

# WATER RECLAMATION PREVENTATIVE MAINTENANCE

Exit Conference Date: October 20, 2020

Release Date: November 17, 2020

Report No. 21-02

## City of Orlando Office of Audit Services and Management Support

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## MEMORANDUM OF TRANSMITTAL

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**To:** David Bass, Water Reclamation Division Manager

**From:** George J. McGowan, CPA  
Director, Office of Audit Services and Management Support

**Dates:** Exit Conference: October 20, 2020  
Release: November 17, 2020

**Subject:** Water Reclamation Preventative Maintenance (Report No. 21-02)

The Office of Audit Services and Management Support performed an audit of the processes and controls over the preventative maintenance of the assets under the control of the Water Reclamation Division. The audit objectives were to ensure that controls over preventative maintenance were adequate and operating effectively. The Water Reclamation Division is required to meet all state and federal standards for the reclamation of sanitary sewage and biosolids handling and disposal.

We conducted this performance audit in conformance with the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The following report contains the issues identified during the audit, recommendations for improvement and management's replies regarding actions taken/planned to be taken with respect to the identified issues.

We appreciate the cooperation and courtesies extended by the staff of the Water Reclamation Division during this audit.

GJM/PG

c:

The Honorable Buddy Dyer, Mayor  
Jody Litchford, Deputy City Attorney  
Kevin Edmonds, Chief Administrative Officer  
Francis Flynn, Deputy Chief Administrative Officer  
Richard Howard, Public Works Director

# SUMMARY OF RECOMMENDATIONS, MANAGEMENT RESPONSES AND ACTION PLAN



#	RECOMMENDATIONS	MANAGEMENT RESPONSE & ACTION PLAN				
		CONCUR	PARTIALLY CONCUR	DO NOT CONCUR	ACTION PLAN	TARGET DATE
1.	Water Reclamation Division should ensure that departmental procedures are communicated to all employees so that proper protocols are followed.	X			Make sure that all policy and procedures are available on the WR Intranet as some are, and any City-Wide policies are available on Workday and inform everyone where these are.	2/28/2021

		MANAGEMENT RESPONSE & ACTION PLAN				
#	RECOMMENDATIONS	CONCUR	PARTIALLY CONCUR	DO NOT CONCUR	ACTION PLAN	TARGET DATE
2.	Water Reclamation should enhance the current process for tracking changes made to records in the CMMS system. Work-around should be developed to ensure changes are properly tracked until the vendor rolls out the CMMS V8.9 with audit configuration functionality.		X		V8.9 has been installed and the audit retention time has been set to 3 months. Changes to PM's are reflected by the Work Orders they Generate. Knowing when a change to a PM Configuration was made is irrelevant because the work orders that are generated are the evidence of that change. WO history is years of records.	DONE
3.	Water Reclamation should evaluate current staffing and position control to ensure that the department is adequately staffed to have an effective preventative maintenance program.	X			The Division Manager gets constant feedback from Section Leaders to evaluate staffing needs to carry out the responsibilities of the Division. When the need arises, additional positions are requested, or upgrades to current positions are requested to keep pace with the current employment situation.	DONE

		MANAGEMENT RESPONSE & ACTION PLAN				
#	RECOMMENDATIONS	CONCUR	PARTIALLY CONCUR	DO NOT CONCUR	ACTION PLAN	TARGET DATE
4.	Water Reclamation should conduct routine scheduled housekeeping exercises to ensure that the information maintained in CMMS is accurate and complete. Also, the maintenance schedule should be communicated to the staff.	X			Our Data Analyst (Aaron Green) and his staff do this on a routine basis.	DONE

The background is a dark blue color with several overlapping, semi-transparent geometric shapes in various shades of blue, creating a layered, abstract effect. The shapes are primarily triangles and quadrilaterals, some pointing towards the top right and others towards the bottom left.

# **ISSUES, RECOMMENDATIONS AND MANAGEMENT ACTIONS**



### **BACKGROUND**

The Office of Audit Services and Management Support performed an audit of the processes and controls over the preventative maintenance program of the Water Reclamation Division. The audit objectives were to ensure that controls over the preventative maintenance process were adequate and operating effectively. The Water Reclamation Division contains several units which share responsibility for collecting and treating approximately 45 million gallons of wastewater per day through a system of gravity and forced mains, lift stations and water reclamation facilities.

