2014 FINAL SRF PROJECT PLAN

FOR IMPROVEMENTS TO THE

DOWNRIVER SEWAGE DISPOSAL SYSTEM

PREPARED FOR THE

WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES

Environmental Services Group

Draft: May 12, 2014

Final: June 19, 2014

Prepared by:

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HRC Job No. 20100602, Task 16

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APPENDICES:

A. NPDES Permit
B. Service Area Characteristics
C. Cost Estimates and Present Worth Analysis
D. Project Planning Correspondence
E. Resolution
F. Public Meeting Affidavit of Publication
G. Public Meeting Information and Transcript

REFERENCES:

1. SEMCOG, the Southeast Michigan Council of Governments, *Population and Household Estimates for Southeast Michigan*, dated July 2013
2. Applied Science, Inc. *Memorandum—Downriver Sewage Disposal System, Service Area Characteristics*, dated April 30, 2012.
3. Hubbell, Roth & Clark, Inc. *Downriver Sewage Disposal System Final 2009 SRF Project Plan*, dated June 25, 2009
4. Hubbell, Roth & Clark, Inc. *Downriver Sewage Disposal System Assessment Report*, dated April 2009
5. Tetra Tech MPS, Inc. *Wyandotte Wastewater Treatment Plant Final 2004 SRF Project Plan*, dated June 2004.

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Summary of Changes Since Issue of Draft Report

The following items summarize the modifications made to this Final 2014 SRF Project Plan, since the Draft 2014 SRF Project Plan was issued on May 12, 2014.

- Corrected dates in Table 1-1 and 5-1 to reflect planning periods for the 2014 Project Plan.
- Additional minor corrections were made to fix typographical errors and to provide additional clarification where necessary.
- Section 8, —Public Participation, was updated to include the public hearing information and adoption of the resolution.
- Additional correspondence received after publishing of the draft 2014 SRF Project Plan was added to Appendix D.
- The final authorized resolutions from the JMC and Wayne County Commission were added to Appendix E.
- The affidavits of publication for the notices for the public hearing were added to Appendix F.
- The transcript from the public hearing was added to Appendix G.

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Section 1 - Introduction and Executive Summary

1.1. Background

The 2014 State Revolving Fund (SRF) Project Plan provides a comprehensive, proactive strategy for planned improvements to the Downriver Sewage Disposal System (DSDS) over a 20 year period. Implementing the 2014 DSDS SRF Project Plan will help ensure continued reliable operation of the system, including the Downriver Wastewater Treatment Facility (DWTF), and compliance with current and future regulatory requirements. In addition, the 2014 DSDS SRF Project Plan is required for the necessary improvements to the DSDS to be eligible for potential low interest financing under the SRF Program administered by the Michigan Department of Environmental Quality (MDEQ).

The 2014 SRF Project Plan presents recommended improvements to the DSDS categorized into four sets of Priority Projects that would be completed every five years. Figure 1-1 (Study Area) shows the DSDS service area and interceptor system, and Figure 1-2 illustrates the location of the Priority 1 Projects, to be completed during the first five years.

The recommendations in the 2014 SRF Project Plan build upon previous Project Plans completed for the DSDS. The first SRF Project Plan for the DSDS was completed in February of 1993 and defined the expansion and improvements required to the DWTF to meet permit requirements. SRF Project Plan supplements were prepared until the early 2000s, with updated SRF Project Plans completed in June 2004 and June 2009 ("2009 DSDS SRF Project Plan"). Many of the projects described in previous Project Plans have been constructed, or are currently under planning, design or construction as described in the next section.

This 2014 SRF Project Plan examines needed improvements to the DSDS for the planning period of 2015 to 2034. Detailed analysis of the projects scheduled for the first five-year planning period (2015 to 2019) and identified as Priority One projects, is highlighted.

1.2. Assessment of Facilities and Analysis of Alternatives

The existing DSDS facilities were grouped into three main areas for assessment as follows:

- The Interceptor System (including the Downriver Regional Storage and Transport System), which transports wastewater from the local communities' collection systems to the DWTF for treatment and disposal.
- The liquid stream at the DWTF, which includes the processes that remove solids and treat the wastewater flow before discharge in accordance with the facility's permit and water quality standards.
- The solids stream at the DWTF, which includes the facilities that dewater and store the solids removed from the liquid stream. The solids are currently trucked to a landfill for ultimate disposal.

This document includes a description of each of these areas, determines the need for any improvements, and develops alternatives for rehabilitation projects. The alternatives were reviewed for feasibility, cost effectiveness, and environmental impact. The proposed alternatives build upon the recently completed and current improvement projects at the DWTF and interceptor system, and are based on system needs over a 20-year planning period.

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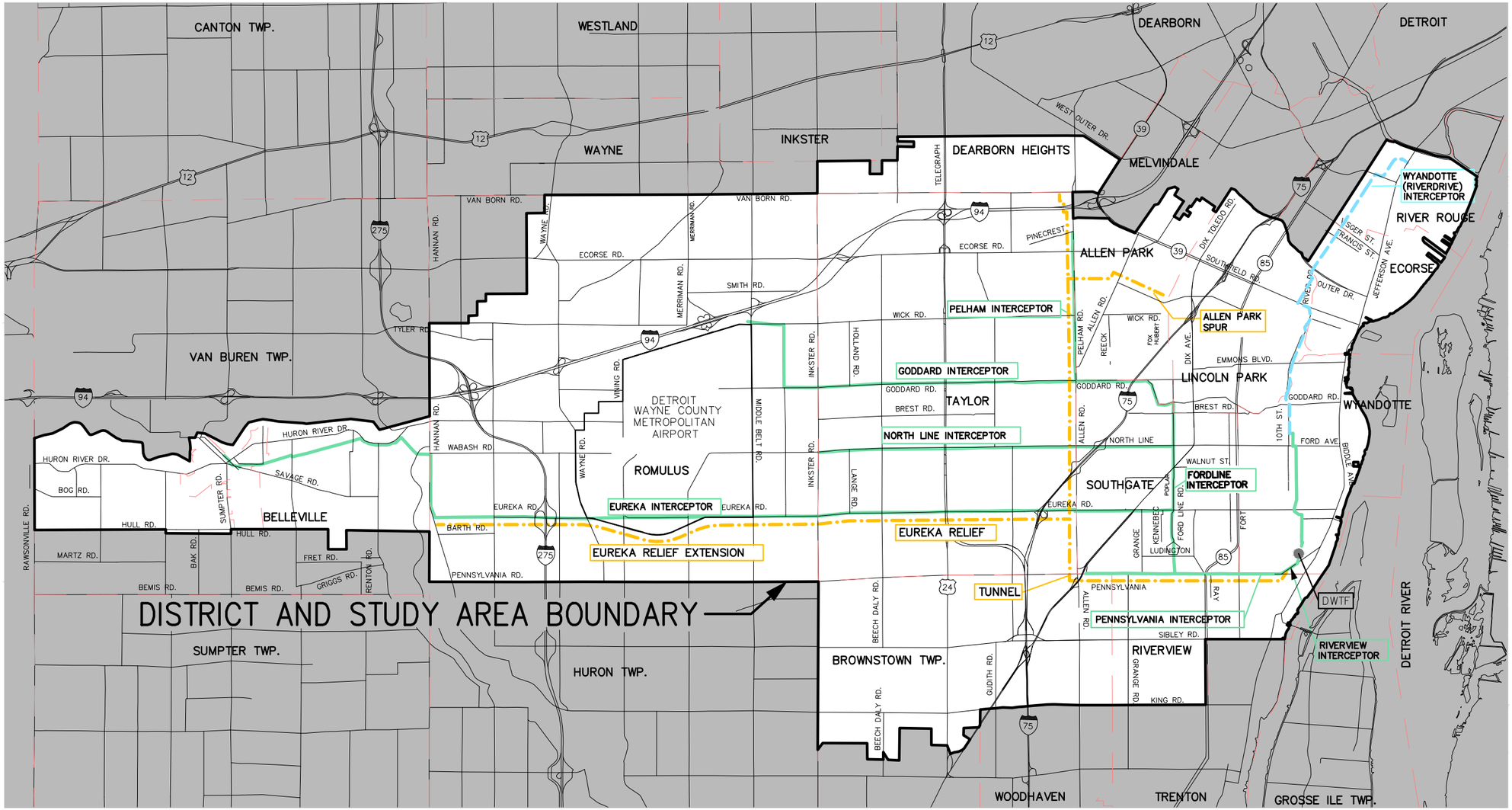

LEGEND

- WYANDOTTE (RIVERDRIVE) INTERCEPTOR (WYI) – 1938 CONSTRUCTION
- DOWNRIVER SEWAGE DISPOSAL SYSTEM INTERCEPTOR (DSDS) – 1962 CONSTRUCTION
- DOWNRIVER REGIONAL STORAGE AND TRANSPORT SYSTEM (DRSTS) – 1998 CONSTRUCTION
- DOWNRIVER WASTEWATER TREATMENT FACILITY (DWTF)

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STUDY AREA

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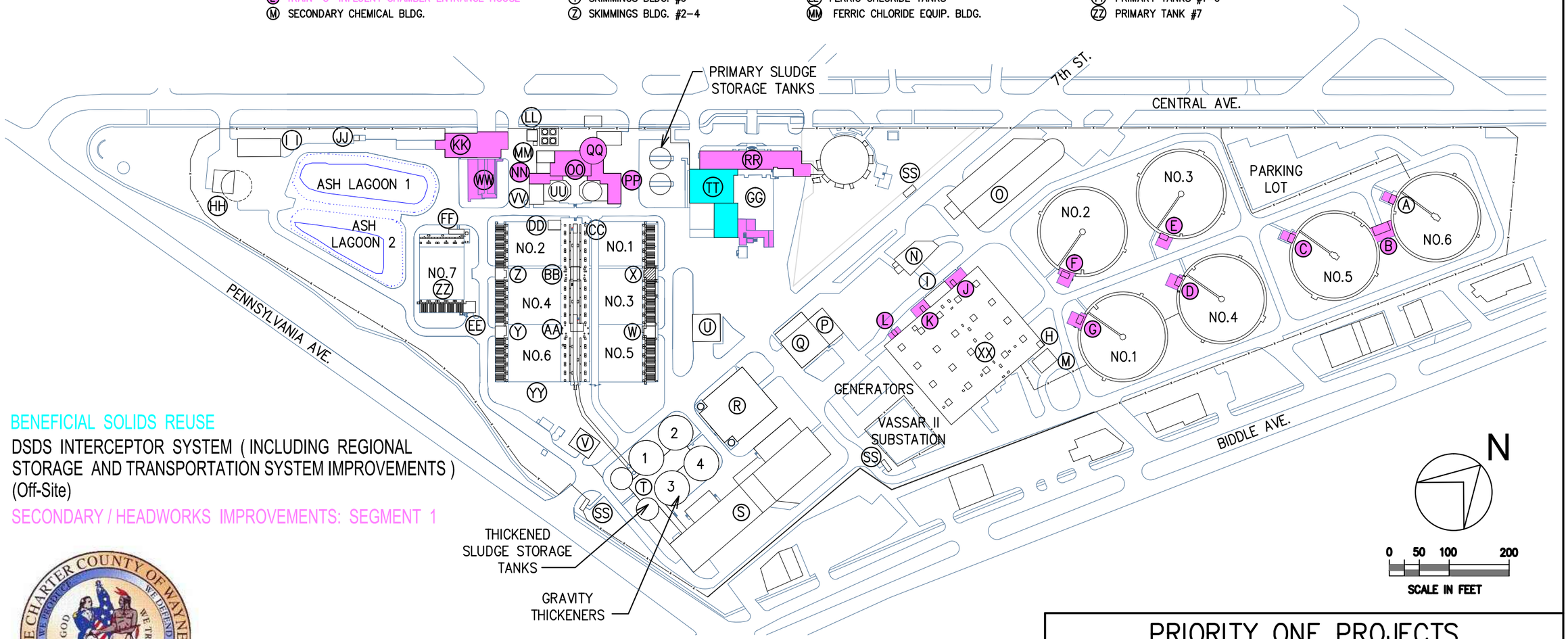
DOWNRIVER WASTEWATER TREATMENT FACILITY

- (A) CLARIFIER BLDG. #6
- (B) RETURN ACTIVATED SLUDGE BLDG.
- (C) CLARIFIER BLDG. #5
- (D) CLARIFIER BLDG. #4
- (E) CLARIFIER BLDG. #3
- (F) CLARIFIER BLDG. #2
- (G) CLARIFIER BLDG. #1
- (H) SAMPLE BLDG.
- (I) SECONDARY OXYGEN CONTROL BLDG.
- (J) N. INFLUENT CHAMBER ENTRANCE HOUSE
- (K) S. INFLUENT CHAMBER ENTRANCE HOUSE
- (L) TRAIN "0" INFLUENT CHAMBER ENTRANCE HOUSE
- (M) SECONDARY CHEMICAL BLDG.
- (N) SECONDARY LOW LIFT PUMP STATION
- (O) MAINTENANCE BLDG.
- (P) STOCKROOM #1
- (Q) EMPLOYEE SERVICE BLDG.
- (R) DISSOLVED AIR FLOTATION (DAF) BLDG.
- (S) SOLIDS HANDLING BLDG.
- (T) SOLIDS THICKENING COMPLEX
- (U) MAINTENANCE GARAGE
- (V) SKIMMINGS PUMP BLDG.
- (W) SKIMMINGS BLDG. #5
- (X) SKIMMINGS BLDG. #1-3
- (Y) SKIMMINGS BLDG. #6
- (Z) SKIMMINGS BLDG. #2-4
- (AA) PRIMARY MOTOR CONTROL CENTER #1-6
- (BB) PRIMARY PUMP GALLERY
- (CC) PRIMARY PUMP GALLERY ENTRANCE HOUSE
- (DD) PRIMARY POLYMER BLDG.
- (EE) SKIMMINGS BLDG. #7
- (FF) PRIMARY MOTOR CONTROL CENTER #7
- (GG) ULTRAVIOLET DISINFECTION
- (HH) TUNNEL PUMP STATION
- (II) TUNNEL PUMP STATION ELECT. BLDG.
- (JJ) RECYCLE SAMPLE BLDG.
- (KK) AERATED GRIT BLDG.
- (LL) FERRIC CHLORIDE TANKS
- (MM) FERRIC CHLORIDE EQUIP. BLDG.
- (NN) WEST GRIT BLDG.
- (OO) FINE SCREENS BLDG.
- (PP) EAST GRIT BLDG.
- (QQ) INFLUENT PUMP STATION
- (RR) ADMINISTRATION BLDG.
- (SS) WATER METER BLDG. (3 SHOWN)
- (TT) OLD SOLIDS BLDG.
- (UU) DETRITORS
- (VV) OLD GREASE BURNER BLDG.
- (WW) AERATED GRIT TANKS
- (XX) AERATION TANKS
- (YY) PRIMARY TANKS #1-6
- (ZZ) PRIMARY TANK #7



1. BENEFICIAL SOLIDS REUSE
2. DSDS INTERCEPTOR SYSTEM (INCLUDING REGIONAL STORAGE AND TRANSPORTATION SYSTEM IMPROVEMENTS) (Off-Site)
3. SECONDARY / HEADWORKS IMPROVEMENTS: SEGMENT 1

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PRIORITY ONE PROJECTS

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1.2.1. DSDS Interceptor System (including Regional Storage and Transport System) Sewers

The 2009 DSDS SRF Project Plan recommended DSDS Interceptor System Improvements as a Priority 1 project, with most of the work to include additional SCADA and other system monitoring upgrades. Wayne County has completed replacement of select flow meters and other related work using funding from non-SRF sources, but the majority of the work proposed in the project was not completed. The required scope of work has been refined and includes improvements to the remaining existing flow meters and consideration of inclusion of the meter network into SCADA programming to allow for improved monitoring and control of the DSDS.

Rehabilitation of the sewers was recommended as a Priority 2 project in the 2009 DSDS SRF Project Plan, and now becomes a Priority 1 project in this updated 2014 Plan. Wayne County continues to televise and inspect the DSDS Interceptor System, and has assessed portions of the system to represent each sewer type (brick/concrete), age, and construction contract. The sewers televised to date serve as an indicator of the conditions of the remainder of the approximately 50-mile sewer network with the condition summarized as follows:

a. Downriver Regional Storage and Transport System

The Downriver Regional Storage and Transport System (DRSTS) was constructed in 1998 and assessments to date do not indicate the need for any improvements at this time, as would be expected for a sewer of this age.

b. Downriver Sewage Disposal System Interceptor

The Downriver Sewage Disposal System (DSDS) Interceptor was constructed in 1962 of brick and concrete. From the portions inspected to date, much of the brick sewer is in good condition, but there are specific areas of missing bricks and mortar and where significant infiltration is occurring that require rehabilitation.

c. Wyandotte/Riverdrive Interceptor

The Wyandotte Interceptor (WYI), also known as the "Riverdrive" interceptor, was constructed in 1938 of concrete. This area was televised in 2004 and areas of spalling concrete at the crown of the sewer were observed, along with some structural cracks and areas of significant infiltration, which will require rehabilitation.

1.2.2. DWTF Liquid Stream Processes

In general, the liquid stream processes at the DWTF have undergone on-going rehabilitation and replacement since 1993. The 2009 DSDS SRF Project Plan recommended the Headworks System Renovations and Secondary System Renovations both as Priority 1 projects. These have since been combined into a single project ("Secondary/Headworks Improvements: Segment 1") that is currently in the planning phase. The project was included into the fundable range for the SRF FY2014 project priority list, but the MDEQ agreed to a request made by Wayne County to defer the project until FY2015. The SRF Program requires projects that are more than five years old to be re-visited in an updated Project Plan or Project Plan supplement before they can be funded, therefore this project has been updated to reflect the revised scope and is included in this 2014 Plan.

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Some recommended specific work items that were included in the project descriptions in the 2009 DSDS SRF Project Plan were not included in the combined project. These lower priority items have been deferred to Segment 2 of this project, under the Priority 2 projects, in this updated 2014 DSDS SRF Project Plan ("Secondary/Headworks Improvements: Segment 2") project.

The D-A-F Complex Renovations project that was recommended as a Priority 1 project in the 2009 DSDS SRF Plan is now deemed a lower priority when compared to other system needs and available funding, and is now recommended as a Priority 2 project in this updated 2014 Plan. The project included re-purposing the existing D-A-F Building as a new Equipment Repair Facility.

1.2.3. DWTF Solids Stream Processes

Upgrades to the solids handling facilities at the DWTF include renovation of the dewatering operation that was recommended in the 2004 Plan, and the Solids Thickening Complex Renovations project that is currently under construction as recommended in the 2009 Plan. However, the resulting unstabilzied solids are currently disposed of by trucking to landfills, and it is not known how much longer this practice will be feasible. Currently, no landfills in Wayne County can accept this type of solids, and most other landfills are limited as to the quantity they can accept in a given period. Wayne County has two years remaining in their current hauling and disposal contract, but this practice cannot be considered a long-term solution due to the risk of significant disposal cost increases and/or lack of landfill availability. The 2009 DSDS SRF Project Plan included a review of alternatives for solids disposal, and this analysis has been revised and updated to current conditions, and to include an additional alternative. This information is presented in the "Analysis of Alternatives" section of this 2014 Plan.

1.3. Potential "Green" Projects

The State Revolving Fund (SRF) program currently prioritizes "projects to address green infrastructure, water or energy efficiency improvements, or other environmentally innovative projects" through funding called the "Green Project Reserve". Either entire projects, or appropriate identifiable components of larger projects, may be considered for inclusion.

Wayne County is striving to implement "Green" options where applicable and cost effective for the DSDS. Biosolids drying for beneficial reuse and reduction in residuals is a project that will be reviewed in this 2014 Plan that may be eligible as a green project in this program.

1.4. Recommendations

Wayne County has the necessary legal, institutional, financial, and managerial authority and resources to build, operate, and maintain the DSDS. It is recommended that the Wayne County Commission approve and adopt this 2014 Plan to ensure improvements necessary for proper operation of the DSDS and to allow for low-interest financing under the Michigan Department of Environmental Quality's State Revolving Fund program.

Table 1-1 summarizes the recommended projects, and associated costs, that will allow for continued operation of the existing DSDS Interceptor System and the DWTF through the 20-year planning period.

Table 1-1: Recommended Improvement Projects for the DSDS

Priority 1 Projects (FY 2015 to 2019)	Capital Cost
Secondary/Headworks Improvements: Segment 1	$18,000,000
Biosolids Drying and Beneficial Reuse: Design* (*Basis of Design completed first at an estimated cost of $1.2M, before proceeding to project design at estimated cost of $4.2M*)	$5,421,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
Biosolids Drying and Beneficial Reuse: Construction	$41,931,000
TOTAL:	***$70,352,000***
Priority 2 Projects (FY 2020 to 2024)	**Capital Cost**
Secondary/Headworks Improvements: Segment 2	$5,977,000
D-A-F Building Renovation	$7,174,000
Instrumentation and SCADA Improvements	$10,000,000
Ultraviolet Disinfection Renovations	$17,226,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
TOTAL:	***$45,377,000***
Priority 3 Projects (FY 2025 to 2029)	**Capital Cost**
Primary Treatment System Improvements	$9,834,000
Secondary/Headworks Improvements: Segment 3	$34,867,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
TOTAL:	***$49,701,000***
Priority 4 Projects (FY 2030 to 2034)	**Capital Cost**
Instrumentation and SCADA Improvements	$10,000,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
TOTAL:	***$15,000,000***
TOTAL ALL PROJECTS (FY 2015-2034):	**$180,430,000**

**Note that the SRF program provides funding for reimbursement of planning and design costs at the time of construction for projects selected for funding. The planning and design costs for the proposed biosolids project is provided for reference only because of the need to further evaluate current commodity and operational costs as well as landfill availability for the project alternatives associated with solids disposal.*

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The user costs to finance the projects proposed for the next five-year period have been determined assuming State Revolving Fund financing with a 2.5% interest rate and 20-year debt retirement. Capital and operation, maintenance and replacement costs are included. The user cost to the typical residential user in each community is shown in Table 1-2.

Table 1-2: Cost for Typical Residential DSDS Customer for FY 2015 - 2020

Community	Annual Cost per Household	Community	Annual Cost per Household
Allen Park	$46.88	Riverview	$41.38
Belleville	$43.81	Romulus	$41.55
Brownstown Twp.	$39.92	Southgate	$43.03
Dearborn Heights	$42.47	Taylor	$41.67
Ecorse	$45.15	Van Buren Twp.	$39.31
Lincoln Park	$45.71	Wyandotte	$40.87
River Rouge	$53.83		

**Based upon 100,000 gallons per year water use.*

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Section 2 - Project Background

2.1. Introduction

This 2014 SRF Project Plan was prepared on behalf of the Wayne County Department of Public Services Environmental Services Group (the County) and the participating Downriver communities 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 Downriver Sewage Disposal System (DSDS), including the Downriver Wastewater Treatment Facility (DWTF).

The first SRF Project Plan for the 13 Downriver Communities in the DSDS was completed in February of 1993 and defined the expansion and improvements required to the DWTF to meet permit requirements. SRF Project Plan supplements were prepared until the early 2000s, with updated SRF Project Plans completed in June 2004 and June 2009.

The 2004 SRF Project Plan evaluated the DWTF needs for the planning period between 2005 and 2025, segregated in five-year planning periods. The 2009 SRF Project Plan presented a similar evaluation but also included the DSDS collection system, and was for the planning period between 2010 and 2015. The majority of these projects have been constructed, or are currently under design or construction as described in the next section.

There are a few work items that were recommended in the 2009 Plan that have not been implemented, with some being completed as part of maintenance and repairs and some are no longer required due to other changes. Providing an update of these projects and other areas of concern form the basis for this document. This 2014 SRF Project Plan examines the needs of the DSDS for the planning period of 2015 to 2034, with a focus on the projects that are proposed to begin construction during the next five-year planning period of 2015 to 2019, which are identified as Priority 1 projects.

2.2. Study Area Characteristics

Service area characteristics for the Downriver Sewage Disposal System are presented in a memorandum prepared by Applied Science, Inc. (ASI), dated April 30, 2012. This memo provides updated District boundary information, and data (population, economic, land use, etc.) relative to the portion of each community within the District. It was created using information originating from the regional planning agency, SEMCOG. Refer to Appendix B for this information.

2.2.1. Delineation of Study Area

The Study Area for this 2014 SRF Project Plan is comprised of all or portions of the 13 communities served by the DSDS. Figure 2-1 shows the Study Area for this 2014 SRF Project Plan. The following is a list of the service area communities:

- City of Allen Park (portion)
- City of Belleville
- Brownstown Township (portion)
- City of Dearborn Heights (portion)
- City of Ecorse
- City of Lincoln Park
- City of River Rouge
- City of Riverview
- City of Romulus (portion)
- City of Southgate
- City of Taylor
- Van Buren Township (portion)
- City of Wyandotte

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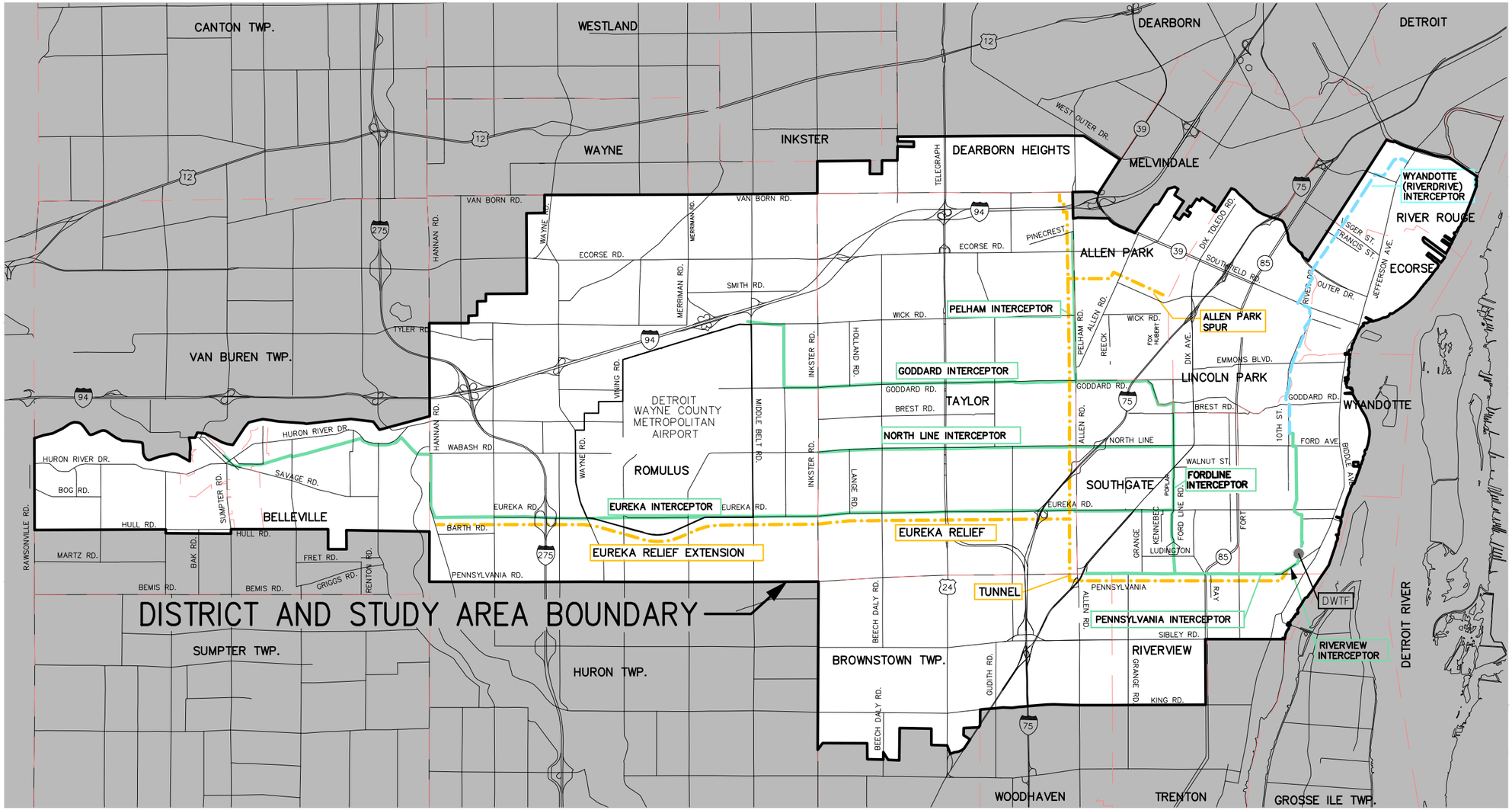

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- WYANDOTTE (RIVERDRIVE) INTERCEPTOR (WYI) – 1938 CONSTRUCTION
- DOWNRIVER SEWAGE DISPOSAL SYSTEM INTERCEPTOR (DSDS) – 1962 CONSTRUCTION
- DOWNRIVER REGIONAL STORAGE AND TRANSPORT SYSTEM (DRSTS) – 1998 CONSTRUCTION
- DOWNRIVER WASTEWATER TREATMENT FACILITY (DWTF)

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STUDY AREA

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2.2.2. Surface and Groundwaters

There are large volumes of water available from the Great Lakes and extensive distribution systems in the Downriver service area. Future dependency on groundwater supplies is not anticipated.

All watersheds draining the Study Area are tributary to the Detroit River, which flows into Lake Erie. The primary watershed for the Study Area is the Ecorse Creek watershed, which consists of 27,700 acres. Other drainage basins in the Service Area include the Rouge River watershed, the Huron River watershed, the Frank and Poet Drain, and Whitaker Creek.

Existing water uses of the Detroit River include swimming, fishing, recreational boating, transport shipping, wastewater disposal, and water supply. The water intake for the City of Wyandotte Water Treatment Plant (WTP) is located upstream of the DWTF, approximately 1.7 miles north-northeast, on Van Alstyne Street.

According to the Michigan Department of Environmental Quality (MDEQ), the U.S. waters of the Detroit River are classified as being suitable for cold-water fish, public water supply, navigation, and total body contact recreation. Since it is an integral part of the Great Lakes systems, the Detroit River's water quality is determined by using basically the same water quality standards applied to the Great Lakes.

The uses designated by MDEQ for the Rouge River are industrial water supply, partial body contact, recreation, warm water fish, agricultural water, and navigation. Ecorse Creek is also designated for partial body contact recreation.

2.3. Existing Facilities

2.3.1. Interceptor System (including Regional Storage and Transport System)

A network of interceptor sewers in the DSDS connects the local sewer systems to the DWTF, as shown in Figure 2-1. The DSDS interceptor system includes the following:

- Riverdrive Interceptor, which transports wastewater from the communities of River Rouge, Ecorse, and Lincoln Park, and approximately 90 percent of the wastewater from Allen Park.
- Riverview Interceptor, which transports wastewater from the City of Riverview.
- Pennsylvania Interceptor, which transports wastewater to the DWTF from eight Downriver communities including Belleville, Van Buren Township, Romulus, Taylor, Dearborn Heights, Brownstown Township, Allen Park, and those portions of Southgate served by separated sewers.

The Regional Storage and Transport System was constructed between 1999 and 2001. The purpose was to divert excess wet weather flow from the interceptor system to the tunnel when the capacity of the existing interceptor system was exceeded. This system was constructed with components consisting of the following:

- Lower Tunnel, which extends from the DWTF west along Pennsylvania Road to Allen Road, then north along Allen and Pelham Roads to Champaign Road.
- Upper Tunnel, which extends along Pelham Road north from the lower tunnel at Champaign Road.
- Allen Park Tunnel Spur, which extends to the east approximately 8,000 feet from the drop structure of the Upper Tunnel at Champaign Road.
- Eureka Road Relief Sewer and Relief Sewer Extension, which extends west along Eureka Road from the connection to the lower tunnel at Allen Road to Wahrman Road.

- Taylor (Pelham) Basin to Jackson Street Pumping Station Connection, which extends north approximately 2,750 feet from the Taylor (Pelham) Basin under Highway I-94 and along Jackson Avenue and Weddel Avenue to Hanover Avenue.

Since 1994, local sewer system rehabilitation projects in Riverview, Romulus, Southgate, Taylor, Van Buren Township, Ecorse, Allen Park, and Dearborn Heights have been constructed to remove extraneous rainfall-related flows which overloaded the DSDS. Local relief sewer construction projects have also been completed since 1994 to reduce collection system surcharge and backups at locations where existing sewers had insufficient capacity to handle wet weather flows. Relief sewer projects were constructed in Allen Park, Dearborn Heights, Romulus, Southgate, and Taylor.

2.3.2. Downriver Wastewater Treatment Facility

The DWTF utilizes preliminary, primary, secondary, and disinfection treatment processes to treat sewage prior to discharging treated effluent to the Trenton Channel of the Detroit River.

The discharge from the DWTF is authorized under NPDES Permit No. MI0021156. The facility and its operation are further described in Section 3 of this 2014 DSDS SRF Project Plan. The following table provides a summary of the discharge limits the DWTF must comply with under its NPDES permit.

Table 2-1: NPDES Permit Limits

Pollutant	***Average Monthly Limits***	***Daily Maximum Limits***
Carbonaceous Biochemical Oxygen Demand (CBOD)	25 mg/l (26,000 lbs./day and 85% BOD_5 min. removal)	40 mg/l[1] (42,000 lbs./day[1])
Total Suspended Solids (TSS)	30 mg/l (31,000 lbs./day and 85% min. removal)	45 mg/l[1] (47,000 lbs./day[1])
Total Phosphorus	1.0 mg/l (1,000 lbs./day)	Not Applicable
Fecal Coliform Bacteria	200 counts/100 ml[2]	400 counts/100 ml[1,2]
Total Mercury	10 ng/l[3] 0.010 lbs/day[3]	Not Applicable
Oil and Grease	10 mg/l (10,000 lbs./day)	Not Applicable
Dissolved Oxygen	Not Applicable	4.0 mg/l (minimum)
PH	Not Applicable	6.0 s.u. (minimum 9.0 s.u. (maximum)

Notes: 1. *7-day average limit.*
2. *Calculated using geometric mean.*
3. *Rolling 12-month average.*

2.4. Environmental Setting

This Section will focus on the general area where the DWTF is located, as well as the DWTF site itself. The majority of the proposed projects will occur at the DWTF site. Projects related to improvements to the interceptor system will typically not involve any earth-changing activities.

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2.4.1. Cultural Setting

There are several historic sites that are listed in the State Register of Historic Sites (SRHS) and/or the National Register of Historic Places (NRHP); however, there are no historic sites located in the immediate vicinity of the DWTF site. The following sites are registered historic sites located within a two-mile radius of the DWTF site.

- Amo-Juchartz House – 434 Plum Street, Wyandotte (SRHS, 3/21/91).
- William Armstrong House – 2234 Biddle Ave., Wyandotte (SRHS, 3/21/91).
- Eureka Iron Works – Northwest corner of Van Alstyne Boulevard and Elm Street, Wyandotte (SRHS, 9/17/57).
- Ford Village Municipal Building – 994 Biddle Avenue, Wyandotte (SRHS, 12/20/89).
- Ford-Bacon House – 45 Vinewood, Wyandotte (SRHS, 2/19/87 and NRHP, 12/1/97).
- George P. MacNichol House – 2610 Biddle Avenue, Wyandotte (SRHS, 11/15/73 and NRHP, 5/24/84).
- Marx House – 2630 Biddle Avenue, Wyandotte (SRHS, 1/16/76 and NRHP, 8/13/76).
- Gustave C. Mehlhose House – 367 Oak Street, Wyandotte (SRHS, 3/21/91).
- Louis Mehlhose House – 355 Oak Street, Wyandotte (SRHS, 3/17/94).
- Michigan Alkali Company Administration Building – 1609 Biddle Street (SRHS, 10/11/90).

2.4.2. Natural Environment

a. Climate

The climate of Wayne County is influenced by the Great Lakes and its location with respect to major storm tracks. The nearest national weather station to the Study Area is located at the Detroit Metropolitan Airport, which monitors climate data. The average annual temperature is approximately 48.6 degrees F, ranging from a low of 22.9 degrees F in January to a high of 72.3 degrees F in July. Precipitation is distributed quite evenly throughout the year. Total annual precipitation averages 32.62 inches, ranging from a monthly average of 1.74 inches in February to 3.61 inches in June.

Prevailing winds are from the southwest with an average annual speed of 12 miles per hour. These prevailing winds limit the effects of Lake St. Clair to local lake breezes and to storm tracks that blow in from the east.

b. Air Quality

The entire State of Michigan is currently designated "Attainment" with the National Ambient Air Quality Standards (NAAQS) for: Carbon Monoxide (CO,) Nitrogen Dioxide (NO_2,) Ozone (O_3,) Particulate Matter Less Than 10 Microns (PM10,) and Annual and 24-hour PM2.5 (fine particles). All of Michigan also meets the Lead (Pb) standard, except for a portion of Ionia County. In Wayne County, a corridor that runs along US I-75 extending east to the shoreline border, which includes portions of the DSDS Service Area, was designated to nonattainment with the 2010 Sulfur Dioxide (SO_2) standard. The proposed work will not have an effect on air quality in the area.

c. Wetlands

Relatively small wetland areas exist primarily in the western and southern regions of the Study Area. The ash lagoons located on the western end of the DWTF property are small man-made wetlands. No regulated wetland areas are present on the DWTF site. However, MDEQ's Land/Water Interface Permitting Staff were contacted as required by the project planning process. This correspondence is included in Appendix D.

d. Coastal Zones

The eastern-most edge of the Study Area is located adjacent to the Detroit River, which serves as the coastal waterway between the United States and Canada. The DWTF site is located approximately 1,200 feet from the shoreline of the Detroit River. Michigan's coastal zone boundary generally extends a minimum of 1,000 feet inland from the Ordinary High Water Mark of the Great Lakes and connecting channels.

e. Floodplains

The floodplain boundaries for 100 and 500-year floods have been mapped for the City of Wyandotte. The DWTF site is not located within delineated floodplain areas. However, MDEQ's Land/Water Interface Permitting Staff were contacted as required by the project planning process. This correspondence is included in Appendix D.

f. Natural or Wild and Scenic Rivers

No surface waters located in the DSDS Study Area have been designated as natural or wild and scenic rivers.

g. Major Surface Waters

The major surface waters in the DSDS Study Area include Belleville Lake, Huron River, Ecorse Creek, Detroit River, and the Frank and Poet Drain. The only surface water in the vicinity of the DWTF is the Detroit River, which receives the treated effluent from the facility.

h. Topography

The topography of the DWTF site is very flat at an elevation of approximately 581 feet above sea level.

i. Geology

The surface geology of Southeast Michigan is characterized by two broad zones, a lowland zone and hill zone. These zones parallel each other in a northeast-southwest direction through the length of the region. The lowland zone, a belt of low, flat lands, varying in width from 20 to 30 miles, lies between the Great Lakes shoreline and the edge of the zone of hills and valleys. This lowland is composed mainly of clay and sand deposits. The Study Area is located entirely within the lowland zone

j. Soils

According to the U.S. Soil Conservation Service, the soils in the surrounding area of the DWTF are comprised of the Pewamo-Blount association, which are characterized as nearly level and gently sloping, very poorly drained to somewhat poorly drained soils that have a moderately fine-textured and fine-textured subsoil.

k. Agricultural Resources

There is no agricultural land in the vicinity of the DWTF site.

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l. Existing Plant/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 Study Area. A request was made to the U.S. Fish & Wildlife Section 7 review website and the Michigan Natural Features Inventory (MNFI) natural heritage database to check against known localities for rare species and unique natural features. The MNFI review found that due the nature of the activity and the urban location, it is unlikely that any negative impacts will occur. A review of the species listed in the USFWS Section 7 website and the MNFI report and their associated habitats indicates that the proposed work would have "no effect." This correspondence is included in Appendix D.

2.4.3. Downriver Wastewater Treatment Facility

The existing DWTF property is the location where the primary earth-changing activities will occur. The site is located in an area that is primarily comprised of either commercial or light industrial, with some residential development inter-mixed. The Wyandotte Shores Golf Course is located east of the DWTF site, across Biddle Avenue.

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Section 3 - Need for Project

3.1. References

The following documents and data sources were used in the development of the need for project:

- Downriver Sewage Disposal System Final 2009 SRF Project Plan, dated June 2009.
- Downriver Sewage Disposal System Assessment Report, dated April 2009

3.2. Compliance Status

The allowable limits for the discharge from the Downriver Wastewater Treatment Facility (DWTF) authorized under NPDES Permit No. MI0021156 are shown in Table 2-1. The NPDES permit compliance history of the DWTF since January 2004 is shown in Table 3-1. (Compliance history prior to 2004 is provided in the 2004 SRF Project Plan.)

Table 3-1: NPDES Compliance History

Month	*NPDES Permit Parameters Violated*
Jan. 2004 through Dec. 2004	None.
Jan. 2005	Fecal exceeded once.
Feb. 2005	TSS exceeded five times.
Mar. 2005	None.
Apr. 2005	BOD and TSS exceeded four times; phosphorus exceeded once.
May 2005 through Nov. 2005	None.
Dec. 2005	Total Phosphorus limit exceeded once
Jan. 2006	Total Suspended Solids limits were exceeded twice.
Feb. 2006 through Dec. 2013	None.
Summary: 115 of 120 months reviewed were in compliance with NPDES permit.	

3.3. Orders

In 1994, a Consent Decree was entered into by the 13 Downriver Communities, Wayne County, the Ecorse Creek Pollution Abatement Drain No. 1 Drainage District, the Southgate-Wyandotte Relief Drains Drainage District, the United States of America, and the State of Michigan. The required improvements were summarized in a 1993 SRF Project Plan and supplemented by periodic updates through 1998, and all required projects have been constructed.

3.4. Water Quality

The Detroit River is a 32-mile international connecting channel that links Lake St. Clair and Lake Erie. The Detroit River is a binational Area of Concern that includes areas draining directly into the river from Michigan and Ontario. Physical boundaries of the Detroit River Area of Concern extend from the flashing navigation light near Peach Island to the Detroit Light in Lake Erie. Known causes of the Beneficial Use Impairments include urban and industrial development within the watershed, bacteria from municipal discharges, and contaminants discharged from industries on both sides of the Detroit River. The Detroit River Remedial Action Plan priorities include issues related to combined sewer overflows and sanitary sewer overflows, nonpoint source pollution, contaminated sediments, habitat restoration, and pollution prevention.

3.5. Projected Needs

3.5.1. Expected Flows and Loadings

Data obtained from SEMCOG indicates that the population in the DWTF service area is anticipated to slightly decrease through 2030, as described in Appendix B.

Based on the previous flow estimate of 65 MGD used in the 2004 and 2009 Plans, and the observed average flow of 53 MGD during 2013, a design average of 65 MGD is appropriate for planning purposes. In fact, the existing primary, secondary and overall plant capacities are well in excess of the proposed design average flows (these are 150, 125, and 225 MGD, respectively.) For the wastewater treatment process evaluation, the accuracy of this design average flow is therefore not critical. A summary of the design flows and loadings is presented in Table 3-2.

Table 3-2: Design Flows and Loadings Summary

Parameter	*2004/2009 SRF Project Plan Value*	*Five-year Average Value*
Average Annual Flow (MGD)	65	53
Average BOD Concentration (mg/l)	180	166
Average TSS Concentration (mg/l)	220	226
Average BOD Loading (lbs/day)	97,587	68,300
Average TSS Loading (lbs/day)	119,260	97,200
Maximum Month BOD Loading (lbs/day)	137,100 [1]	85,300
Maximum Month TSS Loading (lbs/day)	143,110	143,800

[1] *Includes 20,000 lbs./day glycol loading.*

The design loadings for the solids disposal options are based upon a average wet solids production from existing dewatering equipment of 55,241 wet tons/year.

3.5.2. Operational Goals

In the summer of 2002, the Wayne County Department of Environment initiated a Comprehensive Assessment and Master Plan Project (CAMPP), which reviewed all operational aspects of its facilities. The objective was to identify and implement efficiencies and cost savings. Cost savings at the DWTF was a primary goal and it was recommended to reduce staff at this facility, but it was also recognized that improvements were necessary to achieve this goal. This 2014 Plan will continue to identify improvements that will allow for future automation and associated labor reductions.

3.6. General Assessment of Existing Treatment Facilities

3.6.1. Overview

The Downriver Wastewater Treatment Facility (DWTF) was originally constructed in 1938 as a primary treatment plant with solids incineration. The facility has undergone expansions and upgrades in 1964, 1970, 1975 and 1989. In the early 1990s, a State Revolving Fund (SRF) Project Plan was undertaken and completed in 1993. That 1993 SRF Project Plan recommended the improvements required to accommodate a peak flow of 225 MGD, while meeting National Pollution Discharge Elimination System (NPDES) Permit requirements. From that 1993 SRF Project Plan, numerous improvement expansion projects were constructed, specifically Packages A (1994), B (1995), C (1995), F (1999), G (1995), W (1999) and W2 (2000), as well as nine

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contracts for the Downriver Regional Storage & Treatment System (DRSTS) (2000). [Note: The above years represent completion of construction.]

From the approved 2004 Plan, the following projects were constructed:

- Emergency Generators Project
- Secondary Clarifier Improvements and Ultraviolet (UV) Enclosure Building Project
- Phase I Solids Handling Improvements Project
- Supervisory Control & Data Acquisition (SCADA) Improvements Project
- Fine Screen Facilities Renovation Project
- Influent Pump Station Wet Well Improvements Project
- 2009 Capital Improvements Projects (2009 CIP), which included improvements at the Influent Pump Station (IPS), the primary treatment facilities, and the secondary system aeration trains and electrical substation.

From the approved 2009 Plan, the Solids Complex Renovations project is currently under construction. Improvements to the secondary and headworks treatment systems at the DWTF were identified as separate Priority 1 projects in the 2009 Plan. These projects were subsequently combined into a single project and segmented based on need. Select elements from the project, known as Segment 1, are currently in the planning phase. Because this project was first evaluated approximately five years ago, the needed work has been refined and is presented in this updated 2014 Plan. The remaining projects prioritized in the 2009 Plan, the D-A-F Complex Renovations project and the DSDS Interceptor System Improvements, were deferred and are also addressed in this 2014 Plan.

3.6.2. Capacity

The 1993, 2004 and 2009 SRF Project Plans evaluated existing and future flow conditions, existing plant facilities, treatment capabilities and deficiencies and recommended improvements to achieve NPDES effluent limitations under future peak flow conditions of 225 MGD. This capacity was formally certified by the DWTF Facility Stress Test report dated May 2004. As a result of these recent and ongoing projects, the current DWTF process capacities are adequate and no additional facilities expansion is required. However, as presented herein, specific processes have reached their useful life, and where replacement is required, alternate processes and/or improvements have been evaluated.

3.7. Assessment of Existing Liquid Treatment Stream

Process and ancillary equipment is reviewed below. Instrumentation and automation for both the liquid and solid streams assessment are presented later in this Section. This assessment also groups the projects into four, five-year planning periods. Priority 1 improvements are proposed to be implemented within the first five-year period (2015-2019), Priority 2 improvements in the second five-year period (2020-2024), Priority 3 in the third five-year period (2025-2030), and Priority 4 in the last five-year planning period (2031-2035).

3.7.1. Headworks Assessment

a. Influent Junction Chamber

The Influent Junction chamber contains three sluice gates: W901, W902, and W903, and a flap gate which allows overflow to the Southgate Wyandotte Relief Drains Drainage District (S-W

District) Pump Station No. 5 under emergency flow conditions. Sluice gates W901 and W902 were replaced in the Package F expansion in the late 1990s. These gates were replaced with cast iron sluice gates and hydraulic actuators. Both of these gates are in good condition and are scheduled to be replaced in the Secondary/Headworks Improvements: Segment 3 project, which is listed as a Priority 3.

However, the hydraulic actuators (along with stems and the control system) to Gates W901 and W902 will be replaced in the Secondary/Headworks Improvements: Segment 1 project, which is a Priority 1. This project also includes replacing Bypass Gate W903 and its manual actuator and Bypass Flap Gate JC-4, neither of which were not replaced in the 1990s. These gates are necessary to maintaining the control from the 8th and Pennsylvania sewers, and to ensuring reverse flow relief to the S-W District. Because Gates W903 is just outside the DWTF fence, a façade wall and other security features are included to protect the actuator from public access.

b. Coarse Gripper Screen

The coarse gripper type screen was installed in Package F in the late 1990s. The bar screen has 3" openings, is made of galvanized steel and is in very good condition. Thus, it does not need to be replaced until a Priority 3 project or later. The access platform is also in very good condition and does not require any work. However, the gripper mechanism has required higher than expected levels of service and an overhaul is warranted. This gripper rehabilitation is included in the Secondary/Headworks Improvements: Segment 2 project (Priority 2) and replacement of the bar screen is scheduled in the Secondary/Headworks Improvements: Segment 3 project (Priority 3.)

c. Influent Pump Station

Wet Well.

The Influent Pump Station (IPS) wet well was upgraded as part of a 2004 Plan project. A hoist used to provide operating support needs to be rehabilitated (if parts are available) or replaced and is included in the Secondary/Headworks Improvements: Segment 2 project (Priority 2.) If replaced, the capacity of this hoist needs to be established during design to meet current maintenance needs.

Motor Room:

Influent Pumps 1 through 6, including the shafts, shaft bearing, and motors were all replaced under Package F in the late 1990s. The pumps are now operating well and are scheduled for rehabilitation in the Secondary/Headworks Improvements: Segment 3 project (Priority 3.) The motors for the pumps are being rehabilitated as servicing is required.

