



# CITY OF TAMPA

Pam Iorio, Mayor

Internal Audit Department

Cynthia D. Miller, Audit Director

December 30, 2003

Honorable Pam Iorio  
Mayor, City of Tampa  
1 City Hall Plaza  
Tampa, Florida

RE: Advanced Wastewater Treatment Plant (AWTP), Preventive Maintenance Audit 04-21

Dear Mayor Iorio:

Attached is the Internal Audit Department's report on AWTP, Preventive Maintenance.

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

Sincerely,

Cynthia D. Miller  
Director of Internal Audit

cc: Ralph L. Metcalf, Wastewater Director  
Darrell Smith, Chief of Staff  
Dave Pickard, Manager AWTP

**WASTEWATER DEPARTMENT  
ADVANCED WASTEWATER TREATMENT PLANT  
PREVENTIVE MAINTENANCE  
AUDIT 04-21  
DECEMBER 30, 2003**

**WASTEWATER DEPARTMENT  
ADVANCED WASTEWATER TREATMENT PLANT  
PREVENTIVE MAINTENANCE  
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Auditor

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Audit Supervisor

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Director

**WASTEWATER DEPARTMENT  
ADVANCED WASTEWATER TREATMENT PLANT  
PREVENTIVE MAINTENANCE  
AUDIT 04-21**

**INTRODUCTION**

The Howard F. Curren Advanced Wastewater Treatment Plant uses a total maintenance program that is divided between preventive and corrective measures. Preventive maintenance is scheduled on a routine basis either monthly, quarterly, semi-annually or annually. Generally, manufacturer guidelines are followed; however, for some equipment it was determined to use procedures developed by plant personnel. The goal is to become more preventive than reactive in repairs. Specifically, the objective is to achieve an 80% Preventive to 20% Corrective balance. For fiscal year 2003 (October 2002 through September 2003), more than 20,000 preventive maintenance work orders were completed.

**STATEMENT OF OBJECTIVES**

This audit was conducted in accordance with the Internal Audit Department's FY04 Audit Agenda. The objective of this audit was to ensure that equipment was maintained in accordance with the manufacturer's recommended standards or, if applicable, in-house protocols.

**STATEMENT OF SCOPE**

The audit period will cover preventive maintenance work orders generated at the Treatment Plant from October 2002 through September 2003.

**STATEMENT OF METHODOLOGY**

Government Auditing Standards require auditors to determine if computer processed data are sufficiently reliable to be used in the audit process. The Advanced Wastewater Treatment Plant uses a Computerized Maintenance Management System (CMMS) called the PMC2000. We traced work orders from initiation to closing through the system to determine if access was restricted as designated in the system. Based on the results of our analysis we concluded that there were instances where an individual could both initiate and "close out" work orders. Additionally, because the work order numbers were sequentially automatically generated by the system, a review was performed to identify missing work order numbers. This review disclosed that the sequential order of the work order numbers were not exclusively preventive maintenance work orders but also included other "types" of work to be performed. However, these limitations were deemed minor and did not negatively impact use of the data. Also, Management had already initiated replacement of the existing system.

The sample size and selection were statistically generated using a desired confidence level of 90%, expected error rate of 10% and a desired precision of +/- 10%. Statistical sampling was used in order to infer the conclusions of test work performed on a sample to the population from which it was drawn and to obtain estimates of sampling error involved. When appropriate, judgmental sampling was used to improve the overall efficiency of the audit.

### **STATEMENT OF AUDITING STANDARDS**

We conducted our audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to afford a reasonable basis for our judgments and conclusions regarding the organization, program, activity or function under audit. An audit also includes assessments of applicable internal controls and compliance with requirements of laws and regulations when necessary to satisfy the audit objectives. We believe that our audit provides a reasonable basis for our conclusions.

### **AUDIT CONCLUSIONS**

Based upon the test work performed, we conclude that Advanced Wastewater Treatment Plant preventive maintenance was performed as prescribed.