

**BROOME COUNTY  
DEPARTMENT OF  
AUDIT AND CONTROL**

**FUEL INVENTORY CONTROLS  
AUDIT**

**February 2001**

*Alex J. McLaughlin, Comptroller*



Broome County

# Department of Audit and Control

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DANIEL A. SCHOFIELD  
Chairman of the Legislature

ALEX J. McLAUGHLIN  
Comptroller

February 27, 2001

Jeffrey P. Kraham, County Executive:

The Department of Audit and Control has audited the system of controls established by the Aviation, Public Transportation, Parks, Public Works-Highway, Fleet Management, and Solid Waste Management Departments to manage stored motor fuels. The principle objectives were to ensure that stored fuel quantities and capacities are reasonable and that adequate controls are in place to safeguard stored fuels.

The audit was conducted in accordance with generally accepted auditing standards. Such standards require that the Department of Audit and Control plan and perform the audit to assess the adequacy of the internal controls, and that we examine, on a test basis, sufficient, competent, and relevant evidence to afford a reasonable basis for our conclusions.

Based on the results of our examination, except for the instances noted herein, it is our opinion that the above Departments have adequate controls to effectively manage and safeguard their fuel inventory.

Sincerely,

Alex J. McLaughlin  
Comptroller

cc: Daniel A. Schofield, Chairman of the Legislature  
Members of the Legislature  
Louis P. Augostini, Clerk of the Legislature  
Carl G. Olson, Commissioner of Aviation  
James L. Hackett, Commissioner of Parks and Recreation  
Ronald Bailey, Commissioner of Public Transportation  
William A. Sczesny, Commissioner of Public Works

**Background Information:**

The purpose of our audit was to gain an understanding of where the county stores motor fuels, how much it stores and under what conditions. Also, to ensure that adequate control procedures are in place to protect stored fuels and to ascertain whether stored quantities and capacities are reasonable.

In 2000, Broome County appropriated about \$590,000 for Diesel Fuel, Gasoline, Grease and Oil. Broome County participates in the New York State Office of General Services Contract for all gasoline and on-road diesel fuel purchases. Fuel is purchased in bulk for convenience and cost efficiency.

There are twelve above ground diesel fuel tanks and nine above ground gasoline tanks controlled by six different county departments. The departments we reviewed were Aviation, Public Transportation, Parks, Public Works-Highway, Fleet Management and Solid Waste Management. The Parks Department includes Cole Park, Dorchester Park, Greenwood Park and Grippen Park.

All Broome County Departments reviewed, with the exception of Parks, use the Fuel Master management system. The Fuel Master system consists of a Personal Computer with software (Central Controller) that communicates with a keypad (Fuel Management Unit) located at the service island. The system requires the use of an authorized key (Prokee) to gain access. The keys can be encoded with applicable vehicle and/or user information. The system also offers several keypad-input options intended to prevent unauthorized access to fuel. We obtained and reviewed Fuel Master manuals for the purpose of determining if the system controls are being properly utilized.

The Parks Department does not use a computerized system for managing fuel. Instead each Park keeps a written log of all fuel transactions for each month. Each time an employee dispenses fuel, he or she fills out the log with the vehicle number, odometer reading, pump reading, gallons dispensed and their initials. At the end of each month the Park Manager or Assistant Manager reconciles the log and then a copy is sent to the Parks Services Manager.

We reviewed fuel invoices and amounts of dispensed fuel for the period January 1, 2000-October 31, 2000. We calculated turnover ratios based on the number of gallons dispensed divided by the capacity for fuel. These calculations allow us to examine each department for cost efficiency.

We did not review any environmental factors or conditions.

