCTION			 \$ 157,000.00
Assumes 1 year interest at 2.5%			
 <u>ANNUAL OPERATION AND MAINTENANCE COST</u>			
ANNUAL O, M & R COST (NON-ENERGY)		\$ 1,000.00	
PRESENT WORTH OF OM&R COST (NON ENERGY)			\$ 13,000.00
ANNUAL O, M & R COST (ENERGY)		\$ 15,000.00	
PRESENT WORTH OF OM&R COST (ENERGY)			\$ 272,000.00
 PRESENT WORTH			 \$ 6,150,000.00
 AVERAGE ANNUAL EQUIVALENT COST			 \$ 458,000.00

Notes:

⁽¹⁾ April 2014 ENR 20 Cities CCI = 9667

⁽²⁾ Cost is based on a study period of 20 years and a discount rate of 4.125%.

Present Worth Costs are based on Straight Line Depreciation and no inflation.

Appendix F

Public Hearing Information

NOTICE OF PUBLIC HEARING

The Oakland County Water Resources Commissioner's office will hold a public hearing on the proposed Evergreen Farmington Sewage Disposal System (EFSDS) North Evergreen Interceptor (NEI) State Revolving Fund (SRF) Project Plan for the purpose of receiving comments from interested persons.

The hearing will be held at 6:00 p.m. on Tuesday, June 17, 2014 at the following location: Bloomfield Township Hall Auditorium, 4200 Telegraph Road, Bloomfield Hills, Michigan 48302.

The purpose of the proposed project is to make improvements to the EFSDS NEI in several locations in order to reduce the frequency of sanitary sewer overflows (SSOs) and protect water quality. Project construction will involve the construction of four (4) projects, as outlined below:

1. Wattles Road Linear Storage – Construction of a 0.51 million gallon linear storage facility located in Wattles Road east and west of Adams Road.
2. NEI Hydraulic Improvements – This project will consist of improvements to 16 manholes along the NEI, improvements to the NEI crossing of Woodward Avenue, and the replacement of a section of the NEI in a municipal parking area in Birmingham upstream of Old Woodward.
3. Stonycroft Relief Sewer and Amy PS Improvements – Construction of a 21" diameter relief sewer through Stonycroft Golf Course and improvements to the Amy Pump Station.
4. Quarton Road Storage – Construction of a 0.4 million gallon storage tank on the Manresa Jesuit Retreat property located at the northeast corner of Woodward Avenue and Quarton Road.

Impacts of the proposed projects include short term construction related inconveniences such as road closures, traffic disruptions, noise, dust, and other impacts. Signage and notification will be in place during construction to mitigate these impacts. The project construction will take place in several areas where natural features are present. Efforts such as soil erosion control measures will be put in place to protect natural resources. Work is proposed to take place at the Stonycroft Golf Course in Bloomfield Hills and Springdale Golf Course in Birmingham. The work will be scheduled in the winter time to avoid impact to these facilities. In addition, work within the Birmingham municipal parking lot will be scheduled to avoid the summer Farmer's Market.

This project will be funded through loans from the State of Michigan Revolving Fund. The four (4) projects have a combined estimated construction cost of \$13,469,000. This equates to \$6.37 to \$28.50 per residential equivalent unit on annual basis, or \$0.53 to \$2.38 on a monthly basis.

Copies of the plan detailing the proposed project are available for inspection at the following locations:

Oakland County Water Resources Commissioner's Office – One Public Works Drive, Waterford, MI 48328
Auburn Hills City Hall – Clerk's office – 1827 N. Squirrel Road, Auburn Hills, MI 48326
Birmingham City Hall – Clerk's office – 151 Martin Street, Birmingham, MI 48012
Bloomfield Hills City Hall – Clerk's office – 45 E. Long Lake Road, Bloomfield Hills, MI 48304
Bloomfield Township Hall – Clerk's office – 4200 Telegraph Road, Bloomfield Hills, MI 48302
Troy City Hall – Clerk's office – 500 W. Big Beaver Road, Troy, MI 48084

Written comments received through June 17, 2014 at 6 pm will be entered into the public hearing record and responses as necessary will be included in the final project plan. Written comments should be sent to:

Oakland County Water Resources Commissioner's office:
c/o Tom Maxwell
One Public Works Drive
Waterford, MI 48328

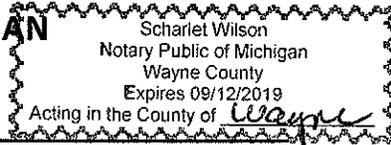
OBSERVER & ECCENTRIC and HOMETOWN WEEKLY NEWSPAPERS
615 W LAFAYETTE BLVD, DETROIT, MI 48226

BE IT MADE KNOWN THAT THE FOLLOWING ADVERTISEMENT APPEARED IN:

Publication: Birmingham Eccentric
Placed By: Hubbell, Roth & Clark
Subject: Notice of Public Hearing
Date of Publication: May 18, 2014

Susan Totoraitis (Susan Totoraitis), being duly sworn, deposes and says that advertising illustrated above/attached was published in the Birmingham Eccentric Newspaper on the following date/s/: May 18, 2014, INVOICE number 195349 and as an authorized employee of the Observer and Eccentric Media, she knows well the facts stated herein. Cost: \$162.90.

STATE OF MICHIGAN



COUNTY OF _____

NOTARIZED BY: Scharlet Wilson

(Acting in) Wayne Notary Public in and for said County

Commission expires 9-12-19

All questions may be directed to Charolette Wilson, Classified Advertising Manager, 586-826-7082, during normal business hours of Monday through Friday 8:30am until 4:30pm.

SOCCER

Continued from Page B1

we look to them and we can score some goals," he added. "We're moving in the right direction. I'm hoping we can peak at the right time when the state tournament begins."

Captains key success

Rodrigues said the team's success starts with its trio of captains – senior JBess Ruby, Jen Kendall and Hannah Haley.

Kendall, who is headed to play soccer at Colorado School of Mines, leads the Maples with eight goals and five assists for 13 points. The versatile athlete – she's also a gymnast – is second on the team in shots with 35.

Ruby, a center midfielder, is second with 10 points on five goals and five assists. The Evansville University recruit leads the team with 47 shots on goal.

Haley, a solid left-side defender, has two goals

and three assists. "I have a nice group of players here and the captains keep them focused," Rodrigues said. "All my captains are tremendous leaders. They all do similar things, but they all have attributes that benefit each other, whether it's the speed of Jen, the quarterback in the middle with JBess and then Hannah, who keeps the back line straightened up.

"JBess has tremendous field awareness and tremendous touch. It's no surprise why she's going to college to play soccer," he added. "Jen has tremendous feet and Hannah just might be one of the smartest players on the field. She sees the field very well."

Seaholm's defense, which has allowed just 18 goals all season, is anchored by Haley. However, juniors Colby Miner and Madison Skornicka are also solid at the back end.

Catherine Perry is versatile and can play midfield or defense.

"I can put (Perry) in



goal and she wouldn't complain," Rodrigues said. "She's a smart player. She doesn't have size, but she has a lot of heart and she's fast and she's sneaky strong."

Tough district awaits

The goalie is sophomore Alaina Betz, who has posted four shutouts.

"I had a big gaping hole at goalie after losing Lisa White last year," Rodrigues said. "She has

Seaholm girls soccer head coach Manny Rodrigues likes the season-long improvement his squad has shown. If the Maples win their final division game at home Tuesday against Ferndale, they will tie for the OAA Blue championship.

Ruby. Senior Andrea Ebling plays right-side defense.

After closing the regular season this week with the game against Ferndale and a non-league affair with neighboring Cranbrook Kingswood, the Maples will play in the seven-team Division 1 district tournament hosted by Bloomfield Hills.

It figures to be a tough district with the likes of traditional powers like Troy and Troy Athens and another OAA Red Division member in Royal Oak. But Rodrigues and the Maples won't be intimidated after the team's season-long improvement.

"We are a possession team and we have some great goal scorers, but too many times this year against some of the stronger teams, we've only played half a game and we kind of fall asleep," Rodrigues said. "When we play a complete game, we're a good team and that's what we're stressing now. If we play a complete game, I wouldn't want to

play us. "We're in a district where anybody can beat anyone at any time and it's been proven," he added. "If you can come in on a good winning streak and are playing well, anything can happen."

STATE OF MICHIGAN PROBATE COURT COUNTY OF OAKLAND

NOTICE TO CREDITORS Decedent's Estate File # 2014-345,506-DE

Estate of JEAN L. CLEAVER, deceased Date of birth March 18, 1929

TO ALL CREDITORS Notice to creditors: The decedent, Jean L. Cleaver, died April 28, 2014.

Creditors of the decedent are notified that all claims against the estate will be forever barred unless presented to Margaret E. Ferro, personal representative, or to both the probate court at 1200 N. Telegraph Road, Pontiac, Michigan, 48311 and the personal representative within 4 months after the date of publication of this notice.

Joyce Q. Lower, Attorney Bar # P16824 800 West Long Lake Road, Suite 210 Bloomfield Hills, MI 48302-2058 248/642-1056

Margaret E. Ferro, Personal Representative 14363 Pernel Drive Sterling Heights, MI 48313

Publish: May 18, 2014 LO-0000195386 1x4

OFFICIAL DOCUMENT

Birmingham Public Schools
31301 Evergreen Rd.
Beverly Hills, MI 48025
(248) 203-3000

ADVERTISEMENT FOR REQUEST FOR BID

Project: Playground Mulch	Bid Package #: 6.1415
----------------------------------	------------------------------

Notice is hereby given that sealed bids for **Playground Mulch** will be received by Birmingham Public Schools, 31301 Evergreen Rd., Beverly Hills, Michigan 48025, Attention: Purchasing Department, Jessica Ritchie-Smola, Public Buyer, Auxiliary Business Services. Delivery on or before **Tuesday, May 27, 2014, at 2:00 p.m.**, local time. No allowance will be made for late delivery for any reason.

Bids shall be prepared in accordance with specifications outlined in Request for Bid.

Bids will be publicly opened on **Tuesday, May 27, 2014, at 2:00 p.m.** local time, by Birmingham Public Schools at 31301 Evergreen Rd., Beverly Hills, Michigan 48025, evaluated, with awards subsequently to be made by Birmingham Public Schools.

The Request for Bid documents may be downloaded by proponent, on or after **May 13, 2014**, at the following website: www.bpsauxiliarybus.net/bids/currentbids.asp Request for Bid documents may be contained in more than one electronic file. It is proponent's responsibility to access and download all pertinent documents related to a particular bid. The email address you input into this website becomes your Login ID for this bid. Request for Bid change notifications, such as addendums, will be electronically sent to this email address. If you do not register a valid email address, which you verify on a regular basis, you will not be notified of changes to Request for Bid documents. No other request for Request for Bid change notifications (addendums) will be honored. All Request for Bids or Request for Bids requires separate registration.

All questions shall be directed to the office of Jessica Ritchie-Smola, Public Buyer, Auxiliary Business Services at (248) 203-3050.

A proponent will be permitted to withdraw their bid, unopened, after it has been submitted if so requested prior to the time specified above for opening of bids. The successful proponent shall be required to enter into a contract with Birmingham Public Schools. The successful proponent shall pay all taxes required by law.

All proponents must provide familial disclosure in compliance with MCL 380.1267 and attach this information to the bid. The bid will be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the proponent or any employee of the proponent, and any member of the Board of Education of the school district, or the Superintendent of the school district. The District will not consider a bid that does not include this sworn and notarized disclosure statement.

The right to reject any or all bids, either in whole or in part, or to waive any informalities or irregularities therein, is reserved by Birmingham Public Schools. The Board of Education will not consider or accept a bid received by the Board after the date and time specified for receipt of bid.

Authorized Signature:

Jessica Ritchie-Smola, Public Buyer, Auxiliary Business Services

Publish: May 18, 2014 LO-0000195404 3x7.5

THE CITY OF BIRMINGHAM IS ACCEPTING BID PROPOSALS FROM QUALIFIED SERVICE PROVIDERS TO MANAGE AND ADMINISTER A PUBLIC SERVICES PROGRAM FOR YARD SERVICES AND SENIOR SERVICES FOR QUALIFIED LOW AND MODERATE-LOW INCOME RESIDENTS OF THE CITY OF BIRMINGHAM FOR THE PROGRAM YEAR JULY 1, 2014 THROUGH JUNE 30, 2015

Bid proposals must include a detailed explanation of the bidder's ability to manage and administer the Public Services Program for Yard Services and Senior Services, the capability of provider having available contractors and staff to do the work required, a detailed cost and/or fees charged to run the above program, and provide reference letters of experience. This program will be funded with Community Development Block Grant (CDBG) funds; therefore, all CDBG program requirements will apply.

All bid proposals will be evaluated by a committee on a **100-point scale** using the following criteria:

- CAPABILITY** – Provider's ability to have and maintain qualified contractors and staff on hand to do required CDBG Yard Services and Senior Services work. All service work is to be completed in an efficient and well-organized manner. **(25 points)**
- EXPERIENCE** – Provider's past experience regarding this type of administration of service will be considered under this criterion. Please include a minimum of three (3) reference letters of experience with the bid proposal request. **(20 points)**
- FAMILIARITY** (CDBG requirements) – Provider's familiarity with the Community Development Block Grant (CDBG) program requirements and ability to comply with all CDBG required guidelines. **(20 points)**
- METHODOLOGY** – Provider's method of approach or work plan summary to meet municipality requirements for the scope of work specified. **(10 points)**
- REFERENCES** – Provide a list of sources. **(10 points)**
- COST** – Costs and/or fees charged by provider to manage and administer the CDBG Public Services Program for Yard Services and Senior Services to the residents of the City of Birmingham. **(15 points)**

ALL BID PROPOSALS ARE DUE BY WEDNESDAY, JUNE 25, 2014 AT 10:00 A.M. AT THE CITY OF BIRMINGHAM CLERK OFFICE. BIDS MUST BE IN A SEALED ENVELOPE ADDRESSED TO:

**CITY OF BIRMINGHAM
CDBG Bid Proposal
ATTN: Kathryn Burrick
151 Martin Street
P.O. Box 3001
Birmingham, MI 48012**

The City of Birmingham is an equal opportunity employer. Businesses owned by women or minorities are strongly encouraged to apply.

If you have any questions regarding this bid request, please contact Kathryn Burrick in the Finance Department at (248) 530-1815.

Publish: May 18, 2014 LO-0000195382 3x6

NOTICE OF PUBLIC HEARING

The Oakland County Water Resources Commissioner's office will hold a public hearing on the proposed Evergreen Farmington Sewage Disposal System (EFSDS) North Evergreen Interceptor (NEI) State Revolving Fund (SRF) Project Plan for the purpose of receiving comments from interested persons.

The hearing will be held at 6:00 p.m. on Tuesday, June 17, 2014 at the following location: Bloomfield Township Hall Auditorium, 4200 Telegraph Road, Bloomfield Hills, Michigan 48302.

The purpose of the proposed project is to make improvements to the EFSDS NEI in several locations in order to reduce the frequency of sanitary sewer overflows (SSOs) and protect water quality. Project construction will involve the construction of four (4) projects, as outlined below:

- Wattles Road Linear Storage – Construction of a 0.51 million gallon linear storage facility located in Wattles Road east and west of Adams Road.
- NEI Hydraulic Improvements – This project will consist of improvements to 16 manholes along the NEI, improvements to the NEI crossing of Woodward Avenue, and the replacement of a section of the NEI in a municipal parking area in Birmingham upstream of Old Woodward.
- Stonycroft Relief Sewer and Amy PS Improvements – Construction of a 21" diameter relief sewer through Stonycroft Golf Course and improvements to the Amy Pump Station.
- Quarton Road Storage – Construction of a 0.4 million gallon storage tank on the Manresa Jesuit Retreat property located at the northeast corner of Woodward Avenue and Quarton Road.

Impacts of the proposed projects include short term construction related inconveniences such as road closures, traffic disruptions, noise, dust, and other impacts. Signage and notification will be in place during construction to mitigate these impacts. The project construction will take place in several areas where natural features are present. Efforts such as soil erosion control measures will be put in place to protect natural resources. Work is proposed to take place at the Stonycroft Golf Course in Bloomfield Hills and Springdale Golf Course in Birmingham. The work will be scheduled in the winter time to avoid impact to these facilities. In addition, work within the Birmingham municipal parking lot will be scheduled to avoid the summer Farmer's Market.

This project will be funded through loans from the State of Michigan Revolving Fund. The four (4) projects have a combined estimated construction cost of \$13,469,000. This equates to \$6.37 to \$28.50 per residential equivalent unit on annual basis, or \$0.53 to \$2.38 on a monthly basis.

Copies of the plan detailing the proposed project are available for inspection at the following locations:

Oakland County Water Resources Commissioner's Office – One Public Works Drive, Waterford, MI 48328
Auburn Hills City Hall – Clerk's office – 1827 N. Squirrel Road, Auburn Hills, MI 48326
Birmingham City Hall – Clerk's office – 151 Martin Street, Birmingham, MI 48012
Bloomfield Hills City Hall – Clerk's office – 45 E. Long Lake Road, Bloomfield Hills, MI 48304
Bloomfield Township Hall – Clerk's office – 4200 Telegraph Road, Bloomfield Hills, MI 48302
Troy City Hall – Clerk's office – 500 W. Big Beaver Road, Troy, MI 48084

Written comments received through June 17, 2014 at 6 p.m. will be included into the public hearing record and responses as necessary will be included in the final project plan. Written comments should be sent to:

Oakland County Water Resources Commissioner's office:
c/o Tom Maxwell
One Public Works Drive
Waterford, MI 48328

Publish: May 18, 2014 LO-0000195349 3x7.5

**ADVERTISEMENT FOR BIDS
2014 CONCRETE ROAD PROGRAM
VILLAGE OF BEVERLY HILLS
OAKLAND COUNTY, MICHIGAN**

Sealed proposals for the construction of the 2014 Concrete Road Program will be received by the Village of Beverly Hills until 11 a.m., Local Time on Thursday, May 22, 2014, at which time and place all bids will be publicly opened and read.

Bidders shall review and comply with the Instructions to Bidders, which are incorporated by reference, and carefully review all Contract Documents, as defined in the Instructions to Bidders. Bids submitted after the exact time specified for, receipt will not be considered.

The Contract will consist of the following principal items of work and appurtenances as specified herein and shown on the Contract Drawings.

The 2014 Concrete Road Program shall consist of the removal of 1,650 square yards of concrete pavement, installation of a new 8-inch thick aggregate base and 7-inch thick non-reinforced concrete section with integral curb and gutter. Installation of 830 lineal feet of 8" HDPE underdrain is also included in the scope of work.

Copies of Plans and Specifications and Proposal Forms shall be available on or after May 6, 2014 at the offices of Hubbell, Roth & Clark, Inc., Consulting Engineers, 555 Hulet Drive, Bloomfield Hills, Michigan 48302 0360.

A non-refundable payment of SEVENTY-FIVE (\$75.00) Dollars, **CHECK ONLY, payable** to "Hubbell, Roth & Clark, Inc." will be required for each set of Drawings and Specifications. Drawings and Specifications can be shipped by U.P.S. ground for a shipping and handling charge of Fifteen (\$15.00) Dollars, **CHECK ONLY, non-refundable**, to Hubbell, Roth & Clark, Inc. The Bidder is advised that to submit a bid on this project, the Bidder must have purchased a set of Plans and Specifications from Hubbell, Roth & Clark, Inc.

Proposals submitted by Bidders who have been debarred, suspended, or made ineligible by any Federal Agency will be rejected.

Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

Each bid proposal shall be submitted on the proposal forms provided and shall be accompanied by a certified check, cashier's check or bid bond, executed by the bidder and Surety Company, payable to the Village of Beverly Hills in the amount of FIVE PERCENT (5%) of the accompanying bid. Proposal Guaranties shall provide assurance that the bidder will, upon acceptance of the bid, execute the necessary Contract with the Village of Beverly Hills. No bid may be withdrawn after scheduled closing time for receiving bids for at least Ninety (90) days.

The successful bidder will be required to furnish satisfactory Performance, Labor and Material, and Maintenance and Guarantee Bonds.

The Village of Beverly Hills reserves the right to reject all bids and to waive irregularities in bidding.

No Proposal will be received unless made on blanks furnished and delivered to the Village Clerk on or before 11 a.m., Local time, May 22, 2014.

All proposals shall be enclosed in sealed envelopes, and labeled as indicated below. If mailed, the sealed envelopes containing proposals shall be inserted in a separate mailing envelope labeled and addressed as follows:

<p>Addressed to: Village of Beverly Hills 18500 13 Mile Road Beverly Hills, MI 48025 Attn: City Clerk</p>	<p>Labeled as: Proposals for 2014 Concrete Road Program Beverly Hills, Oakland County, Michigan HRC Job No. 20140125</p>
--	---

Published in MITN and Birmingham Observer and Eccentric between Tuesday, April 29, 2014 and Sunday, May 18, 2014.
Publish: May 4, 11, & 18, 2014 LO-0000195150 3x9

AFFIDAVIT OF PUBLICATION
48 West Huron Street • Pontiac, MI 48342

HUBBELL, ROTH & CLARK
555 HULET DR

BLOOMFIELD HILLS, MI 48303
Attention: Karyn Stichel

STATE OF MICHIGAN,
COUNTY OF OAKLAND

Debbie Phillips
Debbie Phillips

The undersigned Debbie Phillips, being duly sworn the he/she is the principal clerk of Oakland Press, theoaklandpress.com, published in the English language for the dissemination of local or transmitted news and intelligence of a general character, which are dully qualified newspapers, and the annexed hereto is a copy of certain order, notice, publication or advertisement of:

HUBBELL, ROTH & CLARK

Published in the following edition(s):

Oakland Press 05/15/14
theoaklandpress.com 05/15/14

Sworn to the subscribed before me this May 16, 2014.

Tina M Crown

Notary Public, State of Michigan
Acting in County of Oakland

NOTICE OF PUBLIC HEARING

The Oakland County Water Resources Commissioner's office will hold a public hearing on the proposed Evergreen Farmington Sewage Disposal System (EFSDS) North Evergreen Interceptor (NEI) State Revolving Fund (SRF) Project Plan for the purpose of receiving comments from interested persons.

The hearing will be held at 6:00 p.m. on Tuesday, June 17, 2014 at the following location: Bloomfield Township Hall Auditorium, 4200 Telegraph Road, Bloomfield Hills, Michigan 48302.

The purpose of the proposed project is to make improvements to the EFSDS NEI in several locations in order to reduce the frequency of sanitary sewer overflows (SSOs) and protect water quality. Project construction will involve the construction of four (4) projects, as outlined below:

1. Wattles Road Linear Storage - Construction of a 0.51 million gallon linear storage facility located in Wattles Road east and west of Adams Road.
2. NEI Hydraulic Improvements - This project will consist of improvements to 16 manholes along the NEI, improvements to the NEI crossing of Woodward Avenue, and the replacement of a section of the NEI in a municipal parking area in Birmingham upstream of Old Woodward.
3. Stonycroft Relief Sewer and Army PS Improvements - Construction of a 21" diameter relief sewer through Stonycroft Golf Course and improvements to the Army Pump Station.
4. Quarton Road Storage - Construction of a 0.4 million gallon storage tank on the Manresa Jesuit Retreat property located at the northeast corner of Woodward Avenue and Quarton Road.

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This project will be funded through loans from the State of Michigan Revolving Fund. The four (4) projects have a combined estimated construction cost of \$13,469,000. This equates to \$6.37 to \$28.50 per residential equivalent unit on annual basis, or \$0.53 to \$2.38 on a monthly basis.

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- Birmingham City Hall - Clerk's office - 151 Martin Street, Birmingham, MI 48012
- Bloomfield Hills City Hall - Clerk's office - 45 E. Long Lake Road, Bloomfield Hills, MI 48304
- Bloomfield Township Hall - Clerk's office - 4200 Telegraph Road, Bloomfield Hills, MI 48302
- Troy City Hall - Clerk's office - 500 W. Big Beaver Road, Troy, MI 48064

Written comments received through June 17, 2014 at 6 pm will be entered into the public hearing record and responses as necessary will be included in the final project plan. Written comments should be sent to:

Oakland County Water Resources Commissioner's office:
c/o Tom Maxwell
One Public Works Drive
Waterford, MI 48328

Publish May 15, 2014 Oakland Press

Advertisement Information

Client Id: 611565 Ad Id: 277894 PO: EFSDS

TINA M CROWN
Notary Public - Michigan
Lapeer County
My Commission Expires Mar 30, 2021
Acting in the County of *Oakland*

Evergreen Farmington Sewage Disposal System (EFSDS)
North Evergreen Interceptor (NEI)
2014 State Revolving Fund (SRF) Project Plan

Project Plan Public Hearing
June 17, 2014
6:00 pm

Introductions

Oakland County Water Resources Commissioner's Office:

- Sue Coffey, P.E.
- Tom Maxwell, P.E.