Currently, Pumps 5 and 6 are operated with variable frequency drives (VFDs). These were also installed under Package F. New bypass contactors were installed on Pumps 5 and 6 and new VFDs added for Pumps 3 and 4 under the 2009 CIP project. Therefore, VFDs for Pumps 5 and 6 are included in the Secondary/Headworks Improvements: Segment 3 project (Priority 3.)

The Secondary/Headworks Improvements: Segment 1 project (Priority 1) includes painting of the interior including the top chord of roof trusses to protect against corrosion, replacing man-doors and hardware to ensure proper access is maintained and secured, and miscellaneous masonry repairs including pointing of mortar joints.

First Level Down (Elevation 571.0'):

The detritor drain line is in bad shape and will be replaced in the Secondary/Headworks Improvements: Segment 2 project (Priority 2.) . The compressor is scheduled to be replaced in a Priority 4 project. The power pack for the sluice gates will be replaced with Sluice Gates JC3,

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and a floor topping will be added to eliminate the trip hazards from the protruding bolts both as part of the Secondary/Headworks Improvements: Segment 1 project (Priority 1.)

Second Level Down (Elevation 561.0'):

The magnetic flow meters (mag meters) at this location will be replaced along with all of the remaining mag meters installed under Package F in a Priority 2 SCADA project. The compressed air system is scheduled to be replaced in a Priority 3 project.

Third Level Down (Elevation 551.0'):

The sample pump plugs occasionally, and does not provide a consistent and uniform sample, and the VFD does not function properly. The sampling system is included in the Secondary/Headworks Improvements: Segment 2 project (Priority 2.). The emergency float panel and sump pump control panel is scheduled for replacement in a Priority 2 SCADA project.

Basement Level (Elevation 537.5'):

The knife gate isolation valves on Pumps 1 through 4 were replaced in the late 1990s under Package F. These are stainless steel knife gates with pneumatic actuators. The influent knife gates to Pumps 5 and 6 were replaced as part of the 2004 Plan the IPS Wet Well Improvements Project. These valves are scheduled to be replaced under a Priority 3 project or later. The sump pumps and seal water system is scheduled to be replaced in a Priority 3 project. The Headworks/Secondary Improvements: Segment 1 project (Priority 1) includes new gate actuators on the influent side of Pumps 5 and 6.

d. Fine Screens 1 through 4

Fine Screens 1 through 4, and ancillary equipment were completely renovated under the Fine Screens Facilities Renovations project. As a result, no further need of process improvements is required for this area, except for the plate valves, which are scheduled for replacement in a Priority 3 project.

e. Check Valve Vault

Pumps 5 and 6 flow to either Fine Screens 3 and 4 or Fine Screens 5 and 6. Flow diversion is accomplished through the use of plate valves. To prevent flow from the Tunnel Pump Station to Fine Screens 3 and 4, swing check valves were installed under Package F. These check valves are leaking will be replaced, along with the existing manual plug valves with more suitable valves. The sump pumps will be replaced with a gravity sewer line to the nearby sewer, which also includes high level water detection and integration into the SCADA system. The valve and sump pump replacement is included in the Secondary/Headworks Improvements: Segment 1 project (Priority 1.)

f. Fine Screens 5, 6 and 7

Fine Screens 5, 6 and 7 were installed under Package F. These screens are the traveling screen type similar to the upgraded Fine Screens 1 through 4. However, the reliability of these screens and the harsh operating environment mean that Fine Screen Nos. 5 and 7 require replacement, including the conveyance equipment and building modifications to allow for removal of the screens. Fine Screen No. 6 requires only improvements to the control system. This work is included in the Secondary/Headworks Improvements: Segment 1 project (Priority 1.)

In addition, because of the screen wash requirements, which currently are accomplished using industrial water (IW), an IW booster system is included as a Priority 2 project to improve system pressure and performance.

g. Grit Removal, Detritors

The Detritors were originally installed in 1962. The grit removal equipment was replaced in Package A, and is scheduled for replacement in a Priority 2 project. The Detritor collector mechanisms and bridge were replaced under Package F. This equipment is in good condition and does not require replacement until a Priority 3 project. Under Package F, the influent sluice gates were replaced with orifice plates which were sized to provide balanced flow distribution across the seven openings. The openings do not provide the required flow distribution and short-circuiting (to the last orifice plate) occurs. The Detritors will function much better if the influent flow regime is balanced to provide a more even distribution across the Detritors. Modifications to the inlet will be performed in a Priority 2 project as well as rerouting the tank drains.

h. Aerated Grit Facilities

Aerated Grit Tanks 1 and 2 were installed in 1969 and were improved under the Package F expansion project including the new Aerated Grit Tank 3. The grit collector drag out equipment and aeration equipment are in good condition, but are scheduled to be replaced in a Priority 3 project. The opening between the building and the aerated grit tanks allows heat to escape and this will be corrected in the Secondary/Headworks Improvements: Segment 1 project (Priority 1.) The plate valves are scheduled to be replaced in a Priority 3 project.

Aerated Grit Tanks 1 and 2 do not have a drain, and new drain valves and yard piping is included in the Segment 1 project, as well as improved floor drainage and replacement of all gates and actuators located on the effluent portion of the aerated grit tanks.

Blowers 650, 651, and 652 were installed in 1969 and are at the end of their useful life. These will be replaced in the Segment 1 project. Blower 4 installed in Package F is in good condition and will be replaced in the Segment 3 project.

The Class 1, Division 1 rated H&V equipment does not function and in the Secondary/Headworks Improvements: Segment 1 project (Priority 1.) This project also includes the following additional improvements to the Aerated Grit Building: improved floor drainage, painting, roof repairs, new entry and overhead doors, removing an overhead door, new guardrail at the exterior platform, repair of access stair/walk between the building and tank, miscellaneous masonry repairs, improved electrical system including redundant power feed from the IPS and TPS substations, new gas detection equipment and review of all aspects related to the Class 1, Division 1 rated work area..

i. Grit and Screenings Handling

Grit and screenings are collected at six sites; IPS, TPS, West Screenings Room, East Grit Room, West Grit Room, and the Aerated Grit Facility. Coarse screenings collected from the IPS gripper screen are collected in a dumpster and when full, driven to the Aerated Grit Facility and deposited in the 30 cubic yard roll-off container. Similarly, coarse screenings collected from the TPS gripper screen are also collected in a dumpster and when full, hauled and deposited in the Aerated Grit Facility roll-off.

Screenings from Fine Screens 1 through 4 are conveyed to the dumpster in the West Screenings Room, and when full, hauled and deposited to the Aerated Grit Facility roll-off dumpster. Grit from the West Detritor is conveyed to the dumpster in the West Grit Room and grit from the East Detritor is conveyed to a dumpster in the East Grit Room. When full, both dumpsters are hauled and deposited to the Aerated Grit Facility roll-off dumpster.

j. Tunnel Pump Station

The Tunnel Pump Station (TPS) was installed under Contract 7 of the DRSTS project. The TPS includes four submersible 25 MGD pumps, gripper coarse screen, flushing system, granular

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activated carbon (GAC) odor control system, distribution chamber with flap gates and sluice gates SG 5, 6 and 7, sampler system, and the electrical room. The mechanical equipment is in very good condition and is scheduled for replacement in the Secondary/Headworks Improvements: Segment 3 project (Priority 3.) However, external stairs to the building roof is included in the Segment 2 project (Priority 2.)

The GAC odor control media is likely at the end of its useful life. However, this pump station rarely exhibits objectionable odors and the odor control equipment is not currently used. Since replacement carbon will cost approximately $75,000, HRC recommends that it is not cost-effective to replace this carbon until such time as odor starts to become objectionable.

The Class 1, Division 1 rated H&V equipment is included to be replaced in the Segment 2 project.

k. Recycle Return Sampling Building.

This building is non-functional and can be demolished or abandoned.

l. Ferric Chloride Facilities

The Ferric Chloride Facilities feed ferric chloride into the IPS and the TPS wet wells for the purposes of meeting the NPDES phosphorus limitations. The facilities include four 15,000 gallon fiber reinforced plastic (FRP) storage tanks, and the Ferric Chloride Building, which houses ferric chloride flow control valves feeding both wet wells by gravity. These facilities were constructed under Package F and are in good condition. The storage tanks have a lifespan of approximately 15 to 20 years and, therefore, are scheduled to be replaced in the Secondary/Headworks Improvements: Segment 3 project (Priority 3.)

m. Sewage "Vactor Truck" Receiving and Discharge Station

A new station that will allow the DWTF to receive loads from Wayne County DPS vactor trucks is included in the Secondary/Headworks Improvements: Segment 1 project (Priority 1.) This will allow for improved disposal of materials vactored out of sewers and manholes as part of maintenance and inspection operations.

n. Headworks System General/Site

The Secondary/Headworks Improvements: Segment 1 project (Priority 1) includes related site restoration along with drainage and paving improvements. A trench drain will also be provided in the driveway north of the Aerated Grit Building.

3.7.2. Primary Treatment Assessment

a. Primary Treatment Tanks

The Primary Treatment Facilities include the Polymer Feed Facility, seven Primary Sedimentation Tanks, scum handling facilities, sludge pumps and ancillary equipment. Primary Sedimentation Tanks 1 through 5 were installed in 1962, Tank 6 was installed in 1969, and Tank 7 was installed under Package F. Tanks 1 through 6 were renovated under the Primary Tank Improvements project completed in 2007. This project included replacing all collectors, drives, chains, as well as building improvements such as doors, windows, roofs, and heating and ventilation (H&V) equipment. Instrumentation and control was also augmented. Tank 7, having been recently completed under Package F, was not a part of that work.

Additional improvements were provided as part of the 2009 CIP project. This work included replacing all of the influent and isolation sluice and slide gates, weir replacement, channel aeration blowers and diffusers, improvements to the polymer feed system, and improvements

and/or replacement of the existing scum collection and handling system. This work also included tank automation. As a result, all of the equipment is in very good condition and will not require additional improvements until a Priority 3 project.

The sludge chopper pumps operate in a severe duty application, and are currently being replaced as part of the Solids Complex Renovations project.

3.7.3. Secondary Treatment Assessment

Secondary Treatment consists of the Control, Bypass and Junction chambers, Low Lift Pump Station, the five high purity oxygen activated sludge aeration trains and six secondary clarifiers.

a. Control, Bypass & Junction Chambers

The Control and Emergency Bypass Chambers control and divert flow to both the Secondary System and UV Disinfection System. The Control and Bypass Chambers were installed in 1975 to divert flow to the newly constructed secondary treatment process. Secondary effluent flows back to the Bypass Chamber then to the Chlorine Contact Chamber. At that time, the Control Chamber gate would also modulate and control flow to the peak capacity of the secondary system. Under Package F, this system was modified to allow for preferential bypass treatment. This was done through an additional Junction Chamber and the Bypass Overflow (Sullivan) weirs. The control scheme has worked very well and does not require modification. The sluice gates installed with the Junction Chamber are in good condition, and are scheduled for replacement in the Secondary/Headworks Improvements: Segment 3 project, which is a Priority 3.

The existing slide gates in the Control and Bypass Chambers were not replaced and are included in the in the Secondary/Headworks Improvements: Segment 1 project, which is a Priority 1. The identification numbers for these gates are CC-1, CC-2, BC-1 and BC-2. Gate CC-3 failed in 2008 and was replaced and a new actuator for this gate was installed under the Emergency Generators project.

b. Low Lift Pump Station

The Low Lift Pump Station (LLPS) was renovated under Package W2 in the late 1990s. In addition, the problematic VFDs were replaced in 2007 as a design-build task under the As-Needed Services. Problems with the controls were also addressed and corrected under an As-Needed Services task. As such, the Low Lift Pump Station requires no further work until renovation in a Priority 3 project which will include rebuilding of the four vertical turbine pumps. Replacement of the VFDs is included in the Priority 2 SCADA project.

c. Inlet Chambers

There are three inlet chambers housing the influent, RAS and WAS piping, magnetic flow meters control valves. The control valves and actuators for Aeration Trains 1 through 4, installed in 1975, are scheduled for replacement in a Priority 1 project. All the magnetic flow meters were replaced in Package F and are, therefore, a Priority 2 SCADA project. The sump pumps are scheduled for replacement in a Priority 3 project.

Balanced flow control to each of the operating aeration trains is essential. Because influent and return activated sludge (RAS) is fed separately, flow control is required to each set per train. This is currently achieved with magnetic flow meters and modulating valve control. The 2004 SRF Project Plan evaluated a splitter box, but the selected method was to revise the control valve strategy to a Master Valve control philosophy. The influent and RAS control valves and actuators for Aeration Trains 1-4 will be replaced in the Secondary/Headworks Improvements: Segment 1 project (Priority 1.)

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d. Aeration Trains

Aeration Trains 1 through 4 were installed in 1975 as a high purity activated sludge system. A fifth aeration train (Train 0) was installed under Package F. All of the original sparger diffusers, draft tube, compressors, and controls were also replaced in Tanks 1 through 4 when the fifth tank was added. The new aeration system is a Kruger surface aerator type mixer with high purity oxygen fed into the headspace above the mixers. This equipment is in good condition and is scheduled to be replaced under a Priority 3 project. The purge blower system, LEL panel, oxygen feed and measurement and control equipment and instrumentation are being rehabilitated as needed, with replacement of any remaining equipment included in the Secondary/Headworks Improvements: Segment 2 project (Priority 2.) Therefore, the standalone Secondary Oxygen and Flow Control Improvements project that was a Priority 2 in the 2009 DSDS SRF Project Plan has been eliminated.

The 2009 CIP included structural rehabilitation of the Aeration Trains and replacement of the 1975 vintage electrical substation. It also includes sealing the air leaks in the deck. Installation of an automated SFE wash water system was considered, but is too expensive given the infrequent need.

Consideration was given under the 2004 SRF Project Plan to change the activated sludge process to an enhanced biological phosphorus removal (EBPR) process. Because the existing ferric feed facilities are in good condition, and the plant has used chemical precipitation successfully for many years, we do not recommend converting to an EBPR process until such time as the ferric feed facilities need to be replaced. Therefore, maintaining chemical feed is recommended for the short-term and the Enhanced BioPhosphorus Removal project that was a Priority 2 in the 2009 DSDS SRF Project Plan has been eliminated. The various segments of the Secondary/Headworks projects will include the needs of these systems.

e. Secondary Clarifiers

Secondary Clarifiers 1 through 4 were installed in 1975 and Clarifiers 5 and 6 were installed in 1989. These clarifiers are a suction type sludge withdrawal system with peripheral feed-peripheral discharge flow pattern. The clarifiers were rehabilitated in as part of the 2004 Plan work. Under the design of that project, clarifiers were modeled using computational fluid dynamics as well as physical dye testing, and the annular rings were modified to improve inlet hydraulics. As a result of these modifications, as well as new equipment and structural enhancements, these clarifiers should last the project-planning period.

Dry pit submersible activated sludge (RAS) pumps were installed on Secondary Tanks 1 through 4 in 1991, and conventional end suction centrifugal pumps were used for Tanks 5 and 6 were installed in 1989. All the RAS pumps and VFD drives are being evaluated for rehabilitation and/or replacement as part of the Secondary/Headworks Improvements: Segment 1 project (Priority 1.) The project includes evaluation of RAS pump alternatives for Clarifier Nos. 1 through 4, and in-kind replacement of pumps for Clarifier Nos. 5 and 6, including new piping, valves and meters for Clarifier Nos. 1 through 6.

f. Secondary System General/Site

Included in the Secondary/Headworks Improvements: Segment 1 project (Priority 1) are general improvements to the site area including roads, pavement sidewalks and drainage that are affected by the proposed work. The project also includes roof repairs, painting, replacement of entry doors, heating and filtered ventilation systems, new sump pump systems, electrical upgrades including exterior and emergency lighting, and miscellaneous masonry repairs at Clarifier Building Nos. 1 through 6 the RAS Building, and the North and South Influent Chamber Houses.

3.7.4. Ultraviolet Disinfection

The chlorine disinfection and sulfur dioxide dechlorination systems were replaced with ultraviolet (UV) disinfection under Package F in the late 1990s. The current UV system is a Trojan UV 4000 System. There are four UV disinfection units with a space for a fifth. Current NPDES disinfection limits are being met and a fifth unit is not required. This system is scheduled for replacement in a Priority 2 project, when the UV system will have reached its useful life. The means of disinfection will be evaluated at that time, given the rapid change in technology in this area. The abandoned flow meter will be removed at that time.

There has been extensive maintenance required to properly operate the UV system. Some of this maintenance is required in the winter months, which can be very difficult to perform. As a result, a UV enclosure building was constructed as part of a 2004 Plan project. This project also corrected channel drainage limitations.

There are upstream and downstream slide gates which are used to isolate the UV disinfection channels. Each gate is equipped with electric motor actuators. Operation of these gates is currently inhibited due to poor seating conditions. This deficiency will be remedied in the Secondary/Headworks Improvements: Segment 1 project (Priority 1.)

3.7.5. Downriver Wastewater Treatment Facility Outfall Pipe

The DWTF 84 inch concrete outfall pipe was inspected by a remote operated vehicle (ROV) camera as part of the 2009 Plan. There are no immediate needs or repairs proposed as a result of this survey. However, it is recommended that Wayne County survey the outfall every 5 to 10 years to ensure its structural integrity for future service.

3.8. Solids Treatment Stream Assessment

The primary sludge storage, and collectors were installed in 1964 and the gravity thickeners, and sludge plunger pumps are essentially unchanged from the 1975 construction project. The dissolved air flotation devices equipment installed in the mid-1980s has been taken offline and the equipment demolished, and the waste activated sludge is currently being co-thickened with the primary sludge in the gravity thickeners. All of the pumping, thickening, and mixing equipment is beyond its useful life, it is therefore being upgraded as part of the Solids Complex Renovations project currently under construction.

The Solids Complex Renovation Project includes the following major work:

- Demolition of all the process, mechanical, and electrical work in the Solids Complex, demolition of the entire odor control system, and demolition and removal of the buried concrete Primary Sludge Storage Tanks.
- Civil-related improvements including ductile iron yard piping, hydrants and valves, and minor roadway repairs.
- Structural improvements and concrete repairs, including tank coating, crack repairs, surface repairs and expansion joint repairs.
- Architectural improvements roof, personnel door replacement, vertical lift truck-bay door replacement, toilet room renovations, one ton hoist, interior painting and floor topping, and miscellaneous metals (railing and stairs).
- Process equipment work including sludge pumps, sludge storage tank linear motion mixers, and grinders.
- Mechanical work including pipes and valves, and two air handling units.
- Electrical work, including demolition, wire and conduit, replacement MCCs, panel boards, VFDs, local process equipment panels, LED lighting, etc.

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- Instrumentation and Control (I&C) and SCADA work including level devices, magnetic flow meters, PLC programming, SCADA screen development, new touch screen HMI terminal, additional I/O and new field wiring.

3.8.1. Primary Sludge Storage, Transfer and Thickening

The current primary sludge handling system includes seven primary sludge chopper pumps, two intermediate collector tanks, two primary collector sludge transfer pumps, and four gravity thickeners. The current firm capacity of the primary sludge pumps of 1,500 gpm is adequate for the projected maximum primary sludge quantity at design loadings.

Primary sludge is pumped to the two intermediate sludge storage tanks. From these tanks, stored sludge is directed to gravity thickener tanks for further processing. Primary sludge is currently thickened with gravity thickeners. The storage tanks, pumps and mixing mechanisms are being improved in the Solids Complex Renovation project as identified above.

3.8.2. Waste Activated Sludge Thickening

Waste Activated Sludge (WAS) was processed in the Dissolved Air Flotation (DAF) Building installed in 1985. That facility was difficult to maintain and the DAF process was abandoned in the early 2000s and the equipment removed in 2008. The DWTF currently co-thickens waste activated sludge with primary sludge in the gravity thickeners.

3.8.3. Solids Dewatering

The existing dewatering system consists of two 40 foot diameter thickened storage tanks, two chopper transfer pumps, two muffin monster grinders, a sludge loop to six 2-meter belt filter presses (BFP), dewatered sludge hoppers, sludge cake pumps, and pump discharge header to the truck bay. A 2004 Plan Phase I Solids Handling Improvements project included replacing two of the oldest belt filter press with centrifuges, and sludge feed pumps, a polymer system, and screw auger sludge cake conveyors to the truck bay. The work also included controls and H&V improvements.

The remaining four belt filter presses installed under Package B in the mid-1990s have another 5 to 10 years of useful life. Three of the four alternatives evaluated for biosolids disposal include replacement of the belt filter presses with a new centrifuge in year 5, and then replacement of the old centrifuges and conveying equipment in year 10. The biosolids drying option includes all required dewatering equipment as part of the lump sum cost for construction.

The Dewatering Complex Renovations project and the Class B Lime Stabilization Facility project that were Priority 2 and Priority 3 projects in the 2009 SRF DSDS Project Plan, respectively, have been reconsidered in this 2014 DSDS SRF Project Plan because of the new alternative for solids disposal described below. INCINERATION COMPLEX?

3.8.4. Solids Disposal

Four existing multiple hearth incinerators were constructed in 1975, but were taken out of service due to economic, operational, regulatory, and equipment reliability considerations.

The most cost-effective current means of solids disposal is landfill disposal of dewatered solids cake. The solids are stored in the roll-off containers and are hauled to the landfill during normal operating hours. The dewatered biosolids are conveyed by the cake pumping system directly to roll-off boxes within the truck bay. The on-site operations - filling, transferring and hauling roll-off containers are all performed by the sludge-hauling contractor.

However, it is not known how much longer this practice will be feasible. Currently, no landfills in Wayne County can accept unstabilized solids, and most other landfills are limited as to the quantity they can accept in a given period. Wayne County has two years remaining in their

hauling and disposal contract, but this practice cannot be considered a long-term solution due to the risk of significant disposal cost increases and/or lack of landfill availability. The 2009 DSDS SRF Project Plan included a review of eight alternatives for solids handling, and this analysis has been revised and updated to current conditions, and to include an additional alternative. This information is presented in the "Analysis of Alternatives" section of this 2014 Plan. Because the DWTF has no alternate means of solids disposal, this is considered a Priority 1 project.

3.9. Instrumentation and Automation Assessment

3.9.1. Headworks

a. Influent Junction Chamber

Replace LEL monitoring system and bubbler level monitoring system as a Priority 2 project.

b. Coarse Gripper Screen

The SCADA system will monitor the equipment operation only. Local control is retained. Any process or equipment improvements will be incorporated into the existing SCADA monitoring and control system.

c. Influent Pump Station Wet well

An additional wet well level device was installed (pressure transducer) as a back up to the bubbler level system as part of the 2004 Plan SCADA Improvement project. The new SCADA PLC program continues to use the bubbler as the primary level indication and automatically switches to the new backup level signal upon bubbler signal loss or bubbler out of range value. The existing bubbler system should be replaced or rehabilitated as a Priority 2 project and the new pressure transducer should be replaced as required under normal plant maintenance activities.

New seal water flow switches were added under the SCADA Improvements project on each influent pump seal water line for monitoring and alarming through SCADA if seal water flow is lost. A new control strategy was also implemented under the SCADA Improvements project to control the wet well elevation to result in more steady flow rates through the DWTF, with the goal of providing near constant flow rates over 24 hours during dry weather days. The strategy relies on use of the available storage capacity of the collection system.

d. Fine Screens 1 through 4

Controls were improved as part of the 2004 Plan SCADA Improvements project to provide feedback and limited control of the new fine screen equipment.

e. Check Valve Vault

Under the SCADA Improvement project, new gate limit switches were installed on the valves and position feedback (open and closed limit switches) is provided to SCADA.

f. Fine Screens 5, 6 and 7

The controls to Fine Screen No. 6 will be improved as part of the Secondary/Headworks Improvements: Segment 1 project.

g. Grit Removal Detritors

Equipment improvements recommended as a Priority 2 project will be integrated into the existing SCADA system as part of that project.

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h. Aerated Grit Facilities

A new panel-mounted operator interface terminal and PLC panel are included in the Secondary/Headworks Improvements: Segment 1 project. All gates associated with screening, grit removal and pretreatment flow distribution to the primary treatment process will be equipped with position feedback transmitters and remote control capability to allow SCADA control and SCADA-directed automatic Influent Pump Station pump operation.

i. Tunnel Pump Station

An additional wet well level monitoring device was installed (pressure transducer) under the 2004 Plan SCADA Improvements project, as a back up to the bubbler level system. The new SCADA program continues to use the bubbler as the primary level indication and will automatically switch to the new backup level signal upon bubbler signal loss or bubbler out of range value. The existing bubbler system is in good condition and should be replaced under a Priority 2 SCADA project.

j. Ferric Chloride Facilities

A new control strategy was implemented under the 2004 Plan SCADA Improvement project to control the ferric dosage into the Tunnel Pump Station and Influent Pump Station.

3.9.2. Primary Treatment Tanks

A new process control strategy was implemented under the 2004 Plan SCADA Improvements project to provide time control of the cross collectors, main collectors, scum collectors and sludge pumps through the SCADA System.

3.9.3. Secondary Treatment Assessment

a. Control, Bypass & Junction Chambers

The 2004 SCADA Improvements project retained the existing control capabilities in this area and coordinated them with the Emergency Generators General Construction project for control of a new gate and monitoring of a high water level transmitter.

b. Low Lift Pump Station

The 2004 Plan SCADA Improvements project retained the existing control capabilities in this area. An additional wet well level device was installed (pressure transducer) under the SCADA Improvement project as a back up to the bubbler level system. The new SCADA program continues to use the bubbler as the primary level indication and automatically switches to the new backup level signal upon bubbler signal loss or bubbler out of range value. The existing bubbler system is in good condition but should be planned for replacement under a Priority 2 SCADA project.

c. Inlet Chambers and Aeration Trains

Under the 2004 Plan SCADA Improvement project, new primary influent butterfly valve position transmitters were added to each valve to provide position feedback to SCADA. The aeration train drain valve operators will be automated under the Secondary/Headworks Improvements project (Priority 1) to allow a SCADA-initiated aeration train startup and shutdown. The influent and RAS flow meters are currently operational and will be replaced as part of a Priority 2 SCADA project.

d. Oxygen Control

The 2004 Plan SCADA Improvements project retained the existing control capabilities for the oxygen feed system and added a new control strategy to adjust the oxygen feed rate based on the D.O. concentration in Stage 4 of each Aeration Train. Additional improvements to the system have been on-going on an as-needed basis.

e. Secondary Clarifiers

The 2004 Plan SCADA Improvements project was coordinated with the Secondary Clarifier Improvements and UV Enclosure Building project to provide control and monitoring of the secondary clarifiers. New PLCs were being installed as part of the Secondary Clarifier Improvements and UV Enclosure Building project.

The Secondary/Headworks Improvements Project: Segment 1 project (Priority 1) includes new controls for the RAS pumps, VFDs, magmeters and valves and integration into the SCADA system. The clarifier flow meters, scum beach heaters, sludge depth and turbidity meters should be replaced as part of the Priority 2 SCADA project.

f. Flow Balance Improvements

The 2004 Plan SCADA Improvements project implemented a Master Clarifier flow control strategy to equally distribute influent among the five aeration trains and the six secondary clarifiers.

3.9.4. Ultraviolet Disinfection

The SCADA system will monitor the equipment operation only. Local control is retained. Any future equipment improvements must be integrated into the SCADA system.

3.9.5. Primary Sludge Storage, Transfer and Thickening

The 2004 Plan SCADA Improvements project retained the existing control for these areas and provided some enhancements. Additional SCADA improvements are included with the Solids Complex Renovations project to ensure all new equipment is fully integrated into the system.

3.9.6. Additional Systems

a. General Instrumentation and Automation

The SCADA Improvements Project included an inventory and assessment of SCADA equipment involving a technical evaluation of the condition and utility of the equipment. Through this evaluation, the existing fiber communications network cable, PLCs and control panels were deemed reusable. This equipment is included in the Priority 2 SCADA project.

b. Compressed Air System

Any future improvements to this support equipment should be integrated with the existing SCADA System.

c. Screened Final Effluent Water System

Any future improvements to this support equipment should be integrated with the existing SCADA System.

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d. Industrial Water Systems

The 2004 Plan SCADA Improvements Project included outputs from these systems to monitor pump run signals and system pressures. Local control is retained. Any future improvements to this support equipment should be integrated with the existing SCADA System.

e. Sampling Systems

The 2004 SCADA Improvements Project included flow sensors to alert lab personnel when sampler supply flow is lost. Sampling system improvements are included as a Priority 2 project.

f. Maintenance Facility

The 2004 Plan SCADA Improvements Project included additional integration of various support systems and interfaces for operation personnel. Any future improvements to this support equipment should be integrated with the existing SCADA System.

3.10. Assessment of Support Facilities

3.10.1. Old Solids Building

The sampling system will be upgraded in a Priority 2 project. The wall penetrations into old sludge storage tanks need to be corrected, and the industrial water booster pump system will be replaced as part of the Solids Complex Renovations project. The Trojan control panel will be replaced at the same time as when the new UV units are installed, both in a Priority 2 project.

3.10.2. Maintenance Facility

A maintenance facility was constructed in the mid-1990s as Package C. This maintenance facility includes truck bay, small parts storage, electrician's room, instrumentation tech room, wash down facilities, offices, fabrication area and other areas suitable for maintenance needs. This facility is adequate for the maintenance needs of the DWTF. In addition to this facility, the Priority 2 D-A-F Building Renovation project would provide additional support for operations, maintenance and storage of equipment.

3.10.3. Laboratory

The laboratory facilities were assessed on a walk-through performed on February 26, 2009. The Secondary/Headworks Improvements: Segment 1 project (Priority 1) includes a new vacuum system, filter compressed air supply system, natural gas and lab gasses supply system, safety systems, and laboratory-grade water system. Additional improvements include remodeling of the south laboratory space and part of the office to provide for dedicated rooms based on function and to isolate hazardous and non-compatible uses. A room for employees to eat lunch in a dedicated area will be provided, along with a conference room and utility room and possible additional storage. Work in the remodeled areas also includes related electrical and HVAC systems, interior and emergency lighting, new water supply plumbing, waste disposal and safety systems.

3.10.4. Compressed Air Systems

Air compressors throughout the DWTF are critical to operating and maintaining equipment and should be replaced as part of related projects.

3.10.5. Screened Final Effluent Water System

The existing screened final effluent (SFE) system provides water to the secondary treatment area of the DWTF. The expanded SFE system was deemed a lower priority and may be incorporated into a future project if cost-effective.

3.10.6. Industrial Water System

The original IW piping system in the Solids Handing Building is corroded and is scheduled for replacement in a Priority 2 project along with the IW booster pump system located in the basement of the Old Solids Building area of the DWTF.

3.10.7. Sampling Systems

Automatic samplers are installed at the IPS and TPS (raw sewage sample), the basement of the Old Solids Building (primary effluent, secondary effluent, and final effluent) and the Recycle Flow Station. The sampling system will be evaluated and rehabilitated in a Priority 2 project.

3.10.8. Electrical Systems

An evaluation of the existing electrical equipment was completed in 2013 as part of the DR05, Task 4 Electrical Testing project. All proposed electrical work identified in this Plan include proper abandonment and/or removal of conduit and equipment that is being replaced with new; ensuring interior, exterior and emergency lighting systems are adequate; arc flash and short-circuit coordination studies where required to ensure compliance with electrical code and safety labeling; and any required replacement or upgrades of electrical equipment to ensure proper operation and reliability of the new equipment.

3.11. DSDS Interceptor System (including Regional Storage and Transport System)

3.11.1. SCADA

The sewage interceptor system upstream of the DWTF is shown on Figure 2-1. Within those systems, numerous control and instrumentation systems exist to provide the DWTF staff with historical and real-time operating data and control of the off-site facilities through an Operator Interface Terminal, located at the DWTF. Examples of data the SCADA system collects includes the following: rain gauge data, sewer flow and depth meter stations, profile of the tunnel and hydraulic grade line from DSDS level transmitters, status of all overflow gates, control set points for DSDS facilities, active and acknowledged alarms for all DSDS facilities, and communications network information.

The existing SCADA system components were reviewed to determine the needs for the project-planning period. Select flow meters have been replaced with newer technology as they have required servicing. The remaining flow meters are approaching 20 years in age and will be at the end of their expected useful life. Additional SCADA programming is also required in order to allow for improved system monitoring and control. Replacement of the remaining flow meters and the SCADA programming is included as part of a Priority 1 project to ensure continued reliability and operation.

3.11.2. Collection System Sewers

For the 2009 Plan, approximately 2% of the DSDS Interceptor system was televised to assess the overall conditions within the sewer pipes and manholes. This included 2,943 lineal feet of the Wyandotte (River Drive) Interceptor Sewer, located along 10th Street and River Drive; 3,611 lineal feet of the Downriver Sewage Disposal System Interceptor, located along Electric Avenue and 9th Street, along with 15 manholes located along these sections.

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Since that time, Wayne County has continued to assess the condition of additional portions of the system, and the work is on-going. The assessment program is using the NASSCO (National Association of Sewer Service Companies) Pipe Assessment Certification Program (PACP) and Manhole Assessment Certification Program (MACP.) The sewers televised to date serve as an indicator of the conditions of the remainder of the approximately 50-mile sewer network.

In order to qualify for SRF financing, major rehabilitation of sewers must involve work that is necessary because the current condition of a sewer has been demonstrated to result in a direct discharge of sanitary sewage, or work that is necessary to restore and maintain the structural integrity of a sewer. The sewers involved must have a PACP rating of "Poor" (Grade 4) or "Immediate Attention" (Grade 5.)

Recommended rehabilitation involves point repairs to structural cracks and areas of missing bricks and mortar, and lining where needed to maintain the structural integrity of the sewer along a longer segment. This work is included as part of a Priority 1 project, with the scope based on the estimated quantities of work that will be required. The exact locations of the work are still being refined to ensure the sewers and manholes involved meet the SRF eligibility requirements.

The general condition of the system is summarized as follows:

a. Downriver Regional Storage and Transport System

The Downriver Regional Storage and Transport System (DRSTS) was constructed in 1998 and assessments to date do not indicate the need for any improvements at this time, as would be expected for a sewer of this age.

b. Downriver Sewage Disposal System Interceptor

The Downriver Sewage Disposal System (DSDS) Interceptor was constructed in 1962 of brick and concrete. From the portions inspected to date, much of the brick sewer is in good condition, but there are specific areas of missing bricks and mortar and where significant infiltration is occurring that require rehabilitation in order to maintain the structural integrity of the sewer.

c. Wyandotte/Riverdrive Interceptor

The Wyandotte Interceptor (WYI), also known as the "Riverdrive" interceptor, was constructed in 1938 of concrete. This area was televised in 2004 and areas of spalling concrete and visible reinforcement at the crown of the sewer were observed, along with some structural cracks, which require rehabilitation.

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Section 4 - Alternative Analysis

4.1. General

Section 3 presented areas of deficiencies and/or replacement of equipment needs to maintain treatment plant performance. This Section includes the presentation and analysis of alternatives to those deficiencies identified as Priority 1 (to be addressed within the next five years) concerns.

Alternatives for the recommended improvements are developed and discussed where appropriate. The alternatives are reviewed for feasibility, cost effectiveness, and environmental impact. Where singular components of a system are to be addressed (motors, gates, pumps, etc.), alternatives may be limited to replacement or rehabilitation. These items are generally included as a common component to the alternatives reviewed for overall system improvement.

The proposed alternatives also build upon the recently completed and current improvement projects at the DWTF. These projects were identified in the approved 2004 and 2009 Plans. In some cases, recommendations presented in this Section are a continuation of work already complete or underway, and therefore options for alternatives are limited.

The Solids Disposal alternatives presented in this Section were based on previous alternative analyses that were included in the 2004 and 2009 Plans. The 2009 Plan considered a total of eight alternatives and determined that landfilling of dewatered biosolids was currently the most cost-effective option. However, the Plan also cautioned that switching to another method of solids disposal, such as production of Class B biosolids (for land application and/or landfilling) may be required in the future. For this updated 2014 DSDS SRF Project Plan, the current practice (landfilling of unstabilized solids) is again compared against the two Class B alternatives, as well as an additional option of drying and reuse.

Total project costs for the alternatives are included in this Section, with detailed cost estimates and analyses included in the Appendix C. All costs are in 2014 dollars and include an allowance of for engineering, legal, and administrative costs, and a contingency due to the preliminary nature of the estimates made. The present worth analyses to determine the overall cost-effectiveness of the alternatives use the 2014 Federal discount rate of 4.375%. Salvage value is calculated by using a straight-line depreciation over a 20-year period.

4.2. Regional Alternatives

The capacity of the DSDS sewer system and DWTF is sufficient to satisfy the projected future needs of the Service Area. The options to construct a new regional wastewater treatment facility, or to connect to another existing sewage disposal system, are not feasible due to the size of this system and are not considered further.

4.3. "No Action" Alternative

This alternative was considered for each work item, but was not reviewed in detail because of the existing operational and maintenance issues at the DWTF. The equipment associated with the project reviewed in this Section has served its useful life and/or requires replacement. "No action" would lead to increased maintenance and further deterioration of the equipment until it is no longer functional. Proper operation of these systems is necessary in order for the DWTF to meet its NPDES effluent limitations.

4.4. Secondary/Headworks Improvements

As discussed previously, the 2009 SRF Project Plan recommended improvements to both the headworks and secondary treatment systems at the DWTF as Priority 1 projects. These have since been combined into a single project ("Secondary/Headworks Improvements: Segment 1") that is currently in the planning phase. The project was included into the fundable range for the SRF FY2014 project priority list, but the MDEQ agreed to a request made by Wayne County to defer the project until FY2015. The

SRF Program requires projects that are more than five years old to be re-visited in an updated Project Plan or Project Plan supplement before they can be funded.

Because of previous improvement projects already completed in these areas, and the fact that the proposed Secondary/Headworks Improvements: Segment 1 builds upon those projects, there are limited cost-effective alternatives for consideration. Complete replacement of the headworks system and/or secondary system is not considered because of the investment already made into these systems. Consideration was given to having two separate projects versus a combined project, but the proposed work on each system is similar enough that the same contractors would be likely to bid on both projects, so a combined project would be more cost-effective by reducing overhead and general conditions costs.

The proposed scope of work for the combined project was reviewed and specific items that were no longer considered a priority were deferred to the Secondary/Headworks Improvements: Segment 2 project, which is a Priority 2. A Secondary/Headworks Improvements: Segment 3 project is included in the Priority 3 project list to replace equipment that is currently in good condition, but expected to be at or beyond its useful life by the time of that planning period.

The 2009 DSDS SRF Project Plan included a review of different fine screens available for the headworks, and different types of pumps for the RAS system in the secondary treatment system. Those alternatives have been reviewed and costs updated to the current timeframe. However, there have been no significant changes in the technologies or the costs for these alternatives, so the recommended alternatives are unchanged from 2009.

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4.4.1. Secondary/Headworks Improvements: Segment 1 Project, Common Components

Improvements to the DWTF headworks system include replacing two fine screens, replacing the aerated grit blowers, a new "vactor truck" sewage disposal station, and laboratory area improvements. Improvements to the secondary system include new flow meters and automation, and replacement/rehabilitation of the return activated sludge (RAS) pumps including addition of variable frequency drives (VFDs.) The project also includes improvements to related gates and actuators, piping and valves, building repairs, heating and ventilation system upgrades, and associated electrical, SCADA and site work.

The alternatives considered for this project all include the general work described above. However, for the headworks, two screen types were considered in the 2009 DSDS SRF Project Plan, and this has been revised and updated for the 2014 DSDS SRF Project Plan. Similarly, two types of RAS pumps were compared for the secondary system in 2009, and this analysis has been revised and updated for the 2014 DSDS SRF Project Plan.

4.4.2. Headworks Alternative A, Duperon Screens *(Selected Alternative)*

This Alternative A includes the replacement of Fine Screen Nos. 5 and 7 with Duperon FlexRake screens that would be nearly identical to Fine Screens 1 through 4. Fine Screen 5 would have a design capacity of 50 MGD, while Fine Screen 7 would be rated for 75 MGD. Work includes demolition and replacement of the screenings conveyor. All other work included in the Secondary/Headworks Improvements: Segment 1 project, as described above, would be the same.

4.4.3. Headworks Alternative B, Mahr Bar Screens

This Alternative B includes all of the work items from Alternative A, except the existing Fine Screen Nos. 5 and 7 would be replaced with the Mahr Headworks type screen. This screen is similar to the FlexRake, but is design with a lower bearing assembly.

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4.4.4. Headworks Alternatives Cost Comparison and Summary

The principal difference in the two manufacturer's screens is the lower bearing assembly. The Mahr Bar (Alternative B) assembly contains bushings that are submerged, while the FlexRake (Alternative A) has jointed couplings, which eliminates the need for the lower assembly.

The life cycle costs for these alternatives are summarized below:

Table 4-1: Headworks Alternatives Cost Comparison

	Alternative A Duperon	Alternative B Mahr Bar
Capital Costs	$2,649,000	$2,784,000
Present Worth of Annual OM&R	$234,000	$208,000
Total Present Worth	$2,883,000	$2,992,000

4.4.5. Selected Alternative

Alternative "A" is recommended, which includes using the Duperon FlexRake Screen for the replacement of the existing Fine Screen Nos. 5 and 7. This alternative is more cost-effective and would have the same environmental and other impacts as the use of the Alternative B, Mahr Bar screen type. See Figure 4-1 for areas of the DWTF impacted by this project.

4.4.6. Secondary System Alternative A, Submersible Pumps *(Selected Alternative)*

The eight existing RAS pumps to all six Secondary Clarifiers would be replaced under both alternatives. The three existing vertical RAS pumps serving Secondary Clarifier Nos. 5 and 6 will be replaced in kind and would include new piping, valves and meters. (This is the only type of pump that can be used given the existing configuration.) Alternative A includes the replacement of the five submersible RAS pumps that serve Secondary Clarifier Nos. 1 through 4 with submersible pumps. All other work included in the Secondary/Headworks Improvements: Segment 1 project, as described previously, would be the same.

4.4.7. Secondary System Alternative B, Vertical Turbine Pumps

This Alternative B includes all of the work items from the Secondary/Headworks Improvements: Segment 1 project, as described previously, except for the configuration of the replacement RAS pumps that serve Secondary Clarifier Nos. 1 through 4. The only practical alternative to the existing pump configuration is to utilize vertical turbine RAS pumps, similar to the original equipment. This would require removal of the wet well floor hatch, structural support or concrete deck to support the new pumps and modifications to the discharge piping.

4.4.8. Secondary Alternatives Cost Comparison and Summary

The principal advantage of submersible pumps is the ease of replacement; new pumps can simply be re-installed in the same configuration. Five pumps for the four Secondary Clarifiers are provided to allow ease of pump change-out when servicing and for redundancy. The pumps can be removed easily, and taken to the maintenance building for indoor service during winter months.

The cost for replacing the submersible pumps in-kind is less expensive that installing new vertical turbine pumps. Replacement dry pit submersible pumps must be rated for Class I Division I environments. The life cycle costs for these alternatives are summarized below:

Table 4-2: Secondary Alternatives Cost Comparison

	Alternative A Submersible	Alternative B Vertical Turbine
Capital Costs	$1,456,000	$1,945,000
Present Worth of Annual OM&R	$1,315,000	$1,197,000
Total Present Worth	$2,771,000	$3,043,000

4.4.1. Selected Alternative

Alternative "A" is recommended, which includes replacement of the five submersible RAS pumps that serve Secondary Clarifier Nos. 1 through 4 with similar submersible pumps. This alternative is more cost-effective and would have the same environmental and other impacts as the use of the Alternative B, vertical turbine type pumps. See Figure 4-1 for areas of the DWTF impacted by this project.

4.5. Biosolids Disposal Alternatives

This project will provide an alternate means of solids disposal for the DWTF. The current practice of landfilling unstabilized solids is not considered a long-term solution, as described in Section 3. It is therefore recommended the DWTF establish another means of solids disposal. This analysis builds upon the alternatives reviewed in the 2009 DSDS SRF Project Plan, which included eight alternatives. The three most cost-effective alternatives are included herein, along with review of a fourth alternative, biosolids drying.

4.5.1. Alternative A, Landfill Unstabilized Solids *(Selected Short-Term Alternative)*

This work would continue the current practice of contracting hauling and disposal of unstabilized, dewatered solids to landfill. As described in Section 3, no Wayne County landfills can currently accept these types of solids and the long-term costs and feasibility of continuing to dispose at other landfills is uncertain. However, if this practice were to continue through the planning period, additional reinvestment of the associated dewatering and conveying equipment would be required. The cost analysis therefore includes the cost for a Silo Tank, Silo load/unload, conveyance, one new centrifuge in year 5, two new centrifuges in year 10, and new conveyors in year 10.

Long-term operational costs are very uncertain as the current hauling contract can be extended for another two years. For the purpose of this evaluation, current hauling and disposal pricing is used for the long-term with the assumption that this would remain a viable practice, just for the present worth analysis. Additional discussion on reviewing potential cost increases is provided in the recommendations section.

4.5.2. Alternative B, Landfill Class B Solids *(Possible additional Long-Term Alternative)*

This alternative would continue the practice of contracting hauling and disposal of solids to landfill, but the solids would be stabilized using a lime process to meet Class B requirements. These types of solids are generally accepted by landfills without issue.

The cost analysis includes the costs for the new equipment required to stabilize the solids to Class B requirements using lime, as well as the equipment required to continue dewatering, similar to Alternative A. The work includes demolishing the incinerators and modifications to

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the building so that the area may be re-used to house the new equipment, a lime stabilized sludge silo, silo loading/unloading, conveyance, a pug mill, one new centrifuge in year 5, two new centrifuges in year 10, and new conveyors in year 10.

Long-term operational costs include costs for the lime and an estimate of the cost for hauling and landfill disposal at current pricing. Additional discussion on reviewing potential cost increases is provided in the recommendations section.

4.5.3. Alternative C, Land Apply Class B Solids

This alternative is similar to the previous in that solids would be stabilized using a lime process to meet Class B requirements. However, the resulting stabilized solids would be land applied rather than landfilled. Note that a review of neighboring wastewater treatment facilities indicates that recent weather patterns have required up to 150 days of storage for solids generated during the non-growing season. The analysis made in 2009 used only 120 days, and also did not include a storage facility for the solids.

The cost analysis includes the costs for the new equipment required to stabilize the solids to Class B requirements using lime, as well as the equipment required to continue dewatering, similar to Alternative B. The work includes demolishing the incinerators and modifications to the building so that the area may be re-used to house the new equipment, a lime stabilized sludge silo, silo loading/unloading, conveyance, a pug mill, one new centrifuge in year 5, two new centrifuges in year 10, and new conveyors in year 10. This alternative also includes new storage facilities for the solids generated outside of the growing season, which is the only time Class B solids may be land-applied. Long-term operational costs include costs for the lime and an estimate of the cost for hauling and land application at current pricing.

4.5.4. Alternative D, Biosolids Drying and Beneficial Use *(Selected Long-Term Alternative)*

The Biosolids Drying and Beneficial Use project includes the addition of a new natural gas biosolids drying system, along with all the associated processing, conveying, loading, and emissions control equipment. The process results in dried biosolids in the form of discrete granules that are pathogen-free, and can be sold for reuse as commercial fertilizer, combustible fuel, and/or soil additive. It is assumed the cost of the shipping and sale of the material would be offset by the revenue from the sales. Currently, the Detroit Water and Sewerage Department (DWSD) is utilizing a similar biosolids drying process, as are facilities in other areas of the Country, and there appears to be sufficient market demand for the product. As a worst-case scenario, the product could be landfilled locally as it would not present the same issues and concerns to the landfill operator as the current unstabilized sludge does. The percent solids would also be significantly higher, reducing volume and cost to landfill.

The estimated project costs include the following major elements and equipment:

- The existing centrifuge would be used and the existing four belt filter presses would be replaced with a new centrifuge at the end of its in five years, and replacement of the existing conveying system and two centrifuges at the end of their expected useful lives (approximately 2025.)
- A new sludge grinder, feed pump and dry polymer preparation system to feed the centrifuge.
- New sludge drying system complete with all required equipment including storage bins, feeder screws and conveyors, pug mill, separator, storage silo, and the sludge dryer.
- New air handling and emission control systems.
- Required renovations to the DWTF's existing Solids Building to accommodate the equipment.

- Equipment required to landfill dewatered biosolids one month per year, to allow for major annual maintenance of the new equipment and to provide a contingency an alternate means of solids disposal.

Because the project significantly reduces the volume of residuals stemming from the treatment process, it is anticipated that the project may qualify for Green Project Reserve funding through the State Revolving Fund (SRF) program. While the availability of these funds changes year to year, in the past the program has provided up to 50% principal forgiveness (grant funding) for qualified projects. The project cost estimate and present worth analysis do not take this potential funding into consideration, but it could reduce costs significantly if the funding were available.

4.5.5. Biosolids Disposal Alternatives Cost Comparison and Summary

The life cycle costs for these alternatives are summarized below:

Table 4-3: Biosolids Disposal Alternatives Cost Comparison

	Alternative A Landfill Unstabilized Solids	Alternative B Landfill Class B Solids	Alternative C Land Apply Class B Solids	Alternative D Biosolids Drying and Reuse
Capital Costs	$12,284,000	$24,257,000	$73,248,000	$36,772,000
Present Worth of Annual OM&R	$4,140,600	$6,135,800	$7,231,600	$4,942,350
Total Present Worth	$65,594,506	$102,473,662	$155,259,788	$100,523,000

4.5.6. Selected Alternative

Alternative "D" is recommended for the long-term and Alterative "A" for the short-term. The alternative analysis presented above demonstrates that Biosolids Drying and Beneficial Use is the most cost-effective and environmentally preferred alternative, after the current landfilling practice, which again is not considered a long-term solution.