**Prior Audit:**

None

## **AUDIT FINDINGS, RECOMMENDATIONS, AND RESPONSES**

### **FINDING 1: THE DIVISION OF SOLID WASTE IS OVERPAYING FOR AN UNNECESSARY DYED FUEL PRODUCT**

During the course of our audit, we reviewed the type and amount of diesel fuel purchased by the various departments. From January to August, we noted that Solid Waste Management purchased 11,070 gallons of clear 2-D diesel fuel and 11,423 gallons of dyed 2-D diesel fuel. The dyed fuel is literally just clear fuel that has been dyed red. The red fuel is only for use in “off-road” applications, and is not subject to tax. Normally, it would make sense to buy, store and use this product, where appropriate, to save money on taxes. However, Broome County is exempt from these taxes anyway. The clear fuel that we buy under state contract is not taxed. Furthermore, the state contract price for the clear diesel ranged from \$0.03 to \$0.08 less per gallon than what the county paid for the dyed diesel during the period that we examined.

No economic or operational benefit is being derived as a result of purchasing the dyed fuel. In fact the county is paying more than it needs to for fuel and incurring unnecessary administrative and infrastructure costs to accommodate the purchase of two types of diesel fuel.

#### **RECOMMENDATION:**

We recommend that Solid Waste Management only purchase clear diesel fuel according to prices dictated by the NYS contract.

#### **MANAGEMENT RESPONSE:**

Initially dyed fuel (Hi sulfur) was purchased for off road vehicles instead of clear fuel (low sulfur) because it was less expensive. The pricing structure has changed and the lowest price paid for fuel during the year fluctuated between dyed and clear.

However, since we are presently purchasing clear fuel for on road vehicles, we see no reason to purchase two types of fuels. In the future Solid Waste will only purchase clear fuel (low sulfur).

**FINDING 2: COUNTY DEPARTMENTS ROUTINELY PAY TOO MUCH FOR GASOLINE BY PURCHASING OCTANE THAT EXCEEDS REQUIREMENTS**

During the course of our audit we reviewed the octane, the prices and the amount of gasoline purchased by the various departments. For the period reviewed, we noted that Public Transportation purchased 7,800 gallons of 89 octane gasoline, the Parks department purchased 10,700 gallons of 89 octane gasoline, Aviation purchased 4,900 gallons of 93 octane gasoline and Fleet Garage purchased 101,000 gallons of 93 octane gasoline. The average price per gallon of 87 octane was \$0.9182, 89 octane was \$0.9607 and 93 octane was \$1.0426.

We reviewed the manufacturer's specifications for the vehicles being fueled, and found the manufacturers recommended the use of unleaded gasoline with an 87 octane rating.

Purchasing gasoline of a higher rating than recommended is not cost effective. By buying the 89 and 93 octane rated gasoline, together these departments spent almost \$14,000 more than if they had purchased the 87 octane gasoline.

**RECOMMENDATION:**

We recommend that all departments purchase 87 octane rated gasoline as recommended by the vehicle manufacturer.

**MANAGEMENT RESPONSE:**

Fleet Garage will purchase 87 octane rated gasoline.

For many years, the Department of Aviation has purchased, stored and utilized 93-octane gasoline. The vehicle manufacturers recommended the purchase and utilization of this high-octane fuel.

Following your audit recommendation regarding fuel octane level requirements, octane requirements for the airport's current vehicle fleet was researched. Our research revealed that the 93 octane is no longer required and we may begin purchasing the lower grade 87-octane gasoline. The Department of Aviation will begin this new policy with our next fuel order. Other users of our fuel system have been notified of this change.

The Department of Parks and Recreation will comply with your recommendation and purchase 87 octane rated gasoline and purchase octane additive if a specific piece of equipment requires a higher octane grade.

As of January 10, 2001, all gasoline purchased by the Department of Transportation will be 87 octane.

**FINDING 3: PERSONNEL DO NOT OBSERVE AND MONITOR FUEL DELIVERIES AT THE DEPARTMENT OF PUBLIC TRANSPORTATION, THE DIVISION OF SOLID WASTE MANAGEMENT AND THE AVIATION DEPARTMENT**

During the course of our audit, we noted that the Solid Waste Management and Public Transportation Departments do not direct personnel to observe and monitor fuel deliveries.

The New York State Office of General Services (OGS) issues memorandums to authorized participants in state contracts (e.g. Broome County). Specific to the purchase of diesel fuel and gasoline, purchasing memorandum CL-276 strongly recommends that using agencies "...make certain that receiving personnel are available at the time of delivery to observe and monitor the entire delivery." Purchasing memorandum CL-276 also provides some examples of inappropriate and unsafe methods used by fuel suppliers.

