



Dave Yost • Auditor of State

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Dave Yost • Auditor of State

To the management, and stakeholders of the Metropolitan Sewer District of Greater Cincinnati,

The Auditor of State's Ohio Performance Team conducted a performance audit of the Metropolitan Sewer District of Greater Cincinnati (MSDGC) to provide an independent assessment of operations. Functional areas selected for operational review were identified with input from MSDGC management and were selected due to strategic and financial importance. Where warranted, and supported by detailed analysis, this performance audit report contains recommendations to enhance the MSDGC's overall efficiency and effectiveness. This report has been provided to MSDGC and its contents have been discussed with the appropriate elected officials and management.

MSDGC has been encouraged to use the management information and recommendations contained in the performance audit report. However, it is also encouraged to perform its own assessment of operations and develop alternative management strategies independent of the performance audit report. The Auditor of State has developed additional resources to help Ohio governments share ideas and practical approaches to improve accountability, efficiency, and effectiveness.

SkinnyOhio.org: This website, accessible at <http://www.skinnyohio.org/>, is a resource for smarter streamlined government. Included are links to previous performance audit reports, information on leading practice approaches, news on recent shared services examples, the Shared Services Idea Center, and other useful resources such as the Local Government Toolkit. The Shared Services Idea Center is a searchable database that allows users to quickly sort through shared services examples across the State. The Local Government Toolkit provides templates, checklists, sample agreements, and other resources that will help local governments more efficiently develop and implement their own strategies to achieve more accountable, efficient, and effective government.

This performance audit report can be accessed online through the Auditor of State's website at <http://www.ohioauditor.gov> and choosing the "Search" option.

Sincerely,

A handwritten signature in black ink that reads "Dave Yost". The signature is written in a cursive, flowing style.

Dave Yost
Auditor of State
February 28, 2017

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Executive Summary

Purpose and Scope of the Audit

On February 4, 2016, the Auditor of State's (AOS) Public Integrity Assurance Team initiated a special audit of the Metropolitan Sewer District of Greater Cincinnati (MSDGC) in order to conduct a limited scope examination of various financial records and other information. At that time, AOS simultaneously initiated a performance audit, conducted by the Ohio Performance Team (OPT), of MSDGC designed to provide an objective assessment of the economy, efficiency, and/or effectiveness of select operations and management.

The following scope areas were selected for detailed review and analysis in consultation with MSDGC, including governance structure, staffing, contracted and professional services, payroll systems, and billing services. See **Appendix D: Scope and Objectives** for detailed objectives developed to assess operations and management in each scope area.

Performance Audit Overview

The United States Government Accountability Office develops and promulgates Government Auditing Standards that provide a framework for performing high-quality audit work with competence, integrity, objectivity, and independence to provide accountability and to help improve government operations and services. These standards are commonly referred to as generally accepted government auditing standards (GAGAS).

OPT conducted this performance audit in accordance with GAGAS. These standards require that OPT plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for findings and conclusions based on the audit objectives. OPT believes that the evidence obtained provides a reasonable basis for our findings and conclusions based on the audit objectives.

This performance audit provides objective analysis to assist management and those charged with governance and oversight to improve program performance and operations, reduce costs, facilitate decision making by parties with responsibility to oversee or initiate corrective action, and contribute to public accountability.

Audit Methodology

To complete this performance audit, auditors gathered data, conducted interviews with numerous individuals associated with the various divisions internally and externally, and reviewed and assessed available information. Assessments were performed using criteria from a number of sources including; peer comparison, industry standards, leading practices, statutory authority, and applicable policies and procedures.

In consultation with MSDGC, the following Ohio sewer operations were identified as peers: the City of Columbus, Division of Sewerage & Drainage (Franklin County) and the Northeast Ohio Regional Sewer District (Cuyahoga County).¹ Where reasonable and appropriate these peers were used for comparison. However, in some operational areas industry standards or leading practices were used for primary comparison. Sources of industry standards or leading practices used in this audit include: the Bureau of Labor Statistics (BLS); DiCicco, Gulman, & Company, LLP; MetricNet; the MITRE Corporation; the Ohio Department of Administrative Services (DAS); and the Ohio Department of Transportation (ODOT).

The performance audit involved information sharing with MSDGC, including drafts of findings and recommendations related to the identified audit areas. Periodic status meetings throughout the engagement informed MSDGC of key issues impacting selected areas, and shared proposed recommendations to improve operations. MSDGC provided verbal and written comments in response to various recommendations, which were taken into consideration during the reporting process.

AOS and OPT express their appreciation to the elected officials, management, and employees of the Metropolitan Sewer District of Greater Cincinnati for their cooperation and assistance throughout this audit.

Noteworthy Accomplishments

Noteworthy accomplishments acknowledge significant accomplishments or exemplary practices. The following summarizes a noteworthy accomplishment identified during the course of this audit.

- **Contracted Services:** MSDGC completed a detailed review of supplemental (contracted) staff to determine the feasibility of bringing these positions in house. This review resulted in a plan to shift of 34 of the 46 positions from contract to in-house as well as the elimination of two additional positions. For the 34 shifted positions, MSDGC has established City positions at competitive salaries relative to the contracted salaries. However, under the contracts, the positions had an average multiplier² of 2.46 attached to the hourly rate. MSDGC is able to house these positions at a lower total cost of compensation because the City's benefits ratio is estimated at 43.79 percent (essentially a multiplier of 1.44). Once filled, these positions are projected to result in a decrease of approximately \$2.2 million in operating expenditures and an additional decrease of \$1.2 million in capital improvement program (CIP) expenditures.

¹ Although the Northeast Ohio Regional Sewer District is headquartered in Cuyahoga County, its service area includes parts of Lake, Lorain, and Summit counties.

² It is standard practice for professional services contracts to contain multipliers which compensate the contracted firm for expenses beyond just the rate of labor such as travel, health insurance, and other fringe benefits.

Summary of Recommendations

The following table summarizes performance audit recommendations and financial implications, where applicable.

Summary of Recommendations

Recommendations	Savings
R.1 Develop monitoring operating parameters, goals, and performance measurements	N/A
R.2 Reduce 16.0 Computer-Networking Infrastructure	\$1,557,300
R.3 Outsource customer service dispatch operations	\$237,100
R.4 Increase the capital labor utilization rate	N/A
R.5 Reduce overtime to Bureau of Labor Statistics benchmarks	\$74,200
R.6 Reduce paid leave to Bureau of Labor Statistics benchmarks	N/A
R.7 Right-size the passenger vehicle fleet ¹	\$67,900
R.8 Standardize the payroll process with an integrated system	N/A
Total Cost Savings from Performance Audit Recommendations	\$1,936,500

¹ Includes a one-time revenue enhancement of \$20,000.

Background

Governance

The Metropolitan Sewer District of Greater Cincinnati (MSDGC) was formed in 1968 as a county sewer district pursuant to Ohio Revised Code (ORC) § 6117. Prior to 1968, the City of Cincinnati (the City) operated an independent municipal sewer district that served its residents and 23 area communities. On April 10, 1968, City Ordinances 144-1968, 145-1968, and 146-168 were passed which established a 50-year agreement (the Agreement) between the City and Hamilton County (the County). As set forth in the Agreement, the City is responsible for the management and operation of MSDGC, while the Board of County Commissioners of Hamilton County (the Board) retains the authority to establish sewer service charges, adopt rules and regulations, and approve operating and capital improvement program (CIP) budgets. This agreement expires April 30, 2018. Subsequent to the Agreement, several amendments have been made which have altered the authority of MSDGC, the City, and the County.

For accounting purposes, MSDGC is set up as an enterprise fund³ managed and operated by the City. As a result, the financial statements of MSDGC report information using accounting methods similar to those used by private-sector companies. MSDGC separates its budget into two distinct parts; operating and Capital Improvement Program (CIP). Operating revenues are those revenues generated from customer fees for the treatment of sewerage; the primary activity of MSDGC. CIP revenues are those that arise from outside contributions of capital assets or outside contributions of resources and are restricted to covering capital costs. Operating revenues, accounted for using the Operating Fund, are not restricted and can be used to cover operating as well as debt service costs. CIP revenues, accounted for using the Capital Projects Fund, are restricted to capital acquisition and construction expenditures. Due to the two separate funds, MSDGC is required to annually submit, and gain approval of two separate budgets from the Board. For 2016, MSDGC's operating budget was approved at approximately \$238.0 million; 50.0 percent of which was allocated for daily operating costs such as personnel and non-personnel costs, including expert services, utilities, and supplies, with the remaining 50.0 percent allocated for debt service. The CIP budget was approved at approximately \$300.7 million for 2016 with a majority of the expenditures (i.e. 73.1 percent) designated for required capital projects.

³ Enterprise funds are used to account for governmental goods or services that charge fees intended to make the entity or function self-supporting.

Consent Decrees

33 United States Code (USC) § 1251, establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Enacted in 1948 as the Federal Water Pollution Control Act, it was significantly reorganized and expanded in 1972. Subsequent to this reorganization, the Clean Water Act (CWA) became its common name.

Starting in the 1980s, the US EPA, through the CWA, started requiring the elimination of sanitary sewer overflows⁴ (SSOs) and reductions in discharges from combined sewer overflows (CSOs).⁵ In 1992, MSDGC established a program designed to begin identifying and remediating SSOs through inflow and infiltration reduction and the rehabilitation and construction of sewers.

In February 2002, the City and the County entered into the *Interim Partial Consent Decree on Sanitary Sewer Overflows* with the US EPA. This represented a settlement of alleged violations of the CWA brought by the US EPA in the US District Court of Southern Ohio, Western Division. Specifically, the violations alleged that MSDGC still had SSOs within its system. Among the issues agreed upon in the *Interim Partial Consent Decree* were the continuance of work already begun by MSDGC to address certain SSOs through the implementation of capital improvement projects which had already been planned, the implementation and permanent remedial measures at SSO 700,⁶ and the evaluation of the sewer system in order to allow for the development and proposal of a comprehensive SSO elimination program. Included in this decree was the identification of 17 SSO projects to be completed.

In June 2004, the City and County entered into the *Global Consent Decree* with the US Department of Justice, the US EPA, the Ohio EPA, and the Ohio River Valley Water Sanitation Commission (ORANSCO) the purpose of which was to address the reduction of CSOs through the creation of a long term control plan (LTCP) and the Water in Basement⁷ (WIB) Program. In addition, the continuance of the SSO correction plan established in the *Interim Partial Consent Decree* and capacity related issues at certain wastewater treatment plants was included. This decree identified 23 CSO projects required to be completed.

⁴ The US EPA defines an SSO as a condition where raw sewage can spill into basements or out of manholes and onto city streets, playgrounds, and into streams, before it can reach a treatment facility. The US EPA has found that SSOs caused by poor sewer collection system management pose a substantial health and environmental challenge.

⁵ According to the US EPA, a combined sewer system (CSS) collects rainwater runoff, domestic sewage, and industrial wastewater into one pipe. Under normal conditions, it transports all of the wastewater it collects to a sewage treatment plant for treatment and eventual discharge. When the volume of wastewater exceeds the capacity of the CSS or treatment plant (e.g., during heavy rainfall or snowmelt) a CSO occurs. CSOs result in untreated water discharging directly without proper treatment. CSOs may contain untreated or partially treated human and industrial waste, toxic materials, and debris as well as stormwater.

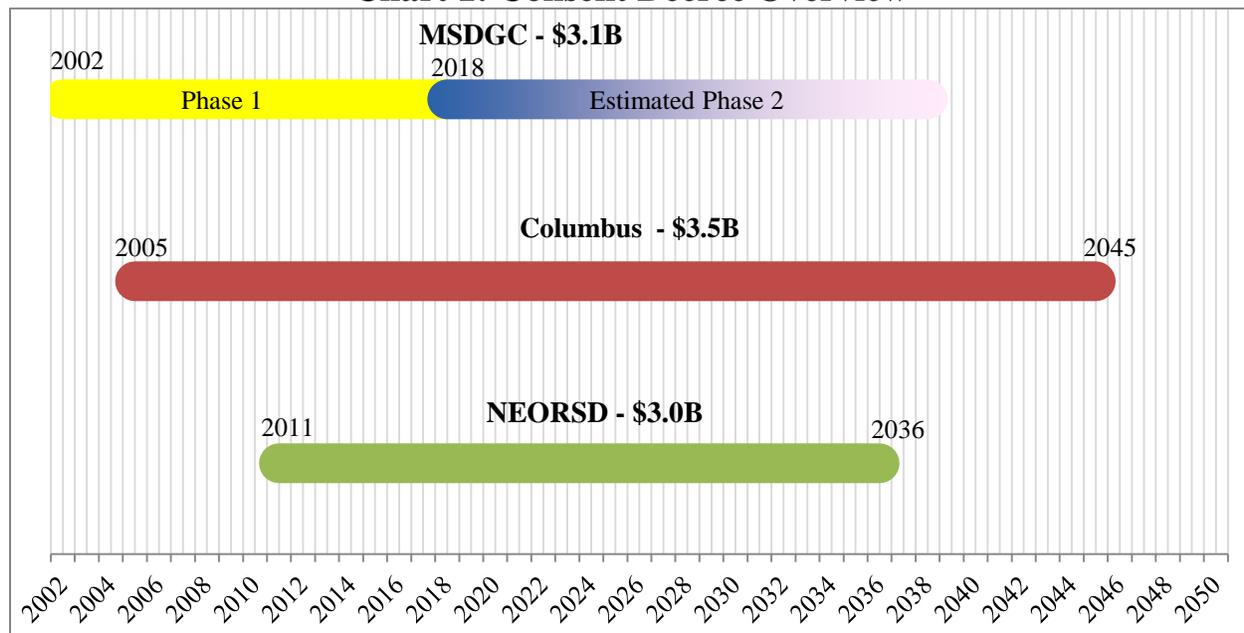
⁶ SSO 700 is MSDGC's largest SSO covering 35 square miles, or 12 percent, of MSDGC's service area and is comprised of all or parts of 16 local communities. Due to its size and impact on the overall system, MSDGC submitted a revised final remedy that includes an Integrated Watershed Action Plan (IWAP) and reliability improvements specifically detailed for this SSO.

⁷ WIB refers to residential basement flooding caused by sewer system backups.

In January 2010, the *Final Wet Weather Improvement Program* (WWIP) was approved by the US EPA, the Ohio EPA, and ORANSCO. The WWIP fulfills the consent decree requirements associated with the LTCP and the Capacity Assurance Program Plan (to determine capacity limits and plan for future needs) and incorporates the remaining work of both the Interim Partial and Global Consent decrees into a final schedule. The WWIP is being conducted in two phases: Phase 1 (i.e., 2009 through 2018) and Phase 2 (i.e., estimated to begin in 2018). Phase 1, including the Lower Mill Creek Partial Remedy,⁸ had completed 98 of 114 projects through October 2016. In total, costs associated with the completion of both phases of the Final WWIP are expected to be approximately \$3.1 billion.

Similar to MSDGC, the City of Columbus (Columbus) and the Northeast Ohio Regional Sewer District (NEORS) also have entered into consent decrees to mitigate CSOs. **Chart 1** shows the estimated cost and timeline for each entity. This provides a high level view of the magnitude of these decrees on a time and cost basis.

Chart 1: Consent Decree Overview



Source: MSDGC, Columbus, and NEORS

Note: MSDGC and NEORS have entered into federal consent decrees while Columbus entered into a consent decree with the Ohio EPA.

As shown in **Chart 1**, all three entities have entered into consent decrees of similar cost with Columbus having the largest estimated cost of \$3.5 billion.⁹ In respect to time, MSDGC's plan was negotiated to occur in two phases. Substantial completion of Phase 1 is required by year-end 2018, at an estimated cost of \$1.5 billion. Scheduling for Phase 2 is required to begin in 2017

⁸ The Lower Mill Creek Partial Remedy modifies the initial plan that involved the construction of a deep, large and expensive underground storage tunnel to a more cost effective plan to separate sewage from stormwater and daylight the stormwater runoff, thus creating recreational and green spaces and enhancing the quality of life for impacted communities.

