PUBLIC UTILITIES'
WATER TREATMENT PLANT AUDIT

Audit No.18-01
December 17, 2018

City of West Palm Beach
Internal Auditor's Office

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Executive Summary

WATER TREATMENT PLANT AUDIT - AUD18-01

DECEMBER 17, 2018

WEST PALM BEACH
Internal Audit

OVERVIEW

- The Public Utilities Water Treatment Plant is a surface water, conventional lime-softening facility, capable of producing 47 million gallons of water per day.
- The Water Treatment Plant has a staff of 52, including Water Plant Operators and skilled tradespeople who maintain the buildings and equipment.
- In FY18 and FY17, the Plant had expenditures (excluding depreciation) of approximately $16.5 million and $16.8 million respectively.
- Plant operations are monitored by federal, state and local regulatory agencies, including periodic water sample testing.

SUMMARY FINDINGS

1. **Disaster Recovery Plan:** The Water Treatment Plant does not have a robust Disaster Recovery or Business Continuity Plan in place.
2. **Physical Security:** This finding has been omitted due to the increased risk of threats to security that may be created.
3. **Safeguarding Inventory:** The Water Treatment Plant does not have a warehouse or adequate storage facility for safeguarding its inventory.
4. **Inventory Process and Controls:** The Water Treatment Plant does not have a methodology or consistent process in place to manage, track and reconcile its inventory used in operations. It has not implemented the inventory module of its Computerized Maintenance Management System (CMMS), Hiper-web.

SUMMARY RECOMMENDATIONS

1. The Department should establish a robust Disaster Recovery Plan, addressing how critical operations would resume in the event of the most likely disaster scenarios.
2. Redacted from the report.
3. The Department should take steps to implement a basic system of inventory controls, including establishment of a warehouse and inventory control system.
4. The Department should work to establish the inventory module of Hiper-web in order to progress with a comprehensive job-order costing system.

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December 17, 2018

Audit Committee
City of West Palm Beach
401 Clematis Street
West Palm Beach, Florida

RE: Public Utilities' Water Treatment Plant, AUD18-01

Dear Audit Committee Members:

Attached is the City of West Palm Beach's Internal Auditor's Office report on the Water Treatment Plant. Although we commend the Public Utilities Department and the Water Treatment Plant's new management for implementing necessary changes to operations, additional opportunities for improvement are presented in this report.

We thank the management and staff of the Water Treatment Plant for their time, assistance, and cooperation during this audit.

Respectfully Submitted,

/s/ Beverly Mahaso
Chief Internal Auditor

cc: Jeri Muoio, Mayor
Jeff Green, City Administrator
Dorritt Miller, Deputy City Administrator
Scott Kelly, Assistant City Administrator
Poonam Kalkat, Public Utilities Director

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Background

The City of West Palm Beach's Water Treatment Plant (WTP) is a surface water, conventional lime softening facility, with the capacity to produce 47 million gallons of water per day. The WTP supplies potable water to a population of over 100,000 citizens, including critical medical facilities within West Palm Beach, Palm Beach, and South Palm Beach. The physical plant is comprised of multiple structures dating from the 1920's, 1950's, and 1980's. A Water Treatment facility was first started in the 1890's when the City was first being established as a residential and commercial center to support Henry M. Flagler's newly built resorts, the Royal Poinciana and the Palm Beach Inn (later known as the Breakers Hotel). The City purchased the WTP from the Flagler Companies in the 1950's.

The Water Treatment Plant draws water primarily from Grassy Waters Preserve through a series of transmission canals and lakes. Raw water is pumped from East Clear Lake using two raw water pump stations to two flocculation and sedimentation basins, where the water is treated with various chemicals to soften it and facilitate the removal of solids and organic carbon. Settled water is then conveyed to the dual media filters to remove the remaining suspended solids, taste and odor compounds, and potentially harmful contaminants present in the raw water. Filtered water is delivered to a transfer pump station where the treated water is pumped to, disinfected, and stored in two ground storage tanks. Two high service pump stations deliver finished water to the customers. The City also has six remote sites where finished water is stored and re-pumped and any necessary chlorine can be added.

In FY18 and FY17, the WTP had a budget of $16.7 million and $16.6 million respectively, with FY18 and FY17 expenditures (excluding depreciation) of approximately $16.5 million and $16.8 million respectively. In both FY18 and FY17, the WTP produced over 10 billion gallons of finished water.

In FY18, the WTP had 52 employees, including Water Plant Operators and tradesmen who maintain the buildings and equipment.