Because of uncertainty associated with the continued practice of landfilling unstabilized solids, it is recommended that the Biosolids Drying and Beneficial Use project proceed first with planning and basis of design development starting in FY2015. It is recommended that the basis of design also include a review of the next lowest-cost alternative, landfilling of Class B solids (Alternative B), because the present worth costs between the two options are very close, and are impacted differently by commodity costs, such as natural gas and fuel/landfill costs, which may change between now and the next two years.

Wayne County currently has two years remaining in their current hauling and disposal contract, and it is anticipated that basis of design would be complete and project costs refined at the same time that a new solids disposal contract would be needed. At that time, the new hauling and landfill disposal costs would be reviewed against the costs to implement the biosolids drying project. Should adequate landfills be available and the hauling and disposal prices remain cost-effective, the DWTF will continue with the current practice. (Note that additional reinvestment and replacement of the equipment used for the current practice would be required, including replacement of the existing belt filter presses with a new centrifuge in approximately five years, and replacement of the existing two centrifuges and conveying system in 10 years. This work was included in the present worth analysis for consideration of the current practice.) If the cost to haul and dispose of the solids increases significantly under a new contract, Wayne County

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could have a design for the Biosolids Drying and Beneficial Use project ready to implement in FY 2017. See Figure 4-1 for areas of the DWTF impacted by the project.

For the purposes of project planning, the Biosolids Drying and Beneficial Use project is included as a FY2017 project. Again, if the current landfilling of unstabilized solids remains feasible and cost-effective in the near term, this project could be deferred into the next five-year planning period. However, given the regulatory and environmental issues associated with the current practice, it is recommended that an alternative method be ready to implement because landfill cost and/or availability could change on very short-notice.

4.6. DSDS Interceptor System (Including the RTDS) Alternatives

In addition, repair of the segment of the DSDS collection system sewers is required as a Priority 1 project, as described in Section 3. The alternative of replacing existing sewers that require rehabilitation with new, similarly-sized sewers using an open-cut replacement method was not considered as a feasible alternative because the defects generally occur at specific locations that would better be addressed by localized rehabilitation. In addition, because of the location of the sewers under existing major roadways and their depths, replacement would be more expensive and impact to the public and surrounding environment would also be much greater. Two alternatives for in-situ sewer repairs were reviewed and are described as follows:

4.6.1. Alternative A, Pressure Grouting *(Selected Alternative)*

This Alternative utilizes pressure grouting to repair the deficient areas found in the recent sewer survey. The work would be performed within the sewer, with no open cut excavation. The cost includes the required bypass pumping.

4.6.2. Alternative B, EPDM/Steel Bands

This Alternative utilizes a repair method such as the proprietary "WEKO-SEAL" product, which is a flexible rubber leak clamp that provides a non-corrodible seal around the inside of the pipe-joint area. Similarly to pressure grouting, the work would be performed within the sewer and the cost includes the required bypass pumping.

4.6.3. Sewer Improvements Cost Comparison and Summary

The life cycle costs for these alternatives are summarized below:

Table 4-4: Sewer Improvements Cost Comparison

	Alternative A Pressure Grouting	Alternative B New Sewers
Capital Costs	$1,935,000	$2,605,000
Present Worth of Annual OM&R	$39,000	$36,000
Total Present Worth	$1,974,000	$2,641,000

4.6.4. Selected Alternative

Alternative "A" is recommended, which utilizes pressure grouting to repair the deficient areas found in the recent sewer survey. The work would be performed within the sewer, with no open cut excavation. The repair cost also includes the required cost for bypass pumping. The Figure 4-2 shows the portions of the sewer that were surveyed and would be addressed as part of this project.

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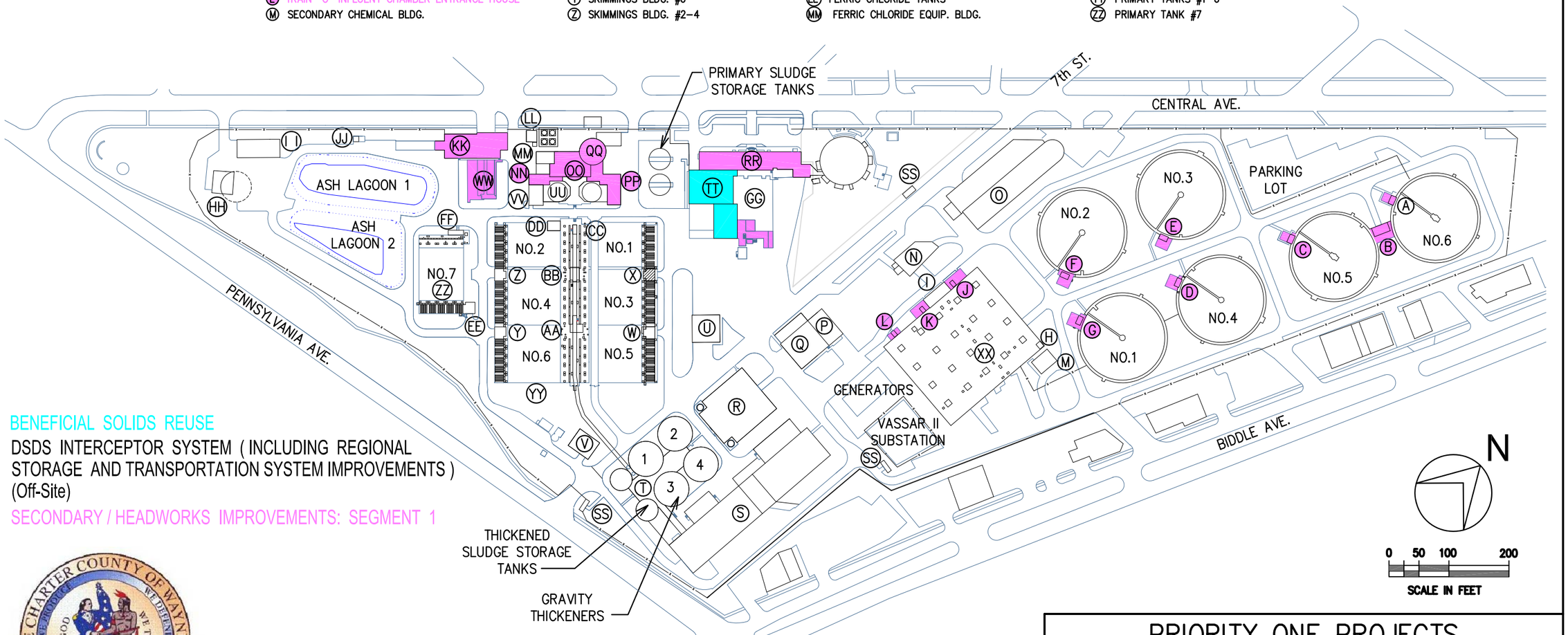
DOWNRIVER WASTEWATER TREATMENT FACILITY

- (A) CLARIFIER BLDG. #6
- (B) RETURN ACTIVATED SLUDGE BLDG.
- (C) CLARIFIER BLDG. #5
- (D) CLARIFIER BLDG. #4
- (E) CLARIFIER BLDG. #3
- (F) CLARIFIER BLDG. #2
- (G) CLARIFIER BLDG. #1
- (H) SAMPLE BLDG.
- (I) SECONDARY OXYGEN CONTROL BLDG.
- (J) N. INFLUENT CHAMBER ENTRANCE HOUSE
- (K) S. INFLUENT CHAMBER ENTRANCE HOUSE
- (L) TRAIN "O" INFLUENT CHAMBER ENTRANCE HOUSE
- (M) SECONDARY CHEMICAL BLDG.
- (N) SECONDARY LOW LIFT PUMP STATION
- (O) MAINTENANCE BLDG.
- (P) STOCKROOM #1
- (Q) EMPLOYEE SERVICE BLDG.
- (R) DISSOLVED AIR FLOTATION (DAF) BLDG.
- (S) SOLIDS HANDLING BLDG.
- (T) SOLIDS THICKENING COMPLEX
- (U) MAINTENANCE GARAGE
- (V) SKIMMINGS PUMP BLDG.
- (W) SKIMMINGS BLDG. #5
- (X) SKIMMINGS BLDG. #1-3
- (Y) SKIMMINGS BLDG. #6
- (Z) SKIMMINGS BLDG. #2-4
- (AA) PRIMARY MOTOR CONTROL CENTER #1-6
- (BB) PRIMARY PUMP GALLERY
- (CC) PRIMARY PUMP GALLERY ENTRANCE HOUSE
- (DD) PRIMARY POLYMER BLDG.
- (EE) SKIMMINGS BLDG. #7
- (FF) PRIMARY MOTOR CONTROL CENTER #7
- (GG) ULTRAVIOLET DISINFECTION
- (HH) TUNNEL PUMP STATION
- (II) TUNNEL PUMP STATION ELECT. BLDG.
- (JJ) RECYCLE SAMPLE BLDG.
- (KK) AERATED GRIT BLDG.
- (LL) FERRIC CHLORIDE TANKS
- (MM) FERRIC CHLORIDE EQUIP. BLDG.
- (NN) WEST GRIT BLDG.
- (OO) FINE SCREENS BLDG.
- (PP) EAST GRIT BLDG.
- (QQ) INFLUENT PUMP STATION
- (RR) ADMINISTRATION BLDG.
- (SS) WATER METER BLDG. (3 SHOWN)
- (TT) OLD SOLIDS BLDG.
- (UU) DETRITORS
- (VV) OLD GREASE BURNER BLDG.
- (WW) AERATED GRIT TANKS
- (XX) AERATION TANKS
- (YY) PRIMARY TANKS #1-6
- (ZZ) PRIMARY TANK #7



1. BENEFICIAL SOLIDS REUSE
2. DSDS INTERCEPTOR SYSTEM (INCLUDING REGIONAL STORAGE AND TRANSPORTATION SYSTEM IMPROVEMENTS) (Off-Site)
3. SECONDARY / HEADWORKS IMPROVEMENTS: SEGMENT 1

SEAL OF THE CHARTER COUNTY OF WAYNE, MICHIGAN 1796

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PRIORITY ONE PROJECTS

JOB NO.	HUBBELL, ROTH & CLARK, INC.	FIGURE NO.
20100602.92	CONSULTING ENGINEERS	4-1
DATE	220 BAGLEY SUITE 420	
APRIL, 2014	DETROIT, MICH. 48226	

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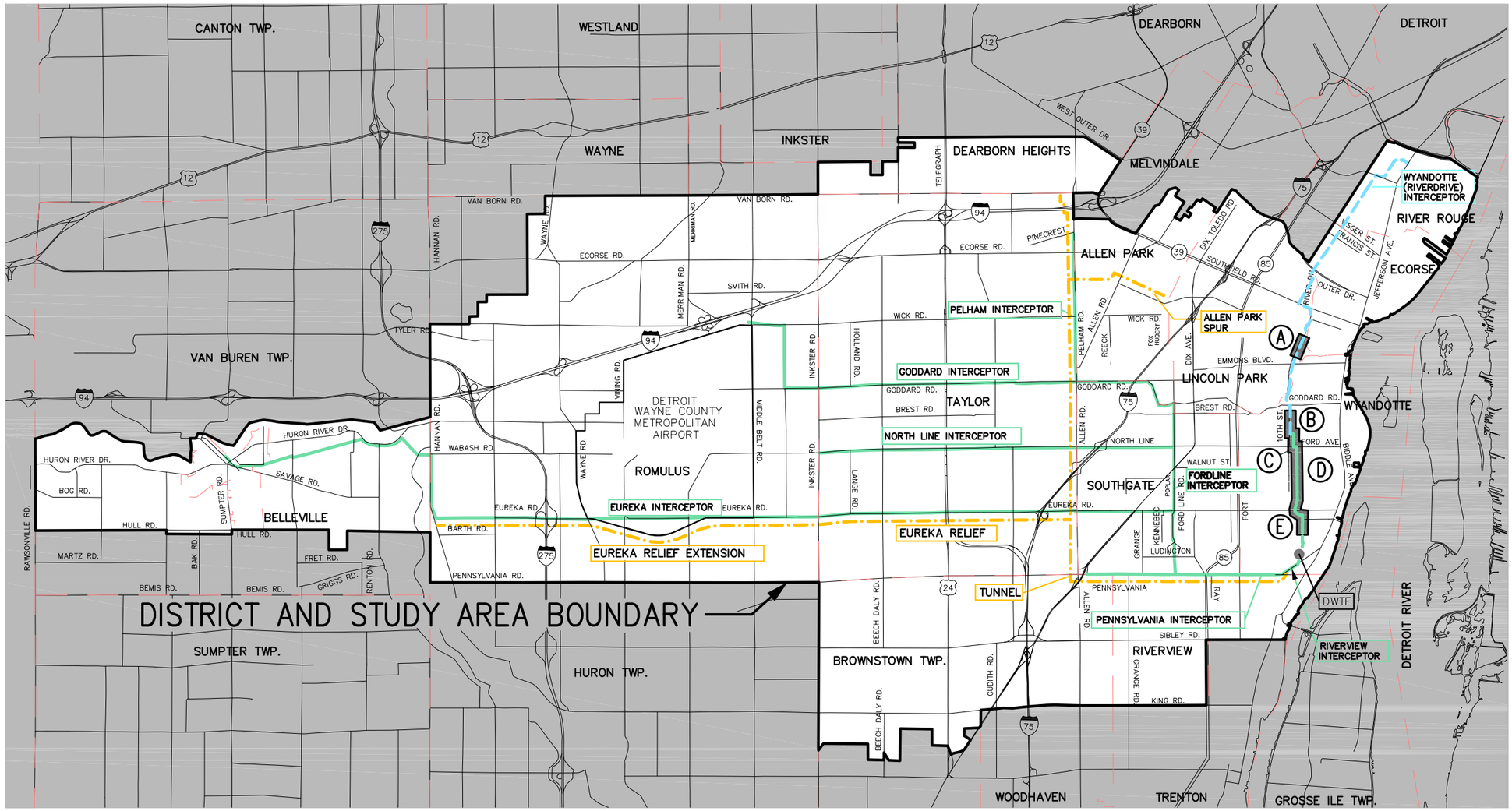

INTERCEPTOR SYSTEM ASSESSMENTS

(A) WYI – CONTRACT NO. 1
RIVER DR. BETWEEN
EMMON BLVD. AND
NEW YORK AVE.
(APPROX. 832 L.F.)

(B) WYI – CONTRACT NO. 1
10 TH ST. BETWEEN
ALKALI AND GODDARD
(APPROX. 2112 L.F.)

(C) DSDS PART 1 – CONTRACT NO. 6
ELECTRIC AVE. BETWEEN
FORD AVE. AND ALKALI
(APPROX. 758 L.F.)

(D) DSDS PART 1 – CONTRACT NO. 6
9TH ST. BETWEEN VINEWOOD AND
FORD AVE. (APPROX. 1801 L.F.)

(E) DSDS PART 1 – CONTRACT NO. 6
8TH ST. BETWEEN ORCHARD AND
PINE (APPROX. 1053 L.F.)

LEGEND

WYANDOTTE (RIVERDRIVE) INTERCEPTOR (WYI) – 1938 CONSTRUCTION
DOWNRIVER SEWAGE DISPOSAL SYSTEM INTERCEPTOR (DSDS) – 1962 CONSTRUCTION
DOWNRIVER REGIONAL STORAGE AND TRANSPORT SYSTEM (DRSTS) – 1998 CONSTRUCTION
DOWNRIVER WASTEWATER TREATMENT FACILITY (DWTF)
COLLECTION SYSTEM ASSESSMENT LOCATIONS
(X)

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INTERCEPTOR SYSTEM ASSESSMENT		
JOB NO. 20100602.92	HUBBELL, ROTH & CLARK, INC.	FIGURE NO.
DATE APRIL, 2014	CONSULTING ENGINEERS 220 BAGLEY SUITE 420 DETROIT, MICH. 48226	4–2

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Section 5 - Recommended Projects

5.1. General

The following summarizes the recommended projects that will allow for continued operation of the existing DWTF through the 20-year planning period, and provides a breakdown of the project costs for each element of the proposed project. Additional project cost breakdowns are included in Appendix C.

Table 5-1: Cost Summary for Recommended Projects

Priority 1 Projects (FY 2015 to 2019)	Capital Cost
Secondary/Headworks Improvements: Segment 1	$18,000,000
Biosolids Drying and Beneficial Reuse: Design* (*Basis of Design completed first at an estimated cost of $1.2M, before proceeding to project design at estimated cost of $4.2M*)	$5,421,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
Biosolids Drying and Beneficial Reuse: Construction	$41,931,000
TOTAL:	***$70,352,000***
Priority 2 Projects (FY 2020 to 2024)	**Capital Cost**
Secondary/Headworks Improvements: Segment 2	$5,977,000
D-A-F Building Renovation	$7,174,000
Instrumentation and SCADA Improvements	$10,000,000
Ultraviolet Disinfection Renovations	$17,226,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
TOTAL:	***$45,377,000***
Priority 3 Projects (FY 2025 to 2029)	**Capital Cost**
Primary Treatment System Improvements	$9,834,000
Secondary/Headworks Improvements: Segment 3	$34,867,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
TOTAL:	***$49,701,000***
Priority 4 Projects (FY 2030 to 2034)	**Capital Cost**
Instrumentation and SCADA Improvements	$10,000,000
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	$5,000,000
TOTAL:	***$15,000,000***
TOTAL ALL PROJECTS (FY 2015-2034):	**$180,430,000**

**Note that the SRF program provides funding for reimbursement of planning and design costs at the time of construction for projects selected for funding. The planning and design costs for the proposed biosolids project is provided for reference only because of the need to further evaluate current commodity and operational costs as well as landfill availability for the project alternatives associated with solids disposal.*

5.2. Authority to Implement Selected Alternative

Wayne County has the necessary legal, institutional, financial, and managerial authority and resources to build, operate, and maintain the wastewater facilities. Implementation of the proposed project requires a resolution of approval and adoption of the 2014 SRF Project Plan by the Wayne County Commission. The Wayne County Commission approved the 2014 SRF Project Plan at the June 19th regular meeting of the Commission. A copy of the approved resolution is included in Appendix E.

5.3. Water Quality Management Plans

The Southeast Michigan Council of Governments (SEMCOG) is the regional planning commission for Wayne County. A copy of the draft 2014 SRF Project Plan was submitted to SEMCOG for their review for consistency with local water quality management plans. Correspondence with SEMCOG is included in Appendix D.

5.4. User Costs

The estimated user costs to finance the projects proposed for the first five-year period have been determined assuming State Revolving Fund financing with a 2.5% interest rate and 20-year debt retirement. Capital and operation, maintenance and replacement costs are included and the allocation to each community tributary to the DSDS is based on each community's portion of the total rate year cost using a five-year average of flows to the system. The estimated annual cost per household (based on 100,000 gallons per year of water use) for the projects to be implemented between 2015 and 2019, for residents of the DSDS service area, is presented below:

Table 5-2: Cost for Typical Residential DSDS Customer for FY 2015 - 2020

Community	Avg. Flow - 2008-2012 (MCF/year)		Avg. Flow - 2008-2012 (1,000 gal/year)		% of Total Flow 5 Yr. Ave.	5-Yr Project Cost Share	Annual Capital Cost	Annual O,M&R Cost	Annual Cost per Household (3)
	Base	Excess	Base	Excess					
Allen Park	162,770	117,567	1,217,601	879,460	10.74%	$7,558,539	$484,857	$85,951	**$46.88**
Belleville	17,214	10,489	128,769	78,463	1.06%	$746,937	$47,914	$8,494	**$43.81**
Brownstown Township	53,013	24,728	396,564	184,978	2.98%	$2,096,079	$134,457	$23,835	**$39.92**
Dearborn Heights	85,121	47,699	636,748	356,812	5.09%	$3,581,137	$229,719	$40,723	**$42.47**
Ecorse	131,054	86,351	980,349	645,949	8.33%	$5,861,745	$376,013	$66,656	**$45.15**
Lincoln Park	167,226	113,603	1,250,934	849,807	10.76%	$7,571,804	$485,708	$86,102	**$45.71**
River Rouge	66,028	64,543	493,922	482,814	5.00%	$3,520,498	$225,829	$40,033	**$53.83**
Riverview	61,791	32,149	462,228	240,491	3.60%	$2,532,841	$162,474	$28,802	**$41.38**
Romulus	210,379	110,746	1,573,740	828,435	12.31%	$8,658,278	$555,402	$98,457	**$41.55**
Southgate	138,821	80,647	1,038,450	603,280	8.41%	$5,917,369	$379,581	$67,289	**$43.03**
Taylor	315,912	167,728	2,363,180	1,254,689	18.54%	$13,040,062	$836,480	$148,284	**$41.67**
Van Buren Township	32,493	14,434	243,064	107,974	1.80%	$1,265,261	$81,163	$14,388	**$39.31**
Wyandotte	197,637	99,127	1,478,424	741,520	11.37%	$8,001,449	$513,269	$90,988	**$40.87**
Total	**1,639,459**	**969,811**	**12,263,973**	**7,254,671**	**100%**	**$70,352,000**	**$4,512,868**	**$800,000**	

(1) Community allocation is based on each community's portion of the total rate year cost.
(2) Annual capital costs and O,M&R costs are based on SRF financing at an interest rate of 2.5%.
(3) Household costs are based on 100,000 gallons per year of water use.

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Estimated annual user costs are based on total project costs for the Priority One projects proposed for 2015-2019, and assume typical household water use of 100,000 gallons per year. A rate study will be made at the time of project construction to determine sufficiency of the existing rate structure.

5.5. Schedule

The proposed schedule for implementation of Priority 1 projects is shown in the table below. The proposed year and quarter in which an SRF loan will be sought is included.

Table 5-3: Proposed Schedule for Priority 1 Projects

Priority 1 Projects (FY 2015 to 2019)	SRF Fiscal Year	SRF Financing Quarter
Secondary/Headworks Improvements: Segment 1	2015	4th quarter
Biosolids Drying and Beneficial Reuse: Design*	2016	n/a
DSDS Interceptor System (Including Regional Storage and Transport System) Improvements	2016	4th quarter
Biosolids Drying and Beneficial Reuse: Construction	2017	4th quarter

**The design portion of this project would funded by the SRF program at the time the project is constructed. This is typical of the SRF program, which allows for inclusion of eligible planning and design project costs for reimbursement at the time the construction costs are approved for bonding.*

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Section 6 - Environmental Impacts

6.1. General

Analysis of anticipated environmental impacts resulting from the construction of the proposed project impacts must address beneficial and adverse, short and long term, and irreversible and irretrievable impacts.

6.1.1. Long-Term Impacts

The implementation of the 2014 Plan would allow for improved operation of the existing facilities by replacing and upgrading equipment that has served its useful life or has been subject to excessive downtime for maintenance.

No acquisition of private property is required for the implementation of the 2014 Plan. The project will be constructed adjacent to and within the existing facilities for economical purposes and in order to minimize any adverse impacts to historic or environmental resources.

6.1.2. Short-Term Impacts

The implementation of the 2014 Plan will create indirect and induced employment in other economic sectors of the area and at sites where materials for the construction programs are manufactured. No residents would be displaced because of construction activities.

Construction will take place at the existing facility sites, and there would be heavy traffic to and from the construction sites. Environmental disruption, including noise, soil erosion, fumes, etc., would occur during construction. All of these factors would produce temporary adverse aesthetic impacts.

6.1.3. Irreversible Impacts

The investment in non-recoverable resources committed to the 2014 Plan would be traded off for the restored and improved performance of the facilities during the life of 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.

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Section 7 - Mitigation

7.1. General

The 2014 Plan is required to include proposed mitigation of any potential adverse impacts on the environment. As described in Section 6.1, the overall environmental impact of the project will allow for water quality improvement, through continued operation of the DWTF.

7.2. Mitigation of Long-Term Impacts

The potential soil erosion impact would be mitigated through the contractor's required compliance with a program for control of soil erosion and sedimentation, as specified in Part 91 of Michigan Act 451, P.A. of 1994. Areas of any earth-changing activities will be restored to the existing condition.

7.3. Mitigation of Short-Term, Construction-Related Impacts

Environmental disruption will occur during construction. Guidelines will be established for cover vegetation removal, dust reduction, traffic control, and accident prevention. Once construction is completed those short-term effects will stop and the area will be returned to the original conditions insofar as possible.

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Section 8 - Public Participation

8.1. General

The 2014 SRF Project Plan was advertised in local papers for each of the 13 communities, which included two separate publications: *The Sunday Press and Guide, and The Sunday News Herald* (see Appendix F.) Copies of the document were made available for public review and inspection at the Clerk's Office for the each of the 13 communities (Allen Park, Belleville, Brownstown Twp., Dearborn Heights, Ecorse, Lincoln Park, River Rouge, Riverview, Romulus, Southgate, Taylor, Van Buren Twp., and Wyandotte); at HRC's Detroit office, and at the Wayne County Department of Public Services' office and website, beginning on May 12, 2014.

Written comments were invited to be sent to the Wayne County Department of Environment, until the close of the public comment period on June 12, 2014, but none were received. Copies of correspondence related to agency notifications and MDEQ correspondence on the 2014 SRF Project Plan are included in Appendix D.

8.2. Public Meetings

A meeting of the Technical, Finance and Legal committees for the Joint Management Committee (JMC) for the DSDS was held on May 1, 2014 at the offices of Wade-Trim with representatives from each of the committees present. Representatives from Wayne County and Hubbell Roth & Clark were also in attendance and made a presentation of the Executive Summary for the draft 2014 SRF Project Plan. A second, general meeting of the JMC with representatives from all 13 member communities present took place on May 29 at Taylor City Hall, where a resolution adopting the 2014 SRF Project Plan was approved. A copy of the resolution is included in Appendix E.

A formal public meeting was held on June 11, 2014 at 7:00 p.m. at the City of Wyandotte City Hall's Council Chambers to review the work associated with the proposed 2014 SRF Project Plan. The meeting reviewed the information presented in the 2014 SRF Project Plan, including estimated user costs, and was to provide an opportunity for interested persons to present comments or questions. However, the only people in attendance were a reporter for the *Times-Herald* / *Sunday Times*, the court stenographer, and Wayne County and HRC staff. No questions or comments were made by anyone during the meeting. An attendance sheet, a transcript of the meeting, and copies of the slides presented are included in Appendix G.

8.3. Resolution

A resolution approved by the Wayne County Commission in their regular meeting on June 19, 2014, to adopt the proposed 2014 SRF Project Plan, is provided in Appendix E.

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Section 9 - Glossary

Term	Description
• 10-year Storm	A storm of a designated duration (ranging from 30 minutes to 24 hours) that has a 10% chance of occurring in a given year.
• 100-year Storm	A storm of a designated duration (ranging from 30 minutes to 24 hours) that has a 1% chance of occurring in a given year.
• AOC	Area of Concern, relates to
• Average Flow	The average quantity of flow that passes a point over a given period of time.
• Biochemical Oxygen Demand (BOD)	A measure of wastewater pollutant strength that quantifies oxygen consumed in a stated period of time, usually 5 days at 20°C. Includes oxygen consumed in ammonia oxidation.
• Bypass	The measurable diversion of raw sewage out of the sewer system.
• cfs	Cubic feet per second.
• CIP	Capital Improvement Projects
• Cost-Effectiveness Analysis	An analysis performed to determine which alternate collection or treatment system would result in the minimum total resource cost to meet the requirements. A cost-effectiveness analysis for a sewer system determines this by comparing with total costs for transportation and treatment of the infiltration/inflow.
• Cost-Effectiveness Guidelines	Developed by EPA to aid grantees in the selection of a system component which will result in the minimum total resources cost over a fixed period of time to meet federal, state, and local requirements.
• CSO	Combined Sewer Overflow. CSOs occur during wet weather events when the capacity of a combined sewerage system (where stormwater and sanitary flows are conveyed in a single pipe) is exceeded.
• Dissolved Air Floatation (DAF)	The separation of flocculated material from liquid by contact with minute bubbles causing the air/floc mass to be buoyed to the surface, leaving behind clarified water.
• Design Flow	The average quantity of wastewater which a treatment facility or collection system component is designed to handle. Usually expressed in millions of gallons per day (MGD) or cubic feet per second (cfs).
• Design Period	Time span over which proposed collector or treatment facilities are expected to be operating; period over which facility costs are amortized.
• Dissolved Oxygen (D.O.)	Molecular (atmospheric) oxygen dissolved in water or wastewater.
• DRSTS	Downriver Regional Storage and Transport System
• Drainage District or Watershed	The tributary area of a particular point on a channel system that contributes storm water runoff upstream of that point.
• DSDS	Downriver Sewage Disposal System

Term	Description
• Elutriation	A process of sludge conditioning whereby the sludge is washed with either fresh water or plant effluent to reduce the demand for conditioning chemicals and to improve the settling and/or filtering characteristics of the solids. Excessive alkalinity is removed during this process.
• Enhanced Biological Phosphorus Removal (EBPR)	A wastewater treatment configuration applied to activated sludge systems for the removal of phosphate.
• Environmental Impact Assessment (EIA)	A preliminary evaluation of the potential environmental impacts (positive and negative) of a proposed federally funded project. It should be submitted as part of a Project Plan.
• Environmental Impact Statement (EIS)	A detailed analysis of the potential environmental impacts of a proposed project required when the EPA Regional Administrator determines that a project is highly controversial or may have significant adverse environmental effects.
• EPA	Environmental Protection Agency
• EPDM	Ethylene-Propylene-Diene, M-class rubber is type of synthetic rubber, or an elastomer, which is characterized by wide range of applications.
• FEMA	Federal Emergency Management Agency.
• Flood	An overflow of lands not normally covered by water that is used or is usable to man. Normally a "flood" is considered as any temporary rise in stream flow and stage that results in significant adverse effects in the vicinity. (See surface runoff for comparison.)
• Floodplain	The relatively flat area or low land adjoining the channel of a river or stream, which has been or may be covered by floodwater. Formally defined as the area that would be flooded during a 100-year storm.
• Floodway	The channel of the stream plus any adjacent flood plain areas that must be kept free of encroachment such that a 100-year flood can be transported without increasing upstream water elevations more than 0.10 feet.
• Force Mains	Pipes used to transport wastewater under pressure against the force of gravity.
• FRP	Fiber-Reinforced Plastic
• GAC	Granular Activated Carbon
• gpd	Gallons per day.
• gpm	Gallons per minute.
• Head	A measure of pressure exerted by a fluid expressed as the height of an enclosed column of the fluid that could be balanced by the pressure in the system.
• Headloss	The difference in water level between the upstream and downstream sides of a treatment process attributed to friction losses.
• HDPE	High Density Polyethylene
• HRC	Hubbell, Roth & Clark, Inc.

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Term	Description
• H&V / HVAC	Heating and Ventilation / Heating, Ventilation, and Air Conditioning.
• Hydraulic Gradient	The slope of the hydraulic grade line. This is the slope of the wastewater surface in an open channel or the slope of the water pressure for pipes under pressure.
• Hydrograph	A curve denoting the discharge of flow over a period of time.
• Infiltration/Inflow (I/I)	The total quantity of water from both infiltration and inflow without distinguishing the source.
• Infiltration	The water entering a sewer system from the soil through defective pipes, foundation drains, pipe joints, connections and manhole walls.
• Inflow	The water discharged into a sewer system from roof drains, cooling water discharges, drains from springs and swampy areas, manhole covers, cross-connections from storm sewers and combined sewers, catch basins, storm waters, surface runoff, street wash waters or drainage.
• Influent	The flow entering a treatment process.
• Interceptor	Any pipe, regardless of size that carries wastewater directly to the treatment plant. Generally, they are the largest pipes in the collection system.
• I/O	Input/Output (related to electrical and control devices)
• IPS	Influent Pumping Station
• Industrial Water (IW)	A water service separated from the potable water system by a backflow preventer. The potable water connection is typically a city-water connection.
• JMC	Joint Management Committee
• Lateral	The pipe to which individual houses and business establishments connect to public sewers.
• LEL	Lower Explosive Limit or Lower Exposure Limit
• Lift Station (Pump Station)	A facility within a sanitary sewer system which pumps flows from a lower elevation to a higher elevation.
• Main/Submain	The word “main” is frequently used loosely to indicate a large pipe, which is not a lateral and not an interceptor. If frequently forms one of the larger branches of a complex collection system.
• MDEQ	Michigan Department of Environmental Quality.
• MDNR	Michigan Department of Natural Resources
• MGD	Millions of gallons per day.
• MH	Manhole.
• MLSS	Mixed Liquor Suspended Solids
• National Pollutant Discharge Elimination System (NPDES)	The effluent discharge permit system established under the 1972 Federal Water Pollution Control Administration as part of the Clean Water Act, which places conditions on the type and concentration of pollutants that discharge to a waterway of the United States.

Term	Description
• OM&R	Operation, Maintenance, and Replacement. The MDEQ SRF Project Planning process requires a cost-effectiveness analysis that includes all present and future costs (OM&R) associated with a project to be considered.
• PAH	Polyaromatic Hydrocarbon
• PCB	Polychlorinated Biphenyl
• Peak Flow	The maximum quantity of flow that passes a point over a given period of time.
• PLC	Programmable Logic Controller
• Primary Impacts	Those which can be attributed directly to a proposed action.
• PSTPCP	Primary Solids Transfer Pumps Control Panel
• RAP	Remedial Action Plan
• Return Activated Sludge (RAS)	Settled activated sludge that is returned to mix with raw or primary settled wastewater.
• RTU	Remote Telemetry Unit. It is an electronic device that provides automatic transmission and measurement of data from remote sources by wire or radio or other means.
• Sanitary Sewer	A sewer intended to carry only sanitary and industrial wastewater from residences, commercial buildings, industrial plants, and institutions, including service connections.
• Sanitary Sewer System (Sewage Collection System)	The entire network of sanitary sewers and pumping stations which collect a municipality's wastewater.
• SCADA	Supervisory Control and Data Acquisition
• Secondary Impacts	Those resulting from indirect or induced changes in community land use patterns, population and economic growth, and environmental quality resulting from induced growth.
• SEMCOG	Southeast Michigan Council of Governments
• Service Area	The area which will be serviced by a wastewater treatment system.
• Sewage	Sewage refers to the wastewater from residential, commercial, and industrial establishments, which flows through the pipes to a treatment plant.
• Sewer	Sewer refers to the pipe used to transport wastewater.
• Sewer or Sanitary District	A sewer district is usually either a semi-autonomous governmental unit whose purpose is the provision of sewerage or a special assessment district within which sewerage facilities are provided to residents.
• Screened Final Effluent (SFE)	Effluent from the treatment facility that is screened and may be utilized for flushing and/or other industrial water needs.
• SMACP	Solids Management Area Control Panel
• SMGRI/O	Solids Management Gallery Remote Input/Output Panel

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Term	Description
• State Revolving Fund (SRF)	This program was established to provide low cost financing for the construction of publicly owned water pollution control facilities. The program is jointly administered by the Michigan Municipal Bond Authority and the Michigan Department of Environmental Quality.
• Storm Sewer	A sewer intended to carry only storm waters, surface runoff, street wash waters, and drainage.
• S-W District	Southgate-Wyandotte Relief Drains Drainage District
• Surface Runoff	Water that is derived directly from precipitation and passes over the ground into storm sewers and water-courses (see "Flood" for comparison).
• TPS	Tunnel Pump Station
• Trunk Sewer	Generally, a large diameter municipal sewer that collects flow from smaller diameter municipal sewers and discharges to an interceptor sewer.
• Total Suspended Solids (TSS)	The measure of particulate matter suspended in a sample of water or wastewater. After filtering a sample of a known volume, the filter is dried and weighed to determine the residue retained.
• US EPA	The United States Environmental Protection Agency.
• User Charge	Fees levied upon users of a water or wastewater system, based on the volume and/or characteristics of the water.
• Ultraviolet Light (UV)	Light rays beyond the violet region in the visible spectrum; invisible to the human eye. UV light at a wavelength near to 254 nm inactivates microorganisms by directly damaging cellular nucleic acids.
• Variable Frequency Drive (VFD)	A control system that allows frequency of the current applied to a motor to be varied. The motor is connected to a low-frequency source while standing still; the frequency is then increased gradually until motor and pump (or other driven machine) operate at desired speed.
• Waste Activated Sludge (WAS)	Excess activated sludge that is discharged from an activated sludge treatment process.
• Water Quality Criteria	The levels of pollutants that affect the suitability of water for a given use. Generally, water use classification includes: public water supply, recreation, propagation of fish and other aquatic life, agricultural use and industrial use.
• WTP	Water Treatment Plant
• WWTF / WWTP	Wastewater Treatment Facility / Wastewater Treatment Plant

APPENDICES

A. NPDES Permit
B. Study Area Characteristics
C. Cost Estimates
D. Project Planning Correspondence
E. Resolution
F. Public Hearing Affidavits of Publication
G. Public Hearing Transcript

Appendix A
NPDES Permit

PERMIT NO. MI0021156

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq; the "Federal Act"), Michigan Act 451, Public Acts of 1994, as amended (the "Michigan Act"), Parts 31 and 41, and Michigan Executive Orders 1991-31, 1995-4, and 1995-18,

Wayne County
Department of Environment
Facilities Management Division
415 Clifford
Detroit, Michigan 48226

is authorized to discharge from the **Wayne County Downriver Wastewater Treatment Facility** located at

797 Central Avenue
Wyandotte, Michigan 48192

designated as **Wayne Co-Downriver WWTP**

to the receiving water named the Trenton Channel of the Detroit River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is based on a complete application submitted on July 16, 2007.

This permit takes effect on November 1, 2008. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules. On its effective date this permit shall supersede NPDES Permit No. MI0021156, expiring October 1, 2007.

This permit and the authorization to discharge shall expire at midnight, **October 1, 2012**. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application which contains such information, forms, and fees as are required by the Department by **April 4, 2012**.

Issued September 26, 2008 by Daniel Dell, Acting Chief, Permits Section. Based on a request submitted on January 8, 2009, this permit was **modified (minor)** on February 4, 2009.

Original Permit Signed by Daniel Dell
Daniel Dell, Chief
Permits Section
Water Bureau

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the Michigan Act, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. The fee shall be postmarked by January 15 for notices mailed by December 1. The fee is due no later than 45 days after receiving the notice for notices mailed after December 1.

In accordance with Section 324.3132 of the Michigan Act, the permittee shall make payment of an annual biosolids land application fee to the Department if the permittee land applies biosolids. In response to the Department's annual notice, the permittee shall submit the fee, which shall be postmarked no later than January 31 of each year.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Michigan Department of Environmental Quality (the "Department") required by this permit shall be made to the Southeast Michigan District Supervisor of the Water Bureau. The Southeast Michigan District Office is located at 27700 Donald Court, Warren, Michigan 48092-2793, telephone: 586-753-3700, fax: 586-753-3751.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the State Office of Administrative Hearings and Rules of the Michigan Department of Labor and Economic Growth, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Labor and Economic Growth may reject any petition filed more than 60 days after issuance as being untimely.

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A – Post Disinfection

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated municipal wastewater from Monitoring Point 001A through Outfall 001 and/or Outfall 002. Outfall 001 and Outfall 002 discharge to the Trenton Channel of the Detroit River. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration					
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Frequency of Analysis**	**Sample Type**
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	26,000	42,000	---	lbs/day	25	40	---	mg/l	Daily	24-Hr Composite
Total Suspended Solids	31,000	47,000	---	lbs/day	30	45	---	mg/l	Daily	24-Hr Composite
Total Phosphorus (P)	1,000	---	---	lbs/day	1.0	---	---	mg/l	Daily	24-Hr Composite
Ammonia Nitrogen (N)	(report)	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	24-Hr Composite
Fecal Coliform Bacteria	---	---	---	---	200	400	---	cts/100 ml	Daily	Grab
Oil and Grease	10,000	---	---	lbs/day	10	---	---	mg/l	Daily	Grab
Total Mercury	(report)	---	---	lbs/day	(report)	---	---	ng/l	Quarterly	Grab
	12-Month Rolling Average				**12-Month Rolling Average**					
	0.010	---	---	lbs/day	10	---	---	ng/l	Quarterly	Calculation
					Minimum Monthly					
$CBOD_5$ Minimum % Removal	---	---	---	---	85	---	---	%	Monthly	Calculation
Total Suspended Solids Minimum % Removal	---	---	---	---	85	---	---	%	Monthly	Calculation
					Minimum Daily		**Maximum Daily**			
pH	---	---	---	---	6.0	---	9.0	S.U.	Daily	Grab
Dissolved Oxygen	---	---	---	---	4.0	---	---	mg/l	Daily	Grab

The following design flow was used in determining the above limitations, but is not to be considered a limitation or actual capacity: 125 MGD

PART I

Section A. Limitations and Monitoring Requirements

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Sampling Locations
Samples for $CBOD_5$, total suspended solids, ammonia nitrogen and total phosphorus shall be taken prior to disinfection. Samples for dissolved oxygen, fecal coliform bacteria, and pH shall be taken after disinfection. The Department may approve alternate sampling locations which are demonstrated by the permittee to be representative of the effluent.

c. Ultraviolet Disinfection
It is understood that ultraviolet light will be used to achieve compliance with the fecal coliform limitations. If disinfection other than ultraviolet light will be used, the permittee shall notify the Department in accordance with Part II.C.11. - Changes in Facility Operations.

d. Percent Removal Requirements
These requirements shall be calculated based on the monthly (30-day) effluent $CBOD_5$ and total suspended solids concentrations for Monitoring Point 001A and the monthly influent concentrations for approximately the same period. These requirements are in effect for all periods of discharge up to and including the accepted annual average design flow rate of the wastewater treatment plant, currently 125 MGD. As allowed under 40 CFR 133, the permittee may submit a written demonstration to the Department that another design flow rate is appropriate. Upon receipt of written approval from the Department for an alternate design flow rate, and consistent with such approval, these permit requirements shall be in effect for the duration of the permit. The Department may rescind a revised design flow rate at any time upon notification to the permittee.

e. Final Effluent Limitation for Total Mercury
The final limit for total mercury is the Level Currently Achievable (LCA) based on a multiple discharger variance from the water quality-based effluent limit of 1.3 ng/l, pursuant to Rule 323.1103(9) of the Water Quality Standards. Compliance with the LCA shall be determined as a 12-month rolling average. The 12-month rolling average shall be determined by adding the present monthly average result to the preceding 11 monthly average results then dividing the sum by 12. For facilities with quarterly monitoring requirements for total mercury, quarterly monitoring shall be equivalent to 3 months of monitoring in calculating the 12-month rolling average. Facilities that monitor more frequently than monthly for total mercury must determine the monthly average result, which is the sum of the results of all data obtained in a given month divided by the total number of samples taken, in order to calculate the 12-month rolling average. If the 12-month rolling average for any quarter is less than the LCA, the permittee will be considered to be in compliance for total mercury for that quarter, provided the permittee is also in full compliance with the Pollutant Minimization Program for total mercury, set forth in Part I.A.7. Quarterly samples shall be conducted in the months of February, May, August and November. The Department may approve alternate months upon request.

The permittee may choose to demonstrate that an alternate site-specific LCA is appropriate and request a permit modification. Such request and supporting documentation shall be submitted in writing to the Department. Supporting documentation shall include a minimum of 12 samples taken over a 12-month period in accordance with EPA Method 1631. Upon approval, this permit may be modified in accordance with applicable laws and rules to incorporate the alternate site-specific LCA as the effluent limitation for total mercury.

f. Total Mercury Testing Requirements
The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, “Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry”. The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is strongly recommended. Guidance for clean technique sampling is contained in: EPA Method 1669, *Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance)*, EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

PART I

Section A. Limitations and Monitoring Requirements

2. Final Effluent Limitations, Monitoring Point 001B – Secondary Effluent Prior to Mixing with Secondary Bypass

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, for wet weather periods when the flow rate is greater than 125 MGD, the permittee is authorized to discharge secondary treated municipal wastewater, prior to mixing with flows from the secondary treatment bypass, from Monitoring Point 001B through Monitoring Point 001A and Outfall 001 and/or Outfall 002. Outfall 001 and Outfall 002 discharge to the Trenton Channel of the Detroit River. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration					
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Frequency of Analysis**	**Sample Type**
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	---	---	---	---	25	40	---	mg/l	Daily	Calculation
Total Suspended Solids	---	---	---	---	30	45	---	mg/l	Daily	Calculation
Total Phosphorus (as P)	---	---	---	---	1.0	---	---	mg/l	Daily	Calculation
Ammonia Nitrogen (as N)	---	---	---	---	(report)	---	(report)	mg/l	Daily	Calculation
					Minimum Monthly					
$CBOD_5$ Minimum % Removal	---	---	---	---	(report)	---	---	%	Monthly	Calculation
Total Suspended Solids Minimum % Removal	---	---	---	---	(report)	---	---	%	Monthly	Calculation

a. Frequency of Analysis
Calculations for Monitoring Point 001B shall be conducted daily during periods of secondary treatment bypass. In order to determine compliance with these effluent limitations, calculations for this monitoring point during wet weather periods may be averaged with monitoring from Monitoring Point 001A from dry weather periods. This may be done at this monitoring point to determine compliance with the 7-day and monthly average requirements for secondary treatment requirements.

During wet weather conditions when secondary treatment is bypassed, 3-portion composite samples representative of the discharge may be taken at Monitoring Point 001B and used in place of the calculations to determine compliance with the effluent limitations.

b. Percent Removal Requirements
These requirements shall be calculated based on the monthly (30-day) effluent $CBOD_5$ and total suspended solids concentrations for Monitoring Point 001C and the monthly influent concentrations for approximately the same period. This requirement is in effect for all periods of discharge exceeding the design flow rate of 125 MGD.

PART I

Section A. Limitations and Monitoring Requirements

3. Final Effluent Limitations, Monitoring Point 001C – Secondary Treatment Bypass

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, for wet weather periods when the flow rate is greater than 125 MGD, the permittee is authorized to discharge primary treated municipal wastewater bypassing secondary treatment from Monitoring Point 001C through Monitoring Point 001A, and Outfall 001 and/or Outfall 002. Outfall 001 and Outfall 002 discharge to the Trenton Channel of the Detroit River. Such discharges are only authorized during wet weather conditions as described in Part I.A.6. of this permit and shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration					
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Frequency of Analysis**	**Sample Type**
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Calculate Total Daily Flow
$CBOD_5$	---	---	---	---	(report)	---	(report)	mg/l	Daily	Composite
Total Suspended Solids	---	---	---	---	(report)	---	(report)	mg/l	Daily	Composite
Ammonia Nitrogen (as N)	---	---	---	---	(report)	---	(report)	mg/l	Daily	Composite
Total Phosphorus (as P)		---	---	---	(report)	---	(report)	mg/l	Daily	Composite

a. Sampling Locations
Samples shall be taken of the primary treatment effluent prior to mixing with flows receiving secondary treatment. The Department may approve alternate sampling locations which are demonstrated by the permittee to be representative of the effluent.

b. Composite Samples
Samples shall be representative composites of the secondary treatment bypass flow through Monitoring Point 001C. The composites shall consist of samples, starting at the time of bypass, taken every half hour for the first hour and then every two hours thereafter.

c. Frequency of Analysis
Sampling at Monitoring Point 001C shall be conducted daily when the facility is bypassing around the secondary treatment processes.

PART I

Section A. Limitations and Monitoring Requirements

4. Final Effluent Limitations, Monitoring Point 001D – Primary Treatment

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, for wet weather periods when the flow rate is greater than 150 MGD, the permittee is authorized to discharge preliminary treated municipal wastewater bypassing primary treatment from Monitoring Point 001D through Monitoring Points 001B and 001A, and Outfall 001 and/or Outfall 002. Outfall 001 and Outfall 002 discharge to the Trenton Channel of the Detroit River. Such discharges are only authorized during wet weather conditions as described in Part I.A.6. of this permit and shall be limited and monitored by the permittee as specified below.

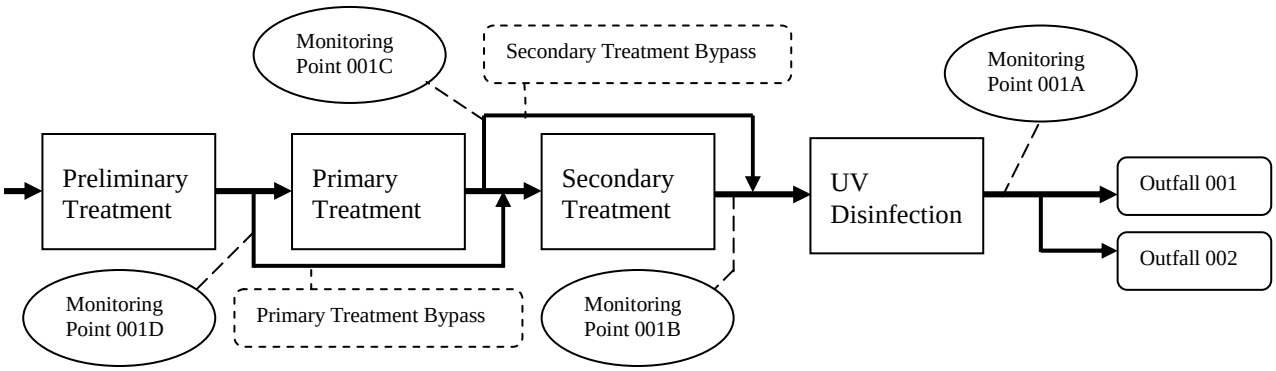
	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration					
Parameter	**Monthly**	**7-Day**	**Daily**	**Units**	**Monthly**	**7-Day**	**Daily**	**Units**	**Frequency of Analysis**	**Sample Type**
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Calculate Total Daily Flow

a. Sampling Locations
Samples shall be taken prior to mixing with flows receiving primary treatment. The Department may approve alternate sampling locations which are demonstrated by the permittee to be representative of the effluent.

b. Frequency of Analysis
Sampling at Monitoring Point 001D shall be conducted daily when the facility is bypassing around the primary treatment processes.