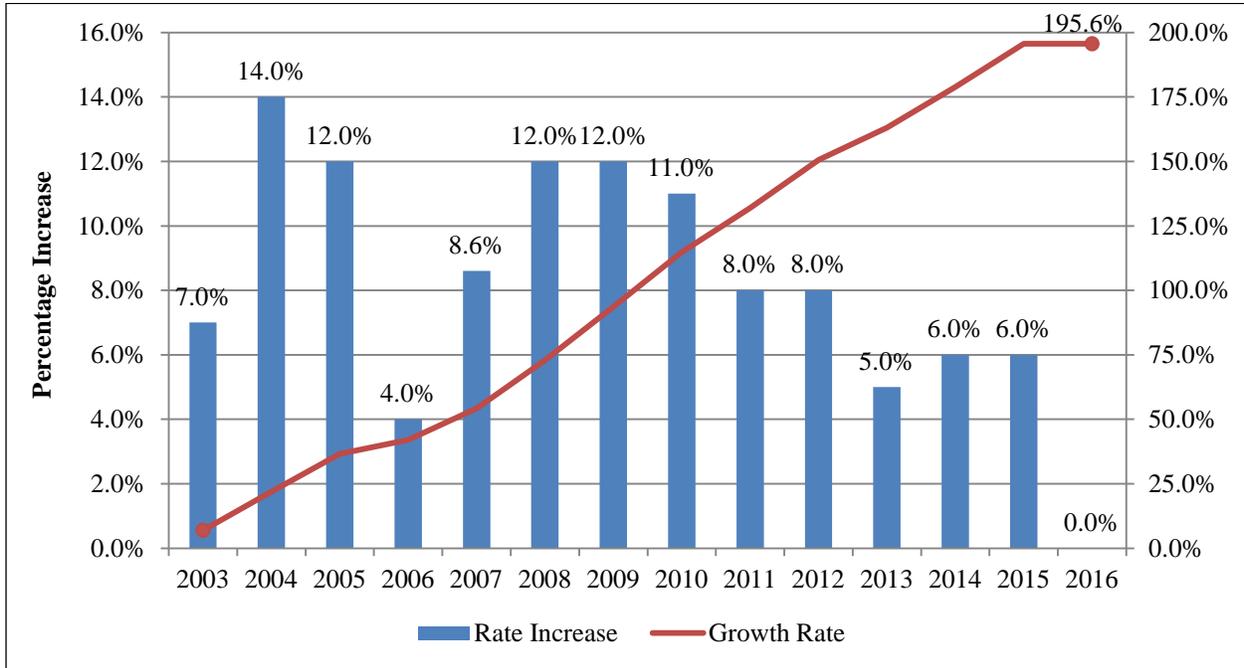
⁹ Each consent decree represents a unique settlement between the entity and regulatory body(s). Therefore, the agreed upon timeline and costs vary between consent decrees.

with an estimated cost of \$1.6 billion. The estimated completion date for Phase 2 is undetermined but “shall be expeditious as practicable” based on such factors as rate affordability; MSDGC’s financing in the tax exempt market; local and national experience with the time, cost, economics, and practicability of CSO/SSO program implementation; availability of stimulus money; and technical feasibility.

MSDGC Rates and Peer Comparison

Beginning in 2003, for the purpose of funding the estimated \$3.1 billion final WWIP projects cost in addition to maintaining operations, MSDGC cited the need to annually increase service rates. **Chart 2** shows MSDGC’s annual rate increases since 2003 as well as the cumulative growth rate. This provides a high level indication of the magnitude of rate increases imposed over that time period.

Chart 2: Historical Rate Increases

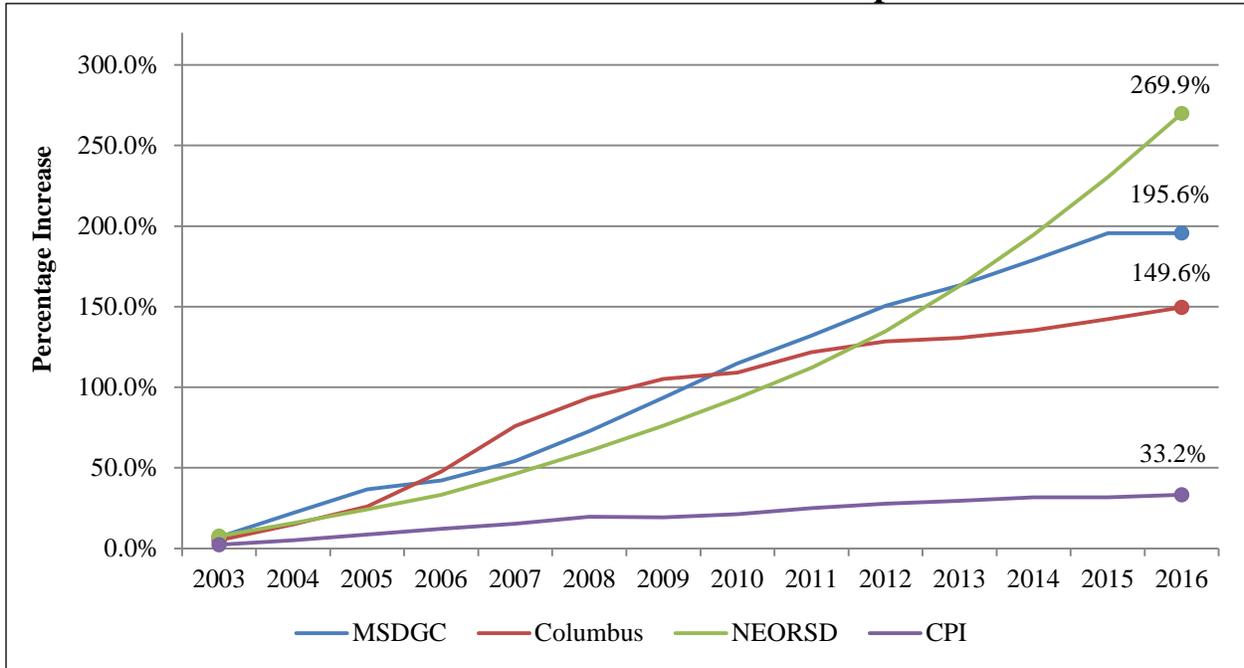


Source: MSDGC

As shown in **Chart 2**, with the exception of 2016, MSDGC has increased rates every year since 2003. It is important to note that the larger rate increases are concentrated in the front half of the period shown with increases exceeding 11.0 percent or higher in five of the first eight years. Although annual rate increases were lower towards the later years of the period examined, rate increases have resulted in a cumulative growth rate of 195.6 percent.

Chart 3 shows how this growth in rates compares to Columbus and NEORSD for the same time period. In addition, the consumer price index¹⁰ (CPI) is included to show how rate increases have fared compared to the rate of inflation. This analysis serves to show how MSDGC’s rate changes have compared to similar entities in Ohio.

Chart 3: Historical Rate Increase Comparison



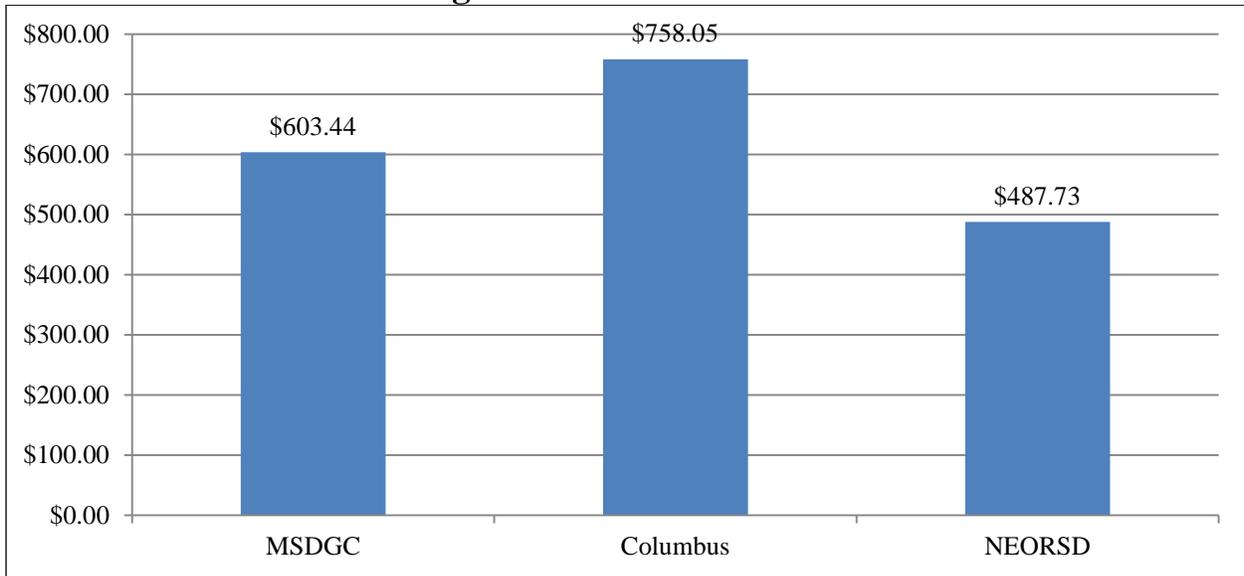
Source: MSDGC, Columbus, NEORSD, and the Bureau of Labor Statistics (BLS)

As shown in **Chart 3**, MSDGC’s rates grew at almost six times the rate of inflation. In relation to the peers, MSDGC’s rate increases since 2003, although significant, were in between Columbus and NEORSD. In examining rate growth in comparison to these two peers, it is important to also take into consideration consent decree data shown in **Chart 1**. Although MSDGC has had significant growth in its rates since 2003, it is nearing completion of Phase 1 and nearing the scheduling period for Phase 2 which is contingent on rate levels and rate payer affordability.

¹⁰ The Bureau of Labor Statistics tracks and produces monthly data on changes in the prices paid by urban consumers for a representative basket of goods and services. This data is published as the consumer price index (CPI) and is used to track the rate of inflation.

While it is important to examine the historical increase in rates, actual rate levels must also be examined as they are ultimately what determine user charges. The County establishes MSDGC user rates assuming average customer usage as 25 hundred cubic feet (CCF).¹¹ Using this usage rate, the County projected an annual customer cost of service of \$845.64 for 2016. According to MSDGC, however, the actual average customer usage for 2016 was 14.7 CCF. **Chart 4** shows a comparison of the charge of this average usage level for 2016 for MSDGC customers compared to the same usage level for a Columbus and NEORS D customer. Examining the average customer charge provides context for the actual cost of service for similar usage.

Chart 4: Average Annual Customer Cost for Service



Source: MSDGC, Columbus, and NEORS D

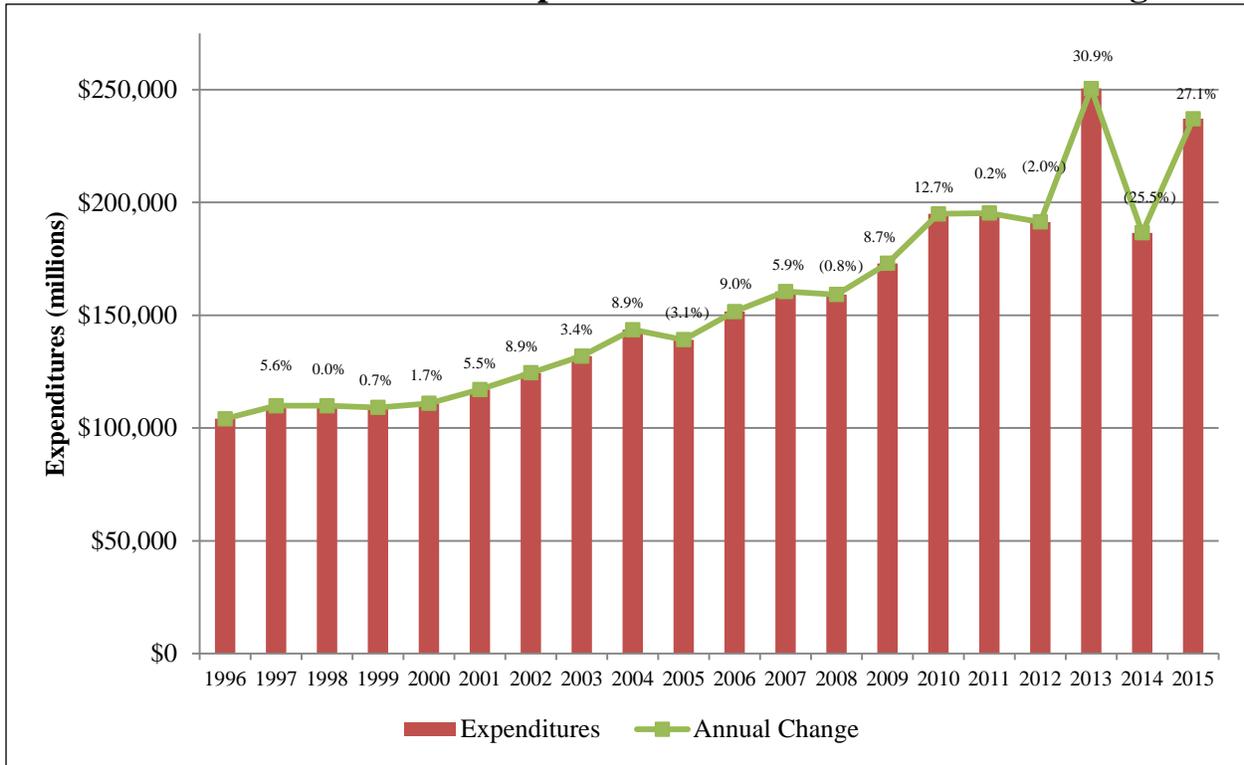
As shown in **Chart 4**, the average charge for service in 2016 was higher at MSDGC than charges for the same usage level at NEORS D lower than Columbus. Specifically, MSDGC was \$154.61, or 20.4 percent, lower than Columbus and \$115.71, or 23.7 percent, higher than NEORS D. It should be noted that that MSDGC’s annual customer cost is still higher than NEORS D, despite NEORS D having a growth rate 74.3 percentage points higher than MSDGC.

¹¹ CCF is an industry accepted measure of utility usage.

Financial Analysis

Chart 5 shows MSDGC’s total expenditures from 1996 through 2015. Examining this data serves to provide insight on the growth of the organization as a result of capital outlays required by the consent decree first settled in 2002 and finalized in 2010.

Chart 5: Historical Total Expenditures and Annual Percent Change

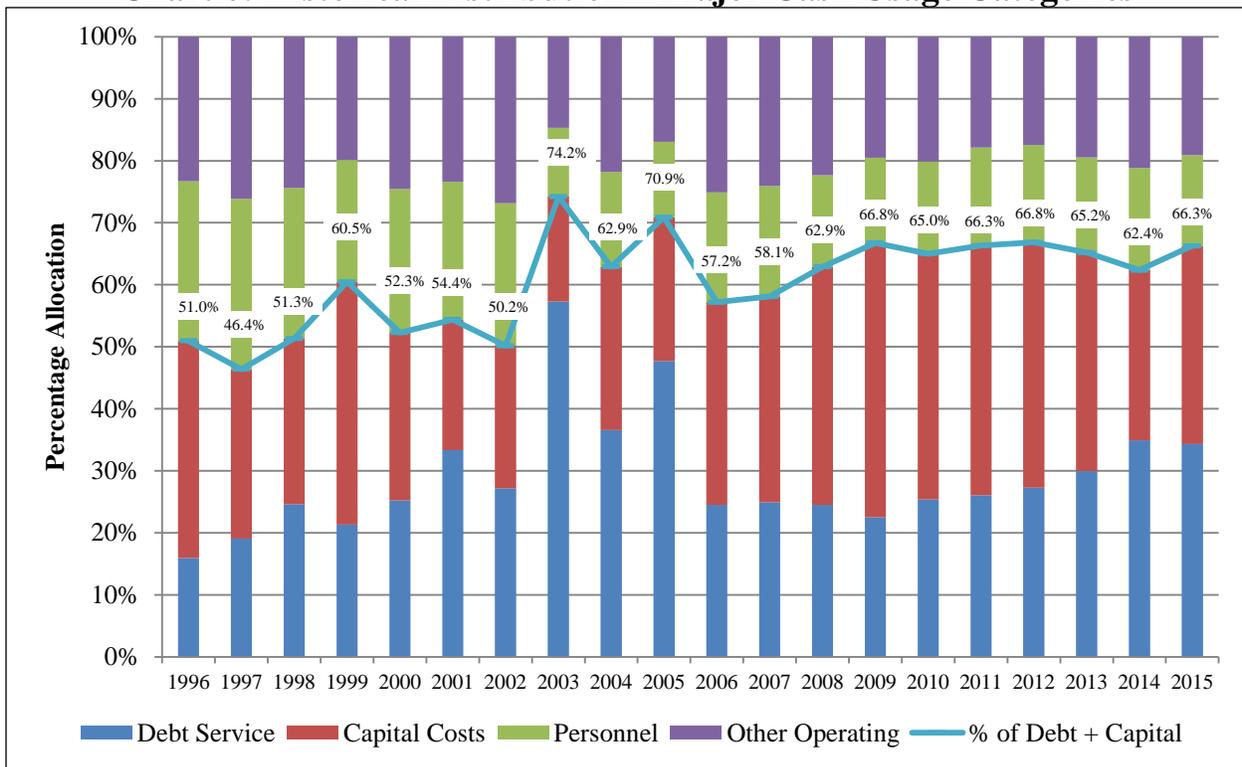


Source: MSDGC financial audits

As shown in **Chart 5**, MSDGC’s total expenditures increased significantly over the 20 year period. Overall, total expenditures increased over \$133.1 million, or 127.9 percent, from 1996 to 2015 with the largest annual increase of 30.9 percent occurring from 2012 to 2013.

Chart 6 shows the allocation of MSDGC’s four largest cash outflow categories (i.e., personnel, other operating expenditures, capital costs, and debt service) for 1996 through 2015. This comparison serves to show the effect that the consent decree requirements started in 2002 have had on the allocation of cash usage and the need for higher operating income margins, by examining the data before and after major work for the interim consent decree and final WWIP began.

