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# **Brookhaven National Laboratory Motor Pool Facility**

**Facility Environmental Monitoring Report**

**Calendar Year 2001**



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Motor Pool Facility  
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*Summary of Results:* Analysis of groundwater samples collected at the Motor Pool facility during calendar year 2001 indicates that historical operations have impacted groundwater quality. As in previous years, the volatile organic compounds 1,1,1-trichloroethane, 1,1-dichloroethane and methyl tertiary butyl ether were detected in several monitoring wells at concentrations above regulatory limits. Monitoring of the leak detection systems and the wells located downgradient of the Motor Pool's underground storage tank area indicate that the tanks and associated distribution lines are not leaking. Furthermore, evaluation of current vehicle maintenance operations indicates that all waste oils and used solvents are being properly stored and recycled. Therefore, it is believed that the solvents detected in groundwater originate from historical vehicle maintenance activities at the Motor Pool, and are not related to current operations.

## **Background**

The Motor Pool (Building 423) and Site Maintenance facility (Building 326) are attached structures located along West Princeton Avenue (Figure 1). The Motor Pool area consists of a five bay automotive repair shop, which includes office and storage spaces. The Site Maintenance facility provides office space, supply storage, locker room and lunchroom facilities for custodial, grounds and heavy equipment personnel. Both facilities have been used continuously since 1947.

Potential environmental concerns at the Motor Pool include the historical use of underground storage tanks (USTs) for the storage of gasoline, diesel fuel and waste oil, hydraulic fluids used for lift stations, and the use of solvents for parts cleaning. In August 1989, the gasoline and waste oil USTs, pump islands and associated piping were upgraded to comply with Suffolk County Article 12 requirements for secondary containment, leak detection devices and overfill alarms. Following the removal of the old USTs, there were no obvious signs of soil contamination. The present tank inventory includes two 8,000 gallon-capacity USTs used for the storage of unleaded gasoline, one 260 gallon-capacity above ground storage tank used for waste oil, and one 3,000 gallon-capacity UST for Number 2 fuel oil. An inactive 275 gallon-capacity UST that was used for diesel fuel is scheduled for removal in early 2002.

The Motor Pool facility has five vehicle lift stations. The hydraulic fluid reservoirs for the lifts are located above ground. In February 1998, it was discovered that hydraulic

fluid was leaking from one of the lift stations (BNL Spill Number 98-14). The lift was excavated and soils below the lift were found to be contaminated with hydraulic oil. Approximately 50 cubic yards of the most contaminated soils were removed. In response to a New York State Department of Environmental Conservation (NYSDEC) request to evaluate whether the spill affected groundwater quality, BNL installed a monitoring well (102-09) inside the building, directly downgradient of the spill area. Hydraulic oil products were not detected in groundwater samples collected during 1999 (Zimmerman, 2000). Based upon these findings, the hydraulic fluid spill was removed from the NYSDEC's Active Spill List (Acampora, 2000).

The only environmental concern associated with the Site Maintenance facility (Building 326) was the December 1996 discovery of a historic oil spill directly south of the building (Figure 1). During the removal of an underground propane tank, the surrounding soils were contaminated with petroleum hydrocarbons (BNL Spill Number 96-54). The site was excavated to the extent that the footings of the building were almost undermined. Although approximately 60 cubic yards of contaminated soil were removed, there was clear evidence that contaminated soils remained. In an effort to investigate the potential impact to groundwater quality, four wells were installed. Although groundwater monitoring detected the presence of the solvent 1,1,1-trichloroethane (TCA) at concentrations above New York State Ambient Water Quality Standards (NYS AWQS), petroleum hydrocarbons were not detected in groundwater downgradient of the spill site (Zimmerman, 2000). Based upon these findings, the oil spill was removed from the NYSDEC's Active Spill List (Acampora, 2000).

## **Environmental Monitoring Program**

In accordance with DOE Order 5400.1 (Environmental Protection), in 1996 BNL established a groundwater monitoring program at Motor Pool facility to evaluate potential impacts to environmental quality from gasoline and used motor oil storage operations. This monitoring program was expanded in 1999 to evaluate potential impacts from the two oil spills described above. The environmental monitoring program for the Motor Pool facility is described in the BNL Environmental Monitoring Plan (Daum *et al.* 2000; BNL, 2001). During 2001, six monitoring wells were used to evaluate groundwater quality.

## **Monitoring Results**

***Underground Storage Tank Area:*** The Motor Pool facility's groundwater monitoring program for the underground storage tank area is designed to confirm that the engineered and institutional controls in place are effective in preventing contamination of the aquifer. Two wells (102-05 and 102-06) are used to monitor for potential contaminant releases from the UST area (Figure 1).

During 2001, no chemicals related to gasoline products (e.g., benzene, ethylbenzene, toluene, xylenes or MTBE) were detected in groundwater downgradient of the gasoline

UST area (Table 1). The solvent TCA was detected in both wells, but at concentrations below the NYS AWQS of 5 µg/L. The TCA contamination is probably due to historical parts degreasing operations at the Motor Pool facility. Wells 102-05 and 102-06 were also tested for the presence of floating petroleum hydrocarbons. As in previous years, no floating product was observed.