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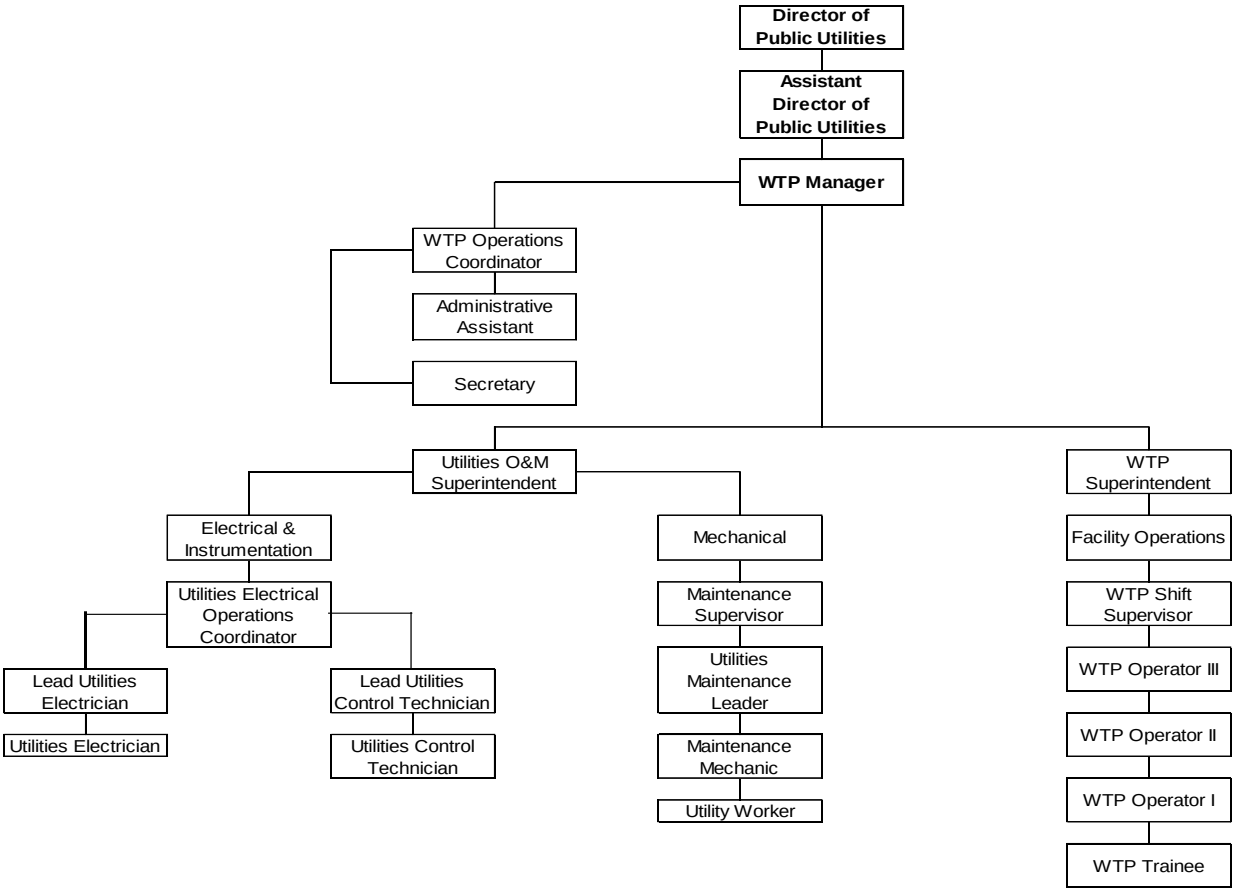

Statement of Scope

The audit scope period was FY17 and FY18. However, in some instances, the scope period may have been adjusted based on the availability of data. The audit included examining controls and conducting interviews with the WTP Manager, Superintendents, Operations Coordinator, and administrative staff, in order to understand the operations of the Water Treatment Plant, its plans for continuity of operations, and inventory management, as well as other challenges that the Department is facing as it moves forward.

The audit did not include a review of the water treatment process as that is heavily regulated on an on-going basis by various levels of the federal, state, and county governments. In addition, the City agreed to the 2007 Consent Decree between the City and Palm Beach County Health Department (PBC Health Department) which stipulates corrections that the City must perform to avoid additional penalties. The PBC Health Department monitors the City's progress regularly. At the time of our review, we found that the Public Utilities Department was in the final stages of compliance with the Consent Decree. Thus, we determined that there was sufficient oversight of the water treatment process to allow us to focus our resources on other areas.