5. Flow Diagram

Outfall and monitoring point designations and bypass connections are shown for reference. Outfall 001 is the dedicated Downriver Wastewater Treatment Facility outfall. Outfall 002 is the connection to the Southgate/Wyandotte Drainage District outfall.



PART I

Section A. Limitations and Monitoring Requirements

6. Wet Weather Flows

During wet weather conditions when flows through the treatment plant exceed 125 MGD, the permittee is authorized to blend effluent from preliminary treatment and primary treatment with effluent receiving primary treatment and secondary treatment, respectively. The effluent must comply with all the effluent limitations and monitoring requirements in Parts I.A.1-4., except that when the flows through the wastewater treatment plant exceed the design flow rate of 125 MGD, the percent removal limitations for $CBOD_5$ and total suspended solids are waived at Monitoring Point 001A.

a. Preliminary Treatment
All dry weather and wet weather flows shall receive preliminary treatment (screening and grit removal) and disinfection.

b. Primary Treatment
All dry weather and wet weather flows up to and including a flow rate equivalent to 150 MGD shall receive primary treatment. During wet weather conditions, incremental flows greater than a flow rate equivalent to 150 MGD may bypass primary treatment with the stipulation that such flows shall receive secondary treatment.

c. Secondary Treatment
All dry weather flows up to and including the design flow rate of 125 MGD shall receive secondary treatment. During wet weather conditions, incremental flows greater than the design flow rate of 125 MGD may bypass secondary treatment with the stipulation that such flows shall receive preliminary and primary treatment and disinfection as stated in a. and b. above.

7. Pollutant Minimization Program for Total Mercury

The goal of the Pollutant Minimization Program is to maintain the effluent concentration of total mercury at or below 1.3 ng/l. The permittee shall continue to implement the Pollutant Minimization Program approved on May 11, 2004, and modifications thereto, to proceed toward the goal. The Pollutant Minimization Program includes the following:

a. an annual review and semi-annual monitoring of potential sources of mercury entering the wastewater collection system;

b. a program for quarterly monitoring of influent and periodic monitoring of sludge for mercury; and

c. implementation of reasonable cost-effective control measures when sources of mercury are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 31 of each year, the permittee shall submit a status report for the previous calendar year to the Department that includes 1) the monitoring results for the previous year, 2) an updated list of potential mercury sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of mercury.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or to demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification), including a reduction in the frequency of the requirements under items a. & b. if the data indicate that the 12-month rolling average mercury concentration is less than 5 ng/l.

This permit may be modified in accordance with applicable laws and rules to include additional mercury conditions and/or limitations as necessary.

PART I

Section A. Limitations and Monitoring Requirements

8. Treatment System Bypass Evaluation

As a condition of this permit, the permittee shall evaluate the operational conditions of the treatment system during periods when the facility is bypassing secondary treatment. This evaluation shall confirm that the conditions causing secondary treatment bypasses are the result of flows through the secondary treatment processes greater than design conditions, or are the result of existing system operational protocol. The treatment system shall be evaluated to determine the size of the storm event at which bypassing occurs under the current operational protocol, and to what extent the frequency, duration or volume of bypassing can be reduced through modifications to the operational protocol.

a. On or before February 1, 2009, the permittee shall submit an approvable work plan for conducting the evaluation of the wastewater treatment system. The evaluation shall evaluate the capability of the facility to treat wet weather flows up to the 125 MGD design flow without bypass under the current operational protocol, and determine the capability of the treatment system to reduce bypassing under modified operational protocols;

b. On or before May 1, 2009, the permittee shall commence the treatment system evaluation in accordance with the approved work plan.

c. On or before November 1, 2010, the permittee shall complete the treatment system evaluation in accordance with the approved work plan.

d. On or before May 1, 2011, the permittee shall submit an approvable certification that the treatment system has the capacity and the operational protocol to treat wet weather flows up to the design flow of 125 MGD without bypass.

e. If the permittee is unable to certify that the treatment system meets the design conditions, on or before July 1, 2011, the permittee shall submit a corrective action plan and implementation schedule for approval. The corrective action plan shall include a program to make operational and/or structural revisions to the treatment system so that design conditions will be met during periods of secondary treatment bypass.

If the permittee is unable to certify that the treatment system meets the design conditions, this permit may be modified to include the approved schedule for implementing the corrective action plan to make operational and/or structural revisions to the treatment system, as approved by the Department.

PART I

Section A. Limitations and Monitoring Requirements

9. Additional Monitoring Requirements

As a condition of this permit, the permittee shall monitor the discharge from Monitoring Point 001A for the constituents listed below. This monitoring is an application requirement of 40 CFR 122.21(j), effective December 2, 1999. Testing shall be conducted in August 2009, May 2010, March 2011, and October 2011. Grab samples shall be taken for available cyanide, total phenols, and parameters listed under Volatile Organic Compounds. For all other parameters, 24-hour composite samples shall be taken.

Test species for whole effluent toxicity monitoring shall include fathead minnow **and** either *Daphnia magna, Daphnia pulex* or *Ceriodaphnia dubia*. If the permittee has received Department approval to conduct acute toxicity testing using the more sensitive species identified in the toxicity database, the first three (3) tests required above may be performed using the more sensitive species. The last (4th) test shall be conducted using two (2) test species. Testing and reporting procedures shall follow procedures contained in EPA-821-R-02-012, "Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (Fifth Edition)." When the effluent ammonia nitrogen (as N) concentration is greater than 5 mg/l, the pH of the toxicity test shall be maintained at the pH of the effluent at the time of sample collection. Toxicity test data acceptability is contingent upon the validation of the test method by the testing laboratory. Such validation shall be submitted to the Department upon request.

The results of such monitoring shall be submitted with the application for reissuance (see the cover page of this permit for the application due date). The permittee shall notify the Department within 14 days of completing the monitoring for each month specified above in accordance with Part II.C.5. Additional reporting requirements are specified in Part II.C.10. The permittee shall report to the Department any whole effluent toxicity test results greater than 1.0 TU_A within five (5) days of becoming aware of the result. If, upon review of the analysis, it is determined that additional requirements are needed to protect the receiving waters in accordance with applicable water quality standards, the permit may then be modified by the Department in accordance with applicable laws and rules.

Whole Effluent Toxicity
acute toxicity

Hardness
calcium carbonate

Metals (Total Recoverable), Cyanide and Total Phenols (Quantification levels in parentheses)

antimony (1 µg/l)	arsenic (1 µg/l)	barium (5 µg/l)
beryllium (1 µg/l)	boron (20 µg/l)	cadmium (0.2 µg/l)
chromium (5 µg/l)	copper (1 µg/l)	lead (1 µg/l)
nickel (5 µg/l)	selenium (1 µg/l)	silver (0.5 µg/l)
thallium (1 µg/l)	zinc (5 µg/l)	

available cyanide (2 µg/l) using Method OIA - 1677
total phenolic compounds

Volatile Organic Compounds

acrolein	acrylonitrile	benzene
bromoform	carbon tetrachloride	chlorobenzene
chlorodibromomethane	chloroethane	2-chloroethylvinyl ether
chloroform	dichlorobromomethane	1,1-dichloroethane
1,2-dichloroethane	trans-1,2-dichloroethylene	1,1-dichloroethylene
1,2-dichloropropane	1,3-dichloropropylene	ethylbenzene
methyl bromide	methyl chloride	methylene chloride
1,1,2,2,-tetrachloroethane	tetrachloroethylene	toluene
1,1,1-trichloroethane	1,1,2-trichloroethane	trichloroethylene
vinyl chloride		

PART I

Section A. Limitations and Monitoring Requirements

Acid-Extractable Compounds

p-chloro-m-creso	2-chlorophenol	2,4-dichlorophenol
2,4-dimethylphenol	4,6-dinitro-o-cresol	2,4-dinitrophenol
2-nitrophenol	4-nitrophenol	pentachlorophenol
phenol	2,4,6-trichlorophenol	

Base/Neutral Compounds

acenaphthene	acenaphthylene	anthracene
benzidine	benzo(a)anthracene	benzo(a)pyrene
3,4-benzofluoranthene	benzo(ghi)perylene	benzo(k)fluoranthene
bis(2-chloroethoxy)methane	bis(2-chloroethyl)ether	bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate	4-bromophenyl phenyl ether	butyl benzyl phthalate
2-chloronaphthalene	4-chlorophenyl phenyl ether	chrysene
di-n-butyl phthalate	di-n-octyl phthalate	dibenzo(a,h)anthracene
1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene
3,3'-dichlorobenzidine	diethyl phthalate	dimethyl phthalate
2,4-dinitrotoluene	2,6-dinitrotoluene	1,2-diphenylhydrazine
fluoranthene	fluorene	hexachlorobenzene
hexachlorobutadiene	hexachlorocyclo-pentadiene	hexachloroethane
indeno(1,2,3-cd)pyrene	isophorone	naphthalene
nitrobenzene	n-nitrosodi-n-propylamine	n-nitrosodimethylamine
n-nitrosodiphenylamine	phenanthrene	pyrene
1,2,4-trichlorobenzene		

10. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

a. The facility contact shall be (or a duly authorized representative of this person):
- for a corporation, a principal executive officer of at least the level of vice president, or a designated representative, if the representative is responsible for the overall operation of the facility from which the discharge described in the permit application or other NPDES form originates,
- for a partnership, a general partner,
- for a sole proprietorship, the proprietor, or
- for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.

b. A person is a duly authorized representative only if:
- the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
- the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section obviates the permittee from properly submitting reports and forms as required by law.

PART I

Section A. Limitations and Monitoring Requirements

11. Untreated or Partially Treated Sewage Discharge Requirements

In accordance with Section 324.3112a of the Michigan Act, if untreated sewage, including sanitary sewer overflows (SSO) and combined sewer overflows (CSO), or partially treated sewage is directly or indirectly discharged from a sewer system onto land or into the waters of the state, the entity responsible for the sewer system shall immediately, but not more than 24 hours after the discharge begins, notify, by telephone, the Department, local health departments, a daily newspaper of general circulation in the county in which the permittee is located, and a daily newspaper of general circulation in the county or counties in which the municipalities whose waters may be affected by the discharge are located that the discharge is occurring.

The permittee shall also annually contact municipalities, including the superintendent of a public drinking water supply with potentially affected intakes, whose waters may be affected by the permittee's discharge of combined sewage, and if those municipalities wish to be notified in the same manner as specified above, the permittee shall provide such notification. Such notification shall also include a daily newspaper in the county of the affected municipality.

At the conclusion of the discharge, written notification shall be submitted in accordance with and on the "CSO/SSO Reporting Form" available via the internet at: **http://www.michigan.gov/deq/0,1607,7-135-3313_3682_3715---,00.html**, or, alternatively for combined sewer overflow discharges, in accordance with notification procedures approved by the Department.

In addition, in accordance with Section 324.3112a of the Michigan Act, each time a discharge of untreated sewage or partially treated sewage occurs, the permittee shall test the affected waters for *Escherichia coli* to assess the risk to the public health as a result of the discharge and shall provide the test results to the affected local county health departments and to the Department. The testing shall be done at locations specified by each affected local county health department but shall not exceed 10 tests for each separate discharge event. The affected local county health department may waive this testing requirement, if it determines that such testing is not needed to assess the risk to the public health as a result of the discharge event. The results of this testing shall be submitted with the written notification required above, or, if the results are not yet available, submit them as soon as they become available. This testing is not required, if the testing has been waived by the local health department, or if the discharge(s) did not affect surface waters.

Permittees accepting sanitary or municipal sewage from other sewage collection systems are encouraged to notify the owners of those systems of the above reporting and testing requirements.

PART I

Section A. Limitations and Monitoring Requirements

12. Monthly Operating Reports

Part 41 of Act 451 of 1994 as amended, specifically Section 324.4106 and associated Rule 299.2953, requires that the permittee file with the Department, on forms prescribed by the Department, reports showing the effectiveness of the treatment facility operation and the quantity and quality of liquid wastes discharged into waters of the state.

On or before December 1, 2008, the permittee shall submit to the Department a treatment facility monitoring program to meet this requirement. Upon approval by the Department the permittee shall implement the treatment facility monitoring program. The reporting forms and guidance are available on the DEQ web site at http://www.michigan.gov/deq/0,1607,7-135-3313_44117---,00.html. The permittee may use alternative operating forms if they are consistent with the approved monitoring program. These forms shall be maintained on site and shall be provided to the Department for review upon request. These treatment facility monitoring records shall be maintained for a minimum of five years.

Section B. Schedule of Compliance

1. Schedule of Compliance Not Required

This section (Section B: Schedule of Compliance) is not needed for this permit.

PART I

Section C. Industrial Waste Pretreatment Program

1. Federal Industrial Pretreatment Program

a. The permittee shall implement the Federal Industrial Pretreatment Program approved on May 1, 1986, as amended through March 28, 2005, and any subsequent modifications approved up to the issuance of this permit. Approval of substantial program modifications after the issuance of this permit shall be incorporated into this permit by minor modification in accordance with 40 CFR 122.63.

b. The permittee shall comply with Rules 323.2301 through 323.2317 of the Michigan Administrative Code (Part 23 Rules), the General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403), and the approved Federal Industrial Pretreatment Program.

c. The permittee shall have the legal authority and necessary interjurisdictional agreements that provide the basis for the implementation and enforcement of the approved Federal Industrial Pretreatment Program throughout the service area. The legal authority and necessary interjurisdictional agreements shall include, at a minimum, the authority to carry out the activities specified in Rule 323.2306(a).

d. The permittee shall develop procedures which describe, in sufficient detail, program commitments which enable implementation of the approved Federal Industrial Pretreatment Program, 40 CFR Part 403, and the Part 23 Rules in accordance with Rule 323.2306(c).

e. The permittee shall establish an interjurisdictional agreement (or comparable document) with all tributary governmental jurisdictions. Each interjurisdictional agreement shall contain, at a minimum, the following:

1) identification of the agency responsible for the implementation and enforcement of the approved Federal Industrial Pretreatment Program within the tributary governmental jurisdiction's boundaries; and

2) the provision of the legal authority which provides the basis for the implementation and enforcement of the approved Federal Industrial Pretreatment Program within the tributary governmental jurisdiction's boundaries.

f. The permittee shall prohibit discharges that:

1) cause, in whole or in part, the permittee's failure to comply with any condition of this permit or the Michigan Act;

2) restrict, in whole or in part, the permittee's management of biosolids;

3) cause, in whole or in part, operational problems at the treatment facility or in its collection system;

4) violate any of the general or specific prohibitions identified in Rule 323.2303(1) and (2);

5) violate categorical standards identified in Rule 323.2311; and

6) violate local limits established in accordance with Rule 323.2303(4).

g. The permittee shall maintain a list of its nondomestic users that meet the criteria of a significant industrial user as identified in Rule 323.2302(cc).

h. The permittee shall develop an enforcement response plan which describes, in sufficient detail, program commitments which will enable the enforcement of the approved Federal Industrial Pretreatment Program, 40 CFR Part 403, and the Part 23 Rules in accordance with Rule 323.2306(g).

i. The Department may require modifications to the approved Federal Industrial Pretreatment Program which are necessary to ensure compliance with 40 CFR Part 403 and the Part 23 Rules in accordance with Rule 323.2309.

PART I

Section C. Industrial Waste Pretreatment Program

j. The permittee shall not implement changes or modifications to the approved Federal Industrial Pretreatment Program without notification to the Department. Any substantial modification shall be subject to Department public noticing and approval in accordance with Rule 323.2309.

k. The permittee shall maintain an adequate revenue structure and staffing level for effective implementation of the approved Federal Industrial Pretreatment Program.

l. The permittee shall develop and maintain, for a minimum of three (3) years, all records and information necessary to determine nondomestic user compliance with 40 CFR Part 403, Part 23 Rules and the approved Federal Industrial Pretreatment Program. This period of retention shall be extended during the course of any unresolved enforcement action or litigation regarding a nondomestic user or when requested by the Department or the United States Environmental Protection Agency. All of the aforementioned records and information shall be made available upon request for inspection and copying by the Department and the United States Environmental Protection Agency.

m. The permittee shall evaluate the approved Federal Industrial Pretreatment Program for compliance with the 40 CFR Part 403, Part 23 Rules and the prohibitions stated in item f. (above). Based upon this evaluation, the permittee shall propose to the Department all necessary changes or modifications to the approved Federal Industrial Pretreatment Program no later than the next Industrial Pretreatment Program Annual Report due date (see item o. below).

n. The permittee shall develop and enforce local limits to implement the prohibitions listed in item f above. Local limits shall be based upon data representative of actual conditions demonstrated in a maximum allowable headworks loading analysis. An evaluation of whether the existing local limits need to be revised shall be submitted to the Department by August 1, 2009. The submittal shall provide a technical evaluation of the basis upon which this determination was made which includes information regarding the maximum allowable headworks loading, collection system protection criteria, and worker health and safety, based upon data collected since the last local limits review.

The following pollutants shall be evaluated:

1) Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Silver, and Zinc;

2) Pollutants that are subject to limits or monitoring in this permit;

3) Pollutants that have an existing local limit; and,

4) Other pollutants of concern which would reasonably be expected to be discharged or transported by truck or rail or otherwise introduced into the POTW.

o. On or before April 1st of each year, the permittee shall submit to the Department, as required by Rule 323.2310(8), an Industrial Pretreatment Program Annual Report on the status of program implementation and enforcement activities. The reporting period shall begin on January 1st and end on December 31st. At a minimum, the Industrial Pretreatment Program Annual Report shall contain the following items:

1) additions, deletions, and any other modifications to the permittee's previously submitted nondomestic user inventory (Rule 323.2306(c)(i));

2) additions, deletions, and any other modifications to the permittee's approved Significant Industrial User List (Rule 323.2306(h));

3) a listing of the names of Significant Industrial Users not inspected by the permittee at least once during the reporting period or at the frequency committed to in the approved Federal Industrial Pretreatment Program;

PART I

Section C. Industrial Waste Pretreatment Program

4) a listing of the names of Significant Industrial Users not sampled for all required pollutants by the permittee at least once during the reporting period or at the frequency committed to in the approved Federal Industrial Pretreatment Program;

5) a listing of the names of Significant Industrial Users without a permit at any time during the reporting period;

6) a listing of the names of nondomestic industrial users in significant noncompliance for each of the criteria as defined in Rule 323.2302(dd)(i)-(viii);

7) proof of publication of all nondomestic users in significant noncompliance in the largest daily newspaper in the permittee's area;

8) a summary of the enforcement activities by the permittee during the report period. This Summary shall include:

a) a listing of the names of nondomestic users which were the subject of an enforcement action;

b) the enforcement action taken and the date the action was taken; and

c) whether the nondomestic user returned to compliance by the end of the reporting period (include date nondomestic user returned to compliance).

9) a listing of the names of Significant Industrial Users who did not submit pretreatment reports in accordance with requirements specified in their permit during the reporting period;

10) a listing of the names of Significant Industrial Users who did not self-monitor in accordance with requirements specified in their permit during the reporting period;

11) a summary of results of all the sampling and analyses performed of the wastewater treatment plant's influent, effluent, and biosolids conducted in accordance with approved methods during the reporting period. The summary shall include the monthly average, daily maximum, quantification level, and number of samples analyzed for each pollutant. At a minimum, the results of analyses for all locally limited parameters for at least one monitoring event that tests influent, effluent and biosolids during the reporting period shall be submitted with each report, unless otherwise required by the Department. Sample collection shall be at intervals sufficient to provide pollutant removal rates, unless the pollutant is not measurable; and

12) any other relevant information as requested by the Department.

PART I

Section D. Residuals Management Program

1. Residuals Management Program for Land Application of Biosolids

A permittee seeking authorization to land apply bulk biosolids or prepare bulk biosolids for land application shall develop and submit a Residuals Management Program (RMP) to the Department for approval. Effective upon Department approval of the permittee's RMP, the permittee is authorized to land apply bulk biosolids or prepare bulk biosolids for land application in accordance with the requirements established in R323.2401 through R323.2418 of the Michigan Administrative Code (Part 24 Rules) which can be obtained via the internet (http://www.michigan.gov/deq/ and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids then click on Biosolids laws and Rules Information which is under the Laws & Rules banner in the center of the screen). The permittee's approved RMP, and any approved modifications thereto, are enforceable requirements of this permit. Incineration, landfilling and other residual disposal activities shall be conducted in accordance with Part II.D.7. of this permit.

a. RMP Approval and Implementation
A permittee seeking approval of an RMP shall submit the RMP to the Department at least 180 days prior to the land application of biosolids. The permittee may utilize the RMP Electronic Form which can be obtained via the internet (http://www.michigan.gov/deq/ and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids then click on RMP Electronic Form which is under the Downloads banner in the center of the screen) or obtain detailed requirements from the Department. The RMP shall become effective and shall be implemented by the permittee upon written approval by the Department.

b. Annual Report
On or before October 30 of each year, the permittee shall submit to the Department an annual report for the previous fiscal year of October 1 through September 30. At a minimum, the report shall contain:

1) a certification that current residuals management practices are in accordance with the approved RMP, or a proposal for modification to the approved RMP; and

2) a completed Biosolids Annual Report Form which can be obtained via the internet (http:/www.michigan.gov/deq/ and on the left side of the screen click on Water, Biosolids & Industrial Pretreatment, Biosolids then click on Biosolids Annual Report Form which is under the Downloads banner in the center of the screen) or from the Department.

c. Modifications to the Approved RMP
Prior to implementation of modifications to the RMP, the permittee shall submit proposed modifications to the Department for approval. The approved modification shall become effective upon the date of approval. Upon written notification, the Department may impose additional requirements and/or limitations to the approved RMP as necessary to protect public health and the environment from any adverse effect of a pollutant in the biosolids.

d. Recordkeeping
Records required by the Part 24 Rules shall be kept for a minimum of five years. However, the records documenting cumulative loading for sites subject to cumulative pollutant loading rates shall be kept as long as the site receives biosolids.

PART II

Section A. Definitions

This list of definitions may include terms not applicable to this permit.

Acute toxic unit (TU_A) means $100/LC_{50}$ where the LC_{50} is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

Chronic toxic unit (TU_C) means 100/MATC or $100/IC_{25}$, where the maximum acceptable toxicant concentration (MATC) and IC_{25} are expressed as a percent effluent in the test medium.

Class B Biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Daily concentration is the sum of the concentrations of the individual samples of a parameter divided by the number of samples taken during any calendar day. If the parameter concentration in any sample is less than the quantification limit, regard that value as zero when calculating the daily concentration. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations (except for pH and dissolved oxygen). When required by the permit, report the maximum calculated daily concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the Discharge Monitoring Reports (DMRs).

For pH, report the maximum value of any <u>individual</u> sample taken during the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs and the minimum value of any <u>individual</u> sample taken during the month in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. For dissolved oxygen, report the minimum concentration of any <u>individual</u> sample in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Department means the Michigan Department of Environmental Quality**.**

Detection Level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

PART II

Section A. Definitions

Fecal coliform bacteria monthly is the geometric mean of the samples collected in a calendar month (or 30 consecutive days). The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

Fecal coliform bacteria 7-day is the geometric mean of the samples collected in any 7-day period. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Flow Proportioned sample is a composite sample with the sample volume proportional to the effluent flow.

Grab sample is a single sample taken at neither a set time nor flow.

IC_{25} means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both:
1) inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal; and
2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference.]

Land Application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

MGD means million gallons per day.

Monthly frequency of analysis refers to a calendar month. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Monthly concentration is the sum of the daily concentrations determined during a reporting month (or 30 consecutive days) divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMRs.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

PART II

Section A. Definitions

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined in the reporting month (or 30 consecutive days). The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMRs.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Federal Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact Cooling Water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's National Pollutant Discharge Elimination System permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

POTW is a publicly owned treatment works.

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly frequency of analysis refers to a three month period, defined as January through March, April through June, July through September, and October through December. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

PART II

Section A. Definitions

Significant Materials Significant Materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111 of the Michigan Act; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Toxicity Reduction Evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.

Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of Act No. 451 of the Public Acts of 1994, as amended, being Rules 323.1041 through 323.1117 of the Michigan Administrative Code.

Weekly frequency of analysis refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

Yearly frequency of analysis refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation must be reported for that period if a discharge occurs during that period.

24-Hour Composite sample is a flow proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period.

3-Portion Composite sample is a sample consisting of three equal volume grab samples collected at equal intervals over an 8-hour period.

7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the month in the “MAXIMUM” column under “QUALITY OR CONCENTRATION” on the DMRs.

7-day loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during any 7 consecutive days in a reporting month. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the month in the “MAXIMUM” column under “QUANTITY OR LOADING” on the DMRs.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Federal Act (40 CFR Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Chief of the Permits Section, Water Bureau, Michigan Department of Environmental Quality, P.O. Box 30273, Lansing, Michigan, 48909-7773. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Control/Quality Assurance program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-up Notification

If the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department within 14 days following the effective date of this permit, and then 60 days prior to the commencement of the discharge.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of Act 451 of 1994, as amended, specifically Section 324.3110(3) and Rule 323.2155(2) of Part 21 allows the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self Monitoring" the permittee shall submit self-monitoring data via the Michigan DEQ Electronic Environmental Discharge Monitoring Reporting (***e2-DMR***) system.

The permittee shall utilize the information provided on the ***e2-Reporting*** website @ **http://secure1.state.mi.us/e2rs/** to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the department no later than the **20th day of the month** following each month of the authorized discharge period(s).

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Water Bureau, Michigan Department of Environmental Quality. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10th of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately describes the discharge.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the Michigan Act or Rule 35 of the Mobile Home Park Commission Act (Act 96 of the Public Acts of 1987) for assurance of proper facility operation shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

PART II

Section C. Reporting Requirements

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Federal Act, Parts 31 and 41 of the Michigan Act, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-hour reporting - Any noncompliance which may endanger health or the environment (including maximum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission shall also be provided within five (5) days.

b. other reporting - The permittee shall report, in writing, all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Written reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the first page of this permit, or if the notice is provided after regular working hours call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706 (calls from out-of-state dial 1-517-373-7660).

Within ten (10) days of the release, the permittee shall submit to the Department a full written explanation as to the cause of the release, the discovery of the release, response (clean-up and/or recovery) measures taken, and preventative measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

8. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset, shall notify the Department by telephone within 24-hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. that the permitted wastewater treatment facility was, at the time, being properly operated; and

c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

PART II

Section C. Reporting Requirements

9. Bypass Prohibition and Notification

a. Bypass Prohibition - Bypass is prohibited unless:

1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and

3) the permittee submitted notices as required under 9.b. or 9.c. below.

b. Notice of Anticipated Bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice to the Department, if possible at least ten (10) days before the date of the bypass, and provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions listed in 9.a. above.

c. Notice of Unanticipated Bypass - The permittee shall submit notice to the Department of an unanticipated bypass by calling the Department at the number indicated on the first page of this permit (if the notice is provided after regular working hours, use the following number: 1-800-292-4706) as soon as possible, but no later than 24 hours from the time the permittee becomes aware of the circumstances.

d. Written Report of Bypass - A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations - The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.10. of this permit.

f. Definitions

1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Notification of Changes in Discharge

The permittee shall notify the Department, in writing, within 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

PART II

Section C. Reporting Requirements

11. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under Rule 323.1098 (Antidegradation) of the Water Quality Standards or b) by notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.12.; and 4) the action or activity will not require notification pursuant to Part II.C.10. Following such notice, the permit may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

12. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of Rules 323.1098 and 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

13. Transfer of Ownership or Control

In the event of any change in control or ownership of facilities from which the authorized discharge emanates, the permittee shall submit to the Department 30 days prior to the actual transfer of ownership or control a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

Part 41 of Act 451 of 1994, as amended, specifically Section 324.4104 and associated Rule 299.2957, allow the Department to require an Operations and Maintenance (O&M) manual for the wastewater treatment facility. An up-to-date copy of the O&M manual shall be kept at the wastewater treatment facility. Upon request a copy of the O&M manual shall be provided to the Department. The Department may review the manual in whole or in part at their discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M manual should include the following information: permit standards, description and operation information for all equipment, staffing information, laboratory requirements, record keeping requirements, maintenance plan for equipment, emergency operating plan, safety program information and copies of all pertinent forms, as-built plans, and manufacturer’s manuals.

Certification of the existence and accuracy of the operations and maintenance manual is required to be submitted to the Department at least sixty days prior to startup of a new wastewater treatment plant. Submittal of re-certifications will also be required sixty days prior to start up of any substantial improvements or modifications made at the wastewater treatment plant.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the Michigan Act and/or the Federal Act and constitutes grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of an application for permit renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the Michigan Act. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the Michigan Act.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or

b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (Rules 324.2001 through 324.2009 of the Michigan Administrative Code). For a Publicly Owned Treatment Work (POTW), these facilities shall be approved under Part 41 of the Michigan Act.

PART II

Section D. Management Responsibilities

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the Michigan Act, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department or the Regional Administrator, upon the presentation of credentials:

a. to enter upon the permittee's premises where an effluent source is located or in which any records are required to be kept under the terms and conditions of this permit; and

b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Act and Rule 2128 (Rule 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department and the Regional Administrator. As required by the Federal Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Act and Sections 3112, 3115, 4106 and 4110 of the Michigan Act.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the Michigan Act.

2. Facility Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities. Approval for such construction for a POTW must be by permit issued under Part 41 of the Michigan Act. Approval for such construction for a mobile home park, campground or marina shall be from the Water Bureau, Michigan Department of Environmental Quality. Approval for such construction for a hospital, nursing home or extended care facility shall be from the Division of Health Facilities and Services, Michigan Department of Consumer and Industry Services upon request.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Federal Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Federal Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environmental Quality permits, or approvals from other units of government as may be required by law.

Appendix B
Study Area Characteristics

Applied Science, Inc.

M E M O R A N D U M

To: Kelly Cave, Director, Water Quality Management Division
Wayne County Department of Public Services

From: Karen Ridgway, Applied Science, Inc.
Jeannette Patterson, Applied Science, Inc.

Project: Downriver Sewage Disposal System

Subject: Service Area Characteristics

Date: Revised April 30, 2012

Downriver Service Area
The Downriver service area boundary is shown on Figure 1. This boundary was determined by reviewing community sewer maps and was reviewed by the communities. Revisions were made based on community comments. Figure 1 also shows a schematic of the Wayne County interceptor system, the storage/transport tunnel and relief sewer system, the equalization basins, and flow meter and level sensor locations.

The flow meter district boundaries also are shown on Figure 1. The flow meter districts were determined from the community provided sewer maps. Some changes have occurred in the meter districts since the work done in the 1990's for the design of the tunnel and relief sewer system. It is important that the customer communities review these meter district boundaries because community sewer maps may not reflect the current situation.

Census / Land Use Intersects
A GIS intersect with the 2010 Census data was completed to determine the population and housing characteristics for the portion of each community in the service area and the portions of the communities within the flow meter districts. Additionally, an intersect with the SEMCOG 2008 land use map was completed.

300 River Place Suite 5400 Detroit, Michigan 48207 p: 313.567.3990 f: 313.567.3750

Community-Wide Data

Appendix A contains the following tables which summarize community-wide data.

Table A-1: Summary Data for Service Area
This is a summary of the population, employment, housing, land use and SIU for the portion of each community in the service area.

Table A-2: Existing and Projected Residential Population in Service Area
This is a table of the SEMCOG projected populations for the portion of each community in the service area. For communities partially in the service area, the percentage of population in the service area for 2010 was used to estimate the projected population in the service area.

Table A-3: Year 2008 Land Use
This table provides the SEMCOG 2008 land use data in the service area taken from an intersect with the community and service area boundaries.

Table A-4: Year 2010 Age of Housing Units in Service Area
This table provides the 2010 Census housing unit data in the service area taken from an intersect with the community and service area boundaries.

Table A-5: Data for Communities Partially Within Service Area
This table provides the factors used to estimate community characteristics for the communities partially in the service area.

Table A-6: Future Housing Estimate
The community population growth (if any) and the persons per housing unit for 2010 were used to project the future housing units for the portion of the community in the service area.

Table A-7: Year 2010 & 2035 Age of Housing Units in Service Area
The Year 2035 housing units were added to the Year 2010 housing units from the 2010 Census intersect to estimate the age of housing units in year 2035.

Table A-8: Employment and Forecasted Employment
The sum of the commercial, industrial, institutional and airport land use areas was used to project the existing and future employment using the SEMCOG full community data.

Table A-9: Onsite Sewage Disposal Systems Within the Service Area
The 1990 Census data for onsite sewage disposal systems were projected forward to Years 2010 and 2035. All newer housing units were assumed to be connected to the public sewer system.

Table A-10: Significant Industrial User (SIU) Average Daily Flow Rate by Community
The addresses of each SIU were plotted and the SIU flow rates were summed for the corresponding community.

Meter District Data

Appendix B contains the following tables that summarize the characteristics of the service area presented by flow meter district.

Table B-1: Summary Data for Incremental Meter Districts
This is a summary of the population, employment, housing, land use and SIU for each incremental meter district. Each incremental meter district was divided into community components.

Table B-2: Summary Data for Incremental Meter Districts by Community
This is a summary of the incremental meter district characteristics summarized by community.

Table B-3: Summary Data for Cumulative Meter Districts
This is a summary of the cumulative meter district characteristics. For example the Eureka interceptor has five (5) incremental meter districts which are added together in the downstream direction and are all metered at PA-1 under dry weather conditions.

Table B-4: Existing and Projected Residential Population in Incremental Meter Districts
The populations in the incremental meter districts for 2010 were used to project the residential populations in 2035 using the SEMCOG projected populations for the full communities.

Table B-5: Year 2008 Land Use for Incremental Meter Districts
This table provides the intersect of SEMCOG 2008 land use data with the incremental meter district boundaries.

Table B-6: Year 2010 Age of Housing Units in Incremental Meter Districts
This table provides intersect of the 2010 Census housing data with the incremental meter district boundaries.

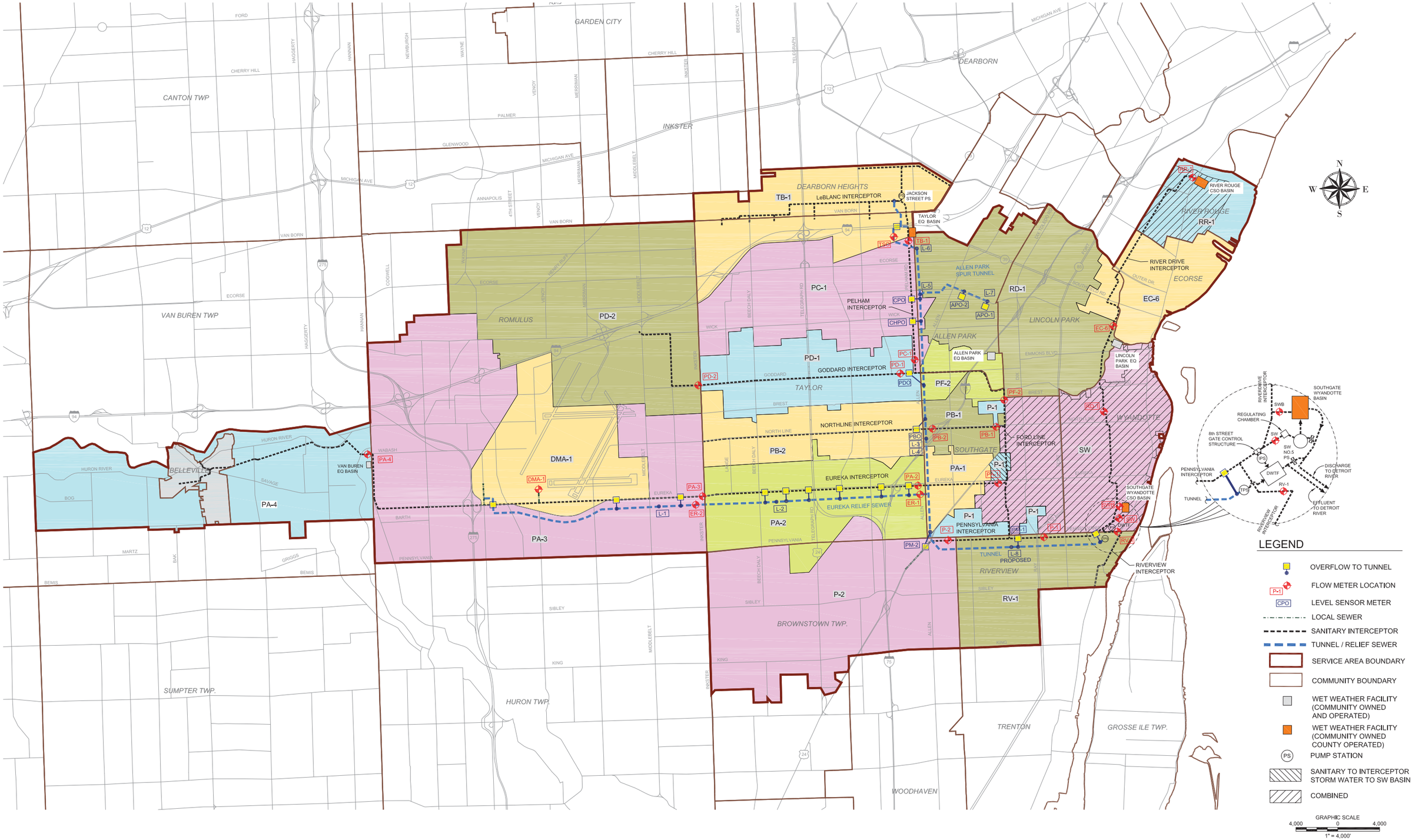
Table B-7: Future Housing Units in Incremental Meter Districts from 2010 to 2035
The community population growth (if any) and persons per housing unit for 2010 in Table A-6 were used to project the future housing units for the incremental meter districts.

Table B-8: Year 2010 and 2035 Age of Housing Units in Incremental Meter Districts
The future housing units were added to the 2010 housing units from the 2010 Census intersect to estimate the Year 2035 age of housing units in the incremental meter districts.

Table B-9: Employment and Forecasted Employment in Incremental Meter Districts
The sum of the commercial, industrial, institutional and airport land use areas in each incremental meter district was used to project the existing and future employment using the SEMCOG full community data.

Table B-10: Significant Industrial User (SIU) Average Daily Flow Rate by Incremental Meter District
The addresses of each SIU were plotted and the SIU flow rates were summed for the corresponding incremental meter districts.

Table B-11: Flow Split Factors for Incremental Meter Districts
This is a comparison of the old and new community flow split factors based on population, housing units and developed land area.



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DESIGN
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APPROVED
ISSUE DATE

DOWNRIVER
SEWAGE DISPOSAL SYSTEM

PREPARED BY:

Applied Science, Inc.
300 River Place, Suite 5400
Detroit, MI 48207
Phone: (313) 567-3990 Fax: (313) 567-3750

DOWNRIVER SERVICE AREA
INCREMENTAL METER DISTRICTS AND
INTERCEPTOR AND METER LOCATION MAP

SCALE:
JOB No.
FILE No.

FIGURE 1

Jun 13, 2012 — 5:26pm
K:\DWG\Tasks\2009\0943\Downriver System\DR System Map.dwg

Appendix A
Community-Wide Characteristics

Table A-1
Downriver Sewage Disposal System
Summary Data for Service Area

Community	Population		Employment		Housing						Year 2008 SEMCOG Land Use Data (acres)							Year 2035	SIU
					Year 2010			Year 2035											
	Year 2010	Year 2035	Year 2010	Year 2035	Pre-1970	Total	Median Year Built	Pre-1970	Total	Median Year Built	Residential	Commercial	Industrial	Institutional	Airport	Total Developed	Total in Service Area	Estimated Total Developed Land (acres)	2010 Average Daily Flow Rate (cfs)
Allen Park (1)	22,531	20,477	3,702	4,185	8,801	9,666	1955	8,801	9,666	1955	1,467	141	5	132	0	1,745	2,779	1,745	0.08
Belleville	3,993	4,033	2,072	2,319	702	2,019	1980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
Brownstown Township (1)	10,645	13,868	5,335	7,213	624	4,061	1986	624	5,290	1995	2,651	703	1,902	639	0	5,895	6,734	6,698	0.16
Dearborn Heights (1)	19,152	17,520	3,913	4,073	7,275	8,125	1955	7,275	8,125	1955	1,205	99	69	147	0	1,520	2,168	1,520	0.00
Ecorse	9,515	8,669	3,359	2,952	4,661	5,003	1947	4,661	5,003	1947	482	87	539	130	0	1,238	1,753	1,238	0.00
Lincoln Park	38,142	34,760	8,982	8,868	13,976	15,615	1954	13,976	15,615	1954	1,722	341	104	177	0	2,345	3,745	2,345	0.01
River Rouge (1)	7,903	6,981	1,688	1,501	3,538	3,852	1944	3,538	3,852	1944	335	35	609	42	0	1,021	1,432	1,021	0.06
Riverview	12,486	12,586	5,205	5,241	2,620	5,177	1967	2,620	5,218	1967	867	217	342	434	0	1,860	2,822	1,867	0.02
Romulus (1)	20,904	23,530	38,083	41,392	4,191	8,636	1972	4,191	9,721	1978	6,203	1,229	4,658	746	4,993	17,828	21,287	18,608	0.85
Southgate	30,047	29,026	14,724	14,522	8,580	13,744	1966	8,580	13,744	1966	1,993	865	151	271	0	3,280	4,399	3,280	0.00
Taylor	63,131	61,745	34,671	36,186	16,774	25,438	1964	16,774	25,438	1964	6,899	1,804	2,026	833	0	11,562	15,125	11,562	0.81
Van Buren Township (1)	5,719	7,676	548	551	577	2,143	1987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
Wyandotte	25,883	24,692	12,575	13,186	10,096	11,912	1948	10,096	11,912	1948	1,291	243	357	151	0	2,043	3,373	2,043	1.70
Totals	270,051	265,562	134,857	142,189	82,415	115,393	1961	82,415	118,500	1962	28,380	5,873	10,909	3,954	4,993	54,108	71,783	54,868	3.71

Sources:

A) Year 2010 Population was obtained from the U.S. Bureau of the Census, Census 2010, Tract Data.

B) SEMCOG, Community Profiles, January, 2012. SEMCOG's most requested data on population trends, household types, age groups, race, ethnicity, and education levels.

C) SEMCOG, 2035 Regional Forecast. The forecast provides detailed population and household numbers at five-year intervals.

D) U.S. Bureau of the Census, Profile of Selected Housing Characteristics: Census 2010.

E) SEMCOG 2008 Regional Land Use Coverage. This map shows land use in Southeast Michigan using 11 generalized categories.

F) SEMCOG Building Permits. Monthly residential building permit counts for every county and community from 1969 to the present.

Note:

1) Information is given for the part of the community within the Service Area.

Table A-2 Downriver Sewage Disposal System Existing and Projected Residential Population in Service Area				
Community	**Year 2010 Census Population**	**Year 2015 SEMCOG Projected Population**	**Year 2025 SEMCOG Projected Population**	**Year 2035 SEMCOG Projected Population**
Allen Park (1)	22,531	21,097	20,723	20,477
Belleville	3,993	3,849	3,935	4,033
Brownstown Township (1)	10,645	10,213	11,287	13,868
Dearborn Heights (1)	19,152	17,495	17,544	17,520
Ecorse	9,515	9,323	8,729	8,669
Lincoln Park	38,142	35,772	35,686	34,760
River Rouge (1)	7,903	7,166	7,000	6,981
Riverview	12,486	12,198	11,980	12,586
Romulus (1)	20,904	19,807	20,908	23,530
Southgate	30,047	28,793	28,880	29,026
Taylor	63,131	60,842	60,508	61,745
Van Buren Township (1)	5,719	5,630	6,198	7,676
Wyandotte	25,883	25,442	25,136	24,692
Totals	270,051	257,626	258,513	265,562

Sources:

A) Year 2010 Population was obtained from the U.S. Bureau of the Census, Census 2010, Census Tract Data.

B) SEMCOG, Population and Household Estimates for Southeast Michigan, July 2009.

Notes:

1) For the parts of Allen Park, Brownstown Township,Dearborn Heights, River Rouge, Romulus, and Van Buren Township in the Service Area, population estimates and projections were made using the percent of population in the service area from Table 5.

Table A-3

Downriver Sewage Disposal System

Year 2008 Land Use (acres)

Community	Residential			Non-Residential								Developed Land	Developed Non-Residential Land Use	Acres in Service Area
	Single-Family Residential	Multiple-family Residential	Total Residential	Commercial	Industrial	Govermental & Institutional	Airport	Transportation, Communication, Utility	Park, Recreation, and Open Space	Agriculture	Water			
Allen Park (1)	1,451	16	1,467	141	5	132	0	946	78	0	10	1,745	278	2,779
Belleville	365	6	371	67	17	141	0	100	11	7	152	596	225	866
Brownstown Township (1)	2,578	73	2,651	703	1,902	639	0	676	7	151	5	5,895	3,244	6,734
Dearborn Heights (1)	1,202	3	1,205	99	69	147	0	618	30	0	0	1,520	315	2,168
Ecorse	465	17	482	87	539	130	0	495	15	0	5	1,238	756	1,753
Lincoln Park	1,669	52	1,722	341	104	177	0	1,281	118	0	0	2,345	623	3,745
River Rouge (1)	320	16	335	35	609	42	0	377	30	0	5	1,021	685	1,432
Riverview	817	49	867	217	342	434	0	452	485	0	24	1,860	993	2,822
Romulus (1)	6,109	94	6,203	1,229	4,658	746	4,993	2,041	247	958	211	17,828	11,625	21,287
Southgate	1,800	193	1,993	865	151	271	0	1,021	96	0	3	3,280	1,288	4,399
Taylor	6,487	412	6,899	1,804	2,026	833	0	2,916	625	0	30	11,562	4,663	15,125
Van Buren Township (1)	2,895	0	2,895	42	129	111	0	373	384	625	741	3,176	281	5,300
Wyandotte	1,274	17	1,291	243	357	151	0	1,192	134	0	5	2,043	752	3,373
Total	27,428	948	28,375	5,873	10,907	3,955	4,993	12,488	2,259	1,742	1,191	54,104	25,728	71,783

Source: SEMCOG 2008 Regional Land Use Coverage.

Notes:

1) Data for the portions of these communities within the Service Area were derived from the SEMCOG 2008 Regional Land Use Map and the Down River Service Area boundary.

Table A-4

Downriver Sewage Disposal System

Year 2010 Age of Housing Units in Service Area

Community	1939 & Earlier	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2004	After 2005	Total Pre-1970	Total Housing Units	% Built Before 1970	Median Year Built
Allen Park (1)	626	1,586	5,194	1,394	486	98	155	116	12	8,801	9,666	91.0%	1955
Belleville	205	73	181	243	316	232	595	153	21	702	2,019	34.8%	1980
Brownstown Township (1)	96	158	199	170	1,089	527	641	970	210	624	4,061	15.4%	1986
Dearborn Heights (1)	622	1,330	4,394	929	355	162	168	148	18	7,275	8,125	89.5%	1955
Ecorse	1,906	1,167	1,046	542	57	80	57	112	36	4,661	5,003	93.2%	1947
Lincoln Park	1,593	3,343	7,181	1,859	950	333	237	91	28	13,976	15,615	89.5%	1954
River Rouge (1)	1,953	763	399	423	60	84	57	61	52	3,538	3,852	91.8%	1944
Riverview	210	217	1,116	1,077	1,703	373	394	18	69	2,620	5,177	50.6%	1967
Romulus (1)	569	556	1,361	1,706	1,941	565	699	706	535	4,191	8,636	48.5%	1972
Southgate	521	1,939	4,418	1,702	2,390	930	999	593	252	8,580	13,744	62.4%	1966
Taylor	1,191	2,184	8,086	5,313	5,075	1,180	903	1,110	396	16,774	25,438	65.9%	1964
Van Buren Township (1)	76	95	250	156	339	218	425	328	256	577	2,143	26.9%	1987
Wyandotte	3,619	2,667	2,903	907	684	265	520	237	110	10,096	11,912	84.8%	1948
Service Area Total	13,188	16,077	36,728	16,422	15,444	5,046	5,850	4,643	1,994	82,415	115,393	71.4%	1961

Source: U.S. Bureau of the Census, Profile of Selected Housing Characteristics: Census 2010, Tract Data.

Notes:

1) Data shown is for the portion of these communities within the Service Area. Census tract and area percentage of tract in Service Area were used to estimate number of housing units.

