



Sewer Rates 201

An in-depth look at **DWSD** wholesale sewer rates

December 2006

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Rates 201 was created by the Rates Work Group of the Detroit Water and Sewerage Department (DWSD) Wastewater First Tier Customer Partnering Effort to build upon another document entitled “Understanding DWSD Wholesale Sewer Rates.” Detailed discussions on the elements of the DWSD wholesale sewer rates are provided including wastewater collection system, budgeting, capital improvement planning, financing and rate setting process. The information is detailed and technical – it was created for the inquisitive public works professional or public official.

We suggest that you use this as a reference document to read about areas where you wish to gain a more in-depth understanding. Each module dives deeper into a topic that was presented in “Understanding DWSD Wholesale Sewer Rates.” We call this collection Rates 201 since it is a higher level discussion of the issues.

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While the Detroit Water and Sewerage Department (DWSD) collects and treats wastewater from 77 communities, there are other entities involved in the operation of systems within the service area. Counties and local communities own and operate the sewers and pump stations discharging into the Detroit system. Other departments within the City of Detroit provide legal and environmental support. This module provides an overview of the responsibilities and services provided by these entities in the delivery of wholesale and retail wastewater service.

The collection and treatment of wastewater in southeast Michigan is a complex process that requires coordinated efforts between a variety of service entities. The network of sewers that collects and transports wastewater from homes and businesses to the Detroit Wastewater Treatment Plant (WWTP) can include multiple owners or service entities as shown in Figure 1-1. DWSD and the Counties provide wholesale services that the local community builds upon to deliver a retail service to their residents and businesses. Figure 1-2 details the flow of service from the suburban retail customer to the Detroit WWTP. Discussion of these services follows.

Local Community Wastewater Services

It is estimated that 77 local communities served by the Detroit system own and maintain 8,700 miles of trunk and lateral sewers that provide 1.5 million service connection points to homes and businesses. These connections and sewers are the starting point for wastewater that eventually makes its way to the Detroit WWTP. In addition to maintaining the pipes to these connections, the local communities must also handle meter readings and billings for the 1.5 million accounts. Local communities also handle connections and disconnections to the system for accounts in their system and answer billing

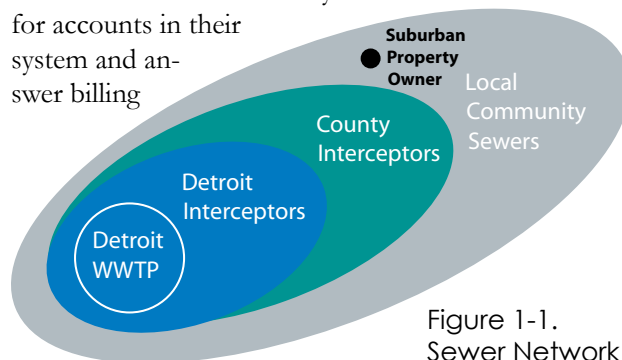
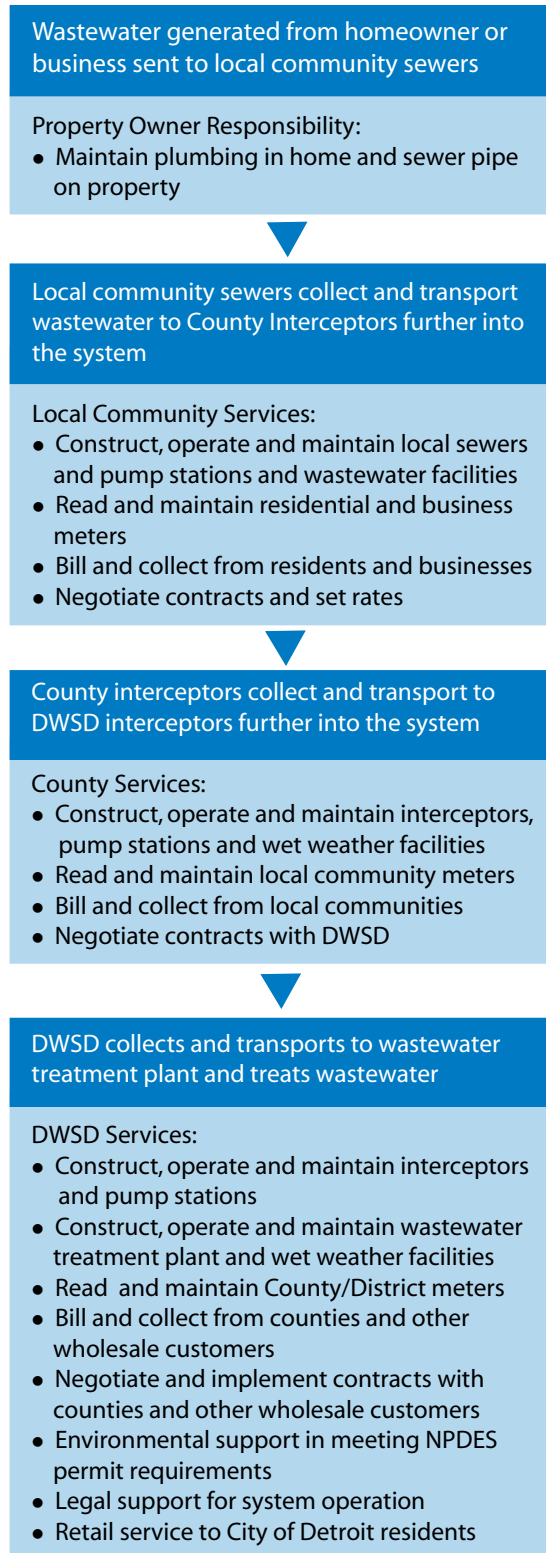


Figure 1-1.
Sewer Network

Figure 1-2. Wastewater Providers in DWSD Service Area



questions and concerns residents may have. The local community provides all customer service functions acting as the primary service provider to the residential and business customer.

Local communities may also have pump stations or wet weather facilities that they operate and maintain as part of their sewer system. The local community purchases capacity in county interceptors allowing it to discharge a fixed amount of wastewater into the county system for transport to Detroit interceptors.

County or Sewer Districts/Authorities Services

Macomb, Oakland and Wayne Counties are divided into 20 sewer districts that are hydraulically independent and send flows to Detroit's three primary interceptors. These sewer districts contain interceptors that receive flows from trunk sewers and convey wastewater to the Detroit interceptors.

Macomb County has three sewer districts. It owns and operates the 13,000-foot Lakeshore Arm Interceptor and the Lenox Pump Station. At the request of the County, DWSD operates two large pump stations in the County located along the Lakeshore Arm Interceptor. Macomb County also operates two combined sewer overflow control (CSO) basins.

Oakland County is divided into four sewer districts. Within these districts, the County owns and operates six interceptors, four CSO retention facilities, two interceptor pump stations, two septage receiving facilities, one equalization basin and one emergency overflow structure.

Wayne County has two major sewer districts tributary to the DWSD regional sewer system. Within those districts, the County operates and maintains over 93 miles of interceptor sewers, including a section of the Northwest Interceptor, several pumping stations, CSO control basins, a sanitary equalization basin, and a system of flow meters.

The Counties have contracted for a peak capacity in Detroit interceptors allowing them to discharge a fixed amount of wastewater for transport to the Detroit WWTP. The Counties provide capacity for local communities to transport wastewater in their interceptors.

There are 12 communities that have contracts with the City of Detroit to directly discharge to DWSD interceptors. They are referred to as first tier customers. Like the Counties, they have direct contracts with DWSD.

DWSD Wastewater Services

DWSD owns and operates 3,800 miles of sewer pipes within the City of Detroit. There are nine sewer districts within the City. Three main interceptors serve as the backbone of Detroit's sewer system sending flows directly to the WWTP. All of the County and Sewer District/Authorities interceptors connect directly to these interceptors or to a sewer that connects directly to these interceptors.

The Detroit River Interceptor (DRI) is the oldest of the three interceptors. Over 12 miles long and made of brick and concrete, the DRI primarily collects sewage from east Detroit and the eastern suburbs. The Oakwood Northwest Interceptor is 15 miles long and constructed of concrete to serve the west side of Detroit and the western suburbs. The North Interceptor East Arm (NIEA) is over 16 miles long and constructed of reinforced concrete. It was built in the late 1960s and 70s to collect sewage from the City of Detroit and the northern suburbs.

Together, these three interceptors can deliver a rate of over a billion gallons of sewage per day to the Detroit WWTP. DWSD also owns, operates and maintains 14 main pump stations, 65 flow meters, 10 internal system meters, and 23 CSO control facilities.

City of Detroit Services

Staff from the City of Detroit Law, Finance, Human Resources, Budget, and IT Departments also assist the Water and Sewerage Department in the delivery of wholesale wastewater service.

Other Wastewater Treatment Providers in Southeast Michigan

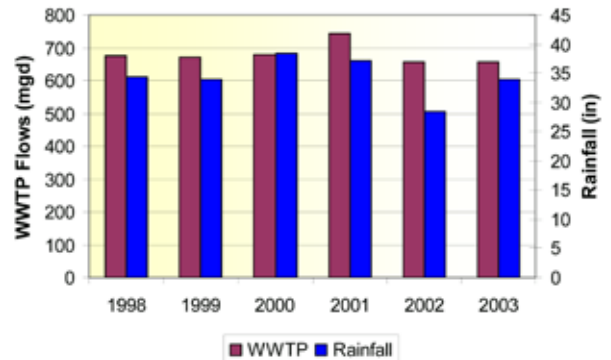
There are 36 other wastewater treatment providers within watersheds in the DWSD service area; 22 of these are considered major providers. During the wastewater master planning process, DWSD discussed areas of common interest to facilitate a watershed approach to dealing with the issues of growth for the regional system and concerns about urban sprawl.



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The collection system serving the Detroit Wastewater Treatment Plant (WWTP) has been expanded and upgraded over the past 60 years to serve new areas and provide storage and treatment of combined sewer overflows. The collection system includes both combined and separated sewers and experiences higher flows during wet weather. This module describes shared components of the collection system, flows contributed by First Tier Customers and meters that monitor flows. Module 9, Estimating Sewage System Flows, goes into greater depth on sources of flows and how they are estimated.

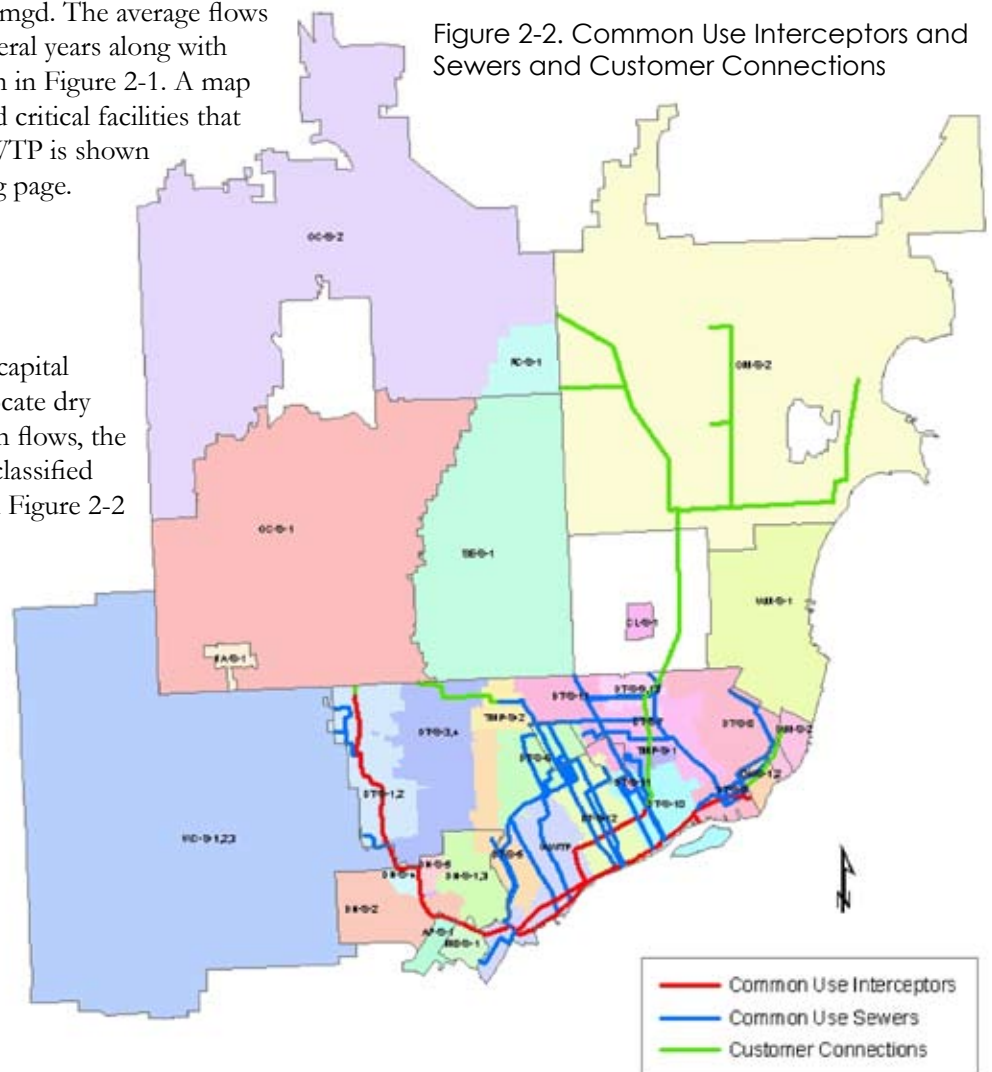
Figure 2-1. Annual Average Flow at WWTP and Annual Total Rainfall



System Sewage Flows

The Detroit WWTP has a capacity of 930 mgd for secondary treatment of flows and a capacity of 1,700 mgd for primary treatment. Typical flows at the plant average 680 mgd, with average flows during dry weather estimated at 575 mgd. The average flows at the WWTP for the last several years along with total annual rainfall are shown in Figure 2-1. A map showing the major sewers and critical facilities that deliver these flows to the WWTP is shown in Figure 2-3 on the following page.

Figure 2-2. Common Use Interceptors and Sewers and Customer Connections



Collection System Components

To support the allocation of capital maintenance costs and to allocate dry weather inflow and infiltration flows, the collection system sewers are classified into components as shown in Figure 2-2 and described as follows.

Common Use Interceptors: The Detroit River Interceptor, the Oakwood-Northwest-Wayne County Interceptor, the North Interceptor-East Arm from Meldrum to WWTP, and all outfall conduits along these interceptors which may contribute inflow are defined as Common Use Interceptors. This definition is consistent with the 1979 Rate Study.

Common Use Sewers: Sewers receiving flows from Detroit and at least one other First Tier customer, excluding any sewers already satisfying the Common Use Interceptor definition, are defined as Common Use Sewers.

Customer Connections: Sewers downstream from one or more DWSD billing meters of First Tier customers, yet not receiving any flow from Detroit, are defined as Customer Connect Sewers. Customer Connect Sewers are also simply referred to as Customer Connections.

Local Sewers: Sewers that are not Common Use Interceptor, Common Use Sewer, or Customer Connect Sewers (Shown in Figure 2-2 on page 3).

