Madison Sewage Collection SystemLast Updated:
6/26/2020Reporting For:
2019

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1. Provider of Financial Info	ormation		
Name:	Steve Danner-Rivers		
Telephone:	(608) 261-9689	(XXX) XXX-XXXX	
E-Mail Address		, ,	
(optional):	sdannerrivers@cityofmadison.com	٦	
		_	
 2. Treatment Works Operate 2.1 Are User Charges or of treatment plant AND/OR composed Yes (0 points) □□ No (40 points) If No, please explain: 	ther revenues sufficient to cover O&M e	xpenses for your wastewater	
Year:	narge System or other revenue source(s	s) last reviewed and/or revised?	
2020 ● 0-2 years ago (0 points)			0
o 3 or more years ago (20			
N/A (private facility)			
	I account (e.g., CWFP required segregate le for repairing or replacing equipment form?	·	
O No (40 points)			
•	JBLIC MUNICIPAL FACILITIES SHALL CO	OMPLETE QUESTION 3]	
Year:	nent Replacement Fund last reviewed an	d/or revised?	
2019 ■ 1-2 years ago (0 points)			
o 3 or more years ago (20	•		
O N/A			
If N/A, please explain:			
3.2 Equipment Replaceme	ent Fund Activity		
• • •	eported on Last Year's CMAR	\$ 406,171.03	
audit correction, withdrawa	cessary (e.g. earned interest, al of excess funds, increase	\$ 0.00	
making up previous shortfa 3.2.3 Adjusted January 1s		\$ 406,171.03	
3.2.4 Additions to Fund (e			
earned interest, etc.)	+	\$ 780,100.00	

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3.2.5	Subtra	ctions	from	Fund	(e.g	., equi	pme	nt
replac	ement,	major	repai	irs - ι	use d	escript	tion	box
3.2.6.	1 below	*)						

\$ 707,847.96

3.2.6 Ending Balance as of December 31st for CMAR Reporting Year

\$ 478,423.07

All Sources: This ending balance should include all Equipment Replacement Funds whether held in a bank account(s), certificate(s) of deposit, etc.

3.2.6.1 Indicate adjustments, equipment purchases, and/or major repairs from 3.2.5 above.

James St Lift Station Replacement

Telemetry/Controls Upgrade at Cherokee 1, Commodore & Debs Lift Stations Pump Replacement at Commodore & Midtown Lift Stations

3.3 What amount should be in your Replacement Fund?

0.00

Please note: If you had a CWFP loan, this amount was originally based on the Financial Assistance Agreement (FAA) and should be regularly updated as needed. Further calculation instructions and an example can be found by clicking the SectionInstructions link under Info header in the left-side menu.

- 3.3.1 Is the December 31 Ending Balance in your Replacement Fund above, (#3.2.6) equal to, or greater than the amount that should be in it (#3.3)?
- Yes
- O No

If No, please explain.

4. Future Planning

- 4.1 During the next ten years, will you be involved in formal planning for upgrading, rehabilitating, or new construction of your treatment facility or collection system?
- Yes If Yes, please provide major project information, if not already listed below. □□
 No

Project #	Project Description		Approximate Construction Year
	Sewer Impact Fee Districts: This program extends sanitary sewer service to developing areas of the City that require sewer infrastructure installation. The program is funded entirely by Impact Fees, and review for planned projects is conducted annually as dictated by demand for development. Amount shown is the estimate for 2020-2022.	5,282,000	
	Sewer Reconstruction: This project involves the replacement of older, problematic sewers in coordination with the City's Street Reconstruction and Pavement Management Program or as 'stand alone' projects. Typically this provides for the replacement of clay sewers that are difficult to maintain, nearing the end of their service life, have significant repair costs or are undersized. Also, the Sewer Utility encourages residents to replace the portion of their sewer lateral that lies within the public right-of-way by offering to fund 75% of the cost. Six-inch mains under streets that are being reconstructed will be replaced because they do not meet current codes. Sewers beneath streets being resurfaced are evaluated for replacement on a case-by-case basis. Amount shown is the estimate for 2020-2025.	69,441,000	