Chart 6: Historical Distribution – Major Cash Usage Categories

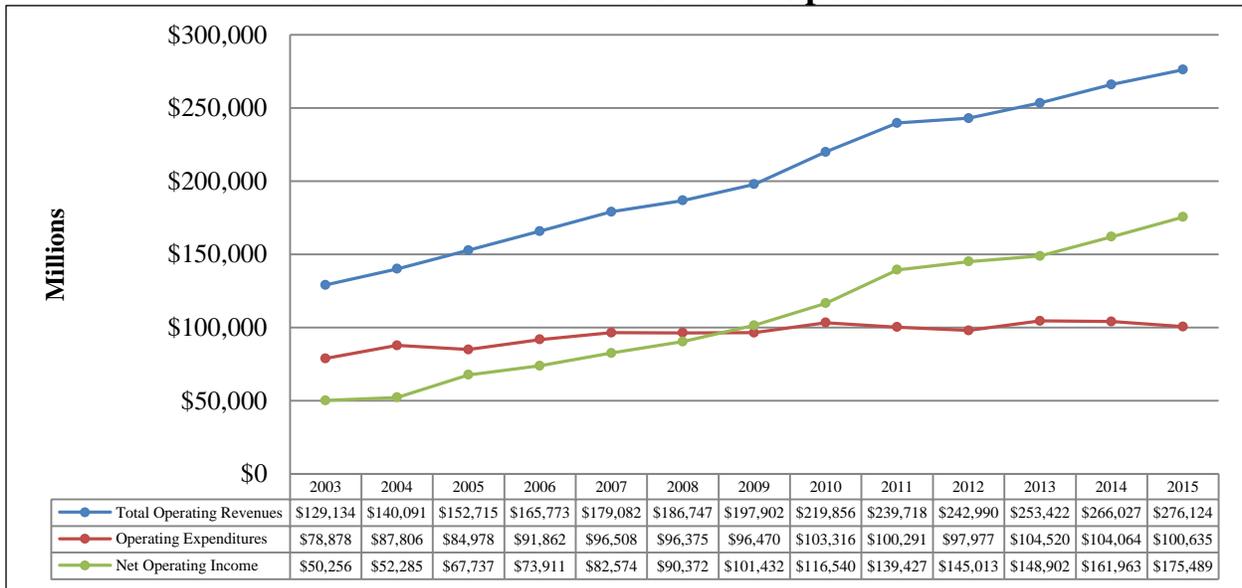


Source: MSDGC financial audits

As shown in **Chart 6**, the allocation of cash to outflows for debt service and capital expenditures has increased as a result of the consent decree. Specifically, a large increase is evident in 2003, the first full year following the interim consent decree settlement. Overall, the allocation of cash outflows for debt and capital averaged 52.3 percent from 1996 through 2002 and increased to 65.0 percent from 2003 through 2015.

Chart 7 shows a historical comparison of MSDGC’s operating revenues, expenditures less debt service, and the resulting net income for the consent decree time period (i.e., 2003 through 2015). It is important to examine the results of operations as it will provide an indication on whether rate increases, and the resulting increase in revenues, were consumed by rising operating costs or if they were available to cover capital costs associated with the consent decree.

Chart 7: Historical Results of Operations

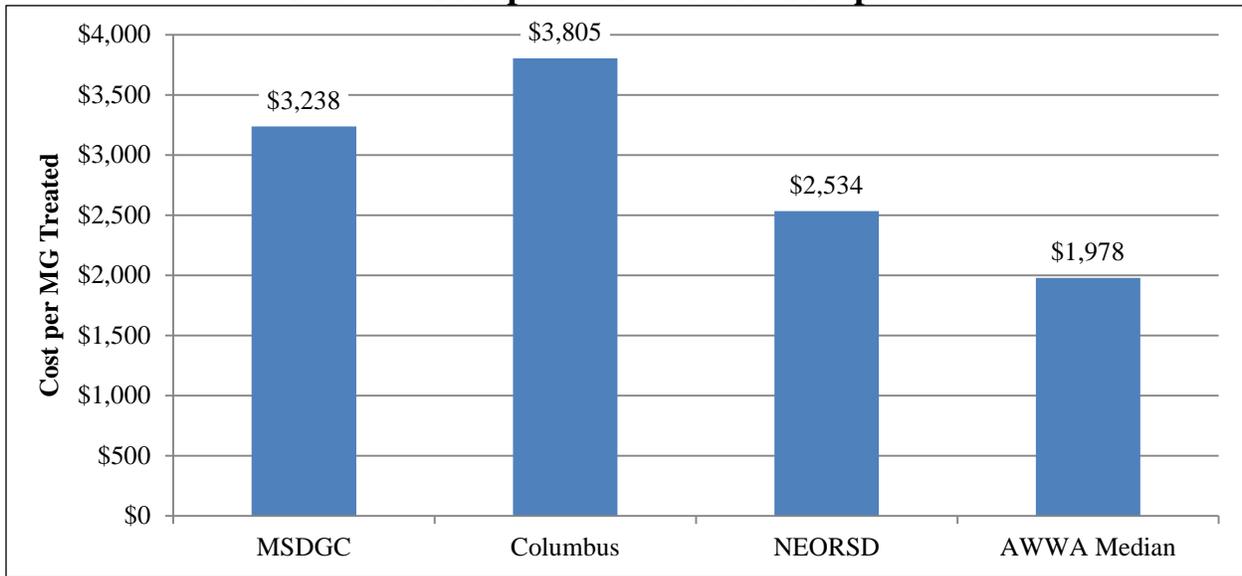


Source: MSDGC financial audits

As shown in **Chart 7**, MSDGC’s operating revenues have increased, as expected; due to the significant rate increases imposed during the same time frame (see **Chart 2**). At the same time, there has also been a steady increase in net operating income. Specifically, operating revenues increased approximately \$147.0 million, or 113.8 percent, while operating income increased approximately \$125.2 million, or 249.2 percent, from 2003 through 2015. The fact that MSDGC’s operating income increased so significantly suggests that it was generally able to exercise control over the growth of operating expenditures. This resulted in it being able to direct additional revenues generated through rate increases to their intended target, additional capital and debt service costs required by the consent decree.

Although MSDGC has been able to control operating expenditure growth, it is still important to gauge the overall appropriateness of actual expenditure levels. **Chart 8** shows a comparison of the cost per million gallons (MG) treated for MSDGC, Columbus, and NEORS for 2015 as well as the American Water Works Association (AWWA) 2013 median.¹² This analysis provides a high level comparison of expenditures using gallons treated to normalize the entities for size.

¹² The AWWA collects survey benchmark data and publishes it in the *Benchmarking Performance Indicators for Water and Wastewater Utilities* (AWWA, 2015). The data included in this report represents data collected from the 2013 operating year, the most recent survey data available from the AWWA.

Chart 8: Cost per MG Treated Comparison

Source: MSDGC, Columbus, NEORSD, AWWA, and BLS

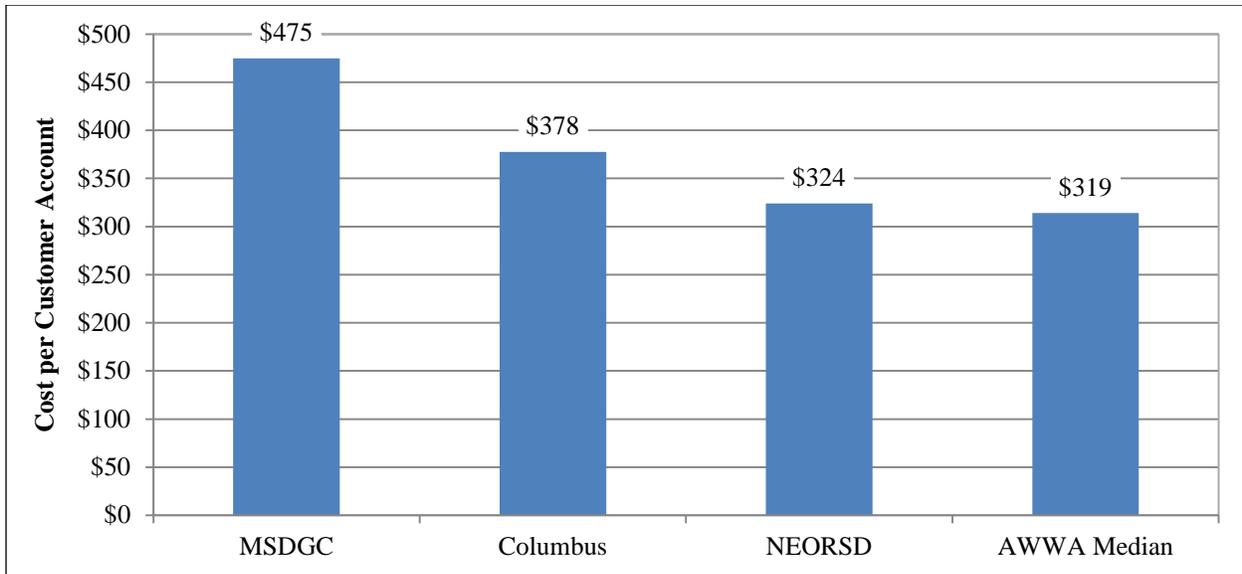
Note: AWWA 2013 benchmark information was adjusted for inflation using 2014 and 2015 BLS data.

As shown in **Chart 8**, MSDGC's cost per million gallons treated was \$567, or 14.9 percent, lower than Columbus but \$704, or 27.8 percent, higher than NEORSD.¹³ Nationally, MSDGC was significantly higher than the AWWA benchmark, having a cost per million gallons treated that was \$1,260, or 63.7 percent, higher than the national median.

Another common cost indicator used is the cost per customer account. **Chart 9** shows a comparison of the cost per customer account for MSDGC, Columbus, and NEORSD for 2015 as well as the American Water Works Association (AWWA) 2013 median. This analysis provides a high level comparison of expenditures using account data to normalize entity size differences.

Chart 9: Cost per Customer Account Comparison

¹³ Costs associated with NEORSD operations do not include maintenance of local sewers and pump stations, as NEORSD is only responsible for interceptors and treatment plants.



Source: MSDGC, Columbus, NEORS, and AWWA

Note: AWWA 2013 benchmark information was adjusted for inflation using 2014 and 2015 BLS data.

As shown in **Chart 9**, MSDGC's cost per customer account was higher than all three comparative data points shown. Specifically, MSDGC was \$97, or 25.7 percent, higher than Columbus and \$151, or 46.6 percent, higher than NEORS and \$156, or 48.9 percent, higher than the AWWA benchmark.

Collectively, these financial analyses (i.e., **Chart 5** through **Chart 9**) shows that MSDGC has incurred a significant increase in expenditures since 2003, and that cash outflows for non-operating uses such as capital costs and associated debt service have also increased significantly. As a result, customer rates were increased to ensure that revenues were available to cover the increase in costs. Although MSDGC has been successful in maintaining moderate growth in operating expenditures, a comparison to the two peer organizations and the AWWA national benchmark data shows that opportunity exists to decrease operating costs. As a result, the objectives in this performance audit were targeted towards those areas where efficiency gains could result in the reduction of operating expenditures.

Recommendations

R.1 Develop monitoring operating parameters, goals, and performance measurements

The County has declared that “compliance with the requirements of the consent decree is imperative.” Because of the magnitude of the capital costs associated with the consent decree, projected to be in excess of \$3.1 billion in total, and the potential effect on rate payers, the County developed a monitoring system, in part, to ensure that requirements set forth are met. The first step in this process was the creation of a full-time position of Compliance Coordinator in 2006 to monitor consent decree progress. In addition, the County required MSDGC to contract, as its agent, with CDM Smith (CDM) for 2007 through 2010 for program management supervision as well as other consulting services.

Starting in 2010, the management of the programs and processes developed under the agreement with CDM were brought in-house, and the County entered directly into a contract with Plante Moran for monitoring services. This agreement requires Plante Moran to assist the County in ensuring that:

- MSDGC’s capital investment portfolio risks are identified and remedied to assure local affordability;
- Consent decree and other capital projects are planned, selected, prioritized, designed, and completed on or before scheduled deadlines, in order to avoid extra costs, including stipulated penalties for missed milestones;
- Consent decree and other capital projects are planned, selected, prioritized, designed and constructed within or under budgeted costs; and
- Changes made to the MSDGC capital improvement programs and WWIP are compatible with consent decree requirements.

In 2013, the County also formally established an internal Utility Oversight function, which consists of two County employees, the Utility Oversight Director and Compliance Coordinator, who work in conjunction with Plante Moran to monitor MSDGC operations. Since that time, this monitoring function has expanded to cover more than just program management and now includes purview over MSDGC’s annual budgeting process, staffing levels, and the change order process.

Despite the broad coverage of the monitoring process, there are no formal goals and/or performance measures to assess the effectiveness of the process. The only stated goals of the monitoring system are broadly contained in a March 20, 2013 letter from the County to the City stating that the “oversight function is to be entirely consistent with the Board’s significant fiduciary responsibilities including:

- Setting rates and charges for [MSDGC];
- Issuing debt to finance the capital program of [MSDGC];
- Approving and monitoring the operating and capital budget of [MSDGC];

- Ensuring compliance with the Consent Decrees (as the lead defendant and “principal” of MSDGC) as well as the named on all permits and licenses issued for the operation of [MSDGC]; and
- Establishing policy direction for [MSDGC], including its rules and regulations.”

The only formal metrics available to determine the effectiveness of the monitoring process are the milestones contained in the WWIP, which requires MSDGC to meet and report certain milestone achievements to the involved parties. The three milestones outlined in the WWIP are permit to install (PTI)¹⁴ submittal, start construction, and end construction. Accordingly, there is a \$5,000 per day penalty for projects that are not completed within 60 days of a milestone. To ascertain the ability to meet these dates, MSDGC tracks its progress using “days of float” available. Days of float are calculated by taking the difference between MSDGC’s projected completion date of a milestone and the date required for that milestone in the WWIP. Positive days of float represent milestones that are projected to be met, while negative days of float represent milestones dates that are expected to be missed.

The County’s monitoring requirements are contained in Article XXIV of the *Rules and Regulations*, with the original iteration having only two administrative rules.¹⁵ The Board ultimately has the authority to modify and adopt a set of revised rules and regulations. Since their initial creation, the *Rules and Regulations* have been amended by the County, or by the County upon recommendation of the City, after public hearing. With the commencement of consent decree work began in 2002, and the expansion of the budget to complete this work, Article XXIV, was amended to allow for the County’s monitoring function to expand. These amendments are as follows:

- **Section 2403 (added January 8, 2014, amended August 6, 2014):** establishes the requirement for submitting program management reports to the Board/County administration and recordkeeping.
- **Section 2405 (added January 8, 2014, amended August 6, 2014):** establishes financial and budget protocols including the establishment of the program contingency protocol, funding “de-legislation”¹⁶ procedures, and procedures for allowance spending.

Monitoring Process

As controllers of the CIP budget, the Board ultimately provides funding for all projects through the legislative approval process. Under this process, MSDGC presents separate legislation for planning, design, and acquisition (construction) funding to the monitoring team that then provides a recommended action to the Board. If approved, the County legislates funding for that particular phase of the project. The expansion of the monitoring process, however, has brought

¹⁴ PTI approval is needed to satisfy ORC § 6111.44 which states that “no municipal corporation, county, public institution, corporation, or officer or employee thereof or other person shall provide or install sewerage or treatment works for sewage, sludge, or sludge materials disposal or treatment or make a change in any sewerage or treatment works until the plans therefor have been submitted to and approved by the director of environmental protection.”

¹⁵ The two original rules were Administrative Rule No. 1 (i.e., Section 2401), which outlines requirements for payments for City overhead services, and Rule No. 2 (i.e., Section 2402), which outlines the requirement to follow the City purchasing policy.

¹⁶ Through a legislation process, the Board approves funding for project components. At the time of the completion of a respective component, if funding amounts are unspent, these amounts are “de-legislated” by the Board.

about additional approvals within the project completion process, as required by the amendments to the *Rules and Regulations*. **Table 1** shows a list of rule amendments that require MSDGC to gain an additional approval from the County beyond the project legislative approval process.

Table 1: Monitoring Process Document and Activity Types

Rule	Description
Approved January 2014	
2403-2 - Other Reports and Notices to the Board	Requires MSDGC to report on substantial completion of construction, project performance, legal disputes, master service agreements, task orders, professional services agreements, and annual month end financial information.
2403-3 Review Process for Consent Decree Reports, Permit Applications, and Other Official Documents	Requires MSDGC to submit to the County for approval of all consent decree and WWIP reports, WWIP PTI applications and other official documents.
2403-4 – Project Cost Estimates	Requires MSDGC to immediately report to the County upon determination of any dollar amount estimated to be spent exceeds applicable WWIP project cost estimate.
2405-2 – Contingency	Requires project cost estimate to be a cost cap, eliminates project contingencies, and establishes rules governing program contingency and project change management.
2405-3 – De-legislation	Requires MSDGC to de-legislate the program contingency monthly and the periodic de-legislation of currently budgeted CIP funds upon the conclusion of planning; upon the award of a design, property appropriation or construction contract or related task order; and upon final completion of a project.
2405-6 Prohibition of Transfers of Legislated Funds	Requires MSDGC to obtain County approval to transfer line item funds in any operating or CIP budget from one line item to another.
2405-7 Procedures of Allowance Spending	Requires MSDGC to prepare an annual detailed budget for each allowance activity and to obtain County legislative approval prior to incurring obligations or expending funds for any and all allowance funded construction activity exceeding \$25,000.
2405-8 Master Service Agreement Task Orders and Professional Service Agreements	Establishes framework for County approval of master service agreements and professional service agreements.
2405-9 MOU/Grants and Transfers, Payments, Disbursements to the City	Requires MSDGC to obtain County approval prior to executing an MOU/grant and report to the County all MOU/grant activity monthly.
Approved August 2014	
2405-12 - CIP and Operating Budget Preparation	Establishes timeframe for the preparation, review, and County approval of MSDGC's operating and CIP budgets.