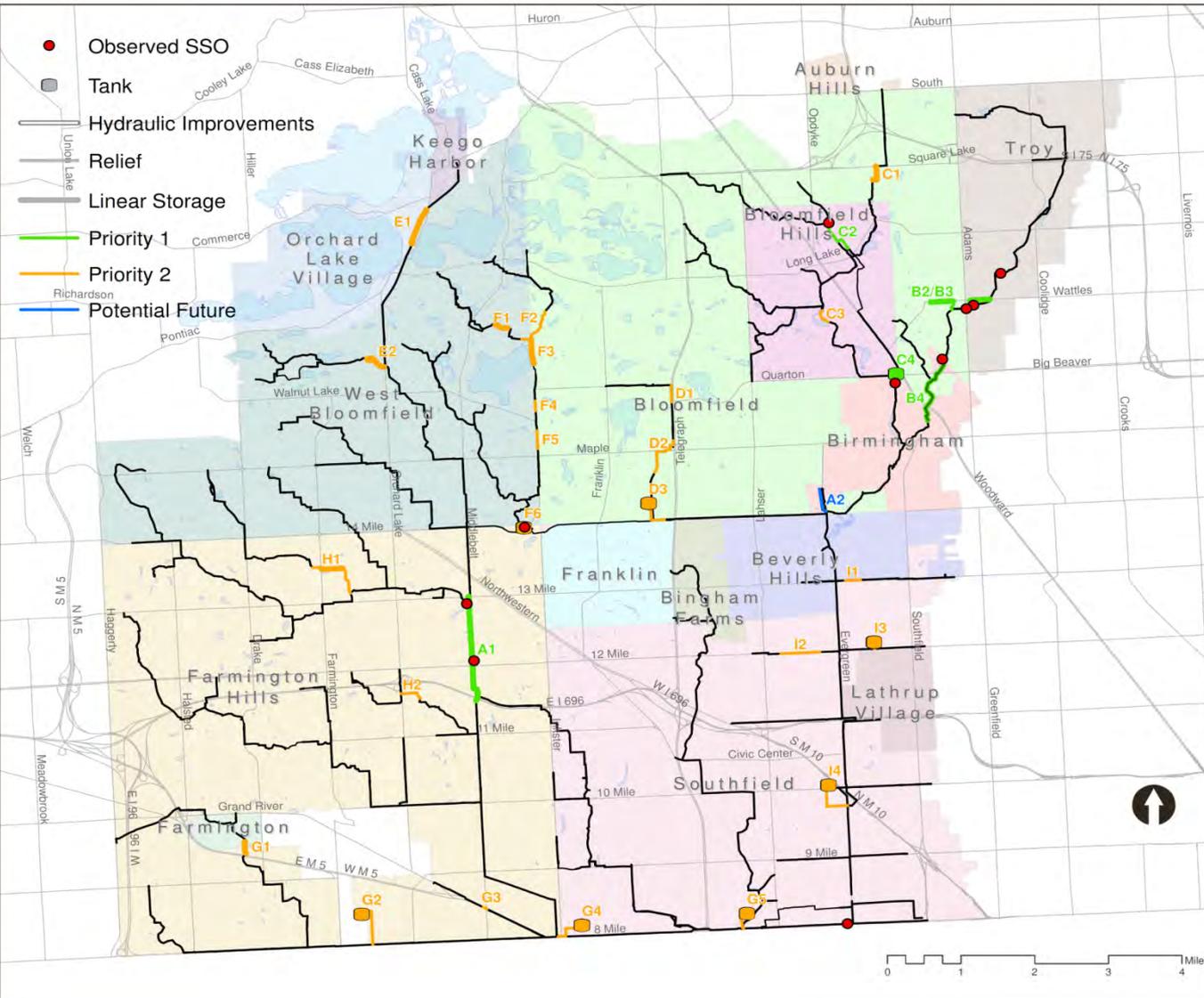
Hubbell, Roth & Clark, Inc.

- Dan Mitchell, P.E.
- Karyn Stickel, P.E.

Need for Project

- The Oakland County Water Resources Commissioner's Office (WRC) owns, operates, and maintains the Evergreen-Farmington Sewage Disposal System (EFSDS)
- Pipe Capacity and hydraulic inefficiencies increase the risk of potential Sanitary Sewer Overflows (SSOs) during higher wet weather flows. SSOs can affect the water quality of the receiving stream
- WRC is under an Administrative Consent Order (ACO) to address known deficiencies

Overall Project Locations



Conceptual Project Summary

No.	Description	Phase
A1	Middlebelt Tunnel Storage	1
A2	WLPS RTB Connection	-
B2/B3	Wattles Road Linear Storage	1
B4	NEI Hydraulic Improvements	1
C1	Eastways Linear Storage	2
C2	Stonycroft Relief & Amy PS upgrades	1
C3	Cranbrook Relief	2
C4	Quarton Road Storage	1
D1	Telegraph Relief	2
D2	Maple Relief	2
D3	Cathedral Storage	2
E1	Orchard Lake Linear Storage	2
E2	Morris Lake Arm Linear Storage	2
F1	WLPS2 Relief A and Linear Storage	2
F2	WLPS2 Relief B	2
F3	WLPS2 Linear Storage	2
F4	Inkster Road Relief	2
F5	Inkster Road Relief	2
F6	WLPS1 Storage	2
G1	Tarabusi Arm Linear Storage	2
G2	8 Mile Storage	2
G3	Grand River Arm Relief	2
G4	Rensselaer Storage	2
G5	8 Mile PS Storage	2
H1	13 Mile Road Arm Linear Storage and Relief	2
H2	Kendallwood Arm Relief	2
I1	13 Mile Road Relief	2
I2	12 Mile Road Relief (West of Evergreen)	2
I3	12 Mile Road Storage (East of Evergreen)	2
I4	Evergreen Downstream Storage	2
Total	(30 Projects - 5 Phase 1; 24 Phase 2)	

Source: Data provided by Oakland County. Orchard, Hiltz and McCliment does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl

Published: 04.02.2014

SRF Program Summary

- State Revolving Fund Program is jointly administered by Michigan Department of Environmental Quality (MDEQ) and the Michigan Municipal Bond Authority (MMBA)
- The SRF Project Plan is the funding application for a low interest loan (currently 2.5% over 20 years)
- Loan will be used to finance proposed system improvements, reduce SSOs, and continue to meet requirements of the ACO issued by the MDEQ

Project Plan Objectives

- Compliance with the requirements of the ACO
- Improved, reliable infrastructure
- Reduction in the frequency of SSOs throughout the Evergreen Farmington service areas by providing storage capacity and system improvements, leading to improved water quality
- Increased level of service for existing customers

Selected Project Alternative Summary

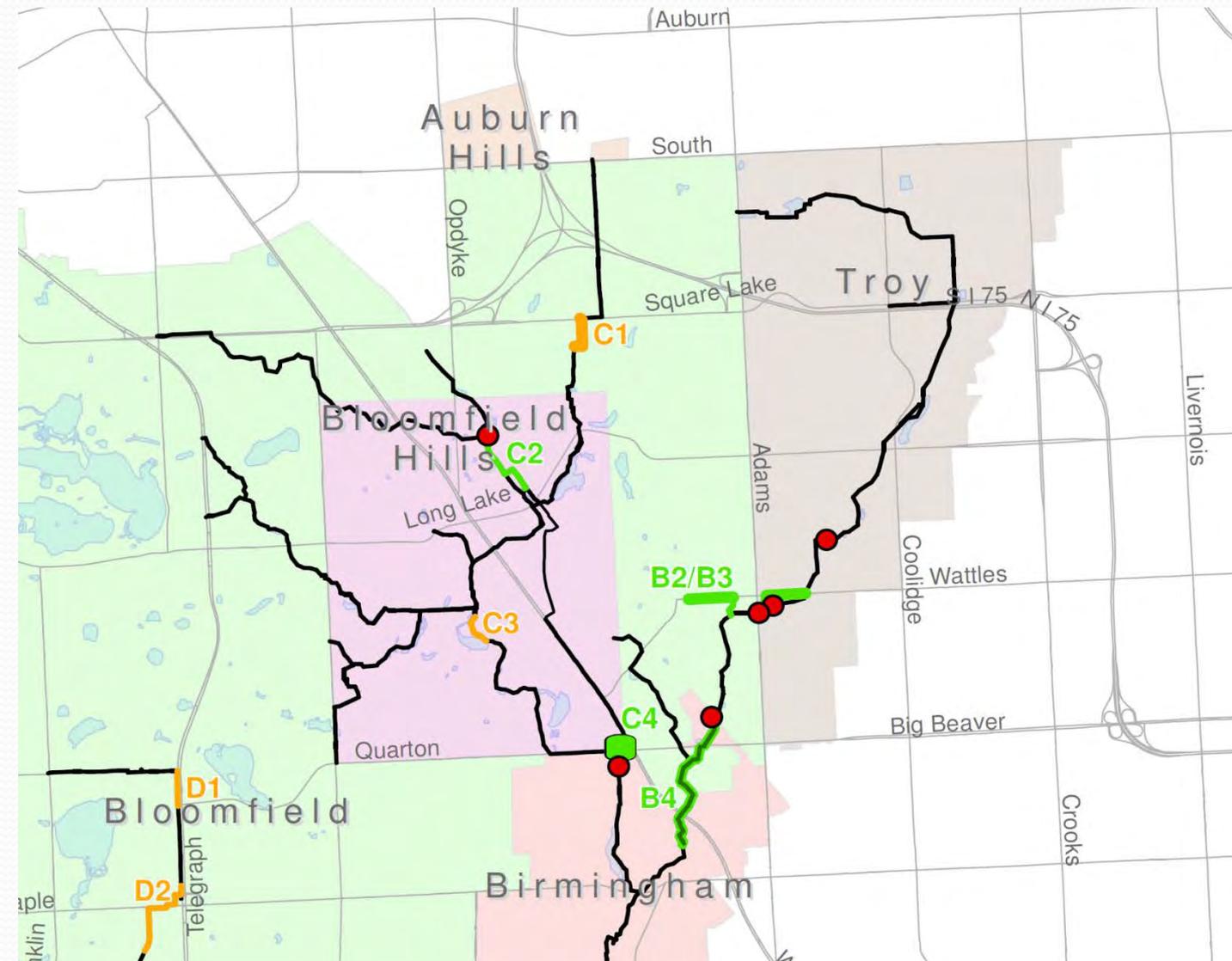
- **Identification of Potential Alternatives**
 - No Action Alternative
 - Optimal Performance of Existing Facilities
 - Regional Alternatives
 - Transport and Treat

Selected Project Alternative Summary

- **Principal Alternatives**

- Troy Arm Storage
 - Wattles Road Linear Storage
 - Harlan Elementary School Storage Tank
- NEI Hydraulic Improvements
 - Optimal Performance of Existing Facilities – Troy Arm Hydraulic Improvements
 - Upsized storage at Wattles Road Linear Storage
- Stonycroft Relief and Amy PS Upgrades
 - Stonycroft Relief and Amy PS Upgrades
 - Kensington Road Relief Sewer and Amy PS Upgrades
- Quarton Road Storage
 - Storage Tank at Northwest Corner of Quarton and Woodward
 - Storage Tank at Southwest Corner or Northeast Corner of Quarton and Woodward

Project Plan Locations



B2/B3: Troy Arm Storage

B4: NEI Hydraulic Improvements

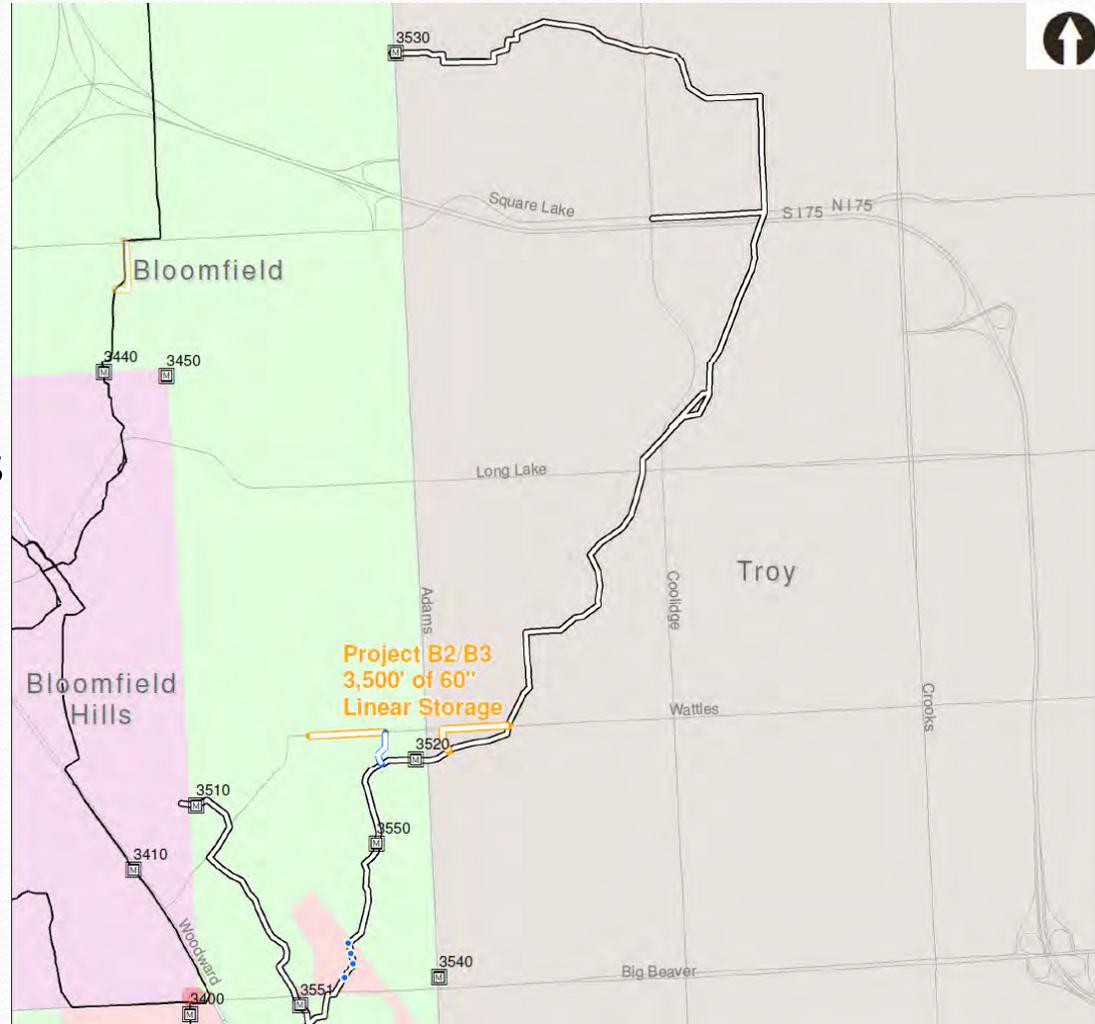
C2: Stonycroft Relief and Amy PS Upgrades

C4: Quarton Road Storage

Troy Arm Storage

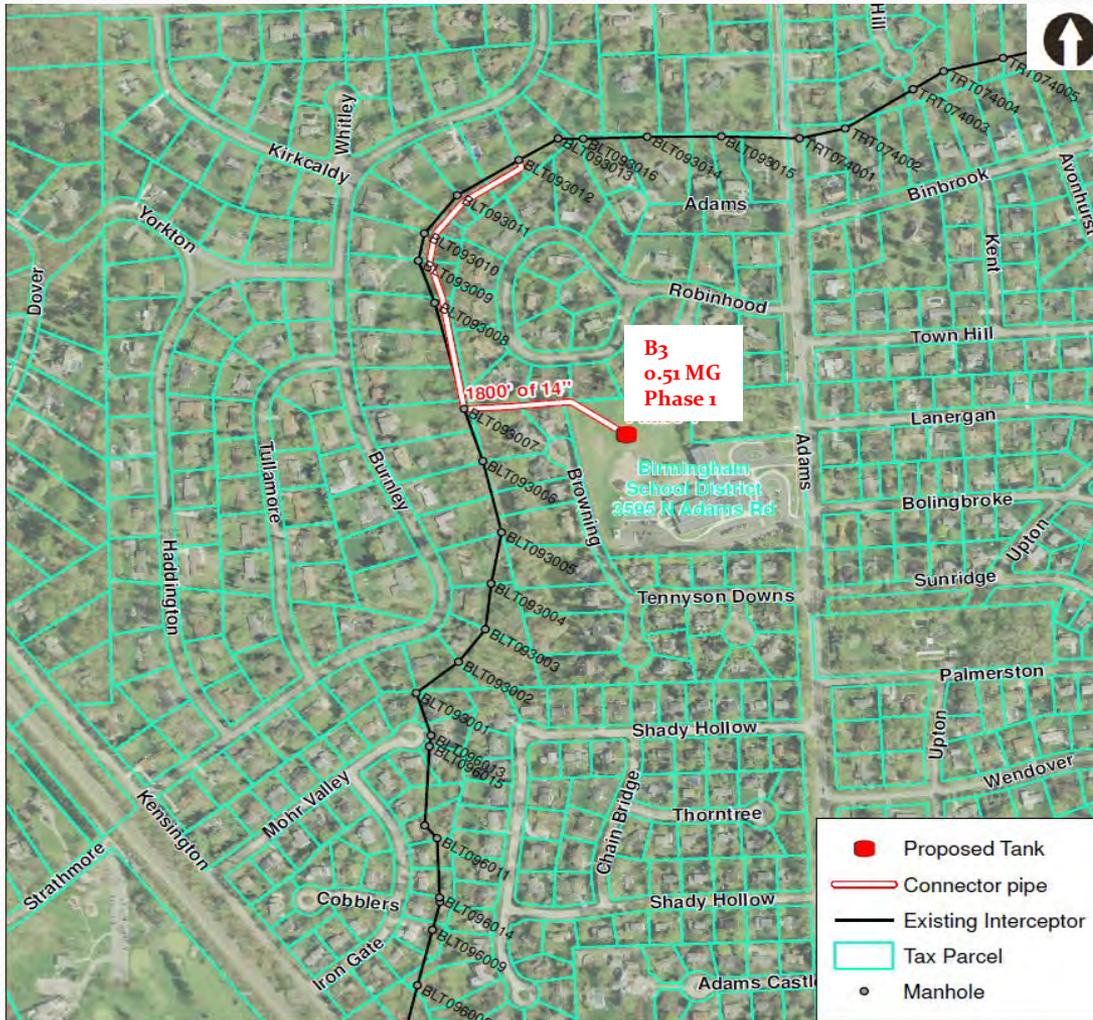
Linear Storage within Wattles ROW

- Construction of 2 offline linear storage tanks
- Provides approximately 0.51 million gallons (mgal) of storage
- Reduce peak flows by 6.1 cfs to reduce the occurrence of SSOs along the Troy Arm
- Preliminary Estimate of Cost = \$4,503,000
- **SELECTED ALTERNATIVE**



Troy Arm Storage

Harlan Elementary School Storage Tank

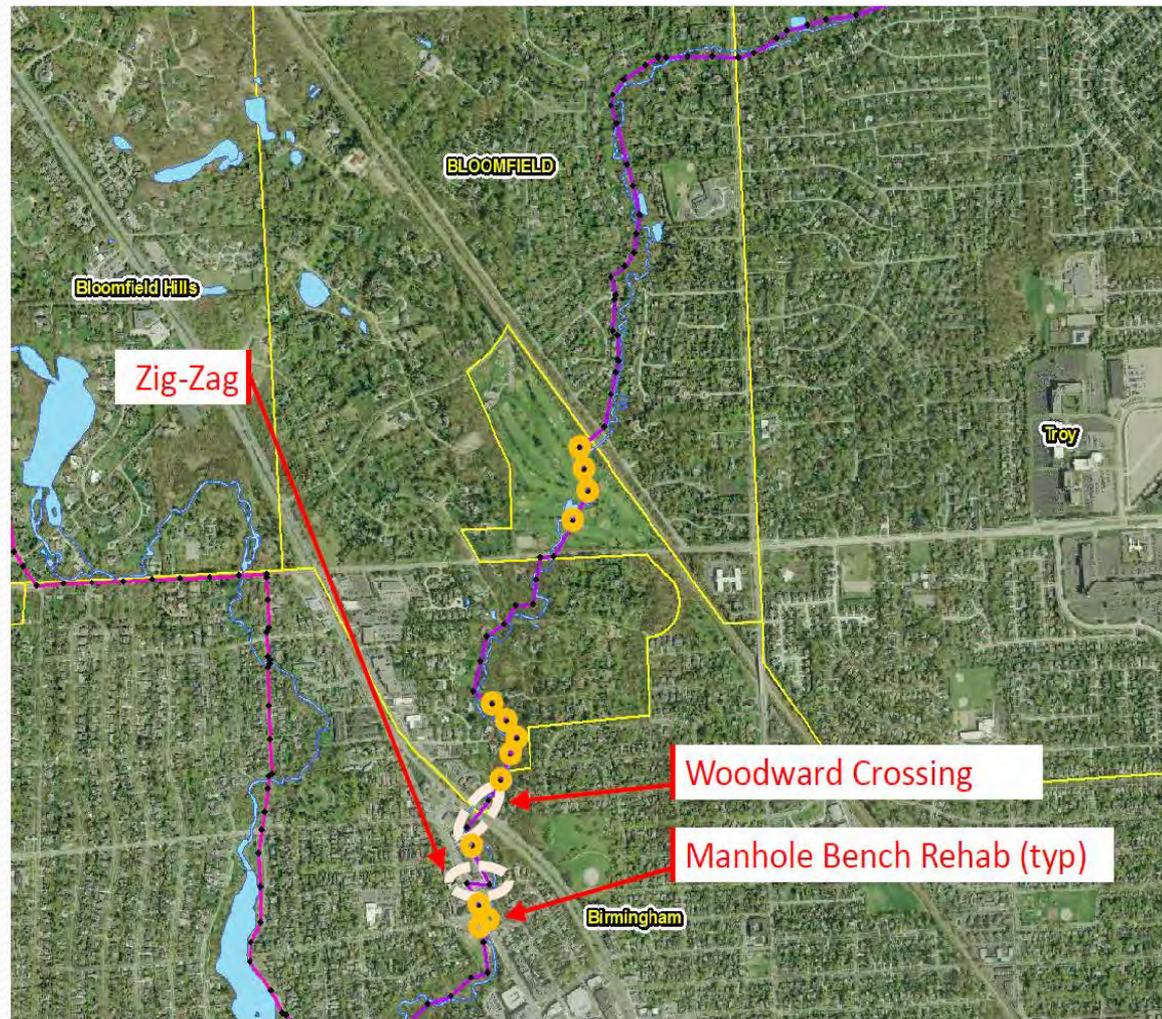


- Construction of a storage tank at Harlan Elementary School on Adam Road south of Wattles Road
- Provides approximately 0.51 million gallons (mgal) of storage
- Preliminary Estimate of Cost = \$6,408,000

NEI Hydraulic Improvements

Optimal Performance of Existing Facilities – Troy Arm Hydraulic Improvements

- Improvements to the Woodward Avenue crossing
- Reducing pipe bends and adjusting manhole benches
- Eliminates need for 0.38 million gallons (mgal) of additional storage
- Preliminary Estimate of Cost = \$966,000
- **SELECTED ALTERNATIVE**



NEI Hydraulic Improvements

Upsized Storage at Wattles Linear Storage

- Alternative to completing improvements along the Troy arm
- Upsizing the storage at Adams and Wattles
- Preliminary Estimate of Cost = \$2,189,000

Stonycroft Relief and Amy PS Upgrades

- Constructing a relief sewer through the Stonycroft Golf Club
- 21" gravity sewer that diverts flows from 2 upstream reaches
- Upgrades to Amy Pump Station
- Preliminary Estimate of Cost = \$1,729,000
- **SELECTED ALTERNATIVE**



Stonycroft Relief and Amy PS Upgrades

Kensington Road Relief Sewer and Amy PS Upgrades



- Installation of an 18" relief sewer on Kensington Road
- Flow would be diverted from the eastern branch of the sewer and eventually discharge to the Amy PS
- Existing 15" sewer through Stonycroft Golf Club will be lined.
- Upgrades to the Amy PS would be required
- Preliminary Estimate of Cost = \$3,169,000

Quarton Road Storage

Storage Tank at Northwest Corner of Quarton and Woodward

- Construction of a 0.4 million gallon (mgal) storage facility
- Removes approximately 3.0 cfs of peak flow
- Tank would intercept flow from the Amy PS outlet to lessen flow at the interceptor
- WRC to take over grade control pump station currently operated by Birmingham
- Preliminary Estimate of Cost = \$6,271,000
- **SELECTED ALTERNATIVE**



Quarton Road Storage

Storage Tank at Southwest Corner or Northeast Corner of Quarton and Woodward



- The southwest and northeast corner of Quarton and Woodward were potential alternatives for the storage tank
- However, easement acquisition and utility conflicts determined that these locations are not feasible

SRF Recommendation Summary

- \$13,469,000 SRF Loan for system improvements
- Construct the following projects:
 - 60” diameter linear storage on Wattles Road
 - Hydraulic improvements to the Troy Arm
 - 21” diameter Relief Sewer through Stonycroft Golf Club
 - 0.4 MG Storage Tank at northwest corner of Woodward and Quarton

Potential Impacts

- Temporary construction disruptions such as traffic, noise, and dust
- Limited use of surrounding facilities during portions of construction
- Golf course facility construction will mostly occur in the winter to minimize impacts on users
- Zig Zag improvements will take place when Farmer's Market is closed
- Minimal environmental impacts anticipated

Mitigation of Impacts

- Establish guidelines for vegetation removal, dust reduction and traffic control
- Installation of proper soil erosion control measures throughout construction
- Construction staging to minimize lane and road closures during construction
- Maintenance of local resident and business access
- Appropriate signage for pedestrian and vehicle traffic during construction
- Construction inspection and project monitoring

Project and User Costs

Site ID	Project Name	Project Cost	Annual Debt Retirement	Annual O&M Debt	REU/ Customers of Tributary Communities	Annual Cost per customer/REU	Annual Cost per customer/REU with O&M
B2/B3	Wattles Road Linear Storage	\$4,503,000	\$288,855	\$3,000	45,830	\$6.30	\$6.37
B4	NEI Hydraulic Improvements	\$966,000	\$66,961	\$3,000	52,277	\$3.74	\$3.91
C2	Stonycroft Relief and Amy PS Upgrades	\$1,729,000	\$110,910	\$3,000	24,647	\$4.50	\$4.62
C4	Quarton Road Storage	\$6,271,000	\$402,266	\$10,000	30,313	\$13.27	\$13.60
	Total	\$13,469,000	\$868,992	\$19,000	NA**	NA**	NA**

*All communities will bill their total number of customers, not just tributary

**Total costs not calculated as different projects have different tributary users.

Changes to the Project Plan since Draft

- Selected alternative memorandum was updated to show correct pipe size for Project C4. Was previously called out as 18” instead of 21”.