For Common Use Interceptors, capital maintenance costs and dry weather inflow/infiltration (DWI/I), flows are allocated as common-to-all. (The WWTP

costs are also classified as common-to-all, because it serves the flows from all customers.) Costs for the Common Use Sewers and the Customer Connections are allocated according to the percentage used by individual customers.

Flows by Customers

Figure 2-4 shows the typical flows and overflows that can be expected from First Tier Customers and Detroit. The annual flows and overflows are calculated using the GDRSS Model simulation of 36 years of precipitation record. These simulations were made with the following conditions:

- 2020 projected dry weather flow
- WWTP capacity at 1700 MGD
- Detroit River elevation of 95 feet

The model configuration for these simulations also included all planned improvements to the system

Figure 2-4. Summary of Flows to DWSD and Overflows by First Tier Customers and Detroit

First-Tier Customers & Detroit	Total Flows to DWSD*		Total Overflow* (MG/Yr)	Average Dry Weather Flows** (MGD)
	(MG/Yr)	(MGD)		
Allen Park	499	1.4	0	0.95
Center Line	540	1.5	0	0.97
Clinton-Oakland	15,564	42.6	0	29.3
Dearborn	10,621	29.1	585	23.9
Dearborn Heights Distr. 2	n.a.	n.a.	0	0.03
Evergreen-Farmington	17,935	49.1	336	39.3
Farmington	785	2.2	0	1.24
Grosse Pointe	351	1.0	0	1.23
Grosse Pointe Farms	825	2.3	32	2.00
Grosse Pointe Park	623	1.7	0	2.15
Hamtramck	n.a.	n.a.	0	5.16
Harper Woods	n.a.	n.a.	0	0.53
Highland Park	n.a.	n.a.	0	2.14
Macomb	21,746	59.6	0	50.9
Melvindale	1,211	3.3	0	1.57
N.E. Wayne	11,766	32.2	548	20.9
North Huron Valley/Rouge Valley	32,809	89.9	842	55.6
Redford Township	n.a.	n.a.	0	0.08
S.E. Oakland	26,190	71.8	1,988	40.7
Wayne Co Area 6	n.a.	n.a.	0	0.16
Detroit	138,573	379.7	7,446	263
TOTAL	280,038	767	11,777	542

*Results from GDRSS Model simulation of 36 years of precipitation records.

**Average dry weather flows from flow balance analysis performed for fiscal year 2003-2004.

Figure 2-6. Meters in DWSD System

DWSD Meter No.	Meter Type	City/District Served
AP-S-1	Open Channel, Multi Path (Transit Time)	Allen Park
AP-S-2	Magmeter	Allen Park
CH-S-5	Parshall Flume	Chesterfield
CL-S-1	Magmeter	Center Line
CT-S-1	Parshall Flume	Clinton Township
CT-S-2	Parshall Flume	Clinton Township
CT-S-3	Parshall Flume	Clinton Township
CT-S-4	Parshall Flume	Clinton Township
DN-S-1	Parshall Flume - 48-in.	Dearborn: East
DN-S-2	Magmeter	Dearborn: West
DN-S-3	Miltronic Hydromanager - 72 in.	Dearborn: East
DN-S-4	Magmeter	Dearborn: North Central
DN-S-5	Magmeter	Dearborn: North Central
DN-S-6	Parshall Flume	Dearborn: North Central
DN-S-7	Parshall Flume	Dearborn: North Central
DT-S-1,2	Open Channel, Multi Path (Transit Time, 1 meter with 2 recording data loggers)	Rouge
DT-S-10	Open Channel, Multi Path (Transit Time)	Central City
DT-S-11	Open Channel, Multi Path (Transit Time)	Central City/Conner Creek
DT-S-12	Open Channel, Multi Path (Transit Time)	Central City
DT-S-3,4	Open Channel, Multi Path (Transit Time, 2 meters (2-barrels) with 1 recording data logger)	Hubbell/Southfield
DT-S-5	Open Channel, Multi Path (Transit Time)	Baby Creek
DT-S-6	Open Channel, Multi Path (Transit Time)	Baby Creek
DT-S-7	Open Channel, Multi Path (Transit Time)	Conner Creek
DT-S-8	Open Channel, Multi Path (Transit Time)	East Side/Grosse Pointe Park/Milk River
DT-S-9	Open Channel, Multi Path (Transit Time)	Conner Creek
FA-S-1	Parshall Flume	City of Farmington
FR-S-1	Parshall Flume	Fraser
GK-S-1	Parshall Flume	Grosse Pointe Park
GK-S-2	Magmeter	Grosse Pointe Park
HR-S-1	Parshall Flume	Harrison Township
HR-S-2	Parshall Flume	Harrison Township
HR-S-3	Parshall Flume	Harrison Township
MA-S-1	Magmeter - 16-in.	Macomb Township

Figure 2-6. Meters in DWSD System continued

DWSD Meter No.	Meter Type	City/District Served
MC-S-1	Open Channel, Multi Path (Transit Time)	Macomb Sanitary District
ME-S-1	Magmeter	Melvindale
OC-S-1	Full Conduit, Single Path (Ultrasonic)	Evergreen-Farmington Sanitary District
OC-S-2	Parshall Flume	Clinton-Oakland Sanitary District
OM-S-1	Open Channel, Multi Path (Transit Time)	Clinton-Oakland Sanitary District/ Macomb Sanitary District
OM-S-2	Open Channel, Multi Path (Transit Time)	Clinton-Oakland Sanitary District/ Macomb Sanitary District
RC-S-1	Parshall Flume	Rochester Hills
SE-S-1	Magmeter	Southeast Oakland Sanitary District
ST-S-1	Parshall Flume	Sterling Heights
ST-S-2	Parshall Flume	Sterling Heights
ST-S-3	Parshall Flume	Sterling Heights
ST-S-4	Parshall Flume	Sterling Heights
ST-S-5	Parshall Flume	Sterling Heights
ST-S-6	Parshall Flume	Sterling Heights
SY-S-1	Parshall Flume	Shelby Township
SY-S-2	Full Conduit, Single Path (Ultrasonic) - 8-in.	Shelby Township
UT-S-1	Parshall Flume	Utica
WC-S-1	Full Conduit, Multi Path (Transit Time)	Wayne County Rouge Valley Sanitary District
WC-S-2	Full Conduit, Single Path (Ultrasonic)	Wayne County Rouge Valley Sanitary District
WC-S-3	Full Conduit, Single Path (Ultrasonic)	Wayne County Rouge Valley Sanitary District
WM-S-1	Magmeter	Northeast Wayne County
WM-S-2	Open Channel, Multi Path (Transit Time)	Grosse Pointe/Grosse Pointe Farms
PS-2-A/B WWTP	7 Magmeters (54-in.) at P.S. 2	WWTP influent flows at P.S. 2
SFE_48	Full Conduit, Multi-Path (Transit Time)	WWTP screened final effluent & recycle measurement
SFE_60	Full Conduit, Multi-Path (Transit Time)	WWTP screened final effluent & recycle measurement



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The Detroit Water and Sewerage Department (DWSD) produces and supplies drinking water, and collects and treats wastewater. These two distinct services generate expenses throughout the utility that must be allocated back to each service for billing purposes. Budget appropriation splits between the water and wastewater functions, as well as the organizational structure of DWSD and how it correlates to these cost allocations are described in this module.

The DWSD maintains separate enterprise funds for its water and sewer utilities and allocates costs between the water and sewer functions for its annual budget in six main areas. When benefits of the service are equally shared by the water and sewer

functions, the budgeted costs are split evenly. The majority of administrative services are shared 50/50 including senior management, ITS, accounting and financial services.

When budgeted services or expenses can be directly linked to the water or sewer function, they are allocated directly to that function based on the benefit received. For example, maintenance and repair costs for a water main are allocated to the water side and legal work for a basement flooding law suit is allocated to the wastewater side. Operations costs for water and wastewater treatment facilities are budgeted and allocated exclusively to the water and sewer functions.

Figure 3-1. DWSD Budget Appropriation

1. Administration & Administrative Support

50/50 split between water and sewer:

- General staff services
- Information Technology System (ITS)
- City direct charges
- Detroit Resource Management System (DRMS), the City's automated accounting system
- Personnel services

Proportional split between water and sewer based on estimated benefit received:

- Office of Program Management Assistance (OPMA) - 75% sewer and 25% water. Created by a federal court order, this office monitors compliance.
- Legal support from City - based on individual law suits. For example, a water main break would be charged to the water side.
- Customer outreach - allocated to where work is being performed. Wastewater partnering goes to sewer side and Technical Advisory Committee goes to water side.

2. Financial Services

50/50 split between water and sewer:

- Accounting
- Rates
- Financial Planning
- Purchasing

Proportional split between water and sewer based on estimated benefit received:

- Materials management - budgeted 60% water and 40% sewer but expensed back based on actual charges for labor, distribution, etc.

3. Engineering Services

50/50 split between water and sewer:

- Assistant Director and administrative staff

Proportional split between water and sewer based on estimated services received:

- Water and wastewater engineering staff assigned to water and sewer

4. Asset Maintenance

Proportional split between water and sewer based on estimated benefit received:

- Maintenance repair yards - roughly 75% water/25% sewer
- Meter Operations Main Office Building - 50% water/50% sewer
- Mechanical Operations - roughly 60% water/40% sewer

5. Water Operations

100% of costs to operate all of the water treatment plants and booster stations is charged to the water side.

6. Wastewater Operations

100% of costs to operate the wastewater treatment plant, interceptors, pump stations and CSO facilities is charged to the sewer side.

Capital Improvement Program costs are allocated directly to the water or sewer function area under a separate budget.

The way DWSD administers the department may change from year to year but the allocation philosophy does not. Allocations are shown in the Figure 3-1 on the previous page. An organization chart, color coded by budget allocation, is also presented in Figure 3-2 on the following page. Brief descriptions of groups and divisions are detailed below.

Detroit Water and Sewerage Department Organizational Structure

The Detroit Water and Sewerage Department (DWSD) employs over 3,000 persons. The utility provides drinking water to 126 communities and sewerage service to 77 communities.

The DWSD Board of Water Commissioners (BOWC) is comprised of seven members who are appointed by and serve at the pleasure of the Mayor. The Board is the governing body of the utility and has the authority to:

- enter into contracts to conduct business of the Department
- implement administrative rules, policies and procedures
- set rates
- adjust water, drainage and sewerage charges

Executive management of DWSD is provided by the Director who is assisted by the Deputy Director. Administrative support is supplied to management through several separate divisions, as noted below.

Six Assistant Directors oversee major areas of operation of the DWSD. These areas include:

Financial Services Group
Engineering Services Group
Asset Maintenance Group
Water Operations Group
Wastewater Operations Group
Office of Program Management Assistance

Each of these groups is divided into divisions and sections.

ADMINISTRATIVE SUPPORT divisions include:

The **Public Affairs Division** compiles and disseminates public information and materials relative to the Department's activities to better provide retail and wholesale customers, and national and international

stakeholders, accurate and up-to-date information about DWSD. The Division also assists with employee information dissemination and feedback on DWSD plans, programs, and initiatives. It reports to the Public Affairs Group.

The **Commercial Operations Division** is responsible for directing, coordinating, processing, and monitoring DWSD retail and suburban wholesale customer billing and collection activities, collection related to delinquent accounts, processing landlord/tenant agreements, bankruptcy claims and other customer service tasks including meter reads, special payment arrangements, coordinating services with other City agencies, scheduling customer billing dispute hearings, and other related activities. It reports to the Public Affairs Group.

The **Meter Operations Division** focuses on the meter maintenance with an emphasis on meter repair, calibration or replacement for water and wastewater clients (wholesale suburban, residential retail and commercial/industrial). This division also provides instrumentation and controls maintenance support related to the operation of the water production/distribution and wastewater collection systems. It reports to the Public Affairs Group.

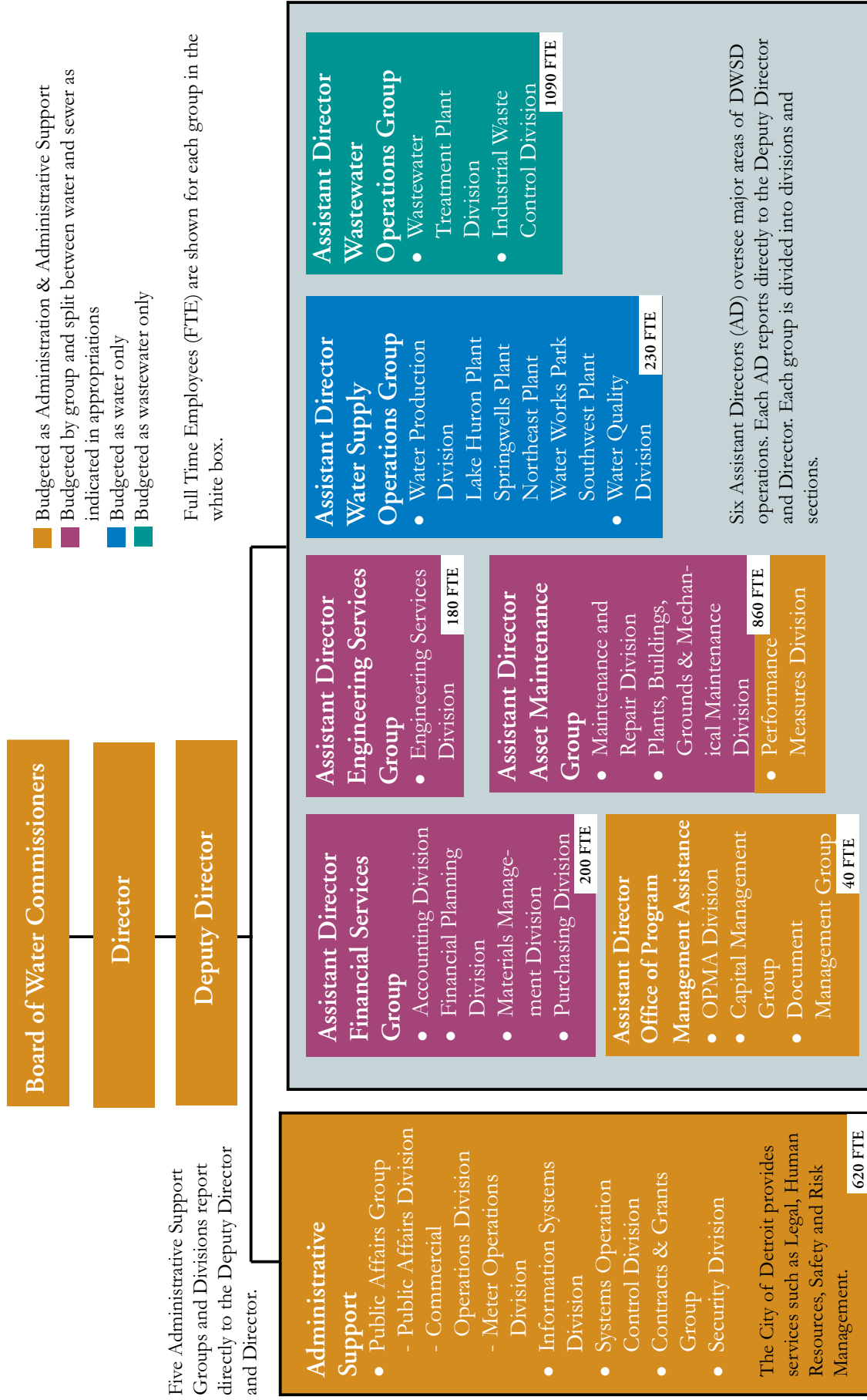
The **Information Services Division** oversees the continued development and operation of the current system/software application network and related technical and system hardware support services within the Department.