Failing to observe and monitor fuel deliveries can result in fuel suppliers attempting to bypass certain failsafes designed to prevent spills and overfills. Additionally, observing and monitoring fuel deliveries adds assurance that the quantity of fuel ordered and invoiced is actually received.

**RECOMMENDATION:**

We recommend that all Broome County Departments receiving bulk fuel direct appropriate personnel to observe and monitor the deliveries to ensure they are being properly made.

**MANAGEMENT RESPONSE:**

Highways, Fleet Garage and Solid Waste Management will monitor fuel deliveries to insure that they are properly made.

All fuel deliveries at the airport must enter the fuel storage tank facilities through a gate located directly adjacent to the Department of Aviation's Maintenance Department. Because this electric gate is locked, maintenance employees must be present to open it for fuel delivery trucks in addition to escorting these vehicles to the fuel storage tank area. Upon completion of their delivery, the fuel trucks have to be escorted as they return to the gate exit. In the time after the delivery truck enters the gate, and prior to their departure, airport maintenance will remain with the delivery truck to observe and monitor the entire operation. Maintenance personnel have been advised.

The Department of Public Transportation will observe all fuel deliveries for the entire delivery.

**FINDING 4: THE COUNTY DOES NOT PERFORM ANY SAMPLING TO ENSURE THAT FUEL DELIVERED MATCHES FUEL ORDERED AND PAID FOR**

During the course of our audit, we noted that County Departments do not perform any sampling to ensure that the fuel delivered is actually the grade and type that is ultimately invoiced and paid for. No tests are performed to measure octane or any other attributes of fuel delivered to County tanks. This shortcoming is made worse by the fact that the County orders and pays for fuels that are rated above the lowest quality fuels available under contract, leaving room at the bottom of the available spectrum of grades for vendors to substitute an inferior product.

The New York State contract for fuel, in which Broome County participates, specifically states that fuel deliveries are subject to sampling and testing, and makes provisions for assessing financial penalties for the delivery of non-complying products. The New York State Office of General Services recommends, in Purchasing memorandum CL-276, that products delivered in accordance with the specifications outlined in the state fuel contracts be sampled on a regular basis to ensure compliance.

Without regular sampling, there is no assurance that the County is actually getting what it is paying for. Additionally, fuel that does not conform to specifications can result in additional operating, maintenance and repair costs.

**RECOMMENDATION:**

We recommend that all County Departments implement a procedure to regularly sample and test fuels that are delivered to County tanks. Any identified instances of non-compliance should be handled in accordance with the terms of the applicable contracts.

**MANAGEMENT RESPONSE:**

Fuel tanks at the County Departments of Highway, Fleet and Solid Waste will be regularly sampled and tested by the Broome County Division of Weights and Measures.

The Department of Aviation agrees that the airport's fuel tanks should be sampled and has contacted the Director of Purchasing about securing a County-wide contract for those Departments in need of these services. A contract should be secured in the near future.

The Department of Parks and Recreation will implement a procedure with the Department of Public Works where all County fuel tanks will be sampled.

Broome County Division of Weights and Measures has agreed to conduct fuel sampling for the Department of Public Transportation.

**FINDING 5: PAYMENT PROCEDURES AT THE AIRPORT SHOULD BE MODIFIED**

During the course of our audit, we noted that the Department of Aviation currently shares the usage of both their gasoline and diesel fuel tanks with five companies (United, Allegheny, USAir, Northwest, and Miller Aviation). The Department of Aviation pays to have the tanks filled every sixth time a fill is required (as do the other five companies sharing the tanks). The Aviation Maintenance Supervisor checks the fuel gauges daily, when more fuel is needed he informs the Keyboard Specialist, who in turn, calls the company who is next in line to purchase the needed fuel. The cost of the fuel that each company pays for is not necessarily the cost of the fuel they actually use. The amount of fuel that is dispensed to county vehicles, as well as the amounts that are dispensed to these other companies is kept track of via the Fuel Master System.