Statement of Objectives

The objectives of this audit were to determine:

- If the WTP is operating efficiently and effectively;
- If the WTP has the capacity to increase production as the demand increases; and
- If the Public Utilities Administration operates the WTP in a fiscally responsible manner.

Statement of Methodology

We utilized several audit methodologies to achieve the objectives. These evidence gathering techniques included:

- Conducting interviews of WTP Administration and personnel;
- Observations made of conditions at the plant through various site visits;
- Performing data analysis to verify key performance measures during the audit period; and
- Other audit procedures determined necessary.

Statement of Auditing Standards

We conducted this audit in accordance with Generally Accepted Government Auditing Standards (GAGAS). 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.

Audit Conclusions and Summary of Findings

1) The WTP does not have a robust Disaster Recovery or Business Continuity Plan in place. In addition, Public Utilities has not performed a Disaster Risk Assessment or Business Impact Analysis to strengthen the plant's ability to continue operations;
2) Management has not performed a physical security threat assessment of the WTP;
3) The WTP does not have a warehouse or adequate storage facility for safeguarding its inventory of equipment, materials, and supplies; and
4) The WTP does not have a consistent process in place to manage, track, and reconcile the inventory of equipment, parts, and supplies used in operations.

Noteworthy Accomplishments

It is important to recognize the significant accomplishments achieved by management and staff of the WTP. As we concluded this audit, the ultra-violet plant was being brought on-line which is a major capital improvement. This improvement in the process will enhance efforts to maintain a high quality of water production. In addition, management has already initiated activities, including new procedures for the use of Departmental P-

cards, as well as strengthening controls over inventory management which should enhance the WTP's efficiencies.

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Opportunities for Improvement

1) Disaster Recovery and Business Continuity Plan

Condition

The Water Treatment Plant does not have a Disaster Recovery Plan or a Business Continuity Plan in place. Although there is a Hurricane Plan and an Emergency Response Plan, these do not take into account any type of long-range disaster impact. Further, Public Utilities has not performed either a Disaster Risk Assessment or a Business Impact Analysis to strengthen the Plant's ability to continue functioning in the event of either a man-made or natural disaster.

Criteria

Business continuity strategy, determination, and selection is a foundational process to allow organizations to continue operations in the event of an emergency. The Disaster Recovery Journal, defines a Disaster Recovery Plan as the detailed process foundation focusing on critical business functionality, while minimizing losses in revenue or other business operations. Prudent business practice would also recommend that both a Disaster Risk Assessment and a Business Impact Analysis be performed, particularly in light of the City's geographic location. These assessments would assist the Water Treatment Plant in identifying and preparing mitigation strategies for potential disruptions to operations.

Cause

Turnover in management at the Water Plant has resulted in a focus on key operations and less emphasis on strategic planning.

Effect

At the present time, the Utilities Department does not have a plan in place for Business Continuity. During the most recent two weather emergencies, essential employees kept the plant operating, providing water to the citizens of the City. The failure of a key process or a prolonged emergency, increases the risk that the Plant could experience a critical failure.

Recommendation 1

In order to ensure business continuity in the event of an emergency, the Department should establish a robust plan, which addresses how critical operations would resume in the event of the most likely disaster scenarios which will enable the plant to assess future operational needs, as well as enhance its asset management program.

Management Response

Utility Administration and Water Plant Management will complete a plan documenting steps for short and long term recovery after a disaster to ensure continued plant operations to produce water. The plant has an Emergency Response Plan and a Hurricane Preparedness and Recovery Plan already in place. The Business Continuity Plan will be an additional plan developed to address continued plant operations in case of a disaster.

Target Implementation Date: Third Quarter FY19

2) Physical Security

Condition

This finding has been omitted due to the increased risk of threats to security that may be created. Public Utilities received the full finding and agreed to the recommendations. We note that in conjunction with City Administration, Public Utilities is taking measures to address the concerns identified.

3) Safeguarding Inventory

Condition

The Water Treatment Plant does not have an adequate warehouse or storage facility for safeguarding inventory. At the time of our review, equipment, materials, and supplies were stored in approximately 12 large, corrugated steel shipping-style containers on the property. Other materials were scattered around the area adjacent to the containers, exposed to weather and potential theft. There is no set organization to the storage methodology. During our site visit, we observed the following items stored outside:

- Items that appeared to be new, shrink wrapping still attached;
- Small parts and tools;
- Containers marked flammable; and
- Equipment that had a clear manufacture date of 2017.

In addition to not having a warehouse function, the Water Treatment Plant does not have a current listing of all equipment, parts, and supplies on hand, or a minimum necessary supply of basic parts for either preventive or corrective maintenance on hand. The Plant Manager advised that an inventory had been conducted, listing what was on the property at a given point in time. However, it had not been updated with additions and deletions.