Water Reclamation uses a supervisory control and data acquisition (SCADA) system to monitor and control their environment to ensure system failures and other matters are identified and rectified timely. The SCADA is not supported by Technology Management, rather the Water Reclamation Industrial Automation Group is responsible for all computerized functions, including but not limited to security. Water Reclamation also uses Accruent's Maintenance Connection, Computerized Maintenance Management System (CMMS) to house information on their 100,000 plus assets, including but not limited to preventative maintenance procedures and work orders. As of June 2020, the Water Reclamation Division has 749 preventative maintenance procedures. Each of these procedures is associated with one (1) or many of the 100,000 plus assets. Accruent's mobile App MC Express, is also used in the field by the division's maintenance workers. The Water Reclamation Business Operations Management unit is responsible for CMMS data maintenance.



## **OBJECTIVES AND SCOPE**

The audit objectives were to determine whether the Water Reclamation Division’s preventative maintenance process is efficient and in compliance with City Code, policies and procedures, and state and federal reporting requirements.

In addition, we tested controls to determine that the Water Reclamation Division ensures that preventative maintenance is performed timely.

## **METHODOLOGY**

We reviewed City Code, state Department of Environmental Protection (DEP) and federal Environmental Protection Agency (EPA) regulations to gain an understanding of the requirements and the associated risks related to these requirements. We also met with Water Reclamation personnel to discuss the process for scheduling, initiating and completing preventative maintenance (PM) work orders as it relates to the following units:

- Lift Station Operations
- System Evaluation and Maintenance (SEM)
- Conserv I Water Reclamation Facility (WRF)
- Conserv II WRF
- Iron Bridge Regional WRF
- Orlando Easterly Wetlands
- Industrial Automation Group (IAG)

Our primary focus was to ensure that scheduled preventative maintenance was performed and completed timely. Due to a recent cleanup of the work orders, staffing issues, and an ongoing overhaul of the preventive maintenance during the audit, we noticed that there were excessive “canceled” and “denied” work orders, procedure tasks that were not checked off for some

employees on work orders, and identified that there was a limited audit trail in CMMS to properly document changes made to: PM frequency, PM name and addition or deletion of PM. As a result, we had to change our sample of work orders selected for review.

Additionally, we reviewed the timeliness of DEP and EPA reporting of related sewage spills, discharge monitoring and the pretreatment program.

Based on our audit we have identified opportunities for improving the current preventative maintenance process.

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## ISSUES AND RECOMMENDATIONS

**Departmental operating procedures should be communicated to all employees**

Our request to review operational policies and procedures revealed that the lift station assistant manager was not fully aware that standard operating procedures (SOP) existed. Initially, the assistant manager indicated that he was not sure if there were operating procedures codified at all. Subsequently, management was able to retrieve SOP #10, #11 and #12 from the departmental shared drive. The manager explained that he wasn't sure if the SOPs were final drafts or whether his staff was ever made aware of these standard operating procedures. After further discussion, the Systems Evaluation and Maintenance manager provided us with a link to the division's standard operating procedures which are published on the employee intranet.

We believe that there may be a lack of communication and/or training from the management level to the front-line workers. Without knowledge of departmental procedures employees may become confused and frustrated which can have a negative impact in the work environment and job performance. This can lead to costly errors which can place financial burdens on the City.

**Recommendation 1**

We recommend that the Water Reclamation Division ensure departmental procedures are communicated to all employees so

that proper protocols are followed while performing day-to-day activities.

**Management Response**

We will gather all SOP's from departments and post them on the Water Reclamation Intranet.

**Changes made in the Maintenance Connection System should be tracked**

Our review of the Preventative Maintenance work orders revealed that the CMMS system does not have a viable audit trail in place. We noticed that during October 2019, several preventative maintenance procedures related to Lift Stations were added to the system. We also noticed that several preventative maintenance work orders related to Lift Stations were not completed. The division's data team explained that due to analysis conducted by the lift station supervisor, new preventative maintenance procedures reflecting different maintenance schedules were created to replace old preventative maintenance procedures schedules; however, the old preventative maintenance procedures were not deleted and appeared as uncompleted preventative maintenance jobs. Our attempts to determine the exact date the changes were made and who made the changes were unsuccessful. The data team further explained that although the actual date of the update is not stored in the system, the new preventative maintenance procedures effective dates can be retrieved by comparing the "Start After" date of the new preventative maintenance procedure to the date the last work order was issued for the old preventative maintenance. We applied the data team's

methodology and was able to determine a date range for when these changes were made.