The **System Operations Control Division** is responsible for pumping treated water to 126 communities and providing wastewater collection services to 77 communities. It remotely operates 21 water booster stations and 13 sewage pump stations from the Systems Control Center and maintains capability for monitoring and controlling the water and sewerage network.

The **Contracts and Grants Group** prepares and advertises contract documents and monitors progress on consultant and construction contract work; monitors and audits project grants and loans; and monitors targeted enterprise participation on contracts.

The **Security Division** is responsible for providing a safe, secure working environment.

Figure 3-2. Detroit Water and Sewerage Department Organizational Structure



An Executive Management Team (EMT), comprised of the Director, Deputy Director, Assistant Directors, Public Affairs Manager, Contracts & Grants Manager and Human Resources Manager, assists the Director in decision-making.

The **FINANCIAL SERVICES ASSISTANT DIRECTOR** is responsible for overseeing the Accounting, Financial Planning, Purchasing and Materials Management Divisions.

The **Accounting Division** is responsible for directing, coordinating, posting, processing and monitoring activities related to cash receipts and disbursements, investments, bank activities, vendor payments, inventory activities and depreciation of property, plant and equipment, year-end closing and financial operation analysis to facilitate preparation of the trial balance and financial statements.

The **Financial Planning Division** is responsible for coordination, development, implementation and monitoring activities related to the operation and maintenance budget, water supply and sewage treatment system service rates and charges, coordination of system revenue bond financing, and other related functions for the department.

The **Materials Management Division** is responsible for the operation and maintenance of fuel dispensing systems, inventory control, stocking of materials, resource recovery and auditing of these functions. The division also provides limited moving, transportation and warehousing services for materials and equipment.

The **Purchasing Division** ensures goods and services are purchased in the most efficient manner, are delivered when needed at the maximum end-use value per dollar spent, meet the quality specified, and follow the appropriate procurement processes.

The **ASSISTANT DIRECTOR OF THE OFFICE OF PROGRAM MANAGEMENT ASSISTANCE (OPMA)** oversees OPMA, the Capital Management Group, Document Management and the Print Shop.

The **Office of Program Management Assistance (OPMA) Division** provides administrative support to the DWSD Director and Deputy Director and prepares, coordinates and distributes regulatory compliance reports for the water and sewerage facilities. It also prepares monthly status reports per the Second Amended Consent Judgment, the DWSD Wastewater System Operational Plan and the PCB/Mercury Minimization Program.

The **Capital Management Group** manages the entire CIP process by taking a broad view of DWSD's needs from a programmatic perspective. The group prepares and manages the CIP; supports management decision-making related to the CIP; coordinates development of project proposals and project execution plans; and provides project and programmatic training.

The **Document Management Group** is responsible for internal information dissemination, the department-wide Records Management program and the Service Improvement Program.

The **Print Shop** prints bills and communications from the Department.

The **ASSISTANT DIRECTOR OF ENGINEERING SERVICES** is responsible for overseeing the planning, design, construction and contract administration of water and sewage projects.

The **Engineering Services Division** includes seven different groups that plan, design and provide field support for water and sewer projects. These groups include Engineering Administration, Wastewater Construction Group, Wastewater Design Group, Facilities Design Group, Water & Sewer Systems Group, Field Engineering Group and CSO Group.

The **ASSISTANT DIRECTOR OF ASSET MAINTENANCE** provides maintenance services and facilities support assistance to DWSD including corrective and preventive maintenance for equipment and facilities; buildings, grounds and plant repair; and vehicle fleet management operations.

The **Maintenance and Repair Division** is responsible for maintenance, repair and extension of sewers, drainage lines, sewer system appurtenances and auxiliary equipment as well as water service lines, water mains and over 30,000 fire hydrants. The maintenance yards work from four geographic units – Central, East, North, and West Yards.

The **Plants, Buildings, Grounds and Mechanical Maintenance Division** provides centralized/major maintenance support assistance at all water plants, water booster stations, customer service centers, maintenance/repair yard facilities and administrative buildings for the purposes of housekeeping, grounds keeping, electrical, mechanical, and other skilled trades functions, as necessary.

The **Performance Measures Division** establishes performance targets across the organization and monitors performance and the implementation of programs for sustained improvement.

The **ASSISTANT DIRECTOR OF WATER OPERATIONS** oversees the operation and maintenance of the water supply system, plans for the water system, and coordinates design and construction for the water system.

The **Water Production Division** operates and maintains three water intakes, five water treatment plants, booster pumping facilities and associated mechanical and electrical equipment.

The **Water Quality Division** is responsible for the testing and reporting of water quality throughout the distribution system to comply with federal and state Safe Drinking Water Act regulations. The division is also responsible for investigating customer complaints, disinfecting and testing new or repaired water mains, and investigating facilities for acceptable water quality.

The **ASSISTANT DIRECTOR OF WASTEWATER OPERATIONS** is responsible for the operation of the wastewater treatment plant and combined sewer overflow (CSO) facilities, directs industrial waste control activities and coordinates design and construction for the wastewater system.

The **Wastewater Treatment Plant Division** operates the Detroit Wastewater Treatment Plant and CSO facilities to comply with all applicable regulatory requirements.

The **Industrial Waste Control Division** regulates the discharge of wastewater into the sewerage system from commercial, industrial and other non-domestic sources.



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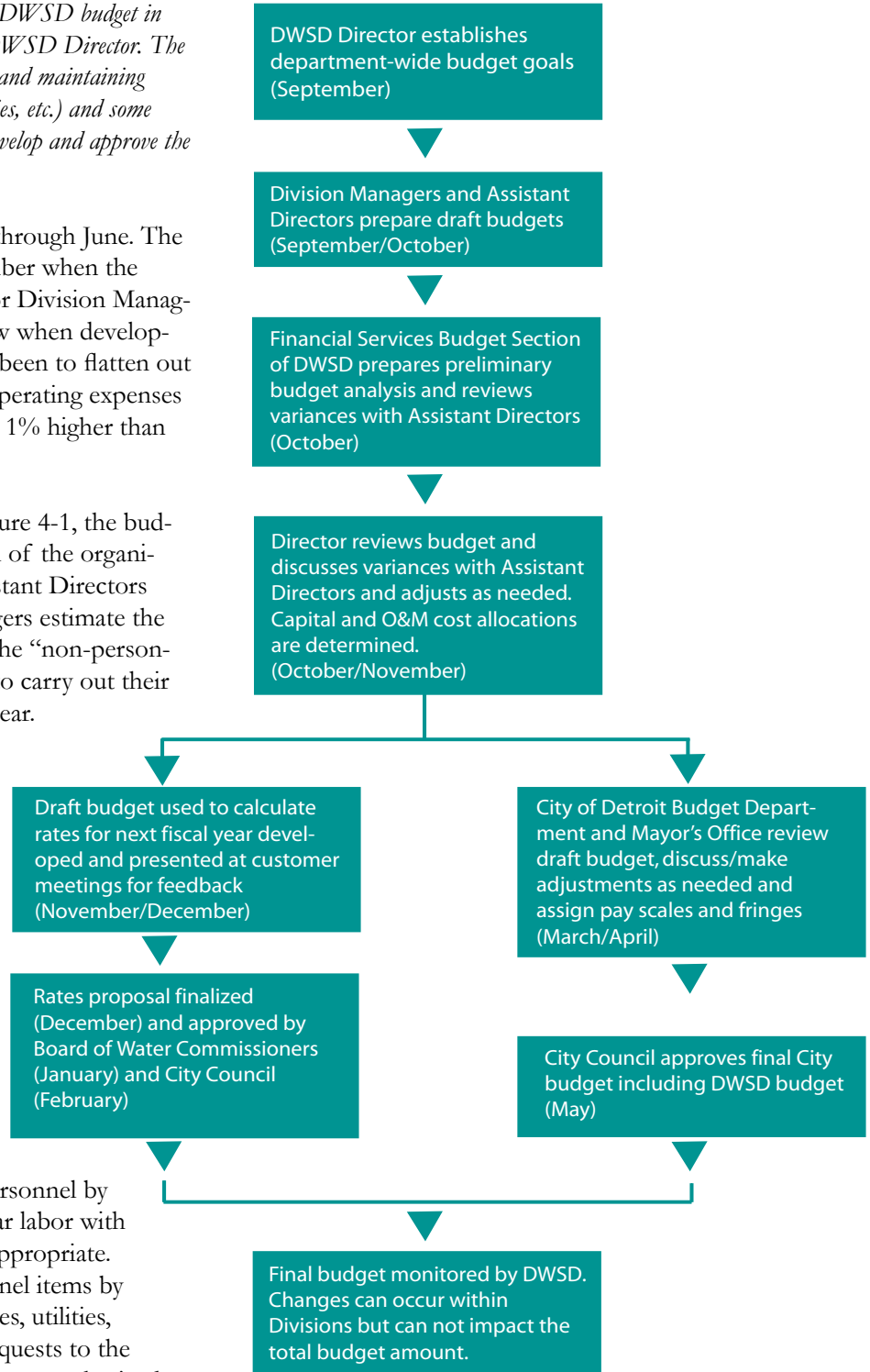
An established process, administered through the Financial Services Group, is followed to develop the DWSD budget in accordance with goals established by the DWSD Director. The budget identifies annual cost of operating and maintaining the system (personnel costs, utilities, supplies, etc.) and some minor capital costs. The process used to develop and approve the budget is explained in this module.

DWSD's fiscal year goes from July through June. The budgeting process begins in September when the Director establishes budget goals for Division Managers and Assistant Directors to follow when developing their budgets. The directive has been to flatten out the budget – as a result, budgeted operating expenses for FY 2005-06 were approximately 1% higher than those for FY 2002-03.

Following the process shown in Figure 4-1, the budget is developed at the division level of the organizational chart. Each of the six Assistant Directors and their respective Division Managers estimate the number and type of positions and the “non-personnel” expenses that will be required to carry out their assigned functions for the coming year.

The process starts when the DWSD Financial Services Budget Section (part of the Financial Planning Division) sends out a budget package to Division Managers. This package contains detailed information on existing budget and actual staffing levels and cost experience, management directives regarding the new budget request, and instructions to complete the request. Using their existing staff as a starting point, individual managers are required to request personnel by specific job titles, augmenting regular labor with overtime where it may be deemed appropriate. They also must identify non-personnel items by specific category (contractual services, utilities, etc.) The managers submit these requests to the DWSD Budget Section, where they are synthesized into a cohesive budget plan. The DWSD Budget Section applies pay scales and fringe benefit factors in

Figure 4-1. Budget Process



accordance with City Budget Department directives to determine overall labor costs, checks non-personnel costs against historical figures and new programs, and performs other review functions before submitting the consolidated budget request to the Director and Deputy Director. A similar review process then takes place at the Director level before the budget request is finalized for purposes of calculating water and sewer rates.

The budget request is submitted to the City of Detroit's Budget Department and the Mayor's office, where additional review occurs. Adjustments made at this stage are generally associated with City-wide programs regarding pay scales and fringe benefit rates. The budget is not formally adopted until acted upon by the City Council, at which point the DWSD Budget Section formally loads it into management systems and monitors actual versus budget activities.

It is worth noting that the budget can be modified after the budget request has been "finalized" for purposes of calculating water and sewer rates. Because of this, there are often variances between the official final budget and the budget used for rate calculations. Additionally, while the overall budget cannot be changed after it is finalized (unless formally modified by the City Council), budget shifts within major appropriations can and do occur. These variations are seldom significant, but impact the ease of comparing actual expenses to budgeted expenses. DWSD's Financial Services Group manages the process by which such changes occur and monitors the impact on individual budgeted cost items.



DWSD Wholesale Sewer Rates 201

The Capital Improvement Program (CIP) development process used by DWSD's Capital Management Group is explained in this module. Each year, two separate five-year CIPs are developed for the water and sewerage systems using a structured process to evaluate, select and prioritize projects. The final CIPs identify projects to be completed and their associated budgets. The CIPs are used to guide and monitor capital spending each fiscal year.

Utilities and Public Works Departments of local communities throughout the country develop Capital Improvement Programs (CIPs) to prioritize rehabilitations and improvements needed to keep water and wastewater systems running efficiently. Continued upgrading is needed to meet regulatory requirements, replace outdated equipment and deteriorating pipe, reduce maintenance requirements and improve operational efficiencies. CIPs provide a method to objectively manage these projects and complete the work in a planned and affordable manner.

The Detroit Water & Sewerage Department (DWSD) has a Capital Management Group (CMG) that is responsible for managing the water and sewerage CIPs including new project development assistance, project scheduling and financial monitoring of each project. The diverse makeup of the CMG enables the group to take a holistic approach to CIP development. The group includes staff with engineering, financial, operational and project management expertise capable of evaluating DWSD's needs from a programmatic perspective. By separating the CMG from DWSD's operating groups, a higher level of objectivity can be achieved when developing the CIPs.

Separate CIPs are published for the water and sewerage disposal systems in July of each year. Each CIP is a dynamic document – it is a five-year strategic plan that is reshaped each year to align with system needs and future goals. The first year of the CIP represents the amount to be funded in the current fiscal year.

New Project Evaluation

New projects being considered for inclusion in the CIP are evaluated and prioritized using a proposal process as shown in Figure 5-1. Divisions within each of the main operating groups submit proposals.

Figure 5-1. CIP Proposal Process



Proposals are typically four to ten pages in length and must contain:

- problem statement
- history or background
- potential alternative solution
- operational benefits of proposed project
- financial benefits of proposed project
- preliminary scope of work
- related projects currently underway or planned
- time requirements
- preliminary cost estimate
- present value/life cycle cost analysis
- in-house group responsible for project

The proposal must explain the need for the project and demonstrate that the problem has been analyzed and a recommended solution identified. If operational and financial benefits do not justify the need for a project, the project will not be included in the CIP.

Proposals are submitted to the CMG in March. The CMG evaluates and compares proposals with ongoing projects to ensure efforts are not being duplicated. Projects are then prioritized using the following criteria:

1. Specific projects mandated by regulatory agencies.
2. Projects mandated by regulatory requirements to maintain compliance such as the dechlorination facility.
3. Projects required to maintain or improve system reliability and/or capacity.
4. Projects that utilize technological advances to improve operational efficiency, worker productivity and/or managerial effectiveness.
5. Projects required for new services.

The Wastewater and Water Master Plans and other major documents like the Long Term Combined Sewer Overflow (CSO) Control Plan are key tools used to identify projects under criteria 3 and 5 above. These master plans are the drivers for needed improvements in the systems over a 50-year period. An in-depth analysis of system needs as well as future planning efforts of wholesale customers have been incorporated into these documents. The master plans were designed to serve as CIP development tools.

Customers are encouraged to provide input to the CIP's current and future years' projects throughout the life of the CIP. DWSD will take every comment under consideration and respond as appropriate. However, current year CIP project changes are usually limited to significant errors; other revisions are reflected in the following year's CIP.