Table A-5

Downriver Sewage Disposal System

Data for Communities Partially Within Service Area

Community	Year 2010 Residential Population	Year 2010 Estimated Residential Population in Service Area	% of Population within Service Area	Year 2008 Residential Area (acres)	Year 2008 Residential Area in Service Area (acres)	% of Residential Area within Service Area	Year 2008 Commercial, Airport, Industrial and Governmental / Institutional Area (acres)	Year 2008 Commercial, Airport, Industrial and Governmental / Institutional in Service Area (acres)	% of Commercial, Airport, Industrial and Governmental / Institutional within Service Area	Year 2008 Total Area (acres)	Year 2008 Area within Service Area (acres)	% of Land Area within Service Area	2010 Total Housing Units	2010 Housing Units in Service Area	% of Housing in Service Area
Allen Park	28,210	22531	79.9%	1,665	1,467	88.1%	1,237	278	22.5%	4,483	2,779	62.0%	12,264	9,666	78.8%
Brownstown Township	30,627	10,645	34.8%	6,603	2,651	40.1%	4,252	3,244	76.3%	14,662	6,734	45.9%	12,576	4,060	32.3%
Dearborn Heights	57,774	19,152	33.2%	3,791	1,205	31.8%	954	315	33.0%	7,531	2,168	28.8%	24,151	8,125	33.6%
River Rouge	7,903	7,903	100.0%	336	335	99.8%	1,025	685	66.9%	1,825	1,432	78.5%	3,909	3,852	98.5%
Romulus	23,989	20,904	87.1%	7,020	6,203	88.4%	12,411	11,625	93.7%	23,003	21,287	92.5%	10,136	8,636	85.2%
Van Buren Township	28,821	5,719	19.8%	8,250	2,895	35.1%	7,174	281	3.9%	23,107	5,300	22.9%	13,176	2,142	16.3%

Sources:
1) Population and Housing unit data was obtained by census tract from the U.S. Bureau of the Census, Census 2010.
2) Land use data was obtained from using a SEMCOG GIS coverage for year 2008.
4) Total community Area for River Rouge taken from Census 2010

Table A-6 Downriver Sewage Disposal System Future Housing Estimate					
Community	**2010 Census Population**	**2010 Census Housing Units**	**Year 2010 Persons per Housing Unit**	**SEMCOG Projected Population Growth from 2010 to 2035**	**Estimated Future Housing Units Built After 2010**
Allen Park (1)	22,531	9,666	2.33	-2,054	0
Belleville	3,993	2,019	1.98	40	20
Brownstown Township (1)	10,645	4,061	2.62	3,223	1,229
Dearborn Heights (1)	19,152	8,125	2.36	-1,632	0
Ecorse	9,515	5,003	1.90	-846	0
Lincoln Park	38,142	15,615	2.44	-3,382	0
River Rouge (1)	7,903	3,852	2.05	-922	0
Riverview	12,486	5,177	2.41	100	41
Romulus (1)	20,904	8,636	2.42	2,626	1,085
Southgate	30,047	13,744	2.19	-1,021	0
Taylor	63,131	25,438	2.48	-1,386	0
Van Buren Township (1)	5,719	2,143	2.67	1,956	733
Wyandotte	25,883	11,912	2.17	-1,191	0
Totals	270,051	115,393	2.31	-4,489	3,109

1) Information is given for the part of the community within the Service Area.

Table A-7

Downriver Sewage Disposal System

Year 2010 & 2035 Age of Housing Units in Service Area

Community	2010				2035					
	Pre-1970 Housing Units	Total Housing Units	% Pre-1970	Median Year Built	% Pre-1970	New Housing Units 2010-2035	Total Housing Units	Median Year Built	New Developed Area (acres)	Estimated Total Developed Area (acres)
Allen Park (1)	8,801	9,666	91.0%	1955	91.0%	0	9,666	1955	0	1,745
Belleville	702	2,019	34.8%	1980	34.4%	20	2,039	1980	4	600
Brownstown Township (1)	624	4,061	15.4%	1986	11.8%	1,229	5,290	1995	803	6,698
Dearborn Heights (1)	7,275	8,125	89.5%	1955	89.5%	0	8,125	1955	0	1,520
Ecorse	4,661	5,003	93.2%	1947	93.2%	0	5,003	1947	0	1,238
Lincoln Park	13,976	15,615	89.5%	1954	89.5%	0	15,615	1954	0	2,345
River Rouge (1)	3,538	3,852	91.8%	1944	91.8%	0	3,852	1944	0	1,021
Riverview	2,620	5,177	50.6%	1967	50.2%	41	5,218	1967	7	1,867
Romulus (1)	4,191	8,636	48.5%	1972	43.1%	1,085	9,721	1978	779	18,608
Southgate	8,580	13,744	62.4%	1966	62.4%	0	13,744	1966	0	3,280
Taylor	16,774	25,438	65.9%	1964	65.9%	0	25,438	1964	0	11,562
Van Buren Township (1)	577	2,143	26.9%	1987	20.1%	733	2,876	1996	990	4,167
Wyandotte	10,096	11,912	84.8%	1948	84.8%	0	11,912	1948	0	2,043
Service Area Total	82,415	115,393	71.4%	1961	69.5%	3,109	118,502	1962	765	54,868

Sources:

A) U.S. Bureau of the Census, Profile of Selected Housing Characteristics: Census 2010, Census Tract Data.

B) SEMCOG, Residential Building Permits , 2000-2011

C) SEMCOG, 2035 Regional Forecast.

Table A-8 Downriver Sewage Disposal System Employment and Forecasted Employment						
Community	**Year 2010**	**Year 2015**	**Year 2020**	**Year 2025**	**Year 2030**	**Year 2035**
Allen Park (1)	3,702	3,830	3,904	3,961	4,044	4,185
Belleville	2,072	2,149	2,217	2,252	2,264	2,319
Brownstown Township (1)	5,335	5,875	6,303	6,618	6,912	7,213
Dearborn Heights (1)	3,913	4,019	4,084	4,074	4,057	4,073
Ecorse	3,359	3,197	3,125	3,049	2,983	2,952
Lincoln Park	8,982	8,945	8,963	8,888	8,817	8,868
River Rouge (1)	1,688	1,608	1,585	1,547	1,518	1,501
Riverview	5,205	5,294	5,373	5,331	5,284	5,241
Romulus (1)	38,083	38,535	39,560	40,012	40,472	41,392
Southgate	14,724	14,812	14,844	14,750	14,593	14,522
Taylor	34,671	35,439	35,939	36,008	35,943	36,186
Van Buren Township (1)	548	544	550	547	547	551
Wyandotte	12,575	12,750	12,885	12,965	13,062	13,186
Total	134,857	136,996	139,332	140,003	140,495	142,189

Source:

A) SEMCOG, Community Profiles for Southeast Michigan, January 2012

B) SEMCOG, 2035 Regional Forecast

Notes:

1) Data is given for the portion of these communities within the Service Area see partial community factors in Table 5.

2) SEMCOG forecasted employment numbers are by place of work. They include wage and salary jobs as well as self-employed. The employment numbers do not include Farming, Construction or Military jobs.

Table A-9

Downriver Sewage Disposal System

Onsite Sewage Disposal Systems Within the Service Area

Community	1990			2010				2035	
	Housing Units Total in Community	Census Percentage on Public Sewer	Estimated Housing Units Served by On-Site Sewage Disposal Systems in Community	Housing Units in Service Area	Estimated Housing Units Served by On-Site Sewage Disposal Systems in Service Area	Year 2010 Housing Units in Service Area	Year 2010 Estimated Percentage of Housing Units on Public Sewer	2035 Housing Units in Service Area	Year 2035 % on Public Sewer
Allen Park (1)	12,233	100.0%	0	100.0%	0	9,666	100.0%	9,666	100.0%
Belleville	1,614	99.5%	8	100.0%	8	2,019	99.6%	2,039	99.6%
Brownstown Township (1)	6,754	97.7%	155	32.3%	50	4,060	98.8%	5,290	99.1%
Dearborn Heights (1)	23,939	99.8%	48	33.6%	16	8,125	99.8%	8,125	99.8%
Ecorse	4,999	99.3%	35	100.0%	35	5,003	99.3%	5,003	99.3%
Lincoln Park	16,763	99.7%	50	100.0%	50	15,615	99.7%	15,615	99.7%
River Rouge (1)	4,666	99.9%	5	98.5%	5	3,852	99.9%	3,852	99.9%
Riverview	5,227	100.0%	0	100.0%	0	5,177	100.0%	5,218	100.0%
Romulus (1)	8,212	94.3%	468	85.2%	399	8,636	95.4%	9,721	95.9%
Southgate	12,504	100.0%	0	100.0%	0	13,744	100.0%	13,744	100.0%
Taylor	25,727	98.2%	463	100.0%	463	25,438	98.2%	25,438	98.2%
Van Buren Township (1)	8,430	86.1%	1,172	16.3%	190	2,142	91.1%	2,876	93.4%
Wyandotte	12,822	99.8%	26	100.0%	26	11,912	99.8%	11,912	99.8%
Total	143,890	98.3%	2,430		1,242	115,390	98.9%	118,502	99.0%

Sources:

A) U.S. Bureau of the Census, Profile of Selected Housing Characteristics: Census 1990.

Note:

1) Information is given for the part of the community within the Service Area.

2) Assumes that all new homes are on public sewer system.

3) Homes with onsite sewage disposal systems in 1990 are assumed to have not connected to public sewer.

Table A-10 Downriver Sewage Disposal System Significant Industrial User (SIU) Average Daily Flow Rate by Community	
Community	**2010 Average Daily SIU Flow Rate (cfs)**
Allen Park	0.08
Belleville	0.00
Brownstown Township	0.16
Dearborn Heights	0.00
Ecorse	0.00
Lincoln Park	0.01
River Rouge	0.06
Riverview	0.02
Romulus	0.85
Southgate	0.00
Taylor	0.81
Van Buren Township	0.01
Wyandotte	1.70
Total	3.71

Sources:
A) Wayne County Downriver Wastewater Treatment Facility, 2010 SIU list with customer reported flow rates.

Appendix B
Flow Meter District Characteristics

Table B-1
Downriver Sewage Disposal System
Summary Data for Incremental Meter Districts

Meter District	Community	Population		Employment		Housing Units						Year 2008 SEMCOG Land Use Data (acres)							Year 2035	SIU
						Year 2010			Year 2035											
		Year 2010	Year 2035	Year 2010	Year 2035	Pre-1970	Total	Median Year Built	Pre-1970	Total	Median Year Built	Residential	Commercial	Industrial	Institutional	Airport	Total Developed	Total in Service Area	Estimated Total Developed Land (acres)	2010 Average Daily Flow Rate (cfs)
DMA-1	Romulus	0	0	11,093	12,057	0	0	0	0	0	0	0	0	38	0	3,348	3,386	3,495	3,386	0.00
EC-6	Ecorse	9,515	8,669	3,359	2,952	4,661	5,003	1947	4,661	5,003	1947	482	87	539	130	0	1,238	1,753	1,238	0.00
	Lincoln Park	3,795	3,459	530	524	1,286	1,583	1957	1,286	1,583	1957	176	25	3	9	0	213	331	213	0.00
	Total	13,310	12,128	3,889	3,476	5,946	6,585	1950	5,946	6,585	1950	658	112	542	139	0	1,450	2,084	1,450	0.00
P-1	Southgate	4,121	3,981	2,506	2,471	1,134	1,917	1969	1,134	1,917	1969	268	102	0	117	0	487	604	487	0.00
P-2	Brownstown Twp	10,397	13,545	5,144	6,954	607	3,965	1986	607	5,165	1995	2,588	700	1,789	639	0	5,716	6,542	6,499	0.16
	Taylor	262	256	871	909	63	131	1970	63	131	1970	5	0	71	46	0	122	176	122	0.00
	Total	10,659	13,801	6,015	7,863	670	4,095	1986	670	5,296	1994	2,593	700	1,860	685	0	5,838	6,718	6,621	0.17
PA-1	Southgate	4,344	4,196	2,372	2,338	801	2,082	1977	801	2,082	1977	380	175	0	33	0	587	804	587	0.00
PA-2	Taylor	13,270	12,978	9,696	10,119	2,003	5,419	1974	2,003	5,419	1974	1,583	835	322	147	0	2,887	3,665	2,887	0.09
	Brownstown Twp	248	323	191	259	17	96	1985	17	125	1994	63	3	114	0	0	179	192	198	0.00
	Total	13,517	13,301	9,887	10,378	2,020	5,515	1974	2,020	5,544	1974	1,646	837	436	147	0	3,066	3,857	3,086	0.09
PA-3	Romulus	11,371	12,800	13,556	14,734	2,492	4,729	1969	2,492	5,324	1975	4,084	440	2,692	570	436	8,222	9,648	8,735	0.10
PA-4	Belleville	3,993	4,033	2,072	2,319	702	2,019	1980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
	Van Buren Twp	5,719	7,676	548	551	577	2,143	1987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
	Total	9,712	11,709	2,620	2,870	1,279	4,162	1983	1,279	4,915	1990	3,266	109	146	252	0	3,772	6,166	4,767	0.01
PB-1	Southgate	4,301	4,155	4,469	4,408	747	2,051	1975	747	2,051	1975	261	280	89	22	0	652	839	652	0.00
PB-2	Taylor	6,462	6,320	7,628	7,961	1,492	2,602	1968	1,492	2,602	1968	873	192	576	258	0	1,898	2,529	1,898	0.01
PC-1	Allen Park	1,019	926	182	205	379	441	1957	379	441	1957	40	5	2	7	0	54	121	54	0.00
	Dearborn Heights	19,152	17,520	3,913	4,073	7,275	8,125	1955	7,275	8,125	1955	1,205	99	69	147	0	1,520	2,168	1,520	0.00
	Taylor	31,039	30,357	11,361	11,858	10,550	12,483	1958	10,550	12,483	1958	2,565	430	864	235	0	4,093	5,818	4,093	0.62
	Total	51,210	48,804	15,456	16,136	18,204	21,049	1957	18,204	21,049	1957	3,810	534	935	388	0	5,667	8,107	5,667	0.62
PD-1	Taylor	12,100	11,834	5,115	5,338	2,666	4,804	1968	2,666	4,804	1968	1,873	348	193	148	0	2,561	2,936	2,561	0.08
PD-2	Romulus	9,532	10,730	13,434	14,602	1,699	3,907	1976	1,699	4,398	1981	2,119	788	1,929	176	1,209	6,220	8,144	6,486	0.75
PF-2	Allen Park	3,332	3,029	452	511	1,289	1,518	1959	1,289	1,518	1959	221	20	2	13	0	255	443	255	0.08
	Southgate	2,166	2,092	1,486	1,466	380	1,051	1975	380	1,051	1975	183	43	63	25	0	313	385	313	0.00
	Total	5,498	5,121	1,938	1,976	1,669	2,569	1966	1,669	2,569	1966	404	63	64	37	0	568	828	568	0.08
RD-1	Allen Park	18,179	16,522	3,068	3,469	7,132	7,707	1955	7,132	7,707	1955	1,206	116	2	113	0	1,437	2,215	1,437	0.00
	Lincoln Park	34,347	31,301	8,452	8,344	12,690	14,032	1953	12,690	14,032	1953	1,546	317	101	168	0	2,132	3,413	2,132	0.01
	Total	52,526	47,823	11,520	11,813	19,823	21,739	1954	19,823	21,739	1954	2,752	433	103	282	0	3,569	5,628	3,569	0.01
RR-1	River Rouge	7,903	6,981	1,688	1,501	3,538	3,852	1944	3,538	3,852	1944	335	35	609	42	0	1,021	1,432	1,021	0.06
RV-1	Riverview	12,486	12,586	5,205	5,241	2,620	5,177	1967	2,620	5,219	1967	867	217	342	434	0	1,860	2,822	1,867	0.02
SW	Southgate	15,115	14,602	3,891	3,838	5,518	6,644	1958	5,518	6,644	1958	901	266	0	74	0	1,241	1,767	1,241	0.00
	Wyandotte	25,883	24,692	12,575	13,186	10,096	11,912	1948	10,096	11,912	1948	1,291	243	357	151	0	2,043	3,373	2,043	1.70
	Total	40,998	39,294	16,466	17,024	15,614	18,556	1951	15,614	18,556	1951	2,192	509	357	226	0	3,284	5,140	3,284	1.70
	Total	270,052	265,563	134,856	142,188	82,414	115,391	1961	82,414	118,500	1961	28,379	5,873	10,909	3,955	4,993	54,109	71,783	56,692	3.71

Sources:

A) Year 2010 Population was obtained from the U.S. Bureau of the Census, Census 2010, Tract Data.
B) SEMCOG, Community Profiles, January, 2012. SEMCOG's most requested data on population trends, household types, age groups, race, ethnicity, and education levels.
C) SEMCOG, 2035 Regional Forecast. The forecast provides detailed population and household numbers at five-year intervals.
D) U.S. Bureau of the Census, Profile of Selected Housing Characteristics: Census 2010.
E) SEMCOG 2008 Regional Land Use Coverage. This map shows land use in Southeast Michigan using 11 generalized categories.
F) SEMCOG Building Permits. Monthly residential building permit counts for every county and community from 1969 to the present.

Table B-2
Downriver Sewage Disposal System
Summary Data for Incremental Meter Districts by Community

Community	Upstream Meter Districts	Population		Employment		Housing Units						Year 2008 SEMCOG Land Use Data (acres)							Year 2035	SIU
						Year 2010			Year 2035											
		Year 2010	Year 2035	Year 2010	Year 2035	Pre-1970	Total	Median Year Built	Pre-1970	Total	Median Year Built	Residential	Commercial	Industrial	Institutional	Airport	Total Developed	Total in Service Area	Estimated Total Developed Land (acres)	2010 Average Daily Flow Rate (cfs)
Allen Park	PC-1	1,019	926	182	205	379	441	1957	379	441	1957	40	5	2	7	0	54	121	54	0.00
	PF-2	3,332	3,029	452	511	1,289	1,518	1959	1,289	1,518	1959	221	20	2	13	0	255	443	255	0.08
	RD-1	18,179	16,522	3,068	3,469	7,132	7,707	1955	7,132	7,707	1955	1,206	116	2	113	0	1,437	2,215	1,437	0.00
	Total	22,531	20,477	3,701	4,185	8,801	9,666	1955	8,801	9,666	1955	1,467	141	5	132	0	1,745	2,779	1,745	0.08
Belleville	PA-4	3,993	4,033	2,072	2,319	702	2,019	1980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
Brownstown Twp	P-2	10,397	13,545	5,144	6,954	607	3,965	1986	607	5,165	1995	2,588	700	1,789	639	0	5,716	6,542	6,499	0.16
	PA-2	248	323	191	259	17	96	1985	17	125	1994	63	3	114	0	0	179	192	198	0.00
	Total	10,645	13,868	5,335	7,213	624	4,061	1986	624	5,290	1995	2,651	703	1,902	639	0	5,895	6,734	6,698	0.16
Dearborn Heights	PC-1	19,152	17,520	3,913	4,073	7,275	8,125	1955	7,275	8,125	1955	1,205	99	69	147	0	1,520	2,168	1,520	0.00
Ecorse	EC-6	9,515	8,669	3,359	2,952	4,661	5,003	1947	4,661	5,003	1947	482	87	539	130	0	1,238	1,753	1,238	0.00
Lincoln Park	EC-6	3,795	3,459	530	524	1,286	1,583	1957	1,286	1,583	1957	176	25	3	9	0	213	331	213	0.00
	RD-1	34,347	31,301	8,452	8,344	12,690	14,032	1953	12,690	14,032	1953	1,546	317	101	168	0	2,132	3,413	2,132	0.01
	Total	38,142	34,760	8,982	8,868	13,976	15,615	1954	13,976	15,615	1954	1,722	341	104	177	0	2,345	3,745	2,345	0.01
River Rouge	RR-1	7,903	6,981	1,688	1,501	3,538	3,852	1944	3,538	3,852	1944	335	35	609	42	0	1,021	1,432	1,021	0.06
Riverview	RV-1	12,486	12,586	5,205	5,241	2,620	5,177	1967	2,620	5,219	1967	867	217	342	434	0	1,860	2,822	1,867	0.02
Romulus	DMA-1	0	0	11,093	12,057	0	0	0	0	0	0	0	0	38	0	3,348	3,386	3,495	3,386	0.00
	PA-3	11,371	12,800	13,556	14,734	2,492	4,729	1969	2,492	5,324	1975	4,084	440	2,692	570	436	8,222	9,648	8,735	0.10
	PD-2	9,532	10,730	13,434	14,602	1,699	3,907	1976	1,699	4,398	1981	2,119	788	1,929	176	1,209	6,220	8,144	6,486	0.75
	Total	20,904	23,530	38,083	41,392	4,191	8,636	1972	4,191	9,721	1978	6,203	1,229	4,658	746	4,993	17,828	21,287	18,608	0.85
Southgate	P-1	4,121	3,981	2,506	2,471	1,134	1,917	1969	1,134	1,917	1969	268	102	0	117	0	487	604	487	0.00
	PA-1	4,344	4,196	2,372	2,338	801	2,082	1977	801	2,082	1977	380	175	0	33	0	587	804	587	0.00
	PB-1	4,301	4,155	4,469	4,408	747	2,051	1975	747	2,051	1975	261	280	89	22	0	652	839	652	0.00
	PF-2	2,166	2,092	1,486	1,466	380	1,051	1975	380	1,051	1975	183	43	63	25	0	313	385	313	0.00
	SW	15,115	14,602	3,891	3,838	5,518	6,644	1958	5,518	6,644	1958	901	266	0	74	0	1,241	1,767	1,241	0.00
	Total	30,047	29,026	14,724	14,521	8,580	13,744	1966	8,580	13,744	1966	1,993	865	151	271	0	3,280	4,399	3,280	0.00
Taylor	P-2	262	256	871	909	63	131	1970	63	131	1970	5	0	71	46	0	122	176	122	0.00
	PA-2	13,270	12,978	9,696	10,119	2,003	5,419	1974	2,003	5,419	1974	1,583	835	322	147	0	2,887	3,665	2,887	0.09
	PB-2	6,462	6,320	7,628	7,961	1,492	2,602	1968	1,492	2,602	1968	873	192	576	258	0	1,898	2,529	1,898	0.01
	PC-1	31,039	30,357	11,361	11,858	10,550	12,483	1958	10,550	12,483	1958	2,565	430	864	235	0	4,093	5,818	4,093	0.62
	PD-1	12,100	11,834	5,115	5,338	2,666	4,804	1968	2,666	4,804	1968	1,873	348	193	148	0	2,561	2,936	2,561	0.08
	Total	63,131	61,745	34,671	36,186	16,774	25,438	1964	16,774	25,438	1964	6,899	1,804	2,026	833	0	11,562	15,125	11,562	0.81
Van Buren Twp	PA-4	5,719	7,676	548	551	577	2,143	1987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
Wyandotte	SW	25,883	24,692	12,575	13,186	10,096	11,912	1948	10,096	11,912	1948	1,291	243	357	151	0	2,043	3,373	2,043	1.70
	Total	270,052	265,563	134,856	142,188	82,414	115,391	1961	82,414	118,500	1961	28,379	5,873	10,909	3,955	4,993	54,109	71,783	56,692	3.71

Table B-3
Downriver Sewage Disposal System
Summary Data for Cumulative Meter Districts

Interceptor	Upstream Meter Districts	Community	Population		Employment		Housing Units						Year 2008 SEMCOG Land Use Data (acres)							Year 2035	SIU
							Year 2010			Year 2035											
			Year 2010	Year 2035	Year 2010	Year 2035	Pre-1970	Total	Median Year Built	Pre-1970	Total	Median Year Built	Residential	Commercial	Industrial	Institutional	Airport	Total Developed	Total in Service Area	Estimated Total Developed Land (acres)	2010 Average Daily Flow Rate (cfs)
Eureka	DMA-1	Romulus	0	0	11,093	12,057	0	0	0	0	0	0	0	0	38	0	3,348	3,386	3,495	3,386	0.00
	PA-4	Belleville	3,993	4,033	2,072	2,319	702	2,019	1980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
		Van Buren Twp	5,719	7,676	548	551	577	2,143	1987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
		Total	9,712	11,709	2,620	2,870	1,279	4,162	1983	1,279	4,915	1989	3,266	109	146	252	0	3,772	6,166	4,767	0.01
	PA-3	Belleville	3,993	4,033	2,072	2,319	702	2,019	1980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
		Romulus	11,371	12,800	24,649	26,791	2,492	4,729	1969	2,492	5,324	1975	4,084	440	2,729	570	3,785	11,609	13,143	12,122	0.10
		Van Buren Twp	5,719	7,676	548	551	577	2,143	1987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
		Total	21,084	24,509	27,269	29,660	3,771	8,891	1976	3,771	10,239	1982	7,350	549	2,876	822	3,785	15,380	19,309	16,888	0.11
	PA-2	Belleville	3,993	4,033	2,072	2,319	702	2,019	1980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
		Brownstown Twp	248	323	191	259	17	96	1985	17	125	1994	63	3	114	0	0	179	192	198	0.00
		Romulus	11,371	12,800	24,649	26,791	2,492	4,729	1969	2,492	5,324	1975	4,084	440	2,729	570	3,785	11,609	13,143	12,122	0.10
		Taylor	13,270	12,978	9,696	10,119	2,003	5,419	1974	2,003	5,419	1974	1,583	835	322	147	0	2,887	3,665	2,887	0.09
		Van Buren Twp	5,719	7,676	548	551	577	2,143	1987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
		Total	34,601	37,810	37,156	40,039	5,791	14,406	1975	5,791	15,783	1979	8,996	1,387	3,312	969	3,785	18,447	23,166	19,974	0.21
	PA-1	Belleville	3,993	4,033	2,072	2,319	702	2,019	1980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
		Brownstown Twp	248	323	191	259	17	96	1985	17	125	1994	63	3	114	0	0	179	192	198	0.00
		Romulus	11,371	12,800	24,649	26,791	2,492	4,729	1969	2,492	5,324	1975	4,084	440	2,729	570	3,785	11,609	13,143	12,122	0.10
		Southgate	4,344	4,196	2,372	2,338	801	2,082	1977	801	2,082	1977	380	175	0	33	0	587	804	587	0.00
		Taylor	13,270	12,978	9,696	10,119	2,003	5,419	1974	2,003	5,419	1974	1,583	835	322	147	0	2,887	3,665	2,887	0.09
		Van Buren Twp	5,719	7,676	548	551	577	2,143	1987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
		Total	38,945	42,006	39,528	42,377	6,592	16,488	1975	6,592	17,865	1979	9,376	1,561	3,312	1,001	3,785	19,034	23,971	20,561	0.21
Northline	PB-2	Taylor	6,462	6,320	7,628	7,961	1,492	2,602	1968	1,492	2,602	1968	873	192	576	258	0	1,898	2,529	1,898	0.01
	PB-1	Southgate	4,301	4,155	4,469	4,408	747	2,051	1975	747	2,051	1975	261	280	89	22	0	652	839	652	0.00
		Taylor	6,462	6,320	7,628	7,961	1,492	2,602	1968	1,492	2,602	1968	873	192	576	258	0	1,898	2,529	1,898	0.01
		Total	10,763	10,475	12,097	12,369	2,239	4,653	1971	2,239	4,653	1971	1,133	472	665	280	0	2,550	3,368	2,550	0.01
Goddard	PD-2	Romulus	9,532	10,730	13,434	14,602	1,699	3,907	1976	1,699	4,398	1981	2,119	788	1,929	176	1,209	6,220	8,144	6,486	0.75
	PD-1	Romulus	9,532	10,730	13,434	14,602	1,699	3,907	1976	1,699	4,398	1981	2,119	788	1,929	176	1,209	6,220	8,144	6,486	0.75
		Taylor	12,100	11,834	5,115	5,338	2,666	4,804	1968	2,666	4,804	1968	1,873	348	193	148	0	2,561	2,936	2,561	0.08
		Total	21,632	22,564	18,549	19,940	4,365	8,711	1972	4,365	9,201	1974	3,992	1,136	2,121	323	1,209	8,781	11,080	9,047	0.83
Pelham	PC-1	Allen Park	1,019	926	182	205	379	441	1957	379	441	1957	40	5	2	7	0	54	121	54	0.00
		Dearborn Heights	19,152	17,520	3,913	4,073	7,275	8,125	1955	7,275	8,125	1955	1,205	99	69	147	0	1,520	2,168	1,520	0.00
		Taylor	31,039	30,357	11,361	11,858	10,550	12,483	1958	10,550	12,483	1958	2,565	430	864	235	0	4,093	5,818	4,093	0.62
		Total	51,210	48,804	15,456	16,136	18,204	21,049	1957	18,204	21,049	1957	3,810	534	935	388	0	5,667	8,107	5,667	0.62
Fordline	PF-2	Allen Park	4,352	3,955	633	716	1,668	1,959	1958	1,668	1,959	1958	260	25	3	19	0	308	564	308	0.08
		Dearborn Heights	19,152	17,520	3,913	4,073	7,275	8,125	1955	7,275	8,125	1955	1,205	99	69	147	0	1,520	2,168	1,520	0.00
		Romulus	9,532	10,730	13,434	14,602	1,699	3,907	1976	1,699	4,398	1981	2,119	788	1,929	176	1,209	6,220	8,144	6,486	0.75
		Southgate	2,166	2,092	1,486	1,466	380	1,051	1975	380	1,051	1975	183	43	63	25	0	313	385	313	0.00
		Taylor	43,138	42,191	16,476	17,196	13,215	17,286	1961	13,215	17,286	1961	4,439	777	1,056	382	0	6,654	8,755	6,654	0.70
		Total	78,340	76,489	35,943	38,052	24,238	32,329	1961	24,238	32,820	1962	8,206	1,732	3,120	748	1,209	15,015	20,016	15,282	1.53

Table B-3
Downriver Sewage Disposal System
Summary Data for Cumulative Meter Districts

Interceptor	Upstream Meter Districts	Community	Population		Employment		Housing Units						Year 2008 SEMCOG Land Use Data (acres)							Year 2035	SIU
							Year 2010			Year 2035											
			Year 2010	Year 2035	Year 2010	Year 2035	Pre-1970	Total	Median Year Built	Pre-1970	Total	Median Year Built	Residential	Commercial	Industrial	Institutional	Airport	Total Developed	Total in Service Area	Estimated Total Developed Land (acres)	2010 Average Daily Flow Rate (cfs)
Pennsylvania	P-2	Brownstown Twp	10,397	13,545	5,144	6,954	607	3,965	1986	607	5,165	1995	2,588	700	1,789	639	0	5,716	6,542	6,499	0.16
		Taylor	262	256	871	909	63	131	1970	63	131	1970	5	0	71	46	0	122	176	122	0.00
		Total	10,659	13,801	6,015	7,863	670	4,095	1986	670	5,296	1994	2,593	700	1,860	685	0	5,838	6,718	6,621	0.17
	P-1	Allen Park	4,352	3,955	633	716	1,668	1,959	1,958	1,668	1,959	1958	260	25	3	19	0	308	564	308	0.08
		Belleville	3,993	4,033	2,072	2,319	702	2,019	1,980	702	2,039	1980	371	67	17	141	0	596	866	600	0.00
		Brownstown Twp	10,645	13,868	5,335	7,213	624	4,061	1,986	624	5,290	1995	2,651	703	1,902	639	0	5,895	6,734	6,698	0.16
		Dearborn Heights	19,152	17,520	3,913	4,073	7,275	8,125	1,955	7,275	8,125	1955	1,205	99	69	147	0	1,520	2,168	1,520	0.00
		Romulus	20,904	23,530	38,083	41,392	4,191	8,636	1,972	4,191	9,721	1978	6,203	1,229	4,658	746	4,993	17,828	21,287	18,608	0.85
		Southgate	14,932	14,424	10,833	10,683	3,062	7,100	1,988	3,062	7,100	1974	1,092	599	151	196	0	2,039	2,632	2,039	0.00
		Taylor	63,131	61,745	34,671	36,186	16,774	25,438	1964	16,774	25,438	1964	6,899	1,804	2,026	833	0	11,562	15,125	11,562	0.81
		Van Buren Twp	5,719	7,676	548	551	577	2,143	1,987	577	2,876	1996	2,895	42	129	111	0	3,176	5,300	4,167	0.01
		Total	142,828	146,751	96,088	103,133	34,873	59,482	1970	34,873	62,549	1971	21,576	4,567	8,956	2,832	4,993	42,924	54,677	45,501	1.92
Riverview	RV-1	Riverview	12,486	12,586	5,205	5,241	2,620	5,177	1967	2,620	5,219	1967	867	217	342	434	0	1,860	2,822	1,867	0.02
River Drive Interceptor	RR-1	River Rouge	7,903	6,981	1,688	1,501	3,538	3,852	1944	3,538	3,852	1944	335	35	609	42	0	1,021	1,432	1,021	0.06
	EC-6	Ecorse	9,515	8,669	3,359	2,952	4,661	5,003	1947	4,661	5,003	1947	482	87	539	130	0	1,238	1,753	1,238	0.00
		Lincoln Park	3,795	3,459	530	524	1,286	1,583	1957	1,286	1,583	1957	176	25	3	9	0	213	331	213	0.00
		River Rouge	7,903	6,981	1,688	1,501	3,538	3,852	1944	3,538	3,852	1944	335	35	609	42	0	1,021	1,432	1,021	0.06
		Total	21,213	19,109	5,577	4,977	9,484	10,437	1948	9,484	10,437	1948	993	147	1,151	181	0	2,471	3,516	2,471	0.06
	RD-1	Allen Park	18,179	16,522	3,068	3,469	7,132	7,707	1,955	7,132	7,707	1,955	1,206	116	2	113	0	1,437	2,215	1,437	0.00
		Ecorse	9,515	8,669	3,359	2,952	4,661	5,003	1,947	4,661	5,003	1,947	482	87	539	130	0	1,238	1,753	1,238	0.00
		Lincoln Park	38,142	34,760	8,982	8,868	13,976	15,615	1,954	13,976	15,615	1,954	1,722	341	104	177	0	2,345	3,745	2,345	0.01
		River Rouge	7,903	6,981	1,688	1,501	3,538	3,852	1,944	3,538	3,852	1,944	335	35	609	42	0	1,021	1,432	1,021	0.06
		Total	73,739	66,932	17,097	16,790	29,307	32,177	1952	29,307	32,177	1952	3,745	580	1,254	462	0	6,041	9,145	6,041	0.07
Southgate Wyandotte	SW	Southgate	15,115	14,602	3,891	3,838	5,518	6,644	1958	5,518	6,644	1958	901	266	0	74	0	1,241	1,767	1,241	0.00
		Wyandotte	25,883	24,692	12,575	13,186	10,096	11,912	1948	10,096	11,912	1948	1,291	243	357	151	0	2,043	3,373	2,043	1.70
		Total	40,998	39,294	16,466	17,024	15,614	18,556	1951	15,614	18,556	1951	2,192	509	357	226	0	3,284	5,140	3,284	1.70
		Total	270,052	265,563	134,856	142,188	82,414	115,391	1961	82,414	118,500	1961	28,379	5,873	10,909	3,955	4,993	54,109	71,783	56,692	3.71

Table B-4

Downriver Sewage Disposal System

Existing and Projected Residential Population in Incremental Meter Districts

Meter District	Community	Year 2010 Census Population	Year 2015 SEMCOG Projected Population	Year 2025 SEMCOG Projected Population	Year 2035 SEMCOG Projected Population
DMA-1	Romulus	0	0	0	0
EC-6	Ecorse	9,515	9,323	8,729	8,669
	Lincoln Park	3,795	3,559	3,551	3,459
	Total	13,310	12,883	12,280	12,128
P-1	Southgate	4,121	3,949	3,961	3,981
P-2	Brownstown Twp	10,397	9,975	11,024	13,545
	Taylor	262	252	251	256
	Total	10,659	10,227	11,275	13,801
PA-1	Southgate	4,344	4,163	4,175	4,196
PA-2	Taylor	13,270	12,788	12,718	12,978
	Brownstown Twp	248	238	263	323
	Total	13,517	13,026	12,981	13,301
PA-3	Romulus	11,371	10,774	11,374	12,800
PA-4	Belleville	3,993	3,849	3,935	4,033
	Van Buren Twp	5,719	5,629	6,198	7,676
	Total	9,712	9,478	10,133	11,709
PB-1	Southgate	4,301	4,122	4,134	4,155
PB-2	Taylor	6,462	6,228	6,193	6,320
PC-1	Allen Park	1,019	955	938	926
	Dearborn Heights	19,152	17,495	17,544	17,520
	Taylor	31,039	29,913	29,749	30,357
	Total	51,209	48,362	48,230	48,804
PD-1	Taylor	12,100	11,661	11,597	11,834
PD-2	Romulus	9,532	9,032	9,534	10,730
PF-2	Allen Park	3,332	3,120	3,065	3,029
	Southgate	2,166	2,075	2,082	2,092
	Total	5,498	5,196	5,147	5,121
RD-1	Allen Park	18,179	17,022	16,720	16,522
	Lincoln Park	34,347	32,212	32,135	31,301
	Total	52,526	49,235	48,855	47,823
RR-1	River Rouge	7,903	7,166	7,000	6,981
RV-1	Riverview	12,486	12,198	11,980	12,586
SW	Southgate	15,115	14,484	14,528	14,602
	Wyandotte	25,883	25,442	25,136	24,692
	Total	40,998	39,926	39,664	39,294
Total		270,051	257,626	258,513	265,563

Sources:

A) Year 2010 Population was obtained from the U.S. Bureau of the Census, Census 2010, Census Tract Data.

B) SEMCOG, Population and Household Estimates for Southeast Michigan, July 2009.

Table B-5

Downriver Sewage Disposal System

Year 2008 Land Use for Incremental Meter Districts (acres)

Meter District	Community	Residential			Non-Residential								Developed Land	Acres in Service Area
		Single-Family Residential	Multiple-family Residential	Total Residential	Commercial	Industrial	Govermental & Institutional	Airport	Transportation, Communication, Utility	Park, Recreation, and Open Space	Agriculture	Water		
DMA-1	Romulus	0	0	0	0	38	0	3,348	107	0	0	2	3,386	3,495
EC-6	Ecorse	465	17	482	87	539	130	0	495	15	0	5	1,238	1,753
	Lincoln Park	172	4	176	25	3	9	0	105	13	0	0	213	331
	Total	637	20	658	112	542	139	0	600	28	0	6	1,450	2,084
P-1	Southgate	240	28	268	102	0	117	0	116	1	0	0	487	604
P-2	Brownstown Twp	2,515	73	2,588	700	1,789	639	0	663	7	151	5	5,716	6,542
	Taylor	5	0	5	0	71	46	0	54	0	0	0	122	176
	Total	2,520	73	2,593	700	1,860	685	0	717	7	151	5	5,838	6,718
PA-1	Southgate	334	46	380	175	0	33	0	134	80	0	3	587	804
PA-2	Taylor	1,435	148	1,583	835	322	147	0	625	150	0	2	2,887	3,665
	Brownstown Twp	63	0	63	3	114	0	0	13	0	0	0	179	192
	Total	1,498	148	1,646	837	436	147	0	638	150	0	2	3,066	3,857
PA-3	Romulus	4,037	46	4,084	440	2,692	570	436	1,104	104	157	61	8,222	9,648
PA-4	Belleville	365	6	371	67	17	141	0	100	11	7	152	596	866
	Van Buren Twp	2,895	0	2,895	42	129	111	0	373	384	625	741	3,177	5,300
	Total	3,260	6	3,266	109	146	252	0	473	396	632	893	3,772	6,166
PB-1	Southgate	213	48	261	280	89	22	0	181	7	0	0	652	839
PB-2	Taylor	816	57	873	192	576	258	0	308	322	0	0	1,898	2,529
PC-1	Allen Park	38	2	40	5	2	7	0	48	20	0	0	54	121
	Dearborn Heights	1,202	3	1,205	99	69	147	0	618	30	0	0	1,520	2,168
	Taylor	2,515	50	2,565	430	864	235	0	1,559	153	0	13	4,093	5,818
	Total	3,755	55	3,810	534	935	388	0	2,225	202	0	13	5,667	8,107
PD-1	Taylor	1,716	157	1,873	348	193	148	0	361	0	0	14	2,561	2,936
PD-2	Romulus	2,071	47	2,119	788	1,929	176	1,209	831	143	801	149	6,220	8,144
PF-2	Allen Park	210	11	221	20	2	13	0	162	17	0	10	255	443
	Southgate	133	51	183	43	63	25	0	69	3	0	0	313	385
	Total	342	61	404	63	64	37	0	230	20	0	10	568	828
RD-1	Allen Park	1,203	3	1,206	116	2	113	0	737	41	0	0	1,437	2,215
	Lincoln Park	1,497	49	1,546	317	101	168	0	1,176	105	0	0	2,132	3,413
	Total	2,700	52	2,752	433	103	282	0	1,913	146	0	0	3,569	5,628
RR-1	River Rouge	320	16	335	35	609	42	0	377	30	0	5	1,021	1,432
RV-1	Riverview	817	49	867	217	342	434	0	452	485	0	24	1,860	2,822
SW	Southgate	881	20	901	266	0	74	0	521	5	0	0	1,241	1,767
	Wyandotte	1,274	17	1,291	243	357	151	0	1,192	134	0	5	2,043	3,373
	Total	2,154	37	2,192	509	357	226	0	1,713	138	0	5	3,284	5,140
Total		27,432	948	28,379	5,873	10,909	3,955	4,993	12,482	2,259	1,742	1,191	54,109	71,783

Source: SEMCOG 2008 Regional Land Use Coverage.

Table B-6

Downriver Sewage Disposal System

Year 2010 Age of Housing Units in Incremental Meter Districts

Meter District	Community	1939 & Earlier	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2004	After 2005	Total Pre-1970	Total Housing Units	% Built Before 1970	Median Year Built
DMA-1	Romulus	0	0	0	0	0	0	0	0	0	0	0	0.0%	0
EC-6	Ecorse	1,906	1,167	1,046	542	57	80	57	112	36	4,661	5,003	93.2%	1947
	Lincoln Park	188	194	629	275	196	49	15	27	11	1,286	1,583	81.2%	1957
	Total	2,093	1,361	1,675	817	253	129	72	139	47	5,946	6,585	90.3%	1950
P-1	Southgate	54	191	611	278	281	154	195	105	48	1,134	1,917	59.2%	1969
P-2	Brownstown Twp	93	154	195	165	1,058	521	624	951	204	607	3,965	15.3%	1986
	Taylor	0	10	30	23	57	9	1	0	0	63	131	48.4%	1970
	Total	93	163	225	189	1,115	530	625	951	204	670	4,095	16.4%	1986
PA-1	Southgate	18	105	281	396	415	282	387	137	61	801	2,082	38.5%	1977
PA-2	Taylor	165	300	818	719	1,910	661	314	364	167	2,003	5,419	37.0%	1974
	Brownstown Twp	3	4	4	5	31	6	18	19	6	17	96	17.2%	1985
	Total	169	305	822	724	1,941	667	332	383	173	2,020	5,515	36.6%	1974
PA-3	Romulus	350	354	826	963	1,126	306	279	213	314	2,492	4,729	52.7%	1969
PA-4	Belleville	205	73	181	243	316	232	595	153	21	702	2,019	34.8%	1980
	Van Buren Twp	76	95	250	156	339	218	425	328	256	577	2,143	26.9%	1987
	Total	281	168	431	399	655	450	1,020	481	277	1,279	4,162	30.7%	1983
PB-1	Southgate	71	195	178	302	633	231	242	148	50	747	2,051	36.4%	1975
PB-2	Taylor	200	213	431	649	565	96	175	197	77	1,492	2,602	57.4%	1968
PC-1	Allen Park	18	54	227	80	28	11	14	9	0	379	441	86.0%	1957
	Dearborn Heights	622	1,330	4,394	929	355	162	168	148	18	7,275	8,125	89.5%	1955
	Taylor	616	1,367	6,130	2,437	1,136	214	256	261	66	10,550	12,483	84.5%	1958
	Total	1,256	2,751	10,750	3,446	1,518	387	437	418	84	18,204	21,049	86.5%	1957
PD-1	Taylor	210	295	677	1,484	1,408	199	157	288	86	2,666	4,804	55.5%	1968
PD-2	Romulus	219	202	535	744	815	259	420	492	221	1,699	3,907	43.5%	1976
PF-2	Allen Park	25	47	890	328	128	24	52	26	0	1,289	1,518	84.9%	1959
	Southgate	61	118	90	111	320	102	102	110	37	380	1,051	36.2%	1975
	Total	86	165	980	439	448	126	154	136	37	1,669	2,569	65.0%	1966
RD-1	Allen Park	584	1,485	4,077	986	329	63	90	81	12	7,132	7,707	92.5%	1955
	Lincoln Park	1,405	3,149	6,552	1,584	754	284	222	64	17	12,690	14,032	90.4%	1953
	Total	1,989	4,634	10,630	2,570	1,084	347	312	145	29	19,823	21,739	91.2%	1954
RR-1	River Rouge	1,953	763	399	423	60	84	57	61	52	3,538	3,852	91.8%	1944
RV-1	Riverview	210	217	1,116	1,077	1,703	373	394	18	69	2,620	5,177	50.6%	1967
SW	Southgate	317	1,329	3,258	614	742	162	72	93	57	5,518	6,644	83.1%	1958
	Wyandotte	3,619	2,667	2,903	907	684	265	520	237	110	10,096	11,912	84.8%	1948
	Total	3,936	3,996	6,161	1,521	1,426	427	592	330	167	15,614	18,556	84.1%	1951
Total		13,188	16,076	36,728	16,421	15,443	5,047	5,851	4,643	1,994	82,414	115,391	71.4%	1961

Source: U.S. Bureau of the Census, Profile of Selected Housing Characteristics: Census 2010, Tract Data.

Notes:

1) Data shown is for the portion of these communities within the incremental meter district. Census tract and area percentage of tract in the incremental meter district were used to estimate number of housing units.

Table B-7
Downriver Sewage Disposal System
Future Housing in Incremental Meter Districts from 2010 to 2035

Meter District	Community	2010 Census Population	2010 Census Housing Units	Year 2010 Persons per Housing Unit	SEMCOG Projected Population Growth from 2010 to 2035	Estimated Future Housing Units Built from 2010 to 2035
DMA-1	Romulus	0	0	0.00	0	0
EC-6	Ecorse	9,515	5,003	1.90	-846	0
	Lincoln Park	3,795	1,583	2.40	-337	0
	Total	13,310	6,585	2.02	-1,183	0
P-1	Southgate	4,121	1,917	2.15	-140	0
P-2	Brownstown Twp	10,397	3,965	2.62	3,148	1,200
	Taylor	262	131	2.00	-6	0
	Total	10,659	4,095	2.60	3,142	1,207
PA-1	Southgate	4,344	2,082	2.09	-148	0
PA-2	Taylor	13,270	5,419	2.45	-291	0
	Brownstown Twp	248	96	2.58	75	29
	Total	13,517	5,515	2.45	-216	0
PA-3	Romulus	11,371	4,729	2.40	1,429	594
PA-4	Belleville	3,993	2,019	1.98	40	20
	Van Buren Twp	5,719	2,143	2.67	1,956	733
	Total	9,712	4,162	2.33	1,996	856
PB-1	Southgate	4,301	2,051	2.10	-146	0
PB-2	Taylor	6,462	2,602	2.48	-142	0
PC-1	Allen Park	1,019	441	2.31	-93	0
	Dearborn Heights	19,152	8,125	2.36	-1,632	0
	Taylor	31,039	12,483	2.49	-681	0
	Total	51,209	21,049	2.43	-2,405	0
PD-1	Taylor	12,100	4,804	2.52	-266	0
PD-2	Romulus	9,532	3,907	2.44	1,198	491
PF-2	Allen Park	3,332	1,518	2.19	-304	0
	Southgate	2,166	1,051	2.06	-74	0
	Total	5,498	2,569	2.14	-377	0
RD-1	Allen Park	18,179	7,707	2.36	-1,657	0
	Lincoln Park	34,347	14,032	2.45	-3,046	0
	Total	52,526	21,739	2.42	-4,703	0
RR-1	River Rouge	7,903	3,852	2.05	-922	0
RV-1	Riverview	12,486	5,177	2.41	100	41
SW	Southgate	15,115	6,644	2.28	-514	0
	Wyandotte	25,883	11,912	2.17	-1,191	0
	Total	40,998	18,556	2.21	-1,705	0
	Totals	270,051	115,391	2.34	-4,488	0

Table B-8

Downriver Sewage Disposal System

Year 2010 & 2035 Age of Housing Units in Incremental Meter Districts

Meter District	Community	2010				2035					
		Pre-1970 Housing Units	Total Housing Units	% Pre-1970	Median Year Built	% Pre-1970	New Housing Units 2010-2035	Total Housing Units	Median Year Built	New Developed Area (acres)	Estimated Total Developed Area (acres)
DMA-1	Romulus	-	-	0.0%	0	0.0%	0	0	0	0	3,386
EC-6	Ecorse	4,661	5,003	93.2%	1947	93.2%	0	5,003	1947	0	1,238
	Lincoln Park	1,286	1,583	81.2%	1957	81.2%	0	1,583	1957	0	213
	Total	5,946	6,585	90.3%	1950	90.3%	0	6,585	1950	0	1,450
P-1	Southgate	1,134	1,917	59.2%	1969	59.2%	0	1,917	1969	0	487
P-2	Brownstown Twp	607	3,965	15.3%	1986	11.8%	1,200	5,165	1995	783	6,499
	Taylor	63	131	48.4%	1970	48.4%	0	131	1970	0	122
	Total	670	4,095	16.4%	1986	12.6%	1,207	5,303	1994	764	6,602
PA-1	Southgate	801	2,082	38.5%	1977	38.5%	0	2,082	1977	0	587
PA-2	Taylor	2,003	5,419	37.0%	1974	37.0%	0	5,419	1974	0	2,887
	Brownstown Twp	17	96	17.2%	1985	13.2%	29	125	1994	19	198
	Total	2,020	5,515	36.6%	1974	36.6%	0	5,515	1974	0	3,066
PA-3	Romulus	2,492	4,729	52.7%	1969	46.8%	594	5,324	1975	513	8,735
PA-4	Belleville	702	2,019	34.8%	1980	34.4%	20	2,039	1980	4	600
	Van Buren Twp	577	2,143	26.9%	1987	20.1%	733	2,876	1996	990	4,167
	Total	1,279	4,162	30.7%	1983	25.5%	856	5,017	1990	671	4,444
PB-1	Southgate	747	2,051	36.4%	1975	36.4%	0	2,051	1975	0	652
PB-2	Taylor	1,492	2,602	57.4%	1968	57.4%	0	2,602	1968	0	1,898
PC-1	Allen Park	379	441	86.0%	1957	86.0%	0	441	1957	0	54
	Dearborn Heights	7,275	8,125	89.5%	1955	89.5%	0	8,125	1955	0	1,520
	Taylor	10,550	12,483	84.5%	1958	84.5%	0	12,483	1958	0	4,093
	Total	18,204	21,049	86.5%	1957	86.5%	0	21,049	1957	0	5,667
PD-1	Taylor	2,666	4,804	55.5%	1968	55.5%	0	4,804	1968	0	2,561
PD-2	Romulus	1,699	3,907	43.5%	1976	38.6%	491	4,398	1981	266	6,486
PF-2	Allen Park	1,289	1,518	84.9%	1959	84.9%	0	1,518	1959	0	255
	Southgate	380	1,051	36.2%	1975	36.2%	0	1,051	1975	0	313
	Total	1,669	2,569	65.0%	1966	65.0%	0	2,569	1966	0	568
RD-1	Allen Park	7,132	7,707	92.5%	1955	92.5%	0	7,707	1955	0	1,437
	Lincoln Park	12,690	14,032	90.4%	1953	90.4%	0	14,032	1953	0	2,132
	Total	19,823	21,739	91.2%	1954	91.2%	0	21,739	1954	0	3,569
RR-1	River Rouge	3,538	3,852	91.8%	1944	91.8%	0	3,852	1944	0	1,021
RV-1	Riverview	2,620	5,177	50.6%	1967	50.2%	41	5,219	1967	7	1,867
SW	Southgate	5,518	6,644	83.1%	1958	83.1%	0	6,644	1958	0	1,241
	Wyandotte	10,096	11,912	84.8%	1948	84.8%	0	11,912	1948	0	2,043
	Total	15,614	18,556	84.1%	1951	84.1%	0	18,556	1951	0	3,284
Total		82,414	115,391	71.4%	1961	71.4%	0	115,391	1961	0	54,109

Sources:

A) U.S. Bureau of the Census, Profile of Selected Housing Characteristics: Census 2010, Census Tract Data.

