

# MUNICIPAL AUDITING REPORT CITY OF ROANOKE



## **Greater Roanoke Transit Company Fuel Management July 28, 2017**

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Audit Plan Number: 17-203

*Municipal Auditing Department  
Chartered 1974*

[www.roanokeva.gov/auditing](http://www.roanokeva.gov/auditing)

Phone 540.853.5235

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## AUDIT OBJECTIVES, SCOPE & METHODOLOGY

### Audit Objectives:

1. To determine if the Greater Roanoke Transit Company (GRTC) maintains and monitors underground storage tanks in compliance with Federal and State regulations.

**Yes** – GRTC uses fiberglass, double-walled storage tanks equipped with an automated tank gauging system that reports total gallons in inventory and continuously monitors for water and leaks. The maintenance facilities, including the underground storage tanks, are regularly inspected. Opportunities for strengthening controls to ensure optimal functionality of both the tank gauging system and fueling system were noted with appropriate action plans developed by management.

2. To determine if fuel deliveries were invoiced and paid in accordance with properly procured and executed contracts.

**Yes with Exceptions** – GRTC competitively bids fuel contracts to obtain guaranteed pricing for each fiscal year. Three vendors have been awarded contracts over the past four years, indicating a competitive market. Contracts are awarded to the vendor who bids the lowest differential on prices quoted on the futures market. GRTC has a 30 day window to lock in the quoted price on the futures market, after the award has been made. Under one (1) of four (4) contracts reviewed, we found that the bid differential had been misread causing the contract and subsequent invoices to be based on an overstated price per gallon. Total overpayments of \$24,904 resulted from this error. In addition, fees that were supposed to be included in the differential were invoiced separately under two contracts, resulting in overpayments of \$7,627.

### Audit Scope and Methodology:

We evaluated the design and operation of the system of controls in place as of December 31, 2016 related to diesel fuel activity. We reviewed transactions which occurred between July 1, 2015 and March 31, 2017. The audit encompassed an analysis of fuel inventory records, including daily tank readings, fuel disbursements, daily fuel reconciliations and fuel contracts and payments.

**End of Audit Objectives, Scope & Methodology**

## BACKGROUND

The Greater Roanoke Transit Company (GRTC) is a private, nonprofit, public service organization wholly owned by the City of Roanoke. GRTC contracts with First Transit, Inc. to operate and maintain the transit system, which is more widely known as “Valley Metro.”

Valley Metro operates a fleet consisting of the following:

- 37 Gillig transit coaches
- 4 MCI Coaches
- 5 body-on-chassis buses
- Two (2) 19–passenger body-on-chassis vehicles

All of GRTC’s coaches and buses operate on ultra-low sulfur diesel. Annually, GRTC invites fuel suppliers to bid a guaranteed price for supplying the diesel needed to operate the fleet. The most recent contract spans 12 months and provides for up to 450,000 gallons to be purchased.

GRTC stores its diesel in two (2) underground storage tanks, each with a capacity to store 12,000 gallons. The tanks were installed in 1989 at the Roy Z. Meador Operations, Maintenance and Administrative Facility.

GRTC’s Finance department reported the following fuel costs:

Fiscal Year	Vendor Payments	Net Gallons	Cost per Gallon
2014	\$1,345,030	441,300	3.048
2015	\$1,246,410	421,622	2.956
2016	\$851,879	426,394	1.998
2017 *	\$246,774	152,246	1.620
<b>Totals</b>	<b>\$3,690,093</b>	<b>1,441,562</b>	

\* As of October 31, 2016

### Annual Vehicle Information FY 2016

Description	Fixed Route	Smart Way	Star Line	Smart Way Connector	Total
Gallons of Fuel Consumed	321,548	68,030	17,271	19,993	426,842
Quarts of Oil Consumed	9,968	972	458	246	11,644
Vehicle Miles	1,222,198	373,526	60,776	105,588	1,762,088
Road Calls	240	27	24	3	294
Major Failures	1	1	0	0	2
Average MPG	3.80	5.49	3.52	5.28	4.13