Leveling Spending

The CIP planning process seeks to manage capital spending from year to year so rates are not dramatically impacted in a single year. This can be challenging when large, mandated projects like CSO facilities must be undertaken. To help minimize the impact of the Long Term CSO Control Program, DWSD has been implementing it over 20 years. This approach breaks the program into a manageable number of projects that can be overseen with current staff, maximizes use of State Revolving Funds, and balances project costs over years where feasible.

The goal is to control programmed project expenditures within 10% of the projected CIP budget each fiscal year. The challenge is to accurately convert project budgets to correspond with the CIP budget. Because projects have different design and construction durations, and frequently occur over more than one fiscal year, the budget can be allocated over two or more CIPs. Accurately estimating these costs is important to achieving budgeted spending – if more spending occurs in one year than anticipated and less in another, the CIP budget can reflect negatively upon a project even if it comes in under budget. The CMG has finetuned the CIP estimating process and as a result projected and actual spending levels are more consistent.

Achieving desired levels of spending is also impacted by projects placed on-hold, delayed starts and revised cost projections to reflect construction impacts. It is important to remember that the CIP is a planning tool and living document; changes occur during detailed design and construction that impact overall CIP implementation.

The CIPs for the Water Supply and Sewage Disposal Systems cover a five-fiscal-year planning horizon. However, many of DWSD's projects are large, multi-year programs that are funded as they progress through multiple bond issues. This approach minimizes the impact of the CIP on both water and sewage rates. New bonds are purchased every 18 to 24 months to finance CIP projects. For example, a project with a five-year construction period would be financed through three separate bond issues for the amount required in each 18- to 24-month period, rather than the entire amount in a single bond issue. Maximum debt financing is used to pay for the capital program. This means that the CIP is paid for primarily through the sale of revenue bonds, with only a small amount of capital financing provided directly from annual revenues.

CIP Organization

After the projects are prioritized, the CMG recommends proposed Water Supply System and Sewage Disposal System CIPs to DWSD's Executive Management Team. Further evaluation takes place through discussion and changes are documented on the draft CIPs. Discussions continue until agreement is reached on which projects the final CIP should contain.

Each CIP is organized into five main sections as shown in Figure 5-2. The first three sections summarize all projects in facility type or new/ongoing project categories. A detailed breakdown of projects is also provided. Ongoing projects are listed into different status categories:

- **Active:** Projects assigned a Detroit Resource Management System number (DRMS, the City's automated accounting system) and approved by the Board of Water Commissioners (BOWC) with expenditures in the last fiscal year.
- **Inactive/On hold:** Projects assigned a DRMS number that have not been charged expenditures in the last fiscal year and/or do not have projected expenditures in the current fiscal year.
- **Under procurement:** Projects with a DRMS number that have only experienced in-house force account charges in preparation for BOWC approval.
- **Pending close out:** Projects with a DRMS number that are substantially complete, have project expenditures of \$100,000 or less for the current year and no future projected expenditures.

New projects, presented in their own section of the CIP Project Detail Section, include projects that have not been assigned a DRMS number, have a project proposal and have never had expenditures charged to them.

Monitoring the CIP

CIP data for the water and sewerage systems is stored in a central database for easy tracking and retrieval. The CMG tracks project schedules and budgets on a monthly basis as they progress and works with the appropriate Assistant Director to close out a project when it is completed. An internal tracking system is also used to monitor detailed project expenses and is supplemented with project manager input on anticipated future progress and cash flow projections.

Figure 5-2. CIP Sections

Executive Summary: Summarizes total number of projects and dollars for five years and includes a chart showing expenditures five years backwards and forwards.

Summary of Project Expenditures Spread by Fiscal Year: Summarizes dollars of projects by type of facility or plant process for a five-year period and indicates the total amount directed toward new and ongoing projects.

Projected Expenditures Spread by Fiscal Year: Summarizes dollars of new and ongoing projects by type of facility or plant process for a five-year period.

Project Detail Section: Details all ongoing and new projects and dollars budgeted for each year. The financial requirements that will be needed to pay for each project over each year of its study, design and construction phase are estimated. The projects are grouped by active, on hold, under procurement, pending closeout and new projects. The contract number and a brief description of each project is also included.

Projects for Future Consideration: A listing of projects submitted for future consideration and the estimated cost to complete them that have not been budgeted into the CIP.



DWSD Wholesale Sewer Rates 201

This module briefly outlines the capital financing process practiced by the Detroit Water and Sewerage Department (DWSD).

DWSD uses a combination of bond proceeds, loans from the State Revolving Fund, and revenue generated funds to finance capital improvements for the Sewage Disposal System. Revenue bonds, backed solely by the revenues of the Sewage Disposal System, are issued. These bonds are independent from the general taxing authority of the City of Detroit. In order to issue these bonds, DWSD and the City of Detroit have made certain covenants with their bondholders, including commitments to:

- Maintain sufficient revenues to meet annual revenue requirements, including operation and maintenance (O&M) expense, debt service on the revenue bonds, and an acceptable level of debt service coverage.
- Establish and maintain reserve funds according to the requirements shown in Figure 6-1. These funds are described in Figure 6-3 on the following page.
- Follow the structured flow of funds shown in Figure 6-2.
- Operate a “closed system” that only uses System revenues for the legal needs of the System.

DWSD usually issues revenue bonds every 18 to 24 months. By rate settlement agreement, DWSD is required to practice the concept of “maximum debt financing”. This concept is designed to result in a capital financing plan that attempts to recover the financing costs of individual assets over their useful life. Under this theory, customers pay for constructing facilities as they use the facilities. Maximum debt financing minimizes the impact of major capital improvements on current customers.

Figure 6-1. Reserve Fund Requirements

1. The Operating Reserve Fund must be equal to at least 30 days of operation and maintenance expense. By policy, DWSD seeks to maintain this reserve at a level equivalent to at least 45 days of operation and maintenance expense.
2. The Debt Service Reserve Fund must be equivalent to the maximum future annual debt service on all outstanding revenue bonds.
3. The Extraordinary Repair and Replacement Reserve Fund must be equal to 15% of annual operation and maintenance expense.

Figure 6-2. Structured Flow of Reserve Fund Account Transfers

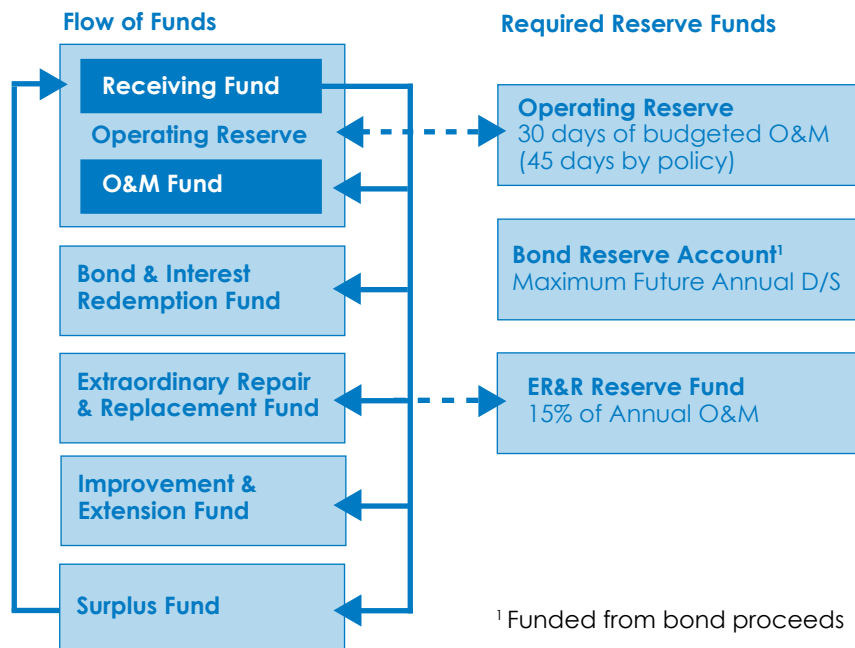


Figure 6-3. Funds within DWSD Accounting System

Receiving Fund: All revenues are initially deposited into this fund for further distribution to other funds.

Operation and Maintenance (O&M) Fund: Provides for the day-to-day operating expenses of the Department.

Operating Reserve: Represents the combined balance in the Receiving and O&M Funds. Must be maintained at a level equivalent to at least 30 days (45 days by policy) of annual O&M expense.

Bond & Interest Redemption Fund: Provides for payment of principal and interest on bonded debt. Monthly deposits to this fund are made to reflect 1/12th of the annual debt service requirement.

Bond Reserve Account: Establishes reserve to pay future debt, funded from bond proceeds and maintained at a level equivalent to maximum future annual debt service.

Extraordinary Repair and Replacement Reserve Fund: Serves as a contingency fund for unanticipated capital improvements in excess of \$1 million. Must be maintained at 15% of annual operating expense.

Improvement and Extension Fund: Used to revenue finance capital improvements.

Surplus Fund: Collects all remaining funds and can redirect them for any lawful use. Generally not used because unused funds are "re-deposited" to the Receiving Fund.

Construction Fund(s): Generated from proceeds of revenue bond issues and reserved for capital improvements. Not part of regular flow of funds and can not be used for any purposes other than capital improvements.



DWSD Wholesale Sewer Rates 201

This module briefly outlines the manner in which DWSD recovers the costs associated with bad debt.

DWSD attempts to recover payment for services from all customers. Like all businesses, there are simply some customers who can not or will not pay. The amount ultimately determined to be uncollectible is referred to as “bad debt expense.” The vast majority of the bad debt expense in the DWSD System is related to retail customers in the City of Detroit.

The 1995 Rate Settlement Agreement established the following approach to deal with bad debt expense in the DWSD Sewage Disposal System:

- Any bad debt expense associated with retail customers in the City of Detroit will be recovered from all other retail customers in the City of Detroit. **Suburban wholesale customers are not impacted by Detroit bad debt expense.**
- Any bad debt expense associated with suburban wholesale customers will be recovered from all other suburban wholesale customers, including the customer to which the bad debt is attributable. **City of Detroit customers are not impacted by suburban wholesale bad debt expense.**
- Any bad debt expense associated with surcharge customers will be recovered from all surcharge customers. **City of Detroit retail and suburban wholesale customers are not impacted by surcharge bad debt.**
- Any bad debt expense associated with State of Michigan or Wayne County Road Agencies are recovered from the respective road agency. **City of Detroit retail and suburban wholesale customers are not impacted by road commission bad debt.**
- Any bad debt expense associated with Industrial Waste Control customers will be recovered from all Industrial Waste Control customers. **City of Detroit retail and suburban wholesale customers are not impacted by Industrial Waste Control bad debt.**

It is important to note that generally accepted accounting principles do not differentiate between true failure to pay and billing disputes. Billing disputes that are not resolved on a timely basis are written

off as bad debt, and recovered under the terms of the settlement agreement. When the dispute is finally settled, the write-off and the associated charges to system users are reversed.

DWSD has recently initiated programs to alleviate the level of City of Detroit bad debt expense. These programs include transferring unpaid City of Detroit receivables to the Wayne County property tax rolls, converting to monthly billing for all City of Detroit customers, and establishing a water affordability program to mitigate the level of unpaid bills from City of Detroit customers.



DWSD Wholesale Sewer Rates 201

This module takes you through each step of the rate calculation process to aid in understanding how first tier wastewater customer rates are calculated.

While complex, rate calculations for DWSD's 22 first tier customer billing districts can be summarized by the four major steps illustrated in this module. The four steps and individual line items used to calculate fixed and commodity charges for each billing district are described in Figure 8-1 and through a sample calculation for Macomb County Wastewater Treatment District on the following pages. A more detailed discussion of the rate development process is available in the annual sewer rate report published on the DWSD web site.

Some of the numbers in the sample rate calculation are highlighted in pink. **Pink numbers indicate that the number was taken from an outside source and used as a rate calculation input.** Sources of these numbers include meter data, estimated flows from wholesale customers, Greater Detroit Regional Sewer System (GDRSS) Model data and Rate Settlement Agreements (RSA).

Figure 8-1. Four Steps of Rate Calculations

Step 1 Units of Service

Estimated flow volumes for each wholesale customer billing district and overall estimated use of the system are determined. A unique Units of Service number is calculated for each wholesale customer billing district.

Step 2 Cost Allocation

Annual revenue requirements are allocated to wholesale customer billing districts by applying the district specific Units of Service (from Step 1) to the System-wide unit costs. The same Unit costs are used for every wholesale customer.

Step 3 Adjustments to Revenue Requirements

Adjustments are made to meet negotiated terms of Rate Settlement Agreements.

Step 4 Rate Calculation

Rates are calculated using rate structure that includes fixed monthly charges to recover costs associated with:

- a. unique customer specific activities
- b. wet weather flows
- c. allocated responsibility for new wet weather facilities being constructed for DWSD's LTCSO program

All other costs are recovered through a commodity charge.

Figure 8-2. Step 1: Units of Service

Macomb County Sewer Rate Calculation (2005-06 Rate Year)

Three flow measurement categories

	Unit	Amount	Reference	Comment
1. Metered Flow	Mcf	2,200,000		
2. Sanitary	Mcf	1,599,582		Metered less Local Community I/I
3. Dry Weather Infiltration	Mcf	585,257	GDRSS data	Includes Local Community plus common sewers/interceptors
4. Wet Weather Inflow	Mcf	118,274	GDRSS data	
5. Overflow Credit		30.8%		Universal for all customers
6. Net Wet Weather Inflow	Mcf	81,846	(4) x [1-(5)]	
7. Total Allocation Volume	Mcf	2,266,684	(2)+(3)+(6)	Higher than metered flow due to common sewer/interceptor I/I
8. System Volume	Mcf	28,883,679		
9. Macomb County Share		7.85%	(7)/(8)	Represents Customer's share of "common" flow costs
10. BOD	lbs	16,293,379	112 mg/l	Lower than volume share (~8%) due to higher strengths of monitored industries
11. TSS	lbs	20,732,370	160 mg/l	Lower than volume share (~8%) due to higher strengths of monitored industries
12. PHOS	lbs	463,807	3.5 mg/l	Lower than volume share (~8%) due to higher strengths of monitored industries
13. FOG	lbs	2,700,976	23.4 mg/l	Lower than volume share (~8%) due to higher strengths of monitored industries
14. Wet Weather		1.60%	1999 RSA	Represents customer's share of DWSD New CSO Facilities cost

Overall estimated use of the system is determined for each wholesale customer based on estimated flow volumes that the wholesale customer develops with DWSD. These “units of service” are aligned with the three flow measurement categories (sanitary, dry weather infiltration and wet weather inflow) to show how each customer uses the system. These units of wastewater flow volumes are quantified in Mcf (thousand cubic feet) for each wholesale customer and the City of Detroit (see Module 9 Estimating Sewage System Flows).

Units of Service are also calculated for four organic pollutant monitored by DWSD and for the wholesale customers’ share of new wet weather facilities under the Combined Sewer Overflow (CSO) control program. Pollutant concentrations are measured at the wastewater treatment plant for Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Phosphorus (PHOS) and Fat, Oil and Grease (FOG). These pollutants increase the cost of treating the wastewater. They are generated to a higher degree

by industrial users so the charge is considered an industrial surcharge that communities can pass on to their industrial customers. Flow from all other retail and wholesale customers is assumed to be equal and referred to as “domestic” flow. All non-industrial customers are assigned pollutant loadings based on this uniform domestic “quality” of contributed wastewater by multiplying total flow from Line 8 by the domestic pollutant concentrations indicated in the reference column on Lines 10 through 13.