B) SEMCOG, Residential Building Permits , 2000-2011

C) SEMCOG, 2035 Regional Forecast.

Table B-9
Downriver Sewage Disposal System
Employment and Forecasted Employment in Incremental Meter Districts

Meter District	Community	Commercial, Industrial, Institutional and Airport Land (acres)	Year 2010	Year 2015	Year 2020	Year 2025	Year 2030	Year 2035
DMA-1	Romulus	3,386	11,093	11,224	11,523	11,654	11,788	12,057
EC-6	Ecorse	756	3,359	3,197	3,125	3,049	2,983	2,952
	Lincoln Park	37	530	528	529	525	521	524
	Total	793	3,889	3,725	3,654	3,574	3,504	3,476
P-1	Southgate	219	2,506	2,521	2,526	2,510	2,483	2,471
P-2	Brownstown Twp	3,128	5,144	5,664	6,077	6,381	6,663	6,954
	Taylor	117	871	890	903	905	903	909
	Total	3,245	6,015	6,554	6,980	7,286	7,567	7,863
PA-1	Southgate	207	2,372	2,385	2,390	2,375	2,350	2,338
PA-2	Taylor	1,304	9,696	9,911	10,050	10,070	10,052	10,119
	Brownstown Twp	116	191	211	226	238	248	259
	Total	1,420	9,887	10,121	10,277	10,307	10,300	10,378
PA-3	Romulus	4,138	13,556	13,717	14,082	14,243	14,406	14,734
PA-4	Belleville	225	2,072	2,149	2,217	2,252	2,264	2,319
	Van Buren Twp	281	548	544	550	547	547	551
	Total	506	2,620	2,693	2,767	2,799	2,811	2,870
PB-1	Southgate	391	4,469	4,496	4,506	4,477	4,429	4,408
PB-2	Taylor	1,026	7,628	7,797	7,907	7,922	7,907	7,961
PC-1	Allen Park	14	182	188	192	194	198	205
	Dearborn Heights	315	3,913	4,019	4,084	4,074	4,057	4,073
	Taylor	1,528	11,361	11,613	11,777	11,800	11,778	11,858
	Total	1,856	15,456	15,820	16,053	16,068	16,034	16,136
PD-1	Taylor	688	5,115	5,228	5,302	5,312	5,302	5,338
PD-2	Romulus	4,101	13,434	13,594	13,955	14,115	14,277	14,602
PF-2	Allen Park	34	452	467	476	483	493	511
	Southgate	130	1,486	1,495	1,498	1,489	1,473	1,466
	Total	164	1,938	1,962	1,974	1,972	1,966	1,976
RD-1	Allen Park	231	3,068	3,174	3,235	3,283	3,351	3,469
	Lincoln Park	586	8,452	8,417	8,434	8,363	8,296	8,344
	Total	817	11,520	11,591	11,669	11,646	11,648	11,813
RR-1	River Rouge	685	1,688	1,608	1,585	1,547	1,518	1,501
RV-1	Riverview	994	5,205	5,294	5,373	5,331	5,284	5,241
SW	Southgate	340	3,891	3,915	3,923	3,898	3,857	3,838
	Wyandotte	752	12,575	12,750	12,885	12,965	13,062	13,186
	Total	1,092	16,466	16,664	16,808	16,863	16,918	17,024
Total		25,730	134,856	136,995	139,330	140,002	140,493	142,188

Source:
A) SEMCOG, Community Profiles for Southeast Michigan, January 2012
B) SEMCOG, 2035 Regional Forecast
Notes:
1) Incremental meter district data is calculated by percentage of Commercial, Industrial, Institutional and Airport Land.
2) SEMCOG forecasted employment numbers are by place of work. They include wage and salary jobs as well as self-employed. The employment numbers do not include Farming, Construction or Military jobs.

Table B-10 Downriver Sewage Disposal System Significant Industrial User (SIU) Average Daily Flow Rate by Incremental Meter District			
Meter District	**Community**	**2010 Average Daily SIU Flow Rate (GPD)**	**2010 Average Daily SIU Flow Rate (cfs)**
DMA-1	Romulus	0	0.00
EC-6	Ecorse	0	0.00
	Lincoln Park	0	0.00
	Total	0	0.00
P-1	Southgate	0	0.00
P-2	Brownstown Twp	105,038	0.16
	Taylor	3,129	0.00
	Total	108,167	0.17
PA-1	Southgate	0	0.00
PA-2	Taylor	59,512	0.09
	Brownstown Twp	0	0.00
	Total	59,512	0.09
PA-3	Romulus	66,216	0.10
PA-4	Belleville	0	0.00
	Van Buren Twp	7,877	0.01
	Total	7,877	0.01
PB-1	Southgate	0	0.00
PB-2	Taylor	7,468	0.01
PC-1	Allen Park	0	0.00
	Dearborn Heights	0	0.00
	Taylor	402,299	0.62
	Total	402,299	0.62
PD-1	Taylor	51,737	0.08
PD-2	Romulus	481,559	0.75
PF-2	Allen Park	53,918	0.08
	Southgate	0	0.00
	Total	53,918	0.08
RD-1	Allen Park	0	0.00
	Lincoln Park	4,822	0.01
	Total	4,822	0.01
RR-1	River Rouge	38,107	0.06
RV-1	Riverview	15,690	0.02
SW	Southgate	0	0.00
	Wyandotte	1,100,515	1.70
	Total	1,100,515	1.70
Total		2,397,888	3.71

Sources:
A) Wayne County Downriver Wastewater Treatment Facility, 2010 SIU list with customer reported flow rates.

Table B-11 Downriver Sewage Disposal System Flow Split Factors for Incremental Meter Districts					
Meter District	**Community**	**2010 Population in Incremental Meter District**	**2010 Housing Units in Incremental Meter District**	**2010 Developed Land in Incremental Meter District**	**Currently Used Flow Split Factor in System Monitoring Plan**
DMA-1	Romulus	100.00%	100.00%	100.00%	100.00%
EC-6	Ecorse	71.49%	75.97%	85.35%	72.14%
	Lincoln Park	28.51%	24.03%	14.65%	27.86%
P-1	Southgate	100.00%	100.00%	100.00%	100.00%
P-2	Brownstown Twp	97.55%	96.81%	97.91%	100.00%
	Taylor	2.45%	3.19%	2.09%	0.00%
PA-1	Southgate	100.00%	100.00%	100.00%	100.00%
PA-2	Taylor	98.17%	98.26%	94.15%	100.00%
	Brownstown Twp	1.83%	1.74%	5.85%	0.00%
PA-3	Romulus	100.00%	100.00%	100.00%	100.00%
PA-4	Belleville	41.11%	48.51%	15.79%	40.83%
	Van Buren Twp	58.89%	51.49%	84.21%	59.17%
PB-1	Southgate	100.00%	100.00%	100.00%	100.00%
PB-2	Taylor	100.00%	100.00%	100.00%	100.00%
PC-1	Allen Park	1.99%	2.09%	0.95%	0.89%
	Dearborn Heights	37.40%	38.60%	26.82%	33.33%
	Taylor	60.61%	59.30%	72.23%	65.78%
PD-1	Romulus	0.00%	0.00%	0.00%	1.62%
	Taylor	100.00%	100.00%	100.00%	98.38%
	Total	100.00%	100.00%	100.00%	100.00%
PD-2	Romulus	100.00%	100.00%	100.00%	100.00%
PF-2	Allen Park	60.61%	59.10%	44.83%	76.40%
	Southgate	39.39%	40.90%	55.17%	23.60%
RD-1	Allen Park	34.61%	35.45%	40.27%	47.71%
	Lincoln Park	65.39%	64.55%	59.73%	52.29%
RR-1	River Rouge	100.00%	100.00%	100.00%	100.00%
RV-1	Riverview	100.00%	100.00%	100.00%	100.00%
SW	Southgate	36.87%	35.80%	37.80%	23.00%
	Wyandotte	63.13%	64.20%	62.20%	77.00%

Appendix C
Cost Estimates

Table 1.0
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**SRF Project Plan Summary of Costs, 2015-2034**	By:	**TMG/SLD**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
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NO.	ITEM	SUB-TOTAL
	PRIORITY 1 PROJECTS (2015 - 2019)	
FY 2015		
1.1	Secondary/Headworks Improvements: Segment 1	$18,000,000
1.2	Biosolids Drying and Beneficial Reuse: Design*	$5,421,000
	(Basis of Design completed first at an estimated cost of $1.2M, before proceeding to project design at estimated cost of $4.2M)	
FY 2016		
1.3	DSDS Interceptor System (Including RSTS) Improvements	$5,000,000
FY 2017		
1.4	Biosolids Drying and Beneficial Reuse: Construction	$41,931,000
	PRIORITY 1 SUBTOTAL	**$70,352,000**
	PRIORITY 2 PROJECTS (2020 - 2024)	
2.1	Secondary/Headworks Improvements: Segment 2	$5,977,000
2.2	D-A-F Building Renovation	$7,174,000
2.3	Instrumentation and SCADA Improvements	$10,000,000
2.4	Ultraviolet Disinfection Renovations	$17,226,000
2.5	DSDS Interceptor System (Including RSTS) Improvements	$5,000,000
	PRIORITY 2 SUBTOTAL	**$45,377,000**
	PRIORITY 3 PROJECTS (2025 - 2029)	
3.1	Primary Treatment System Improvements	$9,834,000
3.2	Secondary/Headworks Improvements: Segment 3	$34,867,000
3.3	DSDS Interceptor System (Including RSTS) Improvements	$5,000,000
	PRIORITY 3 SUBTOTAL	**$49,701,000**
	PRIORITY 4 PROJECTS (2030 - 2034)	
4.1	Instrumentation and SCADA Improvements	$10,000,000
4.2	DSDS Interceptor System (Including RSTS) Improvements	$5,000,000
	PRIORITY 4 SUBTOTAL	**$15,000,000**
	ENGINEER'S OPINION OF PROJECT COST	**$ 180,430,000**

**Note: Design costs are not eligible for SRF financing until the project proceeds to construction, at which time eligible planning and design costs incurred to date are reimbursed.*

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Table 1.1
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**Secondary/Headworks Improvements: Segment 1**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
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NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 02	**CIVIL / SITE**				
1	Site Utilities	1	LS	$ 700,000	$700,000
2	Detritor Drain Lines	2	EA	$ 16,500	$33,000
3	Aerated Grit Drain Lines	3	EA	$ 16,500	$50,000
4	Paving	1	LS	$ 86,000	$86,000
5	Site Restoration	1	LS	$ 111,000	$111,000
				Subtotal:	**$980,000**
DIV. 3	**STRUCTURAL**				
1	Floor Topping	4	EA	$ 11,000	$44,000
2	Wall Penetrations	1	LS	$ 17,000	$17,000
				Subtotal:	**$61,000**
DIV. 04-10	**ARCHITECTURAL**				
1	Gate Façade Wall	1	LS	$ 55,000	$55,000
2	Aerated Grit Building	1	LS	$ 388,000	$388,000
3	Influent Pump Station	1	LS	$ 144,000	$144,000
4	Clarifer Building Nos. 1 thru 6	1	LS	$ 104,000	$104,000
5	Return Activiated Sludge Building	1	LS	$ 28,000	$28,000
6	N. and S. Influent Chamber Houses	1	LS	$ 30,000	$30,000
				Subtotal:	**$749,000**
DIV. 11	**EQUIPMENT**				
1	Sluice Gates	5	EA	$ 56,500	$283,000
2	Slide Gates	4	EA	$ 47,500	$190,000
3	Check Valves	2	EA	$ 34,000	$68,000
4	Fine Screens 5 and 7	1	LS	$ 825,000	$825,000
5	Air Blowers and Piping	3	EA	$ 56,500	$170,000
6	RAS Pumps	8	EA	$ 170,000	$1,360,000
7	RAS Piping and Valves	1	LS	$ 249,000	$249,000
8	Sump Pump Systems	12	EA	$ 37,500	$450,000
9	Laboratory Analytical Equipment	1	LS	$ 655,000	$655,000
10	Aerated Girt Dragout	3	EA	$ 167,500	$503,000
11	Demolition	1	LS	$ 194,000	$194,000
				Subtotal:	**$4,947,000**
DIV. 14	**CONVEYORS**				
1	Fine Screen Conveyors	1	LS	$ 270,000	$270,000
				Subtotal:	**$270,000**
DIV. 15	**MECHANICAL**				
1	H&V Equipment	1	LS	$ 290,000	$290,000
3	Plumbing	1	LS	$ 173,000	$173,000
				Subtotal:	**$463,000**
DIV. 16	**ELECTRICAL**				
1	MCCs, Lighting, Arc Flash & Labeling	1	LS	$ 1,189,000	$1,189,000
2	Redundant Power Feed	1	LS	$ 332,000	$332,000
3	Paging/Communications System	1	LS	$ 55,000	$55,000
4	I&C, Automation and SCADA Integration	1	LS	$ 140,000	$140,000
				Subtotal:	**$1,716,000**
				TRADES SUBTOTAL	**$9,186,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$1,378,000
DIV. 01	General Requirements	7.5%			$689,000
	Contingencies	40%			$3,673,000
	SUBTOTAL			**Subtotal:**	**$14,926,000**
	PROJECT COSTS				
	Engineering	15%			$2,220,000
	Force Account	3%			$671,000
	Annual Cost Adjustment	1%	per yr.	1.0%	$149,000
				TOTAL	**$17,966,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 18,000,000**

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Table 1.2
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**Biosolids Drying and Beneficial Reuse**	By:	**TMG**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
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NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 04-10	**ARCHITECTURAL**				
1	Use existing Solids Building for Dewatering Centrifuges & Dryer incl Odor Control; demo & rehab	10,000	SF	$ 336	$3,360,000
				Subtotal:	**$3,360,000**
DIV. 11	**EQUIPMENT**				
1	Centrifuges, Furnace, Dryer, Bins, Conveyors, Scrubber - Including Mech/Elec/I&C Installation, Painting, Misc. Complete	1	LS	$ 22,000,000	$22,000,000
				Subtotal:	**$22,000,000**
				TRADES SUBTOTAL	**$25,360,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$3,804,000
DIV. 01	General Requirements	7.5%			$1,902,000
	Contingencies	20%			$5,072,000
	SUBTOTAL			**Subtotal:**	**$36,138,000**
	PROJECT COSTS				
	Engineering	25%			$9,035,000
	Force Account	3%			$1,084,000
	Annual Cost Adjustment	1.0%	per yr.	3.0%	$1,095,000
				TOTAL	**$47,352,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 47,352,000**

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Table 1.3
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**DSDS Interceptor System (Including Regional Storage and Transport System) Improvements**	By:	**EJW**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 2	**CIVIL/SITE**				
1	Rehabilitation of existing sewers and manholes with PACP Grade 4 or 5 defects	1	LS	$ 2,100,000	$2,100,000
				Subtotal:	**$2,100,000**
DIV. 16	**EQUIPMENT**				
1	Replacement of select existing flow meters and SCADA programming	1	LS	$ 600,000	$600,000
				Subtotal:	**$600,000**
				TRADES SUBTOTAL	**$2,700,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$405,000
DIV. 01	General Requirements	7.5%			$203,000
	Contingencies	20%			$540,000
	SUBTOTAL			**Subtotal:**	**$3,848,000**
	PROJECT COSTS				
	Engineering	25%			$960,000
	Force Account	3%			$115,000
	Annual Cost Adjustment	1.0%	per yr.	2.0%	$77,000
				TOTAL	**$5,000,000**
	ENGINEER'S OPINION OF PROJECT COST			**$**	**5,000,000**

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Table 2.1
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**Secondary/Headworks Improvements: Segment 2**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 02	**CIVIL / SITE**				
1	Oxygen Piping	1,200	LF	$ 200	$240,000
2	Site Restoration	1	LS	$ 100,000	$100,000
				Subtotal:	**$340,000**
DIV. 04-10	**ARCHITECTURAL**				
1	W. and E. Grit Buildings	1	LS	$ 200,800	$201,000
2	Old Solids Building	1	LS	$ 524,000	$524,000
3	Influent Pump Station Limestone	1	LS	$ 100,000	$100,000
4	Building Addition leaks over Electrical Gear	1	LS	$ 100,000	$100,000
5	Tunnel Pump Station	1	LS	$ 28,800	$29,000
6	Tunnel Pump Station Electrical Building	1	LS	$ 28,800	$29,000
				Subtotal:	**$983,000**
DIV. 11	**EQUIPMENT**				
1	Sluice Gates (remaining after current proj.)	5	EA	$ 51,000	$255,000
2	Slide Gates (remaining after current proj.)	4	EA	$ 43,000	$172,000
3	Gripper Rehabilitation	1	LS	$ 68,000	$68,000
4	Detritor System Improvements	2	EA	$ 170,000	$340,000
5	IW Booster System	1	LS	$ 85,000	$85,000
6	Sample System Renovations	1	LS	$ 255,000	$255,000
				Subtotal:	**$1,175,000**
DIV. 14	**CONVEYORS**				
1	Screen and Hoist	1	LS	$ 128,000	$128,000
				Subtotal:	**$128,000**
DIV. 15	**MECHANICAL**				
1	H&V Equipment	1	LS	$ 200,000	$200,000
2	Headworks Plumbing	1	LS	$ 70,000	$70,000
3	Secondary Plumbing	1	LS	$ 30,000	$30,000
				Subtotal:	**$300,000**
DIV. 16	**ELECTRICAL**				
1	MCCs, Lighting, Arc Flash & Labeling	1	LS	$ 225,000	$225,000
				Subtotal:	**$225,000**
				TRADES SUBTOTAL	**$3,151,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$473,000
DIV. 01	General Requirements	7.5%			$236,000
	Contingencies	20%			$630,000
	SUBTOTAL			**Subtotal:**	**$4,490,000**
	PROJECT COSTS				
	Engineering	25%			$1,123,000
	Force Account	3%			$135,000
	Annual Cost Adjustment	1%	per yr.	5.1%	$229,000
				TOTAL	**$5,977,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 5,977,000**

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Table 2.2
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**D-A-F Building Renovation**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 02	**CIVIL / SITE**				
1	Demolition	1	LS	$ 75,000	$75,000
2	Misc. Site Work	1	LS	$ 120,000	$120,000
				Subtotal:	**$195,000**
DIV. 04-10	**ARCHITECTURAL**				
1	D.A.F. Building	1	LS	$ 1,000,000	$1,000,000
2	Maintenance Building	1	LS	$ 425,000	$425,000
3	Employee Service Building	1	LS	$ 90,000	$90,000
4	Maintenance Garage	1	LS	$ 60,000	$60,000
5	Administration Building	1	LS	$ 275,000	$275,000
				Subtotal:	**$1,850,000**
DIV. 15	**MECHANICAL**				
1	H&V Equipment	1	LS	$ 325,000	$325,000
2	Plumbing	1	LS	$ 80,000	$80,000
				Subtotal:	**$405,000**
DIV. 16	**ELECTRICAL**				
1	MCCs, Lighting, Arc Flash & Labeling	1	LS	$ 1,000,000	$1,000,000
2	SCADA Integration	1	LS	$ 30,000	$30,000
				Subtotal:	**$1,030,000**
				TRADES SUBTOTAL	**$3,480,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$522,000
DIV. 01	General Requirements	7.5%			$261,000
	Contingencies	30%			$1,044,000
	SUBTOTAL			**Subtotal:**	**$5,307,000**
	PROJECT COSTS				
	Engineering	25%			$1,325,000
	Force Account	3%			$159,000
	Annual Cost Adjustment	1.0%	per yr.	7.2%	$383,000
				TOTAL	**$7,174,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 7,174,000**

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Table 2.3
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**Instrumention and SCADA System Improvements**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 15	**MECHANICAL**				
1	Plate Valves	5	LS	$ 34,000	$170,000
				Subtotal:	**$170,000**
DIV. 16	**ELECTRICAL**				
1	SCADA Replacement	1	LS	$ 1,510,000	$1,510,000
2	Field Instruments Replacement	1	LS	$ 1,171,000	$1,171,000
3	VFDs	1	LS	$ 1,700,000	$1,700,000
				Subtotal:	**$4,381,000**
				TRADES SUBTOTAL	**$4,551,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$683,000
DIV. 01	General Requirements	7.5%			$341,000
	Contingencies	40%			$1,820,000
	SUBTOTAL			**Subtotal:**	**$7,395,000**
	PROJECT COSTS				
	Engineering	25%			$1,850,000
	Force Account	3%			$222,000
	Annual Cost Adjustment	1.0%	per yr.	7.2%	$533,000
				TOTAL	**$10,000,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 10,000,000**

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Table 2.4
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**UV Disinfection System Renovations**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 02	**CIVIL / SITE**				
1	Civil Site Work	1	LS	$ 100,000	$100,000
				Subtotal:	**$100,000**
DIV. 3	**CONCRETE**				
1	Concrete	1	LS	$ 1,000,000	$1,000,000
				Subtotal:	**$1,000,000**
DIV. 04-10	**ARCHITECTURAL**				
1	General Architectural	1	LS	$ 700,000	$700,000
				Subtotal:	**$700,000**
DIV. 11	**EQUIPMENT**				
1	UV Equipment	1	LS	$ 4,500,000	$4,500,000
				Subtotal:	**$4,500,000**
DIV. 15	**MECHANICAL**				
1	Plumbing	1	LS	$ 450,000	$450,000
				Subtotal:	**$450,000**
DIV. 16	**ELECTRICAL**				
1	Power, and I&C	1	LS	$ 1,000,000	$1,000,000
				Subtotal:	**$1,000,000**
				TRADES SUBTOTAL	**$7,750,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$1,163,000
DIV. 01	General Requirements	7.5%			$581,000
	Contingencies	40%			$3,100,000
	SUBTOTAL			**Subtotal:**	**$12,594,000**
	PROJECT COSTS				
	Engineering	25%			$3,211,000
	Force Account	3%			$378,000
	Annual Cost Adjustment	1.0%	per yr.	8.3%	$1,043,000
				TOTAL	**$17,226,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 17,226,000**

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Table 2.5
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**DSDS Interceptor System (Including Regional Storage and Transport System) Improvements**	By:	**EJW**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 2	**CIVIL/SITE**				
1	Rehabilitation of existing sewers and manholes with PACP Grade 4 or 5 defects	1	LS	$ 2,000,000	$2,000,000
				Subtotal:	**$2,000,000**
DIV. 16	**EQUIPMENT**				
1	Replacement of select field instrumentation and SCADA programming	1	LS	$ 224,000	$224,000
				Subtotal:	**$224,000**
				TRADES SUBTOTAL	**$2,224,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$334,000
DIV. 01	General Requirements	7.5%			$167,000
	Contingencies	40%			$890,000
	SUBTOTAL			**Subtotal:**	**$3,615,000**
	PROJECT COSTS				
	Engineering	25%			$899,000
	Force Account	3%			$108,000
	Annual Cost Adjustment	1.0%	per yr.	10.5%	$378,000
				TOTAL	**$5,000,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 5,000,000**

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Table 3.1
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**Primary Treatment System Improvements**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 02	**CIVIL / SITE**				
1	Civil Site Work	1	LS	$ 100,000	$100,000
				Subtotal:	**$100,000**
DIV. 3	**CONCRETE**				
1	Concrete	1	LS	$ 100,000	$100,000
				Subtotal:	**$100,000**
DIV. 04-10	**ARCHITECTURAL**				
1	General Architectural	1	LS	$ 600,000	$600,000
				Subtotal:	**$600,000**
DIV. 11	**EQUIPMENT**				
1	Drive and Collector Equipment	1	LS	$ 2,500,000	$2,500,000
				Subtotal:	**$2,500,000**
DIV. 15	**MECHANICAL**				
1	H&V and Plumbing	1	LS	$ 500,000	$500,000
				Subtotal:	**$500,000**
DIV. 16	**ELECTRICAL**				
1	I&C, Automation and SCADA Integration	1	LS	$ 500,000	$500,000
				Subtotal:	**$500,000**
				TRADES SUBTOTAL	**$4,300,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$645,000
DIV. 01	General Requirements	7.5%			$323,000
	Contingencies	40%			$1,720,000
	SUBTOTAL			**Subtotal:**	**$6,988,000**
	PROJECT COSTS				
	Engineering	25%			$1,750,000
	Force Account	3%			$210,000
	Annual Cost Adjustment	1.0%	per yr.	12.7%	$886,000
				TOTAL	**$9,834,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 9,834,000**

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Table 3.2
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**Secondary/Headworks Improvements: Segment 3**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 02	**CIVIL / SITE**				
1	Civil Site Work	1	LS	$ 1,500,000	$1,500,000
				Subtotal:	**$1,500,000**
DIV. 3	**CONCRETE**				
1	Concrete	1	LS	$ 2,000,000	$2,000,000
				Subtotal:	**$2,000,000**
DIV. 04-10	**ARCHITECTURAL**				
1	General Architectural	1	LS	$ 2,500,000	$2,500,000
				Subtotal:	**$2,500,000**
DIV. 11	**EQUIPMENT**				
1	Process Equipment	1	LS	$ 6,000,000	$6,000,000
				Subtotal:	**$6,000,000**
DIV. 15	**MECHANICAL**				
1	H&V and Plumbing	1	LS	$ 1,100,000	$1,100,000
				Subtotal:	**$1,100,000**
DIV. 16	**ELECTRICAL**				
1	I&C, Automation and SCADA Integration	1	LS	$ 2,000,000	$2,000,000
				Subtotal:	**$2,000,000**
				TRADES SUBTOTAL	**$15,100,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$2,265,000
DIV. 01	General Requirements	7.5%			$1,133,000
	Contingencies	40%			$6,040,000
	SUBTOTAL			**Subtotal:**	**$24,538,000**
	PROJECT COSTS				
	Engineering	25%			$6,204,000
	Force Account	3%			$736,000
	Annual Cost Adjustment	1.0%	per yr.	13.8%	$3,389,000
				TOTAL	**$34,867,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 34,867,000**

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Table 3.3
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**DSDS Interceptor System (Including Regional Storage and Transport System) Improvements**	By:	**EJW**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 2	**CIVIL/SITE**				
1	Rehabilitation of existing sewers and manholes with PACP Grade 4 or 5 defects	1	LS	$ 1,500,000	$1,500,000
				Subtotal:	**$1,500,000**
DIV. 16	**EQUIPMENT**				
1	Replacement of select field instrumentation and SCADA programming	1	LS	$ 636,000	$636,000
				Subtotal:	**$636,000**
				TRADES SUBTOTAL	**$2,136,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$320,000
DIV. 01	General Requirements	7.5%			$160,000
	Contingencies	40%			$854,000
	SUBTOTAL			**Subtotal:**	**$3,470,000**
	PROJECT COSTS				
	Engineering	25%			$867,000
	Force Account	3%			$104,000
	Annual Cost Adjustment	1.0%	per yr.	16.1%	$559,000
				TOTAL	**$5,000,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 5,000,000**

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Table 4.1
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**Instrumention and SCADA System Improvements**	By:	**THS**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 16	**ELECTRICAL**				
1	SCADA Replacement	1	LS	$ 2,000,000	$2,000,000
2	Field Instruments Replacement	1	LS	$ 2,000,000	$2,000,000
3	VFDs	1	LS	$ 250,000	$250,000
				Subtotal:	**$4,250,000**
				TRADES SUBTOTAL	**$4,250,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$638,000
DIV. 01	General Requirements	7.5%			$319,000
	Contingencies	40%			$1,700,000
	SUBTOTAL			**Subtotal:**	**$6,907,000**
	PROJECT COSTS				
	Engineering	25%			$1,694,000
	Force Account	3%			$207,000
	Annual Cost Adjustment	1.0%	per yr.	17.3%	$1,192,000
				TOTAL	**$10,000,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 10,000,000**

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Table 4.2
Engineer's Opinion of Project Costs

OWNER	**Wayne County DPS-Environmental Services Group**	Est. Date	**5/8/2014**
PROJECT	**2014 Downriver Sewage Disposal System SRF Project Plan**	Project No.	**20100602.80**
WORK:	**DSDS Interceptor System (Including Regional Storage and Transport System) Improvements**	By:	**EJW**
BASIS OF ESTIMATE:		Ck'd by:	**SLD**
		CCI: Time of Est.	**Feb. 2014: 9681**

[X] Report [ ] Design [ ]
[ ] 50% [X] 90% [ ] Final

NO.	ITEM	QUAN.	UNIT	UNIT PRICE	SUB-TOTAL
DIV. 2	**CIVIL/SITE**				
1	Rehabilitation of existing sewers and manholes with PACP Grade 4 or 5 defects	1	LS	$ 1,800,000	$1,800,000
				Subtotal:	**$1,800,000**
DIV. 16	**EQUIPMENT**				
1	Replacement of select field instrumentation and SCADA programming	1	LS	$ 250,000	$250,000
				Subtotal:	**$250,000**
				TRADES SUBTOTAL	**$2,050,000**
	Contractual Requirement				
DIV. 00	General Conditions	15%			$308,000
DIV. 01	General Requirements	7.5%			$154,000
	Contingencies	40%			$820,000
	SUBTOTAL			**Subtotal:**	**$3,332,000**
	PROJECT COSTS				
	Engineering	25%			$834,000
	Force Account	3%			$100,000
	Annual Cost Adjustment	1.0%	per yr.	22.0%	$734,000
				TOTAL	**$5,000,000**
	ENGINEER'S OPINION OF PROJECT COST				**$ 5,000,000**

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Downriver Sewage Disposal System
2014 SRF Project Plan
Present Worth Analysis

Summary of Biosolids Alternatives' Costs

	Alt. 1 Landfill Dewatered Biosolids	Alt. 2 Landfill Class B Biosolids	Alt. 3 Land Apply Class B Biosolids	Alt. 4 Sludge Drying
Capital Costs	$ 12,284,000	$ 24,257,000	$ 73,248,000	$ 36,772,000
Annual OM&R Costs	$ 4,140,600	$ 6,135,800	$ 7,231,600	$ 4,942,350
PW of 20 Year Salvage Value	$ 1,139,494	$ 2,473,338	$ 13,083,000	$ 1,241,000
Equiv. Annual Cost of PW	$ 4,988,000	$ 7,793,000	$ 11,807,000	$ 7,644,000
Net Present Worth	$ 65,594,506	$ 102,473,662	$ 155,259,788	$ 100,523,000
Rank, PW low to high	**1**	**3**	**4**	**2**
Risk Factor	**3**	**2**	**2**	**1**

Notes:

Net Present Worth is the sum of capital costs and OM&R costs, less 20 year salvage value.
Present Worth Costs are based on Straight Line Depreciation and no inflation.
Cost is based on a study period of 20 years and a discount rate of 4.375%.
Risk Factors -
1 = Lowest Risk with respect to future cost and ability to dispose of biosolids
2 = Moderate Risk with respect to future cost inflation and ability to dispose of biosolids
3 = High Risk with continued landfilling due to potential cost increase and landfills refusing to accept biosolids

ALTERNATIVE 1 - LANDFILL DEWATERED BIOSOLIDS

PRESENT WORTH ANALYSIS

CAPITAL COST		PRESENT WORTH[1]	SERVICE LIFE (YEARS)		NET PW (PW - SALVAGE VALUE[2])
Silo Tank	$	528,000	50	$	393,000
Silo load/unload, conveyance	$	3,806,000	20	$	3,806,000
One New Centrifuge in Year 5	$	6,439,000	20	$	5,755,358
Two New Centrifuges in Year 10	$	1,039,000	20	$	818,374
New Conveyors in Year 10	$	472,000	20	$	371,774
TOTAL CAPITAL COST	**$**	**12,284,000**		$	11,144,506
PRESENT WORTH OF SALVAGE VALUE				$	1,139,494

ANNUAL OPERATION AND MAINTENANCE COST

Electricty, nat gas, polymer	$	822,100
Landfill cake	$	2,430,700
Maintenance	$	497,800
Labor	$	390,000
TOTAL ANNUAL O, M & R COST	$	4,140,600

PRESENT WORTH OF O&M COST	$	54,450,000
PRESENT WORTH	**$**	**65,594,506**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**4,988,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

ALTERNATIVE 2 - LANDFILL OF CLASS B STABILIZED BIOSOLIDS

PRESENT WORTH ANALYSIS

CAPITAL COST		PRESENT WORTH[1]	SERVICE LIFE (YEARS)		NET PW (PW - SALVAGE VALUE[2])
Demolish Incinerators	$	5,800,000	50	$	4,322,000
Lime Stabilized Sludge Silo	$	739,000	50	$	551,000
Incincerator Bldg Modifications	$	4,060,000	50	$	4,903,000
Silo load/unload, conveyance	$	725,000	20	$	725,000
Pug Mill	$	3,625,000	20	$	3,625,000
One New Centrifuge in Year 5	$	3,072,000	20	$	2,745,839
Two New Centrifuges in Year 10	$	5,197,000	20	$	4,093,448
New Conveyors in Year 10	$	1,039,000	20	$	818,374
TOTAL CAPITAL COST	**$**	**24,257,000**		$	21,783,662
PRESENT WORTH OF SALVAGE VALUE				$	2,473,338

ANNUAL OPERATION AND MAINTENANCE COST

Elec, Nat Gas, Polymer	$	1,039,400
Lime/alkaline admixture	$	814,400
Landfill cake	$	3,416,000
Maintenance	$	476,000
Labor	$	390,000
TOTAL ANNUAL O, M & R COST	$	6,135,800

PRESENT WORTH OF O&M COST	$	80,690,000
PRESENT WORTH	**$**	**102,473,662**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**7,793,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

ALTERNATIVE 3 - LAND APPLICATION OF CLASS B STABILIZED BIOSOLIDS

PRESENT WORTH ANALYSIS

CAPITAL COST		PRESENT WORTH[1]	SERVICE LIFE (YEARS)		NET PW (PW - SALVAGE VALUE[2])
Demolish Incinerators	$	5,800,000	50	$	4,322,000
Dewatered Cake Stg Bldg	$	34,800,000	50	$	25,933,000
Incincerator Bldg Modifications	$	4,060,000	50	$	3,025,000
Silo load/unload, conveyance	$	725,000	20	$	725,000
Pug Mill	$	7,250,000	20	$	7,250,000
Conveyence In/Out Cake Storage	$	7,250,000	20	$	7,250,000
Cake Storage Bldg Odor Control	$	3,806,000	20	$	3,806,000
One New Centrifuge in Year 5	$	3,072,000	20	$	2,745,839
Two New Centrifuges in Year 10	$	5,197,000	20	$	4,093,448
New Conveyors in Year 10	$	1,288,000	20	$	1,014,501
TOTAL CAPITAL COST	**$**	**73,248,000**		$	60,164,788
		PRESENT WORTH OF SALVAGE VALUE		$	13,083,000

ANNUAL OPERATION AND MAINTENANCE COST

Electricty, nat gas, polymer	$	1,039,400
Lime/alkaline admixture		814,800
Land application		3,093,500
Land application permit		180,000
Maintenance		1,713,900
Labor		390,000
TOTAL ANNUAL O, M & R COST	$	7,231,600

PRESENT WORTH OF O&M COST	$	95,095,000
PRESENT WORTH	**$**	**155,259,788**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**11,807,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

ALTERNATIVE 4 - SLUDGE DRYING

PRESENT WORTH ANALYSIS

CAPITAL COST		PRESENT WORTH[1]	SERVICE LIFE (YEARS)		NET PW (PW - SALVAGE VALUE[2])
Building demo/rehab	$	4,872,000	50	$	3,631,000
Equipment	$	31,900,000	20	$	31,900,000
TOTAL CAPITAL COST	**$**	**36,772,000**		$	35,531,000
PRESENT WORTH OF SALVAGE VALUE				$	1,241,000

ANNUAL OPERATION AND MAINTENANCE COST		
Labor, equipment, materials	$	2900000
Utilities, chemicals, etc.	$	1550200
Major Maintenance	$	147,100
One Month Landfill	$	345,050
TOTAL ANNUAL O, M & R COST	$	4,942,350

PRESENT WORTH OF O&M COST	$	64,992,000
PRESENT WORTH	**$**	**100,523,000**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**7,644,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

SECONDARY SYSTEM PROJECT, ALTERNATIVE A - SUBMERSIBLE PUMPS

PRESENT WORTH ANALYSIS

CAPITAL COST	PRESENT WORTH[1]	SERVICE LIFE (YEARS)	NET PW (PW - SALVAGE VALUE[2])
Structural	$ 0	50	$ 0
Equipment & Installation	1,322,000	20	1,322,000
Electrical and I&C	134,000	20	134,000
TOTAL CAPITAL COST	**$ 1,456,000**		$ 1,456,000
	PRESENT WORTH OF SALVAGE VALUE		$ 0

ANNUAL OPERATION AND MAINTENANCE COST

Power and Staff	$	74,000
Mechanical Maintenance		26,000
TOTAL ANNUAL O, M & R COST	$	100,000

PRESENT WORTH OF O&M COST	$	1,315,000
PRESENT WORTH	**$**	**2,771,000**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**211,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681, Original Estimate 2009 ENR = 8534

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

SECONDARY SYSTEM PROJECT, ALTERNATIVE B - VERTICAL TURBINE PUMPS

PRESENT WORTH ANALYSIS

CAPITAL COST	PRESENT WORTH[1]	SERVICE LIFE (YEARS)	NET PW (PW - SALVAGE VALUE[2])
Structural	$ 388,000	50	$ 289,000
Equipment & Installation	1,366,000	20	1,366,000
Electrical and I&C	191,000	20	191,000
TOTAL CAPITAL COST	**$ 1,945,000**		$ 1,846,000
	PRESENT WORTH OF SALVAGE VALUE		$ 99,000

ANNUAL OPERATION AND MAINTENANCE COST

Power and Staff	$	75,000
Mechanical Maintenance		16,000
TOTAL ANNUAL O, M & R COST	$	91,000

PRESENT WORTH OF O&M COST	$	1,197,000
PRESENT WORTH	**$**	**3,043,000**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**231,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681, Original Estimate 2009 ENR = 8534

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

HEADWORKS SYSTEM PROJECT, ALTERNATIVE A - DUPERON FLEXRAKE

PRESENT WORTH ANALYSIS

CAPITAL COST	PRESENT WORTH[1]	SERVICE LIFE (YEARS)	NET PW (PW - SALVAGE VALUE[2])
Structural	$ 0	50	$ 0
Equipment & Installation	2,303,000	20	2,303,000
Electrical and I&C	346,000	20	346,000
TOTAL CAPITAL COST	**$ 2,649,000**		$ 2,649,000
	PRESENT WORTH OF SALVAGE VALUE		$ 0

ANNUAL OPERATION AND MAINTENANCE COST

Power & Maintenance	$	18,000
TOTAL ANNUAL O, M & R COST	$	18,000

PRESENT WORTH OF O&M COST	$	234,000
PRESENT WORTH	**$**	**2,883,000**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**222,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681, Original Estimate 2009 ENR = 8534

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

HEADWORKS SYSTEM PROJECT, ALTERNATIVE B - MAHR BAR

PRESENT WORTH ANALYSIS

CAPITAL COST	PRESENT WORTH[1]	SERVICE LIFE (YEARS)	NET PW (PW - SALVAGE VALUE[2])
Structural	$ 0	50	$ 0
Equipment & Installation	2,422,000	20	2,422,000
Electrical and I&C	362,000	20	362,000
TOTAL CAPITAL COST	**$ 2,784,000**		$ 2,784,000
	PRESENT WORTH OF SALVAGE VALUE		$ 0

ANNUAL OPERATION AND MAINTENANCE COST

Power & Maintenance	$ 16,000
TOTAL ANNUAL O, M & R COST	$ 16,000

PRESENT WORTH OF O&M COST	$	208,000
PRESENT WORTH	**$**	**2,992,000**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**230,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681, Original Estimate 2009 ENR = 8534

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

COLLECTION SYSTEM STRUCTURAL REPAIR, ALTERNATIVE A - PRESSURE GROUTING

PRESENT WORTH ANALYSIS

CAPITAL COST		PRESENT WORTH[1]	SERVICE LIFE (YEARS)		NET PW (PW - SALVAGE VALUE[2])
Capital Cost of System	$	1,935,000	20	$	1,935,000
TOTAL CAPITAL COST	**$**	**1,935,000**		$	1,935,000
PRESENT WORTH OF SALVAGE VALUE				$	0

ANNUAL OPERATION AND MAINTENANCE COST

Recurring Costs for System		3,000
TOTAL ANNUAL O, M & R COST	$	3,000

PRESENT WORTH OF O&M COST	$	39,000
PRESENT WORTH	**$**	**1,974,000**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**152,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681, Original Estimate 2009 ENR = 8534

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

COLLECTION SYSTEM STRUCTURAL REPAIR, ALTERNATIVE B - EPDM

PRESENT WORTH ANALYSIS

CAPITAL COST		PRESENT WORTH[1]	SERVICE LIFE (YEARS)		NET PW (PW - SALVAGE VALUE[2])
Capital Cost of System	$	2,605,000	20	$	2,605,000
TOTAL CAPITAL COST	**$**	**2,605,000**		$	**2,605,000**
PRESENT WORTH OF SALVAGE VALUE				$	0

ANNUAL OPERATION AND MAINTENANCE COST

Recurring Costs for System		2,800
TOTAL ANNUAL O, M & R COST	$	2,800

PRESENT WORTH OF O&M COST	$	36,000
PRESENT WORTH	**$**	**2,641,000**
AVERAGE ANNUAL EQUIVALENT COST	**$**	**203,000**

Notes:

(1) February 2014 ENR 20 Cities CCI = 9681, Original Estimate 2009 ENR = 8534

(2) Present Worth Costs are based on Straight Line Depreciation and no inflation. Cost is based on a study period of 20 years and a discount rate of 4.375%

Appendix D
Project Planning Correspondence to Date

From: Pocan, Eric (DEQ)
To: Duffy Sally
Subject: RE: Wayne County/Downriver 2014 Draft SRF Project Plan
Date: Friday, May 23, 2014 2:59:31 PM

Thanks for the update.

Eric Pocan, Project Manager
Department of Environmental Quality
Office of Drinking Water and Municipal Assistance
Revolving Loan Section
517-284-5416 Office

From: Duffy Sally [mailto:sduffy@hrc-engr.com]
Sent: Friday, May 23, 2014 2:56 PM
To: Pocan, Eric (DEQ)
Cc: 'Kcave@waynecounty.com'; 'gtupancy@waynecounty.com'; VanDeCreek Jesse; Beauchamp, Dan (DEQ); 'dalford1@waynecounty.com'
Subject: FW: Wayne County/Downriver 2014 Draft SRF Project Plan

Hi Eric,
Thank you for the Email to follow up. I already shared that information with Kelly and Greg at Wayne County, but am forwarding for their record also.

Just so you are aware, we did correct the dates in those two recommended projects tables in the PDF of the Project Plan on the County's website, and also in the hard copies at each of the 13 Clerks' offices that are currently available for public review. We will also be sure to note that during the public hearing.

Thanks again,

Sally Duffy
Hubbell, Roth & Clark, Inc.
Direct: (248) 454-6583
Cell: (734) 776-7336
E-mail: sduffy@hrc-engr.com

From: Sally Duffy
Sent: Friday, May 23, 2014 2:15 PM
To: Duffy Sally
Subject: Fw: Wayne County/Downriver 2014 Draft SRF Project Plan

----- Forwarded Message -----

From: "Pocan, Eric (DEQ)" <POCANE@michigan.gov>
To:
Cc: "Beauchamp, Dan (DEQ)" <BEAUCHAMPD@michigan.gov>
Sent: Thursday, May 22, 2014 3:19 PM
Subject: Wayne County/Downriver 2014 Draft SRF Project Plan

Sally,
Just want to summarize our phone conversation regarding my comments on the draft project plan:

- Please update the Recommended Project tables so Priority 1 projects are shown as FY 2015-2019 and so on for Priority 2-4.
- Before we can score and place the DSDS Interceptor System Improvement project on the fiscal year 2016 priority list we will need to see the NASSCO PACP and MACP review documentation that identifies which segments will be targeted for rehabilitation. This portion of the project plan can be listed on the FY 2015 list as a future project. The best case scenario would be to have this study submitted in early 2015 so I can clear the entire project plan in one environmental assessment.
- We will as have to evaluate the Biosolids portion of the project in the future to ensure the cost effective solution is selected depending on the availability of the local landfills.

Eric Pocan, Project Manager
Department of Environmental Quality
Office of Drinking Water and Municipal Assistance
Revolving Loan Section
517-284-5416 Office

SEMCOG . . . Shaping the Future of Southeast Michigan
Southeast Michigan Council of Governments • 1001 Woodward, Suite 1400 • Detroit, Michigan 48226 • (313) 961-4266 • Fax (313) 961-4869
www.semcog.org

Regional Clearinghouse File No: EN 113486

May 27, 2014

Sally Duffy, Project Engineer
Wayne County Department of Public Services, Environmental Services Group
400 Monroe Street, Suite 400
Detroit, MI 48226

This is to acknowledge receipt of your complete application which you have submitted for review, according to Michigan Federal Project Review System guidelines developed in response to Presidential Executive Order 12372 - Intergovernmental Review of Federal Programs - or according to other state or federal guidelines.

Funding Agency/Program: Environmental Protection Agency
State Clean Water Revolving Loan

Project Title: 2014 Downriver Sewage Disposal System SRF Project Plan

Please direct any questions you may have concerning this review to the following SEMCOG staff person:

Calvin Johnson, Regional Review Office, at (313) 324-3339.

A Regional Clearinghouse review will be completed by **Jun 26, 2014**, within the federal time limits.

The following agencies will be contacted for their comments during the review period:

SEMCOG/Environmental Programs

Please supply them with appropriate information, if requested, to expedite the review process.

Note: Applicant is responsible for providing all comments they receive to the funding agency.

Joan Gebhardt, Treasurer, Schoolcraft College
Kathy D. Vosburg, First Vice Chair, Commissioner, Macomb County
Robert Clark, Vice Chairperson, Mayor, City of Monroe
Rodrick Green, Vice Chairperson, Trustee, Superior Township
Jeffrey Jenks, Vice Chairperson, Commissioner, Huntington Woods
Phil Lajoy, Vice Chairperson, Supervisor, Canton Township
Michael Sedlak, Immediate Past Chair, Mayor, Green Oak Township
Paul E. Tait, Executive Director

HRC 100 YEARS
CONSULTING ENGINEERS SINCE 1915

PRINCIPALS
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Thomas E. Biehl
Walter H. Alix
Peter T. Roth
Keith D. McCormack
Nancy M.D. Faught
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Charles E. Hart

HUBBELL, ROTH & CLARK, INC.
OFFICE: 220 Bagley, Suite 420
Detroit, MI 48226-1453
PHONE: 313.965.3330
FAX: 313.965.3342
WEBSITE: www.hrc-engr.com
EMAIL: info@hrc-engr.com

TRANSMITTAL

DATE: May 12, 2014

TO: Clerk's Offices of: City of Allen Park City of Belleville Brownstown Township City of Dearborn Heights City of Ecorse City of Lincoln Park City of River Rouge City of Riverview City of Romulus City of Southgate City of Taylor Van Buren Township City of Wyandotte **ATTN:** City Clerk **COPY TO:** (2 copies) Wayne County DPS, Environmental Services Group: Kelly Cave & Greg Tupancy; (1 copy) SEMCOG (for Planning agency review)	**JOB NAME:** 2014 Downriver Sewage Disposal System (DSDS) SRF Project Plan HRC Job 20100602.92

SENT VIA:	*Hand delivery*
ISSUED:	For public review and examination

PLEASE FIND THE FOLLOWING ENCLOSED:
On behalf of the Wayne County DPS, Environmental Services Group, please find one copy of the DRAFT 2014 Downriver Sewage Disposal System SRF Project Plan.