Questions

- Please state name and address for the record.
- Questions are recorded and responded to at the end.

STATE OF MICHIGAN

In the Matter of:

Evergreen Farmington Sewage Disposal System

North Evergreen Interceptor
State Revolving Fund Project Plan

_____ /

PUBLIC HEARING

4200 Telegraph, Bloomfield Township, Michigan

Tuesday, June 17, 2014, 6:00 p.m.

APPEARANCES:

DAN MITCHELL, PE
Hubbell, Roth & Clark

KARYN STICKEL, PE
Hubbell, Roth & Clark

SUE COFFEY, PE
Water Resource Commission

TOM MAXWELL, PE
Water Resource Commission

OLIVIA OLSZTYN-BUDRY
Bloomfield Township

RECORDED BY -

Rachel Sunde, CER 6538
Certified Electronic Recorder
Network Reporting Corporation
Firm Registration Number 8151
1-800-632-2720



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1 Bloomfield Township, Michigan

2 Tuesday, June 17, 2014 - 6:08 p.m.

3 MR. MITCHELL: I'd like to thank you all for
4 coming to our project plan public hearing for the Evergreen
5 Farmington Sewage Disposal System, North Evergreen
6 Interceptor Project. This is for the 2014 State Revolving
7 Fund, also known as the SRF project plan. My name is Dan
8 Mitchell, I'm with Hubbell, Roth & Clark. With me today are
9 two people from the Oakland County Water Resources
10 Commissioner's Office, Sue Coffey and Tom Maxwell. Also
11 with me is Karyn Stickel from our office. We'll be going
12 through a series of slides today. You will have a chance at
13 the end to ask any questions. But we'd like to have you
14 hold off on those as we go through these slides. And
15 another thing you should all do is make sure to sign-in at
16 the sign-in sheets at the front entrance there. Again, this
17 is an official public hearing and we need all this
18 documentation.

19 So with that we'll get started. What is the need
20 for this project? This is a project relating to the
21 Evergreen Farmington Sewage Disposal System. You'll see a
22 series of acronyms, this one is called EFSDS. It's a big
23 interceptor system runs through the southern part of Oakland
24 County, covers about 15 different communities in Oakland
25 County. The Water Resources Commissioner's Office actually

1 owns, operates, and maintains that sewer system. This
2 project really stems from the mid 1990's there was a series
3 of overflows, basement floodings, miscellaneous surcharging
4 problems that occurred. It was studied for a number of
5 years in those mid 90's to the early 2000's. In 2004 it
6 ultimately culminated in what's called an Administrative
7 Consent Order. This is an agreement between the communities
8 and the agencies with the MDEQ who is the regulating
9 authority in Michigan.

10 Since that time the county has worked on what's
11 called a series corrective action plans. From 2004 until
12 now it was the short-term corrective action plan. And
13 that's where they were trying to maximize the efficiency of
14 the existing system. And seeing what they could do with
15 that system. We've now come to a point where we've reached
16 all we could do with that plan and have moved into what's
17 called a long-term corrective action plan. And this is a
18 map that details the various projects involved with that
19 long-term corrective action plan. Shown on the map is a
20 series of green projects, they're described and labeled over
21 in this table to the right. What we'll be talking about
22 today is what we're calling the North Evergreen
23 improvements, which are these projects up here located along
24 Birmingham, Troy, Bloomfield Hills, and Bloomfield Township.

25 Also shown on this are a series of projects that

1 are projected in yellow, or shown in yellow. As these
2 projects are being constructed, again, these -- the green
3 projects in this area are what we're talking about today in
4 our project plan. These yellow projects are future projects
5 that will be studied and could potentially be implemented in
6 the future. But they have nothing to do with what we're
7 talking about now.

8 So what is an SRF program? Through the State of
9 Michigan, again, this is a program run by the Michigan
10 Department of Environmental Quality, it's called the State
11 Revolving Fund. What happens is the project plan is
12 actually the application to get what's known as -- what is a
13 low interest loan, currently two and a half percent over 20
14 years. So a community puts a project plan together, they
15 submit it to the DEQ, they're then prioritized and go
16 through a rating system. And the DEQ comes out with a
17 listing ranking top projects down to as many applications as
18 they get in and are found eligible. They then compared that
19 with available funds and projects that are within that
20 funding range are prioritized to receive this low interest
21 loan.

22 So what are our project plan objectives? One
23 thing we want to do is become -- return the system to be in
24 compliance with the Administrative Consent Order. We also
25 want to improve our infrastructure system. As part of that

1 ACO requirement, we need to reduce the frequency of these
2 SSOs. And also enhance the level of service for our
3 existing customers.

4 So what a project plan requires you to do is look
5 at four basic approaches to addressing these projects.
6 They're shown here on this slide. One, the no action
7 alternative. That means we'll, we're going to do nothing.
8 That's obviously not feasible alternative because we have an
9 ACO agreement that says we have to do something to fix the
10 system. Another thing that's really not feasible is the
11 last one on there, transport and treat. What says you'll do
12 is, for all these additional flows that you have, you take
13 that flow and transport it through your system, and get it
14 down to the end where it's treated.

15 Again, the Evergreen Farmington is a collection
16 system. Ultimately that discharges to DWSD system, the
17 Detroit Water and Sewage Department system, where it's
18 treated at their facility. And again, we're under an
19 agreement with DWSD, we're limited to the amount we can
20 discharge to them. And even to build a new system to convey
21 all this additional flow down there is really not cost
22 effective. So really the first and last one on there are
23 not really feasible. So that leaves those middle two for
24 what we're looking at. Again, the optimal performance of
25 existing facilities was what was done in that short-term

1 corrective action plan. And will be continued to do as we
2 move forward. But really what we're moving to with this
3 project plan is the regional alternatives.

4 So here is the four project areas that we'll talk
5 about and we'll run through quick. For each one of these we
6 have what we call a selected alternative. That's the one
7 we've determined to be most cost effective. That's the one
8 we're actually proposing in our project plan to proceed
9 forward with. But you'll also see an alternative where we
10 were looking at other potential measures. So it's not just
11 like we pick one thing and say that's the end-all solution,
12 we did look at available solutions. But there is a cost
13 effective analysis to determine which is the best project as
14 we move forward.

15 So with that, again this is a map showing those
16 locations. In summary, the projects they have this
17 alphanumeric designation. That's to tie back into that
18 long-term corrective action plan. The actual names of these
19 projects are B2, B3, which is the Troy Arm Storage. B4
20 which is a series of three different projects which we're
21 calling the North Evergreen Improvement Hydraulic
22 improvements. Project C2 is the Stonycroft Relief and the
23 Amy pump station upgrades. Project C4 is the Quarton Road
24 storage. And I have a series of slides to describe each one
25 of these.

1 So the Troy Arm Storage, basically what that
2 involves is two offline storage tanks, they're not really
3 tanks, they're more big, large diameter sewers, six foot
4 diameter sewers. They're located in Wattles Road, they
5 would provide about half a million gallons, .51 to be
6 specific, a million gallons of storage. What they would do
7 is reduce our peak flow by about 6.1 cfs, that means cubic
8 feet per second. And it would help to reduce and eliminate
9 overflows or reduce the occurrence of overflows, sanitary
10 sewer overflows -- again, you see another acronym there --
11 along the Troy Arm. Our preliminary cost estimate on this
12 project is 4.5 million. And it is our selected alternative.

13 This is one of the other alternatives that was
14 evaluated that could provide a solution. This involved
15 building a parallel line in the rear yard of those homes,
16 and building a new storage tank at the Harlan Elementary
17 School. Again, it still provided .51 million gallons of
18 storage. But it had a cost estimate of about \$6.4 million.
19 So what you're comparing is that 6.4 million to the selected
20 alternative of 4.5 million. And it becomes pretty obvious
21 why it is the selected alternative.

22 The North Evergreen or NEI Hydraulic improvement
23 project, again this is a series of three different projects
24 that would be constructed. The first one there is what
25 we're calling the zig-zag project. It eliminates an area of

1 the interceptor sewer system where it actually turns back on
2 itself and provides some hydraulic efficiencies through
3 there. There is also the existing Woodward crossing, that
4 is an existing 24 inch which converts to a vertical
5 elliptical sewer in a very inefficient hydraulic manner.
6 And we'll be fixing that crossing. And then there is a
7 number of manholes that have bench problems that would be
8 reconstructed as part of this project. These three projects
9 in total would offset or eliminate the need for an
10 additional .38 million gallons of storage that would be
11 required if we did not do these projects. So they run -- to
12 complete these projects the preliminary estimate right now
13 is \$966,000.

14 As discussed, by doing those projects, it
15 eliminated the need for the additional storage. Putting a
16 cost estimate to that additional storage it was \$2.189
17 million to construct that project. So again, we're under a
18 million dollars versus this, and you can see why it was
19 cost effective and selected.

20 Our third project is what's called the Stonycroft
21 Relief project and Amy pump station upgrades. This is a
22 project that's located just west of Kensington, between
23 Long Lake Road and Opdyke. It's called Stonycroft because
24 there is a Stonycroft Golf Course there. There is an
25 existing sewer that runs through that golf course. It has

1 some limitations on its capacity. And so what this project
2 proposes is to run a parallel line to that sewer, it's a new
3 21" gravity sewer. It would run down through the golf
4 course, then east over to Kensington and down to our Amy
5 pump station. It has a preliminary cost estimate of about
6 1.7 million, actually 1,729,000. And it is our selected
7 alternative.

8 To give you a comparison or another option that we
9 looked at. We could also, instead of running through the
10 golf course, construct a sewer entirely within the
11 right-of-way of Kensington Road. It did require us to cross
12 a railroad track and it would involve much deeper
13 construction. As a result of that, this had a tabulated
14 cost of over 3 million, 3,169,000. So you compare that with
15 the approximate 3.2 -- or the approximate 1.7 million of the
16 selected alternative and you can see why it was cost
17 effective and selected.

18 Our fourth project is the Quarton Road storage
19 tank. It is located at the northwest corner of Woodward and
20 Quarton right next to the Birmingham border. What this
21 project involves is a .4 million gallon storage facility.
22 Basically an underground storage tank. It shaves
23 approximately three cfs of flow, peak flow off the system.
24 What this tank would do is intercept as that sewer was
25 surcharged, it would intercept that flow, store it until a

1 later time when flow had subsided, and it would bleed that
2 flow back into the system. The project also involves the
3 City of Birmingham, because of hydraulic restrictions that
4 had occurred in this area back in the late 90's, early
5 2000's, they installed a hydraulic grade protection pump
6 station. And as part of this project, the county would be
7 taking over that pump station. In total, this project has a
8 preliminary cost estimate of 6,271,000 and is the selected
9 alternative.

10 As alternates to this location, again that
11 location is privately owned property, and the county is
12 going to have to go in and acquire some right-of-way to
13 construct that project. There is no publicly owned property
14 along this area. We did, however, look at the northeast
15 quadrant there and the southwest quadrant. Both of these
16 properties had a number of issues that resulted in them not
17 being feasible. There was utility conflicts that would
18 couldn't mitigate, and there was also some land restrictions
19 that wouldn't allow us to construct such a facility in that
20 northeast quadrant. So because of these, our alternatives
21 were not considered to be feasible, and therefore there was
22 the selected alternative.

23 In total, what our project plan is proposing is
24 \$13,469,000 worth of improvements. That's the loan that the
25 county would be applying for through the SRF program. It

1 would construct those four projects we discussed. The 60"
2 diameter linear storage on Wattles, the hydraulic
3 improvements to the Troy Arm, the 21" relief sewer through
4 Stonycroft Golf Club, and the .4 million gallon storage tank
5 at the northwest corner of Woodward and Quarton.

6 What are the potential impacts of this project?
7 Most of these are basically construction related impacts.
8 When these things are built, you will experience typical
9 construction. You will have traffic, noise, dust, you'll
10 have limited access to these facilities. If you're a member
11 of that golf course, you could potentially have some of your
12 play impacted. When we get down into that zig-zag at
13 Birmingham there is also the potential to cause some
14 interruption in the local farmer's market that's located
15 there. We are not anticipating any major environmental
16 impacts however.

17 But with each impact, as designers, we try to
18 mitigate those to minimize the impacts on the public. Here
19 is a series of things that would be incorporated into the
20 planning and actual construction of these projects. So to
21 give you an example, there would be soil erosion control
22 measures put into place to minimize sediments being
23 discharged into surrounding lakes and streams. We would
24 also try a construction staging project to minimize that
25 Woodward zig-zag project that we talked about to the

1 farmer's market. We will also try to schedule these
2 construction projects to be at the most convenient time.
3 For instance, the golf course project could be -- would be
4 scheduled to be completed in the winter when that facility
5 is not being used. So these are a number of examples of
6 mitigation items that we would put into place to alleviate
7 the impact of construction.

8 User costs, the SRF plan requirements requires
9 that an estimate of approximate cost per user be developed
10 to show the affordability of the project. This shows each
11 of the four projects, what their costs are, what the
12 tributary, the number of customers in the tributary
13 communities are. And it breaks it down on a per customer
14 basis. So you can see for project B2, B3, the annual cost
15 per customer with O&M is estimated at \$6.37. For project B4
16 you can see it's estimated at \$3.91. For project C2
17 estimated at \$4.62. And finally project C4 it's estimated
18 at \$13.60.

19 This gives you an idea of the project schedule.
20 You can see right now we are in the planning stages. When
21 it gets to be in the end of this year through 2015 we go
22 into a design stage. And finally we go into a construction
23 stage in 2016. And there is still some details on when
24 these projects may be constructed, whether they all get
25 constructed at the same time, or staged at different times.

1 Again, this is an approximate schedule of when these things
2 will be constructed. Really per the AC, all that's mandated
3 is we have to be done and have these facilities running by
4 that November 2017 date. So this is not a firm schedule,
5 it's an estimated schedule at this time.

6 Since we published our draft project plan, this is
7 all the changes that have been incorporated. Basically it's
8 just one. On that project C4, going through the golf
9 course, there was an 18" pipe shown. Actually that is --
10 had been corrected now to a 21" pipe. And that is the total
11 of our changes.

12 With that, I'll open it up to any questions anyone
13 may have. If you have any, please state your name and
14 address for the record and we will try to respond to them.
15 Seeing none --

16 MS. COFFEY: I have a comment for the record.

17 MR. MITCHELL: Sure.

18 MS. COFFEY: Sue Coffey. So project C4 is the
19 Quarton Road storage not the Stonycroft Golf Course; right?
20 So the slide that you're looking at has C4 -- do I have that
21 wrong? C4 is Quarton Road storage. So the 18 to 21" should
22 be project C2.

23 MR. MITCHELL: Yeah, I think that was -- should be
24 C2; right.

25 MS. COFFEY: I just wanted to correct for the

1 record. Not that anybody is here.

2 MR. MITCHELL: Yup. That's what that should be.
3 Good catch. Is there any other questions, comments,
4 concerns? With that I guess we'll conclude today's meeting.
5 Thank you.

6 (Meeting concluded at 6:29 p.m.)

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Appendix G

Resolution Adopting Final Project Plan

**A RESOLUTION ADOPTING A FINAL PROJECT PLAN
FOR WASTEWATER SYSTEM IMPROVEMENTS AND
DESIGNATING AN AUTHORIZED PROJECT REPRESENTATIVE**

WHEREAS, the Board of Commissioners for the County, by majority vote of its members-elect, has authorized and directed that there be established a county system of sewage disposal improvements and services to serve municipalities in the County, said system being known as the "Evergreen Farmington Sewage Disposal System" (hereafter sometimes referred to as the "System"), and has designated the Oakland County Water Resources Commissioner as the county agency for the System (said Water Resources Commissioner being hereinafter referred to as the "County Agency"); and

WHEREAS, under and subject to the terms of Act 342, Public Acts of Michigan, 1939, as amended ("Act 342"), the County is authorized, through the County Agency, to acquire and construct the sewage disposal facilities hereinafter described to improve and extend the System (the "Project"); and,

WHEREAS, the System recognizes the need to make improvements to its existing wastewater pumping and collection system; and

WHEREAS, the County Agency authorized Hubbell, Roth, & Clark, Inc., to prepare a Project Plan, which recommends the construction of approximately 3,500 feet of 5-ft diameter linear storage along Wattles Road, hydraulic improvements to the North Evergreen Interceptor, a relief sewer and pumping improvements in Stonycroft Golf Club and the Amy Pumping Station, and a 0.4 mgal storage tank at the northwest corner of Quarton Road and Woodward Avenue to improve the conveyance of sanitary sewage through the Evergreen Farmington Sewage Disposal System; and

WHEREAS, said Project Plan was presented at a Public Hearing held on June 17, 2014 and all public comments have been considered and addressed;

NOW THEREFORE BE IT RESOLVED, that the County Agency formally adopts said Project Plan and agrees to implement the selected alternative (the construction of approximately 3,500 feet of 5-ft diameter linear storage along Wattles Road, hydraulic improvements to the North Evergreen Interceptor, a relief sewer and pumping improvements in Stonycroft Golf Club and the Amy Pumping Station, and a 0.4 mgal storage tank at the northwest corner of Quarton Road and Woodward Avenue).

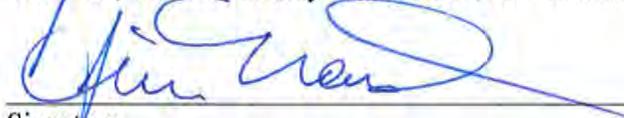
BE IT FURTHER RESOLVED, that the County Agency, a position currently held by Jim Nash, Phil Sanzica, Chief Deputy, and Suzanne R. Coffey, P.E., Manager are designated as the authorized representatives for all activities associated with the project referenced above, including the submittal of said Project Plan as the first step in applying to the State of Michigan for a revolving fund loan to assist in the implementation of the selected alternative.

I certify that the above Resolution was adopted by the County Agency on 6/18/14.

BY:



Jim Nash, Oakland County Water Resources Commissioner (County Agency)



Signature

6/18/14

Date

Appendix H

Administrative Consent Order Documents

- 1. ACO SW005-001 – December 6, 2004**
- 2. Final Order of Abatement 2098 – September 14, 1988**
- 3. AFO SW008-006 – March 24, 2009**

**STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU**

In the matter of:

ACO-SW05-001

Date Entered: December 6, 2004

County of Oakland

By: Oakland County Drain

Commissioner in his capacity

As the "County Agency" for the Evergreen-Farmington Sewage Disposal System

SECOND AMENDED ADMINISTRATIVE CONSENT ORDER

This proceeding results from the need to amend Final Order of Abatement Number 2098 in order to meet the statutory requirements of state and federal law. The Water Bureau (WB) of the Department of Environmental Quality (DEQ) has determined that the County of Oakland (County) by and through the Oakland County Drain Commissioner, in his capacity as the "County Agency", which owns and operates a regional interceptor sewer system known as the Evergreen-Farmington Sewage Disposal System (EFSDS), established pursuant to 1939 PA 342, as amended, and 1957 PA 185, as amended, serving all or parts of the communities of Auburn Hills, Beverly Hills, Bingham Farms, Birmingham, Bloomfield Hills, Bloomfield Township, Farmington, Farmington Hills, Franklin, Keego Harbor, Lathrup Village, Orchard Lake Village, Southfield, Sylvan Lake, Troy and West Bloomfield Township, tributary to the Detroit Water and Sewerage Department (DWSD) Interceptor System and Wastewater Treatment Plant needs to perform further corrective actions to the sewerage system in order to fully comply with Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, (NREPA) MCL 324.3101 et seq.; and the rules promulgated under Part 31. The County and the DEQ agree to resolve the discharges set forth in the Findings section of this Second Amended Consent Order and to terminate this proceeding by entry of this Second Amended Consent Order.

I. STIPULATIONS

The County and the DEQ stipulate as follows:

- 1.1 The NREPA MCL 324.101 et seq. is an act that controls pollution to protect the environment and natural resources in the state.

- 1.2 Article II, Pollution Control, Part 31, Water Resources Protection, of the NREPA, MCL 324.3101 et seq., and rules promulgated pursuant thereto, provides for the protection, conservation, and the control of pollution of the water resources of the state.
- 1.3 The DEQ is authorized by Section 3112(2) of Part 31 of the NREPA to enter orders requiring persons to abate pollution and, therefore, the Director has authority to enter this Second Amended Consent Order with the County.
- 1.4 The County stipulates to the issuance and entry of this Second Amended Consent Order to comply by consent and stipulates that the termination of this matter by a final order to be entered as a Second Amended Consent Order is proper and acceptable. The County further agrees not to contest the issuance of this Second Amended Consent Order. This Second Amended Consent Order, thus, shall be considered a final order of the DEQ and shall become effective on the date it is signed by the Chief of the WB, delegee of the Director, pursuant to Section 301(b) of the NREPA.
- 1.5 The County and the DEQ agree that the signing of this Second Amended Consent Order is for settlement purposes only and does not constitute an admission by the County that the law has been violated.
- 1.6 The County shall achieve compliance with the aforementioned regulations in accordance with the requirements contained in Section III, Compliance Program, of this Second Amended Consent Order.