An example units of service calculation is illustrated above. Flow volumes are depicted on Lines 1 through 8, and result in the relative allocation of “common” flow related costs for each wholesale customer district shown on Line 9. Estimated pollutant loadings are shown on Lines 10 through 13 and are used to allocate specific costs at the wastewater treatment plant. Participation in DWSD’s CSO program is indicated on Line 14 and is a result of the 1999 Rate Settlement Agreement. *Units of Service are unique for every customer community.*

Figure 8-3. Step 2: Cost Allocation

Macomb County Sewer Rate Calculation (2005-06 Rate Year)				
	(1)	(2)	(3)	
	Units	Unit Cost ^(a)	Allocated Rev Req't (1)*(2)	Comment
1. City Only	0	\$1.642	\$0	Collection System Costs
2. Wholesale Only	2,266,684	\$0.269	\$610,428	Collection System Costs
3. Oakland Only	0	\$0.342	\$0	Collection System Costs
4. Macomb Only	2,266,684	\$0.473	\$1,072,923	Collection System Costs
5. Common X C/O Mac ^(b)	0	\$0.032	\$0	Collection System Costs
6. Common X Mac ^(c)	0	\$0.121	\$0	Collection System Costs
7. Common	2,266,684	\$4.740	\$10,744,943	Common Collection & WWTP Costs
8. BOD	16,293,379	\$0.221	\$3,607,682	WWTP Costs
9. TSS	20,732,370	\$0.300	\$6,219,561	WWTP Costs
10. PHOS	463,807	\$3.640	\$1,688,260	WWTP Costs
11. FOG	2,700,976	\$0.146	\$395,460	WWTP Costs
12. New WW Facilities	1.60%	\$24,882,911	\$399,266	
13. Total			\$24,738,523	Represents Unadjusted Annual Revenue Requirement from Customer

^(a)Unit costs are uniform for every customer
^(b)Refers to costs allocated to all customers except the Clinton Oakland District and Macomb County
^(c)Refers to costs allocated to all customers except Macomb County

DWSD assigns its operating budget and capital improvement program to functional cost categories that align with units of service. For instance, costs associated with the major interceptors are assigned to the “common” cost category, while costs associated with sludge disposal are assigned to the four pollutant categories. The cost allocation and units of service are used to establish a “price list” of unit costs for the wastewater collection, treatment, and disposal services that DWSD provides. This price list is adjusted annually. The FY 2005-06 price list is shown in Column 2 above. Annual revenue requirements are then allocated to wholesale customer districts by applying the customer specific units of service (Lines 7 and 10-13 from Step 1) to each System-wide unit cost. For instance, the customer in the above example has total flow units of service of approximately 2.26 million. Multiplying this figure by the common volume unit cost of \$4.74 results in allocated cost of approximately \$10.7 million, as shown on Line 7. This process is applied for each category and the totals are

aggregated to arrive at the total cost allocation for each wholesale customer. *Unit costs are the same for every customer community.*

Figure 8-4. Step 3: Adjustments to Revenue Requirements

Macomb County Sewer Rate Calculation (2005-06 Rate Year)			
	Amount	Reference	Comment
1. Revenue Requirement Allocation	\$24,738,523		From Part 2
2. Adjustment A	\$544,889	1978 RSA	Indirect Benefits - allocates revenue requirements from Detroit to Suburbs
3. Adjustment B1	\$(65,082)	1980 RSA	15 Mile & Hayes Repairs - reallocates common costs away from all customers
4. Adjustment B2	\$989,966	1980 RSA	15 Mile & Hayes Repairs - reallocates common costs to Macomb County only
5. Adjustment B3	\$63,803		Reallocates common control facilities costs to Macomb County
6. Adjustment B4	\$5,010,012	1980 RSA	15 Mile & Corridor/Garfield Interceptor- reallocates common costs to Macomb County
7. Wayne County Adjustment	\$8,500	1982 RSA	15 Mile & Corridor Collapse - reallocates costs to from Wayne County to all others
8. Adjustment D	\$(460,535)	1999 RSA	Allocates revenue requirements from Suburbs to Detroit (reverses prior implementation adjustment)
9. Adjusted Revenue Requirement	\$30,830,076		Represents Annual Revenue Requirement from Customer

The four Rate Settlement Agreements (RSA) require certain adjustments to implement the terms that the parties negotiated. These adjustments result in additional revenue requirements for certain wholesale customers and reduced revenue requirements for others. For instance, the 1978 Rate Settlement Agreement specifies a payment from Customer Communities to City of Detroit customers for indirect benefits or services. This is accommodated through Adjustment A and results in an increase to Customer Communities and a decrease to the City of Detroit, as shown on Line 2. Similarly, Line 8 illustrates the impact of Adjustment D, a phased implementation strategy called for in the 1999 Rate Settlement Agreement that results in a decrease to Customer Communities and an increase to the City of Detroit. The other adjustments are related to Oakland/Macomb Interceptor System collection system facilities. *For a more detailed discussion of these adjustments, see the annual sewer rate report published on the DWSD web site.*

Figure 8-5. Step 4: Rate Calculation

Macomb County Sewer Rate Calculation 2005-06 Rate Year

	Total	Fixed	Commodity	Existing Charge	Comment
1. Direct	\$7,136,704	\$7,136,704			Direct allocations and adjustments
2. New WW Facilities	\$399,266	\$399,266			From Part 2
3. Other	\$23,294,106				
4. Allocated to Sanitary	\$16,438,471		\$16,438,471		Other allocated based on Part 1 - (Line 3) * [(Part 1, Line 2)/(Part 1, Line 7)]
5. Allocated to Infiltration	\$6,014,527		\$6,014,527		Other allocated based on Part 1 - (Line 3) * [(Part 1, Line 3)/(Part 1, Line 7)]
6. Allocated to Inflow	\$841,108	\$841,108			Other allocated based on Part 1 - (Line 3) * [(Part 1, Line 6)/(Part 1, Line 7)]
7. Total	\$30,830,076	\$8,377,078	\$22,452,998		Total Lines 1 through 6
8. Units		12	2,200,000		
9. Fixed Charge		\$698,090		\$501,944	(Line 7)/(Line 8) = 39.08%
10. Commodity Charge			\$10.21	\$10.20	(Line 7)/(Line 8) = 0.10%
11. "All Commodity" Unit Charge			\$14.01	\$12.82	Total (Line 7)/(Line 8) = 9.29%

The current rate structure includes fixed monthly charges and a commodity charge unique to each wholesale customer. In order to calculate these charges, the total allocated costs are unbundled into specific elements. Costs associated with unique customer community facilities and DWSD's Long Term CSO program are allocated to the fixed cost column, as shown on Lines 1 and 2. The remaining costs are allocated to fixed and commodity columns based on the makeup of each wholesale customer's contributed wastewater flow as depicted in Step 1. Costs associated with sanitary and infiltration are assigned to the commodity column, while costs associated with inflow are recovered through fixed charges. This process is illustrated on Lines 4 through 6. The total costs to be recovered from each charge element are shown on Line 7 and then divided by the appropriate element to result in the rates and charges shown on Lines 9 and 10.

The overall cost to a customer community can also be expressed as an "all commodity" unit charge to facilitate comparison of the actual unit costs of service for each of the communities that DWSD serves. This figure is illustrated on Line 11.



DWSD Wholesale Sewer Rates 201

In this module, you will learn the sources of dry and wet weather flows and how these flows are estimated. Three different tools are used to estimate sewage flows: meters, flow calculations and a computer model of the sewer system. Module 2, Collection System, describes the collection system components that may aid in understanding this module.

Sewage flows within the regional sewer system are divided into two major categories: dry weather flows and wet weather flows. Dry weather flows include sewage flows and groundwater flows that enter through defective pipe joints, connections or manhole walls (dry weather inflow/infiltration or DWI/I flows). Dry weather flows travel through the system every day and represent all flows in the sewer pipes on a typical day without precipitation. Typically, dry weather sewage flows peak every day between 6 AM and 9 AM, when water usage is at its peak. Wet weather flows include storm water that gets into sewer systems during rain storms and periods of snowmelt. A combined sewer (generally found in older areas) is a single sewer designed to convey sanitary sewage and storm flows. Newer areas have separate sanitary sewers that only convey residential, commercial and industrial sewage as well as unintended infiltration and inflow. Flows can increase over 50-fold during wet weather conditions within a combined sewer system. Meters, flow calculations, and the Greater Detroit Regional Sewer System (GDRSS) model are used to estimate dry and wet weather flows for each customer district to use in the rate model. Note that some customer districts listed in Figure 9-1 contain more than one municipality.

Dry Weather Flows

Dry weather flows represent the greatest amount of customer flows each year. The sewage or sanitary flow in dry weather flow is estimated in three categories: residential, commercial/business/institutional, and significant industrial users (SIU). These categories recognize the different pollutant loadings and volumes contributed by different users. The breakdown of these categories of users in each sewer district is determined using specific formulas.

Figure 9-1 Billing and System Meters in the Detroit Sewer System

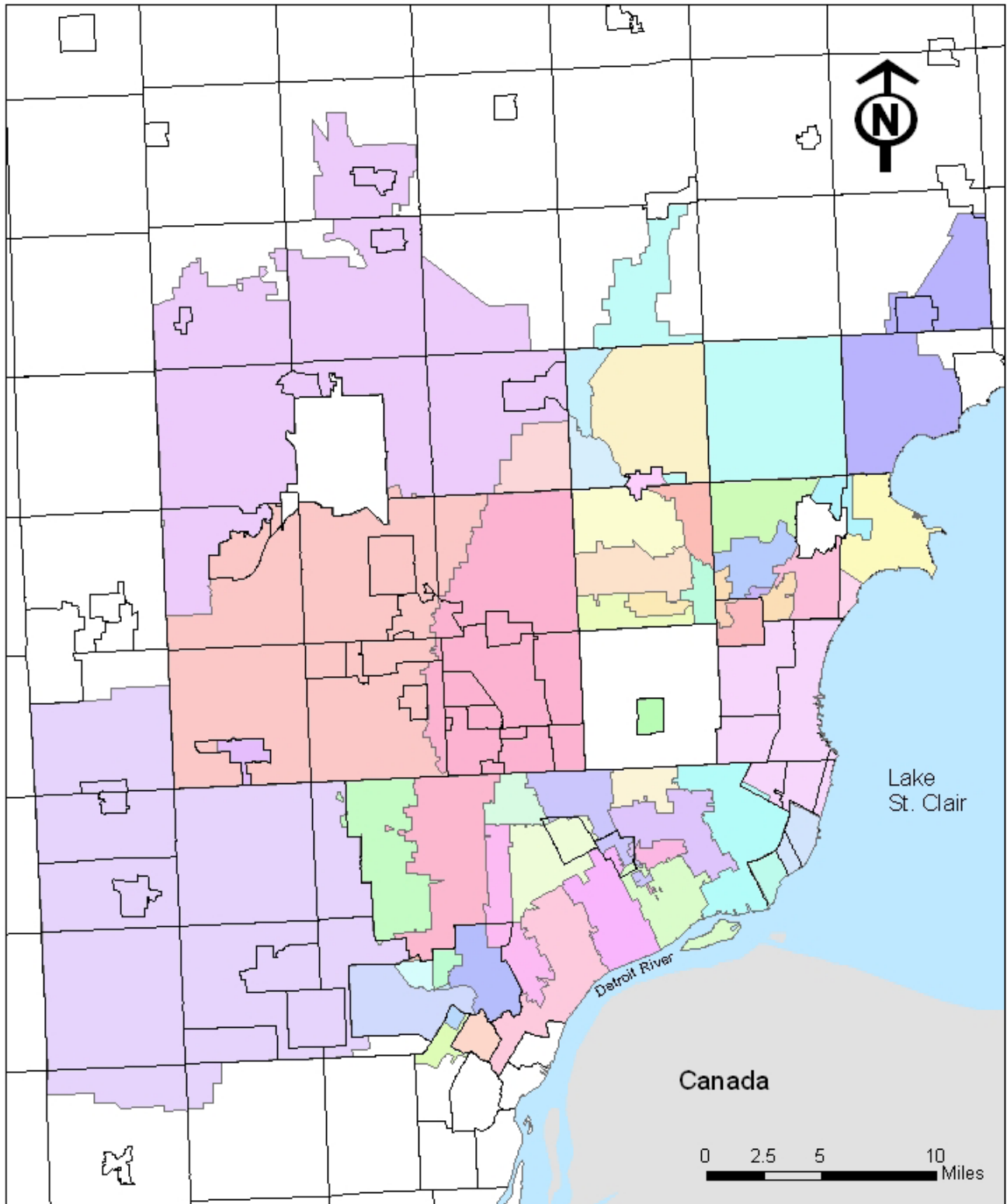
First Tier Customer Districts	Billing Meters	System Meters
Allen Park	2	
Centerline	1	
Clinton-Oakland	3	
Dearborn	7	1
Evergreen-Farmington	1	
Farmington	1	
Grosse Pointe		1
Grosse Pointe Farms		1
Grosse Pointe Park	2	
Hamtramck		5
Harper Woods		1
Highland Park		3
Macomb	20	3
Melvindale	1	
NE Wayne County	1	
North Huron Valley/Rouge Valley	3	
Redford Township		2
SE Oakland	1	
Wayne County Area 3		2
Wayne County Area 6		2
City of Detroit		13
Wastewater Treatment Plant		1
Total	43	13¹

¹System meters are used by the City of Detroit and multiple customer districts

Two types of meters are used to estimate dry weather flows: billing meters and system meters. Billing meters measure a single first tier customer's flows at the point or points where their main sewer(s) connects to the DWSD sewer system. There are 43 billing meters in the system.

System meters measure the flows contributed to the large interceptor sewers. System meters can have multiple wholesale customers sharing a single meter. There are 13 system meters in operation used to determine flows within the City of Detroit and for ten first tier customer districts. This is to better divide the flows between the adjacent areas within the district.

Figure 9-2 Detroit Sewer System Meter Districts



Meter Districts are shown in color and community boundaries are shown in black.

Dry Weather Flows continued

Each billing and system meter has a contributing area or sewer district. The contributing area to the wastewater treatment plant (WWTP) is also considered a sewer meter district because the WWTP is a point in the system where flows are measured. Figure 9-1 gives the number and type of meters used for each first tier customer district and Detroit. The meter districts are shown in Figure 9-2.

A discussion of how these meters are used to estimate dry weather flows for wholesale customers follows. Figure 9-3 explains the three different methods used to calculate dry weather flows using system and billing meters.

Customers with Billing Meters Only

The simplest scenario to calculate dry weather flows is for a customer with billing meters in all of their districts, like Customer 1 in Figure 9-3. In this instance, the billing meter reading is used to determine sanitary flows and dry weather infiltration. Of the 15 first tier customers, six have billing meters throughout their districts and four have billing meters for the majority of their service area.