The Aviation Department's fuel tanks and dispensing systems are County property, as is the fuel that the Aviation Department pays for. It is unacceptable for non-county employees to have free access to County property. Additionally, there are unresolved issues as to liability for workers' compensation, property damage and product quality. Fuel dispensing is a relatively dangerous task and the Aviation Department should not allow it to be treated so casually.

Our testing confirmed that the Department of Aviation has not actually paid for any more fuel than it has used, but there is a potential for problems with this arrangement, legally, financially and operationally.

**RECOMMENDATION:**

We recommend that the Department of Aviation discontinue the practice of "taking turns" purchasing the gasoline and diesel fuel used by the five other companies and ourselves.

The other companies using our tanks should be given a reasonable notice that they will no longer be allowed to do so. The other companies must be advised to make other arrangements for fuel procurement as soon as possible. In the interim, they should be required to sign waivers releasing the County from any liability associated with this practice. The Law Department should approve these waivers.

**MANAGEMENT RESPONSE:**

In response to this finding, the Aviation Department analyzed several different options to remedy this situation. The first option, which is a requirement of tenants to supply their own fuel storage, would not be beneficial for multiple reasons. First,



up to five separate tanks would be needed to satisfy the other tenants currently using our fuel tank facility (United Express, Allegheny, US Airways, Northwest AirlinK and Flight Options). These excess fuel tanks would require utilization of valuably situated real estate, and because of the layout of our surroundings, the airport does not possess a great deal of additional land to lease. Secondly, additional fuel tanks would also significantly increase the chances of fuel spills, fires or other emergency incidences on airport property. Thirdly, current Minimum Standards of Aeronautical Activities prohibit tenants from fueling from their own tanks at Binghamton Regional Airport.

We have decided to work in conjunction with the Broome County Law Department to develop a formal tenant fueling agreement which would address issues involving workers' compensation, property damage and product quality. In order to utilize our fuel tank facility, tenants would have to sign this agreement and submit appropriate insurance certificates. We do not anticipate any problems with having an agreement signed by all parties.

#### **AUDITORS NOTE:**

We find the Aviation Department's proposed corrective action to be an acceptable alternative to our recommendation. Fuel use should be monitored to ensure that all participating parties are paying their fair share.

#### **FINDING 6: THE COUNTY HAS INVESTED IN MORE FUEL STORAGE CAPACITY THAN IT REQUIRES**

During the course of our audit, we calculated the ratio of gallons dispensed to fuel storage capacity for all departments that store diesel and gasoline. With the exception of the Public Transportation department's diesel fuel and the Fleet department's gasoline turnover, we found the ratios to be excessively low. This indicates that the County has built fuel storage capacity that exceeds its requirements.

Capacity decisions are important to an organization because they result in a significant commitment of resources for construction, operation and maintenance. Decisions on how much capacity to build should be based on a realistic measure of product need, consumption rate and required lead-time for inventory replenishment.

Having built more fuel storage capacity than it requires, the County has invested more money into this category than was necessary. The excess capacity also means excess maintenance costs will be incurred over the life of the storage facilities.

Additionally, the County will incur unnecessarily high risks associated with possible loss or environmental damage because it is storing larger quantities than required. There is also a potential for quality deterioration in fuels stored for excessively long periods.

## **RECOMMENDATION:**

We recommend that, in the future, the County should make a more careful assessment of need before constructing storage capacity.

## **MANAGEMENT RESPONSE:**

Department of Public Works concurs with the recommendations.

The Aviation Department agrees that to compare our fuel system's gallons dispensed to fuel storage capacity reveals excessively low ratios. However, we feel that other variables need to be incorporated into this finding. This system was constructed for multiple users with different operational requirements. For example, the Department of Aviation is required per our federally approved airport certification manual to maintain enough fuel in our storage tanks to keep our entire fleet of snow removal vehicles operational for a seventy-two hour period. Airlines, also governed by federal regulations, are also subject to similar rules and regulations requiring access to minimum fuel levels.