Source: Rules and Regulations

As shown in **Table 1**, the approval requirements contained in the *Rules and Regulations* cover all aspects of the project process. In addition, the County places a hold on a portion of funds approved in the annual operating and CIP budgets until MSDGC meets certain conditional requirements. To facilitate the monitoring process and the adherence to the requirements included in the annual budgets as well as those listed above, the County review (CR) system was developed. The CR system is used to record the receipt of MSDGC requests for review of documents and activities associated with the *Rules and Regulations*, other coordination needs, and to record the results of the County reviews and decisions. In addition, other non-rule-related coordination is also managed using the CR system. The CR system has become the primary tool used by the County and MSDGC to track coordination activities and report the status of these actions.

Submissions for approval in the CR system are recorded and reported by MSDGC using 21 different submission types. Not all submission types, however, are required by the *Rules and Regulations* or are critical to the project completion process. **Table 2** shows the monitoring process types that are required by the Agreement and the *Rules and Regulations*, and impact MSDGC operations or budget approval process. This information is important to examine as it provides guidance as to the monitoring process submissions that impact the flow of the project process.

Table 2: Monitoring Requirements with Impact on Project Process

Operational Impact	
<ul style="list-style-type: none"> • Allowance • Completion • Construction Order • Cost Activity • Legislation¹ • Line Item • MOU 	<ul style="list-style-type: none"> • Program Contingency • PTI • Scope Change • Task Order • Transfer of Funds • Work Order
Budgetary Impact	
<ul style="list-style-type: none"> • Budget • Capital Fund 	

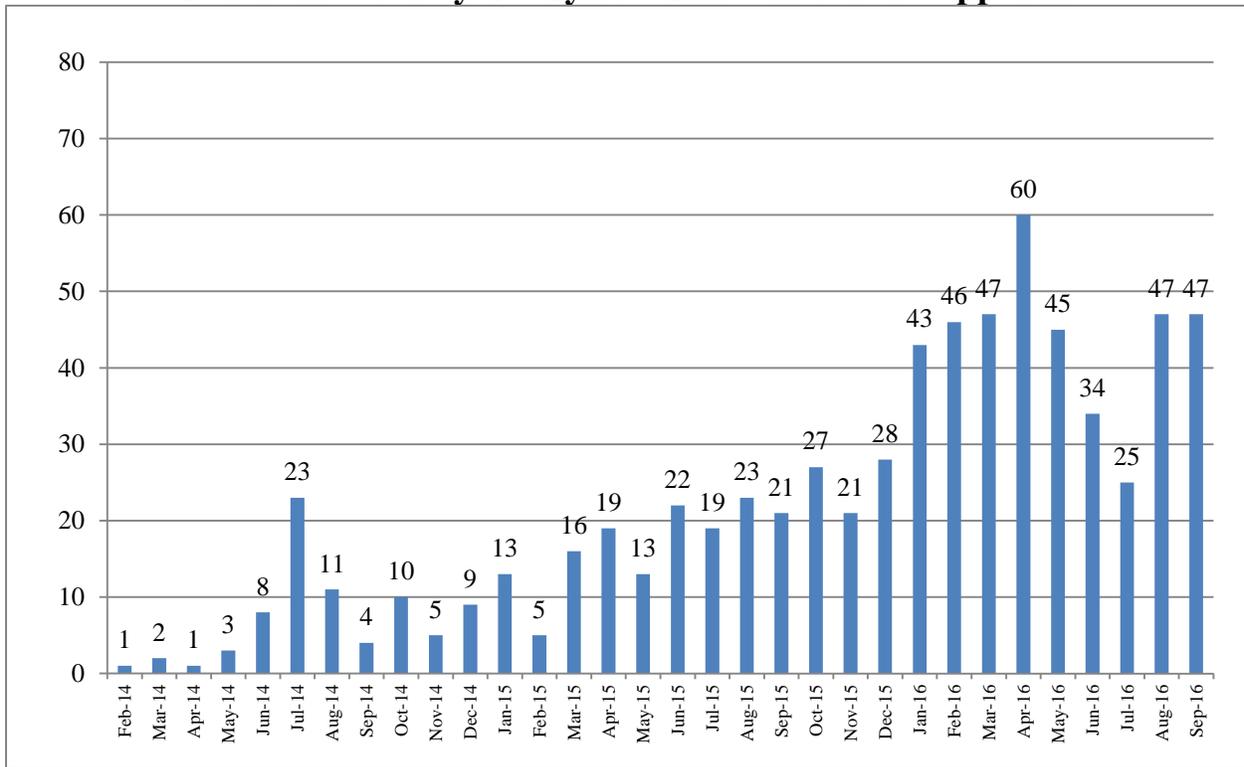
Source: MSDGC

¹Legislative process is required as a result of the formation of a county sewer district under ORC § 6117.

As shown in **Table 2**, in addition to the legislative process, the County has implemented an additional 12 monitoring process requirements that impact the flow of the project process. The *Rules and Regulations* outline the stipulations of these submissions, in some cases placing required timeframes on MSDGC, but no timeframe requirements on the County’s response.

Chart 10 shows MSDGC’s monthly CR system submissions since 2014. This analysis provides a high level indication of the volume of project process submissions requiring approval from the County.

Chart 10: Monthly CR System Submissions for Approval



Source: MSDGC

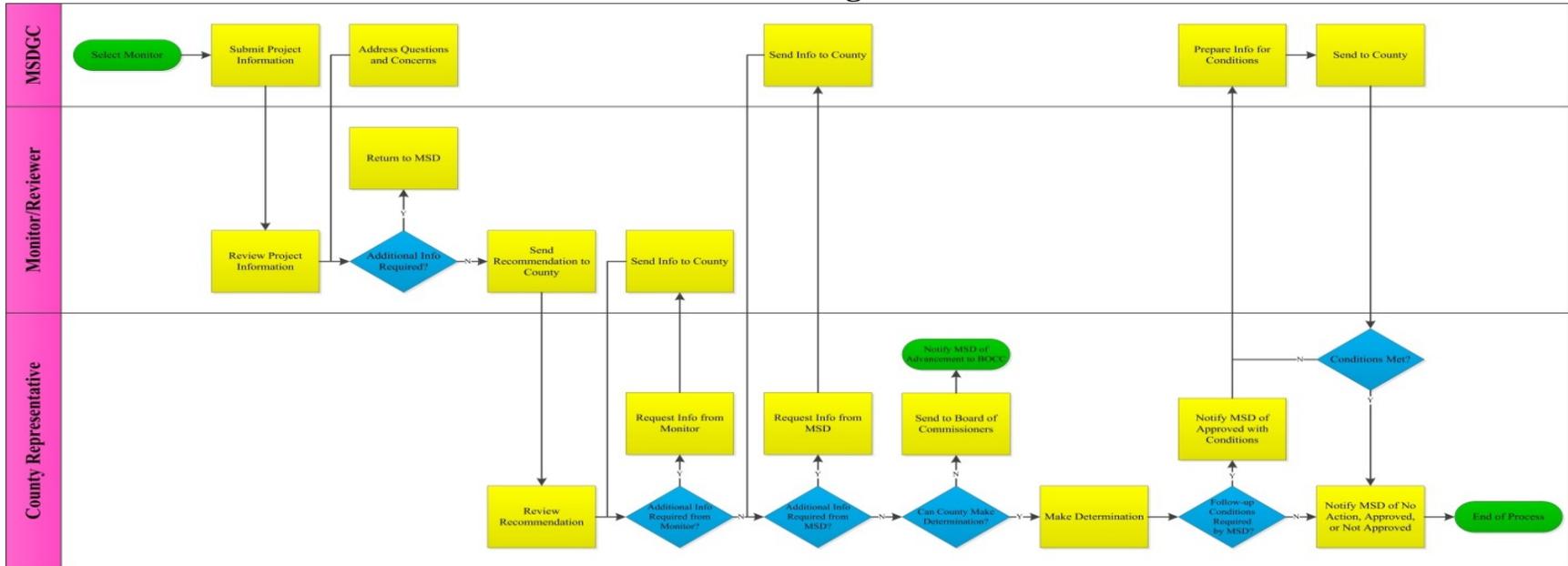
Note: Data for September 2016 was obtained from the October 2016 Enterprise Management Activity Report, the latest report available as of completion of this analysis.

As shown in **Chart 10**, submissions from MSDGC to the County have generally increased throughout the time period. For example, submissions in year-to-date 2016 averaged 43.8 per month, the highest of the three years shown.

All monitoring process submissions are input by MSDGC into the CR system for approval by the County. Once submitted, the County follows an approval process that includes a Plante Moran monitor/reviewer, the Utility Oversight Director or Compliance Coordinator, and in some instances, the Board.

Chart 11 shows a flowchart detailing the monitoring process of submissions made by MSDGC through the CR system. Analyzing the flowchart shows the multiple potential touch points for each submission for approval.

Chart 11: Monitoring Flowchart



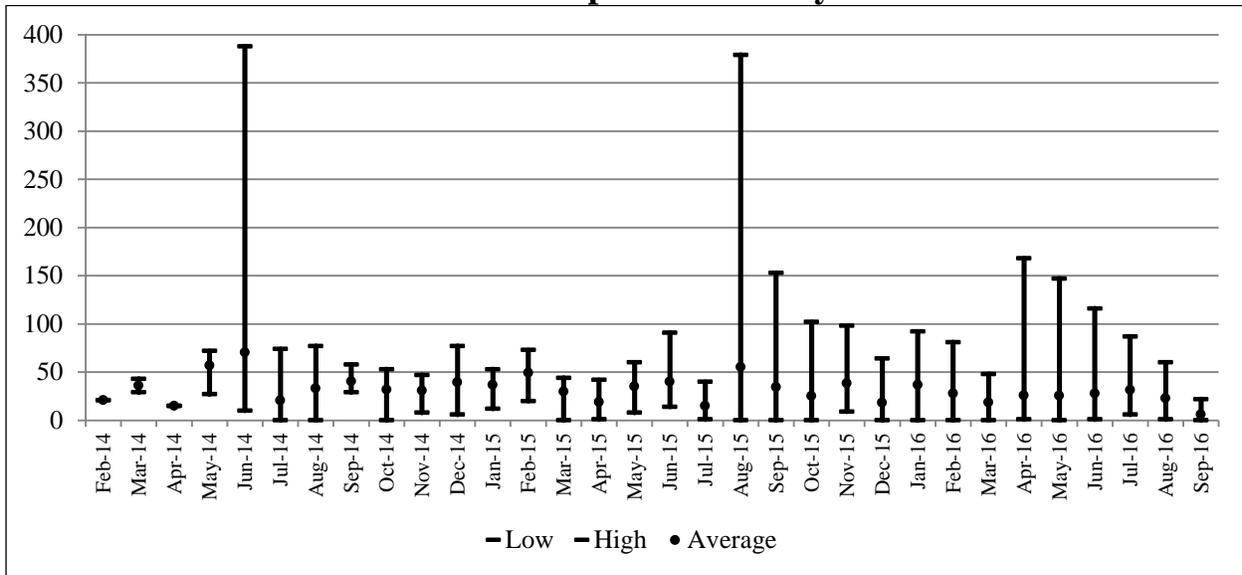
Source: MSDGC

As shown in **Chart 11**, CR system submissions have up to three touch points prior to an approval decision, including: the review monitor, the Utility Oversight function, and the Board. The flow of submissions through this process is not just a formality, as not every submission is approved. For example:

- The County has requested additional information or rejected a submission 392 times since the process started in February 2014, equating to a request for additional information or rejection 60.6 percent of the time;
- Every category averaged more than one resubmission per project, with the exception of scope changes with an overall average of 2.3 submissions from MSDGC to the County before a final decision was levied; and
- The County averaged 27.6 days to respond to a submission in the CR system.

Because there are no true performance metrics in place, it is impossible to determine what an appropriate response time should be. In addition, there are no parameters established to dictate a maximum response time for the County. In the Enterprise Management Activity Reports, MSDGC tracks and publishes monitoring process submission data such as submission date, the decision of the monitor, and the date the decision was made concerning that submission. **Chart 12** shows the average response time and the range of response time (i.e., difference between the lowest and highest time), stated in days, for the County by month. Examining this data provides an indication of the overall responsiveness to submissions. Timely decisions are important because they may have an impact on the ability to meet WWIP milestones and avoid penalties.

Chart 12: CR Response Times by Month



Source: MSDGC

As shown in **Chart 12**, significant variance in the range of response times is evident. Also, while response time ranges seem to increase with the number of CR process submission, on average, there does not appear to be a clear pattern. For example, some relatively low-volume months such as June 2014 and August 2015 had relatively large response time ranges, while some relatively high-volume months such as July 2015 and September 2016 had relatively small response time ranges. It is important to note that the County has been able to shrink the range of

response times in each successive month since April 2016. Also in March 2016, the County had its lowest response time range since April 2014 as well as the lowest average response time of any month included, despite having a relatively high number of submissions (i.e., 47).

Time Cost of the Monitoring Function

To show the impact of the current state of the CR process on project length, **Table 3** shows the added days each CR process resubmission adds to the overall project process.

Table 3: Time Impact of CR Process Resubmissions

Submission Type	Resubmissions	Average Resubmission Response Time	Time Cost (Days) of Resubmissions
Operational Impact			
Allowance/Transfer	8.0	21.6	172.8
Completion	7.0	24.5	171.5
Construction Change Order	29.0	26.0	754.0
Legislation	100.0	22.0	2,200.0
MOU	5.0	25.0	125.0
Program Contingency	65.0	24.4	1,586.0
PTI	11.0	26.2	288.2
Scope Change	0.0	N/A	N/A
Work Order	35.0	26.5	927.5
Total Days			6,225.0
Budgetary Impact			
Budget/Capital Fund	15.0	14.6	219.0
Total Days			291.0

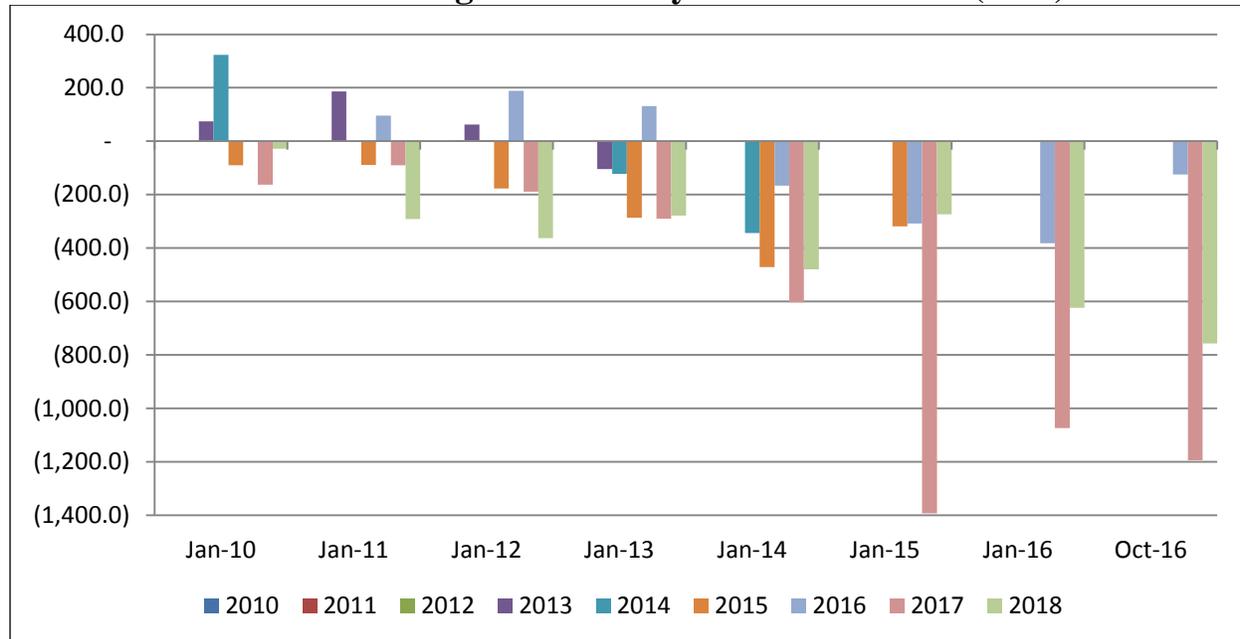
Source: MSDGC

As shown in **Table 3**, resubmissions added an estimated total of over 6,200 days to the project timeframes. A decrease in CR process resubmissions could result in a significant decrease in project timeframes; however, no mechanism exists to speed the facilitation of an approval. Meetings between MSDGC and the County that could possibly expedite an agreed-upon solution for rejected submissions do not occur, regardless of the reason or request by the County for additional information. Instead, all resubmissions follow the CR system flowchart shown in **Chart 11**, resulting in the expansion of days in the project process. Examining the impact of these additional days in the process, and total project length in general, is important because MSDGC and the County have agreed to specific project milestones in the WWIP. These milestones cannot be met without PTI, design and construction legislation, and project completion approval by the County through the CR system. Additionally, the ability of MSDGC to meet these milestones is effected by the required County approvals imbedded in the monitoring process.

In order to track the likelihood of meeting each milestone, MSDGC tracks days of float for each project milestone and reports this data in the monthly Enterprise Management Activity Reports. **Chart 13** shows the net days of float to milestone achievement gained or lost each year from

2010 through October 2016.¹⁷ This data reflects the average change in projected float, by project by month. This data is important to examine, as it provides an indication of project length in relation to its original timeline as it moves through the completion process.