II. FINDINGS

- 2.1 On September 8, 1988, the County and the Michigan Department of Natural Resources (now known as the DEQ), entered into a Final Order of Abatement Number 2098 requiring the County to complete construction of a regional portion of the EFSDS.

- 2.2 On May 8, 1992, the County and the Michigan Department of Natural Resources (now known as the DEQ), entered into a First Amended Final Order of Abatement Number 2098A modifying the construction schedule for the EFSDS Project in order to coincide with the completion of the local municipality sewer projects.
- 2.3 On May 10, 2000, the DEQ issued its "Strategy for the Regulatory Control and Correction of Illegal Overflows from Separate Sanitary Sewer Systems in Michigan." (Strategy) Under the Strategy, the DEQ required Michigan municipalities to report all known Sanitary Sewer Overflows (SSOs) that have occurred in the past five years, and requested that the communities promptly report all future SSOs.
- 2.4 The following chart lists the dates and estimated discharge volumes of SSOs that have occurred between July 2000 and October 2004, which the DEQ maintains are violation of Part 31 of NREPA. The parties agree that these alleged violations are resolved pursuant to this Second Amended Consent Order and that the DEQ will not take any further enforcement action with regard to the following alleged violations.

List of Dates and Estimated Volume of Discharges from the Oakland County-Evergreen Farmington Sewage Disposal System:

DATE	ESTIMATED VOLUME (gallons)	RECEIVING WATER	REASON FOR DISCHARGE
7/3/00	455,016	Rouge River	Overflow at Walnut Lake pump station #1
7/30/00	40,395	Rouge River	Overflow at Walnut Lake pump station #1 due to heavy rain (2.05")
8/2/00	10,099	Rouge River	Overflow at Walnut Lake pump station #1
9/10/00	1,586	Rouge River	Overflow at Walnut Lake pump station #1
9/10/00	107,158	Rouge River	Overflow at Walnut Lake pump station #1
9/10/00	Unknown	Rouge River	Overflow due to heavy rain at MH#FHC041002 near 13 Mile Road and Middlebelt Road
9/11/00	16,315	Rouge River	Overflow at Walnut Lake pump station #1

12/24/00	126,084	Rouge River	Overflow at Walnut Lake pump station #1
2/9/01	Unknown	Rouge River	Overflow at MH#FAT0098103 near Eldon Road & Middlebelt Road
2/9/01	Unknown	Rouge River	Overflow at MH#WBT133001 & WBT133002 due to plugged sewers
2/9/01	Unknown	Rouge River	Overflow at MH#FAT047103 near Utley Road & Middlebelt Road
2/9/01	3,765,933	Rouge River	Overflow due to heavy rain at Walnut Lake pump station #1 near 14 Mile Road and Telegraph Road
2/9/01	Unknown	Rouge River	Overflow at MH#FHC041002 near 13 Mile Road and Middlebelt Road
2/25/01	54,174	Rouge River	Overflow due to heavy rain at Walnut Lake pump station #1 near 14 Mile Road and Inkster Road
10/12/01	71,800	Rouge River	Overflow at Walnut Lake pump station #1 due to exceedence of town outlet capacity and surcharged system
10/16/01	2,589,905	Rouge River	Overflow at Walnut Lake pump station #1 due to exceedence of town outlet capacity and surcharged system
10/16/01	4,776,000	Rouge River	Overflow at 8 Mile Road and Evergreen Road due to exceedence of town outlet capacity and surcharged system

10/16/01	Unknown	Rouge River	Overflow at MH#FHC046006 near 13 Mile Road & Middlebelt Road
10/16/01	Unknown	Rouge River	Overflow at MH#FAT047102 btw. 12 Mile Road and 13 Mile Road, east of Middlebelt Road
10/17/01	154,600	Rouge River	Overflow at Walnut Lake pump station #1 due to exceedence of town outlet capacity and surcharged system
11/30/01	463,667	Rouge River	Overflow at Walnut Lake pump station #1 due to exceedence of town outlet capacity and surcharged system
7/18/02	Unknown	Rouge River	ARV in front of bldg. at 21255 Melrose, Southfield, MI
3/16/03	90,895	Rouge River	Overflow at Walnut Lake pump station #1 due to exceedence of town outlet capacity and surcharged system
4/4/03	645,915	Rouge River	Overflow at Walnut Lake pump station #1 due to exceedence of town outlet capacity and surcharged system
4/14/03	Unknown	Mud Lake	Overflow at MF#BLT070004 due to plugged sewer
6/19/03	569,354	Rouge River	Overflow at Walnut Lake pump station due to exceedence of town outlet capacity
3/5/04	7,016	Rouge River	Overflow at Walnut Lake pump station due to exceedence of town outlet capacity

5/9/04	46,596	Rouge River	Overflow at Walnut Lake pump station due to exceedence of town outlet capacity
5/21/04	121,333	Rouge River	Overflow at Walnut Lake pump station due to exceedence of town outlet capacity
5/23/04	960,836	Rouge River	Overflow at Walnut Lake pump station due to exceedence of town outlet capacity
5/24/04	Unknown	Rouge River	Overflow at MHSOT034155 at Sager Court due to plugged sewer
TOTAL ESTIMATED VOLUME DISCHARGED > 15,074,677 GALLONS			

III. COMPLIANCE PROGRAM

IT IS THEREFORE AGREED AND ORDERED THAT THE SCHEDULE OF Final Order of Abatement Number 2098 SHALL BE AMENDED AS FOLLOWS:

- 3.1 By August 31, 2001, the County did submit the following documents to the DEQ in accordance with previous DEQ requests:
 - a. An updated Phase I Study Report utilizing the flow monitoring data from permanently installed flow meters for three intense rainfall events that occurred during 2000.
 - b. A summary of the effect these recent events had on Segment III sewers; SSOs and Community Town Outlet Capacities (TOCs); and
 - c. A list of communities that are in excess of their TOC during the events analyzed.

- 3.2 On or before **January 1, 2005**, the County shall submit a short-term corrective action plan and schedule to the DEQ for review and approval that includes the following projects:

- a. Provide a connection from the Farmington interceptor (at the Walnut #1 pumping station) to the Evergreen interceptor to allow the transfer of up to 14 cubic feet per second (cfs) of wet weather sanitary flow. Also, the Walnut #1 pumping station shall be repaired/rehabilitated/or replaced in accordance with Part 41. As part of this project, the County may modify the regulators that control flow from the Acacia Park, Bloomfield Village, and Birmingham Retention Treatment Basins (RTB) during wet weather to the Evergreen interceptor and replace this available capacity amounting to 14 cfs in the Evergreen interceptor with excess separate sanitary flow. Controlling flow through these regulators to the Evergreen Interceptor to less than the equivalent of the peak hourly sanitary flow shall be in accordance with an approved operation plan (see paragraph 3.4 below). The connection from the Farmington Interceptor to the Evergreen Interceptor can remain after December 1, 2013, and can be used to optimize the EFSDS, provided these regulators from the RTBs a) pass flows to the Evergreen Interceptor that are equivalent to peak hourly sanitary flow averaged over the RTB dewatering period (not to exceed seven days) following a wet weather event, and b) are controlled during events to maximize use of available downstream interceptor capacity while ensuring acceptance of community TOC.
- b. Remove four siphons crossing the Edwards Drain in West Bloomfield Township, and provide adequate replacement of the sanitary sewer conveyance system. A Part 41 permit was issued for this project.
- c. The County may also provide a wet weather connection from the Evergreen Farmington interceptor system to the Bloomfield Village RTB (subject to Part 41 permit review). As part of this project, storm sewer relief will be provided to offset the increase in wet weather sanitary flow to the RTB. Operation of this system shall be in accordance with an approved operation plan (see paragraph 3.4 below). After **December 1, 2013**, this wet weather sanitary connection to the Bloomfield Village RTB is only authorized, in accordance with an approved operation plan, for use during events that exceed the remedial design standard (defined in paragraph 3.5) to protect public health and water quality, unless current state and federal SSO requirements are changed to allow for its use during lesser events.

The short-term corrective action plan shall include a detailed description of the projects, and a schedule for each project for; 1) the submittal of the basis of design, 2) the submittal of complete plans and specifications, 3) the assignment of a construction commencement date, and 4) the assignment of construction completion date.

- 3.3 Following DEQ review and approval of the short-term corrective action plan and schedule, the approved schedules shall be incorporated into this modified order by reference. However, construction of the projects specified in items 3.2.a, and 3.2.b above, shall be completed no later than **December 1, 2006**.
- 3.4 The County shall submit an operation plan for the projects specified in paragraph 3.2.a to the DEQ for review and approval no later than **December 1, 2006**. Operation of the Walnut #1 pumping station, the CSO regulators, and the wet weather sanitary connection to the Bloomfield Village RTB shall conform to the operation plan once the plan is approved by the DEQ. This operation plan may be part of the Comprehensive Operation Plan required as part of the OCDC RTB permits.
- 3.5 The County shall collect and evaluate flow monitoring data from permanently installed flow meters, for a period of 12 consecutive months, following completion of construction of the projects specified in paragraph 3.2. If the County cannot certify 2025 Segment III flows and volumes as defined below (based upon these results), or has had SSOs from the County system due to capacity issues during events that are less than the remedial design standard defined below, then the County shall submit a long term corrective action plan to the DEQ for review and approval no later than **December 1, 2009**. The long term corrective action plan shall include; a) projects and schedules that will ensure that 2025 Segment III flows and volumes will be certified as previously established and defined in the Final Order of Abatement 2098; and b) appropriate engineering and structural improvements to the sewer system with corresponding schedules, to meet applicable state and federal law regulating SSOs using as guidance the remedial design standard defined below.

The remedial design standard as defined in the SSO Policy Guidance dated December 27, 2002, is a 25 year, 24 hour storm using growth conditions and normal soil moisture. This remedial design standard will remain the goal of all projects described in this Consent Order. A ten year, one hour storm under dormant and growth conditions will be considered a comparable alternative remedial design standard as defined in the MDEQ SSO Clarification Statement dated October 23, 2003. All SSO events that result from events that exceed this "comparable alternative remedial design standard" will be considered for enforcement discretion. To document the appropriateness of the use of the "comparable alternative remedial design standard," the County shall complete a hydrologic and hydraulic modeling analysis comparing the system response (at the EFSDS outlet and agreed to representative system locations) to both the ten year, one hour storm under dormant and growth conditions and the 25 year, 24 hour storm using growth conditions and normal soil moisture. The study shall be completed no later than **December 1, 2006**. Any revised remedial design standard that is effective on December 1, 2009, shall take precedence if current state and federal SSO requirements are changed to allow for its use during lesser events.

For the purposes of this paragraph, "projects" and "appropriate engineering and structural improvements" may include Segment III relief sewers (primarily Stages D, E, F, and G) or alternatives to relief; storage, additional removal of infiltration and inflow (I/I) as realistically documented during the short-term corrective action plan (by the County and member communities) and/or additional capacity from DWSD provided that full secondary treatment is provided [i.e. routed through the current connection to DWSD (First Hamilton)]. Revision of current TOC may also be considered in a coordinated plan across the EFSDS. Also note that starting no later than **December 1, 2013**, 1) the regulators at the existing CSO RTBs shall be a) operated to pass at least the equivalent flow to the peak hourly sanitary flow from their upstream tributary areas, to the Evergreen interceptor, measured as an average over the RTB dewatering period (not to exceed seven days) following wet weather events that do not exceed the remedial design standard and b) controlled during events to maximize use of available downstream interceptor capacity while ensuring acceptance of community TOC (basin dewatering

during events can also be considered) and 2) the wet weather sanitary connection to the Bloomfield Village RTB is only authorized, in accordance with an approved operation plan, for use during events that exceed the remedial design standard, defined above, to protect public health and water quality, unless current state and federal SSO requirements are changed to allow for its use during lesser events. Flow certification and the final corrective action plan (if applicable) must consider these conditions 1 and 2.

- 3.6 Following review and approval of the final corrective action plan and schedules by the DEQ, the approved schedules will be incorporated into this modified order by reference. However, final compliance with paragraph 3.5 shall be completed no later than **December 1, 2013**.
- 3.7 On or before **May 1, 2013**, the County shall submit to the DEQ for review and approval, a work plan for conducting a year long Project Performance Certification Program (PPC) to certify that the long-term corrective action plan meets Segment III flows and volumes as established and defined in the Final Order of Abatement 2098, and all applicable state and federal laws regulating SSOs using as guidance the remedial design standard as defined in the SSO Policy Guidance dated December 27, 2002, or a comparable alternative remedial design standard as defined in the MDEQ SSO Clarification Statement dated October 23, 2003 (or a revised remedial design standard as effective on December 1, 2009).
- 3.8 On or before January 1, 2015, the County shall submit to the DEQ for review and approval, the PPC Program report. If the County does not certify that the long-term corrective action plan meets Segment III flows and volumes as established and defined in the Final Order of Abatement, and all applicable state and federal laws regulating SSOs using as guidance the remedial design standard as defined in the SSO Policy Guidance dated December 27, 2002, or a comparable alternative remedial design standard as defined in the MDEQ SSO Clarification Statement dated October 23, 2003 (or a revised

remedial design standard as effective on December 1, 2009), then the County shall submit an approvable Corrective Action Program work plan to the DEQ on or before **May 1, 2015**.

- 3.9 Progress reports shall be submitted to the DEQ beginning upon the entry date of this amended order on an annual basis, and shall be due on or before January 15 of each calendar year. The submittal of progress reports shall cease upon termination of this order.
- 3.10 The County shall submit all reports, work plans, specifications, schedules, or any other writing required by this section to the District Supervisor, WB, DEQ, 38980 Seven Mile Road, Livonia, Michigan 48152 or other relevant address as determined by the DEQ. The cover letter with each submittal shall identify the specific paragraph and requirement of this Second Amended Consent Order that the submittal is intended to satisfy.

IV. DEQ APPROVAL OF SUBMITTALS

- 4.1 For any work plan, proposal, or other document, excluding applications for permits or licenses, that are required by this Second Amended Consent Order to be submitted to the DEQ by the County, the following process and terms of approval shall apply.
- 4.2 All work plans, proposals, and other documents required to be submitted by this Second Amended Consent Order shall include all of the information required by the applicable statute and/or rule, and all of the information required by the applicable paragraph(s) of this Second Amended Consent Order.
- 4.3 In the event the DEQ disapproves a work plan, proposal, or other document, it will notify the County, in writing, specifying the reasons for such disapproval. The County shall submit, within thirty (30) days of receipt of such disapproval, a revised work plan, proposal, or other document which adequately addresses the reasons for the DEQ's

disapproval. If the reviewed work plan, proposal, or other document is still not acceptable to the DEQ, the DEQ will notify the County of this disapproval.

- 4.4 In the event the DEQ approves with specific modifications, a work plan, proposal, or other document, it will notify the County, in writing, specifying the modifications required to be made to such work plan, proposal, or other document prior to its implementation and the specific reasons for such modifications. The DEQ may require the County to submit, prior to implementation and within thirty (30) days of receipt of such approval with specific modifications, a revised work plan, proposal, or other document which adequately addresses such modifications. If the reviewed work plan, proposal, or other document is still not acceptable to the DEQ, the DEQ will notify the County of this disapproval.
- 4.5 Upon DEQ approval, or approval with modifications, of a work plan, proposal, or other document, such work plan, proposal, or other document shall be incorporated by reference into this Second Amended Consent Order and shall be enforceable in accordance with the provisions of this Second Amended Consent Order.
- 4.6 Failure by the County to submit an approvable work plan, proposal, or other document, within the applicable time periods specified above, constitutes a violation of this Second Amended Consent Order and shall subject the County to the enforcement provisions of this Second Amended Consent Order, including the stipulated penalty provisions specified in paragraph 9.3.
- 4.7 Any delays caused by the County's failure to submit an approvable work plan, proposal, or other document when due shall in no way affect or alter the County's responsibility to comply with any other deadline(s) specified in this Second Amended Consent Order.
- 4.8 No informal advice, guidance, suggestions, or comments by the DEQ regarding reports, work plans, plans, specifications, schedules, or any other writing submitted by the County will be construed as relieving the County of its obligation to obtain written approval, if and when required by this Second Amended Consent Order.

V. EXTENSIONS

5.1 The County and the DEQ agree that the DEQ may grant the County a reasonable extension of the specified deadlines set forth in this Second Amended Consent Order. Any extension shall be preceded by a written request in duplicate to the DEQ's WB's Enforcement Unit Chief, Constitution Hall, 525 W. Allegan, P.O. Box 30273, Lansing, Michigan, 48909-7773, and the Southeast Michigan District Supervisor at the address in paragraph 3.7, no later than ten (10) business days prior to the pertinent deadline, and shall include:

- a. Identification of the specific deadline(s) of this Second Amended Consent Order that will not be met,
- b. A detailed description of the circumstances which will prevent the County from meeting the deadline(s),
- c. A description of the measures the County has taken and/or intends to take to meet the required deadline; and
- d. The length of the extension requested and the specific date on which the obligation will be met.

The District Supervisor, in consultation with the Enforcement Unit Chief, shall respond in writing to such requests. No change or modification to this Second Amended Consent Order shall be valid unless in writing from the DEQ, and if applicable, signed by both parties.

VI. REPORTING

- 6.1 The County shall verbally report any violation(s) of the terms and conditions of this Second Amended Consent Order to the Southeast Michigan District Supervisor by no later than the close of the next business day following detection of such violation(s) and shall follow such notification with a written report within five (5) business days following detection of such violation(s). The written report shall include a detailed description of the violation(s), as well as a description of any actions proposed or taken to correct the violation(s). The County shall report any anticipated violation(s) of this Second Amended Consent Order to the above-referenced individual in advance of the relevant deadlines whenever possible.

VII. RETENTION OF RECORDS

- 7.1 Upon request by an authorized representative of the DEQ, the County shall make available to the DEQ all records, plans, logs, and other documents required to be maintained under this Second Amended Consent Order or pursuant to Part 31 of the NREPA or its rules. All such documents shall be retained by the County for at least a period of three (3) years from the date of generation of the record unless a longer period of record retention is required by Part 31 of the NREPA, or its rules.

VIII. RIGHT OF ENTRY

- 8.1 The County shall allow any authorized representative or contractor of the DEQ, upon presentation of proper credentials, to enter upon the premises of the facility at all reasonable times for the purpose of monitoring compliance with the provisions of this Second Amended Consent Order. This paragraph in no way limits the authority of the DEQ to conduct tests and inspections pursuant to the NREPA and the rules promulgated there under, or any other applicable statutory provision.

IX. PENALTIES

- 9.1 The County agrees to pay to the State of Michigan **TWENTY-FIVE HUNDRED (\$2,500) DOLLARS** as compensation for the cost of enforcement actions arising from the activities surrounding this Second Amended Consent Order. Payment shall be made within thirty (30) days of the effective date of this Second Amended Consent Order in accordance with paragraph 9.8.
- 9.2 The County agrees to pay a civil fine of **TWENTY-SIX THOUSAND (\$26,000) DOLLARS** for all violations stated herein of this Second Amended Consent Order and those violations listed in Second Amended Consent Order ACO-SW05-009 (City of Troy) and Second Amended Consent Order ACO-SW05-006 (City of Farmington Hills). Payment shall be made within thirty (30) days of the effective date of this Second Amended Consent Order in accordance with paragraph 9.8.
- 9.3 The County agrees to complete a Supplemental Environmental Project (SEP) that consists of the following: (1) a Footing Drain Disconnection (FDD) Pilot Study with a value of at least \$150,000. The FDD Pilot Study shall consist of identification of homes with footing drains connected to the sanitary sewer, pre-disconnection flow monitoring, footing drain disconnection, post-disconnection flow monitoring and the submittal of a final report and analysis documenting the findings of the pilot study to the DEQ on or before **December 31, 2006**; (2) in conjunction with the FDD pilot study the performance of a residential house lead investigation shall be conducted at a value of at least \$250,000. This investigation shall consist of the study of infiltration into residential house leads and the submittal of a final report documenting the findings of such a study to the DEQ on or before **December 31, 2006**, and (3) the publishing and distributing of at least \$10,000 worth of public outreach/educational materials explaining how water is drained from their home site currently; how these flows impact the sanitary sewer system; and how removal of the excess flow by footing drain disconnection can provide for safer, more efficient,

potentially less costly sewer service and the importance of maintaining their residential house leads. The County shall submit documentation to the DEQ certifying that this has been completed on or before **December 31, 2006**.

9.4 For each failure to comply with the provisions of Section III and IV of this Second Amended Consent Order, the County shall pay stipulated penalties of **\$500** per violation per day from the first day (1st) to the seventh (7th) day of violation, and if the same violation continues shall pay **\$1,000** per violation per day from the eighth (8th) to the fourteenth (14th) day of violation, and if the same violation continues shall pay **\$2,500** per violation per day for each day of violation thereafter. Failure to perform any of the following requirements shall be considered separate violations of this Second Amended Consent Order and are subject to stipulated penalties under this paragraph:

- a. Failure to submit an approvable work plan, proposal, or other document by the required dates in accordance with Section III.
- b. Failure to implement, complete, or comply with any activity or condition required by Section III, including those contained in any approved work plan or other document required to be implemented and completed by Section III; and
- c. Failure to submit approvable revised work plans, proposals, or other documents addressing a DEQ disapproval or approval with modifications by the required dates in accordance with paragraphs 4.3 or 4.4.

9.5 For each failure to comply with any other provision of this Second Amended Consent Order not specified in paragraph 9.4, the County shall pay stipulated penalties of **\$1,500** per violation per day for each day of violation. Failure to perform any of the following requirements shall be considered separate violations of this Second Amended Consent Order and are subject to stipulated penalties under this paragraph:

- a. Failure to verbally report violations and submit written reports by the required dates in accordance with paragraph 6.1.

- b. Failure to retain records on site in accordance with paragraph 7.1.
 - c. Failure to pay civil fines, costs, or stipulated or interest penalties by the required dates in accordance with this section; and
 - d. Any other requirement of this Second Amended Consent Order.
- 9.6 Stipulated penalties accruing under paragraphs 9.4 or 9.5 shall be paid within thirty (30) days after written demand by the DEQ in accordance with paragraph 9.8.
- 9.7 To ensure timely payment of the above civil fine, costs, and stipulated penalties, the County shall pay an interest penalty to the General Fund of the State of Michigan each time it fails to make a complete or timely payment. This interest penalty shall be based on the rate set forth at MCL 600.6013(6), using the full increment of amount due as principal, and calculated from the due date for the payment until the delinquent payment is finally made in full.
- 9.8 The County agrees to pay all funds due pursuant to this agreement by check made payable to the State of Michigan and delivered to the Michigan Department of Environmental Quality, Revenue Control Unit, P.O. Box 30657, 525 West Allegan Street, 5th floor south, Lansing, Michigan 48909-8157. To ensure proper credit, all payments made pursuant to this Order must include the **Payment Identification Number WTR3017**.
- 9.9 The County agrees not to contest the legal basis of the civil fine or costs paid pursuant to paragraphs 9.1, and 9.2, above. The County further agrees not to contest the legal basis of any stipulated penalties or an interest penalty assessed pursuant to paragraphs 9.4, 9.5 and 9.7, above, but reserves the right to dispute the factual basis upon which a demand by the DEQ for stipulated penalties or interest penalties is made.

X. DISPUTE RESOLUTION

- 10.1 Unless otherwise provided in this Second Amended Consent Order, the dispute resolution procedures of this section shall be the exclusive mechanism to resolve disputes arising under or with respect to this Second Amended Consent Order. However, the procedures set forth in this section shall not apply to actions by the state to enforce obligations of the County that are not disputed in accordance with this section. Initiation of dispute resolution shall not be cause for the County to delay the performance of any compliance requirements or response activity.
- 10.2 Any dispute that arises under this Second Amended Consent Order shall in the first instance be the subject of informal negotiations between the County and the DEQ (parties). The period of negotiations shall not exceed twenty (20) days from the date of written notice by any party that a dispute has arisen, unless the time period for negotiations is modified by written agreement between the parties. A dispute under this section shall occur when one party sends the other party a written notice of dispute. If agreement cannot be reached on any issue within this twenty (20) day period, the DEQ shall provide a written statement of its decision to the County and, in the absence of initiation of formal dispute resolution by the County under paragraph 10.3, the DEQ's position as outlined in its written informal decision, shall be binding on the parties.
- 10.3 If the County and the DEQ cannot informally resolve any dispute under paragraph 10.2, the County may initiate formal dispute resolution by requesting review of the disputed issues by the DEQ, WB Chief. This written request must be filed with the DEQ, WB Chief within fifteen (15) days of the County's receipt of the DEQ's informal decision that is issued at the conclusion of the informal dispute resolution procedure set forth in paragraph 10.2. The County's request shall state the issues in dispute; the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting its position; and all supporting documentation upon which the County bases its position. Within twenty one (21) days of the WB Chief's receipt of the County's request for a review of disputed issues, the WB Chief will provide a written statement of decision to the County, which will include a statement of his/her understanding of the issues in dispute;

the relevant facts upon which the dispute is based; any factual data, analysis, or opinion supporting her/his position; and all supporting documentation relied upon by the WB Chief's review of the disputed issues. The WB Chief's time period for review of the disputed issues may be extended by written agreement of the parties.