Customers with System Meters

Because sewers operate by gravity, flows from outlying (upstream) areas will go through other districts (downstream) as they travel to the WWTP. This is particularly true for flows that pass through system meters since they are located in the City of Detroit on major interceptors closer to the WWTP. In these instances, a method called differential metering is used to determine the flows for the sewer meter district. Flows for the meter area are determined by subtracting the upstream meter(s) flows from the downstream meter flows. This calculation results in the flows for just the meter area, referred to as the differential or incremental meter flows.

Most customers have billing meters at their connection to the DWSD system. However, five customers have portions of their community that do not have billing meters and four customers do not have any billing meters. These customers tend to be located adjacent to Detroit and have numerous connections to the interceptors making it difficult and costly to meter. As a result, while billing meter districts are associated with one customer, system meter districts can include a portion of Detroit and one or more customers (or portions thereof). These customer

Figure 9-3 Dry Weather Flow Meter Calculation Methods

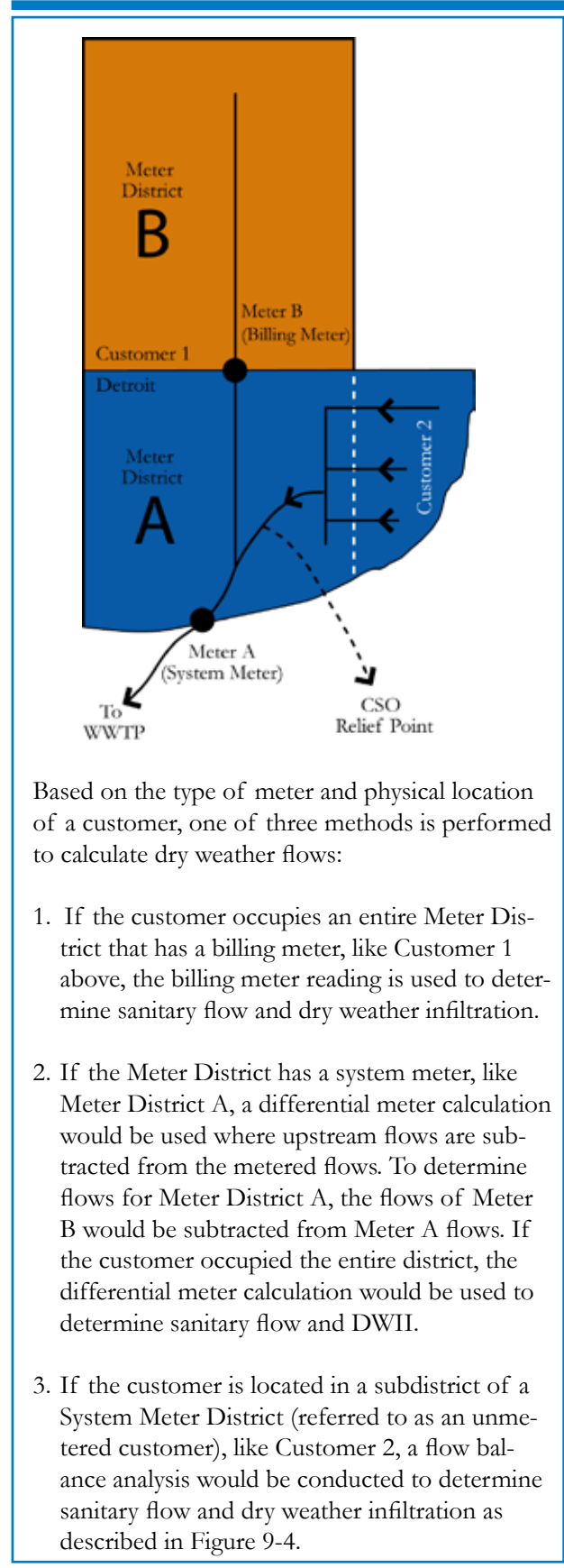


Figure 9-4 Flow Balance Analysis to Determine Dry Weather Flow for a Customer in Subdistrict that uses System Meters (Unmetered Customer)

1. Separate recorded meter flows into dry day and non-dry day flows

- a. Reduce 5-minute flow data to daily averages for fiscal year (July 1 through June 30 of following calendar year)
- b. Select dry days of the year based on review rainfall records and flows at plant
- c. Calculate single dry weather flow value for each meter based on average dry days flow for the year



2. Calculate incremental meter district flows for each meter district

Equation: Meter District Flow = Meter Flow – Upstream Meter Flow

For example, Meter Dist. A Flow = Meter A Flow – Meter B Flow

3. Separate dry weather flows into sanitary sewage flow and dry weather infiltration and inflow (DWII) flow

- a. Calculate three components of sanitary flow based on unit rates determined in DWSD's Wastewater Master Plan.

Equation:

$$Q_s = \text{Residential Flow} + \text{Commercial/Business/Institutional Flow} + \text{Significant Industrial Users}$$

For example, census data for residential and employed populations and DWSD data for location of SIU flows were used for Customer 2 and the Detroit portion of Meter District A.

Sanitary Flow Formulas

Residential population flow

= Resident population from census data x 77 gallons per capita per day (gpcd)
This unit rate is based on water use from 66 communities during winter months (three-year average) within the DWSD service area.

Commercial, business, and institutional population flow

= (Employed populations within the service area - SIU employees) x 50 gallons per employee per day (gped)
This unit rate is based on review of 12 communities' billing records, including Detroit.

Significant industrial users (SIUs)

= Volume of flows from SIUs based on industrial waste permit with DWSD
In the year 2000, there were 403 SIUs with flows of approximately 45 mgd.

- b. Calculate DWII flows through a flow balance as the difference between meter district flows and sanitary flows

Equation: DWII = Meter District Flow – Sanitary Flow

For example, DWII for Meter District A would be the Meter District Flow less sanitary flow calculated for Customer 2 and the Detroit portion of Meter District A.

4. Allocate two components of dry weather flows to each subdistrict within a meter district

- a. Calculate sanitary flows and allocate to each subdistrict
- b. Allocate DWII flow to each subdistrict based on area
For example, if an area of Customer 2 is 25% of Meter District A, then Customer 2 is assigned 25% of DWII flow calculated for Meter District A.
- c. Calculate total dry weather flows for each subdistrict as the sum of the sanitary flow and the DWII flow.

areas are sometimes referred to as unmetered areas; however, it is important to note that dry weather flows from these areas are measured at a system meter located downstream, or, in some cases, recorded at the WWTP itself. This concept is illustrated for customer 2 in Figure 9-3. Flows for any customer district without a billing meter are determined using a flow balance analysis. The flow balance procedure is demonstrated in Figure 9-4.

Wet Weather Flows

Wet weather flows include storm water that gets into separate and combined sewers during storms and snowmelt. Combined sewers accept storm flows by design. Separated sewers often experience increased flows during wet weather due to a variety of reasons, including building footing drains and illegal connections. The community sewer systems that make up the greater Detroit collection system include separated sewers that experience rain-dependent inflow and infiltration and combined systems conveying storm flows.

During dry weather and small storms, all flows are monitored through the billing and system meters. However, during and immediately following large storm events, excessive flows are discharged from relief points in the system. These relief points can be permitted combined sewer overflow (CSO) outfalls to a river or unintended discharges from a sanitary system manhole located at a low point within the system. This discharge will travel to a nearby storm system or water body.

These overflows generally are not measured, with the exceptions being at CSO facilities constructed to screen and disinfect overflows. For this reason, the Greater Detroit Regional Sewer System (GDRSS) computer model is used to estimate wet weather flows. This model has been tuned or calibrated to a number of actual rainfall events and locations within the system. As additional data is collected or detail is added to the model, the model's predictive capabilities are improved. The data includes actual rainfall intensities (inches per hour) as measured by a rain gauge network, as well as information from billing and system meters. The model predicts the wet weather flow response for both combined and separated systems for each district and subdistrict, as needed. Using the meter districts in Figure 9-3, the model would predict the response to precipitation records for Meter District B, Customer 2 (as a subdistrict of Meter District A) and Detroit's portion of Meter District A.

For the rates calculations, the GDRSS Model was used to determine a wet weather flow volume coefficient for each district and subdistrict, as needed. This coefficient is the percent of annual rainfall that the model determined enters the sewer system in response to rainfall. The rate calculation uses this coefficient along with the total rainfall recorded for the fiscal year to calculate the wet weather volumes for each district and subdistrict within the system.

Additional information on metering can be found in the Module 2, Collection System. The use of metered data in rate calculations is explained in the Module 8, Sample Rate Calculation. The use of estimated flows in rate calculations is discussed in Module 10, Use of Flows in the Rate Model.



DWSD Wholesale Sewer Rates 201

This module briefly describes how the estimated and metered flows are used in the sewer rate model.

Module 9, Estimating Sewage System Flows, presents a detailed evaluation of the protocol for determining annual wastewater flow volumes in the DWSD System. The principal objective of that protocol is to conduct flow balance analyses to evaluate the source of annual flows into the DWSD System.

DWSD and the Customer Communities have collectively established wastewater rate methodology principles that require subtle modifications to the annual flow volumes for purposes of establishing data to be included in the sewer rate model. These principles require the following adjustments.

Dry Weather Infiltration:

- Rate model applies five-year rolling average, rather than annual figures.
- Infiltration is estimated for the various elements of the DWSD collection system, and allocated (based on protocol established as part of the 1999 Rate Settlement Agreement) accordingly:
 - Interceptors – common to all
 - Customer Connections – to specific Customer Communities
 - “Common Use Sewers” – to specific Customer Communities and the City of Detroit, in proportion to their relative use of those sewers

Wet Weather Inflow:

- A five-year average rainfall figure is used to calculate annual storm flow
- A standard overflow percentage is applied to storm flows from all customers, reducing the relative inflow for purposes of rate calculations for all customers on an equal proportional basis.

Sanitary Volumes:

- Sanitary volumes for customer classes without billing meters are estimated based on a proportion of water sales for those customers, rather than population based parameters.
- Sanitary volumes for customer classes with billing meters are determined by subtracting other (infiltration and inflow) volumes from the metered wastewater flow.



DWSD Wholesale Sewer Rates 201

Through its customer partnering and outreach efforts, DWSD has established a method for sharing information on matters that impact sewer rates and inviting feedback on those matters, as described in this module.

For the past several years, DWSD has sponsored a Sewer Rates Work Group made up of key representatives of the First Tier Wastewater Partnering effort. This work group meets periodically to gain a deeper understanding of the rate model, explore detailed technical and financial information, and evaluate the impact of policy matters on sewer rates. This forum provides customer communities an opportunity to participate in rate development through an interactive process. DWSD believes that customer communities should take advantage of this opportunity by being represented on the work group and providing input throughout the year.

A major recent goal of the DWSD customer partnering and outreach efforts has been to provide broader, more detailed information earlier in the rate development season. This goal led to a structured schedule of wholesale customer meetings set forth in the Figure 11-1 on the following page. This schedule identifies the meetings that DWSD holds with representatives of ALL customer communities to share information affecting water and sewer rates and to receive feedback on rate methodologies and data. Customers have found that participation in these meetings has contributed to an improved understanding of the rates. The specific topics covered at each meeting are identified, and links to actual data, reports, and presentations are provided. Methodology and policy issues affecting all customers are usually referred to the Sewer Rates Work Group for additional discussion. Customers with specific issues that only affect their individual community are invited to meet individually with DWSD for further exploration. DWSD believes that customer communities should take advantage of this opportunity by making sure that they participate in this slightly more formal forum.

The rate season culminates with public hearings before the Board of Water Commissioners and the City Council in January and February, respectively. These are the formal public participation opportunities for customer communities. Correspondence is accepted for the record and speakers are invited to make limited commentary.

Figure 11-1. DWSD Rates Rollout Process for FY 2006-07 Rates

Preliminary (late May) Meeting with Water Customers	Explanation of the methodology that will be used to establish demand factors, as developed by the DWSD customer work group.
Meeting #1 (early October)	<p>Preliminary prior year actuals</p> <p>Presentation of FY 2006-07 CIP, with detailed project descriptions</p> <p>Preliminary units of service data – (water peaking factors, sewer flows, etc.)</p> <ul style="list-style-type: none"> • Flow analysis and projections • Preliminary water peaking factors • Sewer flows from GDRSS, etc. • Unaccounted for water update <p>Preliminary O&M budget forecasts</p> <ul style="list-style-type: none"> • Director’s expectations of projected O&M expenses, including factors expected to affect rates and rationale for those expectations <p>Preliminary Operating and Capital Financing Plans & Revenue Requirement Levels, including:</p> <ul style="list-style-type: none"> • Anticipated debt service coverage for coming rate cycle and supporting rationale • Information on direct and indirect charges from the City of Detroit • “System” rate increases
Meeting #2 (mid November)	<p>Preliminary Prior Year Actuals</p> <ul style="list-style-type: none"> • Comparison of actual and projected O&M expenses for previous periods <p>Preliminary cost allocations to customer communities and supporting key elements including (for Water):</p> <ul style="list-style-type: none"> • Projected depreciation expense, supporting rationale and impact on rates • Discussion of the policies/criteria used to develop proposed rate of return <p>Preliminary “System” Look-Back Adjustment – Sewer</p> <p>Customer comments on preliminary units of service & revenue requirements (Includes flow volumes, peaking factors, CIPs, O&M budgets, overall revenue requirement levels)</p>
Meeting #3 (early - mid December)	<p>“Final” Prior Year Actuals – with comparisons</p> <p>Final Operating Budget, CIP and Financing Plan</p> <ul style="list-style-type: none"> • “Final” Operating Budget for purposes of rate design – modifications may be made during continuing internal review <p>Final Peaking Factor Calculations – incorporating any customer information</p> <p>Recommended Water and Sewer Rates to Customer Communities</p> <p>Recommended Look-Back Adjustments to Customer Communities</p>
Meeting #4 (early January)	Presentation of rate proposals to Technical and Administrative Leaders of Customer Communities
Late January	BOWC Public Hearing
Mid-February	City Council Public Hearing
March 1 st	Rates Approved



DWSD Wholesale Sewer Rates 201

In this module, you will learn about the common issues between first tier customers and the DWSD that drove the need for a new model contract and what specific issues were addressed in the model contract.

One of the goals identified in the February 2001 First Tier Partnering Agreement was to create a model sewer contract that reflects the current operating and regulatory environment of the DWSD system by January 2004, to coincide with the adoption of the Wastewater Master Plan. During the partnering process, DWSD and its customers identified a number of common interests that they wanted to address through revisions to existing contracts. Since many of the existing contracts were drafted years ago, some as far back as the 1930's, creating a model contract to address regulatory and system changes since that time seemed a necessity. Common interests identified included compliance with the current regulatory climate, incentives for flow management, addressing transport and treatment capacity, wet weather issues, and the need for alternative dispute resolution processes.

The model sewer contract, adopted for use in March 2005, was created to function as a template that can be modified to fit the special needs of each first tier sewer customer. The model sewer contract addresses the following issues:

- delivery of sewage flow, maximum allowable sewage flow limits and enforcement thereof
- meter ownership, maintenance and accuracy and data collection therefrom
- customer's service area
- sewage flow measurement
- sewage flow reallocation
- contract term, renewal and termination thereof
- construction standards
- dispute resolution
- payment for service
- industrial waste control program
- rights-of-way
- other general miscellaneous provisions

One of the more significant differences between the older sewer contracts and the new model sewer contract is the establishment of a firm flow limit for each first tier customer. The Wastewater Master Plan identified flow limits for each customer; these limits will be used in the contracts unless a compelling argument is made otherwise.