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	Trenchless Sewer Rehabilitations: This program rehabilitates failing sewers that meet certain criteria but do not necessitate the need for a complete replacement by means of open cutting. New technology allows the lining of existing sewer mains using cameras and remote controlled tools. Some are also rehabilitated (or lined) to address inflow and infiltration problems, where clear water flow enters the sewer system, reducing pipe capacity and increasing treatment costs. The amount budgeted will repair approximately seven miles of sewer main at a number of strategically selected locations, based on citywide need. This item may also include replacement of inaccessible sewers by a 'direct bore' method, which is a relatively new technology for replacement of gravity sewer mains. Backyard sewer mains are a focus. Amount shown is the estimate for 2020-2025.	9,884,000	
4	Citywide Pumping Stations-Emergency Power Stationary Generators: This program funds the installation of emergency power stationary generators at the City's pumping stations. The goal of the program is to ensure continuous service in the event of a power loss. Amount shown is for 2020-2025.	350,000	

5. Financial Management General Comments

Annually, the City of Madison adopts a Capital Budget which funds equipment replacement and infrastructure improvements, listed in a project format. Each project is reviewed and the funding amount for the next budget year is determined. In addition, the budget details future year estimates for the five subsequent years for each project.

ENERGY EFFICIENCY AND USE

- 6. Collection System
- 6.1 Energy Usage
- 6.1.1 Enter the monthly energy usage from the different energy sources:

COLLECTION SYSTEM PUMPAGE: Total Power Consumed

Number of Municipally Owned Pump/Lift Stations: 30

	Electricity Consumed (kWh)	Natural Gas Consumed (therms)
January	58,276	259
February	54,194	237
March	54,267	171
April	46,536	42
May	45,022	14
June	40,642	32
July	43,415	24
August	44,492	46
September	45,662	27
October	47,366	34
November	52,063	89
December	60,081	196
Total	592,016	1,171
Average	49,335	98

6.1.2 Comments:

Gas usage is higher due to adding additional gas fired generators at several lift stations.

- 6.2 Energy Related Processes and Equipment
- 6.2.1 Indicate equipment and practices utilized at your pump/lift stations (Check all that apply):

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☐ Comminution or Screening		
☑ Extended Shaft Pumps		
☑ Pneumatic Pumping		
SCADA System System		
Submersible Pumps		
☐ Variable Speed Drives		
☐ Other:		
6.2.2 Comments:		
6.3 Has an Energy Study been performed for your pump/lift stations?		
• No		
o Yes		
Year:		
By Whom:		
,		
Describe and Comment:		
6.4 Future Energy Related Equipment		
6.4.1 What energy efficient equipment or practices do you have planned for pump/lift stations?	or the future for	your
The City plans to replace five lift stations within the next 5 years because excessive repair work or they have reached the end of their service life(5 numbs and equipment will be more energy efficient than the old equipment	0+ years old). 7	

Total Points Generated	
Score (100 - Total Points Generated)	100
Section Grade	Α

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Sanitary Sewer Collection Systems

 Capacity, Management, Operation, and Maintenance (CMOM) Program Do you have a CMOM program that is being implemented?
• Yes
○ No
If No, explain:
1.2 Do you have a CMOM program that contains all the applicable components and items
according to Wisc. Adm Code NR 210.23 (4)?
• Yes
o No (30 points)
o N/A
If No or N/A, explain:
1.3 Does your CMOM program contain the following components and items? (check the
components and items that apply)

☑ Goals [NR 210.23 (4)(a)] Describe the major goals you had for your collection system last year:

Goals & Objectives

A. DNR Required

The City of Madison's CMOM program is designed to ensure that the following general standards as articulated in NR 210.23 are met:

- 1. The sewage collection system is properly managed, operated, and maintained at all times.
- 2. The sewage collection system provides adequate capacity to convey all peak design flows.
- 3. All feasible steps are taken to eliminate excessive infiltration and inflow as defined in s. NR 110.03 (13c), cease sanitary sewer overflows and sewage treatment facility overflows and mitigate the impact of such overflows on waters of the state, the environment, and public health.
- 4. A process is in place to notify the public and other directly affected parties of any incidents of overflows from the sewerage system.
- 5. Annual reports are submitted in accordance with the provisions of ch. NR 208.
- B. MSU Specific

The City of Madison's goals for the operation and maintenance of its wastewater collection system are:

- Convey wastewater to the Nine Springs Wastewater Treatment Plant with minimum inflow, infiltration and exfiltration.
- Prevent public health hazards.
- Reduce inconvenience and damage by responsibly handling service interruptions.
- Eliminate claims and legal fees related to backup by providing immediate, concerned and efficient service to all emergency calls.
- Protect municipal investment by increasing the useful life and capacities of the system and parts.
- Use operating funds efficiently.
- Perform all activities safely and avoid injury.