- 10.4 The written statement of the WB Chief issued under paragraph 10.3 shall be a final decision and is binding on the parties unless, in accordance with applicable law, after receipt of DEQ's written statement of decision, the County files a petition for judicial review in a court of competent jurisdiction that shall set forth a description of the matter in dispute, the efforts made by the Parties to resolve it, the relief requested, and the schedule, if any, within which the dispute must be resolved to ensure orderly implementation of this Second Amended Consent Order.
- 10.5 An administrative record of the dispute shall be maintained by DEQ. The administrative record shall include all of the information provided by the County pursuant to paragraph 10.3, as well as any other documents relied upon by DEQ in making its final decision pursuant to paragraph 10.3. DEQ shall allow submission of supplemental statements of position by the parties to the dispute that are timely submitted and do not unreasonably prejudice the DEQ.
- 10.6 A final decision of DEQ issued pursuant to paragraph 10.3 may be challenged by the County pursuant to applicable law.
- 10.7 Notwithstanding the invocation of dispute resolution procedures under this section, stipulated penalties shall accrue from the first day of any failure or refusal to comply with any term or condition of this Second Amended Consent Order, but payment shall be stayed pending resolution of the dispute. Stipulated penalties shall be paid within thirty (30) days after resolution of the dispute. The County shall pay that portion of a demand for payment of stipulated penalties that is not subject to dispute resolution procedures in accordance with and in the manner provided in Section IX (penalties).

XI FORCE MAJEURE

- 11.1 The County shall perform the requirements of this Second Amended Consent Order within the time limits established herein, unless performance is prevented or delayed by events that constitute a "Force Majeure." Any delay in the performance attributable to a "Force Majeure" shall not be deemed a violation of the County's obligations under this Second Amended Consent Order in accordance with this section.
- 11.2 For the purpose of this Second Amended Consent Order, "Force Majeure" means an occurrence or non-occurrence arising from causes not foreseeable, beyond the control of, and without the fault of the County, such as: an Act of God, untimely review of permit applications or submissions by the DEQ or other applicable authority, and acts or omissions of third parties that could not have been avoided or overcome by the County's diligence and that delay the performance of an obligation under this Second Amended Consent Order. "Force Majeure" does not include, among other things, unanticipated or increased costs, changed financial circumstances, or failure to obtain a permit or license as a result of the County's actions or omissions.
- 11.3 The County shall notify the DEQ, by telephone, within forty eight (48) hours of discovering any event which causes a delay in its compliance with any provision of this Second Amended Consent Order. Verbal notice shall be followed by written notice within ten (10) calendar days and shall describe, in detail, the anticipated length of delay, the precise cause or causes of delay, the measures taken by the County to prevent or minimize the delay, and the timetable by which those measures shall be implemented. The County shall adopt all reasonable measures to avoid or minimize any such delay.
- 11.4 Failure of the County to comply with the notice requirements and time provisions under paragraph 11.3, shall render this Section XI void and of no force and effect as to the particular incident involved. The DEQ may, at its sole discretion and in appropriate circumstances, waive in writing the notice requirements of paragraph 11.3, above.

- 11.5 If the parties agree that the delay or anticipated delay was beyond the control of the County, this may be so stipulated, and the parties to this Second Amended Consent Order may agree upon an appropriate modification of this Second Amended Consent Order. If the parties to this Second Amended Consent Order are unable to reach such agreement, the dispute shall be resolved in accordance with Section X (Dispute Resolution) of this Second Amended Consent Order. The burden of proving that any delay was beyond the reasonable control of the County, and that all the requirements of this Section XI have been met by the County, rests with the County.
- 11.6 An extension of one compliance date based upon a particular incident does not necessarily mean that the County qualifies for an extension of a subsequent compliance date without providing proof regarding each incremental step or other requirement for which an extension is sought.

XII. GENERAL PROVISIONS

- 12.1 With respect to any violations not specifically addressed and resolved by this Second Amended Consent Order, the DEQ reserves the right to pursue any other remedies to which it is entitled for any failure on the part of the County to comply with the requirements of the NREPA and its rules.
- 12.2 The DEQ and the County consent to enforcement of this Second Amended Consent Order in the same manner and by the same procedures for all final orders entered pursuant to Part 31, MCL 324.3101 et seq.; and enforcement pursuant to Part 17, Michigan Environmental Protection Act, of the NREPA, MCL 324.1701 et seq.
- 12.3 This Second Amended Consent Order in no way affects the County's responsibility to comply with any other applicable state, federal, or local laws or regulations.
- 12.4 The WB, at its discretion, may seek stipulated fines or statutory fines for any violation of this Second Amended Consent Order. However, for the same violation the WB may only

seek a stipulated fine under this Second Amended Consent Order or a statutory fine but not both.

- 12.5 Nothing in this Second Amended Consent Order is or shall be considered to affect any liability the County may have for natural resource damages caused by the County's ownership and/or operation of the Facility. The State of Michigan does not waive any rights to bring an appropriate action to recover such damages to the natural resources.
- 12.6 In the event the County sells or transfers the facility, it shall advise any purchaser or transferee of the existence of this Second Amended Consent Order in connection with such sale or transfer. Within 30 calendar days, the County shall also notify the WB Southeast Michigan District Supervisor, in writing, of such sale or transfer, the identity and address of any purchaser or transferee, and confirm the fact that notice of this Second Amended Consent Order has been given to the purchaser and/or transferee. The purchaser and/or transferee of this Second Amended Consent Order must agree, in writing, to assume all of the obligations of this Second Amended Consent Order. A copy of that agreement shall be forwarded to the WB Southeast Michigan District Supervisor within thirty (30) days of assuming the obligations of this Second Amended Consent Order.
- 12.7 The provisions of this Second Amended Consent Order shall apply to and be binding upon the parties to this action, and their successors and assigns.
- 12.8 All other elements, schedules, and conditions of Final Order of Abatement Number 2098 and First Amended Final Order of Abatement Number 2098A shall remain in full force and effect until said termination date. This Second Amended Consent Order shall pose no conflict with any remaining requirements yet to be completed per Final Order of Abatement Number 2098 and First Amended Final Order of Abatement Number 2098A.

XIII. TERMINATION

13.1 This Second Amended Consent Order, Final Order of Abatement Number 2098, and First Amended Final Order of Abatement Number 2098A shall remain in full force and effect until terminated by a written Termination Notice issued by the DEQ. Prior to issuance of a written Termination Notice, the County shall submit a request consisting of a written certification that the County has fully complied with the requirements of this Second Amended Consent Order, Final Order of Abatement Number 2098, and First Amended Final Order of Abatement Number 2098A and has made payment of any fines, including stipulated penalties, required in this Second Amended Consent Order. Specifically, this certification shall include:

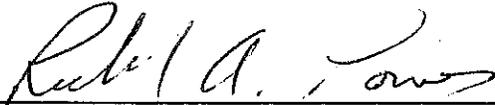
- a. The date of compliance with each provision of the compliance program in section, and the date any fines or penalties were paid.
- b. A statement that all required information has been reported to the District Supervisor; and
- c. Confirmation that all records required to be maintained pursuant to this Second Amended Consent Order are being maintained at the facility.

The DEQ may also request additional relevant information. The DEQ shall not unreasonably withhold issuance of a Termination Notice.

Signatories

The undersigned CERTIFY they are fully authorized by the party they represent to enter into this Consent Order to comply by consent and to EXECUTE and LEGALLY BIND that party to it.

DEPARTMENT OF ENVIRONMENTAL QUALITY



Richard A. Powers, Chief
Water Bureau

12/6/04

Date

**COUNTY OF OAKLAND BY AND THROUGH ITS COUNTY AGENCY
OFFICE OF THE DRAIN COMMISSIONER**



By: John P. McCulloch, Oakland County Drain Commissioner
In his capacity as the "County Agency" for the Evergreen-Farmington
Sewage Disposal System, pursuant to 1939 PA 342 as amended,
And 1957 PA 185, as amended

Date

APPROVED AS TO FORM:



By: Alan F. Hoffman, Assistant Attorney General
For: Mark Matus
Assistant Attorney General in Charge
Environment, Natural Resources, and Agriculture Division
Michigan Department of Attorney General



STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

December 7, 2004

CERTIFIED MAIL 7002 3150 0003 3281 7507

Mr. John McCullough
Drain Commissioner
Oakland County Drain Commission
Building 95 West
One Public Works Drive
Waterford, Michigan 48328-1907

Dear Mr. McCullough:

SUBJECT: Administrative Consent Order ACO-SW05-001

Enclosed please find a fully executed Administrative Consent Order (Consent Order) for Oakland County (County). This Consent Order was entered into between the Department of Environmental Quality (DEQ) and the County on December 6, 2004. Payment of the cost reimbursement and the civil penalty, as required in the Consent Order, was received on December 2, 2004.

Thank you for your assistance in this matter. If you have any questions, please contact me at the number below.

Sincerely,

Jodie N. Taylor, Environmental Engineer
Enforcement Unit
Field Operations Division
Water Bureau
517-373-8545
FAX: 517-373-2040

Enclosure

cc: Mr. Barry H. Selden, DEQ
cc/enc: Mr. Joseph Colaianne, Attorney, Oakland County Drain Commissioner
Mr. Steven E. Chester, Director, DEQ
Mr. Thomas Knueve, DEQ



STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING



JENNIFER M. GRANHOLM
GOVERNOR

STEVEN E. CHESTER
DIRECTOR

December 10, 2004

CERTIFIED MAIL 7001 1140 0003 6467 9586

Mr. John McCullough
Drain Commissioner
Oakland County Drain Commission
Building 95 West
One Public Works Drive
Waterford, Michigan 48328-1907

Dear Mr. McCullough:

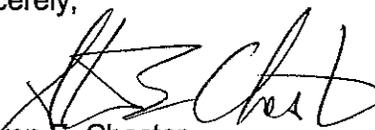
This letter is in regard to our July 20, 2004, discussions at resolving several outstanding issues. You raised the concern that should Oakland County and the Evergreen-Farmington communities (Oakland County Communities) enter into enforceable agreements setting forth long-term schedules for construction and implementation of the Sanitary Sewer Overflow (SSO) Projects, the Oakland County Communities should not be held liable for exceedances that occur during the time the projects are being implemented.

As I explained, the Department of Environmental Quality (DEQ) cannot agree to categorically waive its statutory responsibility to enforce state and federal water quality laws. The DEQ will exercise enforcement discretion with regard to communities experiencing SSOs occurring during the period of time that the approved corrective action program (CAP) is being implemented and where the Oakland County Communities demonstrate that good faith efforts are being made to advance the CAP; and the violations are of a kind being addressed by the CAP.

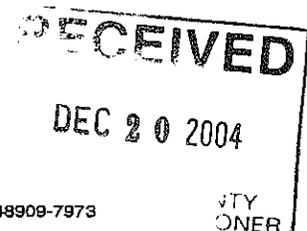
It is the DEQ's intent to work collaboratively with the Oakland County Communities to address the SSO issues as efficiently and effectively as possible. We acknowledge the record of accomplishments and regional leadership Oakland County has demonstrated in attending to water quality and water management issues.

We look forward to working with you and the Oakland County Communities in the future.

Sincerely,


Steven E. Chester
Director
517-373-7917

cc: Evergreen-Farmington Communities
Mr. Stanley F. Pruss, Deputy Director, DEQ
Mr. Richard A. Powers, DEQ
Mr. Frank J. Baldwin, DEQ
Mr. Barry H. Selden, DEQ
Mr. Thomas Kneuve, DEQ
Ms. Jodie Taylor, DEQ



OAKLAND CO.

STATE OF MICHIGAN



JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING
BOX 30028
LANSING, MI 48909

~~XEROX COPY~~
David F. Hales, Director



NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
MARLENE J. FLUHARTY
KERRY KAMMER
O. STEWART MYERS
DAVID D. OLSON
RAYMOND POUPORE

September 14, 1988

CERTIFIED MAIL

Mr. Milton W. Handorf, P.E., Director
Oakland County Department of Public Works
One Public Works Drive
Pontiac, Michigan 48054-1695

Dear Mr. Handorf:

Please find enclosed a fully executed original of Final Order of Abatement No. 2098 for the regional interceptor relief and rehabilitation components of the Evergreen-Farmington Sewage Disposal System project. The Order has been entered by the Department and Water Resources Commission, and contains a compliance schedule for performing the required work. This Final Order rescinds the previously entered Final Order No. 2085.

Please review the Order carefully. If you have any questions concerning the Order, please contact Mr. Roy Schrameck, Supervisor, Northville District Office, Surface Water Quality Division, at 313-344-9460.

Sincerely,

Paul D. Zugger, Chief ACTING
Surface Water Quality Division
517-373-1949

Enclosure

- cc: Mr. Stewart Freeman, Attorney General's Office
- Water Resources Commission
- Mr. Paul Blakeslee, MDNR
- Mr. William McCracken, MDNR
- Mr. Frank Baldwin, MDNR
- Mr. Tom Kamppinen, MDNR
- Mr. Roy Schrameck, MDNR
- Data Entry, MDNR
- District Supervisors, MDNR

W-S Porter
Duncan Decker
M. J. Smith

HRC Waring

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
WATER RESOURCES COMMISSION

IN THE MATTER OF

FINAL ORDER NO.: 2098

ABATEMENT OF WATER POLLUTION

OAKLAND COUNTY DEPARTMENT OF PUBLIC WORKS
EVERGREEN-FARMINGTON SEWAGE DISPOSAL SYSTEM

FINAL ORDER OF ABATEMENT

AT THE SESSION OF THE Water Resources Commission (the "Commission") on July 21, 1988, at Lansing, Michigan, upon a presentation of staff of the Surface Water Quality Division, Department of Natural Resources (the "Department") and based upon the official files of the Surface Water Quality Division:

IT IS THE EXPRESS FINDING OF FACT of the Commission and the Department that the Oakland County Department of Public Works ("The COUNTY") owns and operates a regional interceptor system known as the Evergreen - Farmington Sewage Disposal System, serving all or parts of the communities of Auburn Hills, Beverly Hills, Bingham Farms, Birmingham, Bloomfield Hills, Bloomfield Township, Farmington, Farmington Hills, Franklin, Keego Harbor, Lathrup Village, Orchard Lake Village, Southfield, Sylvan Lake, Troy, and West Bloomfield Township, tributary to the Detroit Water and Sewerage Department Interceptor System and Wastewater Treatment Plant.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that the County's Interceptor experiences excessive infiltration/inflow, and lacks necessary capacity to collect and transport peak separate sanitary wastewater flows to the Detroit Water and Sewerage Department Interceptor System and Wastewater Treatment Plant which results in bypasses of untreated sewage and combined sewage overflows exceeding design conditions to the Rouge River tributary to the Detroit River.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that discharges of untreated sewage are in violation of Sections 6(b) and 7(1) of the Water Resources Commission Act, 1929 P.A. 245, as amended, unless authorized by a permit from the Commission.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that on October 1, 1985, the Commission approved a Rouge River Basin Strategy. The Rouge River Basin Strategy is a program directed towards correcting the water quality problems associated with the Rouge River Basin.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that Oakland County has prepared a facilities plan titled the "Evergreen-Farmington Pollution Control Facilities Comprehensive Facilities Plan", dated October, 1982, as amended and approved, identifying necessary modifications needed for providing and maintaining the proper devices for the collection and transportation of sanitary wastewater in the Evergreen-Farmington Sewage Disposal System. This facilities plan project known as the Evergreen-Farmington Project, is an integral component of the Rouge River Basin Strategy.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that the County has prepared, as part of the facilities plan, an infiltration/inflow analysis study of the regional Evergreen-Farmington Sewage Disposal System. This infiltration/inflow analysis study as amended, identifies areas experiencing excessive infiltration/inflow. This infiltration/inflow analysis study titled "Evergreen-Farmington Pollution Control Facilities Comprehensive Facilities Plan Infiltration/Inflow Analysis" dated October 1982, as amended and approved, is an integral component of the Evergreen-Farmington Project.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that the County has prepared, as part of its facilities plan for the Evergreen-Farmington Project, a sanitary sewer system evaluation survey study of its sanitary sewer interceptor system. This sanitary sewer system evaluation survey study identifies areas experiencing excessive infiltration/inflow. This study, titled "Evergreen-Farmington Pollution Control Facilities Sewer System Evaluation Survey" dated August, 1983, as amended and approved, is an integral component of the Evergreen-Farmington Project.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that, pursuant to Rule 299.2941 promulgated under 1913 PA 98, as amended, the Director of the Department shall issue permits for the construction of sanitary sewers only when plans and specifications for the proposed sanitary sewers are "found to be in accordance with good modern practices" and either 1) proper devices for collection and treatment are available or, 2) "a definite program or agreement satisfactory to the Department leading to the construction and operation of such collection, transportation or treatment devices shall have been officially adopted by the applicant for such permit".

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that compliance with the requirements of this Final Order of Abatement shall constitute satisfaction of the requirements of Rule 299.2941(a) of the Rules promulgated pursuant to 1913 PA 98, as amended. The Department shall issue permits for the construction of sanitary sewers to the County based upon compliance with this Final Order; 1913 P.A. 98, as amended, 1929 P.A. 245, as amended; and the rules promulgated pursuant to those statutes. Compliance with this Final Order is deemed to mean satisfactory performance of all scheduled/required activities prior to the submittal of an Act 98 sewer construction permit application.

IT IS FURTHER THE EXPRESS FINDING OF FACT of the Commission and the Department that the County has agreed to the terms and conditions of this Order and has expressly approved and consented to the entry of this Order as a Final Order of this Commission. The Commission and the Department acknowledge that the compliance schedule contained herein was developed in anticipation that federal construction grant monies will be made available to assist the County in financing construction of the sanitary sewer system improvements described herein, and that if such monies are not available, the County may request modification of the schedule contained in this Order.

ABATEMENT PROGRAM

NOW THEREFORE IT IS HEREBY ORDERED that the County shall make modifications to its sanitary sewer interceptor system in accordance with the following requirements and schedule.

A. Sanitary Sewer System Evaluation Survey Study.

1. By September 1, 1988, the County shall submit to the Northville District Supervisor of the Surface Water Quality Division ("District Supervisor") for approval, a work plan for conducting the Sanitary Sewer System Evaluation Survey Study Phase I and II identified in the approved amended infiltration/inflow analysis study (Appendix A).
2. By October 1, 1988, the County shall have started the Sanitary Sewer System Evaluation Survey Study in accordance with the approved work plan. The County shall notify the District Supervisor, in writing, of compliance with this requirement by October 15, 1988.
3. By June 1, 1989, the County shall complete the Sanitary Sewer Evaluation Survey Study and submit a final report to the District Supervisor for approval.

B. Sanitary Sewer System Rehabilitation Program.

1. By August 1, 1989, the County shall submit plans and specifications for approval to the District Supervisor for completing the Sanitary Sewer System Rehabilitation Program Phase I and II identified in the approved Sanitary Sewer System Evaluation Survey Study Report.
2. By August 1, 1990, the County shall commence construction of the Sanitary Sewer System Rehabilitation Program in accordance with the approved plans and specifications. The County shall notify the District Supervisor, in writing, of compliance with this requirement by August 15, 1990.
3. By August 1, 1991, the County shall complete construction of the Sanitary Sewer System Rehabilitation Program. The County shall notify the District Supervisor, in writing, of compliance with this requirement by August 15, 1991.

C. Regional Sanitary Sewer System Improvement Program.

1. By July 1, 1988, the County shall submit plans and specifications to the District Supervisor, for Segment I of the Sanitary Sewer System Improvement Program as identified in the approved amended facilities plan (Appendix B).
2. By July 1, 1989, the County shall award contracts for Segment I.
3. By August 1, 1989, the County shall commence construction of Segment I of the Sanitary Sewer System Improvement Program in accordance with the approved plans and specifications. The County shall notify the District Supervisor, in writing, of compliance with this requirement by August 15, 1989.
4. By August 1, 1991, the County shall complete construction of Segment I and notify the District Supervisor, in writing, of compliance with this requirement by August 15, 1991.
5. By July 1, 1989, the County shall submit plans specifications for Segment II for approval to the District Supervisor for the Sanitary Sewer System Improvement Program identified in the approved amended facilities plan (Appendix B).
6. By August 1, 1990, the County shall award contracts for the construction of said Segment II facilities.
7. By September 1, 1990, the County shall commence construction of the Segment II Program in accordance with the approved plans and specifications. The County shall notify the District Supervisor, in writing, of compliance with this requirement by September 15, 1990.
8. By September 1, 1992, the County shall complete construction of Segment II and notify the District Supervisor, in writing, of compliance with this requirement by September 15, 1992.
9. By January 15th of each year, the County shall submit a report detailing the results of a continuously on-going evaluation of the flows in the sanitary sewers identified in Segment III of the Sanitary Sewer System Improvement Program. The report shall contain a certification by the County to the District Supervisor that the flows in these sanitary sewers do not exceed 90 percent of the maximum carrying capacity of the sewer pipe.
10. If the County cannot make the certification required by C.9, above, or at any time the County becomes aware, based upon information available from its sanitary sewer flow evaluation program, that sanitary flows exceed 90 percent of the maximum carrying capacity of the existing sewer pipe, then within 90 days the County shall submit to the District Supervisor a written remedial action plan. The plan shall contain a basis of design and a fixed-date schedule to construct the relief sewers needed to eliminate the anticipated surcharge conditions in the sewer system for year 2025 population needs as identified in the amended facilities plan.

Starting 1991

D. Sanitary Sewer System Performance Certification Program.

1. By July 1, 1992, the County shall submit a work plan for approval to the District Supervisor for conducting a Sanitary Sewer System Performance Certification Program to certify basis of design flow criteria (Appendix C).
2. By September 1, 1992, the County shall have started the Sanitary Sewer Performance Certification Program in accordance with the approved work plan. The County shall notify the District Supervisor, in writing, of compliance with this requirement by September 15, 1992.
3. By September 1, 1993, the County shall complete the Sanitary Sewer System Performance Certification Program and submit a project certification letter and evaluation report to the District Supervisor for approval.
4. In accordance with the requirements of the "ABATEMENT PROGRAM" Item D.3., if the County cannot certify the project meets its performance standards, then by October 1, 1993, the County shall submit an evaluation/corrective action report with schedule to the District Supervisor for approval (Appendix C).
5. In accordance with the requirements and schedule of the "ABATEMENT PROGRAM" Item D.4., when the project is acceptable for certification (after corrective action has been completed), the County shall submit a project certification letter to the District Supervisor for approval.

E. Sanitary Sewer System Operation and Maintenance Program.

1. By March 1, 1989, the County shall submit a work plan for approval to the District Supervisor for conducting a Sanitary Sewer System Operation and Maintenance Program (Appendix D).
2. By July 1, 1989, the County shall implement the Sanitary Sewer System Operation and Maintenance Program in accordance with the approved work plan. The County shall notify the District Supervisor, in writing, of compliance with this requirement by July 15, 1989.
3. By January 15th of each year, the County shall update and submit for approval to the District Supervisor, a work plan for continuation of the Sanitary Sewer System Operation and Maintenance Program.