***Building 423/326 Area:*** The groundwater quality downgradient of Building 423 and Building 326 is monitored using four wells (102-10, 102-11, 102-12, and 102-13). The program is designed to periodically assess existing solvent contamination that resulted from historical vehicle maintenance operations, and to confirm that the current engineered and institutional controls are effective in preventing additional contamination of the aquifer.

During CY 2001, TCA was detected in all four wells at concentrations ranging from 6.0 µg/L to 77.3 µg/L. 1,1-dichloroethane (DCA) was detected in Well 102-12 at concentrations up to 14.5 µg/L (Table 1). The NYS AWQS for TCA and DCA is 5 µg/L. The gasoline additive MTBE was detected in all four wells, with a maximum observed concentration of 73.8 µg/L. The NYS standard for MTBE is 10µg/L. It is believed that the TCA and DCA originate from historical vehicle maintenance/part degreasing operations. MTBE has been used as a gasoline additive since 1977, and is also found in fuel oil. This compound has been detected at low levels in the Motor Pool wells since the monitoring program began in 1996. The presence of MTBE in groundwater is likely due to small-scale spillage.

## **Evaluation of Current Operations**

Motor Pool operations were evaluated as part of the BNL Process Evaluation Project (Process ID: SM-550-VMO). The process evaluation found that all waste oils and used solvents generated from current operations are being properly stored and recycled. Two self-contained parts cleaners are located in the service shop. Automotive parts and tools are placed on trays in the cleaners, which are filled with a proprietary cleaning fluid called Safety Kleen. Used Safety Kleen is periodically replaced with clean fluid, and all spent fluid is taken off-site for recycling by an outside vendor. The Process Evaluation findings support the suggestion that the TCA, DCA and MTBE detected in groundwater is not related to current operations. Based upon electronic leak detection system monitoring and product reconciliation (i.e., an accounting of the volume of gasoline stored in underground storage tanks and volume of gasoline sold), there are no indications that the underground storage tanks or associated piping are leaking. Furthermore, if the contaminants were related to a recent (significant) gasoline spill, it would be expected that groundwater samples would contain very high levels of chemicals such as benzene, ethylbenzene, xylenes, toluene and MTBE.

## **Future Monitoring Actions**

The following actions are recommended for CY 2002:

- Maintain the groundwater monitoring program on its current semiannual schedule, and test for floating product, VOCs and semi-VOCs.

## **References**

Acampora, N., 2000. N. Acampora to G. Malosh letter dated April 19, 2000. *Reference Spill #96-11117, Building 326, Upton. BNL Internal Number: 96-54; Spill #97-13266, Building 423, Upton. BNL Internal Spill Number: 98-14.*

BNL, 2001. *Brookhaven National Laboratory Environmental Monitoring Plan, CY 2001 Update* (January 2001). BNL-52584 Update.

Daum, M., Dorsch, W., Fry, J., Green, T., Lee, R., Naidu, J., Paquette, D., Scarpitta, S., and Schroeder, G., 2000. *Brookhaven National Laboratory, Environmental Monitoring Plan 2000* (March 31, 2000).

Zimmerman, E.A., 2000. E.A. Zimmerman to G. Malosh letter dated January 5, 2000. *Groundwater Monitoring at the BNL Motor Pool and Site Maintenance Facility – NYSDEC Spill Numbers 96-11117 and 97-13266.*

**BNL Facility Environmental Monitoring Report**  
**Motor Pool Facility**  
**Groundwater Monitoring Program**  
**Volatile Organic Compound Analytical Results for CY 2001**  
**Table 1**

Well	Sample Period	1,1,1-TCA (ug/L)	1,1-DCA (ug/L)	MTBE (ug/L)
<i>Wells Downgradient of Gasoline UST Area</i>				
102-05	March	2.3	<2.0	<2.0
	September	0.8J	<2.0	<2.0
102-06	March	0.6J	<2.0	<2.0
	September	1.6J	<2.0	<2.0
<i>Wells Downgradient of Building 423/326</i>				
102-10	March	13.9	<2.0	<2.0
	August	25.7	<2.0	4.2
102-11	March	24.3	2.8	3.9
	August	6.0	<2.0	2.4
102-12	March	22.3	2.8	5.5
	August	77.3	14.5	6.1
102-13	March	31.8	2.5	73.8
	August	7.9	<2.0	17.3
Typical MDL		2	2	2
NYSAWQS		5	5	10

MDL: Minimum Detection Limit

J: Estimated value (below MDL)

Note 1: Upgradient well 102-08 was not sampled during 2001 because: 1) no other contaminant sources are located directly upgradient of this facility; 2) no VOCs were detected in this well during CY 1999.

Note 2: Well 102-09 was installed inside Building 423, adjacent to vehicle lift/hydraulic oil spill site. No contaminants were detected in this well, and it was abandoned in 2001.