We noted that the storage areas are accessible to employees. Further, employees are not required to record or track items taken from the storage areas. Inventories do not have an allocated space in the storage areas. Finally, there are no procedures for identifying obsolescence or shrinkage.

Criteria

Effective asset stewardship is a fundamental principle of sound internal control principles. Management is responsible for establishing physical controls to secure and safeguard vulnerable assets, including inventories and equipment that might be vulnerable to risk of loss or unauthorized use. Management is also responsible for periodically counting and comparing such assets to control records.

Cause

Utilities Administration has not established a warehouse or supply control operation at the Water Treatment Plant.

Effect

The current inventory situation at the Plant impedes the Plant's ability to adequately plan for its maintenance needs. If equipment is purchased that is not part of a just-in-time inventory system, there is a risk that manufacturer's warranties could expire prior to items being placed in service, or becoming obsolete. There is a risk that purchases made on P-

cards are not adequately captured in the records of the plant, resulting in exposure for the employees making the purchases.

Supplies consumed during the course of business are not properly accounted for, since required minimums, additions, and usages throughout the accounting period are not known.

Recommendation 3

The Department should take steps to implement a basic system of inventory controls, including establishment of a warehouse and inventory control function. A baseline inventory should be established so that supervisors will be better able to anticipate and plan for maintenance needs, thus reducing reliance on P-cards. Inventory should be periodically reconciled in accordance with standard inventory management practices.

Management Response

Utility Administration and Water Plant Management will establish a process to review existing inventory at all locations in the plant. Based on the list, a system will be established to safeguard the items and controlled issuance in the short term.

Target Implementation Date: Third Quarter FY20

4) Inventory Process and Controls

Condition

The Water Treatment Plant does not have a methodology or consistent process in place to manage, track, and reconcile the inventory of equipment, parts, and supplies used in operations. The plant transitioned from PMC tools to a Computerized Maintenance Management Software (CMMS) tool, HiperWeb, in approximately November 2017. Prior records from PMC tools were not migrated to the new system.

It was anticipated that HiperWeb would schedule, plan, manage, and track maintenance of equipment, including parts inventory and labor. At the current time, the inventory module of HiperWeb has not been implemented, nor has HiperWeb been interfaced with Oracle. Utilities Administration has advised that they do not believe it would be cost-effective to establish an interface between the two systems. An interface would avoid dual data entry into both Oracle and HiperWeb for purposes of requisition, receiving, and usage, as well as labor costs. Based on the aforementioned, we determined that the Department may still be able to gain efficiencies and improve inventory management by implementing HiperWeb's inventory module.

Criteria

Effective asset stewardship is a fundamental principle of sound internal control principles, cutting across all aspects of control activities. An effective CMMS process should have the ability to manage and control work, labor, and materials, including parts usage, as well as track maintenance activity over the life of an asset. It would also provide metrics on time and materials spent on work-orders, enabling management to allocate resources effectively.

Cause

Based on our interviews, Utilities Administration has not been able to facilitate an interface between Oracle and HiperWeb due to cost and prioritization issues with Administration and other City Departments.

Effect

The plant is reliant on labor-intensive processes, such as spreadsheets to manage purchases of supplies and materials inventory as a result of not implementing the full functionality of the CMMS product purchased. Asset Management planning is impacted as Operations and Maintenance personnel at the plant do not have a fully integrated inventory management system. Therefore, purchases are not being tagged or organized in a manner that permits employees to know what equipment, materials, and supplies are available to complete work orders. Further, front-line staff and supervisors are not spending time proactively to anticipate supply chain issues. Therefore, crews may be

inadequately prepared for their workday without the guaranteed listing of needed equipment, materials, and supplies that are matched to daily work orders. It has been the practice of supervisors to use P-cards to purchase equipment, materials, and supplies, which increases both man-hours spent on the work-order and fleet costs through excess trips to vendors. Further, items purchased on a P-card are not verified by a receiving function, and may result in excess purchases or shrinkage.

Recommendation 4

The Department should work to establish the inventory module of HiperWeb and input related labor costs in order to progress with a comprehensive job-order costing system for the WTP.

Management Response

Utility Administration and Water Plant Management is reviewing inventory control practices and will establish an organized system for taking stock inventory of current equipment, materials and supplies in all locations including trucks. A system will be established to control issuance and tracking of equipment, materials and supplies in the short and long term.

Target Implementation Date: Third Quarter FY20