F. Sanitary Sewer System Use Ordinance.

1. By February 1, 1989, the County shall analyze its existing sanitary sewer system use ordinance and certify, in writing, to the District Supervisor that it contains provisions which (a) prohibit introduction of new inflow sources to the separate sanitary sewer system; (b) prohibit construction of new

combined sewers except when no prudent or feasible alternative exists; (c) require that new construction tributary to the combined sewer system is designed to minimize inflow contribution to the combined sewer system; and (d) provide that any new building sanitary wastewater connection shall not contain footing drain and/or roof leader wastewater contributions.

2. By February 1, 1989, the County shall finalize and submit intermunicipal agreements between the County and the participating Communities and/or between the Communities, as appropriate, to the District Supervisor. These agreements must at a minimum identify the contract capacity allotments and the funding obligations for the total project.

GENERAL CONDITIONS

THIS FINAL ORDER entered on September 8, 1988, by direction of the Michigan Water Resources Commission and the Director of the Department of Natural Resources, is effective on the date of entry.

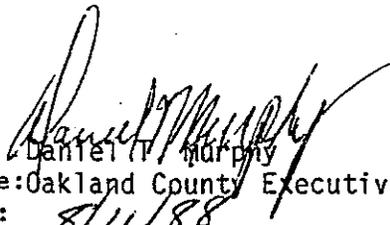
THE COUNTY OF OAKLAND is put on notice that any violation of the terms and conditions of this Final Order subjects the County to full enforcement remedies under law. Compliance with the requirements of this Final Order does not constitute a release or waiver of liability for past or continuing violation of the Act.

THE COUNTY OF OAKLAND is further put on notice that failure to comply with requirements of this Final Order may result in the denial of permits to construct sanitary sewers pursuant to 1913 PA 98, as amended.

THIS FINAL ORDER rescinds Final Order No. 2085 entered on December 18, 1987.

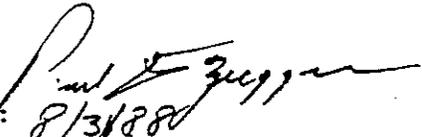
THE COMMISSION AND THE DEPARTMENT retain jurisdiction to enter such further Orders as the facts and circumstances may warrant and, with the Consent of the County, to modify this Order.

COUNTY OF OAKLAND

By: 
Title: Oakland County Executive
Date: 8/11/88

STATE OF MICHIGAN

MICHIGAN WATER RESOURCES COMMISSION

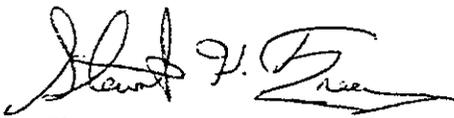
By: 
Date: 8/3/88
Paul D. Zugger, Executive Secretary

MICHIGAN DEPT. OF NATURAL RESOURCES

By: 
Date: 9/2/88
David F. Hales, Director

APPROVED AS TO FORM:

DEPARTMENT OF ATTORNEY GENERAL

By: 
Date: September 8, 1988

Stewart H. Freeman
Assistant Attorney General in Charge
Environmental Protection Division

APPENDIX A

In accordance with the requirements and the compliance schedule of the "ABATEMENT PROGRAM" Item A., the County shall conduct the Sanitary Sewer System Evaluation Survey Study identified and detailed in the document titled "Evergreen-Farmington Pollution Control Facilities Comprehensive Facilities Plan Infiltration/Inflow /analysis", dated October, 1982 as amended and approved.

APPENDIX B

In accordance with the requirements and the compliance schedule of the "ABATEMENT PROGRAM" Item C., the County shall complete the Regional Sanitary Sewer System Improvement Program identified and detailed in the document titled "Evergreen-Farmington Pollution Control Facilities Comprehensive Facilities Plan", dated October, 1982, as amended and approved. The Segments I, II, and III are identified as given below and identified in the attached map labelled "Exhibit A":

SEGMENT I

- | | |
|---------|--|
| Stage 1 | Kendallwood Retention Basin |
| Stage 2 | 8 Mile Road Pump station and Interceptor Relief
(Design Points: 140, 216) |
| | First Hamilton Connection |

SEGMENT II

- | | |
|---------|--|
| Stage 3 | Farmington Interceptor Relief thru Southfield
(Design Points 69 thru 120A, 118 and 119) |
| Stage 5 | Beverly Hills Pump Station and Relief
(Design Points 193D thru 198B) |
| Stage K | Morris Lake Arm
(Design Points 9B, 9A, 9) |
| Stage M | North Evergreen Interceptor Relief
(Design Points 158A, 158) |
| Stage J | Walnut Lake Arm Relief
(Design Points 16B, 16A, 16, 23, 24) |
| Stage C | 14 Mile Road Relief
(Design Point 184) |

Seg. II Contd.

- Stage D Grand River Arm
(Design Points 114)
- Stage B 13 Mile Road Relief
(Design Points 192 and 191)
- State A 11 Mile Road Relief
(Design Points 203A, 204)

SEGMENT III:

- Stage L Farmington Interceptor Relief
(Design Points 6, 7, 8)
- Stage K Morris Lake Arm
(Design Points 10A, 10, 11)
- Stage H Farmington Interceptor Relief
(Design Points 14)
- Stage I 14 Mile Road/Maple Road Relief
(Design Points 29, 32, 33, 34)
- Stage G Farmington Interceptor Relief
(Design Points 38, 38A)
- Stage F Farmington Interceptor Relief
(Design Points 67A thru 74)
- Stage E Tarabusi Industrial Arm
(Design Points 103, 104, 104A and 105)
- Stage D Grand River Arm
(Design Points 114A, 115)
- Stage M North Evergreen Interceptor Relief
(Design Points 158A, 158) per G. Aho

APPENDIX C

In accordance with the requirements and the compliance schedule of the "ABATEMENT PROGRAM" Item D., the County shall conduct a Sanitary Sewer System Performance Certification Program to certify that peak sanitary wastewater flows delivered to the Detroit Water and Sewerage Department Interceptor System and Wastewater Treatment Plant from the County's Interceptor system do not exceed 164.25 cfs based on the comparison of first year operation actual flows to first year operation anticipated design flows. Peak sanitary wastewater flows are as defined and outlined in the document titled "EvergreenFarmington Pollution Control Facilities Comprehensive Facilities Plan" dated October, 1982, as amended, and approved.

The County must, on the date one year after completion of its Sanitary Sewer System Rehabilitation/Improvement Program, certify with a project certification letter, whether the project meets its performance standards. A flow monitoring program shall be conducted for each inteceptor reach where infiltration or inflow was determined to be cost-effective to remove. In addition, flow monitoring at strategic points along the interceptor system shall be conducted to determine if the total flow generated from all connection points is less than or equal to the design flow rates set forth in the approved Basis of Design.

Proof of certification shall be provided in an evaluation report to be prepared by the County as outlined in Item 1 below. If the project does not meet its performance standards, an evaluation/corrective action report, as outlined in Item 2 below, is required.

1. Evaluation Report

As required by the Compliance Schedule of the "ABATEMENT PROGRAM" Item D., the County shall submit an evaluation report indicating the overall success of its Sanitary Sewer System Rehabilitation/Improvement Program. The report shall demonstrate whether or not infiltration/inflow remains a problem for the sanitary sewer system and whether capacity problems have been corrected by comparing pre-rehabilitation/improvement wastewater flow conditions used as a basis for design, including consideration of bypassing and back-up events, with actual monitored post-rehabilitation improvement wastewater flow conditions. This comparison must be based on wastewater flow components (domestic, industrial, commercial, infiltration and inflow). It must relate actual wastewater flow components monitored during the first year operation to anticipated design wastewater flow components for the first year of operation (as opposed to year 2025 design wastewater flow components). Year 2025 wastewater flow growth component will be adjusted and subtracted from design peak sanitary wastewater flow to calculate first year operation anticipated design flow.

The report information to be gathered throughout the first year of operation shall include the following:

- (a) Wastewater flows for - Winter, Spring Runoff, and a Major Rainfall Event(s).

- Wet*
- (b) Quantified infiltration - Average Wet Weather Flow (AWW), Maximum Wet Weather Flow (MWW), and Peak Instantaneous Wet Weather Flow (PIWW).
 - (c) Quantified inflow - AWW, MWW and PIWW.
 - (d) Identification and quantification of any bypassing or back-up events, including the reason for the event.
 - (e) Identification of the groundwater and rainfall characteristics that existed at the time Items a-d were determined. This includes rainfall intensities, and groundwater elevations for those areas where infiltration/inflow occurred. Sufficient rainfall data to determine wastewater flows must be obtained.
 - (f) The relationship of the above items to the groundwater and rainfall characteristics used in determining the design wastewater flow.

2. Evaluation/Correction Action Report

If required, and in accordance with the Compliance Schedule of the "ABATEMENT PROGRAM" Item D., the County shall submit an evaluation/corrective action report outlining the corrective action needed and schedule to be taken to bring the project into compliance with its performance standards.

This report shall contain the following information:

- (a) An analysis of the cause of the project's inability to meet the performance standards and estimates of the nature, scope and cost of the corrective action necessary to bring the project into compliance. This report shall be consistent with the evaluation report, with necessary actions(s) proposed appropriate for the design life of the project. In addition, actions shall be included to minimize any adverse environmental impacts caused by unsatisfactory performance.
- (b) A schedule for undertaking in a timely manner the corrective action necessary to bring the project into compliance including a date for certifying that the project is capable of meeting the project performance standards.

Costs associated with developing this report and implementing corrective action necessary to bring a project into compliance with the project performance standards shall be undertaken by the County at other than Federal/State expense.

APPENDIX D

In accordance with the requirements and compliance schedule of the "ABATEMENT PROGRAM" Item E., the County shall develop and implement a Sanitary Sewer System Operation and Maintenance Program for its wastewater collection system. The essential components to be included in the program are listed as follows:

1. A schedule to systematically and routinely inspect the entire sewage collection and transport system to assure that the integrity of the system is maintained.
2. A schedule and method of rehabilitation for removing all excess infiltration/inflow sources found during inspection that threaten the integrity of the sewage collection and transport system.
3. A schedule to eliminate all cost effective excess infiltration/ inflow resulting from connected sump pumps found during the inspection.
4. Identification of the mechanism that will be used to assure that sufficient funds are available at all times to correct excessive infiltration/inflow sources and/or structural defects within the sewage collection and transport system.
5. Development of a projected annual Operation and Maintenance budget for the next five years including projected funding sources.
6. Development of an operational plan which includes system inventory, administrative controls, system maintenance and operational control strategy.

**STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU**

In the matter of:

AFO-SW08-006
Date Entered: 3-24-09

County of Oakland
Office of the Water Resources Commissioner
By: Water Resources Commissioner
In his capacity as the "County Agency" for the
Evergreen-Farmington Sewage Disposal System

One Public Works Drive
Building 95 West
Waterford, Michigan 48328-1907

ACO-SW05-001
_____ /

THIRD AMENDED ADMINISTRATIVE CONSENT ORDER

Second Amended Administrative Consent Order, ACO-SW05-001, entered on December 6, 2004, between the Department of Environmental Quality (DEQ), Water Bureau (WB), and the County of Oakland (County) by and through the Oakland County Drain Commissioner (now known as Water Resources Commissioner), in his capacity as the "County Agency", which owns and operates a regional interceptor system known as the Evergreen-Farmington Sewage Disposal System (EFSDS), is hereby amended as follows. Upon the consent of the parties and by the authority granted to the DEQ by the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, it is hereby AGREED AND ORDERED:

III. COMPLIANCE PROGRAM

Paragraphs 3.2, and 3.5 through 3.8, of ACO-SW05-001 and any prior amended Consent Orders shall be amended as specified below:

- 3.2. On or before **January 1, 2005** (completed and submitted), the County shall submit a short-term corrective action plan and schedule to the DEQ for review and approval that includes the following projects:
 - a. Provide a connection from the Farmington Interceptor (at the Walnut #1 pumping station) to the Evergreen Interceptor to allow the transfer of up to 14 cubic feet per second (cfs) of wet weather sanitary flow. Also, the Walnut #1 pumping station shall be repaired/rehabilitated/or replaced in accordance with Part 41. As part of this project, the County may modify the regulators that control flow from the Acacia Park, Bloomfield Village, and Birmingham

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Retention Treatment Basins (RTB) during wet weather to the Evergreen Interceptor and replace this available capacity amounting to 14 cfs in the Evergreen Interceptor with excess separate sanitary flow. Controlling flow through these regulators to the Evergreen Interceptor to less than the equivalent of the peak hourly sanitary flow shall be in accordance with an approved operation plan (see paragraph 3.4 below). The connection from the Farmington Interceptor to the Evergreen Interceptor can remain after March 1, 2016, and can be used to optimize the EFSDS, provided these regulators from the RTBs a) pass flows to the Evergreen Interceptor that are equivalent to peak hourly sanitary flow averaged over the RTB dewatering period (not to exceed 7 days) following a wet weather event, and b) are controlled during events to maximize use of available downstream interceptor capacity while ensuring acceptance of community TOC.

- b. Remove four siphons crossing the Edwards Drain in West Bloomfield Township, and provide adequate replacement of the sanitary sewer conveyance system. A part 41 permit was issued for this project.
- c. The County may also provide a wet weather connection from the Evergreen Farmington interceptor system to the Bloomfield Village RTB (subject to Part 41 permit review). As part of this project, storm sewer relief will be provided to offset the increase in wet weather sanitary flow to the RTB. Operation of this system shall be in accordance with an approved operation plan (see paragraph 3.4 below). After **March 1, 2016**, this wet weather sanitary connection to the Bloomfield Village RTB is only authorized, in accordance with an approved operation plan, for use during events that exceed the remedial design standard (defined in paragraph 3.5) to protect public health and water quality, unless current state and federal SSO requirements are changed to allow for its use during less events.

The short-term corrective action plan shall include a detailed description of the projects, and a schedule for each project for; 1) the submittal of the basis of design, 2) the submittal of complete plans and specifications, 3) the assignment of a construction commencement date, and 4) the assignment of construction completion date.

- 3.5. The County shall collect and evaluate flow monitoring data from permanently installed flow meters, for a period of 12 consecutive months, following completion of construction of the projects specified in paragraph 3.2. If the County cannot certify 2025 Segment III flows and volumes as defined below (based on these results), or has had Sanitary Sewer Overflows (SSOs) from the County system due to capacity issues during events that are less than the remedial design standard defined below, then the County shall submit a long-term corrective action plan to the DEQ for review and approval no later than **March 1, 2011**. The long-term corrective action plan shall include; a) projects and schedules that will ensure that 2025 Segment III flows and volumes will be certified as previously established and defined in Final Order of Abatement 2098; and b) appropriate engineering and structural improvements to the sewer system with corresponding schedules, to meet applicable state and federal law regulating SSOs using as guidance the remedial design standard defined below.

The remedial design standard as defined in the SSO Policy Guidance dated December 27, 2002, is a 25-year, 24-hour storm using growth conditions and normal soil moisture. This remedial design standard will remain the goal of all projects described in this Consent Order. A ten-year, one-hour storm under dormant and growth conditions will be considered a comparable alternative remedial design standard as defined in the DEQ SSO Clarification Statement dated October 23, 2003. All SSO events that result from events that exceed this "comparable alternative remedial design standard" will be considered for enforcement discretion. To document the appropriateness of the use of the "comparable alternative remedial design standard", the County shall complete a hydrologic and hydraulic modeling analysis comparing the system response (at the EFSDS outlet and agreed to representative system locations) to both the ten-year, one-

hour storm under dormant and growth conditions and the 25-year, 24-hour storm using growth conditions and normal soil moisture. The study shall be completed no later than **March 1, 2007** (report completed and submitted on 2/26/07). Any revised remedial design standard that is effective on **March 1, 2011**, shall take precedent if current state and federal SSO requirements are changed to allow for its use during lesser events.

For purposes of this paragraph, "projects" and "appropriate engineering and structural improvements" may include Segment III relief sewers (primarily Stages D, E, F, and G) or alternatives to relief; storage, additional removal of infiltration and inflow (I/I) as realistically documented during the short-term corrective action plan (by the County and member communities) and/or additional capacity from the Detroit Water and Sewerage Department (DWSD) provided that full secondary treatment is provided [i.e. routed through the current connection to the DWSD (First Hamilton)]. Revision of current TOC may also be considered in a coordinated plan across the EFSDS. Also note that starting no later than **March 1, 2016**, 1) the regulators at the existing Combined Sewer Overflow RTBs shall be a) operated to pass at least the equivalent flow to the peak hourly sanitary flow from their upstream tributary areas, to the Evergreen interceptor, measured as an average over the RTB dewatering period (not to exceed seven days) following wet weather events that do not exceed the remedial design standard and b) controlled during events to maximize use of available downstream interceptor capacity while ensuring acceptance of community TOC (basin dewatering during events can also be considered) and 2) the wet weather sanitary connection to the Bloomfield Village RTB is only authorized, in accordance with an approved operation plan, for use during events that exceed the remedial design standard, defined above, to protect public health and water quality, unless current state and federal SSO requirements are changed to allow for its use during lesser events. Flow certification and the final corrective action plan (if applicable) must consider these conditions 1 and 2.

- 3.6 Following review and approval of the final corrective action plan and schedules by the DEQ, the approved schedules will be incorporated into this modified order by reference.

However, final compliance with paragraph 3.5 shall be completed no later than **March 1, 2016**.

3.7 On or before **August 1, 2015**, the County shall submit to the DEQ for review and approval, a work plan for conducting a year long Project Performance Certification Program (PPC) to certify that the long-term corrective action plan meets Segment III flows and volumes as established and defined in the Final Order of Abatement 2098, and all applicable state and federal laws regulating SSOs using as guidance the remedial design standard as defined in SSO Policy Guidance dated December 27, 2002, or a comparable alternative remedial design standard as defined in the MDEQ SSO Clarification Statement dated October 23, 2003 (or a revised remedial design standard as effective on March 1, 2011).

3.8 On or before **April 1, 2017**, the County shall submit to the DEQ for review and approval, the PPC Program report. If the County does not certify that the long-term corrective action plan meets Segment III flows and volumes as established and defined in the Final Order of Abatement, and all applicable state and federal laws regulating SSOs using as guidance the remedial design standard as defined in the SSO Policy Guidance dated December 27, 2002, or a comparable alternative remedial design standard as defined in the MDEQ SSO Clarification Statement dated October 23, 2003 (or a revised remedial design standard as effective on March 1, 2011), then the County shall submit an approvable Corrective Action Program work plan to the DEQ on or before **August 1, 2017**.

GENERAL PROVISIONS

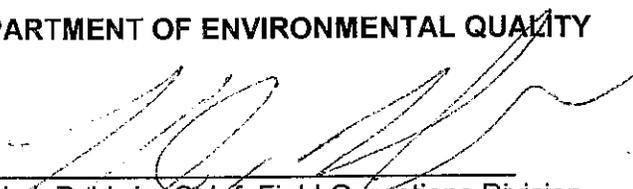
All other terms and conditions of ACO-SW05-001 shall remain in full force and effect and are not altered by this Third Amended Administrative Consent Order, except as specifically prescribed in this document. The effective date of this Third Amended Administrative Consent Order shall be the date upon which the chief of the DEQ, WB, Field Operations Division signs this document.

✓

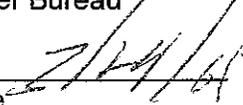
Signatories

The undersigned CERTIFY they are fully authorized by the party they represent to enter into this Amended Consent Order to comply by consent and to EXECUTE and LEGALLY BIND that party to it.

DEPARTMENT OF ENVIRONMENTAL QUALITY



Frank J. Baldwin, Chief, Field Operations Division
Water Bureau

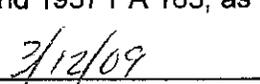


Date

**COUNTY OF OAKLAND BY AND THROUGH ITS COUNTY AGENCY
OFFICE OF THE WATER RESOURCES COMMISSIONER**

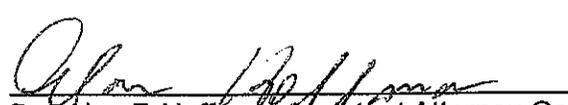


By: John P. McCulloch, Water Resources Commissioner
In his capacity as the "county Agency" for the Evergreen-Farmington
Sewage Disposal System, pursuant to 1939 PA 342 as amended,
And 1957 PA 185, as amended

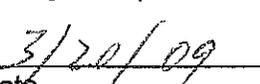


Date

APPROVED AS TO FORM:



By: Alan F. Hoffman, Assistant Attorney General
For: S. Peter Manning, Chief
Environment, Natural Resources, and Agriculture Division
Michigan Department of Attorney General



Date

Appendix I

Detailed Population Equivalency Memorandum

Evergreen-Farmington Sewage Disposal System

Master Plan – Population Projections

December 28, 2010

The purpose of this technical memorandum is to summarize the methods used to develop the existing equivalent population and projected equivalent population for the year 2040.

Existing Population

The current equivalent population data used for this analysis was taken from the Mass Flow Balance (MFB) tool. This data was developed using a combination of Southeast Michigan Council of Governments (SEMCOG) residential population data and Geographic Information System (GIS) parcel data. Non-residential population equivalencies were generated by obtaining non-residential winter-water consumption records from most of the EFSDS communities, and analyzing winter-water use for non-residential parcels within each meter district using GIS spatial data. For communities where non-residential winter-water consumption data were not readily available, non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential population equivalency for the communities where winter-water consumption records were available. The different methodologies used to estimate the magnitude and distribution of residential populations and non-residential population equivalencies are described in more detail in Technical Memorandum #6 “OCWRC – EFSDS Billing System, Detailed Population Equivalency Analysis for Use in the Mass Flow Balance”, December 9, 2010.

2040 Population

Future residential population projections for 2040 were developed by combining the SEMCOG 2035 population forecast and GIS spatial data. This population was then projected to 2040 by assuming the same rate of growth from 2035 to 2040. Non-residential population equivalencies for year 2040 were assumed to remain the same since no significant changes to land use were expected.

CVT	Abbreviation	Existing Total Equivalent Population	2040 Total Equivalent Population	Difference Actual	Difference Percent Existing
Auburn Hills	AHC	3,017	3,017	0	0%
Bingham Farms	BFV	1,665	1,757	+ 92	+ 6%
Bloomfield Hills	BHC	6,282	6,590	+ 308	+ 5%
Village of Beverly Hills / Southfield Township	BHV	10,485	11,095	+ 610	+ 6%
Birmingham	BIC	12,711	13,660	+ 949	+ 7%
Bloomfield Township	BLT	39,146	42,895	+ 3,750	+ 10%
City of Farmington	FAC	2,427	2,524	+ 97	+ 4%
Farmington Hills	FHC	88,020	93,243	+ 5,223	+ 6%
Franklin	FRV	3,451	3,942	+ 490	+ 14%
Keego Harbor	KHC	3,172	3,417	+ 245	+ 8%
Lathrup Village	LVC	4,577	4,947	+ 370	+ 8%
Orchard Lake Village	OLC	2,805	3,251	+ 446	+ 16%
Southfield	SOC	75,020	79,572	+ 4,552	+ 6%
Troy	TRC	14,328	15,712	+ 1,384	+ 10%
West Bloomfield Township	WBT	45,093	49,830	+ 4,737	+ 11%
Total =		312,199	335,454	+ 23,255	+ 7%

Technical Memorandum #6
OCWRC – EFSDS Billing System
Detailed Population Equivalency Analysis for Use in the Mass Flow Balance
October 5, 2009

Introduction

The Mass Flow Balance (MFB) tool uses unitized measures of flow, including gallons per capita per day (gpcd) and cubic feet per second per thousand acres, to determine the reasonableness of flow rates from the various meter districts. The first draft of the MFB tool was prepared using only the residential population from the U.S. Census to calculate the per capita unitized flows. This was adequate for initial calculations where the balance was being checked for very large flows from the major branches, but did not account for the population equivalency of non-residential areas such as commercial, industrial, and institutional.

The second draft of the MFB tool incorporated non-residential equivalent population estimates based on a land-use analysis, with a correction factor based on water consumption records for six communities to calibrate the total magnitude of non-residential flows. Technical Memorandum #2 described this analysis in detail. It was desired to have a more accurate estimate of the total equivalent population within each meter district for use in the MFB tool. This was accomplished by performing the detailed population equivalency analysis described in this memorandum.

Methodology

Residential populations were updated by using the most recent data available from the Southeast Michigan Council of Governments (SEMCOG). A better understanding of the spatial distribution of residential populations across different meter districts was developed by using GIS parcel data.