Laws and Regulations:

The Environmental Protection Agency (EPA) requires careful management of underground storage tanks to ensure stored fluids do not leak. Tanks with anti-corrosive properties have been required since 1998. The EPA also requires meticulous monitoring records that include reconciling the number of gallons delivered into the tanks with the number of gallons pumped out of the tanks. Tank monitoring systems may be used in place of manual processes involving the use of stick measurements, conversion charts, and daily logging of inventory, deliveries and dispensing.

The Virginia Administrative Code requires automatic tank gauging systems in all underground storage tanks holding motor fuels (9 VAC-580-160). The tank gauging system must be calibrated according to manufacturer's recommendations. Operators must be trained and knowledgeable about applicable regulations, the operation and maintenance of their tank gauging system, and proper response actions in the event of a release.

**End of Background**

**Objective 1: Underground Storage Tanks**Audit Objective

Does the Greater Roanoke Transit Company (GRTC) maintain and monitor underground storage tanks in compliance with Federal and State regulations?

**Yes**

Overview

The EPA and Virginia Department of Environmental Quality specify the requirements for maintaining fuel in underground storage tanks. The regulations are extensive and require non-corrosive tanks, monthly monitoring for leaks, and meticulous records of fuel received and dispensed. Automatic tank gauging systems satisfy many of the manual procedures once required, such as daily stick measurements and monthly tests for water using water-sensitive paste. Tank gauging systems must be capable of accurately measuring the level of fuel to within 1/8 inch.

GRTC maintains two 12,000 gallon underground storage tanks for storing its diesel fuel inventory. Both tanks were installed in 1989 and are double-walled, fiberglass tanks. A brine solution exists between the fiberglass walls which enables continuous monitoring for leaks that might develop in either the internal or external wall. The piping between the tank and pumping system is also double-walled fiberglass. Other required features around the tanks, such as spill containment systems and tank locks are in place.

A GRTC employee completes a monthly inspection of the facilities, including the storage tanks and certain system controls. We verified that the monthly inspection checklists were completed.

Automatic Tank Gauging System:

GRTC's automatic tank gauging system, Veeder Root, provides information on fuel levels in the tanks, the temperature of the fuel, and the presence of water. It reports the volume increase in each tank after fuel deliveries. The system also provides warnings when a tank is nearing overflow. While tank capacity is ~ 12,000 gallons, they are generally not filled beyond the 9,000 to 10,000 gallon level. Based on our sample testing of gallons dispensed on 14 different days across 11 months, GRTC's fleet consumes approximately 1,400 gallons of diesel fuel each operating day. At that pace, a combined tank inventory of 20,000 gallons provides fuel for ~ 14 operating days.

### Fuel Dispensing System:

Buses and coaches go through the service line nightly to be cleaned and refueled. The OPW fuel management system is a key-based system in which a physical key is assigned to each bus or coach. The keys are kept on individual hooks by the fueling station. The key assigned to the bus or coach being fueled must be inserted into the system and an odometer reading entered before fueling can begin. The system includes built in controls to prevent spills and detect leaks based on drops in line pressure. The pump will shut down if line pressure falls below 20 psi.

### Fuel In / Fuel Out:

In combination, the automatic tank gauging system and the fueling system serve as GRTC's primary controls to ensure compliance with EPA and DEQ regulations. On a test basis, we compared the gallons pumped as reported by the fueling system, to the change in fuel inventory reported by the automatic tank gauging system. Our sample looked at 14 days over 11 months:

- 6 of 14 days showed variances of greater than +/- 3%.
- Total overall variance was ~ 306 gallons (1.55%)

A fundamental concept included in federal and state regulations is that the amount of fuel delivered into a tank should equal the amount of fuel pumped out of the tank over the course of time. On a monthly basis, the number of gallons pumped should not vary from the number of gallons delivered plus or minus the change in fuel inventory. The EPA specifies that the variance should not exceed 1% of throughput (fuel pumped) + 130 gallons. If the variance exceeds this amount two consecutive months, a tank owner in Virginia would be expected to promptly report a potential leak to the Virginia Department of Environmental Quality.