Please make this document available to the public for their review until June 12, 2014. A public meeting on this matter will be held on June 11, 2014 at 7:00 p.m. at the City of Wyandotte's Council Chambers, located at the Wyandotte City Hall building, 3200 Biddle Avenue, Wyandotte, MI 48192.

A public notice was advertised in legal classifieds of the *News Herald* and *Press & Guide*, on May 11, 2014.

See Appendix F for additional information on the public hearing.

HUBBELL, ROTH & CLARK, INC.

SENT BY: Sally Duffy, P.E.
Direct: 248-454-6583
sally.duffy@yahoo.com

HUBBELL, ROTH & CLARK, INC
Consulting Engineers

Memorandum

To: 2014 DSDS SRF Project Plan File

From: Sally L. Duffy, P.E.

Subject: MNFI Rare Species Review #1350, and USFWS Section 7 HRC Job No. 20100602

USFWS Section 7 Review

HRC visited the U.S. Fish & Wildlife Service (USFWS) website in order to request an endangered, threatened, proposed and candidate species and proposed and critical habitat list as required for a Section 7 project review. The website URL is: http://www.fws.gov/midwest/endangered/section7/sppranges/michigan-cty.html, and was visited on May 10, 2014. Species listed included the following: Indiana bat (endangered), Northern long-eared bat (proposed endangered), Rufa Red knot (proposed threatened), Eastern massasauga (candidate), Northern riffleshell (endangered), Rayed Bean Mussel (endangered), and the Eastern prairie fringed orchid (threatened.)

None of the projects proposed in the DSDS Project Plan would be located in areas that include typical habitats for the species identified above. The proposed projects will occur at the existing DWTF site, which has been developed and functioning as a wastewater treatment facility for many years. Proposed improvement projects for the DSDS collection system, will occur in previously developed road right-of-ways in an urban area. Limited ground-distributing activity is expected for all proposed projects.

In addition, the proposed projects are keeping with the existing general land use and existing wastewater treatment processes. The proposed projects will actually reduce the potential for adverse impacts to the environment by ensuring the systems and facilities in the DSDS will operate reliably.

For these reasons, we conclude the proposed projects identified in the 2014 DSDS SRF Project Plan will have "no effect" on Section 7 listed species, their habitats, or proposed or designated critical habitats.

MNFI Species Review

HRC submitted a request to the Michigan Natural Features Inventory (MNFI) in accordance with SRF guidelines, and received a letter response from Michael Sanders of the MNFI office, dated February 12, 2014. The MNFI review indicated that impact from the proposed projects to any listed species of concern was "not likely."

As indicated in our request for MNFI review, the proposed projects will occur at the existing DWTF site, which has been developed and functioning as a wastewater treatment facility for many years. Proposed improvement projects for the DSDS collection system, will occur in previously developed road right-of-ways in an urban area. Limited ground-distributing activity is expected for all proposed projects. The following tables summarize the species listed in the MNFI review, and potential for these species to be encountered during the proposed projects:

Table 1: Legally protected species within 1.5 miles of #1350

Scientific Name	Common Name	Habitat Presence at Proposed Project Sites
Silene virginica	Fire pink	Habitat is forests, unlikely to be at project sites
Hydrastis canadensis	Goldenseal	Habitat is forests, unlikely to be at project sites
Myotis sodalis	Indiana bat	Habitat is forests and riparian corridors, unlikely to be at project sites
Pantherophis gloydi	Eastern fox snake	Habitat is shoreline wetlands, unlikely to be at project sites
Sterna hirundo	Common tern	Habitat is islands, unlikely to be at project site
Noturus stigmosus	Northern madtom	Habitat is large rivers, no projects involve surface waters, SESC permit will obtained.
Sander canadensis	Sauger	Habitat is turbid lakes and rivers, no projects involve surface waters, SESC permit will obtained.
Epioblasma torulosa rangiana	Northern riffleshell	Habitat is small rivers, no projects involve surface waters, SESC permit will obtained.
Ligumia nasuta	Eastern pondmussel	Habitat is rivers, no projects involve surface waters, SESC permit will obtained.
Lampsilis fasciola	Wavyrayed lampmussel	Habitat is shallow streams, no projects involve surface waters, SESC permit will obtained.

Table 2: Special concern species and rare natural features within 1.5 miles of #1350

Scientific Name	Common Name	Habitat Presence at Proposed Project Sites
Macrhybopsis storeriana	Silver chub	Habitat is deep rivers, no projects involve surface waters, SESC permit will obtained.
Sistrurus catenatus catenatus	Eastern massasauga	Habitat is open wetlands, unlikely to be at project site
Carex squarrosa	Sedge	Habitat is forests, unlikely to be at project sites
Strophostyles helvula	Trailing wild bean	Habitat is sandy soil, unlikely to be at project sites
Ptychobranchus fasciolaris	Kidney shell	Habitat is rivers, no projects involve surface waters, SESC permit will obtained.
Cerastium velutinum	Field chickweed	Habitat is southern oak savannahs, unlikely to be at project sites
Ptychobranchus fasciolaris	Kidney shell	Habitat is rivers, no projects involve surface waters, SESC permit will obtained.

As stated above, none of the projects proposed in the DSDS Project Plan would be located in areas that include typical habitats for the species identified by the MNFI. In the unlikely event that any suitable habitat, or evidence of possible presence of any of the identified species be made during construction, further actions will be taken as required.

In addition, the proposed projects are keeping with the existing general land use and existing wastewater treatment processes. The proposed projects will actually reduce the potential for adverse impacts to the environment by ensuring the systems and facilities in the DSDS will operate reliably.

HRC therefore does not anticipate that any listed species will be affected by the proposed projects, and therefore the project will NOT require an endangered species permit.

MICHIGAN STATE UNIVERSITY | Extension

Dan Royal
Hubbell, Roth & Clark, Inc.
555 Hulet Drive
Bloomfield, NI 48302

February 12, 2014

Re: Rare Species Review #1350 – Wayne County Dept. of Environment, DSDS improvements, Wayne County, MI T3S, R11E, Several Sections.

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 the nature of the activity and the urban location, it is **not likely** negative impacts will occur. Keep in mind that MNFI cannot fully evaluate this project without visiting the project site. MNFI offers several levels of Rare Species Reviews, including field surveys which I would be happy to discuss with you. Please notify me if you have questions or comments.

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

MSU is an affirmative-action, equal-opportunity employer.

Table 1: Legally protected species within 1.5 miles of #1350

SNAME	SCOMNAME	FIRSTOBS	LASTOBS	USESA	SPROT	GRANK	SRANK	ELCAT
Silene virginica	Fire pink	1838	1917-07-01		E	G5	S1	Plant
Hydrastis canadensis	Goldenseal	1914	1916-05-11		T	G4	S2	Plant
Myotis sodalis	Indiana bat	1865	1865	LE	E	G2	S1	Animal
Pantherophis gloydi	Eastern fox snake		1912-06		T	G3	S2	Animal
Sterna hirundo	Common tern	2002-05-31	2002-05-31		T	G5	S2	Animal
Noturus stigmosus	Northern madtom	1978-05-16	1978-05-16		E	G3	S1	Animal
Sander canadensis	Sauger	1937-10-10	1937-10-10		T	G5	S1	Animal
Epioblasma torulosa rangiana	Northern riffleshell	2006-07-10	2006-07-10	LE	E	G2T2	S1	Animal
Ligumia nasuta	Eastern pondmussel	2006-07-10	2006-07-10		E	G4	SNR	Animal
Lampsilis fasciola	Wavyrayed lampmussel	2006-07-10	2006-07-10		T	G5	S2	Animal

Table 2: Special concern species and rare natural features within 1.5 miles of #1350

SNAME	SCOMNAME	FIRSTOBS	LASTOBS	USESA	SPROT	GRANK	SRANK	ELCAT
Macrhybopsis storeriana	Silver chub	1984	1985-03		SC	G5	S2S3	Animal
Sistrurus catenatus catenatus	Eastern massasauga	1858	1858	C	SC	G3G4T3T4Q	S3S4	Animal
Carex squarrosa	Sedge	1911	1911-07-22		SC	G4G5	S1	Plant
Strophostyles helvula	Trailing wild Bean	1914	1916-09-04		SC	G5	S3	Plant
Ptychobranchus fasciolaris	Kidney shell	2006-07-10	2006-07-10		SC	G4G5	SNR	Animal
Cerastium velutinum	Field Chickweed	1913-05-18	1913-05-18		X	G5T4?	SX	Plant
Ptychobranchus fasciolaris	Kidney shell	1933-06-13	1933-06-13		SC	G4G5	SNR	Animal

Comments for Rare Species Review #1350: 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, 517-248-6216, 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.

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

RICK SNYDER
GOVERNOR

SCOTT WOOSLEY
EXECUTIVE DIRECTOR

March 18, 2014

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

RE: ER-940025 Wayne County Downriver Sewage Disposal System 2014 SRF Project Plan, Sec. 32, T3S, R11E, Wyandotte, Wayne 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 the effects of the proposed undertaking do not meet the criteria of adverse effect [36 CFR § 800.5(a)(1)]. Therefore, the project will have **no adverse effect** [36 CFR § 800.5(b)] on historic properties within the area of potential effects for the above-cited undertaking.

This letter evidences the EPA's compliance with 36 CFR § 800.4 "Identification of historic properties" and 36 CFR § 800.5 "Assessment of adverse effects," and the fulfillment of the EPA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.5(c) "Consulting party review." **If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.**

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.**

Finally, 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. Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely,

Martha MacFarlane-Faes
Deputy State Historic Preservation Officer

MMF:SAT:BGG

copy: Sally Duffy, Hubbell, Roth & Clark, Inc.

Little River Band of Ottawa Indians
Tribal Historic Preservation
375 River Street
Manistee, MI 49660
1-888-723-8288

February 4, 2014

Hubbell, Roth & Clark, Inc.
555 Hulet Drive
Bloomfield Hills, MI 48303

Dear Ms. Duffy;

The Tribe has received your Letter of Jan. 24, 2014, referencing Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility, SRF Project Plan and requesting a determination as to whether or not the proposed project will affect Indian religious sites. Thank you for ensuring that we received notification. This letter is the Tribe's formal answer to your request.

In reply to the above cited letter, I can reply by stating that the site listed is located in a region of the state of Michigan that Little River Band of Ottawa Indians did not occupy significantly. Further, after a careful review of our information the Little River Band of Ottawa Indians has determined there that this project will not affect any religious, cultural or historic Little River Band of Ottawa Indians sites of which we are currently aware.

The Tribe would, however, appreciate work stopping and being contacted should there be something of a cultural, religious or historic nature discovered so as to assist in mitigation of the discovered site.

Signed

Jonnie Sam II, Director
Historic Preservation Department
Little River Band of Ottawa Indians

Pokégnek Bodéwadmik • Pokagon Band of Potawatomi
Department of Language and Culture

32142 Edwards Street • Dowagiac, MI 49047 • www.PokagonBand-nsn.gov
(269) 462-4325 • (269) 783-0452 fax

SCANNED
20100602
RECEIVED
FEB 26 2014
HUBBELL, ROTH & CLARK, INC

February 19, 2014

Sally L. Duffy, P.E.
Hubbell, Roth & Clark, Inc.
420 Michigan Building, 220 Bagley
Detroit, MI 48226

RE: Wayne County Downriver Sewage Disposal, System and Wastewater Treatment Facility, State Revolving Loan (SRF) Project Plan, HRC Job No. 20100602.92

Dear Ms. Duffy:

My name is Marcus Winchester and I am the Tribal Historic Preservation Officer for the Pokagon Band of Potawatomi Indians. I am writing to inform you that after reviewing the Downriver Sewage Disposal System project details, we determined that we are unaware of any historical or culturally significant resources to the Pokagon Band of Potawatomi Indians in the vicinity of the project area. However, if any archaeological resources are uncovered during this undertaking, please contact me immediately. Should you have any other questions, please don't hesitate to contact me at your earliest convenience.

Sincerely,

Marcus Winchester
Tribal Historic Preservation Officer
Pokagon Band of Potawatomi Indians
Office: (269) 462-4224
Cell: (269) 783-9269
marcus.winchester@pokagonband-nsn.gov

HUBBELL, ROTH & CLARK, INC
Consulting Engineers

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

February 6, 2014

Michigan Historical Center
702 West Kalamazoo Street
P.O. Box 30740
Lansing, Michigan 48909-8240

Attn: Environmental Review Office

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility Project Plan, Application 106 Review

HRC Job No. 20100602.92

Ladies and Gentlemen:

Hubbell, Roth & Clark, Inc. is presently working Wayne County Department of Environment on a Project Plan for improvements to the existing Downriver Sewage Disposal System (DSDS.) The work includes improvements and repairs to the existing sewers and the existing Downriver Wastewater Treatment Facility (DWTF.) 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. Please find enclosed the application for Section 106 review and all necessary attachments.

If you should have any questions please do not hesitate to contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Dan Royal

Dan Royal
Graduate Engineer

DJR
Enclosure
pc: HRC; File

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices\004Trans_SHPO.docx

555 Hulet Drive, PO Box 824
Bloomfield Hills, Michigan 48303-0824
Telephone 248 454 6300 **Fax** 248 454 6312
www.hrc-engr.com

STATE HISTORIC PRESERVATION OFFICE
Application for Section 106 Review

SHPO Use Only					
☐ IN	Received Date	____ / ____ / ____	Log In Date	____ / ____ / ____
☐ 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: Wayne County Downriver Sewage Disposal System SRF Project Plan
b. Project Address (if available): various locations, see Attachment "A"
c. Municipal Unit: Wayne County County: Wayne
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*.): US EPA, Region 5, Andrew Lausted (see Attachment "A")
e. State Agency (if applicable), Contact Name and Mailing Address: MDEQ-ESSD, Jeff Herrold, see Attachment "A"
f. Consultant or Applicant Contact Information (if applicable) *including mailing address*: Hubbell, Roth & Clark, Inc., Sally Duffy (see Attachment "A")

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: Wyandotte (for potential ground disturbing work, see Attachment "A" .)
b. Township: T3S Range: R11E Section: 32
c. Description of width, length and depth of proposed ground disturbing activity: See Attachment "A"
d. Previous land use and disturbances: Yes, approx. half of the plant was constructed in 1938. The rest was part of a major addition in 1964. Several improvement projects occurred in the late 1990s.
e. Current land use and conditions: Wastewater Treatment Facility, property entirely developed.
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 Attachment "A"
b. Provide a localized map indicating the location of the project; road names must be included and legible.
c. On the above-mentioned map, identify the APE.
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 "A"

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: See Attachment "A"
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 "A"
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 "A"

V. PHOTOGRAPHS

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

a. Provide photographs of the site itself.
b. Provide photographs of all properties 50 years of age or older located in the APE (faxed or photocopied photographs are not acceptable).

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

HUBBELL, ROTH & CLARK, INC
Consulting Engineers

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Walter H. Alix
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Keith D. McCormack
Nancy M.D. Faught
Daniel W. Mitchell
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Thomas D. LaCross
James F. Burton
Jane M. Graham
Donna M. Martin
Charles E. Hart

Attachment A

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility Project Plan, Application 106 Review

Ladies and Gentlemen:

Hubbell, Roth & Clark, Inc. is presently working Wayne County Department of Environment on a Project Plan for improvements to the existing Downriver Sewage Disposal System (DSDS.) The work includes improvements and repairs to the existing sewers and the existing Downriver Wastewater Treatment Facility (DWTF.) 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:
Mr. Jeff Herrold, 517-335-1977
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.

Consultant Contact Person:
Ms. Sally Duffy
Hubbell, Roth & Clark, Inc.
555 Hulet Drive
PO Box 824
Bloomfield Hills, MI 48303
Phone: 248-454-6583, Fax: 248-338-2592
Email: sduffy@hrc-engr.com

420 Michigan Building, 220 Bagley
Detroit, Michigan 48226-1453
Telephone 313 965 3330 **Fax** 313 965 3342
www.hrc-engr.com

Engineering. Environment. Excellence.

II. GROUND DISTURBING ACTIVITY:

There is a minimal amount of ground disturbing activity associated with this project. At the location of the Downriver Wastewater Treatment Facility, roads, sidewalks and/or equipment pads may be replaced and excavation performed to access existing buried utilities and structures. All areas will be restored to their existing uses.

The work will include renovation and improvements to the existing wastewater treatment facility. The majority of this work will be performed within the existing buildings and structures on site (replacement of existing equipment, etc.) The earth-changing activities at the WWTF site will consist of excavation, backfill and restoration to access existing utilities at the site and pavement replacement. This facility is generally not accessed by the public and is located in an existing industrial area. There are very few trees on the site and only minimal lawn areas, which generally provide cover over below-grade facilities.

Any sewer repair work, if required, will take place below-grade, within the existing structures and will involve cleaning, lining, and structural repairs. The existing sewers are located within in the existing roadway or utility right-of-ways and have been previously disturbed. There will be minimal ground disturbance and no change to the streetscape view of any historic properties.

The undertaking **will not** alter, directly or indirectly, any of the characteristics of any 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 the site's existing use and context. The site 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.

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

Project Work Description:

The proposed work includes the following specific tasks:

- Headworks and Secondary Treatment System Rehabilitation and Improvements
- Biosolids System Improvements
- DSDS Collection System Lining and Spot Repairs
- Instrumentation and Controls (SCADA) System Improvements

Description of the APE:

The Area of Potential Effects (APE) is limited to the Downriver Wastewater Treatment Facility (DWTF) site and the utility rights-of-way where the existing Downriver Sewage Disposal System (DSDS) sewers are located. The APE is limited to these areas because no new facilities are proposed outside the DWTF property. Any work to be performed on the existing DSDS sewers would be performed within the existing structures and would not be visible from the ground surface.

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 and reviewing additional information available from Wayne County and the included municipalities. The following list provides all of the registered sites, along with other sites of local interest. Any historic features within the APE are shown on the attached location maps.

Allen Park:
Aaron Greeley / St. Cosme Line Road Informational Designation
16850 Southfield
State Register listed, P25002

Historical Museum
Englewood Ave. & Park Ave.

Belleville:
French Landing Dam and Powerhouse
12100 Haggerty Road
State Register listed, P25393

Franklin L. Robbe House
12955 Haggerty Road
State Register listed, P25395

Belleville Area Museum
405 Main Street
State Register listed

Van Buren Township Hall
405 Main Street, Belleville
State Registrar Listed

Detroit:
West Jefferson Avenue Bridge
Jefferson Avenue over Rouge River
National Register listed, P25591

Ford Hunger March Site
10520 Fort St.
State Register listed, P25110

Ecorse:
Steamer Columbia Ship
Nicholson Terminal and Dock
National Historic Landmark,
National Register listed, P561

Lincoln Park:
Historical Museum
1335 Southfield Rd.
Not registered

Riverview:
Nike Missile site D-54
14100 Civic Park Drive

Romulus:
Merrill-Morris House
13880 Huron River Drive South
State Register listed, P25346

Romulus (cont.):
Romulus Historical Park
11120 Hunt Street

Romulus Wesleyan Church
Pullens Corner / Five Points

Southgate:
Southgate Historical Museum
14120 Toledo Dix Rd.

Taylor:
John Sell Farmstead House
20904 Northline Road
State Register listed, P25351

Sandhill Cemetery
Telegraph and Pardee Roads
State Register listed, P25349

Taylor Heritage Park
12111 Pardee

Taylor Methodist Episcopal Church
22395 Eureka Road
State Register listed, P25352

Taylor Township Cemetery
Golden Ridge and McKinley Rds.
State Register listed, P25348

Wyandotte:
Ford Village Municipal Building
994 Biddle Avenue
State Register listed, P25367

Amo-Juchartz House
434 Plum Street, Wyandotte
State Register listed, P25365

William and Amelia Kuehn Glinke House
434 Cherry Street
State Register listed, P711

Gustave C. Mehlhose House
367Oak Street
State Register listed, P25371

Louis Mehlhose House
355 Oak Street
State Register listed, P3225

Eureka Iron Works
Northwest corner Van Alstyne Boulevard and Elm Street
State Register listed, P25366

George P. MacNichol House (Wyandotte Historical Museum)
2610 Biddle Avenue
National Register listed, State Register listed, P25369

Marx House
2630 Biddle Avenue, Wyandotte
National Register listed, State Register listed, P25370

Ford-Bacon House
45Vinewood
National Register listed, State Register listed, P25368

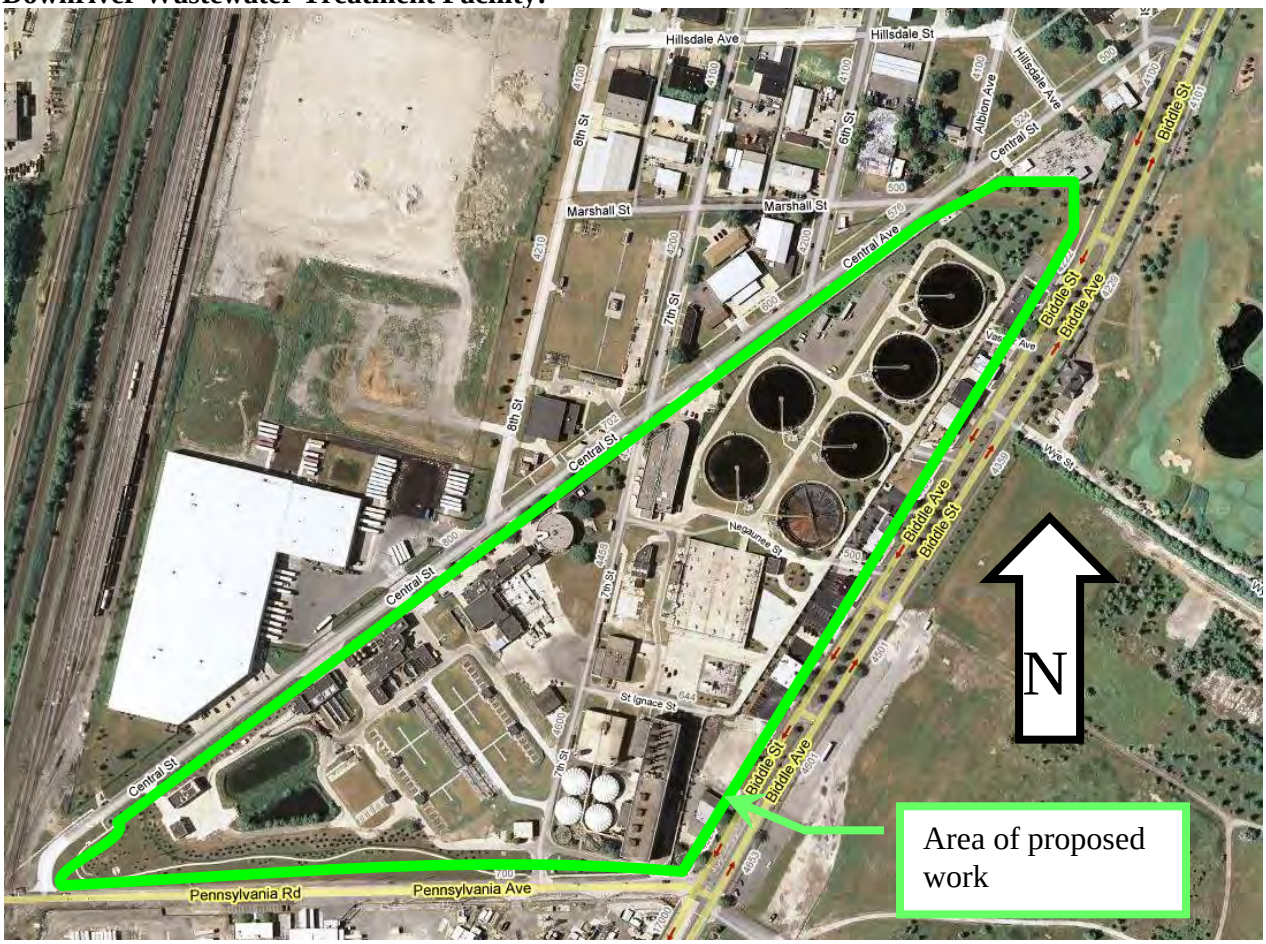
William Armstrong House
2234 Biddle Avenue
State Register listed, P25364

Michigan Alkali Company (BASF) Administration Building
1609 Biddle Street
State Register listed, P25372

Ford Village Municipal Building
994 Biddle Avenue
State Register listed, P25367

V. PHOTOGRAPHS:

Downriver Wastewater Treatment Facility:



Preliminary Treatment Buildings:

Solids Handling Building:

Secondary Treatment Building:

Sidewalk and Road in Utility Area:

VI. DETERMINATION OF EFFECT:

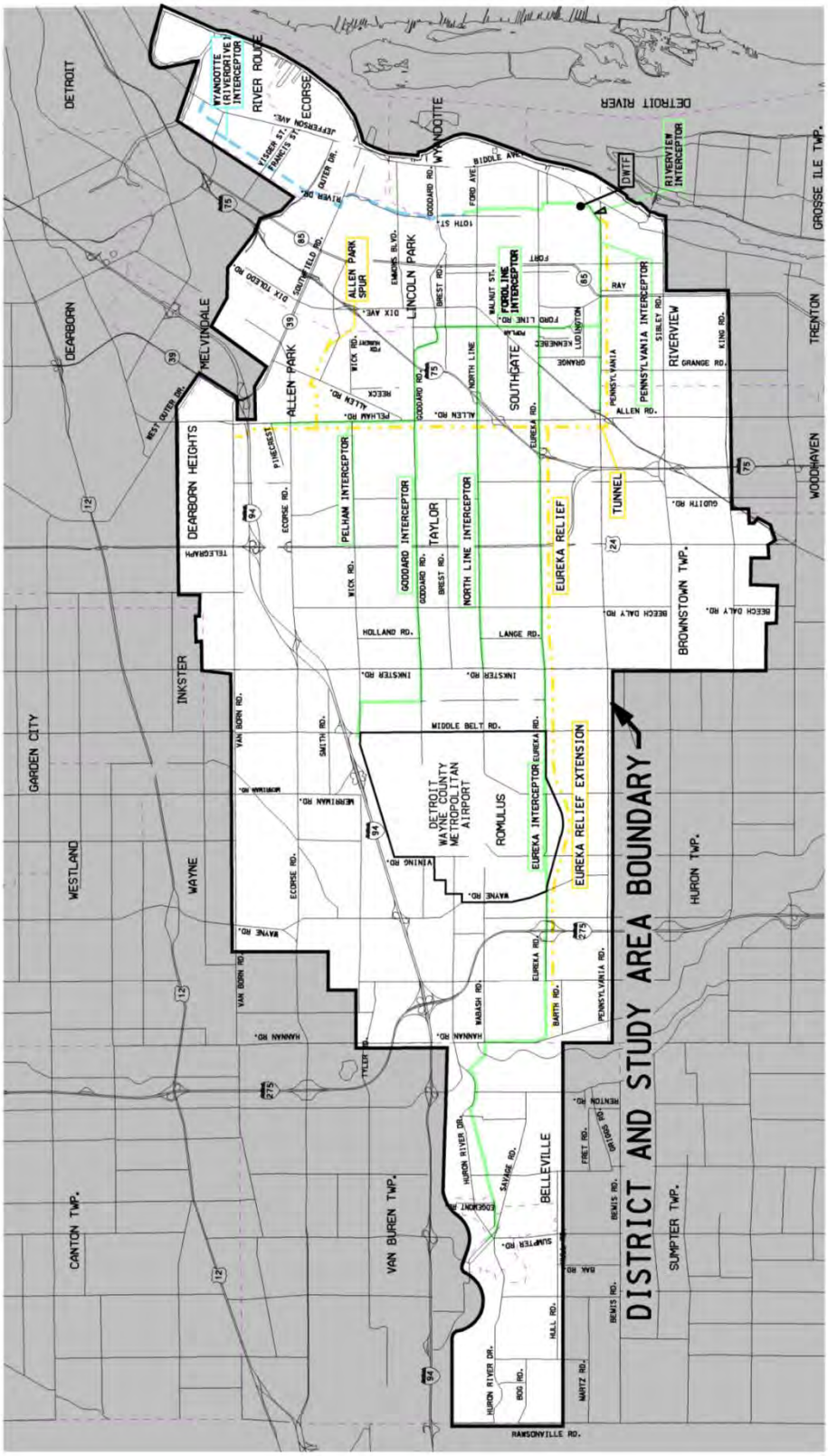
This project will not have any adverse effect on the nearby historic properties.

The undertaking **will not** alter, directly or indirectly, any of the characteristics of the 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.

The majority of the work will be located on the property of the Downriver Wastewater Treatment Facility (DWTF). This site is located in an industrial area, not typically seen by residents. The site was originally developed in 1938, with major addition and renovation projects taking place in the 1960s and 1990s. The property is entirely developed. There are no historic features within the immediate vicinity (see the attached location maps.)

Any sewer repair work, if required, will take place below-grade, within the existing structures and will involve cleaning, lining, and/or structural repairs. The existing sewers are located within in the existing roadway or utility right-of-ways and have been previously disturbed. There will be minimal ground disturbance and no change to the streetscape view of any historic properties. All areas will be restored to their existing conditions. The pre and post-construction climate of the APE therefore will not be altered.

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 State Building Codes.



HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

DSDS SYSTEM LIMITS

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

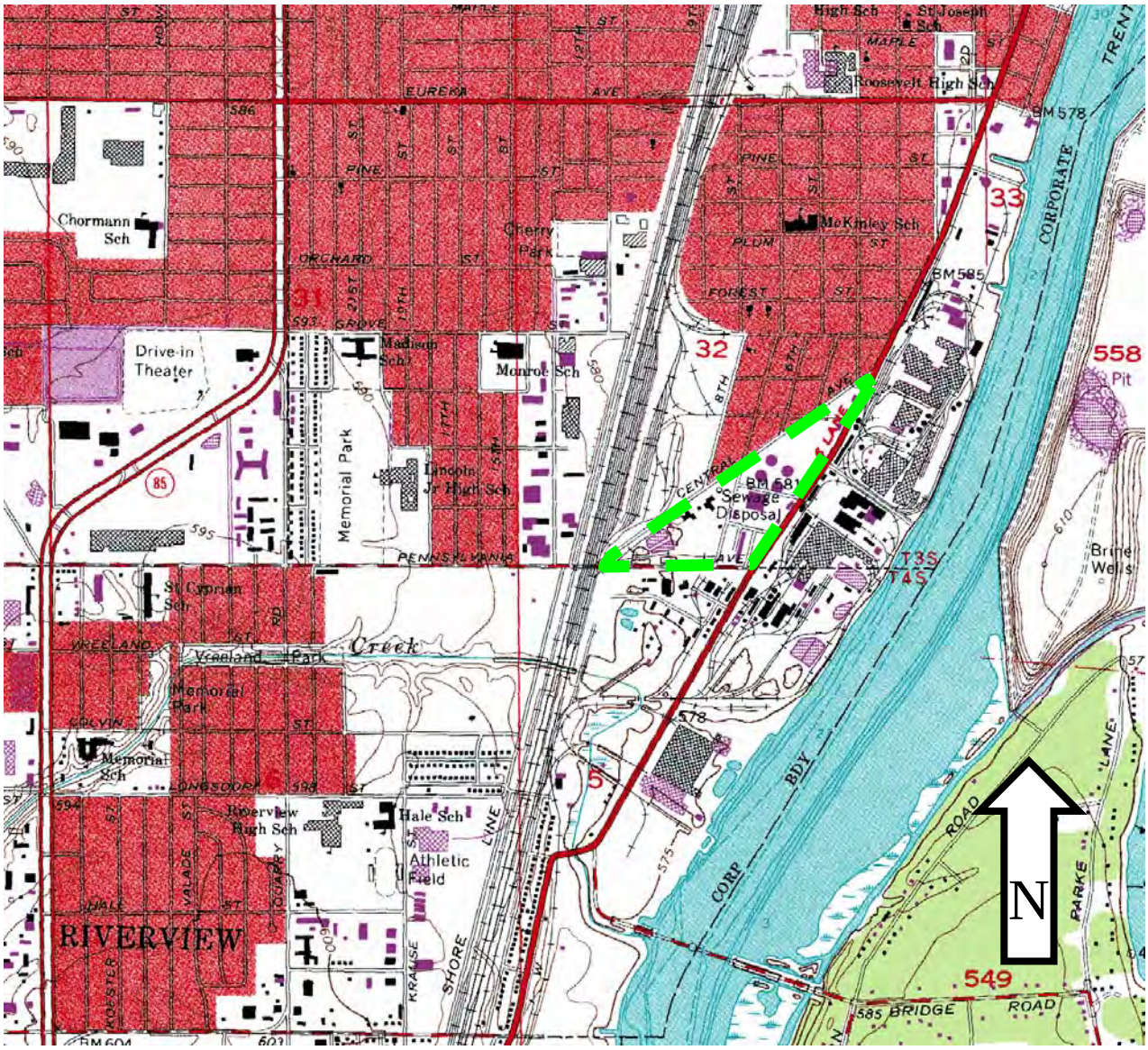
Job No. 20100602.92

Date January 2014

Figure No. 1

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan
T3S, R11E Area Map



Downriver Wastewater Treatment Facility limits

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

LOCATION MAP DWTF

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

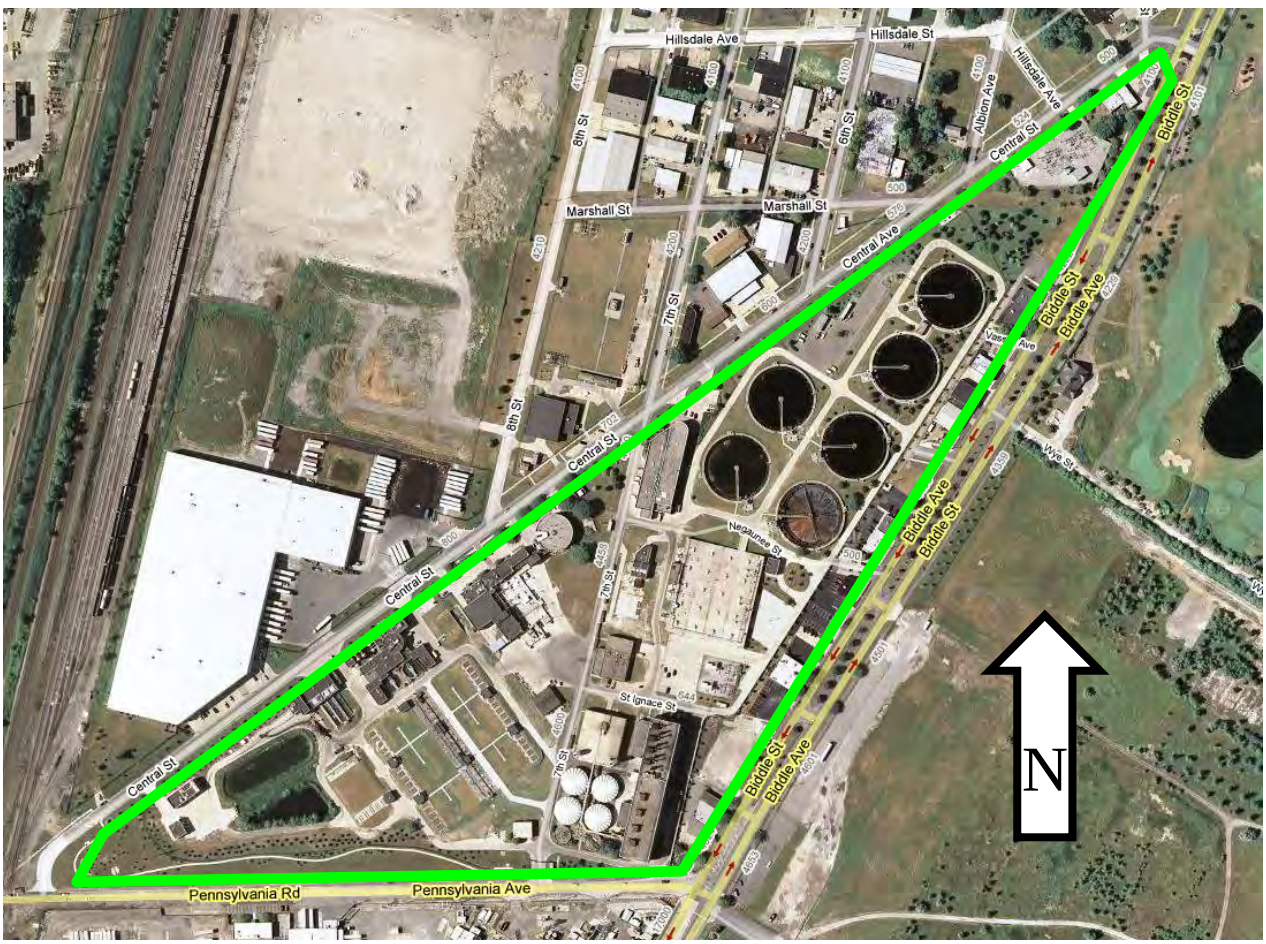
Job No. 20100602.92

Date January 2014

Figure No. 2

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan
T3S, R11E Area Map



Downriver Wastewater Treatment Facility limits

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

DWTF PHOTOS

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

Job No. 20100602.92

Date January 2014

Figure No. 3

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan

Downriver Sewage Disposal System sewers

See Figure No. 3 for Downriver Wastewater Treatment Facility limits

Historic Features within APE:

① John Sell Farmstead House, State Register listed, P25351

② Taylor Methodist Episcopal Church, State Register listed, P25352

③ Merrill-Morris House, State Register listed, P25346

The above image was obtained from the State's "Historic Properties Online" website at: http://www.mcgi.state.mi.us/hso/

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HUBBELL, ROTH & CLARK, INC
Consulting Engineers

REGISTERED HISTORICAL SITES

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

Job No. 20100602.92

Date January 2014

Figure No. 4

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan
T3S, R11E Area Map

Downriver Wastewater Treatment Facility limits

The above image was obtained from the State's "Historic Properties Online" website at: http://www.mcgi.state.mi.us/hso/

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

REGISTERED HISTORICAL SITES

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

Job No. 20100602.92
Date January 2014
Figure No. 5

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

HUBBELL, ROTH & CLARK, INC
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Donna M. Martin
Charles E. Hart

January 24, 2014

Michigan Department of Environmental Quality
Southeast Michigan District Office
Land/Water Interface Permit Staff
27700 Donald Court
Warren 48092

Attn: Mr. Jeremy Richardson

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

Dear Mr. Richardson:
Hubbell, Roth & Clark, Inc. is presently working for the Wayne County Department of Environment on a Project Plan for improvements to the existing Downriver Sewage Disposal System (DSDS.) The work includes improvements and repairs to the existing sewers and the existing Downriver Wastewater Treatment Facility (DWTF.)

The attached map identifies the locations of the various DSDS components. The majority of the work is proposed to occur at the existing DWTF site, located in Wyandotte, Michigan. The earth-changing activities at the DWTF site will consist of excavation, backfill and restoration to access existing utilities at the site and pavement replacement. The majority of the improvement work will actually occur within the existing buildings and structures (equipment replacement and upgrades). No impacts to streams, wetlands, or the floodplain are anticipated, but if any of these areas may be impacted by related activities, the required permits would be applied for.

Additional improvements may be made to the existing sewer system (cleaning, lining, and/or structural repairs.) This work, if necessary, would include only a minimal amount of ground-disturbing activities. The existing sewers are located in the roadway and utility right-of-ways, in previously disturbed grounds. 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 any of the project sites.

Please inform us of your findings at your earliest convenience. If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Sally L. Duffy, P.E.
/sld
Attachment
pc: MDEQ-ESSD; HRC; File

420 Michigan Building, 220 Bagley
Detroit, Michigan 48226-1453
Telephone 313 965 3330 **Fax** 313 965 3342
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Donna M. Martin
Charles E. Hart

January 24, 2014

Bay Mills Indian Community
12140 West Lakeshore Drive
Brimley, MI 49715-9320

Attn: Paula Carrick

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

Ladies and Gentlemen:

Hubbell, Roth & Clark, Inc. is presently working for the Wayne County Department of Environment on a Project Plan for improvements to the existing Downriver Sewage Disposal System (DSDS.) The work includes improvements and repairs to the existing sewers and the existing Downriver Wastewater Treatment Facility (DWTF.)

The Project Plan will be submitted to the Michigan Department of Environmental Quality for prioritization of a State Revolving Fund loan. We are contacting you to seek input whether there is any religious and cultural significance to historic properties in the area of potential effects and to invite you to make any associated comments.

The attached map identifies the locations of the various DSDS components. The majority of the work is proposed to occur at the existing DWTF site, located in Wyandotte, Michigan. Additional improvements may be made to the existing sewer system (cleaning, lining, and/or structural repairs.) This work, if necessary, would include only a minimal amount of ground-disturbing activities. The existing sewers are located in the roadway and utility right-of-ways, in previously disturbed grounds. 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 any of the project sites.

Please inform us of your findings at your earliest convenience. If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Sally L Duffy

Sally L Duffy, P.E.
SLD/djr
Attachment
pc: MDEQ-ESSD; HRC; File

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Donna M. Martin
Charles E. Hart

January 24, 2014

Burt Lake Band of Ottawa & Chippewa Indians
6461 Brutus Road
P.O. Box 206
Brutus, MI 49716

Attn: Curtis Chambers

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

Ladies and Gentlemen:

Hubbell, Roth & Clark, Inc. is presently working for the Wayne County Department of Environment on a Project Plan for improvements to the existing Downriver Sewage Disposal System (DSDS.) The work includes improvements and repairs to the existing sewers and the existing Downriver Wastewater Treatment Facility (DWTF.)

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Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Sally L Duffy, P.E.
SLD/djr
Attachment
pc: MDEQ-ESSD; HRC; File

420 Michigan Building, 220 Bagley
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James F. Burton
Jane M. Graham
Donna M. Martin
Charles E. Hart

January 24, 2014

Grand River Band of Ottawa Indians
1251 Plainfield NE Ste B
PO Box 2937
Grand Rapids, MI 49501

Attn: Ron Yob

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

Ladies and Gentlemen:

Hubbell, Roth & Clark, Inc. is presently working for the Wayne County Department of Environment on a Project Plan for improvements to the existing Downriver Sewage Disposal System (DSDS.) The work includes improvements and repairs to the existing sewers and the existing Downriver Wastewater Treatment Facility (DWTF.)

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Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Sally L Duffy, P.E.
SLD/djr
Attachment
pc: MDEQ-ESSD; HRC; File

420 Michigan Building, 220 Bagley
Detroit, Michigan 48226-1453
Telephone 313 965 3330 **Fax** 313 965 3342
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January 24, 2014

Grand Traverse Band of Ottawa and Chippewa Indians
2605 NW Bayshore Drive
Peshawbetown, MI 49682

Attn: Mark E. Russell

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

Ladies and Gentlemen:

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January 24, 2014

Hannahville Potawatomi Indian Community
M-14911 Hannahville B-1 Road
Wilson, MI 49896

Attn: Earl Meshigaud

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Keweenaw Bay Indian Community
16429 Beartown Road
Baraga, MI 49908

Attn: Summer Sky Cohen

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Lac Vieux Desert Band of Lake Superior Chippewa Indians
P.O. Box 249
Watersmeet, MI 49969

Attn: Giiwegiizhigookway Martin

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Little River Band of Ottawa Indians
375 River Street
Manistee, MI 49660

Attn: Jay Sam

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Little Traverse Bay Band of Odawa
7500 Odawa Circle
Harbor Springs, MI 49740

Attn: Eric Hemenway and/or Gijigowi Bipskaabiimii

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

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January 24, 2014

Match-e-be-nash-shee-wish Gun Lake Band of Potawatomi Indians
P.O. Box 218
Dorr, MI 49323

Attn: Lorraine Shananaquat

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Nottawaseppi Band of Huron Potawatomi
2221 1½ Mile Road
Fulton, MI 49052

Attn: RoAnn Beebe-Mohr

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Pokagon Band of Potawatomi
P.O. Box 180
Dowagiac, MI 49047

Attn: Michael Zimmerman

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Saginaw Chippewa Indian Tribe of MI
6650 E. Broadway
Mt. Pleasant, MI 48858

Attn: William Johnson

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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January 24, 2014

Sault Ste. Marie Tribe of Chippewa
523 Ashmun
Sault Ste. Marie, MI 49783

Attn: Cecil E. Pavlat Sr.