A customer's contractual flow limits do not determine the rate paid by the customer. Although the model sewer contract does not so specify, all rates will continue to be based on cost-of-service principles as required by Michigan law. See MCL 117.4f(d). In addition, the Federal User Charge Regulations, 40 CFR 35.929 et seq. and 40 CFR 35.2140 et seq., require DWSD to adopt sewage rates based on actual or estimated use of the system, which ensures that each user (or class of users) of the system pays its proportionate share of the cost of operating and maintaining the system. The regulations require DWSD to comply with the user charge regulations for the useful life of the treatment works. See 40 CFR 35.2208.

A copy of the model sewer contract is presented on the following pages.

**WASTEWATER DISPOSAL SERVICES CONTRACT
BETWEEN
CITY OF DETROIT, BOARD OF WATER COMMISSIONERS
AND**

This Wastewater Disposal Services Contract (“Contract”) is made this ____ day of _____, 20____, by and between the City of Detroit, a municipal corporation, by its Board of Water Commissioners (“Board”), and _____, a municipal corporation (“Customer”).

Whereas, the Board owns and operates a wastewater disposal system; and

Whereas, the Board has contracted to supply wastewater Disposal Services to numerous governmental entities in southeastern Michigan; and

Whereas, Customer desires to obtain wastewater Disposal Services from the Board; and

Whereas, the wastewater disposal system owned and operated by the Board is subject to the jurisdiction of the United States District Court for the Eastern District of Michigan, by virtue of the consent judgments entered in United States Environmental Protection Agency v City of Detroit, Civil Action No. 77-77100; and

Whereas, the Board implemented a voluntary partnering effort with its First Tier Customers, of which the Sewer Steering Committee is a central part, which assists the Board in data gathering, alternative evaluations and recommendations; and

Whereas, the Rates Work Group and the Contracts Work Group, whose functions are defined in the Wastewater Partnering Agreement, along with the GDRSS Technical Work Group are key components of the Sewer Steering Committee;

Now Therefore, in consideration of the promises, the mutual undertakings and benefits to accrue to the parties and to the public, the parties hereto agree as follows:

Article 1. Definitions

1.01 The following words and expressions, or pronouns used in their stead, shall be construed as follows:

“Board” shall mean the Board of Water Commissioners of the City of Detroit.

“CFS” shall mean cubic feet per second.

“City” shall mean the City of Detroit, a municipal corporation, acting by and through its Board of Water Commissioners.

“City Council” shall mean the legislative body of the City of Detroit.

“Contract” shall mean each of the various provisions and parts of this document, including all attached Exhibits and any amendments thereto, as may be executed and approved by the Board of Water Commissioners and by the City Council.

“Customer” shall mean the First Tier Customer which is designated herein as a party to this wastewater Disposal Services contract.

“Disposal Services” shall mean the collection, transportation, and treatment of wastewater by the Detroit Water and Sewerage Department.

“DWSD” shall mean the Detroit Water and Sewerage Department.

“Exhibit A” shall be a description of the locations of the meters serving the Customer.

“Exhibit B” shall be a description of the Customer’s service area from which wastewater may be delivered to the wastewater disposal system of the Detroit Water and Sewerage Department.

“Exhibit C” shall be a description of the purpose, responsibilities, and membership of the Detroit Water and Sewerage Department Design Standards Committee.

“Exhibit D” shall be a description of the terms of the Industrial Waste Control Program that has been adopted by the Detroit Water and Sewerage Department and the Customer.

“First Tier Customer(s)” shall mean all directly contracted wastewater disposal service customers of the Board of Water Commissioners’ wastewater disposal system, including but not limited to Allen Park, Centerline, Clinton-Oakland, Dearborn, Evergreen-Farmington, Farmington, Grosse Pointe, Grosse Pointe Farms, Grosse Pointe Park, Hamtramck, Harper Woods, Highland Park, Macomb County, Melvindale, Northeast Wayne County, North Huron Valley/Rouge Valley, Redford Township, Southeast Oakland County, Wayne County Area 3, and Wayne County Area 6.

“Flow” shall mean wastewater delivered by Customer to the Board of Water Commissioners’ wastewater disposal system. It shall include sanitary flow, dry weather infiltration and inflow, and a wet weather flow component. It shall also include wastewater from industrial and/or commercial facilities in compliance with the Industrial Pretreatment Ordinance.

“Future Flow” shall mean all additional Flow delivered by Customer to the Board of Water Commissioners’ wastewater disposal system after the approval of this Contract by the City Council.

“GDRSS” shall mean the Greater Detroit Regional Sewer System.

“GDRSS Technical Work Group” shall mean the committee consisting of representatives of the Detroit Water and Sewerage Department, its First Tier Customers, and its respective sub-work groups, and shall include its successor or replacement if altered or discontinued.

“Maximum Allowable Flow Limit” shall mean the maximum allowable wastewater Flow which Customer may deliver to the Board of Water Commissioners’ wastewater disposal system. This limit shall be established in accordance with the approved Detroit Water and Sewerage Department Wastewater Master Plan and any subsequent revisions thereto. This limit shall be expressed in units of cubic feet per second and shall be determined by calculating an average of meter readings over a rolling one (1) hour time frame.

“Meter” shall mean a wastewater billing meter.

“MGD” shall mean million gallons per day.

“Notices” shall mean all notices, consents, approvals, requests and other communications required to be given under the terms of this Contract.

“Service Area” shall mean the service area of Customer designated in Exhibit B to this Contract.

“Sewer Steering Committee” shall mean the committee consisting of representatives of the Detroit Water and Sewerage Department, its First Tier Customers, the technical advisor to the federal court, and its respective sub-work groups, and shall include its successor or replacement if altered or discontinued.

“System” shall mean the wastewater disposal system owned, operated and maintained by the Board of Water Commissioners.

“WWMP” shall mean the Detroit Water and Sewerage Department’s 50-Year Wastewater Master Plan dated October 2003, as amended.

“WWTP” shall mean the Detroit Water and Sewerage Department’s Wastewater Treatment Plant.

Article 2.

Delivery of Flow; Maximum Allowable Flow Limit; Enforcement

- 2.01 Maximum Allowable Flow Limit. Customer understands and agrees that its Maximum Allowable Flow Limit shall be _____ CFS.

CHOOSE ONE SECTION 2.02

Option 1: All Flow

- 2.02 Delivery of All Flow. The Board agrees to accept and Customer agrees to deliver all Flow from Customer originating within Customer’s Service Area, excluding any overflow volumes, up to its Maximum Allowable Flow Limit.

Option 2: Percentage of Flow

- 2.02 Delivery of Percentage of Flow. The Board agrees to accept and Customer agrees to deliver no less than _____% of all instantaneous Flow generated within Customer's Service Area and existing as of the date of City Council approval of this Contract. Further, the Board agrees to accept and Customer agrees to deliver _____% of all Future Flow generated within Customer's Service Area, but no more than its Maximum Allowable Flow Limit as may be revised to reflect the above noted Flow split.
- 2.03 Calculation of Charges. Customer shall pay the Board for wastewater Disposal Services for Flow delivered into the System at such rates as the Board may from time to time establish.
- 2.04 Enforcement of Maximum Allowable Flow Limit. The Board and Customer acknowledge and agree that Customer deviations over its Maximum Allowable Flow Limit may occur. If Customer has multiple incidents of its Flow exceeding its Maximum Allowable Flow Limit which amount to a pattern of exceedences, as determined in the sole and reasonable discretion of the Board, the Board shall give written notice of such exceedences to Customer. Thereafter, the Board and Customer shall meet and attempt to develop a plan for reducing or eliminating the exceedences. If, in the opinion of the Board, the parties are unable to agree on a plan, the Board shall have the right to assert any available remedies for breach of contract.
- 2.05 Nothing in this Article 2 shall be construed to preclude Customer from constructing or operating wastewater facilities constructed and operated for the purpose of reducing or eliminating wastewater overflows.

Article 3.

Meter Ownership, Maintenance, and Accuracy; Data Collection

- 3.01 Ownership and Maintenance Responsibility. The Board shall own and maintain all Meters and meter pits used for billing purposes. A list of Meters located in Customer's Service Area is attached hereto as Exhibit A.
- 3.02 Meter Maintenance. The Board shall maintain its Meters in accordance with the GDRSS Phase IV Technical Memoranda 8, or subsequent modifications thereto. The Board shall collect data from its Meters in accordance with the Good Metering Practice specified in the GDRSS Phase IV Technical Memoranda 8, or subsequent modifications thereto. The Board may contract for any such services.
- 3.03 Meter Accuracy. The Board will ensure the accuracy of its Meters. Customer shall have the right to inspect the Meters and check for proper operation, including inspection of records. The Board and the GDRSS Technical Work Group shall review the accuracy of the Meters on a regular basis and compare the findings to the then-best available technology. The parties agree that in the event the accuracy of a Meter is found to be unsatisfactory, as determined by the GDRSS Technical Work Group and approved by the Board, the Board shall repair, rehabilitate or replace the Meter.

Article 4.
Service Area; Acceptance of Flow

4.01 Service Area. The area within the Customer's Service Area for which the Board agrees to provide wastewater Disposal Services shall be as shown in Exhibit B, attached hereto and made a part of this Contract. Customer shall not deliver to the Board any Flow originating in any area outside of the specified Service Area.

CHOOSE ONE SECTION 4.02

Option 1: Directly Metered Customer

Note: Supplementary language may be necessary in the contracts with Oakland County and Macomb County to properly describe the situation with the interceptors, meters and meter pits.

4.02 Acceptance of Flow. The Board will accept Flow from Customer, as limited by the terms of this Contract, at the points of metered connection evidenced on Exhibit B. The points of connection between the wastewater collection system owned, operated and maintained by Customer and the Board's System shall also be shown on Exhibit B. The Board shall have no responsibility for operating and maintaining any portions of the wastewater collection system upstream of the points of connection shown on Exhibit B. (Note: Supplementary language may be inserted here to address exceptions to this sentence.) The Board owns and is responsible for operating and maintaining all parts of its System downstream from Customer's wastewater collection system.

Option 2: Customers Metered By System Meter

4.02 Acceptance of Flow. Due to the configuration of the wastewater collection system owned, operated and maintained by Customer and the Board's System, the Board will accept Flow from Customer, as limited by the terms of this Contract, at any of the system-metered points of connection evidenced on Exhibit B. The points of connection between the wastewater collection system owned, operated and maintained by Customer and the Board's System shall also be shown on Exhibit B. The Board shall have no responsibility for operating and maintaining any portions of the wastewater collection system upstream of the points of connection shown on Exhibit B. (Note: Supplementary language may be inserted here to address exceptions to this sentence.) The Board owns and is responsible for operating and maintaining all parts of its System downstream from Customer's wastewater collection system.

4.03 Change in Service Area. The boundaries of the Service Area may be changed only by the express written agreement of the Board and Customer and shall be embodied in an amendment to this Contract.

Article 5. Flow Measurement

5.01 The GDRSS Technical Work Group shall make all reasonable efforts to use the best available information to establish Customer's estimated (1) sanitary flows, (2) dry

weather infiltration and inflow, (3) wet weather inflow that reaches the WWTP, and (4) wet weather inflow that does not reach the WWTP.

CHOOSE ONE SECTION 5.02

Option 1: Directly Metered Customer

- 5.02 The GDRSS Technical Work Group shall have oversight authority, shall decide on the type of analyses, and shall carry out analyses of Flow from Customer using Meter information and other relevant data. The results of such analyses shall be utilized by the Board, in its sole and reasonable discretion, in its annual cost allocation and rate design processes and shall form the basis of billings for Customer.

Option 2: Customers Metered By System Meter

- 5.02 The GDRSS Technical Work Group shall have oversight authority, shall decide on the type of analyses, and shall carry out analyses to estimate Flow from Customer using the best available information. Customer shall submit to the Board, on a monthly basis, water sales data for its individual wastewater customers. The water sales data, in combination with other best available information, shall be utilized by the Board, in its sole and reasonable discretion, in its annual cost allocation and rate design processes and shall form the basis of billings for Customer.
- 5.03 The Board and Customer agree that the GDRSS Technical Work Group shall have the responsibility for reviewing the information it obtains pursuant to this Article 5 for the purpose of verifying that the information is acceptable from a technical basis. The Board and Customer further agree that the Board shall have the authority for determining how best to utilize the information analyzed by the GDRSS Technical Work Group.

Article 6. Flow Re-Allocation

- 6.01 Flow Re-Allocation. Should Customer terminate or reduce its Flow into the System, that portion of its Maximum Allowable Flow Limit so terminated or reduced shall be re-allocated at the discretion of the Board for the benefit of the System. Flow re-allocation between First Tier Customers may occur only with the prior written approval of the Board.
- 6.02 Responsibility for Debt Service. The Board and Customer agree that should Customer reduce or terminate its Flow into the System, Customer shall remain responsible for any remaining debt service for facilities built to provide Customer its Maximum Allowable Flow Limit. In the event that Customer terminates its participation in the System, Customer shall either (1) pay in full all outstanding debt service costs accumulated to the date of its termination of participation in the System, or (2) enter into a contract guaranteeing monthly payments to the Board of the remaining debt service costs, or (3) assign the responsibility for the remaining debt service costs to the First Tier Customer to whom Customer has re-allocated its Flow (the “RAF Customer”) provided that Customer shall remain ultimately responsible for the remaining debt service costs in the event the RAF Customer fails to timely pay said debt service costs.

Article 7.
Contract Term; Renewal and Termination

CHOOSE ONE ENTIRE OPTION

Option 1: 15 Year Term

- 7.01 Initial Term. Subject to Customer's satisfaction of the repayment of its debt service repayment obligations under Article 6 of this Contract, if any, the term of this Contract shall be for fifteen (15) years from the effective date of this Contract.
- 7.02 Renewal. At the end of ten (10) years, this Contract shall automatically renew for an additional fifteen (15) year term, unless one of the parties provides written notification to the other party in accordance with Article 17 herein stating the reasons such renewal should not occur.
- 7.03 Additional Renewals. At the conclusion of the second term, if any, this Contract shall be renewed on a year-to-year basis without further action of the parties and shall remain in effect until one party gives the other party one (1) year's written notice of its intent to terminate the Contract.

Option 2: 30 Year Term

- 7.01 Initial Term. Subject to Customer's satisfaction of the repayment of its debt service repayment obligations under Article 6 of this Contract, if any, the term of this Contract shall be for thirty (30) years from the effective date of this Contract.
- 7.02 Renewal. At the end of twenty (20) years, this Contract shall automatically renew for an additional thirty (30) year term, unless one of the parties provides written notification to the other party in accordance with Article 17 herein stating the reasons such renewal should not occur.
- 7.03 Additional Renewals. At the conclusion of the second term, if any, this Contract shall be renewed on a year-to-year basis without further action of the parties and shall remain in effect until one party gives the other party one (1) year's written notice of its intent to terminate the Contract.