Initially we were told that there were no system audit trails in CMMS, however the History module stores changes/updates made to records, for a period of time. We do not believe that the data team utilizes this feature as they had to reach out to the vendor for clarification as to how the storage feature works. The vendor confirmed that the current CMMS version (v8.5) does not allow for configuration of an audit history and the system default only allows for storage of 500,000 records per module, thus the reason some changes made are not logged. However, CMMS version (v8.9) which is currently being developed will allow Water Reclamation to configure the audit history as required. A release date for has not been finalized.

We believe that a weak audit trail can lead to compliance issues, as well as data security and data integrity issues. A proper audit trail of records containing details that include the date, time, and user associated with each transaction should be readily available or archived for ease of use.

**Recommendation 2**

We recommend that the Water Reclamation Division enhance the current process for tracking changes made to records in the CMMS system. A “work-around” should be developed to ensure changes are properly tracked until the vendor rolls out the CMMS V8.9 with audit configuration functionality.

**Management Response**

Since this review, version 8.9 has been installed and audit records are set to be retained for up to 3 months. If there is a defined time limit or types of audits that need to be retained, we can make the changes to meet those requirements.

**Current Staffing  
Practices should be  
reevaluated**

Our review of the scheduled preventative maintenance work orders revealed that large number of the work orders specific to the Lift Stations were “cancelled” or “denied.” The Lift Station Assistant Manager explained that many work orders could not be completed due to staffing issues, therefore, the supervisors had to cancel or deny the work orders. The data team also confirmed that due the large number of cancelled and denied work orders that resulted from lack of staffing, an automated cancellation feature was added to CMMS in October 2019, to reduce the time it took management to manually cancel or deny work orders. After two consecutive missed preventative maintenance services, the system automatically cancels the work orders and the data team submits a report to the manager and/or supervisor in charge.

We reviewed Workday and determined that as of August 2020 there were 12 vacant positions in the Lift Station unit. During the audit the Assistant Manager informed us that the unit was having difficulties filling open positions due to the salary offered and the

restrictive job requirements. We were able to confirm these staffing issues with Human Resources.

In any case, the continued staff shortage is causing the department to neglect good preventative maintenance practices and, over the long term this may cause the assets to deteriorate more quickly, exposing the City to financial, legal and reputational risk.

**Recommendation 3**

We recommend that the Water Reclamation Division evaluate current staffing and position control to ensure that the department is adequately staffed to have an effective preventative maintenance program.

**Management's Response**

The Division Manager gets constant feedback from Section Leaders to evaluate staffing needs to carry out the responsibilities of the Division. When the need arises, additional positions are requested, or upgrades to current positions are requested to keep pace with the current employment situation.

**Scheduled data  
"housekeeping" should  
be performed in CMMS**

Our review of the work orders in CMMS revealed that there are few "housekeeping" items that need to be addressed. There were instances where the name of a preventative maintenance procedure did not correspond with the preventative maintenance frequency. For example, preventative maintenance procedure "C2 Fuel Pump Semi Annual" indicated semi-annual maintenance should be performed, however, the frequency field indicated that it should be performed monthly. Our review confirmed that the procedure frequency is semi-annual. Also, we notice a pattern where work

orders completed by a specific employee from the IAG group, did not have a completed preventative maintenance task list indicating what was performed during the maintenance service.

Also, we could not locate a few preventative maintenance procedures in CMMS due to updates that were currently being performed by the data team. We were not able to confirm whether the staff was informed that maintenance was currently being conducted in CMMS. After discussions with the data team we were able to locate the procedures by using key words in the preventative maintenance procedure name and the wildcard (%) character in the search criteria.

We believe that failure to correctly capture data in the system can negatively reflect the department's output and create incorrect records of preventative maintenance performance which may lead to compliance issues.

**Recommendation 4**

We recommend that the Water Reclamation Division conduct routine scheduled housekeeping exercises to ensure that the information maintained in CMMS is accurate and complete. Also, the maintenance schedule should be communicated to the staff.

**Management's Response**

Our Data Analyst (Aaron Green) and his staff do this on a routine basis.