Chart 13: Average Annual Days of Float Gained/(Lost)



Source: MSDGC

As shown in **Chart 13**, MSDGC has experienced a significant decrease of available float days since 2010. Although MSDGC has not missed a required milestone, the decrease apparent in available float days signals an increased likelihood of the failure to meet milestone dates. It should be noted that days of float lost increased significantly starting in 2014 and continued through 2016. From this data, it is reasonable to infer that as the monitoring process has expanded to require the approval of monitoring processes shown in **Table 2**, it has had a negative impact on project length.

Although the monitoring function could serve as a valuable tool, given the unique governance structure of MSDGC as the manager of a county sewer district, the lack of performance metrics associated with the monitoring process makes it difficult to assess its effectiveness. For its part, the County has stated the process has identified over \$693 million in realized savings since 2012; however, \$504.5 million, or 72.8 percent, of this total is identified as savings from budget reductions or funding “de-legislation”; a duty already inherent to the County as the approver of the budget (see **Appendix C: Estimated County Monitor Savings**). With no specifically identified goals of the monitoring process, no tools available to measure these goals, and no clear rules governing the process, an increased risk exists of unnecessarily hindering the capital project process. If the original intent of the monitoring process continues to be to monitor MSDGC’s progress in satisfying the consent decree, it may not be achieving its optimal effectiveness given the decrease in milestone float days. In addition, in the October 2016 Enterprise Management

¹⁷ The October 2016 report details activity through September 2016.

Report, MSDGC has identified \$1.141 million in potential fines for missing consent decree milestones.

Direct Cost of the Monitoring Function

In addition to the time cost previously noted, there are also direct costs associated with the monitoring function. **Table 4** shows the total cost of administrative, overhead, and County monitoring costs for 2013 through 2015 that were incurred as a result of the current governance structure. This analysis is important, as it provides an indication of total administrative type costs incurred by MSDGC.

Table 4: Administrative and Overhead Costs per Year

	2013	2014	2015
Office of the Director	\$12,093,165	\$5,936,326	\$5,015,108
Indirect City Overhead	\$1,937,092	\$2,886,760	\$2,544,382
Total Internal Overhead Costs	\$14,030,257	\$8,823,086	\$7,559,490
County Monitoring Billed Services	\$2,584,665	\$2,978,614	\$2,906,683
Total Administrative/Overhead Costs	\$16,523,827	\$11,801,691	\$10,466,172
Total Customer Accounts	211,581	211,795	211,999
Administrative/Overhead Costs per Account	\$78.10	\$55.72	\$49.37
County Monitoring Costs per Account	\$12.22	\$14.06	\$13.71
County Monitoring Costs as a % of Total Administrative/Overhead Costs	15.6%	25.3%	27.8%

Source: MSDGC and the County

As shown in **Table 4**, the current governance structure resulted in a cost of \$49.37 per customer for administrative type costs in 2015. Of this total, \$13.71 per account, or 27.8 percent, was for the County monitoring function. Due to the significance of these costs, it is imperative that goals and measurements agreed upon by MSDGC and the County are put into place to assess effectiveness.

Many of the approvals required through the CR process are duties entrusted to MSDGC management as manager of the County's system. However, the current monitoring process has essentially created an additional administrative layer that operates without strict parameters or clear expectations at a cost to rate payers. As it currently operates, the monitoring process has resulted in MSDGC and the County communicating through the CR system. Informal meetings that could quickly or easily rectify or clarify requests for amendments or additional information in the project process do not take place between MSDGC and the County, despite the potential to streamline the process and benefit rate payers. Because these conversations take place within the CR system, multiple re-submissions routinely occur. It is incumbent upon both parties to work together to ensure submissions are approved in a more timely fashion, while still maintaining the elements deemed necessary by the County for review.

R.2 Eliminate 16.0 FTE Computer-Networking Infrastructure positions

MSDGC's computer-networking infrastructure (CNI) function is collectively maintained by two distinct groups: a dedicated information technology (IT) group with 21.0 full-time equivalent (FTE) employees,¹⁸ and a separate 9.5 FTEs¹⁹ tasked with maintaining the Supervisory Control and Data Acquisition²⁰ (SCADA) system within the Wastewater Treatment (WWT) division. The current structure of maintaining a separate SCADA group was put into place by MSDGC based on a consulting recommendation that cited security network concerns as the need for having separate groups.

From January 2016 through November 2016, the IT group handled 1,846 incidents or service requests while the SCADA group completed 470 service requests (i.e., "work orders"). According to *Metric of the Month: Tickets per User per Month* (MetricNet,²¹ 2012), an incident refers to unplanned work that requires an on-site technician to resolve and a service request refers to planned work, with the sum of all incidents and service requests referred to as tickets.

Table 5 shows a comparison of the cost per ticket and the number of tickets per technician per month for MSDGC for 2016²², relative to the MetricNet benchmarks. The analysis is important, as it provides an indication of the appropriateness of the cost and workload of MSDGC's CNI function.

¹⁸ The IT group is housed within the Wastewater Administration (WWA) division.

¹⁹ Although there are 11.0 total FTEs within the SCADA group, 9.5 FTEs were included for the purpose of this analysis as one employee splits time (0.5 FTE) supervising a separate non-SCADA workgroup and another employee completes duties associated with serving as the union president.

²⁰ SCADA is primarily used by wastewater treatment plant operators to monitor and assist in the processing of wastewater.

²¹ MetricNet is private sector firm that provides benchmarks, performance metrics, scorecards and business data to help manage organizations more efficiently and effectively.

²² Information for MSDGC is from January through November 2016; the most up-to-date information as of the completion of this analysis.

Table 5: CNI Cost and Workload Comparison

Cost per Ticket						
Group	Personnel Cost	Total Tickets	Cost per Ticket	Benchmark	Difference	% Difference
IT	\$2,197,774	2,000	\$1,198.98	\$125.00	\$974.98	778.3%
SCADA	\$1,074,424	509	\$2,110.16	\$125.00	\$1,985.16	1,586.4%
Workload Analysis						
Group	Tickets per Month	Total FTEs	Tickets per Month per FTE	Benchmark	Difference	% Difference
IT	166.7	21.0	7.9	88.1	(80.2)	(91.0%)
SCADA	42.4	9.5	4.5	88.1	(83.6)	(94.9%)

Source: MSDGC

Note: Total tickets are projected for a full year using data from January through November 2016.

As shown in **Table 5**, the IT group's personnel cost of more than \$1,100 per ticket is almost \$1,000 per ticket above the benchmark of \$125 per ticket. Similarly, the SCADA group's personnel cost of more than \$2,100 per ticket is more than \$1,980 above the benchmark of \$125 per ticket. In addition, the two groups handled 80 and 83 fewer tickets per technician per month than the benchmark, respectively, a difference of over 90.0 percent. These large variances relative to cost and workload efficiency benchmarks suggest higher than necessary CNI staffing levels.

In addition to cost and workload measures, the appropriateness of CNI staffing can also be measured based on the number of users supported. *Predicting Staffing Sizes for Maintaining Computer-Networking Infrastructures* (The MITRE Corporation,²³ 2000) suggests an effective staffing level as one that approaches 42 users for each CNI FTE position. **Table 6** shows a comparison of MSDGC's users²⁴ per CNI FTE to the benchmark in order to gauge an alternative measure of the appropriateness of CNI staffing levels.

Table 6: Users per CNI FTE Comparison

Group	FTEs	Users	Users per FTE	Benchmark	Difference	% Difference
IT	21.0	548.0	26.1	42.0	(15.9)	(37.9%)
SCADA ¹	9.5	73.0	7.7	42.0	(34.3)	(81.7%)

Source: MSDGC and MITRE Corporation

¹ SCADA users include only WWT operators. Although there are various other WWT employees, the operators are the primary users of SCADA.

As shown in **Table 6**, MSDGC is significantly overstaffed when it comes to users per CNI FTE, serving 15.9, or 37.9 percent, fewer IT users when compared to the benchmark of 42 users per FTE and 34.3, or 81.7 percent, fewer SCADA users per FTE. This reaffirms the initial indications of overstaffing previously shown in **Table 5**.

²³ The MITRE Corporation is a not-for-profit company that operates multiple federally funded research and development centers that provide innovative, practical solutions in the defense and intelligence, aviation, civil systems, homeland security, judiciary, healthcare, and cybersecurity fields.

²⁴ For the purpose of this analysis only MSDGC employees were counted as users. Actual user numbers may vary depending on the number of temporary accounts, such as those associated with consultants and contractors.

Table 7 shows the FTE reduction that would be needed to bring CNI staffing in line with the benchmark as well as the impact that this change in staffing level could have on cost and workload metrics.

Table 7: Adjusted Users per CNI FTE Comparison

Group	Users	Current FTEs	Staffing Reduction	Adjusted Staffing Level	Adjusted Users per FTE	
IT	548.0	21.0	8.0	13.0	42.2	
SCADA ¹	73.0	9.5	8.0	1.5	48.7	
Future State Cost Metrics						
Group	Personnel Cost	Total Tickets	Cost per Ticket	Benchmark	Difference	% Difference
IT	\$1,385,268	2,000	\$692.69	\$125.00	\$567.69	454.2%
SCADA	\$150,457	509	\$295.59	\$125.00	\$170.59	136.5%
Future State Workload Metrics						
Group	Tickets per Month	Total FTEs	Tickets per Month per FTE	Benchmark	Difference	% Difference
IT	166.7	13.0	12.8	88.1	(75.3)	(85.4%)
SCADA	42.4	1.5	28.3	88.1	(59.8)	(67.9%)

Source: MSDGC and MITRE Corporation

¹ SCADA users include only WWT operators. Although there are various other WWT employees, the operators are the primary users of SCADA.

As shown in **Table 7**, MSDGC could bring staffing ratios closer to the users-per-FTE benchmark by eliminating a total of 16.0 CNI FTE positions; 8.0 FTE positions from the IT group and 8.0 FTE positions from the SCADA group. Doing so would still leave the CNI function with higher cost and lower ticket-based workload than benchmarks, but would still represent positive progress toward increasing the overall staffing efficiency.

The City is currently analyzing the impact of consolidating IT functions across all City departments. As an alternative to the direct elimination of these positions, MSDGC may be able to achieve the same efficiencies by merging or consolidating IT functions with the City. In doing so, maintaining proper security measures for the SCADA system by keeping it separate from the larger network would need to be considered.

Financial Implication: Eliminating 16.0 CNI FTE positions could save MSDGC approximately **\$1,557,300** in salaries and benefits annually. This savings was calculated using salaries and fringe benefits of the 16 lowest tenured CNI employees.

During the course of the audit, MSDGC eliminated 3.0 CNI FTEs.

R.3 Consider contracting for all customer service dispatching

MSDGC has a customer service dispatch function that operates out of the Wastewater Collections (WWC) division. MSDGC employs 4.0 FTE dispatchers to handle customer service calls and requests. Dispatchers are on site from 7 AM to 9 PM, seven days a week, with overlapping schedules, and generate reactive work orders for maintenance crews after receiving calls or online submissions from ratepayers requesting service. In addition, dispatchers prioritize open work orders and provide support to field crews and ensure minimal drive time to meet consent decree mandated response times. Absences are mostly covered by revising the schedule to provide coverage or by incurring overtime. During off hours, weather events that cause high call volume, or absences not covered by MSDGC dispatchers, an on-call contractor is used to handle the call volume at a charge of \$0.99 per call minute with a flat administrative fee of \$250 per month. During off-hours, Assistant Customer Service Supervisors serve as on-call personnel that assist the contractor by either calling the customer back for additional information or dispatching an on-call service request crew to handle the request for service. This contract extends through December 31, 2017.

Table 8 shows dispatch call volume for 2015 and year-to-date (YTD) 2016. This data provides context as to the workload of dispatchers at MSDGC as well as the contractor.

Table 8: Dispatch Call Volume

Year	Internal Dispatch Calls	Contractor Calls	Total Calls	% of Total Calls Outsourced
2015	4,225	1,852	6,077	30.5%
YTD 2016 ¹	4,168	9,163	13,331	68.7%

Source: MSDGC

¹ As of December 24, 2016.

As shown in **Table 8**, MSDGC received a total of 6,077 and 13,331 calls in 2015 and 2016, respectively. While the contractor handled 30.5 percent of calls in 2015, this percentage increased to 68.7 percent of the calls in 2016. The significant increase in contractor calls was the result of a 100-year storm that saturated MSDGC's service area on August 28, 2016, causing extensive flooding and numerous sewer backups. This high volume of calls exceeded MSDGC's internal capacity, causing calls to overflow to the contractor. From the date of this storm through October 2016, the contractor received an average of 2,580 calls per month. In comparison, the contractor averaged 156 calls per month in all other months of the analysis period.

Table 9 shows the average length of call and cost per call for contractor-received calls using 2015 and 2016 call and cost data. This analysis establishes the per-call costs used for a comparison of cost differences between the two service delivery options.

Table 9: Contractor Cost per Call Comparison

	2015	YTD 2016 ¹
Total Contractor Calls	1,852	9,163
Total Call Minutes	7,739	42,562
Average Minutes per Call	4.2	4.6
Cost per Minute Fee	\$0.99	\$0.99
Total per Minute Charge	\$7,661.61	\$42,136.38
Monthly Administrative Fee	\$250.00	\$250.00
Total Administrative Fees	\$3,000.00	\$3,000.00
Total Contractor Cost	\$10,661.61	\$45,136.38
Average Total Cost per Call	\$5.76	\$4.93

Source: MSDGC

¹ As of December 24, 2016.

As shown in **Table 9**, MSDGC paid an average of \$5.76 and \$4.93 per contractor received call in 2015 and 2016, respectively.

Because of unusually high call volume in 2016 due to the 100-year storm that occurred, 2015 call and cost data was used to determine potential savings. **Table 10** shows a comparison of the current state total dispatching cost versus a future state dispatch system, based on 2015 actual operations, where all calls are handled by the contractor. This analysis shows potential savings available to MSDGC by fully utilizing the contractor for all customer service dispatch calls.

Table 10: Dispatching Cost Comparison: Current vs. Future State

Based on 2015	Current State	Future State
Total Internal Cost¹	\$254,657.00	\$0.00
Total Contractor Cost	\$10,661.61	\$28,140.17
Total Administrative Fees	\$3,000.00	\$3,000.00
• Total Calls	1,852	6,077
• Average Minutes per Call	4.18	4.18
• Total Call Minutes	7,739	25,394
Total per Minute Cost	\$7,661.61	\$25,140.17
Total Dispatching Cost	\$265,318.61	\$28,140.17
Estimated Total Savings		\$237,178.44

Source: MSDGC

¹ Total internal cost represents the salaries and benefits costs of 4.0 FTE waterworks dispatchers.

As shown in **Table 10**, MSDGC could have saved approximately \$237,100 in 2015 if all calls were routed to an outsourced dispatch function.²⁵

Financial Implication: Outsourcing dispatching operations could save approximately **\$237,100** annually based on 2015 call and cost data.

R.4 Bring engineering staff utilization rates in line with benchmarks

MSDGC employees can charge labor to the two established funds: the Operating Fund or the Capital Projects Fund. The Operating Fund covers general expenses and is funded by service fees. The Capital Projects Fund covers CIP expenses and is funded by a combination of service fees, revenue bonds, and State revolving loans.

Each division within MSDGC can recommend projects to be funded by the CIP, but the Wastewater Engineering (WWE) division is directly tasked with management and completion of approved CIP projects. It should be noted that although the other divisions report engineering staff, these individuals are not charged with managing the capital projects. For example, the main task for engineers in WWC is to develop a risk assessment model for replacement of its collection system. As such, they have a hand in identifying and recommending CIP projects when the collection infrastructure needs to be replaced; however, they do not conduct the actual project management of CIP projects. WWE is responsible for the design and project management of all CIP projects, and as a result, the division charged over 79,693 hours to the CIP 2015, 51.6 percent of the total. As WWE is charged with the management and construction of major capital projects associated with the consent decree, assessing the capital labor utilization would provide an indication of efficient staffing levels. Because this was the only division with this primary responsibility, it was the only division assessed using this methodology.

A utilization rate is a common benchmark used to assess engineering staffing. *5 Key Metrics for Engineering Business Performance* (DiCicco, Gulman, & Company, LLP,²⁶ 2012) defines a utilization rate as “the percentage of chargeable hours to hours worked” and establishes a target utilization rate range of 65.0 to 67.0 percent for the engineering industry. Utilization rates are important in that they show the amount of available work hours that are charged to specific projects versus those that are not; a general indicator of labor capacity. A low utilization rate can signify overstaffing due to lack of available project work or misallocation of resources. In contrast, a high utilization rate may limit the organization’s flexibility to take on important projects as needed due to lack of manpower.

²⁵ Financial savings was calculated using 2015 data. The analysis did not use 2016 data because it included the operational effects of a 100-year storm and would not represent a typical year of operations. In addition, required queue times are negotiable as part of the contracting process and could affect agreed upon costs in future agreements. Financial savings identified assume a continuation of a maximum queue time of five minutes as required by the current contract.

²⁶ DiCicco, Gulman & Company LLP (DGC) is a CPA and business consulting firm that provides new approaches and offers proactive, innovative solutions for businesses.

Table 11 compares MSDGC's utilization rate to NEORSD (which operates a similar engineering department) for 2015.²⁷ This analysis serves to show the usage of capital labor by the engineers in similar sewer districts that are both under federal consent decrees.