Re: Wayne County Downriver Sewage Disposal System and Wastewater Treatment Facility State Revolving Loan (SRF) Project Plan

HRC Job No. 20100602.92

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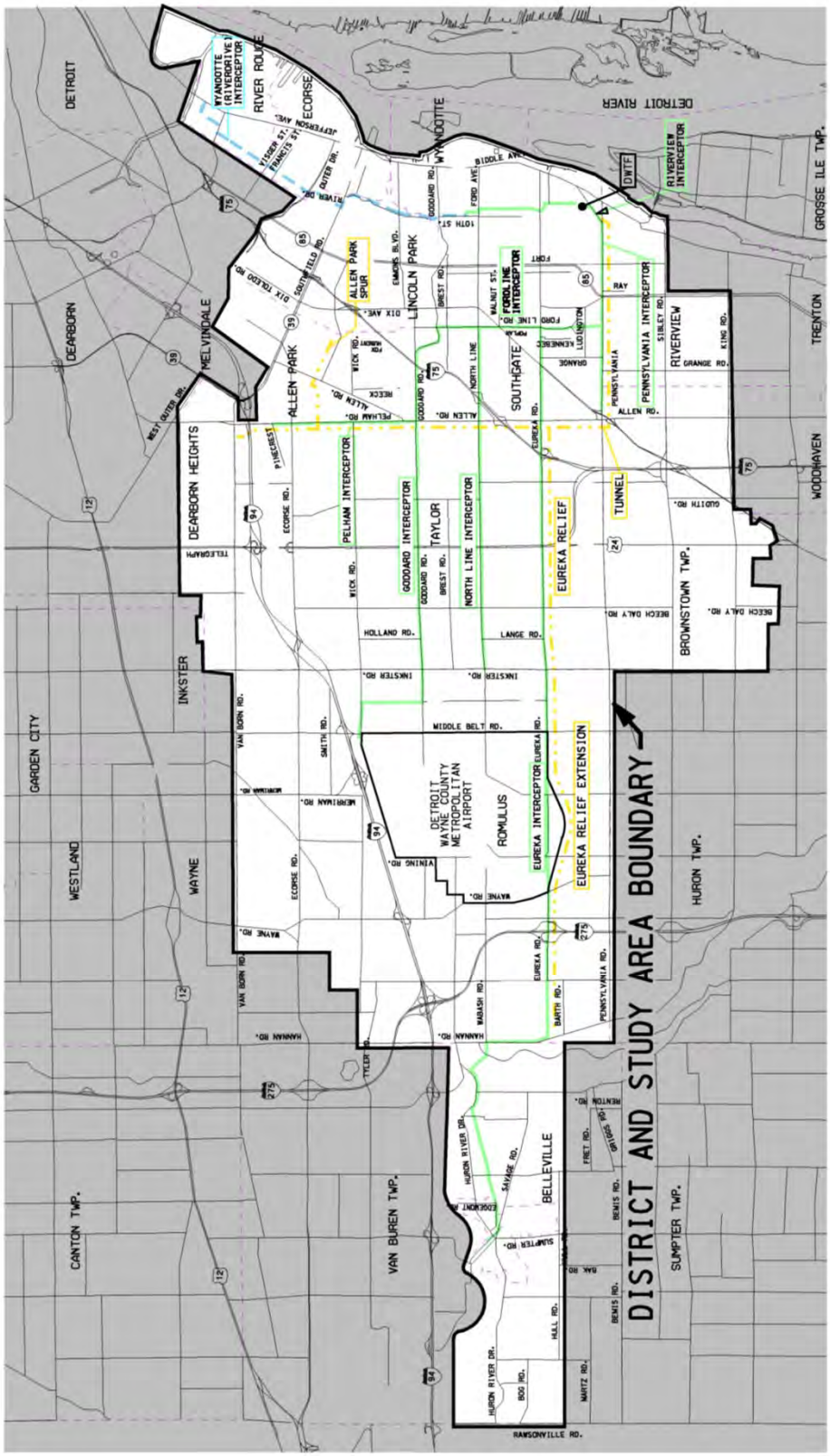
Please inform us of your findings at your earliest convenience. If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Sally L Duffy, P.E.
SLD/djr
Attachment
pc: MDEQ-ESSD; HRC; File

420 Michigan Building, 220 Bagley
Detroit, Michigan 48226-1453
Telephone 313 965 3330 **Fax** 313 965 3342
www.hrc-engr.com



HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

DSDS SYSTEM LIMITS

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

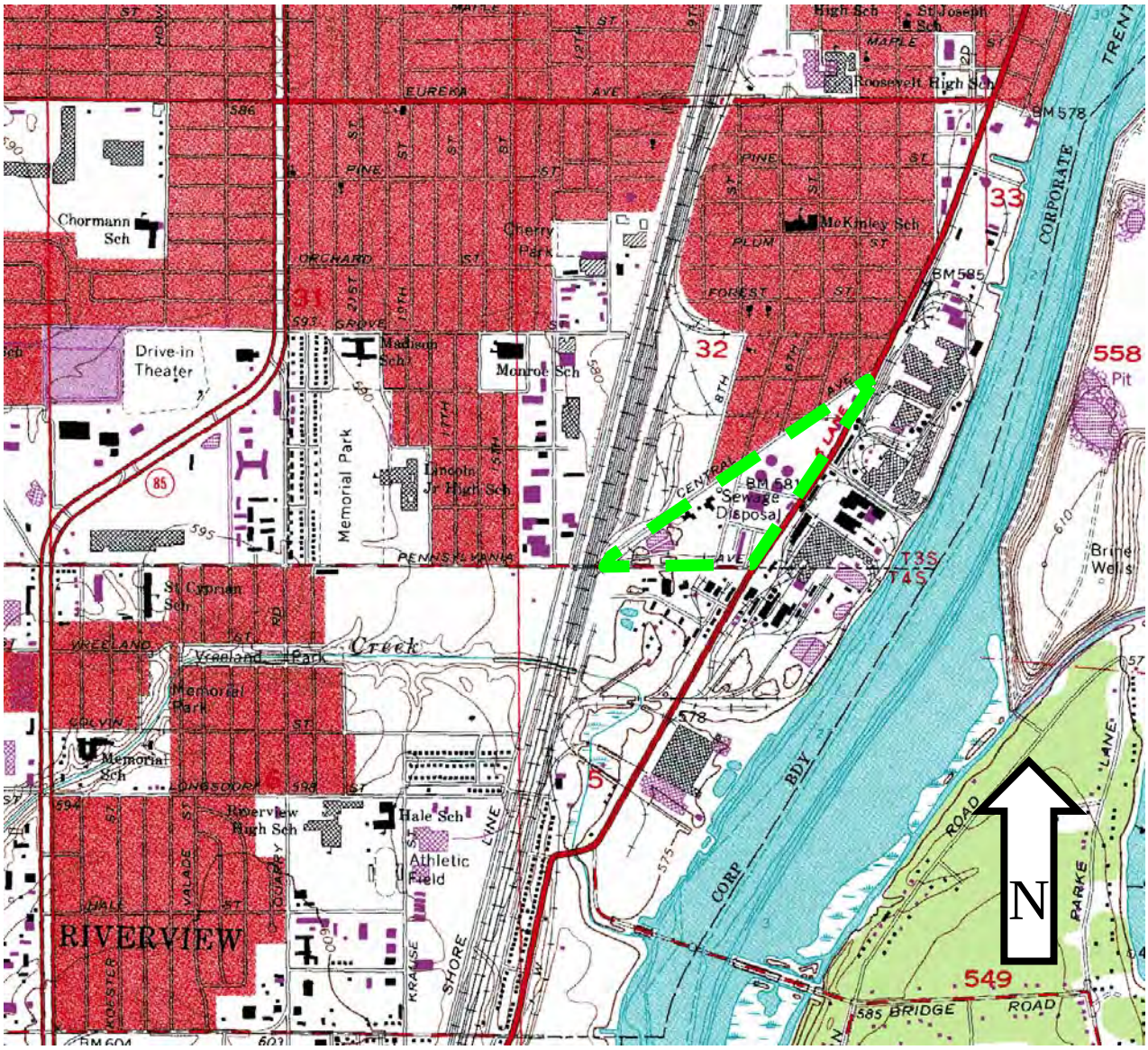
Job No.
20100602.92

Date
January 2014

Figure No.
1

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan
T3S, R11E Area Map



Downriver Wastewater Treatment Facility limits

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

LOCATION MAP DWTF

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

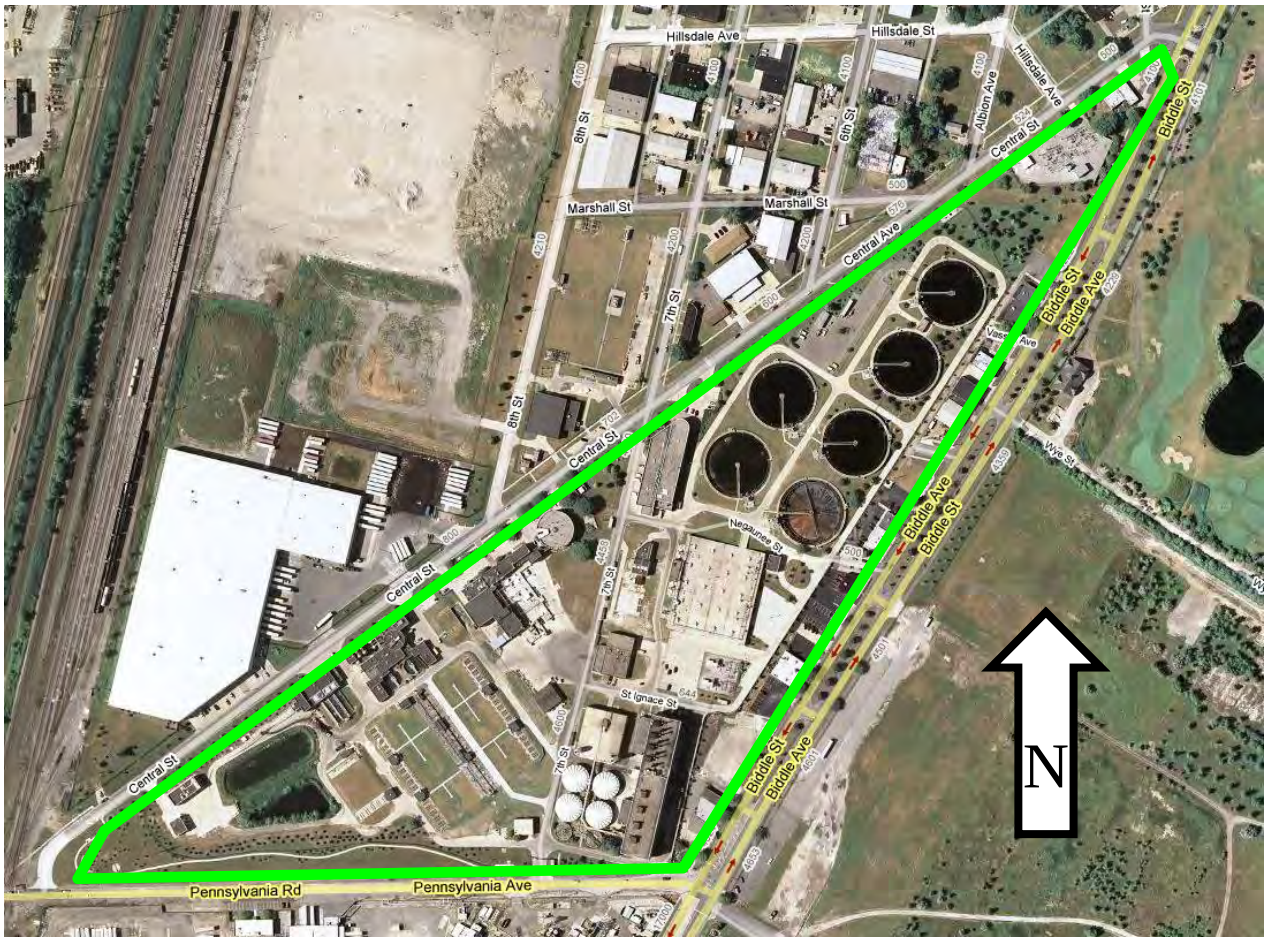
Job No. 20100602.92

Date January 2014

Figure No. 2

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan
T3S, R11E Area Map



Downriver Wastewater Treatment Facility limits

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

DWTF PHOTOS

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM
PROJECT PLAN

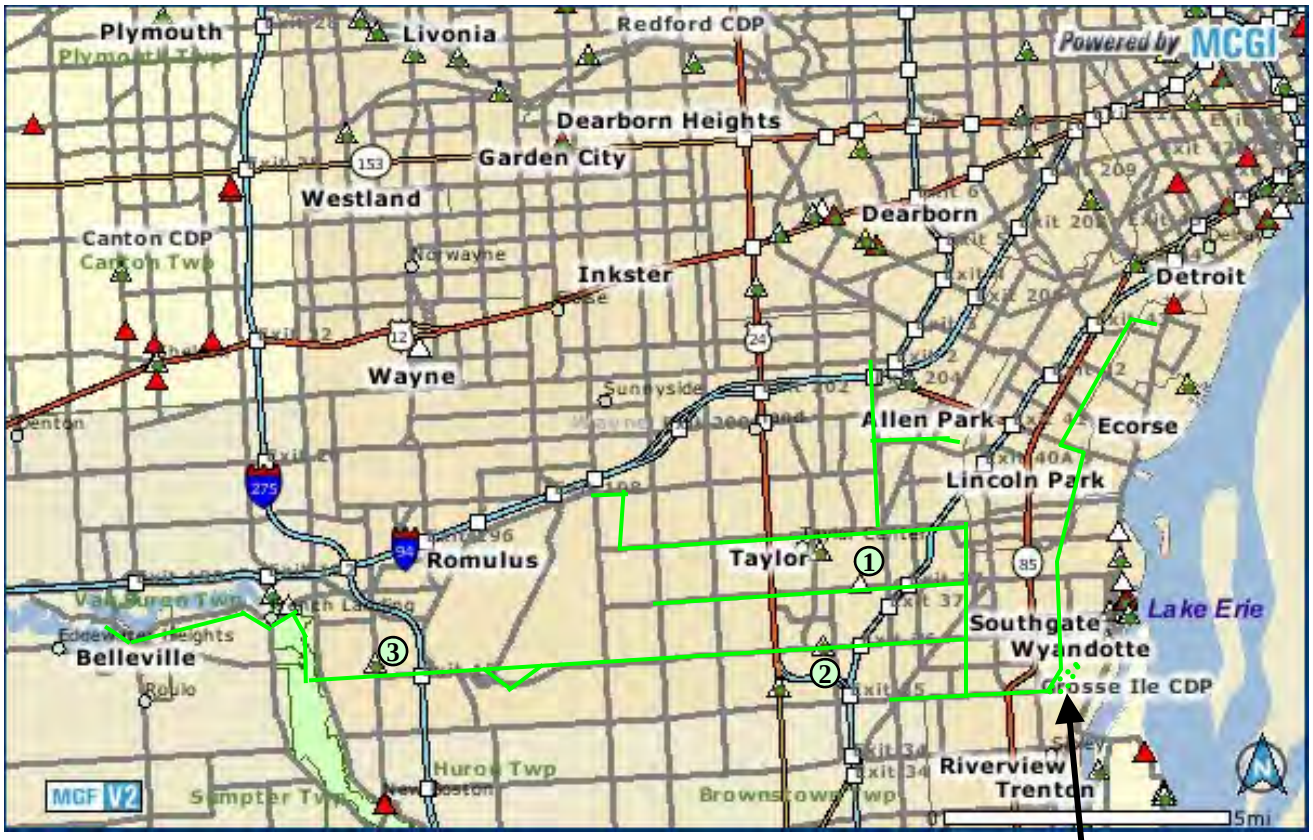
Job No.
20100602.92

Date
January 2014

Figure No.
3

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan



Downriver Sewage Disposal System sewers

See Figure No. 3 for Downriver Wastewater Treatment Facility limits

Historic Features within APE:

① John Sell Farmstead House, State Register listed, P25351

② Taylor Methodist Episcopal Church, State Register listed, P25352

③ Merrill-Morris House, State Register listed, P25346

The above image was obtained from the State's "Historic Properties Online" website at: http://www.mcgi.state.mi.us/hso/

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

REGISTERED HISTORICAL SITES

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

Job No. 20100602.92
Date January 2014
Figure No. 4

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Wyandotte, Michigan USGS Quadrangle
Wayne County, Michigan
T3S, R11E Area Map

Downriver Wastewater Treatment Facility limits

The above image was obtained from the State's "Historic Properties Online" website at: http://www.mcgi.state.mi.us/hso/

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers

REGISTERED HISTORICAL SITES

WAYNE COUNTY DOWNRIVER SEWAGE DISPOSAL SYSTEM PROJECT PLAN

Job No. 20100602.92

Date January 2014

Figure No. 5

\\vh16\Projdocs\201006\20100602\Design\Task_Files\16_Project_Plan\Corrs_mtgs\SRF_Notices

Robert A. Ficano
County Executive

24 October 2013

Mr. Eric Pocan, Project Manager
Michigan Department of Environmental Quality
Resource Management Division
Revolving Loan Section
Constitution Hall – 3rd Floor South
525 W. Allegan
Lansing, MI 48933-1502

Re: Downriver Wastewater Treatment Facility
Secondary System and Headworks System Renovations Project: Segment 1
State Revolving Fund Project No. 5420-01

Dear Mr. Pocan:

I am writing to inform you that Wayne County will not be able to pursue funding from the State Revolving Fund (SRF) for Fiscal Year (FY) 2014 for the above referenced project. We intend to seek FY2015 SRF funding for this project (4th quarter loan closing), and therefore respectfully request that this project be transferred from the fundable range of the FY14 SRF Project Priority List (PPL) to the "future" list for consideration during preparation of the FY15 PPL.

We are aware that in order to be considered for SRF funding in FY15 or beyond, this project will need to be included in an approved update to the Project Plan for the Downriver Sewage Disposal System. We are working toward submitting an updated Project Plan for the Downriver Sewage Disposal System in July 2014.

Please contact me if you have any questions about this transmittal.

Regards,

Kelly A. Cave

Kelly A. Cave, P.E.
Director, Water Quality Management Division

cc: Dan Beauchamp, P.E., MDEQ/WRD SE District
Kenneth M. Kucel, P.E., Deputy Director, WCDPS
Elmeka N. Allen, Firooz Fath-Azam, P.E., Dan Alford, P.E., Dennis Scully; WCDPS/FMD
Greg C. Tupancy, P.E., WCDPS/WQMD

DEPARTMENT OF PUBLIC SERVICES • WATER QUALITY MANAGEMENT DIVISION
400 MONROE, SUITE 400 • DETROIT, MICHIGAN 48226 • (313) 224-8279 • FAX (313) 224-0045

Appendix E
Resolution

CERTIFICATION

STATE OF MICHIGAN)
)
CHARTER COUNTY OF WAYNE)

I, John Pfeiffer, Acting Clerk of the County Commission for the Charter County of Wayne, State of Michigan, do hereby certify that the attached Resolution No. 2014-366, *approving a final Project Plan for improvements to the Downriver Sewage Disposal System to the Clean Water State Revolving Fund Loan Program administered by the Michigan Department of Environmental Quality, and designating an authorized project representative*, was duly adopted by the Wayne County Commission at the FIFTH DAY EQUALIZATION MEETING on the NINETEEN DAY of June, 2014 by the following:

YEAS: Commissioners Basham, Clark-Coleman, Cox, Killeen, LeBlanc, Leland, McNamara, Palamara, Scott, Varga, Webb, Vice-Chair Pro Tempore Ware, Vice-Chair Bell, Chairman Woronchak – 14

NAYS: Price --01

NOT VOTING: None

ABSTAIN: None

EXCUSED: None

I further certify that the attached Resolution is a true, correct, and complete transcript of the original of said Resolution appearing on file and of record in my office and that said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, as amended, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Seal of the County of Wayne this 19th day of June, 2014 A.D.

JOHN PFEIFFER
ACTING CLERK OF THE COMMISSION
CHARTER COUNTY OF WAYNE, MI

RESOLUTION

No. 2014-366

By Commissioner McNamara

A RESOLUTION ADOPTING A FINAL PROJECT PLAN
FOR IMPROVEMENTS TO THE DOWNRIVER SEWAGE DISPOSAL SYSTEM AND
DESIGNATING AN AUTHORIZED PROJECT REPRESENTATIVE

WHEREAS, the Charter County of Wayne recognizes the need to regularly make improvements to its existing wastewater transport, treatment and disposal systems to ensure their reliability and compliance with current and future regulatory requirements; and

WHEREAS, submittal of a Project Plan to the Michigan Department of Environmental Quality is necessary for any wastewater system improvements within the Project Plan to be eligible for funding under the Clean Water State Revolving Fund Loan program; and

WHEREAS, the Charter County of Wayne and Hubbell, Roth & Clark, Inc. (of Detroit) its consultant prepared the 2014 Project Plan for Improvements to the Downriver Sewage Disposal System (including the Downriver Wastewater Treatment Facility) to identify, evaluate and recommend the construction of necessary improvements to ensure the reliability of the Downriver Sewage Disposal System and its compliance with current and future regulatory requirements; and

WHEREAS, the Joint Management Committee for the Downriver Sewage Disposal System approved submission of said Project Plan to the Michigan Department of Environmental Quality at their meeting held on May 29, 2014; and

WHEREAS, said Project Plan was presented at a Public Meeting held on June 11, 2014 and all public comments have been considered and addressed; and

WHEREAS, the projects recommended for construction during the first five years ("Priority 1 Projects") total $70,352,000; and

WHEREAS, it is anticipated that application will be made to the State Revolving Fund to provide loans for the Priority 1 Projects, and said loans will be repaid by the Downriver Sewage Disposal System rates; and

WHEREAS, construction of the proposed improvements for the Downriver Sewage Disposal System will not impact the Wayne County General Fund; and

WHEREAS, said Project Plan must be submitted to the Michigan Department of Environmental Quality no later than July 1, 2014;

Now therefore be it

RESOLVED, that the Wayne County Commission this 19th day of June 2014 formally adopts the 2014 Project Plan for Improvements to the Downriver Sewage Disposal System and plans to implement the selected alternatives for the Priority 1 Projects; and be it further

RESOLVED, that the Deputy Director of the Wayne County Department of Public Services, a position currently held by Kenneth M. Kucel, is designated as the authorized representative for all activities associated with construction of improvements for the Downriver Sewage Disposal System identified in said Project Plan, including the submittal of said Project Plan as the first step in applying to the State of Michigan for revolving fund loans to assist in the implementation of the selected alternatives for improvements to the Downriver Sewage Disposal System.

[Project Plan on File]

(2014-70-017)

A RESOLUTION OF SUPPORT FOR THE 2014 SRF PROJECT PLAN FOR IMPROVEMENTS TO THE DOWNRIVER SEWAGE DISPOSAL SYSTEM

WHEREAS, the Joint Management Committee of the Downriver Sewage Disposal System (DSDS) recognizes the need to regularly make improvements to the DSDS wastewater transport, treatment and disposal systems to ensure their reliability and compliance with current and future regulatory requirements; and

WHEREAS, submittal of a Project Plan to the Michigan Department of Environmental Quality is necessary for any wastewater system improvements within the Project Plan to be eligible for funding under the Clean Water State Revolving Fund (SRF) Loan program; and

WHEREAS, the Charter County of Wayne and its consultants prepared the 2014 SRF Project Plan for Improvements to the Downriver Sewage Disposal System (including the Downriver Wastewater Treatment Facility) to identify, evaluate and recommend the construction of necessary improvements to ensure the reliability of the Downriver Sewage Disposal System and its compliance with current and future regulatory requirements; and

WHEREAS, the projects recommended for construction during the first five years ("Priority 1 Projects") total $70,352,000; and

WHEREAS, it is anticipated that application will be made to the State Revolving Fund to provide loans for the Priority 1 Projects, and said loans will be repaid by the Downriver Sewage Disposal System rates; and

WHEREAS, said Project Plan must be submitted to the Michigan Department of Environmental Quality no later than July 1, 2014;

NOW THEREFORE BE IT RESOLVED by the Joint Management Committee of the Downriver Sewage Disposal System, this 29th day of May 2014, that the Joint Management Committee hereby supports Wayne County's adoption of the 2014 SRF Project Plan for Improvements to the Downriver Sewage Disposal System and its submittal to the Michigan Department of Environmental Quality as the first step of the application process to obtain State Revolving Fund financing for implementation of recommended improvements to the Downriver Sewage Disposal System.

Daniel S. Paletko

Honorable Daniel S. Paletko
Chair, Joint Management Committee

Appendix F
Public Meeting Affidavits of Publication

digitalfirst MEDIA

MICHIGAN GROUP

AFFIDAVIT OF PUBLICATION

48 West Huron Street • Pontiac, MI 48342

HUBBELL, ROTH & CLARK
555 HULET DR

BLOOMFIELD HILLS, MI 48303
Attention: Souzan Hanna

STATE OF MICHIGAN,
COUNTY OF OAKLAND

The undersigned Debbie Phillips, being duly sworn the he/she is the principal clerk of Heritage Sunday, heritage.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):

Heritage Sunday	05/11/14
heritage.com	05/11/14

NOTICE OF PUBLIC MEETING

The County of Wayne will hold a public meeting on an application to the Michigan Department of Environmental Quality for funding assistance through the State Revolving Fund (SRF) Program for needed improvements to the Downriver Sewage Disposal System, including the Downriver Wastewater Treatment Facility (DWTF) and the tributary interceptor sewer system. The Public Meeting is being held for the purpose of receiving comments from interested persons.

The meeting will be held at 7:00 p.m. on June 11, 2014 at the City of Wyandotte Council Chambers, located at the City Hall building, 3200 Biddle Avenue, Wyandotte, MI 48192.

The proposed improvements to the Downriver Sewage Disposal System (DSDS) are organized into a comprehensive 20 year "Project Plan". Planned improvements are categorized into four sets of Priority Projects to be completed every five years. Implementing the 2014 DSDS SRF Project Plan will help ensure continued reliable operation of the DSDS, including the Downriver Wastewater Treatment Facility, and compliance with current and future regulatory requirements.

If the SRF application is successful, Wayne County plans to begin construction of the first of the planned improvements in 2015. Sanitary sewer service for customers will be unaffected by the proposed improvements. Construction activities will be localized to the subject facilities, with little or no impact to traffic.

The estimated user costs to finance the projects proposed for the first five-year period have been determined assuming State Revolving Fund financing with a 2.5% interest rate and 20-year debt retirement. Capital and operation, maintenance and replacement costs are included and the allocation to each community tributary to the DSDS is based on each community's portion of the total rate year cost using a five-year average of flows to the system. The estimated annual cost per household (based on 100,000 gallons per year of water use) for the projects to be implemented between 2015 and 2019, for residents of the DSDS service area, is presented below:

Community	Annual Cost per Household
Allen Park	$46.88
Belleville	$43.81
Brownstown Twp.	$39.92
Dearborn Heights	$42.47
Ecorse	$45.15
Lincoln Park	$45.71
River Rouge	$53.83
Riverview	$41.38
Romulus	$41.55
Southgate	$43.03
Taylor	$41.67
Van Buren Twp.	$39.31
Wyandotte	$40.87

The draft 2014 DSDS SRF Project Plan detailing the proposed projects is available for inspection at the Clerk's Office for the following communities: Allen Park, Belleville, Brownstown Twp., Dearborn Heights, Ecorse, Lincoln Park, River Rouge, Riverview, Romulus, Southgate, Taylor, Van Buren Twp., and Wyandotte. The 2014 SRF Project Plan is also available for inspection at Hubbell, Roth & Clark, Inc., 420 Michigan Building, 220 Bagley, Detroit, Michigan, and at the Wayne County Department of Public Services, Environmental Services Group, 400 Monroe, Suite 400, Detroit, MI 48226, beginning on May 12, 2014. The draft 2014 DSDS SRF Project Plan is also available online at http://waynecounty.com/doe/index.htm under "Public Notices".

Written comments received before the meeting record is closed on June 12, 2014 will receive responses in the final 2014 DSDS SRF Project Plan. Written questions should be sent to:

Downriver Sewage Disposal System 2014 SRF Project Plan
c/o Wayne County Department of Public Services,
Environmental Services Group
400 Monroe, Suite 400
Detroit, MI 48226
Attention: Greg Tupancy, P.E.

Publish May 11, 2014 in the New Herald and Press & Guide

Sworn to the subscribed before me this May 13, 2014.

Notary Public, State of Michigan
Acting in County of Oakland

Advertisement Information

Client Id: 611565 **Ad Id:** 274982 **PO:** SRF Fund Notice

TINA M CROWN
Notary Public - Michigan
Lapeer County
My Commission Expires Mar 30, 2021
Acting in the County of Oakland

Appendix G
Public Meetings Information and Transcript

HRC

HUBBELL, ROTH & CLARK, INC
Consulting Engineers

Date: 6/11/14 Project No.:
Client Name: Wayne County
Project Name: 2014 DSDS Project Plan
Employee: Sign-In

Page: 1 of 1

Public Meeting Sign-In
Wyandotte City Hall 7:00 pm

Sally Duffy HRC 248-454-6583
GREG TUPANCY WCDPS 313-224-7558
Tereasa Nims Times 313-584-4000

meeting start 7:08 pm
end 7:25 pm

Tereasa Nims
tnims@bewickpublications.com
313-584-4000

ON THE RECORD
REPORTING & VIDEO
Lillian J. Altpeter, RPR
(313) 274-2800 23169 Michigan Ave. #2278
Fax: (313) 274-2802 Dearborn, MI 48124
www.dearborncourtreporter.com
ontherecord@dearborncourtreporter.com

STATE REVOLVING FUND PUBLIC HEARING
FOR THE DOWNRIVER WASTEWATER TREATMENT FACILITY

Wednesday, July 11, 2014, at 7:08 p.m.

Wyandotte City Hall
Council Chambers
3200 Biddle, Wyandotte, Michigan

- - -

In Attendance:
Sally L. Duffy, P.E., Hubbell, Roth & Clark
Greg C. Tupancy, P.E., Department of Environment
Tereasa Nims, Bewick Publications

- - -

MR. TUPANCY: The public hearing we're about to conduct is being held to review the Wayne County's Downriver disposal system. This meeting is required by the state for the county to obtain low interest loans through the State Revolving Loan program.

A public notice was listed in the News Herald and the Press and the Guide 30 days in advance of this meeting. A copy of the project plan has been available for public review at the clerk's office at all of the 13 Downriver communities and at the Wayne County building. The purpose of this meeting is to receive comments from citizens and interested parties. All comments today will be transcribed and go on the record.

Sally Duffy of Hubbell, Roth, and Clark is with us today and will give a brief summary of the project plan, and then the meeting will be open to public discussion. We also have a sign-in sheet that is required to record the attendance. Please sign in. It's right here on the table.

I'll now turn the meeting over to Sally to discuss the plan.

MS. DUFFY: Thank you, Greg. The MDEQ State Revolving Fund Loan Program was established in 1987 by Federal Clean Water Act amendment. It provides low interest loans for projects to improve water quality or

1 protect public health. The rate is currently
2 2.5 percent. Projects may qualify for additional funding
3 such as green projects. It is administered by MDEQ's
4 office of drinking water and municipal assistance
5 revolving loan section. They review and approve the
6 project plan and manage the loan process for individual
7 projects. MDEQ does not use project plans for regulatory
8 compliance.
9 The SRF project planning process requires that
10 you prepare a project plan to qualify. You must include
11 long-term for 20-year needs of the system, develop an
12 alternative analysis to determine the most cost-effective
13 and environmentally preferred project over the life
14 cycle, consider all short-term and long-term impacts
15 including administrative, financial, environmental, and
16 social aspects of the project.
17 Public involvement is required to estimate
18 annual costs to users of the system. We must publish an
19 advertisement and allow a 30-day period for review of the
20 draft project plan. There were copies located at each of
21 the 13 communities for the public's review, and several
22 public meetings have been presented to gather input and
23 comments. They include the Joint Management Committee,
24 or the JMC; a meeting at Wayne County Committee on Public
25 Services this morning; and this meeting today. There

will also be a public meeting of the Wayne County Commission for approval.

In introduction to the 24 DSDS project plan provides long-term planning for system improvements to maintain reliable transport, treatment, and disposal of wastewater from the DSDS service area and maintain continued NPDES permit compliance. The plan preserves the ability to secure state revolving funds, low interest loans, and any possible related funding to finance needed system improvements.

The project plan addresses the Downriver Waste Water Treatment Facility, or DWTF; the Downriver Sewage Disposal System, or DSDS, that's an interceptor system that transports waste water from local community collection sewers to the DWTF; and the Downriver Tunnel, Storage, and Transport System, that provides relief for select system interceptors during wet weather events.

There's a figure shown (indicating) describing the Downriver sewage disposal systems service area. It shows the location of the DWTF facility and the sewers under the jurisdiction of the DSDS system.

The 2014 DSDS SRF project plan is a proactive, 20-year assessment of necessary future capital improvements. It builds upon previous project plans, for example, the 2009 SRF plan. It focuses on Priority 1

1 projects, those that would be undertaken between 2015 and
2 2019. It also identifies other required improvements to
3 system needs for the 20-year planning period which are
4 broken up into five-year increments: Priority 2, Priority
5 3, and Priority 4.
6 An alternative analysis is required, and a
7 general alternative of no action must be considered. It
8 was not considered in detail in this plan, because the
9 equipment would continue to require excessive maintenance
10 and eventually become unusable. It would ultimately
11 impact the DWTF's ability to meet MDEQ's discharge permit
12 requirements.
13 Regional alternatives must also be considered.
14 The DWTF is adequately sized for future capacity and its
15 size limits possibilities for connection to other
16 facilities. So this was also not considered in detail.
17 Other project alternatives were considered as part of a
18 present worth analysis included in the plan for specific
19 project alternatives. These include life cycle costs and
20 project impacts.
21 A summary of the Priority 1 projects includes
22 the following major projects: A secondary headworks
23 improvement Segment 1 project at a project cost of
24 $18.0 million. This was a Priority 1 project in the 2009
25 DSDS SRF project plan, and the loan was deferred to

fiscal year 2015, so we must revisit it as part of this plan. The SRF program requires a supplement to update projects older than five years. The project includes select headworks system improvements, replacing two fine screens, replacing aerated drip blowers, a new backer truck station, and laboratory area improvements. It also includes secondary system improvements -- new flow meters and automation and a return-activated sludge pump, replacement and rehabilitation in addition to variable frequency drives. It also includes a group of related gates and actuators, piping and valves, building repairs, heating and ventilation system upgrades, and associated electrical, data, and site work.

Another Priority 1 project identified in the plan is the biosolids drying and beneficial reuse project. It has an approximate design cost of $5.4 million and an approximate construction cost of $41.9 million. Unstabilized solids are currently dewatered and a contractor hauls and disposes of them at area landfills. It is not known how much longer this practice will be feasible. Landfills are limited as to the quantity they can accept in a given period, and the risk is that landfills could stop accepting the solids on short notice, and the DWTF does not have an alternate or backup method of solids disposal. Landfilling of

1 Unstabilized solids is, therefore, not considered a
2 long-term solution and it is recommended that the DWTF
3 establish another means of solids disposal.
4 It is also anticipated that there will be a
5 significant cost increase for the disposal contract at
6 renewal in two years as landfill availability continues
7 to be an issue and could require further haul distances.
8 Therefore, the project will proceed first with
9 planning and basis of design development starting in
10 fiscal year 2015. The current solids disposal contract
11 will be up for renewal at the same time design is
12 complete and the project costs are refined. The new
13 hauling and landfill disposal costs would be reviewed
14 against the cost to implement the biosolids drying
15 project. If adequate landfills are available and the
16 hauling and disposal prices remain cost-effective, the
17 DWTF will continue with the current practice. If
18 adequate landfill space is not available and/or disposal
19 costs rise as expected, the project can proceed to
20 construction. It includes new natural gas biosolids
21 drying system, along with all of the associate processing
22 conveying, blowing, and emissions control equipment. The
23 process results in dry biosolids in the form of discrete
24 granules that are pathogen-free and can be sold for reuse
25 as commercial fertilizers, combustible fuel, and/or soil

1 additives. The product can be landfilled locally. It
2 does not present the same issues and concerns to landfill
3 operators as the current Unstabilized sludge does, and it
4 has a reduced volume and cost to landfill.
5 The project would be submitted for potential
6 Green Project Reserve funding through the SRF program.
7 Availability of these funds changes year to year, but in
8 the past the program has provided up to 50 percent
9 principal forgiveness or grant funding for qualified
10 projects. And now on the screen (indicating) is a figure
11 showing the locations of the Priority 1 projects at the
12 Downriver Waste Water Treatment facility.
13 An additional Priority 1 project is interceptor
14 system improvements at an estimated cost of $5 million.
15 This includes investigation and necessary rehabilitation
16 of select segments of the DSDS interceptor system,
17 including the regional storage and transport system.
18 Portions of the system date to 1938 and include brick and
19 concrete construction of the sewers.
20 The project also provides for improvements to
21 select existing flowmeters. Consideration of inclusion
22 of metered network and data programming allow for
23 improved monitoring and control of the Downriver Sewage
24 Disposal System. And then the figure shown on the screen
25 is showing the location of the DSDS interceptor system.

To summarize the project costs presented in the 2014 project plan, the Priority 1 projects are those that would be implemented between 2015 and 2019, total approximately $70.4 million. The Priority 2 projects, those that would be implemented between 2020 and 2024, total approximately $45.4 million. The Priority 3 projects, those that would be implemented between 2025 and 2029, have an approximate total cost of $49.7 million. And the Priority 4 projects, those that would be implemented between 2030 and 2034, have an approximate total cost of $15 million. Therefore, the total for all projects considered over the next 20 years in the project plan is $180.4 million. This equates to user costs of approximately 39 to $54 per year for a typical household.

Now on the screen is a chart showing the approximate annual costs per household for the 13 communities. The estimated annual user costs are based on total project costs for the Priority 1 projects proposed for 2015 to 2019 and assume a typical household water use of approximately 100,000 gallons per year. A rate study will be made at the time of any project construction to determine the sufficiency of the existing rate structure, but these costs represent just the dollars required for the project divided by the household

use.

The impacts of the selected projects include both short-term and long-term. The positive short-term impacts are the projects will create indirect and induced employment during construction. The negative short-term impacts include noise, soil erosion, dust and fumes, and increased traffic due to construction activities. Positive long-term impacts are that costs for maintenance will be reduced for these systems and the quality of the Detroit River will be enhanced. There are no long-term negative impacts expected to result from these projects.

Irreversible impacts include nonrecoverable resources committed to the project, which are traded off to provide necessary repair and replacement of aging and worn out structures and equipment. It will protect and enhance the quality of the receiving water during the lifetime of the system, and the resources include public capital, energy, labor, and materials. An additional irreversible impact includes possible construction damage or accidents.

Mitigation of these impacts will be accomplished for the short-term construction-related impacts by establishing guidelines for vegetation removal, dust reduction, and traffic control, and the projects will comply with any required permits such as

1 MDEQ construction, soil erosion, floodplain permits, etc.
2 Mitigation of long-term impacts will be accomplished by
3 periodically reviewing the operation of the system to
4 optimize processes and reduce energy consumption.
5 2014 schedule for implementation of the project
6 plan: Some of the key dates were on May 1st there was a
7 joint meeting of the technical, finance, and legal
8 committees for the system. On May 12th there was a
9 public hearing notice advertised and the draft project
10 plan was made available for public review. On
11 May 29th there was a meeting of the Joint Management
12 Committee at the Taylor City Hall. On June 11, earlier
13 today, the Wayne County Committee on Public Services
14 approved the resolution for the project plan. We are
15 having this public meeting here today. On June 19th the
16 Wayne County Commission will review the project plan for
17 approval, and on July 1st the project plan must be
18 submitted to the DEQ.
19 So at this time that concludes our
20 presentation. There's some pictures of the Downriver
21 Waste Water Treatment Plant up on the screen. Are there
22 any questions from any member of the public?
23 Hearing none, I propose we close the public
24 hearing at 7:25. Thank you.
25 - - -

STATE OF MICHIGAN)
) SS.
COUNTY OF WAYNE)

I, Lillian Altpeter, a duly certified stenographic reporter, do hereby state that the foregoing proceedings were reported by me using the stenographic method, to the best of my ability.

IN WITNESS WHEREOF, I have hereunto set my hand at Dearborn, County of Wayne, State of Michigan, this 24th day of June, 2014.

_____
Lillian Altpeter, CSR-6274
Registered Professional Reporter
Notary Public, Wayne County, Michigan
My Commission expires: September 24, 2006

- - -

Wayne County Downriver Sewage Disposal System
2014 SRF Project Plan

Public Meeting Presentation
June 11, 2014

MDEQ STATE REVOLVING FUNDS (SRF) LOAN PROGRAM

Overview

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- Established in 1987 by Federal Clean Water Act amendments
- Provides low-interest loans for projects to improve water quality or protect public health, rate is currently 2.5%
  - Projects may qualify for additional funding, such as "green" projects
- Administered by MDEQ's Office of Drinking Water and Municipal Assistance, Revolving Loan Section
  - Review/approve Project Plan
  - Manage loan process for individual projects
- MDEQ does not use Project Plan for regulatory compliance

SRF PROJECT PLANNING PROCESS

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- Must prepare a Project Plan to qualify:
  - Include long-term (20 years) needs of the system
  - Develop an alternative analysis to determine most cost-effective and environmentally preferred project(s) over the life cycle
  - Consider all short-term and long-term impacts, including administrative, financial, environmental, and social aspects of the project(s)
  - Public involvement:
    - Estimate annual costs to users of the system
    - Publish advertisement and allow 30 day period for review of draft Project Plan
    - Copies located at each community for review
    - Public meetings to gather input and comments
- Wayne County Commission must approve the Project Plan

INTRODUCTION TO 2014 DSDS PLAN

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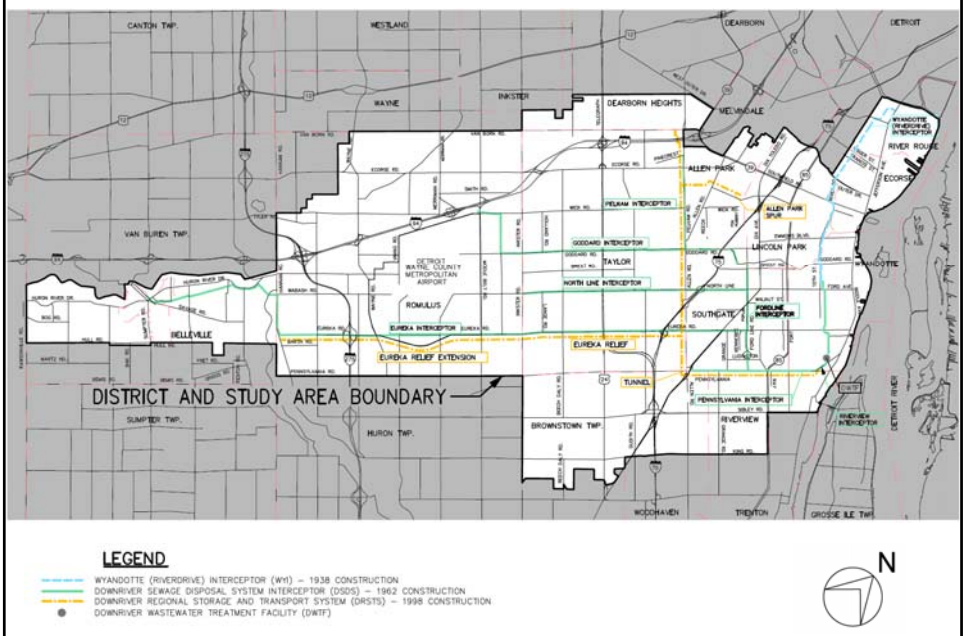
- The 2014 DSDS SRF Project Plan provides:
  - Long term plan for system improvements to:
    - Maintain reliable transport, treatment and disposal of wastewater from the DSDS service area
    - Maintain continued NPDES permit compliance
  - Preserve the ability to secure State Revolving Fund (SRF) low interest loans and any possible related funding to finance needed system improvements
- The Project Plan addresses:
  - Downriver Wastewater Treatment Facility (DWTF)
  - Downriver Sewage Disposal System's interceptor sewer system that transports wastewater from local community collection sewers to the DWTF
  - Downriver Tunnel Storage and Transport system that provides relief for select system interceptors during wet weather events

DOWNRIVER SEWAGE DISPOSAL SYSTEM SERVICE AREA



2014 DSDS SRF PROJECT PLAN

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- Proactive, 20 Year Assessment of necessary future capital improvements
  - Builds upon previous Project Plans (e.g., 2009 SRF Plan)
- Focus on Priority 1 Projects (2015-2019)
- Also identify other required improvements and system needs for the 20-year planning period
  - Priority 2 (2020-2024)
  - Priority 3 (2025-2029)
  - Prioirty 4 (2030-2034)

ALTERNATIVE ANALYSIS

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- General Alternative—No Action
  - Not considered because equipment would continue to require excessive maintenance and eventually become unusable
  - Ultimately would impact DWTF's ability to meet MDEQ discharge permit requirements
- Regional Alternatives
  - The DWTF is adequately sized for future capacity and its size limits possibilities for connection to other facilities
- Project Alternatives
  - Present worth analysis included in Plan for specific project alternatives
    - Includes life-cycle costs and project impacts

SUMMARY OF PRIORITY ONE PROJECTS

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- Secondary/Headworks Improvements: Segment 1 ($18.0 M)
  - A Priority One project in 2009 DSDS SRF Project Plan; loan deferred to FY2015
    - SRF requires a supplement to update projects older than five years
  - Select Headworks System improvements: replacing two Fine Screens, replacing Aerated Grit Blowers, new "vactor truck" station, and laboratory area improvements
  - Select Secondary System improvements: new flow meters and automation, RAS pump replacement/rehabilitation and addition of VFDs
  - Includes improvements to related gates and actuators, piping and valves, building repairs, heating and ventilation system upgrades, and associated electrical, SCADA and site work

SUMMARY OF PRIORITY ONE PROJECTS

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- **Biosolids Drying and Beneficial Reuse: Design ($5.4 M) and Construction ($41.9M)**
  - Unstablized solids are currently dewatered and a contractor hauls/disposes at area landfills
    - It is not known how much longer this practice will be feasible. Landfills are limited as to the quantity they can accept in a given period.
    - Risk is that landfills could stop accepting the solids on short notice; the DWTF does not have an alternate or backup method of solids disposal
  - Landfilling of unstabilized solids is therefore not considered a long-term solution, and it is recommended that the DWTF establish another means of solids disposal
  - It is also anticipated that there will be a significant cost increase for the disposal contract at renewal in two years as landfill availability continues to be an issue and could require further haul distances

SUMMARY OF PRIORITY ONE PROJECTS

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- **Biosolids Drying and Beneficial Reuse, cont.**
  - Proceed first with planning and basis of design development starting in FY 2015
    - Current solids disposal contract will be up for renewal at same time design is complete and project costs refined
  - The new hauling and landfill disposal costs would be reviewed against the costs to implement the biosolids drying project
  - If adequate landfills are available and the hauling and disposal prices remain cost-effective, the DWTF will continue with the current practice
  - If adequate landfill space is not available and/or disposal costs rise as expected, the project can proceed to construction

SUMMARY OF PRIORITY ONE PROJECTS

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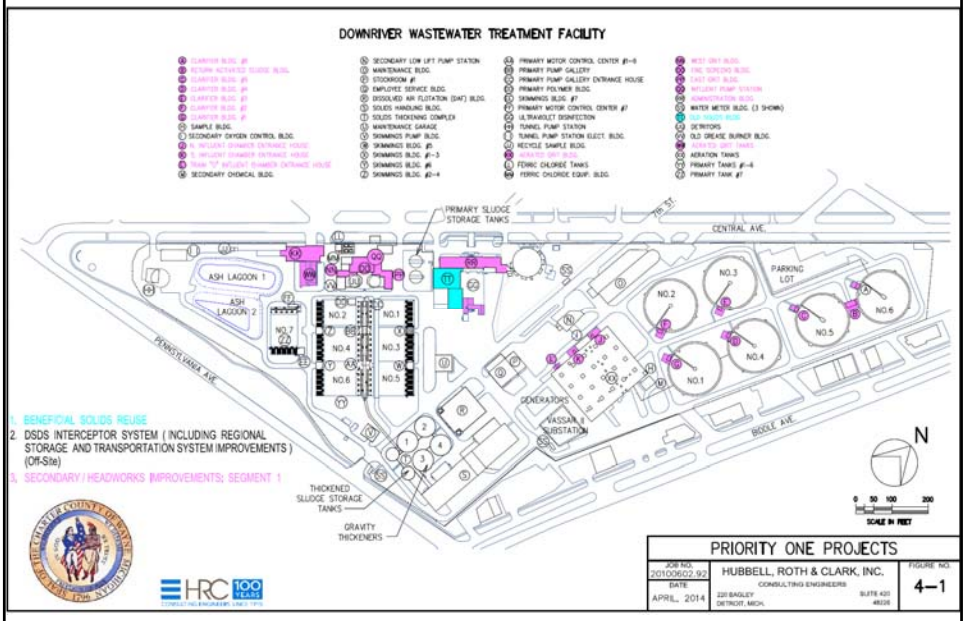
- **Biosolids Drying and Beneficial Reuse, cont.**
  - Includes new natural gas biosolids drying system along with all the associated processing, conveying, loading, and emissions control equipment
  - Process results in dried biosolids in the form of discrete granules that are pathogen-free, and can be sold for reuse as commercial fertilizer, combustible fuel, and/or soil additive
  - The product can be landfilled locally; does not present the same issues and concerns to landfill operators as the current unstabilized sludge does, and has a reduced volume and cost to landfill
  - Project would be submitted for potential Green Project Reserve funding through the SRF program
    - Availability of these funds changes year to year, but in the past the program has provided up to 50% principal forgiveness (grant funding) for qualified projects

PRIORITY ONE PROJECTS AT THE DWTF



SUMMARY OF PRIORITY ONE PROJECTS

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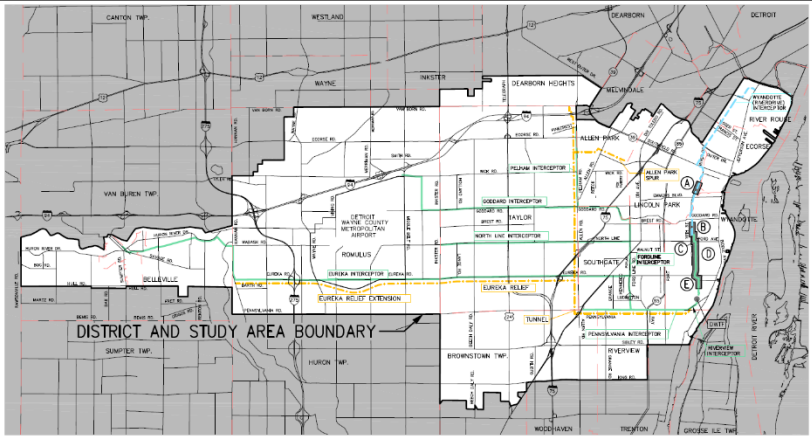
- **Interceptor System Improvements ($5.0 M)**
  - Includes investigation and necessary rehabilitation of select segments of the DSDS Interceptor System, including Regional Storage and Transport System
    - Portions of the system date to 1938 and include brick and concrete construction
  - Provides for improvements to select existing flow meters
    - Consideration of inclusion of meter network into SCADA programming to allow for improved monitoring and control of the DSDS

PRIORITY ONE PROJECTS IN THE INTERCEPTOR SYSTEM



2014 DSDS SRF PROJECT PLAN PROJECT COSTS

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- Priority 1 (2015-2019) - $70.4 M
- Priority 2 (2020-2024) - $45.4 M
- Priority 3 (2025-2029) - $49.7 M
- Priority 4 (2030-2034) - $15.0 M

Total: $180.4 M

User costs equate to ~ $39-$54 per year for a "typical" household

2014 DSDS SRF PROJECT PLAN TYPICAL ANNUAL USER COSTS

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Community	Annual Cost per Household	Community	Annual Cost per Household
Allen Park	$46.88	Riverview	$41.38
Belleville	$43.81	Romulus	$41.55
Brownstown Twp.	$39.92	Southgate	$43.03
Dearborn Heights	$42.47	Taylor	$41.67
Ecorse	$45.15	Van Buren Twp.	$39.31
Lincoln Park	$45.71	Wyandotte	$40.87
River Rouge	$53.83		

Estimated annual user costs are based on total project costs for the Priority One projects proposed for 2015-2019, and assume typical household water use of 100,000 gallons per year. A rate study will be made at the time of project construction to determine sufficiency of the existing rate structure.

IMPACTS OF SELECTED PROJECTS

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- **Short-Term Impacts:**
  - Positive Impacts
    - Create indirect and induced employment during construction
  - *Negative* Impacts
    - Noise, soil erosion, dust and fumes, and increased traffic due to construction activities
- **Long-Term Impacts:**
  - Positive Impacts
    - Will reduce maintenance costs
    - Enhance quality of the Detroit River
  - *Negative* Impacts
    - None

IMPACTS OF SELECTED PROJECTS

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- **Irreversible Impacts:**
  - Non-recoverable resources committed to project are traded off to provide necessary repair and replacement of aging and worn-out structures and equipment
  - Protect and enhance the quality of the receiving water during the lifetime of the system
  - Resources include public capital, energy, labor and materials
  - Possible construction damage or accidents

MITIGATION OF IMPACTS

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- Mitigation of Short-Term, Construction-Related Impacts
  - Establishing guidelines for vegetation removal, dust reduction, and traffic control
  - Comply with any required permits (MDEQ construction, soil erosion, floodplain, etc.)
- Mitigation of Long-Term Impacts
  - Operation of system will be periodically reviewed to optimize processes and reduce energy consumption

2014 DSDS SRF PROJECT PLAN SCHEDULE

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KEY DATES:

May 1st	–	Joint Meeting of Technical, Finance and Legal Committees (Wade Trim Office, 25251 Northline Rd., Taylor, 9:30 am)
May 12th	–	Public Hearing Advertisement and Draft Project Plan available for public review
May 29th	–	JMC Meeting (Taylor City Hall, 23555 Goddard Road, 9:00 am)
June 11th	–	Wayne County COPS Approval (500 Griswold, Room 704, Detroit, 9:30 am)
June 11th	–	Public Meeting (Wyandotte City Hall, Council Chambers, 7:00 pm)
June 19th	–	Wayne County Commission Approval (500 Griswold, Lower Level, Detroit, 10:00 am)
July 1st	–	SRF Project Plan submittal to MDEQ

QUESTIONS?

Overview

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