To place the overall variance of our sample into context, we applied the EPA's monthly throughput computation. On this basis, GRTC was allowed to have a variance of up to ~328 gallons. GRTC's actual variance was only 306 gallons and was within EPA's guidelines.

GRTC has not had a policy to compare the gallons of fuel dispensed with the change in fuel inventory reported by the tank gauging system each night. GRTC should consider implementing this policy as one means of validating the accuracy of data in both systems and identifying any potential system problems.

### Data Quality / System Interfaces:

Based on our observations of the system and discussions with GRTC employees, the fueling management system has data quality issues and does not interface with the fleet management system. It appears a combination of operator error and software issues need to be addressed in order to maximize the utility of the system. Currently, employees manually log the gallons

dispensed and odometer reading for each bus on paper. The logged data is manually keyed into GRTC's fleet management system, which tracks maintenance and fuel costs for each vehicle, as well as performance information such as average miles per gallon. There are opportunities to improve data accuracy and reduce labor associated with logging and rekeying data.

Audit tests also indicated that the automatic tank gauging system had a data quality issue. We tested a sample of fuel deliveries to determine if the gallons billed by the vendor were consistent with the gallons reported by the automatic tank gauging system as being received for the same delivery. We initially looked at 9 deliveries made between August 2015 and November 2016. We noted significant variances, as follows:

- 9 of 9 deliveries showed more gallons billed than delivered
- 6 of 9 exceeded 1% above the gallons reported by the tank system
- Average variance was 138 gallons (more billed than delivered)
- Overall variance for the nine deliveries was 1,243 gallons (1.89%)

Based on discussions with management, we learned that there was no record of the last time the tank gauging system (and the fueling system) had been calibrated. Management immediately scheduled a calibration of the tank gauging system for 12/28/16.

We later expanded our testing to include deliveries from January 2017 through March 2017, noting the following improvements in results:

- 2 of 7 deliveries showed more gallons billed than delivered, both ~ 0.12%
- 5 of 7 deliveries showed more gallons delivered than billed.
- Average variance was 56 gallons (more delivered than billed)
- Overall variance for the seven deliveries was 0.74%

Vendor invoices were paid as invoiced, without validating the gallons billed against independent stick readings or the tank gauging system data. Vendors bill deliveries based on net gallons, which adjusts for contraction or expansion of fuel caused by variances in temperature.

#### Emergency Plans:

We confirmed that GRTC has documented emergency plans to address fuel spills, addressing EPA and DEQ requirements. Spill prevention procedures were last updated February 17, 2011. The procedures address the following:

- o Inventory Reconciliation (leak detection)
- o Spill/overflow prevention methods
- o Spill control countermeasures

- Site specifications
- Tank tightness testing program
- Spill response plan
- Employee training plan
- Spill containment emergency numbers
- Monthly inspections of tanks

**End of Objective 1**

**Objective 2: Fuel Purchases**Audit Objective

Were fuel deliveries invoiced and paid in accordance with properly procured and executed contracts?

**Yes with exceptions**Overview

GRTC uses sealed bidding to acquire 12 month contracts from suppliers to provide diesel at a guaranteed fixed price. The invitation to bid actually asks vendors to bid the differential that will be added to the futures price listed on the New York Mercantile Exchange for a gallon of New York Harbor Heating Oil. GRTC accepts the lowest differential bid and has 30 days from the bid opening date to lock in the final per gallon price based on the NYMEX daily futures price.