Table 11: Utilization Rate Benchmark Comparison

WWE CIP Hours Charged	79,692.7
WWE Total Hours Worked	195,992.1
MSDGC Utilization Rate	40.7%
NEORSD Utilization Rate	60.8%
Difference	20.1%

Source: MSDGC and NEORSD

As shown in **Table 11**, MSDGC had a utilization rate of 40.7 percent, 20.1 percentage points less than NEORSD's utilization rate of 60.8 percent. Low utilization compared to NEORSD as well as to the 65.0 to 67.0 percent range suggested in *5 Key Metrics for Engineering Business Performance* suggests either a miscalculation of labor needed in relation to work demand, or the inability to fully apply the labor capacity to the required work. For example, utilization rates could be improved by decreasing project timeframes allowing for more total projects and hours. In addition, an analysis of leave usage found that WWE employees used relatively higher levels of paid leave time (see **R.6**). Alternatively, if project timeframes and leave usage cannot be reduced, utilization rates could be improved by adding additional long-duration projects to the workload.

In reference to the low engineer utilization rates, MSDGC noted that with the expansion of the monitoring process, the perception is that engineers now spend more time fulfilling tasks associated with CR process submissions, which decreases available time for traditional engineering work. Although the monitoring function has added time to the CR process (see **R.1**), the extent to which this has impacted the engineering staff or has actually resulted in increased workload is not currently tracked. Regardless of the monitoring process, timely completion of CIP projects is necessary to ensure compliance with consent decree requirements, especially those that are milestone oriented. However, maintaining a staffing level that is higher than necessary to perform the required work is also inefficient.

Table 12 shows the potential impact of WWE increasing its engineering CIP utilization rate to match that of NEORSD for 2015. This analysis is important in that it reasonably quantifies the opportunity cost of potential CIP hours that could be taken on by WWE through a refocus on traditional capital engineering tasks or a reduction of non-capital tasks. Alternatively, this analysis also quantifies capital engineering productivity in a way that could potentially indicate overstaffing based on available workload.

²⁷ Columbus does not track capital utilization. Therefore, only NEORSD data was available from the peers.

Table 12: Adjusted Utilization Rate WWE

Current CIP Hours	79,692.7
Current Total Hours Worked	195,992.1
Current Utilization Rate	40.7%
Benchmark Utilization Rate	60.8%
Difference from Benchmark Utilization Rate	20.1%
Total CIP Hours at Benchmark Utilization Rate	119,163.2
Additional CIP Hours at Benchmark Utilization Rate	39,470.5

Source: MSDGC and NEORS

As shown in **Table 12**, in order to achieve the NEORS utilization rate of 60.8 percent, WWE would have had to charge an additional 39,470.5 hours to the CIP Fund in 2015. This signifies that, with the existing workforce, there is potential to increase labor efficiency and gain additional work hours equal to approximately 19.0 engineering FTEs.²⁸ Furthermore, with a WWE average salary and benefits of \$38.57 per hour, this potential increase in work hours equates to more than \$1.5 million in direct compensation.

R.5 Bring overtime in line with Bureau of Labor Statistics benchmarks

According to the collective bargaining agreement (CBA),²⁹ MSDGC employees are entitled to overtime after working: more than eight hours in a work day; more than 40 hours in a work week; on a legal holiday; or if called out to work, without prior notice, and outside of the normal work schedule. Employees who are called out to work receive a minimum of four hours of overtime pay if they respond within 60 minutes of the call and work at least two hours; otherwise, employees are paid for time worked, but still at the overtime rate.

The Bureau of Labor Statistics (BLS) annually tracks the percentage of overtime as a total of personnel costs for both public and private sector employers. The BLS collects and publishes this information as part of the *National Compensation Survey*, a quarterly survey of employee salaries, wages, and benefits used to measure compensation trends. **Table 13** shows MSDGC's 2015 overtime costs as a percentage of total personnel costs for each of its divisions compared to the BLS benchmark for public employers in the service-providing industry.³⁰ This analysis provides both overview of those divisions which incurred overtime costs, and also how that cost compares to the benchmark by division and in total.

Table 13: Overtime Costs as Percentage of Personnel Costs

Division	Total Overtime Cost	Total Personnel Cost	Overtime Percentage	BLS Benchmark ¹	Difference
Regulatory Compliance Security	\$37,678	\$3,553,366	1.1%	0.4%	0.7%

²⁸ Additional potential labor is conservatively calculated based on a total of 2,080 annual work hours per FTE. This does not take into account holidays, leave usage, training time, or any other non-engineering time. An inclusion of this time would increase, potentially significantly, the FTEs gained through additional labor efficiency.

²⁹ WWT and WWC employees are covered under the Labor Management Agreement by and between the City of Cincinnati and Ohio Council 8 and Locals 190, 223, 240, 250, 1543, and 3119 American Federation of State, County, and Municipal Employees AFL-CIO, effective August 18, 2013 through August 13, 2016.

³⁰ BLS includes utilities in the service-providing industries super-sector group. Utilities include water and sewage systems.

Wastewater Engineering	\$277,488	\$10,153,923	2.7%	0.4%	2.3%
Wastewater Administration	\$5,113	\$5,379,650	0.1%	0.4%	(0.3%)
Wastewater Treatment	\$1,249,342	\$17,309,031	7.2%	0.4%	6.8%
Wastewater Collections	\$669,590	\$8,797,865	7.6%	0.4%	7.2%
Total	\$2,239,210	\$47,341,263	4.7%	0.4%	4.3%

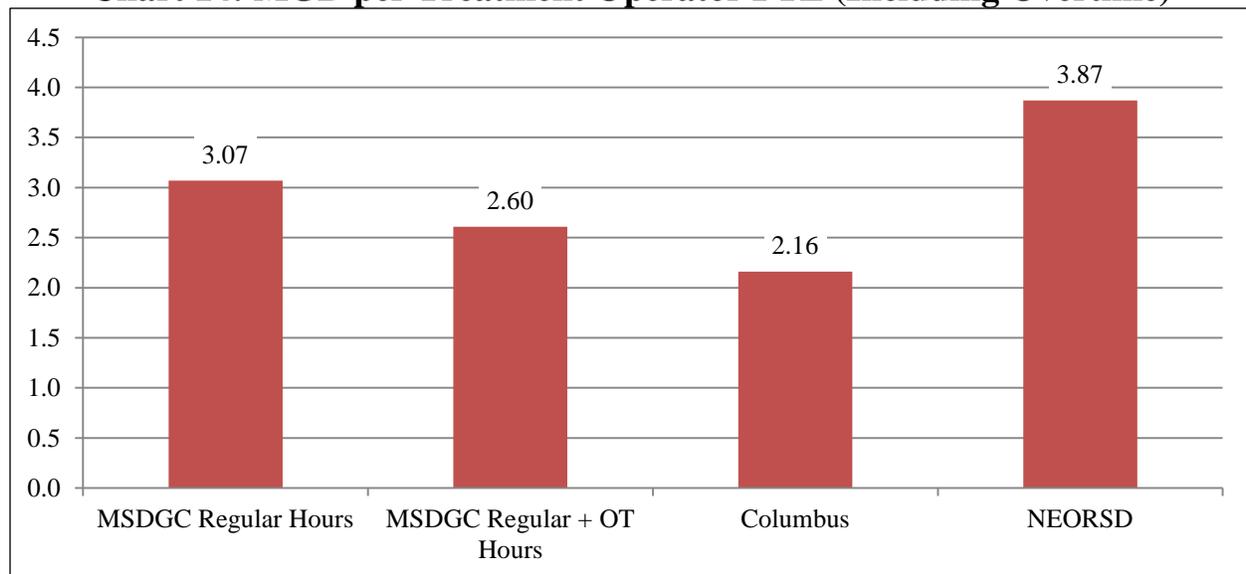
Source: MSDGC and BLS

¹ Data was obtained from the September 2016 Quarterly Report, the latest report as of the completion of this analysis.

As shown in **Table 13**, MSDGC’s total overtime cost as a percentage of total personnel cost was 4.3 percentage points higher than the BLS benchmark. The primary drivers of this variance were two divisions: WWT and WWC. While WWE and Regulatory Compliance Security (RCS) had higher overtime, WWT and WWC were the only two divisions to significantly exceed the benchmark, with 2015 overtime levels that were 6.8 percentage points and 7.2 percentage points higher, respectively.

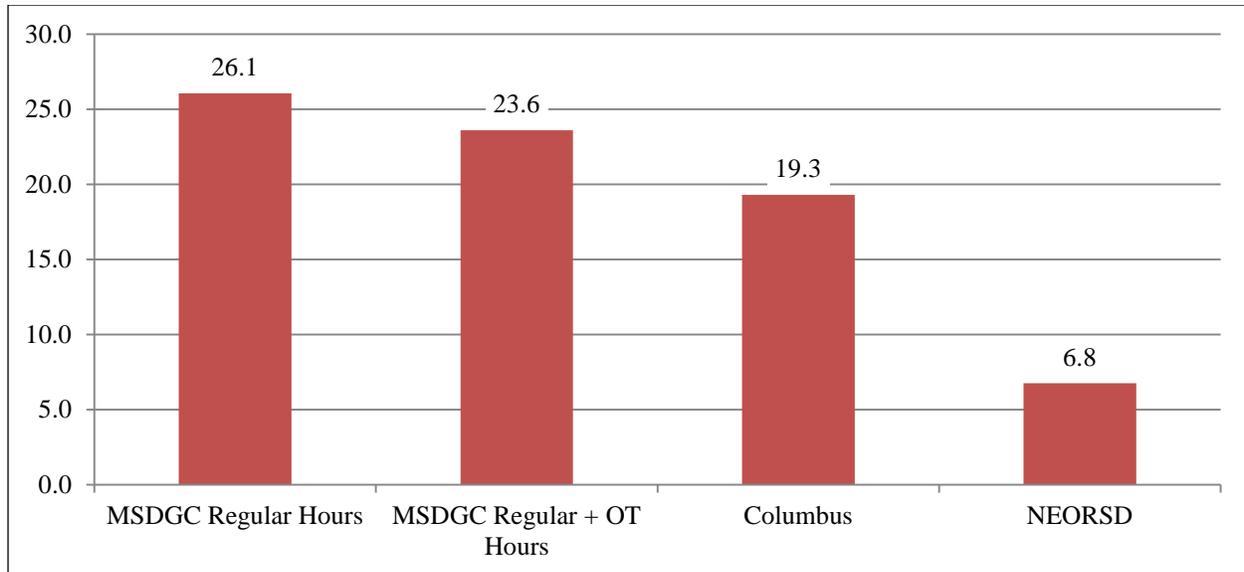
In some circumstances, high overtime can be caused by understaffing relative to the work demanded. Therefore, it is necessary to examine the staffing levels and workload of WWT and WWC to understand if high overtime use is the product of understaffing or potentially unnecessary utilization of overtime. **Chart 14** shows a comparison of million gallons daily (MGD) of wastewater treated per FTE for MSDGC, Columbus, and NEORSRD for 2015. **Chart 15** shows a similar comparison but focuses on collections staffing and uses line miles as the workload measure. In both analyses, MSDGC’s FTEs have been adjusted to include overtime accrued. These analyses provide a relative assessment of the appropriateness of treatment and collections staffing levels using industry measures that normalize comparisons across entities regardless of size.

Chart 14: MGD per Treatment Operator FTE (Including Overtime)



Source: MSDGC, Columbus, and NEORSRD

Chart 15: Line Miles per Collections FTE (Including Overtime)



Source: MSDGC, Columbus, and NEORSD

Note: NEORSD operations do not include maintenance of local sewers and pump stations, as NEORSD is only responsible for interceptors and treatment plants.

As shown in **Charts 14** and **15**, MSDGC's treatment staff workload per FTE (including overtime) falls in between Columbus and NEORSD, while collections staff workload per FTE (including overtime) was significantly higher than both peers. Specifically, MSDGC collections employees are responsible for 4.3, or 22.3 percent, more line mileage per FTE than Columbus' employees and 16.8, or 247.1 percent, more line mileage per FTE than NEORSD's employees. This shows that, even with the higher relative level of overtime included, workload indicators show higher workload per employee. In contrast, higher WWT employee overtime could not be linked to higher work load indicators, indicating the possibility for efficiencies through the reduction of overtime.

WWT and WWC employees accrue overtime due to covering absent shifts, maintaining an excessive maintenance backlog for its treatment plants, and for responding to after-hours sewer backups within consent decree requirements. Currently, four out of MSDGC's seven wastewater treatment plants are staffed 24 hours a day, 7 days a week. The night shift staffing varies by plant, but absences are required to be covered according to current staffing procedures. In 2015, WWT employees worked 39,580 hours of overtime. As shown in **R.6**, however, WWT employees also used a relatively high level of leave time. Specifically, exceeding the BLS leave time benchmark accounted for 2,268 hours, or 5.7 percent, of the overtime hours accrued. In addition, MSDGC has a maintenance backlog for its treatment plants averaging 9.3 weeks per employee, significantly higher than its stated goal of maintaining a two to four week backlog, established by industry standards. WWC, employees are required to respond to reports of sewer backups within four hours, per consent decree requirements. Since WWC does not maintain night staffing, any sewer backups reported after hours incurs overtime.

Excessive overtime leads to higher operational costs and potential for employee burnout. Irrespective of actual staffing levels, MSDGC should take steps such as modifying its minimum staffing requirements; implementing strategies to reduce its maintenance backlog; and

eliminating the accrual of overtime for working more than 8 hours in a day, as allowed by the Fair Labor Standards Act, to reduce its overtime to the BLS benchmark.

Financial Implication: Reducing overtime resulting from leave usage to the BLS benchmark could save approximately **\$74,200** in annual personnel costs. This savings was calculated by reducing the overtime leave hours by 3,000 and applying an average cost per hour of \$32.71.

R.6 Bring paid leave in line with Bureau of Labor Statistics benchmarks

According to the CBA, MSDGC employees are entitled to paid sick leave; 11 paid holidays, including a birthday holiday; vacation leave on an ascending, seniority-based scale; and miscellaneous leave, such as for jury duty. Leave must be approved by a supervisor and leave that an employee is allowed to bank, such as sick and vacation, is tracked using the Cincinnati Human Resource Information System (CHRIS).

Similar to overtime, as part of the *National Compensation Survey*, the BLS also tracks on a quarterly basis the percentage of paid leave as a total of personnel costs for the public sector. **Table 14** shows MSDGC's 2015 paid leave costs as a percentage of total personnel costs for each of its divisions compared to the BLS benchmark for public employers working in a service-providing industry. This analysis provides an overview of not only which divisions are incurring paid leave cost, but also how that cost compares to the benchmark.

Table 14: Paid Leave as Percentage of Personnel Costs

Division/Office	Total Paid Leave Cost	Total Personnel Cost	Paid Leave Percentage	BLS Benchmark ¹	Difference
Office of the Director	\$202,603	\$2,147,427	9.4%	7.1%	2.3%
Wastewater Engineering	\$1,114,012	\$10,153,923	11.0%	7.1%	3.9%
Wastewater Administration	\$584,294	\$5,379,650	10.9%	7.1%	3.8%
Wastewater Treatment	\$1,772,655	\$17,309,031	10.2%	7.1%	3.1%
Wastewater Collections	\$1,075,510	\$8,797,865	12.2%	7.1%	5.1%
Regulatory Compliance Security	\$319,181	\$3,553,366	9.0%	7.1%	1.9%
Total	\$5,068,255	\$47,341,263	10.7%	7.1%	3.6%

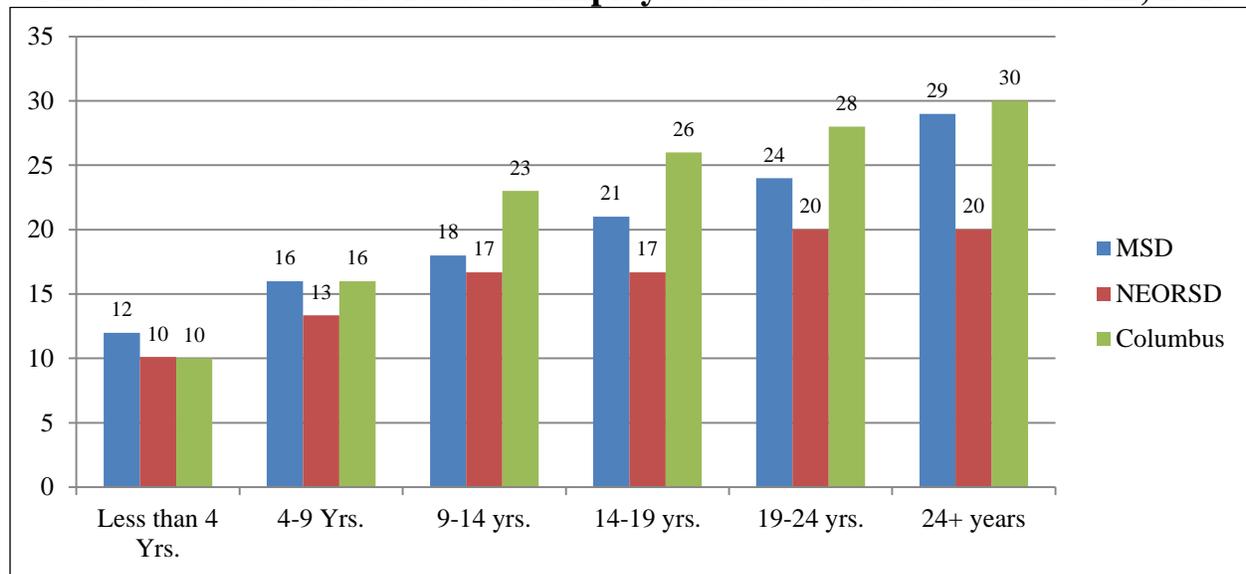
Source: MSDGC and BLS

¹ Data was obtained from the September 2016 Quarterly Report, the latest report as of the completion of this analysis.