Secondly, the size of our tanks allows users to purchase fuel in bulk at cost savings. For example, US Airways has a policy of only buying in 1,000 to 1,500 gallons increments allowing them to experience costs savings with each bulk purchase. In this instance, if US Airways were forced to purchase in smaller increments because of a smaller storage tank, their important cost savings would be lost. Although it is not a large amount of money, small savings add-up and assist in keeping businesses operating at Binghamton Airport and possibly attract more.

Lastly, attracting more air service providers at any airport is always a top priority. Obviously, as more airlines fly to/from Binghamton Regional Airport, more fuel capacity would be required. It is very important from our perspective to be able to offer a facility ready-made to meet their requirements.

The Department of Parks and Recreation will comply with your recommendation to carefully assess the fuel need prior to constructing any future storage capacity.

## **FINDING 7: THE COUNTY IS HAVING FUEL DELIVERED MORE FREQUENTLY THAN SHOULD BE REQUIRED**

During the course of our audit, we reviewed the amount of fuel purchased and the amount of fuel dispensed for each department. For the period we reviewed, we noted that, Public Transportation, Highway Department, and Solid Waste Management only allow their diesel fuel tanks to deplete to about half of their capacity before ordering more fuel. Aviation and Fleet Management only allow their gasoline fuel

tanks to deplete to about half of their capacity before ordering more fuel. A normal fuel order was delivered two days after the order was placed.

Fuel deliveries should be scheduled to ensure that sufficient product is on hand to meet operating requirements and to minimize the number of such deliveries within a given period. Consideration should be given to storage capacity, consumption rate, lead-time and product shelf life.

Since a normal fuel order is delivered in two days, it is unnecessary to have the tank filled with fuel weeks before it will be used. These unnecessary deliveries create more purchase orders/invoices. It also takes time away from employees' regular duties, because they should be required to observe and monitor each fuel delivery. The potential risk associated with losses is greater because the fuel tanks are filled to capacity more often than needed. Additionally, there is a greater risk of environmental contamination associated with spills occurring during delivery.

#### **RECOMMENDATION:**

We recommend that all County Departments reduce the number of fuel deliveries to the bare minimum, making better utilization of available capacity and increasing operational efficiency.

#### **MANAGEMENT RESPONSE:**

Fuel for the two (2) 5,000 gallon tanks in the fuel farm is ordered when the level reaches 2,000 gallons, while fuel for the 1,500 gallon tank on the landfill face is ordered every two weeks. If the tanks were allowed to deplete further, there is a potential for a condensation problem. Condensation in the fuel would raise havoc with the machinery.

Therefore, we will continue with our present purchasing procedure.

Because the Aviation Department's fuel storage tanks receive deliveries from multiple users rather than just one, fuel deliveries occur on a more frequent basis. On average fuel is delivered every month and a half. Tenants order fuel deliveries rotationally based on their usage and, mostly, will not order again for many months. However, because of minimum fuel requirement discussed earlier, fuel quantities must be kept above certain levels.

Department of Aviation personnel will continue to monitor the fuel deliver schedule to ensure fuel delivery frequencies are kept to a minimum.

The Department of Public Transportation orders fuel when our supply gets down to about 7200 gallons. We use about 1500 gallons per day and it takes up to three days for delivery. We order a full tanker load of 7500 gallons for each delivery. We wish to continue to order fuel in this manner.

**FINDING 8: AVIATION DEPARTMENT AND SOLID WASTE DIVISION DO NOT MAKE FULL USE OF AVAILABLE FUEL MANAGEMENT SYSTEM CONTROLS**

During the course of our audit, we noticed that the Aviation Department and the Solid Waste Division do not make full use of available fuel management system controls. Specifically, Aviation and Solid Waste do not use controls that are meant to prevent unauthorized access to fuel (input of odometer readings and/or hour meter readings). In conjunction with this input, an appropriate range of miles per gallon needs to be set for each vehicle. Similarly, Aviation and Solid Waste do not make use of system controls over how much fuel can be dispensed per day or per transaction.