Did	vou	accomplish	them?
Diu	you	accomplish	CITCITI:

Yes

O No

If No, explain:

 \boxtimes Organization [NR 210.23 (4) (b)] \square

Does this chapter of your CMOM include:

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□ Lift Station Evaluation Report

☑ Others:

Last Updated: Reporting For: 6/26/2020 2019 ☐ Organizational structure and positions (eg. organizational chart and position descriptions) ☑ Internal and external lines of communication responsibilities ☑ Person(s) responsible for reporting overflow events to the department and the public □ Legal Authority [NR 210.23 (4) (c)] What is the legally binding document that regulates the use of your sewer system? Chapter 35 of the Madison General Ordinances The Public Sewage System If you have a Sewer Use Ordinance or other similar document, when was it last reviewed and 2019-04-29 revised? (MM/DD/YYYY) Does your sewer use ordinance or other legally binding document address the following: □ Private property inflow and infiltration Mew sewer and building sewer design, construction, installation, testing and inspection ☐ Rehabilitated sewer and lift station installation, testing and inspection Sewage flows satellite system and large private users are monitored and controlled, as necessary □ Fat, oil and grease control ☑ Enforcement procedures for sewer use non-compliance ☑ Operation and Maintenance [NR 210.23 (4) (d)] Does your operation and maintenance program and equipment include the following: ☑ Equipment and replacement part inventories ☑ Up-to-date sewer system map A management system (computer database and/or file system) for collection system information for O&M activities, investigation and rehabilitation ☑ A description of routine operation and maintenance activities (see question 2 below) □ Capacity assessment program ☐ Basement back assessment and correction □ Regular O&M training ☑ Design and Performance Provisions [NR 210.23 (4) (e)]
☐ ☐ What standards and procedures are established for the design, construction, and inspection of the sewer collection system, including building sewers and interceptor sewers on private property? ☑ State Plumbing Code, DNR NR 110 Standards and/or local Municipal Code Requirements □ Construction, Inspection, and Testing ☑ Others: City of Madison Standard Specifications for Public Works Construction \square Overflow Emergency Response Plan [NR 210.23 (4) (f)] \square Does your emergency response capability include: ☑ Responsible personnel communication procedures ☑ Response order, timing and clean-up ☑ Public notification protocols ☑ Annual Self-Auditing of your CMOM Program [NR 210.23 (5)]
☐ ☐ ☑ Special Studies Last Year (check only those that apply): ☑ Infiltration/Inflow (I/I) Analysis ☑ Sewer Evaluation and Capacity Managment Plan (SECAP)

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I/I Analysis- The City has 3 areas where we have been focusing our efforts to reduce I/I due to observing high pump run times at the pumping stations that serve the basins. These 3 areas are the Hargrove/Johns Street area, the Truax Airport area and the Midtown Pumping Station area. With the Johns Street/ Hargrove Area, the City studied the area in 2012 utilizing pump run time data and flow monitors. We continue to replace/ line defective sewers in this area and monitor our end results by observing pump run time data at the pumping station. In 2019, we installed 684' of 12", 55' of 10" and 2,576' of 8" sewer main on Buckeye Road. In 2019, we also installed 1,253' of 8" south of Cottage Grove Road on Davidson Street, Drexel Ave. and Lake Edge Boulevard. We intend to install 1,253' of 8" diameter sewer on Drexel Ave. and Lake Edge Boulevard in 2019. We have several street reconstruction projects planned for these area.