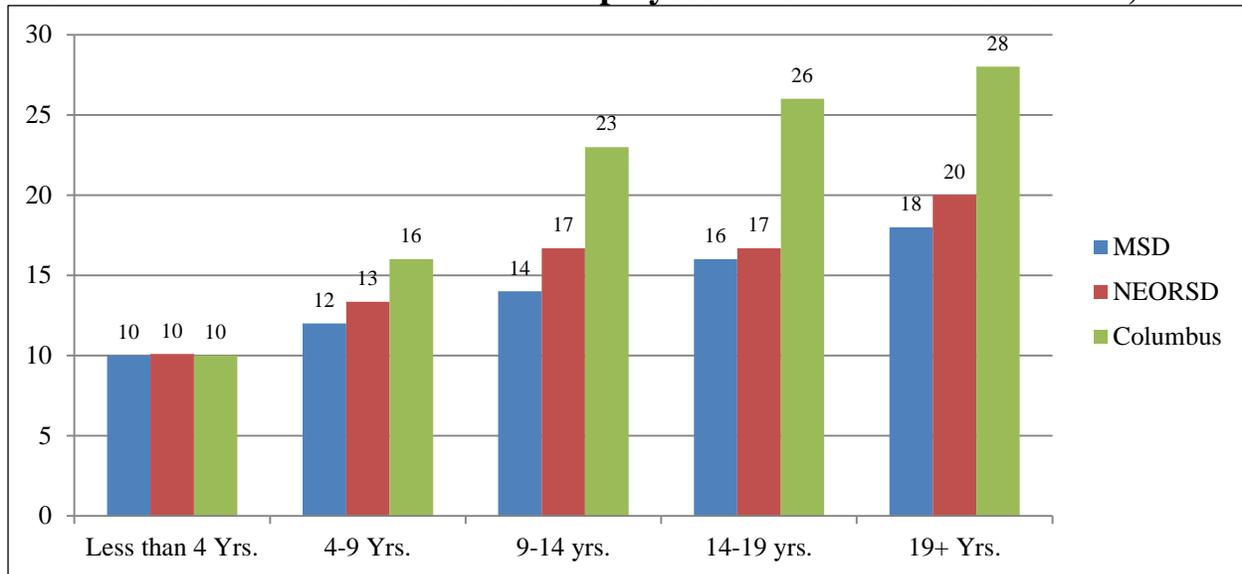
As shown in **Table 14**, MSDGC’s total paid leave cost as a percentage of total personnel cost was 3.6 percentage points higher than the BLS benchmark. Analyzing the data on a divisional level shows that every division exceeded the 7.1 percent benchmark. The most significant variance occurred in WWC, where the 12.2 percent paid leave percentage exceeded the benchmark by 5.1 percentage points.

MSDGC employees have separate leave accrual rates and maximum allowable balance provisions for two employee groups; those hired after December 22, 2013 and those employees hired prior this date. A review of 2015 payroll records shows that 68.6 percent of MSDGC employees are grandfathered into the higher leave entitlement group. **Charts 16 and 17** compare the vacation accrual rates (in days) for both MSDGC employee groups to the accrual rates of Columbus and NEORS. This comparison provides context as to the relative appropriateness of leave accrual rates.

Chart 16: Vacation Accrual for Employees Hired Before December 22, 2013



Source: MSDGC, Columbus, and NEORS

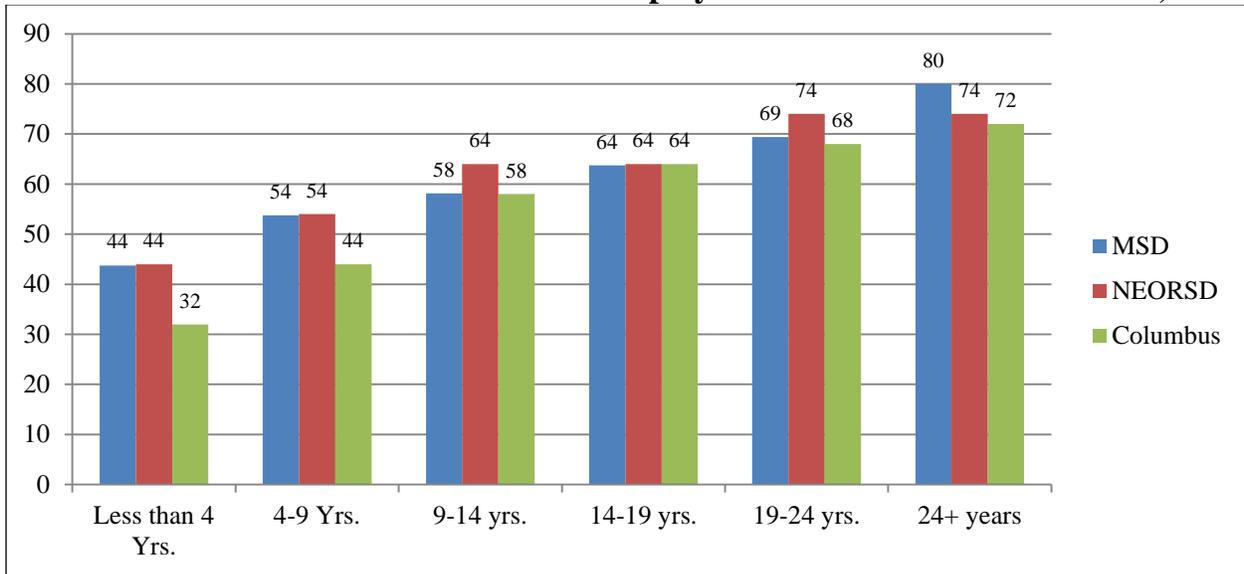
Chart 17: Vacation Accrual for Employees Hired After December 22, 2013

Source: MSDGC, Columbus, and NEORSD

As shown in **Chart 16**, MSDGC employees in the group hired before December 22, 2013 have higher total vacation accrual than the peers. Although only three of the seniority classifications had higher accrual rates, applying the scale over an employee's 30 year career would result in MSDGC employees receiving 617 total vacation days compared to the peer average of 590, a difference of 27 more days. With the split vacation accrual groups, MSDGC has limited accrual rates for newly hired employees. The effect of this can be seen by applying the accrual scale shown in **Chart 17** over a 30 year career, as MSDGC employees hired after December 22, 2013 now accrue a total of 448 total leave days, 142 fewer than the peer average. Although total accrual has been significantly reduced, this leave scale could take a considerable amount of time to have its intended effect, as it is dependent on employee turnover.

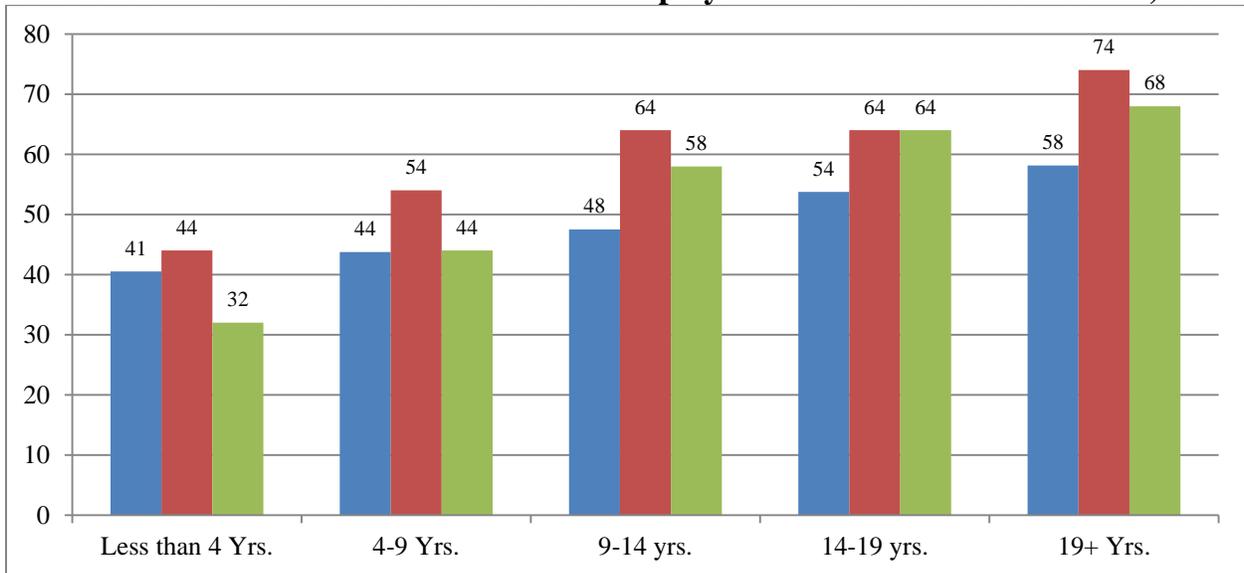
MSDGC employees are also able to bank a higher number of leave days as they gain seniority. Although not to the extent of actual leave accrual rates, the banking of a higher number of leave days could result in an increase in the level of leave used by employees. **Charts 18** and **19** show a comparison of maximum allowable leave balances for both MSDGC employee groups compared to Columbus and NEORSD. This comparison provides context as to the relative appropriateness of leave banking allowances.

Chart 18: Maximum Leave Balance for Employees Hired Before December 22, 2013



Source: MSDGC, Columbus, and NEORS

Chart 19: Maximum Leave Balance for Employees Hired After December 22, 2013



Source: MSDGC, Columbus, and NEORS

As shown in **Chart 18**, MSDGC employees in the group hired before December 22, 2013 are allowed to carry higher leave balances than the peers. For example, an employee with over 24 years of experience can bank up to 80 days of leave, 7 more days than the peer average of 73 days. As with vacation accrual, splitting the allowable balance scales has limited newly-hired employees to bank a higher level of leave time, limiting MSDGC’s exposure to higher leave usage. As shown in **Chart 19**, examining employees in the highest experience bracket, over 19 years, shows that MSDGC employees can accumulate up to 58 days, 13 fewer days than the peer average of 71 days.

In addition to vacation accrual and allowable leave balances, paid holidays were also analyzed. This examination showed that MSDGC employees are allowed a paid birthday holiday, resulting in the provision of one additional holiday over the State of Ohio's 10 paid holidays. Although Columbus provides this holiday to its employees, NEORS does not.

In order to more rapidly bring paid leave in line with the BLS benchmark, MSDGC should further negotiate future CBAs to reduce maximum leave balances for employees hired before December 23, 2013 as well as for the elimination of the birthday holiday. In addition, MSDGC should ensure that current leave policies are being enforced consistently across all divisions; specifically, the provisions governing sick leave that require a doctor's note after five instances of sick leave in a calendar year and proper supervisorial approval of leave including documentation. *Managing Paid Leave Benefits* (RPI Consultants, 2009) recommends employers track paid leave use, including trends, to properly manage the benefit. Doing so could identify any potential abuse while ensuring productivity does not suffer as a result of excessive leave use.

Reducing paid leave use to the BLS benchmark will improve productivity and have an impact on overtime use (see **R.5**). MSDGC should take the steps necessary to ensure paid leave is being properly used and monitored while its corresponding policies are effectively enforced.

R.7 Right-size the passenger vehicle fleet

MSDGC maintains a fleet of 183 passenger vehicles including sedans, sport utility vehicles (SUVs), pick-up trucks, and vans.³¹ These vehicles are used to transport employees to and from City and County offices, treatment facilities, pump stations, construction sites, and for miscellaneous work-related tasks.

The fleet is managed through the WWC division by a full-time fleet manager and maintained by a full-time mechanic. Additional work is performed by City of Cincinnati Fleet Services Division mechanics, whose labor is charged back to MSDGC. Fleet data is collected by Zonar,³² which requires users to input data on the vehicle's condition and mileage, which is then collected to create a history of the vehicle, such as its condition and mileage. That data is then inputted into AssetWorks, a computerized system which tracks preventative maintenance schedules and activities as well as all costs associated with the upkeep of the vehicles. Each vehicle is tracked individually in both Zonar and AssetWorks.

³¹ This represents the fleet count as of August 25, 2016; the most up-to-date information as of the completion of this analysis.

³² Zonar is a fleet-management software program that provides management with data to include location, fuel efficiency, speed, stops, idling, and maintenance needs.

MSDGC has a vehicle utilization policy that is set by the City. The policy mandates a minimum utilization of 350 miles per month for passenger vehicles, which includes administrative vehicles; light trucks/vans; and heavy trucks. During the course of the audit, MSDGC conducted an internal analysis of the fleet's utilization relative to the requirements of this policy. The internal analysis resulted in the identification and elimination of 13 underutilized vehicles, and the creation of pools of vehicles to increase utilization by increasing vehicle sharing. In addition, a key kiosk system has been installed to manage the utilization of the vehicles and gather data on usage beyond just mileage as a singular benchmark. For example, it would be able to provide data for how often a vehicle is taken out of the pool, and for how long, in order to better gauge demand.

The City also recently contracted for a study of fleet management practices specific to the Public Services Department through Public Financial Management, Inc. (PFM). The methodology used by PFM includes calculating a full-time equivalent vehicle (FTEV). This is done by taking the total mileage driven in a year and dividing by the annual utilization policy mileage to determine actual FTEVs needed. Vehicles that are utilized less than the annual mileage threshold are considered candidates for reduction.

Fleet policies vary across organizations. For example, the Ohio Department of Administrative Services (DAS) follows ORC § 125.832(O)(2), which requires it to “annually establish the number of business miles an employee of a state agency must drive in order to qualify for approval by the department to receive a motor vehicle for business use.” For fiscal year 2015-16 the mileage breakeven point was calculated by DAS to be 6,500 miles. Also, the Ohio Department of Transportation (ODOT) has an established replacement plan that sets the replacement for the majority of its vehicles at 10 years and/or 120,000 miles, which translates to 12,000 minimum miles in each fiscal year.

Table 15 shows an analysis of MSDGC's fleet using the City policy; the average of the utilization policy of three peer cities used in the PFM report (i.e., Columbus, OH; Cleveland, OH; and Lexington, KY); the replacement guideline used by DAS; and the ODOT replacement criteria. This examination serves to show potential rightsizing of MSDGC's fleet under these four different utilization scenarios.

Table 15: Fleet Utilization Analysis

	City Policy	PFM Peer Average	DAS	ODOT
Total Vehicles	183	183	183	183
Benchmark Mileage (Annual)	4,200	6,500	6,500	12,000
Low Mileage Vehicles	61	113	113	159
FTEV Count	42	70	70	71
Proposed Reduction	19	43	43	88
MSD Reduction	13	13	13	13
Net Reduction	6	30	30	75

Source: MSDGC, PFM, DAS, and ODOT

As shown in **Table 15**, MSDGC is underutilizing its fleet by at least six vehicles and possibly by as many as 75 vehicles, depending on the benchmark applied. As a result, MSDGC is maintaining a larger fleet than is needed for its operations.

Table 16 shows the financial impact of reducing MSDGC's fleet to bring it in line with each of the benchmarks. This analysis shows the potential impact that right sizing MSDGC's fleet may have on MSDGC's budget moving forward.

Table 16: Financial Impact of Fleet Right-Sizing

	City Policy	PFM Peer Avg.	DAS Policy	ODOT Policy
Vehicle Reductions	6	30	30	75
Total Operating Cost Savings	\$47,990	\$129,314	\$129,314	\$433,820
Deferred Purchase Cost ¹	\$164,038	\$823,250	\$823,250	\$2,309,026
Total Revenue Enhancement	\$20,025	\$100,500	\$100,500	\$248,918

Source: MSDGC

¹ MSDGC's actual 2016 average purchase cost per vehicle of \$27,021 was used to calculate the deferred purchase cost.

Note: Total revenue enhancement has been reduced to account for the 15.0 percent auction fee charged by GovDeals.

Financial Implication: Reducing its underutilized vehicles to meet, at minimum, the City policy could save approximately **\$47,900** per year in vehicle operating costs and provide a one-time revenue enhancement of approximately **\$20,000**.

During the course of the audit, MSDGC eliminated eight vehicles in addition to the six vehicles included in Table 15.

R.8 Standardize timekeeping process with an integrated system

MSDGC does not have a single, standardized process for completing and reviewing the time keeping process that is used by all of the divisions. While all data must be input into CHRIS for payroll processing, the steps prior to final input vary across the divisions. In addition, there are multiple timekeeping systems in place. For example, the WWT division tracks employee's sign-in and sign-out times using Maximo, an electronic timekeeping system; the WWC division uses Kronos, another electronic timekeeping system; and the IT function monitors the times its employees enter its secured workspace as time worked instead of using a timekeeping system. WWT requires employees to print out physical copies of timesheets, attach additional documentation as needed for leave or overtime, and submit for supervisory review and signature. The documentation is then scanned and sent to Wastewater Administration (WWA) for final approval. The IT group within WWA has employees enter time, as well as all leave and overtime requests, electronically. Supervisors are able to review and approve timesheets electronically, which eliminates the use of paper forms. MSDGC's remaining divisions currently have a mix of paper and electronic timekeeping. MSDGC is in the process of implementing Kronos organization-wide in 2017.