More accurate non-residential population equivalencies were generated by obtaining non-residential winter-water consumption records from most EFSDS communities, and analyzing winter-water use for non-residential parcels within each meter district using Geographic Information System (GIS) spatial data. For communities where non-residential winter-water consumption data were not readily available, non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential population equivalency for the communities where winter-water consumption records were available.

The different methodologies used to estimate the magnitude and distribution of residential populations and non-residential population equivalencies are described in more detail within the following sections.

Residential Population Methodology

Residential populations, which represent 86.5% of the total population equivalency within the EFSDS, were based on SEMCOG's April 2009 community estimates. SEMCOG's community population estimates were divided into single-unit (single-family home) and multi-unit (apartment and condominium) components. GIS parcel data were used to distribute residential populations across individual meter districts for better spatial accuracy. Single-unit residential populations were distributed in proportion to the number of non-vacant, single-unit residential parcels within each meter district. Multi-unit residential populations were distributed in proportion to the amount of non-vacant, multi-unit residential parcel acreage within each meter district.

Non-Residential Population Equivalency Methodology

Non-residential population equivalency, which represents 13.5% of the total population equivalency within the EFSDS, was estimated using winter-water consumption data provided by individual communities, if available. Non-residential winter-water consumption volumes (converted to gallons per day) were divided by 100 gallons per capita per day in order to estimate the corresponding non-residential population equivalencies. The per capita flow rate of 100 gpcd was selected because it represents the text-book published rate most commonly used for average water consumption. A sample of residential water consumption within the EFSDS verified that 100 gpcd was a reasonable value for estimating non-residential population equivalencies.

Non-residential population equivalencies were distributed by meter district in proportion to actual water consumption or in proportion to non-residential parcel acreage, depending on available information. For Farmington Hills, 90% of the total winter-water consumption volume was matched with parcel data information in order to distribute their non-residential equivalent population between meter districts. The remaining 10% was assumed to follow the same distribution. This was done because of the high number of parcels comprising the last 10% of the water use, and difficulties matching the water consumption database to the parcel database.

For communities in which winter-water consumption data was not available, non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential population equivalency. Table 1 shows the relationship between daytime working population and non-residential population equivalency based on water consumption for the seven communities where this information is available. Table 1 shows that the overall ratio of non-residential equivalent population to SEMCOG daytime working population is 0.15, which suggests that one daytime worker contributes approximately 15% as much sewage as one resident.

Table 1. Ratio of SEMCOG daytime working population to non-residential population equivalency

Communities for which non-residential winter water consumption was provided for entire community (i.e., inside and outside EFSDS)	Daytime working population for entire community (SEMCOG, 2000)	Non-res equivalent pop of entire community, based on winter water consumption divided by 100 gpcd	Ratio of non-res equiv pop of entire community to SEMCOG daytime working pop
Bingham Farms	6,994	674	0.10
Bloomfield Hills	15,687	2,281	0.15
Bloomfield Twp	24,943	3,374	0.14
Farmington Hills	78,835	14,672	0.19
Keego Harbor	1,426	301	0.21
Orchard Lake	1,232	505	0.41
Southfield	128,407	15,566	0.12
Overall	257,524	37,373	0.15

Note: Auburn Hills, Troy, and West Bloomfield Township also provided winter-water consumption records for the portions of their communities served by the EFSDS. Their data was not used to compute overall ratio because the non-residential population equivalency within the EFSDS is not directly comparable to the entire community's daytime working population.

Figure 1 shows a strong linear relationship between non-residential population equivalency computed using winter water consumption data and the corresponding SEMCOG daytime working population. Therefore, for each community in which winter-water consumption data was not available, their non-residential population equivalency was estimated to be equal to 15% of their SEMCOG daytime working population (Table 2).

Figure 1. Non-residential population equivalency versus SEMCOG Daytime Working Population

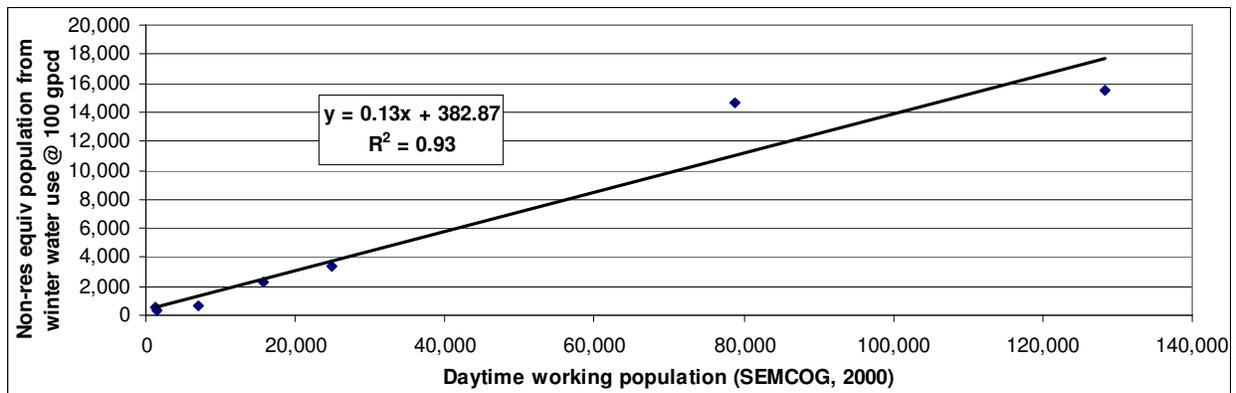


Table 2. Estimates of non-residential population equivalency for communities where winter-water consumption records were not available

Communities for which non-res winter water consumption was NOT available	Daytime working population for overall community (SEMCOG, 2000)	Overall ratio of non res equiv pop to SEMCOG daytime working pop	Estimate of non-res equivalent pop based on overall ratio of non-res equiv pop to SEMCOG daytime working pop	Notes
Beverly Hills	2,949	0.15	428	No response yet to request for winter water use
Birmingham	22,802	0.15	3,309	No response yet to request for winter water use
Farmington	8,127	0.15	1,179	Water meters not read in the winter months
Franklin	2,911	0.15	422	Winter water use not available (wells)
Lathrup Village	3,873	0.15	562	Non-res specific winter water not readily available
Overall	40,662	0.15	5,901	

Special Considerations

Some communities served by the EFSDS contain un-sewered areas, areas served by other sewer systems, and cross-jurisdictional areas. The methodologies used to handle these special considerations are outlined below.

- SEMCOG residential population (Appendix A) and non-residential population equivalency of entire community broken down into:
 - Served by EFSDS versus other systems
 - Sewered versus un-sewered
 - Cross-jurisdictional
- Served by EFSDS versus other systems distinguished by using:
 - Single-family residential parcel count
 - Multi-unit residential acreage
 - Non-residential acreage
- Sewered versus un-sewered distinguished by using:
 - Same as above
- Cross-jurisdictional districts
 - See Technical Memorandum #5

Table 3, which is sorted by community, lists the actual methodology used for each component of the total equivalent population. Detailed notes within Table 3 describe variations to the general methodologies presented above and explain how supplemental information was incorporated.

Table 3. Methodologies used to estimate population equivalencies for EFSDS communities

EFSDS Community	Methodology used to Estimate Residential Populations	Methodology used to Estimate Non-residential Equivalent Populations			Notes
		Method A	Method B	Method C	
Auburn Hills	Metering Study	•			(1)
Bingham Farms	SEMCOG, April 2009	•			
Bloomfield Hills	SEMCOG, April 2009	•			
Beverly Hills	SEMCOG, April 2009			•	(2)
Birmingham	SEMCOG, April 2009			•	(2)
Bloomfield Twp.	SEMCOG, April 2009		•		
Farmington	SEMCOG, April 2009			•	(3)
Farmington Hills	SEMCOG, April 2009	•			(4)
Franklin	SEMCOG, April 2009			•	(5)
Keego Harbor	SEMCOG, April 2009	•			
Lathrup Village	SEMCOG, April 2009			•	(6)
Orchard Lake	SEMCOG, April 2009	•			(7)
Southfield	SEMCOG, April 2009		•		(8)
Troy	SEMCOG, April 2009	•			
West Bloomfield	SEMCOG, April 2009		•		(9)

Method A	==> Winter-water consumption divided by 100 gpcd ==> Distributed proportional to consumption volume within each meter district
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Method B	==> Winter-water consumption divided by 100 gpcd ==> Distributed proportional to non-res parcel acreage within each meter district
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Method C	==> Relationship established between SEMCOG Daytime Working Population and non-residential equivalent populations from winter-water consumption.
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Notes:

- (1) Residential population based on the 2006 report, titled "City of Auburn Hills Bloomfield Orchards Footing Drain Disconnection Program."
- (2) No response yet to request for non-residential winter water consumption.
- (3) Winter water consumption not available (water meters not read in the winter months).
- (4) 90% of the total winter-water consumption volume was matched with parcel data information in order to distribute Farmington Hills's non-residential equivalent population between meter districts. The remaining 10% was assumed to follow the same distribution. This was done because of the high number of parcels comprising the last 10% of the water use, and difficulties matching the water consumption database to the
- (5) Winter water consumption not available (wells).
- (6) Winter water consumption not readily available specifically for non-residential users.
- (7) Orchard Lake's 4130A cross-jurisdictional population (Abbot Middle School + West Bloomfield School + Tri-City Fire Department flows metered within Keego Harbor), was estimated using average water consumption data (March 2007-June 2009 billdates).
- (8) Accounts for 670 homes on septic systems within (3800/3900)inc, based on HRC's estimate of homes not connected from SPCF project. This estimate was supported by data provided by the City of Southfield, which indicated approximately 921 single-family homes with active sewer connections within (3800/3900)inc, compared to 924 sewerred single-unit residential parcels used in this analysis.
- (9) West Bloomfield Township's EFSDS residential population was estimated by subtracting the residential population reported in the COSDS Master Plan from SEMCOG's April 2009 estimate for the entire township.

Results

Table 4 summarizes the results of the population equivalency analysis for each community. The total sewered equivalent population within the EFSDS is approximately 317,548 people. Appendix A contains a more detailed summary for each community, including the population breakdown for each meter district and cross-jurisdictional sewer districts. These results will continue to be updated as additional information is received from communities and incorporated into the equivalent population analysis.

Table 4. EFSDS sewered equivalent populations by community

EFSDS Community	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
Auburn Hills	2,809	208	3,017
Beverly Hills	10,057	428	10,485
Bingham Farms	991	674	1,665
Birmingham	10,939	1,881	12,819
Bloomfield Hills	3,648	2,269	5,917
Bloomfield Township	36,147	3,009	39,156
Farmington	2,352	75	2,427
Farmington Hills	79,101	14,509	93,610
Franklin	3,029	422	3,451
Keego Harbor	2,871	301	3,172
Lathrup Village	4,015	562	4,577
Orchard Lake	2,300	505	2,805
Southfield	61,034	13,990	75,024
Troy	14,100	228	14,328
West Bloomfield	41,317	3,776	45,093
Totals	274,710	42,838	317,548

Appendix A

EFSDS Population Equivalency Analysis Summaries by Community

Auburn Hills Population Summary

Residential Population within the EFSDS	2,809
Sewered Residential Population within the EFSDS	2,809
Un-Sewered Residential Population within the EFSDS	0
Total Residential Population within the EFSDS	2,809
Sewered Non-Residential Equivalent Population within the EFSDS	208
Un-Sewered Non-Residential Equivalent Population within the EFSDS	0
Total Non-Residential Equivalent Population within the EFSDS	208
Sewered Residential Population within the EFSDS	2,809
Sewered Non-Residential Equivalent Population within the EFSDS	208
Total Sewered Equivalent Population	3,017

Table 1. Sewered Population within the EFSDS by Meter District			
Meter District	Sewered Residential Population*	Sewered Non-Residential Equivalent Population**	Total Sewered Equivalent Population
3460 inc	2,809	208	3,017
Cross-Jurisdictional Areas	0	0	0
Totals	2,809	208	3,017

Percent of sewered equivalent population in cross-jurisdictional areas = 0.00%

Notes:

*Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day)

**Residential population estimates are from the 2006 report prepared for the City of Auburn Hills, titled "Bloomfield Orchards Footing Drain Disconnection Program (100%)"

Beverly Hills Population Summary

SEMCOG (April 2009) = 10,057

Sewered Residential Population	10,057
Un-Sewered Residential Population	0
Total Residential Population	
Total Residential Population	10,057
Sewered Non-Residential Equivalent Population	428
Un-Sewered Non-Residential Equivalent Population	0
Total Non-Residential Equivalent Population	
Total Non-Residential Equivalent Population	428
Sewered Residential Population	10,057
Sewered Non-Residential Equivalent Population	428
Total Sewered Equivalent Population	
Total Sewered Equivalent Population	10,485

Table 1. Sewered Population by Meter District

Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3230	751	25	776
3240 inc	748	111	859
(3250/3310) inc	1,520	35	1,555
3270	3,927	132	4,059
3300 inc	118	0	118
3305	2,466	80	2,546
3315	290	0	290
Cross-Jurisdictional Areas	236	45	281
Totals	10,057	428	10,485

Percent of sewered equivalent pop. in cross-jurisd. areas = 2.68%

Table 2. Detailed Sewered Population Breakdown by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3220A	15	0.46%	43	0.00	0.00%	0	43	0	43
3230	238	7.35%	684	5.39	8.88%	68	751	25	776
3240 inc	256	7.91%	735	1.01	1.66%	13	748	111	859
(3250/3310) inc	444	13.72%	1,276	19.55	32.17%	245	1,520	35	1,555
3270	1,360	42.03%	3,907	1.63	2.68%	20	3,927	132	4,059
3300 inc	41	1.27%	118	0.00	0.00%	0	118	0	118
3305	714	22.06%	2,051	33.19	54.62%	415	2,466	80	2,546
3315	101	3.12%	290	0.00	0.00%	0	290	0	290
3340G	67	2.07%	192	0.00	0.00%	0	192	45	238
Totals	3,236	100.00%	9,297	60.76	100.00%	760	10,057	428	10,485

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential equivalent population developed from other communities using winter water consumption. Winter water consumption data has been requested and, if available, will be used to revise this estimate.

Bingham Farms Population Summary

SEMCOG (April 2009) = 991

Sewered Residential Population	991
Un-Sewered Residential Population	0
<hr/>	
Total Residential Population	991
Sewered Non-Residential Equivalent Population	674
Un-Sewered Non-Residential Equivalent	0
<hr/>	
Total Non-Residential Equivalent Population	674
Sewered Residential Population	991
Sewered Non-Residential Equivalent Population	674
<hr/>	
Total Sewered Equivalent Population	1,665

Table 1. Sewered EFSDS Population by Meter District			
Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3707 inc	942	674	1,616
Cross-Jurisdictional Areas	49	0	49
Totals	991	674	1,665

Percent of sewered equivalent population in cross-jurisdictional areas = 2.94%

Table 2. Detailed Sewered Population Breakdown by EFSDS Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3340H	24	8.99%	49	0.00	0.00%	0	49	0	49
3707 inc	243	91.01%	502	88.23	100.00%	440	942	674	1,616
Totals	267	100.00%	551	88.23	100.00%	440	991	674	1,665

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day).

Birmingham Population Summary

SEMCOG (April 2009) = 19,285

Residential Population within the EFSDS	10,939
Residential Population Outside of the EFSDS	8,346
Total Residential Population	
Total Residential Population	19,285
Sewered Residential Population within the EFSDS	10,939
Un-Sewered Residential Population within the EFSDS	0
Total Residential Population within the EFSDS	
Total Residential Population within the EFSDS	10,939
Non-Residential Equivalent Population within the EFSDS	1,881
Non-Residential Equivalent Population Outside of the EFSDS	1,429
Total Non-Residential Equivalent Population	
Total Non-Residential Equivalent Population	3,309
Sewered Non-Residential Equivalent Population within the EFSDS	1,881
Un-Sewered Non-Residential Equivalent Population within the EFSDS	0
Total Non-Residential Equivalent Population within the EFSDS	
Total Non-Residential Equivalent Population within the EFSDS	1,881
Sewered Residential Population within the EFSDS	10,939
Sewered Non-Residential Equivalent Population within the EFSDS	1,881
Total Sewered Equivalent Population	
Total Sewered Equivalent Population	12,819

Table 1. Sewered Population within the EFSDS by Meter District			
Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3270A	1,927	88	2,015
3320 inc	92	8	100
3335A	1,295	661	1,956
3370	7,623	895	8,518
Cross-Jurisdictional Areas	2	229	231
Totals	10,939	1,881	12,819

Percent of sewered equivalent population in cross-jurisdictional areas = 1.80%

Table 2. Detailed Sewered Population Breakdown within the EFSDS by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3270A	780	19.43%	1,552	8.81	12.72%	376	1,927	88	2,015
3320 inc	46	1.15%	92	0.00	0.00%	0	92	8	100
3335A	651	16.22%	1,295	0.00	0.00%	0	1,295	661	1,956
3370	2,536	63.18%	5,045	60.42	87.28%	2,577	7,623	895	8,518
3500A	0	0.00%	0	0.00	0.00%	0	0	229	229
3500B	1	0.02%	2	0.00	0.00%	0	2	0	2
Totals	4,014	100.00%	7,986	69.23	100.00%	2,953	10,939	1,881	12,819

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential equivalent population developed from other communities using winter water consumption. Winter water consumption data has been requested and, if available, will be used to revise this estimate.

Bloomfield Hills Population Summary

SEMCOG (April 2009) = 3,663

Sewered Residential Population	3,648
Un-Sewered Residential Population	15
Total Residential Population	3,663
Sewered Non-Residential Equivalent Population	2,269
Un-Sewered Non-Residential Equivalent Population	12
Total Non-Residential Equivalent Population	2,281
Sewered Residential Population	3,648
Sewered Non-Residential Equivalent Population	2,269
Total Sewered Equivalent Population	5,917

Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3335B	212	0	212
3400 inc	1,953	2,094	4,047
3410 inc	1,109	167	1,276
3510	287	0	287
Cross-Jurisdictional Areas	87	8	96
Totals	3,648	2,269	5,917

Percent of sewered equivalent pop. in cross-jurisd. areas = 1.61%

Table 2. Detailed Sewered Population Breakdown by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3335B	85	7.77%	212	0.00	0.00%	0	212	0	212
3400 inc	550	50.27%	1,370	106.84	63.18%	583	1,953	2,094	4,047
3410 inc	351	32.08%	874	43.05	25.46%	235	1,109	167	1,276
3430A	0	0.00%	0	0.00	0.00%	0	0	8	8
3440A	14	1.28%	35	0.00	0.00%	0	35	0	35
3510	73	6.67%	182	19.22	11.36%	105	287	0	287
3610A	1	0.09%	2	0.00	0.00%	0	2	0	2
3630A	3	0.27%	7	0.00	0.00%	0	7	0	7
3640A	17	1.55%	42	0.00	0.00%	0	42	0	42
Totals	1,094	100.00%	2,725	169.11	100.00%	923	3,648	2,269	5,917

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of occupied, multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day), and distributed by meter district according to the percentage of winter water consumption within each meter district.

Bloomfield Township Population Summary

SEMCOG (April 2009) = 41,023

Sewered Residential Population	36,147
Un-Sewered Residential Population	4,876
Total Residential Population	41,023
Sewered Non-Residential Equivalent Population	3,009
Un-Sewered Non-Residential Equivalent Population	366
Total Non-Residential Equivalent Population	3,374
Sewered Residential Population	36,147
Sewered Non-Residential Equivalent Population	3,009
Total Sewered Equivalent Population	39,156

Table 1. Sewered Population by Meter District			
Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3335	5,702	580	6,283
3340	7,821	453	8,275
3420	1,730	333	2,063
3430	2,305	130	2,435
3440inc	3,493	77	3,570
3450	274	0	274
3470	1,013	15	1,028
3500inc	2,985	143	3,128
3530	794	64	858
3610	536	1	536
3630	1,967	154	2,120
3640	5,177	797	5,974
4810inc	654	35	689
4840inc	1,060	203	1,263
Cross-Jurisdictional Areas	637	25	661
Totals	36,147	3,009	39,156

Percent of sewered equivalent pop. in cross-jurisd. areas = 1.69%

Table 2. Detailed Sewered Population Breakdown by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3335	2,263	19.88%	5,484	25.30	2.55%	218	5,702	580	6,283
3340	2,636	23.15%	6,388	166.21	16.76%	1433	7,821	453	8,275
3370A	1	0.01%	2	0.00	0.00%	0	2	9	12
3400A	6	0.05%	15	0.00	0.00%	0	15	0	15
3400B	64	0.56%	155	0.00	0.00%	0	155	0	155
3410A	13	0.11%	32	7.37	0.74%	64	95	0	95
3410B	2	0.02%	5	8.56	0.86%	74	79	0	79
3410C	11	0.10%	27	0.00	0.00%	0	27	0	27
3410D	5	0.04%	12	0.00	0.00%	0	12	0	12
3410E	1	0.01%	2	0.55	0.06%	5	7	0	7
3420	714	6.27%	1,730	0.00	0.00%	0	1,730	333	2,063
3430	593	5.21%	1,437	100.63	10.15%	868	2,305	130	2,435
3440 inc	711	6.24%	1,723	205.22	20.69%	1770	3,493	77	3,570
3450	113	0.99%	274	0.00	0.00%	0	274	0	274
3470	359	3.15%	870	16.58	1.67%	143	1,013	15	1,028
3500 inc	1,196	10.50%	2,898	10.05	1.01%	87	2,985	143	3,128
3510A	1	0.01%	2	0.00	0.00%	0	2	0	2
3520A	0	0.00%	0	0.00	0.00%	0	0	6	6
3520D	3	0.03%	7	0.00	0.00%	0	7	0	7
3530	94	0.83%	228	65.61	6.61%	566	794	64	858
3540C	5	0.04%	12	2.01	0.20%	17	29	8	38
3610	221	1.94%	536	0.00	0.00%	0	536	1	536
3630	393	3.45%	952	117.59	11.86%	1014	1,967	154	2,120
3640	1,435	12.60%	3,478	197.03	19.86%	1699	5,177	797	5,974
4810 inc	244	2.14%	591	7.22	0.73%	62	654	35	689
4840 inc	217	1.91%	526	61.97	6.25%	534	1,060	203	1,263
4870A	85	0.75%	206	0.00	0.00%	0	206	1	207
Totals	11,386	100.00%	27,593	991.91	100.00%	8,554	36,147	3,009	39,156

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day), and distributed by meter district according to the percentage of non-residential parcel acreage within each meter district, obtained from the WRC's parcel data.

City of Farmington Population Summary

SEMCOG (April 2009) = 10,256

Residential Population within the EFSDS	2,352
Residential Population Outside of the EFSDS	7,904
Total Residential Population	
Sewered Residential Population within the EFSDS	2,352
Un-Sewered Residential Population within the EFSDS	0
Total Residential Population within the EFSDS	
Non-Residential Equivalent Population within the EFSDS	75
Non-Residential Equivalent Population Outside of the EFSDS	1,104
Total Non-Residential Equivalent Population	
Sewered Non-Residential Equivalent Population within the EFSDS	75
Un-Sewered Non-Residential Equivalent Population within the EFSDS	0
Total Non-Residential Equivalent Population within the EFSDS	
Sewered Residential Population within the EFSDS	2,352
Sewered Non-Residential Equivalent Population within the EFSDS	75
Total Sewered Equivalent Population	

Table 1. Sewered Population within the EFSDS by Meter District			
Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
4920 inc	2,352	75	2,427
Cross-Jurisdictional Areas	0	0	0
Totals	2,352	75	2,427

Percent of sewered equivalent population in cross-jurisdictional areas = 0.00%

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential equivalent population developed from other communities using winter water consumption.