The market for suppliers has been competitive as shown by the contracts awarded:

Vendor	Contract Period	Price
PAPCO INC	7/1/13 to 6/30/14	\$3.0475
Petroleum Traders Corp	7/1/14 to 6/30/15	\$2.9470
James River Solutions, LLC	9/1/15 to 8/31/16	\$1.9720
James River Solutions, LLC	9/1/16 to 6/30/17	\$1.2470

Upon reviewing the contract files, we noted that James River Solutions had actually bid a negative differential in its last contract. This meant that the futures price should have been reduced by the differential amount rather than having the differential added to it. When GRTC prepared the contract, Purchasing inserted the guaranteed price per gallon based on adding the differential to the futures price. The resulting guaranteed price per gallon was still lower than competitors had bid and the error was not caught. Based on our analysis, overpayments totaled \$24,904. GRTC has alerted James River, who has agreed to credit future invoices to return the overpayment.

We also noted that federal and state fees were added to invoices during two contract terms with two different vendors. Bid requests and contracts specified that these fees were supposed to be included in the differential and not to be billed separately. We estimated overcharges totaled \$ 7,627.

**End of Objective 2**

**MANAGEMENT ACTION PLANS**

<b>System calibration</b>	
<p>The Veeder-Root tank monitoring system and OPW fuel meter system will both be calibrated by a contractor on a semi-annual basis.</p>	
<b>Assigned To</b>	<b>Target Date</b>
John Thompson, Director of Maintenance.	12/15/17

<b>Diesel Fuel Billing Error</b>	
<p>Future contracts will include two areas in which the Purchasing Supervisor will verify if the differential is an addition or deduction to the futures price to help ensure the contract is consistent with the bid. The Purchasing Supervisor and the Director of Finance are reviewing invoices and confirming the pricing is consistent with the contract prior to approving the invoice for payment.</p>	
<b>Assigned To</b>	<b>Target Date</b>
Tiffany Ollie, Purchasing Supervisor	Done

<b>Reconciling Fuel Inventory</b>	
<p>A procedure has been established to reconcile the change in fuel inventory reported by the Veeder-Root tank monitoring system with the gallons of fuel dispensed per the OPW fuel metering system.</p>	
<b>Assigned To</b>	<b>Target Date</b>
Margaret Dogan, Inventory Control Clerk	Done

<b>Stick Readings of Fuel Deliveries</b>	
<p>Delivery drivers will be required to use the fuel sticks provided by Valley Metro employees to help ensure accurate measurements.</p>	
<b>Assigned To</b>	<b>Target Date</b>
Margaret Dogan, Inventory Control Clerk	Done

**Monitoring for Water in Tanks**

A procedure has been established to manually stick tanks using water-sensing paste to verify no water has accumulated in the bottom of the tanks. This testing will be completed monthly; records will be retained for a period of 7 years.

<b>Assigned To</b>	<b>Target Date</b>
Margaret Dogan, Inventory Control Clerk	9/1/17

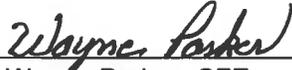
**Fuel Dispensing System**

Our information technology employee is evaluating the OPW system's functionality and configuration. If the system's performance cannot be improved through reconfiguration, the software will be replaced by August 31, 2018.

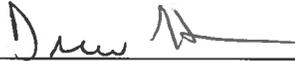
<b>Assigned To</b>	<b>Target Date</b>
John Thompson, Director of Maintenance	8/31/18

**ACKNOWLEDGEMENTS**

We would like to thank the management and employees of Valley Metro for their assistance and cooperation throughout the audit. A special thanks to John Thompson, Director of Maintenance, for his time and consideration as the point person with whom we worked. We would also like to thank Tiffany Ollie, Purchasing Supervisor; Sarah Godsey, Accounting Supervisor; and Margaret Dogan, Inventory Control Clerk for their time and input.



Wayne Parker, CFE  
Senior Auditor



Drew Harmon, CPA, CIA  
Municipal Auditor