Time and Attendance Strategies: Beyond Compliance and Payroll Accuracy (Aberdeen Group, 2011) finds that integration of payroll, scheduling, and leave management is a best practice amongst well-performing organizations. The use of technology helps to improve accuracy and

reduce payroll errors by integrating the payroll system and absence/leave management. In addition, having a fully-integrated payroll and leave management system could prevent errors from occurring again due to the elimination of paper forms.

According to *HR Process Standardization & KPI's* (Aason, 2014), organizations should gather stakeholders to discuss streamlining the payroll process in order to develop key performance indicators to assess the efficiency and effectiveness of the current payroll process. Doing so will identify any issues with the current process, potentially leading to standardization that could yield enterprise-wide best practices and greater efficiency and reduced costs.

Integrating the timekeeping and leave management system and streamlining the process will lead to more efficiency through the elimination of variation. MSDGC could reduce the instances of record retention errors through the use of an integrated system while potentially reducing the hours needed to process payroll each pay period.

Appendix A: Additional Analysis

Greater Cincinnati Water Works (GCWW) provides billing services to MSDGC customers. The cost of this service is based on an allocation model that was included in the original agreement formed in 1968. **Table A-1** shows comparison of billing costs for MSDGC, Columbus, and NEORSRD for 2015. This analysis shows how cost effective MSDGC's billing function through GCWW is relative to other sewer entities.

Table A-1: Billing Cost Analysis

	MSDGC	Columbus	NEORSRD
Operating Revenues	278,226,000	250,153,000	\$280,430,000
Billing Cost	4,404,762	12,804,351	7,870,531
Customer Accounts	211,999	272,433	326,496
Billing Cost as Percentage of Revenues	1.6%	5.1%	2.8%
Billing Cost per Account	\$20.78	\$47.00	\$24.11

Source: MSDGC, Columbus, and NEORSRD

As shown in **Table A-1**, MSDGC's billing function through GCWW was significantly lower in cost than Columbus and NEORSRD when examined as a percentage of revenues and per account.

Appendix B: Abbreviated Terms and Acronyms

Agreement – the 1968 Agreement
AOS – Auditor of State
AWWA - American Water Works Association
BLS - Appendix: Scope and Objectives
Board - Board of County Commissioners of Hamilton County
CDM – CDM Smith
CHRIS - Cincinnati Human Resource Information System
CNI - Computer-Networking Infrastructure
CIP – Capital Improvement Program
City – the City of Cincinnati
Columbus - City of Columbus, Division of Sewerage & Drainage
CSS – Combined Sewer System
County – Hamilton County
CPI – Consumer Price Index
CR – County Review
CSO – Combined Sewer Overflow
CWA - Clean Water Act
DAS - Ohio Department of Administrative Services
FTE – Full-time Equivalent
FTEV – Full-time Equivalent Vehicle
GAGAS – Generally Accepted Government Auditing Standards
IT – Information Technology
KPI – Key Performance Indicators
LTCP – Long Term Control Plan
MSDGC – Metropolitan Sewer District of Greater Cincinnati
MG – Million Gallons
MGD – Million Gallons Daily
MOU – Memorandum of Understanding
NACWA - National Association of Clean Water Agencies
NEORS - Northeast Ohio Regional Sewer District
ODOT – Ohio Department of Transportation
OPT – Ohio Performance Team
ORANSCO - Ohio River Valley Water Sanitation Commission
ORC – Ohio Revised Code
PFM - Public Financial Management, Inc.
PTI – Permit to Install
RCS - Regulatory Compliance Security
SCADA - Supervisory Control and Data Acquisition
SSO - Sanitary Sewer Overflow
SUV – Sport Utility Vehicle
USC – United States Code
WIB – Water in Basement

WWA - Wastewater Administration
WWC – Wastewater Collections
WWE – Wastewater Engineering
WWIP - Final Wet Weather Improvement Program
WWT – Wastewater Treatment
YTD – Year-to-Date

Appendix C: Estimated County Monitor Savings

Table C-1 shows the County's November 2016 estimate of realized savings as a result of the monitoring function.

Table C-1: Estimated Realized Savings

Risk/Issue	Approximate Economic Benefit
Identified that the Spring 2012 OOD plan for the Lower Mill Creek Partial Remedy (LMCPR) alternative solution exceeded \$300 million v. WWIP budget of \$244.3 million.	\$70.0 million
Fall of 2012 identified incorrect application of project cost escalation factors by MSD which, if not corrected, would have resulted in costs more than \$18 million over the LMCPR's \$244.3 million budget.	\$18.0 million
In 2012, identified over \$61 million in authorized, but unspent, spending authority for de-legislation.	\$61.0 million
In 2013, identified \$4 million of unbilled Duke Energy reimbursable costs due to MSD.	\$4.0 million
Identified that MSD's proposed \$5 million renovation of an Administration building was significantly above industry average.	\$5.0 million
In 2013, identified \$15 million in authorized, but unspent, spending authority for de-legislation.	\$15.0 million
During 2012-2014, identified that MSD's a plan to eliminate SSO 700 was greater than \$100M more than the Final WWIP budget. MSD had no alternative plan to bring the cost within the WWIP budget. The Monitor team proposed the use of the Integrated Watershed Management approach to identify alternatives that could be performed within the WWIP budget and provide superior community benefits and Water Quality improvement for the County and 14 political jurisdictions.	\$106.0 million
In 2014, identified unspent and unneeded appropriated budget amounts within the CIP of \$114 million for de-legislation.	\$114.0 million
Identified \$19.2 million in budget reduction opportunities during the 2014 MSD operating budget review.	\$19.2 million
Identified \$78.5 million in budget reduction opportunities during the 2014 MSD capital improvement budget review.	\$78.5 million
In August 2014, identified opportunity for MSD to reallocate \$6.3 million in funds rather than have the BOCC legislate this amount.	\$6.3 million
Identified that MSD's planned approach to the Werk and Westbourne WWIP projects were projected at \$73 million (over twice the WWIP final budget). Monitor recommended a \$51 million alternative accepted by the Regulators in January 2015.	\$22.0 million
In 2014, MSD presented a \$1 million Stout Avenue project. The Monitor identified that the model used for design was not calibrated or validated and requested that MSD finalize the model prior to bringing legislation forward and starting the project. After proper model calibration and validation, MSD determined that the project would not solve the issue and withdrew the project.	\$1.0 million
Identified \$14 million in savings in the 2015 operating budget proposed by MSD (net of debt) (\$110.6M v. \$124.6 M) while still preserving critical operations.	\$14.0 million
Identified \$33 million in project savings in the 2015 capital improvement budget proposed by MSD (\$330M proposed vs. \$297M actual).	\$33.0 million
The June 2015 Monitor focus on Greater Cincinnati Water Works customer services billings charged to MSD resulted in MSD performing an analysis and discovering a fiscal year 2012 credit due to MSD.	\$165,000
In 2015, identified unspent and unneeded appropriated budget amounts within the CIP of \$64 million for de-legislation.	\$64.0 million
In 2015, identified unspent and unneeded appropriated budget amounts within the CIP Contingency of \$7 million for de- legislation.	\$7.0 million

Risk/Issue	Approximate Economic Benefit
In 2015, identified unspent and unneeded appropriated budget amounts within the CIP Allowances of \$3 million for de-legislation.	\$3.0 million
Identified \$14 million in budget reduction opportunities during the 2016 MSD operating budget review while still preserving critical operations.	\$14.0 million
Identified \$38.5 million in budget reduction opportunities during the 2016 MSD capital improvement budget review.	\$38.5 million
Capital cost savings achieved related to CSO's 194, 195, 525 during the planning and negotiation phases.	TBD
Capital cost savings achieved related to the SSO 700 default during the planning and negotiation phases.	TBD
Identified \$TBD million in budget reduction opportunities during the 2017 MSD operating budget review while still preserving critical operations.	TBD
Identified \$TBD million in budget reduction opportunities during the 2017 MSD capital improvement budget review.	TBD
Total Approximate Realized Savings	\$693.0 million

Source: County

Table C-2 shows the County's November 2016 estimate of prospective savings as a result of the monitoring function.

Table C-2: Estimated Realized Savings

Risk/Issue	Approximate Prospective Economic Benefit
Identified that MSD's planned approach to the Upper Duck Creek WWIP projects was projected at \$45 million over the WWIP budget.	\$45.0 million
Performed conceptual analysis that could yield \$60-\$70 million in reduced costs to MSD's current LM CPR plan.	\$60.0-\$70.0 million
Additional design, construction and other cost savings MSD will realize by not relocating the fire station currently within the expanded LM CPR footprint (which is contacted to the size previously authorized by the County and the regulators through the analysis performed related to the item above).	\$29.0 million
In 2015, identified \$80 million in CIP budget amounts for de-legislation compared to the \$20 million identified by MSD.	\$60.0 million
Reached tentative agreement with Regulators to not have to "make-up" Lick Run short fall in overflow volume.	\$80.0-\$130.0 million
Identified \$2 million in efficiencies and improvements for consent decree projects during review of MSD's Post Construction Monitoring Plan.	\$2.0 million
Reduced ratepayer debt when drafted a Program Contingency policy which minimizes the amount of project contingency required to support the CIP.	TBD
Total Approximate Prospective Savings	\$300.0 million

Source: County

Appendix D: Scope and Objectives

Generally accepted government auditing standards require that a performance audit be planned and performed so as to obtain sufficient, appropriate evidence to provide a reasonable basis for findings and conclusions based on audit objectives. Objectives are what the audit is intended to accomplish and can be thought of as questions about the program that the auditors seek to answer based on evidence obtained and assessed against criteria.

In consultation with the City and MSDGC, OPT identified the following scope areas for detailed review: governance structure, staffing, contracted and professional services, payroll systems, and billing services. Based on the agreed upon scope, OPT developed objectives designed to identify improvements to economy, efficiency, and/or effectiveness. **Table D-1** shows the objectives assessed in this performance audit and references the corresponding recommendation when applicable. Four of the seven objectives did not yield a recommendation.

Table D-1: Audit Objectives and Recommendations

Objective	Recommendation
Determine the appropriateness of the level of contracted services used through an examination of the cost of contracted services versus in-house services, including an examination of contract multipliers.	NA and Noteworthy Accomplishment
Determine the appropriateness of the level of contracted services used through an examination of the cost of professional services versus in-house services.	N/A and Noteworthy Accomplishment
Identify opportunities to improve the payroll process through an examination of the efficiency and/or effectiveness of the current system in relation to industry standards, leading practices, and/or peer data.	R.8
Determine the impact of the current governance structure on revenues and expenditures and identify opportunities to improve the efficiency and/or effectiveness.	R.1
Determine the appropriateness of personnel costs using industry standards, leading practices, and/or peer data and identify opportunities for increases in efficiency.	R.2, R.3, R.4, R.5, and R.6
Identify opportunities to improve the customer billing function through an examination of the efficiency and/or effectiveness of the current system in relation to industry standards, leading practices, and/or peer data.	Appendix A
Identify opportunities to improve fleet management function through an examination of the efficiency and/or effectiveness of the current system in relation to industry standards and/or leading practices.	R.7

Client Response

The letter that follows is the City's official response to the performance audit. Throughout the audit process, staff met with City officials to ensure substantial agreement on the factual information presented in the report. When the City disagreed with information contained in the report, and provided supporting documentation, revisions were made to the audit report.

February 23, 2017

Mr. Dave Yost
Auditor of the State of Ohio
88 East Broad Street, 5th Floor
Columbus, Ohio 43215

RE: Performance Audit of the Metropolitan Sewer District of Greater Cincinnati

Dear Mr. Yost,

On February 4, 2016 the State of Ohio Auditor's office started the process of a special audit of the Metropolitan Sewer District of Greater Cincinnati (MSDGC.) This "Level 1" audit was also accompanied by a Performance Audit aimed at providing an assessment of MSDGC efficiency and effectiveness. The Metropolitan Sewer District of Greater Cincinnati would like to thank you for conducting the two audits, the Performance Audit and the Special Audit. We have received the first of the two audits, the Performance Audit, and have reviewed the findings. I would like to commend your staff, the Ohio Performance Team (OPT), for their intensive research and efforts to understand this very complicated organization.

MSDGC is satisfied with and supports the findings of the Performance Audit. The audit was thorough and reflects well on our management of the District. MSDGC strives to meet the principles that guide an efficient and effective organization while providing its ratepayers an excellent return on their investment. The Performance Audit includes eight (8) recommendations that total less than \$2 Million in potential savings in our \$100 million operating budget. We will continue to look for more opportunities to improve our processes and find efficiencies. We welcome these audit recommendations and have already implemented several changes.

BENCHMARKING

MSDGC recognizes the difficulties of comparing its performance with some peer agencies and also with National data. Throughout the performance document, MSDGC is mainly benchmarked against the Bureau of Labor Statistics and two other agencies that are similar in size and located in Ohio.

Bureau of Labor Statistics: The Service Industries which includes the Utility sector also includes other industries that are very different from the work of MSDGC. We are unsure of the appropriateness of such comparison, since the industries that are parts of this sector vary in size, duty and labor environment. A case in point is for the issue of paid leave. Compared to the peer agencies (Columbus and NEORS,) as well as Hamilton County and even State employees, MSDGC is either at or below the amount of time earned both as vacation and as sick time, but compared to the BLS, MSD is higher than the benchmark.

Peer Agencies: All peer agencies have local circumstances that should be considered when comparing data. As an example, the Northeast Ohio Regional Sewer District (NEORS) is only responsible for

Interceptors and Treatment processes, which means that the costs of operation and maintaining local sewers is not included in its budget and consequently, in its cost of services. In comparison, MSDGC spends 39.7% of its budget on operating and maintaining over 3000 miles of “local” sewer including pump stations.

IN SUMMARY:

- MSDGC has done exemplary work in containing its operating expenses. Table 7 shows that in the last 10 years, the operating expenses of the utility have only increased by 1% compounded annually. This increase compares very favorably with Columbus (increase of 1.25%) and NEORS (increased by 3.46 %.) *This minimal increase in Operating expenses saved over **\$10 million** (compared to Columbus) or over **\$100 million** (Compared to NEORS) to MSDGC ratepayers over the last 10 years.*
- Billing costs (service provided by GCWW) are less than any comparable agencies, and notably, a third of what Columbus pays (Appendix A) for similar service, or a savings of about **\$8 million annually compared to Columbus or \$3.75 million compared to NEORS.**
- Fleet has already been reduced to a level below the recommended level of the Performance Audit Recommendation **R.7** (Table 15,) or a savings of about **\$70,000 annually.** We have exceeded the Auditor’s recommendation by 4 vehicles, and are still assessing per the MSDGC plan provided in January 2016.
- Supplemental or contractual employees have been reduced, and with the hiring of City staff, have seen savings both in Operating and Capital funds (Page 2) or a savings of about **\$3.4 million annually.**
- MSDGC cost per gallon of sewage treated is much less than for Columbus and slightly less than NEORS if the adjustment for local sewers is acknowledged (Chart 8 and Chart 14.)
- MSD employees take care of 22% more underground pipe lines per employee than their colleagues in Columbus and NEORS is not comparable because they do not maintain local sewers (Chart 15).
- The average annual customer cost (Chart 4,) is less for MSDGC than for Columbus and for NEORS (adjusted for local sewer issue.)
- Time off taken by MSDGC employees, though higher than the BLS is in par with peer agencies as well as Hamilton County and the State of Ohio.
- On the issue of IT and Service Dispatching, MSDGC has used different benchmarks, for example IT uses Gartner Report as a benchmark. Going forward we will include the State’s benchmarking and continue to monitor both sets of benchmark and further assess performances. *MSDGC analysis can be provided upon request.*
- In addition, we whole heartedly support the main recommendation “R1” that reinforces the continued claims of MSDGC that the process of the monitoring function is inefficient. And further agree with the State assessment (page 24) that savings claimed by the County monitor are “a duty already inherent” of the County (i.e. to de-legislate savings created by MSDGC) and not actual tangible savings. *MSDGC analysis can be provided upon request.*

CONCLUSION:

For the purpose of the Audit, MSDGC put in place a “rapid response team” to insure that requests for information would be promptly answered. The City of Cincinnati’s top administrator, the City Manager, unequivocally requested total transparency and cooperation from MSDGC, a message that was delivered several times by me, MSDGC Director, to all staff at all levels, encouraging employees to meet privately with auditors as they found it necessary. We understand that many employees took advantage of this request and spoke to the Auditor’s teams. MSDGC appreciates the Auditor’s note (page 2) expressing “their appreciation to the elected officials, management and employees of the Metropolitan Sewer District of Greater Cincinnati for their cooperation and assistance throughout the audit.” We viewed the auditor’s team as a group of professionals assessing with “fresh eyes” our practices and helping us assess our operation.

The timing of the Audit is excellent as the City of Cincinnati and Hamilton County are in discussion about the future status of our organization. Such in-depth analysis is essential for putting the “new” (post 1968 Agreement) MSDGC on the right track.

The Performance audit provided by the State of Ohio is very thorough and we appreciate the time taken in carefully providing an objective assessment. The findings confirm that MSDGC is a performant organization, providing good return on investment to its ratepayers, with strong leadership within the context of a strong City Administration. We are looking forward to the findings of the forthcoming special audit.

Sincerely,



Gérald Checco
Director

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Dave Yost • Auditor of State

**METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
HAMILTON COUNTY**

CLERK'S CERTIFICATION

This is a true and correct copy of the report which is required to be filed in the Office of the Auditor of State pursuant to Section 117.26, Revised Code, and which is filed in Columbus, Ohio.

Susan Babbitt

CLERK OF THE BUREAU

**CERTIFIED
FEBRUARY 28, 2017**