We studied the Truax Airport Lift Station Basin also utilizing flow monitoring equipment and pump run time data in 2004 and again in 2015. This basin has cured-in-place liners that were installed in 2008 as a result of recommendations from the 2004 Brown and Caldwell I/I study and some of these liners have since failed due to an inadequate amount of resin in the pipe liner. The 2015 Truax study done by City staff included reviewing the condition of the sewer mains with and without liners, reviewing flow monitoring data and evaluating pump flow data. Because of a lack of large rainfall events while we had our sewer flow monitors in place, we decided to continue our flow monitoring of the Truax Basin in 2016 when we did have rainfall. We found a significant amount of work needing to be done to reduce I/I. As a result of this study, in 2016, we open cut replaced 347' of 24" diameter sewer along Anderson Street, and in 2018, cured in place (CIPP) lined 10,677 ft of sewer main varying in size from 8" diameter to 18" diameter. In 2019, we CIPP lined 3,361' of sewer mains in this basin on and area the Air National Guard base. In 2019 we lined 17 manholes in this basin.

The Mid-Town basin is a very new area (less than 20 years old) where we experienced a casting being dislodged by farm equipment in September of 2014. We have since raised the problem casting and installed a bolted locking lid but we are still observing I/I in this basin with spikes in pump run times during rain events. The I/I problem in the basin was not believed to be an issue with the sewer mains but rather the manholes. In 2017 the City adjusted 10 of the manholes to the estimated 100 year flood elevations, installed bolted castings and sealed the manhole barrel joints. We still are experiencing high I/I in this basin. We have now televised the sewer mains, lifted casting using additional barrel sections, and wrapped the manhole joints. We believe that the problem is that foundation floor drains are exposed while the numerous homes in this area are under construction. We will continue to monitor pump run times in this area.

In 2019, the City experienced 1 major rain event on the west side exceeding 2 inches, October 2nd (3.17 inches). According to the City's Pump data (Midtown), we experienced a 231% of normal flow spike during rain event over normal flows (average flow 215,216 gpd, 496,080 gpd during rain event). On March 14th, we experienced a 226% of normal flow spike during rain event over normal flows (average flow 215,216 gpd, 486,720 gpd during rain event). There wasn't a major storm event on March 14th (0.31 inches) so it is unclear why there was a spike.

On the East side, we had our largest rain event on October 1st (2.4") and July 19, 2019 (1.91"). We observed flow spikes in the Johns Street basin MMSD Pump Station #6 (1.89 MGD Average, 3.61 MGD Peak 10/2/2019, 191% of average flow) and on 7/19/2019, we had 3.67 MGD of flow (194% over average flow). The largest pump run time spike in 2019 was 12/3/2019 (4.05 MGD, 214% of average flow). There was no weather event on 12/3/2019. There was one on 11/30/2019 (0.36") but it is unclear whether the flow spike was related to weather.

In the Truax basin, as a result of the 10/1/2019 storm event (2.4"), we observed 828,000 gpd on 10/2/2019 and 1,200,000 vs 572,597 gallon average flow (144% and 209% of average flow). As a result of the 7/19/2019 rain event (1.91''), we observed 930,000 gallon vs 572,597 gallon average flow (162% average flow).

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2. Operation and Maintenance 2.1 Did your sanitary sewer collection system maintenance program include the following maintenance activities? Complete all that apply and indicate the amount maintained. Cleaning 62.46 % of system/year 0.28 % of system/year Root removal % of system/year Flow monitoring % of system/year Smoke testing Sewer line % of system/year 6.43 televising Manhole % of system/year inspections 1.66 Lift station O&M 71 # per L.S./year Manhole 1.76 % of manholes rehabbed rehabilitation Mainline % of sewer lines rehabbed rehabilitation 1.15 Private sewer % of system/year inspections Private sewer I/I % of private services removal River or water % of pipe crossings evaluated or maintained 19.2 crossings Please include additional comments about your sanitary sewer collection system below: 3. Performance Indicators 3.1 Provide the following collection system and flow information for the past year. 46.39 Total actual amount of precipitation last year in inches 34.48 Annual average precipitation (for your location) 785.69 Miles of sanitary sewer 30 Number of lift stations 0 Number of lift station failures 4 Number of sewer pipe failures 7 Number of basement backup occurrences 21 Number of complaints 30.085 Average daily flow in MGD (if available) Peak monthly flow in MGD (if available) Peak hourly flow in MGD (if available) 3.2 Performance ratios for the past year: 0.00 Lift station failures (failures/year) 0.01 Sewer pipe failures (pipe failures/sewer mile/yr) 0.00 Sanitary sewer overflows (number/sewer mile/yr) 0.01 Basement backups (number/sewer mile) 0.03 Complaints (number/sewer mile) 0.0 Peaking factor ratio (Peak Monthly: Annual Daily Avg)