Failure to implement these controls increases the risk that fuel stored at these sites will be stolen and that the theft will go undetected.

**RECOMMENDATION:**

We recommend that the Aviation Department and the Solid Waste Division revise their procedures and make full use of available fuel management system controls.

**MANAGEMENT RESPONSE:**

Solid Waste Management will revise procedures and make full use of available system management controls.

The Department of Aviation will make the following revisions to our utilization of our fuel management software package:

1. The Odometer/Hours meter requirement will be enabled which will force fuelers to input a valid mileage or engine hour figure for the appropriate vehicle. This requirement will only affect Department of Aviation Personnel, and not the airlines, as we have found that the majority of their equipment does not have any type of working meter.
2. An inventory feature will be enacted that will enable this department to further monitor product deliveries and inventories.

3. After review of the product quantities dispensed by each user over the past calendar year, it is clear that the maximum daily transaction setting of 250 gallons was too high. The default setting has been revised to better represent daily usage, which is normally in the range of 100 gallons.

**FINDING 9: THE PUBLIC TRANSPORTATION DEPARTMENT, FLEET MANAGEMENT AND SOLID WASTE MANAGEMENT DIVISIONS DO NOT PERIODICALLY VERIFY COMPUTERIZED FUEL INVENTORY**

During the course of our audit, we discovered that the Solid Waste Management Division, the Fleet Management Division and the Public Transportation Department do not conduct periodic physical verification of computerized fuel inventory records.

Periodic physical verification of inventory records is an essential element of an adequate system of internal control.

Failure to perform periodic physical verification of inventory records may result in undetected product loss or uncorrected system problems.

**RECOMMENDATION:**

We recommend that the Solid Waste Management Division, Fleet Management Division and the Public Transportation Department perform periodic physical verifications of computerized fuel inventory records. The results of these physical measures should be compared with and reconciled to the computerized records. Any variances should be investigated and explained.

**MANAGEMENT RESPONSE:**

Solid Waste Management will conduct a physical verification at the time of fuel delivery and the results will be reconciled to the computer records. Variances will be explained and reasons documented.

The Department of Public Transportation verifies our fuel inventory with our OEL 8000 Reader Computerized System. We will now also verify our fuel inventory by taking a periodic physical verification using the “clocks” on each of our fuel tanks.

**FINDING 10: NEW YORK STATE CONTRACT FUEL PRICE REVISIONS ARE AVAILABLE ON THE INTERNET**

During the course of our audit, we noted that the New York State Office of General Services Contract prices for gasoline and diesel fuel are subject to weekly changes. These price changes are not received by mail in Broome County departments until several weeks after the revisions. The due date on the invoices from the fuel companies ranged from 11-30 days. Therefore, some invoices are due and submitted for payment prior to receipt of the mailed price revisions. As a result, prices were not verified until after payment. The NYS-OGS web site provides up-to-date fuel prices for all NYS contracts.

Departments are responsible for ensuring that invoice prices are in accordance with the NYS contract prior to submitting purchase orders to Audit and Control for payment.

Use of the NYS-OGS web site should allow claims for payment to be submitted in a more timely manner. Additionally, use of the web site reduces the risk that department personnel will not detect billing errors.

**RECOMMENDATIONS:**

We recommend that all Broome County Departments receiving fuel purchased under the NYS-OGS contract use the Internet as a means of verifying the price of fuel being invoiced. The NYS-OGS site is [www.ogs.state.ny.us](http://www.ogs.state.ny.us). Click on *Procurement*, then *Buyer Information*, then *Fuel Prices*, select *Broome County*, type in the *delivery date* and finally click on the *View Net Fuel Prices*.

**MANAGEMENT RESPONSE:**

Solid Waste Management, Fleet Management, and Public Works Highway will verify price of fuel being invoiced with the OGS contract price.

The Department of Aviation will utilize the Internet to verify invoiced fuel prices.

The Department of Parks and Recreation will comply with your recommendation regarding verifying fuel prices by utilizing NYS-OGS website.

As of January 10, 2001, the Department of Public Transportation will verify the price we are charged for fuel on-line before payment is made.