Article 8. Construction Standards

- 8.01 Customer agrees to abide by the design specifications and construction standards as adopted by the Board. DWSD shall form a Design Standards Committee. The Design Standards Committee shall create a set of design standards and shall make a recommendation to the Board regarding adoption of the design standards. Customer agrees that plans and specifications for new wastewater collection or transport facilities shall be submitted for review and approval to DWSD prior to the installation of such facilities. DWSD will review the plans and specifications and provide Customer with a determination as to its approval or disapproval of the plans and specifications. If Customer does not agree with the outcome of the DWSD review, Customer may request

a review by the Design Standards Committee. The Design Standards Committee will be governed by the guidelines described in Exhibit C, attached hereto.

Article 9. Dispute Resolution

- 9.01 The Board and Customer agree that any and all claims alleging a breach of this Contract, other than claims requiring immediate relief to prevent irreparable harm to a party, public health or the environment, may first be submitted to an alternative dispute resolution process. Such an alternative dispute resolution process may include, but is not limited to, facilitation, binding arbitration, or non-binding arbitration. The parties shall agree upon the form and procedures for the agreed upon alternative dispute resolution process. If the matter is not resolved through an alternative dispute resolution process, or if the parties cannot agree upon the form and procedures for the alternative dispute resolution process, the parties may seek legal recourse in a court of competent jurisdiction. For claims requiring immediate relief to prevent irreparable harm, either party may seek relief directly from a court of competent jurisdiction without submitting the matter to the alternative dispute resolution process.

Article 10. Timely Payment

- 10.01 Bills for wastewater disposal service shall be rendered to Customer on a monthly basis. All such bills shall be due and payable not more than thirty (30) days from the date shown on the bill. Any portion of the charges that is not paid by the due date shall be subject to a finance charge at a rate of 1.5% per month for each month that they remain unpaid. Any portion of the total bill, plus any finance charges applied to the bill which are not paid by the next billing date, shall be shown on the next bill as arrears. If the accuracy of a bill is in dispute, Customer shall place the disputed amount in an escrow account pending resolution of the dispute. Accrued interest on the escrow account shall belong to the party that prevails in the resolution of the dispute.

Article 11. Emergency Situations

- 11.01 No failure or delay in performance of this Contract, by either party, shall be deemed to be a breach thereof when such failure or delay is caused by a force majeure event, including but not limited to, any Act of God, strikes, lockouts, wars, acts of terrorism, riots, epidemics, explosions, sabotage, breakage or accident to machinery or lines of pipe, the binding order of any court or governmental authority, or any other cause, whether of the kind herein enumerated or otherwise, not within the control of a party.

Article 12. Default Provisions

- 12.01 In the event either party commits a material breach of this Contract, the party alleging the breach shall give written notice of the breach to the other party within a reasonable time of discovering the breach. The party in breach shall be given a reasonable time to cure the breach. If the party in breach fails to cure the breach, the non-breaching party may declare this Contract in default and pursue all available legal remedies, including termination of this Contract for cause.

Article 13. Assignment

13.01 Neither this Contract nor any part of it shall be assigned by either party without the prior written consent of the other party. Consent to an assignment by either party shall not be unreasonably withheld.

Article 14. Governance-Decision Making

14.01 The Board and Customer acknowledge and agree that the Sewer Steering Committee is formed to facilitate a cooperative working partnership between the DWSD and its First Tier Customers and is based on the free flow of information regarding financial and operational functions.

Article 15. Amendment

15.01 The parties may from time to time consider it in their best interests to change, modify or extend a term, condition or covenant of this Contract. Any such change, addition, deletion, extension or modification, which is mutually agreed upon by the Board and Customer shall be incorporated in written amendments to this Contract. Such amendments shall not invalidate this Contract nor relieve or release either party of any of its respective obligations under this Contract unless so stated in the amendment.

15.02 No amendment to this Contract shall be effective and binding upon the parties unless it expressly makes reference to this Contract, is in writing, is signed and acknowledged by duly authorized representatives of both parties, and is approved by the City Council and other appropriate City agencies.

Article 16. Notices

16.01 Except as otherwise specified herein, all notices, consents, approvals, requests and other communications (collectively, "Notices") required or permitted under this Contract shall be given in writing and mailed by first class mail, addressed as follows:

If to the Board:

Director
Detroit Water and Sewerage Department
735 Randolph
Detroit, Michigan 48226

If to the Customer:

Title _____
Address _____

- 16.02 All Notices shall be deemed given on the day of post-marked mailing. Any Notice given by a party hereunder must be signed by an authorized representative of such party.
- 16.03 Notwithstanding the requirement above as to the use of first-class mail, change of address notices, termination notices, and other Notices of a legal nature, shall be sent by certified first-class mail, postage prepaid, return receipt requested.

Article 17. Industrial Waste Control Program

- 17.01 Customer agrees to abide by the requirements of the Industrial Waste Control Program as set forth in Exhibit D to this Contract.

Article 18. Rights-of-Way

- 18.01 The Customer shall assist the Board to obtain permission to use streets, highways, alleys, and/or easements in the local governmental units within the Customer's jurisdiction for the purpose of constructing, maintaining, and operating wastewater disposal facilities to adequately service the Customer's jurisdiction and other areas. This assistance shall include obtaining the consent of the local governmental units, as provided in Article 7, Section 29, Michigan Constitution of 1963. In the event of such construction, the Board shall request the Customer and local governmental units within the Customer's jurisdiction to execute such separate instruments granting rights-of-way in its streets, highways, and alleys as may be reasonably required by the Board. The Board shall restore all existing structures and/or improvements lying in the right-of-way of construction to as good a condition as before the construction took place. Any such facilities constructed, maintained and operated under this section shall remain the property of the Board and shall not be operated or maintained by any entity other than the Board or its authorized representatives.

Article 19. Miscellaneous

- 19.01 If any provision of this Contract or its application to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Contract shall not be affected and shall remain valid and enforceable to the fullest extent permitted by law.
- 19.02 This Contract contains the entire agreement between the parties and all prior negotiations and agreements are merged into this Contract. Neither party has made any representations except those expressly set forth in this Contract, and no rights or remedies are, or shall be, acquired by either party by implication or otherwise unless expressly set forth in this Contract.
- 19.03 Unless the context otherwise expressly requires, the words "herein," "hereof," and "hereunder," and other words of similar import, refer to this Contract as a whole and not to any particular section or subdivision.
- 19.04 The headings of the sections of this Contract are for convenience only and shall not be used to construe or interpret the scope or intent of this Contract or in any way affect the same.

- 19.05 The rights and remedies set forth in this Contract are not exclusive and are in addition to any of the rights or remedies provided by law or equity. This Contract and all actions arising under it shall be governed by, subject to, and construed according to the law of the State of Michigan. Each party agrees, consents and submits to the exclusive personal jurisdiction of any state or federal court of competent jurisdiction in Wayne County, Michigan, for any action arising out of this Contract. Each party also agrees that it shall not commence any action against the other party because of any matter whatsoever arising out of or relating to the validity, construction, interpretation and enforcement of this Contract in any state or federal court of competent jurisdiction other than one in Wayne County, Michigan.
- 19.06 The Customer covenants that it is not, and shall not become, in arrears to the City upon any contract, debt, or other obligation to the City.
- 19.07 This Contract may be executed in any number of originals, any one of which shall be deemed an accurate representation of this Contract. Promptly after the execution of this Contract, the Board shall provide a copy to the Customer.
- 19.08 The rights and benefits under this Contract shall inure to the benefit of and be binding upon the respective parties hereto, their agents, successors, and assigns.
- 19.09 Any and all documents, memoranda, reports, exhibits or other written material referred to in this Contract are and shall be incorporated by reference herein.
- 19.10 This Contract shall not become effective until the Contract has been adopted and executed by Customer and the Board, the Contract has been authorized by resolution of the City Council, and the Contract has been signed by the City's Purchasing Director.

* * * *

In Witness Whereof, the Board and Customer, by and through their duly authorized officers and representatives, have executed this Contract.

Witnesses:

1. _____
(signature)

2. _____
(signature)

Witnesses:

1. _____
(signature)

2. _____
(signature)

City of _____ :

By: _____
(signature)

(print name)

Its: _____
(title)

**City of Detroit,
Board of Water Commissioners:**

By: _____
(signature)

(print name)

Its: _____
(title)

THIS CONTRACT WAS APPROVED
BY THE CITY COUNCIL ON

Date

APPROVED BY LAW DEPARTMENT
PURSUANT TO SECTION 6-406 OF THE
CHARTER OF THE CITY OF DETROIT

Purchasing Director Date

Corporation Counsel Date

**THIS CONTRACT IS NOT VALID OR AUTHORIZED UNTIL APPROVED BY
RESOLUTION OF THE CITY COUNCIL AND SIGNED BY THE PURCHASING
DIRECTOR.**

EXHIBIT A
Meters Serving Customer's Service Area

* * * *

EXHIBIT B
Customer's Service Area

Note: This Exhibit will be a map showing corporate limits, Service Area of Customer, the agreed upon sewer service area within the corporate limits of Customer, points of metered or non-metered connection, specific location of points of connection shown, and Customer's Maximum Allowable Flow Limit.

* * * *

EXHIBIT C
DWSD Design Standards Committee

Name. The name of this committee is the Detroit Water and Sewerage Department Design Standards Committee (hereinafter, the “Committee”).

Purpose/General Responsibilities. The Committee is formed to discuss and make recommendations to the Board, or its designee, on the appropriate specifications and standards which shall govern the design, use of material, and construction of wastewater collection and transport facilities which may, from time to time, be constructed by a First Tier Customer for the purpose of collecting and transporting wastewater to the Board’s System. To effectuate this purpose, First Tier Customers may request a review of construction plans and specification by the Committee. In such a case, the Committee shall make the requested review and shall make its recommendations thereon to the Board or its designee.

Membership. The entities comprising the Committee shall consist of one (1) representative from the DWSD and one (1) representative from each First Tier Customer. The DWSD member shall also serve as Chairperson of the Committee.

Meetings. Committee meetings shall be held as follows:

(a) Meetings and Notice Thereof. The Committee shall meet at an agreed upon date and time. The time and place of such meeting shall be fixed by the Chairperson. Meetings shall be held as may be necessary and at such times and places as shall be determined by the Committee.

(b) Meeting Quorum. A majority of all the members present shall constitute a quorum.

(c) Recordkeeping. The Committee shall keep a journal of its proceedings which shall include a record of each vote and each recommendation made to the Board, or its designee, by the Committee.

(d) Voting. The Committee shall act by motion. Passage of any measure shall require a simple majority affirmative vote of the quorum present. Deliberation and consideration are required prior to any vote. Each member shall be entitled to one (1) vote adhering to the principle of “one person, one vote”.

(e) Committee Recommendation. All Committee recommendations shall be transmitted to the Board, or its designee, for consideration and final determination.

Dissolution. The Committee shall continue in existence until dissolved by action of the Committee membership.

Effective Date. The Committee shall become effective upon the approval and adoption by DWSD and its First Tier Customers.

Appeals Procedure. Any First Tier Customer who is aggrieved by a decision of the Board, or its designee, relating to a determination based upon a Committee recommendation may appeal to the Director of the DWSD for possible relief of that grievance. Any such appeal shall be made in writing. The determination of the Director of the DWSD shall be final.

* * * *

EXHIBIT D
Industrial Waste Control Program

- I. The Customer agrees that it shall adopt and enforce, and shall cause each of the local governmental units within its jurisdiction for sewage treatment and disposal service as provided by the Board to adopt and enforce, rules and regulations to implement and maintain a revenue system whereby, as a minimum, the operation, maintenance and replacement portion of the Board's rates are distributed proportionately to each user or user class that is tributary to the Board's treatment works. In particular, these rules and regulations shall provide that surcharges established by the Board for the recovery of incremental operation, maintenance and replacement costs of treating extraordinary concentrations of sewage, shall be billed to and collected from individual firms as identified by the Board in its billings. These rules and regulations shall conform to Section 204 (b) (1) (A) of Public Law 92-500, as amended, and regulations of the United States Environmental Protection Agency (hereinafter referred to as the U.S. EPA), being 40 CFR 35.929 through 35.929-3, and shall achieve a proportionate User Charge System which is effective throughout the Board's service area. The rules and regulations shall provide for monitoring of commercial, governmental and industrial users and shall be consistent with the monitoring rules and regulations of the City of Detroit. The Board shall have the right under said rules and regulations to audit all monitoring activities including the right to perform monitoring tests itself to verify the accuracy of monitoring results.

- II. The Customer agrees that it shall adopt and enforce, and shall cause each of the local governmental units within its jurisdiction for sewage treatment and disposal service as provided by the Board to adopt and enforce, rules and regulations pertaining to the use, design and construction of sewers, and the discharge of industrial or commercial wastes into sewers, where such sewers are tributary to the Board's treatment works. Such rules and regulations shall be consistent with and at least as stringent as all applicable provisions of the pertinent ordinances adopted by the City of Detroit, these being the 1979 amendments to Chapter 56, Article 1, and Chapter 56, Article 6, of the Municipal Code of the City of Detroit as they may be adopted and amended from time to time. In the event any municipality or other governmental unit shall fail to adopt an ordinance as required herein, or shall fail to diligently enforce the same, the Board shall take appropriate action which may include suit in an appropriate court of general jurisdiction alleging such municipality's failure to adopt or enforce an ordinance, and following a hearing on the merits, should the court find that the allegations in the Board's petition are true, it is agreed that such court may, in such instance, grant appropriate injunctive relief against said municipality or any individual discharger there; terminate the municipality's contractual right to discharge waste waters into the Board's system and/or to grant the Board such other relief as may be appropriate under the circumstances. These actions shall enable the Board to:
 - A. Deny or condition new or increased contributions of pollutants or changes in the nature of pollutants, to the waste collection system by Industrial and Commercial Users. The terms "Industrial and Commercial" user shall mean those users defined in Section 56-6-3(H) and (P) of Detroit Ordinance No. 353-H of Chapter

56 of Article 6 passed on November 7, 1979 and as may be amended from time to time.

- B. Require compliance with applicable current and future national Pretreatment Standards and other more restrictive requirements as may be imposed by the Board promulgated by the U.S. EPA under the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq.
- C. Control, through permit, contract order, or similar means, the contribution to the waste collection system by Industrial and Commercial Users to ensure compliance with paragraph B above.
- D. Require the development of compliance schedules by Industrial and Commercial Users for the installation and facilities required to meet applicable National Pretreatment Standards and other more restrictive requirements as may be imposed by the Board.
- E. Require the submission of notices and self-monitoring reports from Industrial and Commercial Users to assess and assure compliance with National Pretreatment Standards and other more restrictive requirements as may be imposed by the Board.
- F. Carry out all inspection, surveillance and monitoring procedures necessary to determine, independent of information supplied by Industrial and Commercial Users, compliance or noncompliance with applicable National Pretreatment Standards and other more restrictive requirements as may be imposed by the Board. It being further understood that the Board may contract with qualified parties to carry out the inspection, surveillance and monitoring procedures of this paragraph.
- G. Seek injunctive relief for noncompliance with National Pretreatment Standards and other more restrictive requirements as may be imposed by the Board.
- H. Require Industrial and Commercial Users to install containment facilities to protect the treatment works from accidental spills of critical or hazardous materials.

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