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0.0 Peaking factor ratio (Peak Hourly: Annual Daily Avg)

4. Overflows

LIST OF SANITARY SEWER (SSO) AND TREATMENT FACILITY (TFO) OVERFLOWS REPORTED **				
Date Location Cause Estimate Volume (I				
1 ' '	Gravity sewer pipe at 4008 Milwaukee Street, Madison WI 53714	Plugged Sewer	0.0003 - 0.0003	
9/26/2019 12:27:00 PM - 9/26/2019 1:10:00 PM	2702 Shopko Drive	Plugged Sewer	0.0120 - 0.0120	

^{**} If there were any SSOs or TFOs that are not listed above, please contact the DNR and stop work on this section until corrected.

What actions were taken, or are underway, to reduce or eliminate SSO or TFO occurences in the future?

Post-SSO Standard Operating Procedure:

After resolving issues causing SSO our standard operating procedure is to televise impacted line. The inspection is reviewed to determine if a structural deficiency is present that needs to be remedied, if a different preventive maintenance cleaning schedule or process is required, and/or if a sewer system user needs to be contacted to address discharge issues.

FOG Specific:

Implemented a 3-tier rate structure for restaurant and similar food prep businesses/ Proof of grease trap maintenance in conformance with MSU standards enables such customers to remain in the lower billing rate tier. Goal is to educate customers and provide them a financial incentive to properly maintain their grease traps.

Mapped businesses in restaurant/food prep 3-tier billing system in GIS. Televise mains to which these businesses connect to identify maintenance issues and optimize cleaning frequencies, equipment, and tools.

Working on additional FOG educational materials to educate users.

- 5. Infiltration / Inflow (I/I)
- 5.1 Was infiltration/inflow (I/I) significant in your community last year?
- o Yes
- No

If Yes, please describe:

- 5.2 Has infiltration/inflow and resultant high flows affected performance or created problems in your collection system, lift stations, or treatment plant at any time in the past year?
- o Yes
- No

If Yes, please describe:

5.3 Explain any infiltration/inflow (I/I) changes this year from previous years:

The 2019 storm events were not as significant storm events as we have had in the recent past. The largest storm event was on October 2nd (3.17 inches) on the west side, 2.4 inches on East Side. We continue to observe elevated pump run times at the City's lift stations during rain events. We did not experience sewer backups or SSOs as a result of the 2019 rain events.

5.4 What is being done to address infiltration/inflow in your collection system?

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The City continues to monitor problem areas in the collection system where we have observed Infiltration/ Inflow (I/I). The primary method to correct I/I has been the City's aggressive Cured in Place Lining program (approximately 7 miles of pipe lined per year). The other method to address I/I has been replacing sewer mains and laterals with street reconstruction projects. Manholes installed in high groundwater areas with construction projects are wrapped at the joints to prevent seepage of groundwater into the sanitary sewer. All sanitary manholes installed near street low points include internal chimney seals to prevent water from entering the sanitary sewer through the manhole's adjustment rings. The City had a City wide manhole lining project planned for construction in 2019 (bid in 2018) to also address I/I (53 manholes)

Beyond construction projects, clearwater sources such as roof drain and sump pump connections are eliminated as they are discovered with our studies, smoke testing, and through televising.

Total Points Generated	
Score (100 - Total Points Generated)	100
Section Grade	Α

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Grading Summary

WPDES No: 0047341

SECTIONS	LETTER GRADE	GRADE POINTS	WEIGHTING FACTORS	SECTION POINTS
Financial	А	4	1	4
Collection	А	4	3	12
TOTALS			4	16
GRADE POINT AVERAGE (GPA) = 4.00				

Notes:

A = Voluntary Range (Response Optional)

B = Voluntary Range (Response Optional)

C = Recommendation Range (Response Required)

D = Action Range (Response Required)

F = Action Range (Response Required)