Farmington Hills Population Summary
SEMCOG (April 2009) = 79,101

Sewered Residential Population	79,101
Un-Sewered Residential Population	0*
Total Residential Population	79,101
Sewered Non-Residential Equivalent Population	14,509
Un-Sewered Non-Residential Equivalent Population	162
Total Non-Residential Equivalent Population	14,672
Sewered Residential Population	79,101
Sewered Non-Residential Equivalent Population	14,509
Total Sewered Equivalent Population	93,610

Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
(3910/4030) inc	6,213	1,048	7,261
4000 inc	3,516	1,106	4,622
4010 inc	7,303	508	7,811
4050 inc	4,734	1,220	5,954
4200	2,998	1,034	4,032
4300 inc	5,229	985	6,214
4340	8,377	1,322	9,699
4400 inc	2,217	1,877	4,095
4430	3,192	359	3,551
4500 inc	5,880	1,734	7,614
4520 inc	9,959	127	10,085
4900 inc	3,803	152	3,955
4910	8,429	496	8,925
4930	3,554	316	3,870
4940	3,402	2,226	5,627
Cross-Jurisdictional Areas	296	0	296
Totals	79,101	14,509	93,610

Percent of sewered equivalent pop. in cross-jurisd. areas = 0.32%

*Note: Un-sewered residential population will be updated after the un-sewered parcel analysis is complete

Table 2. Detailed Sewered Population Breakdown by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3800/3900A	30	0.16%	74	0.00	0.00%	0	74	0	74
3800/3900B	2	0.01%	5	0.00	0.00%	0	5	0	5
(3910/4030) inc	1,406	7.47%	3,445	178.91	8.40%	2768	6,213	1,048	7,261
4000 inc	1,174	6.23%	2,876	41.32	1.94%	639	3,516	1,106	4,622
4010 inc	2,697	14.32%	6,608	44.95	2.11%	695	7,303	508	7,811
4050 inc	1,073	5.70%	2,629	136.05	6.39%	2105	4,734	1,220	5,954
4200	800	4.25%	1,960	67.06	3.15%	1038	2,998	1,034	4,032
4300 inc	1,815	9.64%	4,447	50.52	2.37%	782	5,229	985	6,214
4340	1,321	7.02%	3,236	332.19	15.59%	5140	8,377	1,322	9,699
4400 inc	564	3.00%	1,382	53.99	2.53%	835	2,217	1,877	4,095
4430	1,303	6.92%	3,192	0.00	0.00%	0	3,192	359	3,551
4500 inc	1,565	8.31%	3,834	132.19	6.20%	2045	5,880	1,734	7,614
4520 inc	2,543	13.51%	6,230	240.95	11.31%	3728	9,959	127	10,085
4541A	0	0.00%	0	9.60	0.45%	149	149	0	149
4800A	1	0.01%	2	0.00	0.00%	0	2	0	2
4900 inc	292	1.55%	715	199.56	9.37%	3088	3,803	152	3,955
4910	1,641	8.71%	4,021	284.91	13.37%	4409	8,429	496	8,925
4920A	1	0.01%	2	4.12	0.19%	64	66	0	66
4930	334	1.77%	818	176.82	8.30%	2736	3,554	316	3,870
4940	268	1.42%	657	177.40	8.33%	2745	3,402	2,226	5,627
Totals	18,830	100.00%	46,134	2,130.54	100.00%	32,967	79,101	14,509	93,610

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data. *Note: Sewered residential population will need to be updated after the un-sewered parcel analysis is complete*

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day), and distributed by meter district according to the percentage of winter water consumption within each meter district.

Franklin Population Summary

SEMCOG (April 2009) = 3,029

Sewered Residential Population	3,029
Un-Sewered Residential Population	0
Total Residential Population	3,029
Sewered Non-Residential Equivalent Population	422
Un-Sewered Non-Residential Equivalent Population	0
Total Non-Residential Equivalent Population	422
Sewered Residential Population	3,029
Sewered Non-Residential Equivalent Population	422
Total Sewered Equivalent Population	3,451

Table 1. Sewered Population by Meter District			
Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3750	2,492	422	2,915
3760	534	0	534
Cross-Jurisdictional Areas	3	0	3
Totals	3,029	422	3,451

Percent of equivalent population within cross-jurisdictional areas = 0.08%

Table 2. Detailed Sewered Population Breakdown by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3707A	1	0.09%	3	0.00	0.00%	0	3	0	3
3750	915	82.43%	2,445	29.49	76.09%	47	2,492	422	2,915
3760	194	17.48%	519	9.27	23.91%	15	534	0	534
Totals	1,110	100.00%	2,967	38.76	100.00%	62	3,029	422	3,451

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential equivalent population developed from other communities using winter water consumption.

Keego Harbor Population Summary

SEMCOG (April 2009) = 2,871

Sewered Residential Population	2,871
Un-Sewered Residential Population	0
Total Residential Population	
	2,871
Sewered Non-Residential Equivalent Population	301
Un-Sewered Non-Residential Equivalent	0
Total Non-Residential Equivalent Population	
	301
Sewered Residential Population	2,871
Sewered Non-Residential Equivalent Population	301
Total Sewered Equivalent Population	
	3,172

Table 1. Sewered EFSDS Population by Meter District

Meter District	Sewered Residential Population*	Sewered Non-Residential Equivalent Population**	Total Sewered Equivalent Population
4130 inc	2,871	301	3,172
Cross-Jurisdictional Areas	0	0	0
Totals	2,871	301	3,172

Percent of sewered equivalent population in cross-jurisdictional areas = 0.00%

Notes:

* SEMCOG, April 2009

** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day).

Lathrup Village Population Summary

SEMCOG (April 2009) = 4,015

Sewered Residential Population	4,015
Un-Sewered Residential Population	0
Total Residential Population	4,015
Sewered Non-Residential Equivalent Population	562
Un-Sewered Non-Residential Equivalent Population	0
Total Non-Residential Equivalent Population	562
Sewered Residential Population	4,015
Sewered Non-Residential Equivalent Population	562
Total Sewered Equivalent Population	4,577

Table 1. Sewered Population by Meter District			
Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3100	1,045	57	1,102
3130	2,970	505	3,475
Cross-Jurisdictional Areas	0	0	0
Totals	4,015	562	4,577

Percent of equivalent population within cross-jurisdictional areas = 0.00%

Table 2. Detailed Sewered Population Breakdown by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3100	439	28.18%	1,045	0.00	0.00%	0	1,045	57	1,102
3130	1,119	71.82%	2,664	19.83	100.00%	306	2,970	505	3,475
Totals	1,558	100.00%	3,709	19.83	100.00%	306	4,015	562	4,577

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using the relationship between SEMCOG daytime working population and non-residential equivalent population developed from other communities using winter water consumption.

Orchard Lake Population Summary

SEMCOG (April 2009) = 2,300

Sewered Residential Population	2,300
Un-Sewered Residential Population	0
<hr/>	
Total Residential Population	2,300
Sewered Non-Residential Equivalent Population	505
Un-Sewered Non-Residential Equivalent	0
<hr/>	
Total Non-Residential Equivalent Population	505
Sewered Residential Population	2,300
Sewered Non-Residential Equivalent Population	505
<hr/>	
Total Sewered Equivalent Population	2,805

Table 1. Sewered EFSDS Population by Meter District

Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
4110	606	5	611
4121	1,059	93	1,152
4125	559	17	575
Cross-Jurisdictional Areas	76	390	467
Totals	2,300	505	2,805

Percent of sewered equivalent population in cross-jurisdictional areas = 16.63%

Table 2. Detailed Sewered Population Breakdown by EFSDS Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Population	Total Sewered Residential Population	Non-Residential Sewered Equivalent Population**	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*				
4100A	29	3.32%	76	0	76	327	404
4110	230	26.35%	606	0	606	5	611
4121	402	46.05%	1,059	0	1,059	93	1,152
4125	212	24.28%	559	0	559	17	575
4130A	0	0.00%	0	0	0	63	63
Totals	873	100.00%	2,300	0	2,300	505	2,805

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** Non-residential population equivalency was estimated for each meter district using winter water consumption (100 gallons per person per day).

City of Southfield Population Summary

SEMCOG (April 2009) = 76,195

Residential Population within the EFSDS	62,500
Residential Population Outside of the EFSDS	13,695
Total Residential Population	76,195
Sewered Residential Population within the EFSDS	61,034
Un-Sewered Residential Population within the EFSDS	1,466*
Total Residential Population within the EFSDS	62,500
Non-Residential Equivalent Population within the EFSDS	14,012
Non-Residential Equivalent Population Outside of the EFSDS	1,555
Total Non-Residential Equivalent Population	15,566
Sewered Non-Residential Equivalent Population within the EFSDS	13,990
Un-Sewered Non-Residential Equivalent Population within the EFSDS	22
Total Non-Residential Equivalent Population within the EFSDS	14,012
Sewered Residential Population within the EFSDS	61,034
Sewered Non-Residential Equivalent Population within the EFSDS	13,990
Total Sewered Equivalent Population	75,024

Table 1. Sewered Population within the EFSDS by Meter District

Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
(3000/3010) inc	4,638	1,476	6,114
3001 inc	310	13	323
3020 inc	12,839	3,361	16,200
3030	3,568	903	4,471
3120	3,045	380	3,425
3200	2,103	344	2,447
3210 inc	1,718	145	1,862
3220	303	4	307
3260	840	10	851
3700 inc	25,512	4,473	29,986
(3800/3900) inc	4,741*	2,777	7,518
Cross-Jurisdictional Areas	1,417	104	1,521
Totals	61,034	13,990	75,024

Percent of sewered equivalent population in cross-jurisdictional areas = 2.03%

* Accounts for 670 homes on septic systems within (3800/3900)inc, based on HRC's estimate of homes not connected from SPCF project. This estimate was supported by data provided by the City of Southfield, which indicated approximately 921 single-family homes with active sewer connections within (3800/3900)inc, compared to 924 sewered single-unit residential parcels used in this analysis.

Table 2. Detailed Sewered Population Breakdown within the EFSDS by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Sewered Non-Residential Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
(3000/3010) inc	1,100	9.15%	2,385	82.20	6.44%	2,252	4,638	1,476	6,114
3001 inc	143	1.19%	310	0.00	0.00%	0	310	13	323
3020 inc	3,589	29.86%	7,783	184.54	14.46%	5,056	12,839	3,361	16,200
3030	930	7.74%	2,017	56.63	4.44%	1,552	3,568	903	4,471
3100A	23	0.19%	50	0.00	0.00%	0	50	0	50
3120	1,210	10.07%	2,624	15.38	1.21%	421	3,045	380	3,425
3130A	0	0.00%	0	0.00	0.00%	0	0	2	2
3200	877	7.30%	1,902	7.33	0.57%	201	2,103	344	2,447
3210 inc	437	3.64%	948	28.10	2.20%	770	1,718	145	1,862
3220	55	0.46%	119	6.71	0.53%	184	303	4	307
3250/3310A	1	0.01%	2	0.00	0.00%	0	2	30	33
3250/3310B	0	0.00%	0	49.02	3.84%	1,343	1,343	72	1,416
3250/3310C	10	0.08%	22	0.00	0.00%	0	22	0	22
3260	223	1.86%	484	13.02	1.02%	357	840	10	851
3700 inc	2,496	20.77%	5,413	733.61	57.47%	20,100	25,512	4,473	29,986
(3800/3900) inc	924	7.69%	2,004	99.91	7.83%	2,737	4,741	2,777	7,518
Totals	12,018	100.00%	26,061	1,276.45	100.00%	34,973	61,034	13,990	75,024

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data. Sewered portion accounts for 670 homes on septic systems within (3800/3900)inc, based on HRC's estimate of homes not connected from SPCF project. This estimate was supported by analyzing data provided by the City of Southfield, which indicated approximately 921 single-family homes with active sewer connections within (3800/3900)inc, compared to 924 sewered single-unit residential parcels used in this analysis.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day), and distributed by meter district according to the percentage of non-residential parcel acreage within each meter district, obtained from the WRC's parcel data.

Troy Population Summary
SEMCOG (April 2009) = 80,366

Residential Population within the EFSDS	14,100
Residential Population Outside of the EFSDS	66,266
Total Residential Population	
Sewered Residential Population within the EFSDS	14,100
Un-Sewered Residential Population within the EFSDS	0
Total Residential Population within the EFSDS	
Sewered Non-Residential Equivalent Population within the EFSDS	228
Un-Sewered Non-Residential Equivalent Population within the EFSDS	0
Total Non-Residential Equivalent Population within the EFSDS	
Sewered Residential Population within the EFSDS	14,100
Sewered Non-Residential Equivalent Population within the EFSDS	228
Total Sewered Equivalent Population	
	14,328

Table 1. Sewered Population within the EFSDS by Meter District			
Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
3520 inc	13,350	227	13,577
3540	750	1	751
Cross-Jurisdictional Areas	0	0	0
Totals	14,100	228	14,328

Percent of sewered equivalent population in cross-jurisdictional areas = 0.00%

Table 2. Detailed Sewered Population Breakdown within the EFSDS by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Non-Residential Sewered Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3520 inc	4,265	93.31%	10,446	106.63	100.00%	2,904	13,350	227	13,577
3540	306	6.69%	750	0.00	0.00%	0	750	1	751
Totals	4,571	100.00%	11,196	106.63	100.00%	2,904	14,100	228	14,328

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day), and distributed by meter district according to the percentage of non-residential parcel acreage within each meter district, obtained from the WRC's parcel data.

West Bloomfield Township Population Summary
SEMCOG (April 2009) = 64,992

Residential Population within the EFSDS	44,442
Residential Population Outside of the EFSDS	20,550
Total Residential Population	64,992
Sewered Residential Population within the EFSDS	41,317
Un-Sewered Residential Population within the EFSDS	845
Total Residential Population within the EFSDS	42,162
Sewered Non-Residential Equivalent Population within the EFSDS	3,776
Un-Sewered Non-Residential Equivalent Population within the EFSDS	236
Total Non-Residential Equivalent Population within the EFSDS	4,011
Sewered Residential Population within the EFSDS	41,317
Sewered Non-Residential Equivalent Population within the EFSDS	3,776
Total Sewered Equivalent Population	45,093

Meter District	Sewered Residential Population	Sewered Non-Residential Equivalent Population	Total Sewered Equivalent Population
4100 inc	5,200	311	5,511
4140	1,316	30	1,346
4541	5,962	215	6,177
4560	1,855	295	2,151
4580	5,022	388	5,410
4600	6,624	644	7,268
4700	3,539	885	4,425
4800 inc	570	0	570
4804/4806 inc	17	0	17
4801	3,609	640	4,248
4820	578	22	600
4830	601	1	602
4850	3,401	265	3,666
4860	1,000	34	1,033
4870	527	6	534
Cross-Jurisdictional Areas	1,497	39	1,536
Totals	41,317	3,776	45,093

Percent of sewered equivalent population in cross-jurisdictional areas = 3.41%

Table 2. Detailed Sewered Population Breakdown within the EFSDS by Meter District

Meter District	Single-Unit Residential Sewered			Multi-Unit Residential Sewered			Total Sewered Residential Population	Sewered Non-Residential Equivalent Population***	Total Sewered Equivalent Population
	(parcel count)	(% of total parcels)	(population)*	(parcel acreage)	(% of total acreage)	(population)**			
3640B	7	0.07%	20	0.00	0.00%	0	20	8	28
4050A	455	4.33%	1,290	0.00	0.00%	0	1,290	26	1,316
4100 inc	1,620	15.43%	4,592	76.64	5.26%	608	5,200	311	5,511
4110A	3	0.03%	9	0.00	0.00%	0	9	0	9
4121A	1	0.01%	3	0.00	0.00%	0	3	0	3
4140	430	4.10%	1,219	12.24	0.84%	97	1,316	30	1,346
4541	867	8.26%	2,458	442.03	30.32%	3,505	5,962	215	6,177
4560	495	4.72%	1,403	57.02	3.91%	452	1,855	295	2,151
4580	713	6.79%	2,021	378.50	25.96%	3,001	5,022	388	5,410
4600	1,957	18.64%	5,547	135.74	9.31%	1,076	6,624	644	7,268
4700	962	9.16%	2,727	102.46	7.03%	812	3,539	885	4,425
4800 inc	201	1.91%	570	0.00	0.00%	0	570	0	570
4801	995	9.48%	2,820	99.41	6.82%	788	3,609	640	4,248
4804/4806 inc	6	0.06%	17	0.00	0.00%	0	17	0	17
4820	204	1.94%	578	0.00	0.00%	0	578	22	600
4830	212	2.02%	601	0.00	0.00%	0	601	1	602
4840A	2	0.02%	6	16.18	1.11%	128	134	4	138
4840B	4	0.04%	11	0.00	0.00%	0	11	0	11
4840C	11	0.10%	31	0.00	0.00%	0	31	0	31
4850	1,010	9.62%	2,863	67.89	4.66%	538	3,401	265	3,666
4860	157	1.50%	445	69.94	4.80%	554	1,000	34	1,033
4870	186	1.77%	527	0.00	0.00%	0	527	6	534
Totals	10,498	100.00%	29,758	1,458.05	100.00%	11,560	41,317	3,776	45,093

Notes:

* SEMCOG's single-unit residential population was distributed by meter district according to the percentage of occupied, single-unit parcels within each meter district, obtained from the WRC's parcel data.

** SEMCOG's multi-unit residential population was distributed by meter district according to the percentage of multi-unit residential parcel acreage within each meter district, obtained from the WRC's parcel data.

*** Non-residential population equivalency was estimated using winter water consumption (100 gallons per person per day), and distributed by meter district according to the percentage of non-residential parcel acreage within each meter district, obtained from the WRC's parcel data.

Appendix J

PPL Scoring Form

Project Priority List (PPL) Scoring Data Form

Please complete the information requested below and indicate the page numbers or appendices in the project plan which verify the information provided. Enter "N/A" if information is not pertinent.

PROJECT APPLICANT: Oakland County Water Resources Commissioner – Evergreen Farmington Sewage Disposal System

PROJECT LOCATION: Oakland County, Michigan

1. Water Pollution Severity Data (0 to 500 points)

- page II-11 1. Pre-project conditions, including wastewater collection/treatment deficiencies and water quality problems currently occurring.
- page IV-1 2. Post-project conditions, including proposed facilities and water quality improvements.

Does the existing facility (or facilities) being upgraded, expanded, or replaced by this project file either surface water or groundwater discharge monitoring reports?

YES, Proceed to Section C or NO, Proceed to Section A or B

Note: If a project with either a surface water or groundwater discharge is also causing a nitrate problem in the groundwater (i.e., leaky lagoons), please be sure to complete Item B.5. Projects may receive points for both surface water and groundwater contamination.

A. Data on Existing Surface Water Discharge

- page II-7 1. Discharge type:
- Continuous
 - Seasonal
 - Intermittent (*if CSO, or SSO, please complete Sections E and F below*)
- page II-9 2. **Flow.** For facilities that discharge to regional treatment plants and do not file surface water discharge monitoring reports, provide the average daily metered flow (*identify whether units are MGD or MGY*)
- Discharges to DWSD
-
- page II-7 3. Identify Receiving Water and Type
- Detroit River
-
- page _____ 4. Location (*town, range, and section*)
- Discharges to DWSD
-
- page II-7 5. Existing Treatment
- Untreated Secondary Combined Sewer Overflow Tertiary
 - Primary (including septic systems with direct surface water discharge)
- page _____ 6. Existing Disinfection Process:
- None
 - Chlorination
 - Alternative Technology (*specify type*)

B. Data on Existing Groundwater Discharge

- page NA 1. Discharge Type:
- Continuous
 - Seasonal
 - Intermittent

- page NA 2. **Flow.** For unsewered areas, flow should be calculated using a figure of 70 gpcd. For facilities that do not file groundwater discharge monitoring reports, provide the existing metered flow figure (*identify whether units are MGD or MG Y*) _____
- page NA 3. **Location** (*provide town, range, and section*) _____
- page NA 4. **Existing Treatment**
 Untreated Primary (including septic with tile field) Secondary
- page NA 5. **Nitrate contamination of public or private wells caused by the discharge of effluent/waste from the treatment system or systems**
 Public well(s) in vicinity contains nitrates > 10 mg/L (100 points)
 Private well(s) in vicinity contains nitrates > 10 mg/L (75 points)
 Monitoring well(s) in vicinity contains nitrates > 10 mg/L (50 points)*
 No evidence of nitrate contamination in local wells

*Note: If only the total inorganic nitrogen ("TIN" ammonia + nitrite + nitrate) concentration is available, a separate sampling and nitrate analysis should be performed to document the nitrate concentration.

C. Information on Proposed Surface Water/Groundwater Discharge

(Attach additional pages if necessary; a copy of the effluent limits letter/permit table may suffice.)

- page NA 1. **Discharge Type:**
 Continuous
 Seasonal Identify all discharge points and receiving waters.
 Intermittent
- page NA 2. **Average Design Flow** (*identify units as MGD or MG Y*) _____
- page NA 3. **Identify receiving water for a surface water discharge** _____
- page NA 4. **Location** (*town, range, and section*) _____
5. **List Effluent Limits:**
 Minimum Dissolved Oxygen _____
 CBOD₅ _____
 Ammonia _____
 Phosphorus _____
 Total Inorganic Nitrogen (TIN) (from Groundwater Permit) _____
- page NA 6. **Will the proposed facility address documented total residual chlorine (TRC) violations?**
 YES, proceed to 7 NO
7. **Will the proposed disinfection improvements involve either dechlorination or an alternative disinfection technology (e.g. ultraviolet disinfection, ozonation) that eliminates the use of chlorine?**
 YES NO

D. Data on Existing (Pre-Project) CSO and SSO Discharges

Information must be provided for each outfall directly associated with the proposed correction project.

Outfall #	Receiving Stream	Location* Town/Range/Section	Estimated Overflow Volume (MG) for 1-year, 1-hour storm event
			NO SSOs for 1-year, 1-hour event

Outfall #	Estimated Overflow Duration (Hours)	Estimated Annual Overflow Volume (MG)	Tributary Residential Population
			No SSOs for 1-year, 1-hour event

* A map showing the discharge locations by number is highly preferable and can be attached to this sheet.

E. Data on Future (Post-Project) CSO and SSO Discharges

List each outfall from Section E. For outfalls which will cease to function as combined sewer outfalls upon the completion of this project, simply enter "Eliminated" under Receiving Stream. List any new outfalls (e.g., for a retention/treatment basin) created by this project and include its associated discharge data.

Outfall #	Receiving Stream	Location* Town/Range/Section	Estimated Overflow Volume (MG) for 1-year, 1-hour storm event
			No SSOs for 1-year, 1-hour event

Outfall #	Estimated Overflow Duration (Hours)	Estimated Annual Overflow Volume (MG)	Detention Time Prior to Discharge for 1-year, 1-hour storm event
			No SSOs for 1-year, 1-hour event

* A map showing the discharge locations by number is highly preferable and can be attached to this sheet.

Please attach additional pages if necessary.

2. Enforcement Actions (0 or 300 points)

Is the proposed project necessary for compliance with a fixed-date construction schedule established by an order, permit, or other document issued by the DEQ, or entered as part of an action brought by the state against a municipality?

YES, Proceed to Item A or NO, Proceed to Section 3

page II-11, Appendix H A. Copy of the enforcement action, order, permit or other DEQ document.

3. Population Data (30 to 100 points)

page	<u>II-2</u>	A. Existing residential population to be served by the proposed project:	<u>312,199</u>
page	<u>DWS D</u>	B. Existing population of the POTW service area:	<u>2,400,000 (DWSD Treatment Plant)</u>

4. Dilution Ratio (25 to 100 points)

The data for the dilution ratio scoring category is collected from several questions in the Water Quality Severity Data section of this document and information in DEQ files, therefore, **no action is required from the applicant for the completion of this item of the PPL Scoring Data Form.** The primary purpose of this section is to clarify and document the figures utilized in the dilution ratio calculation. Please note that for new collection system projects, the existing discharge is calculated by multiplying the residential population to be served by the proposed project by 70 gallons per capita per day (gpcd). For projects with existing Groundwater and NPDES permits, the Discharge Monitoring Report (DMR) data will be obtained by the DEQ staff. For projects that discharge to regional facilities and do not have individual discharge permits, the existing discharge will be based on the average daily metered flow.

The following information will be completed by DEQ staff:

The dilution ratio is _____ and was calculated from _____ / _____.
(Specify the units for both the numerator and denominator).

5. Failing On-Site Septic Systems (0 or 100 points)

Does the project propose to correct failing on-site septic systems that have no suitable replacement?

YES, Proceed to Item A or NO, Proceed to Section 6

page _____ A. Documentation of site limitations that prevent septic system replacement.

6. Septage Receiving/Treatment Facilities (0 or 100 points)

Does the project propose to construct, upgrade, or expand a septage receiving or treatment facility?

YES, Proceed to Item A or NO

page _____ A. Description of the proposed septage facility improvements.