

**TNT AREAS SITE INVESTIGATION  
RECOMMENDATIONS**

**MAY 1996**

**235 PEACHTREE STREET, N.E.  
NORTH TOWER, SUITE 2000  
ATLANTA, GEORGIA 30303**

## TNT AREAS SITE INVESTIGATION RECOMMENDATIONS

The Plum Brook Ordnance Works (PBOW) TNT Areas Site Investigation included assessment of soils and groundwater. The results of the Site Investigation confirm that nitroaromatics are present in the soils in all three TNT areas. Low levels of explosives residues were detected in the groundwater in each of the three TNT areas. However, in Dames & Moore's experience, the results of only one groundwater sampling event do not definitively confirm nitroaromatics contamination in the groundwater in the three TNT areas.

At the PBOW TNT areas, contamination originating in the soils is the most likely source of contamination in the groundwater. Therefore, contamination in the two media is intimately linked. Removal of the contaminant source in the soils would probably decrease significantly future migration of contamination into the groundwater.

### SOILS

Dames & Moore believes that the results of the Site Investigation demonstrate conclusively that soil contamination by nitroaromatics is present in each of the three TNT areas. Contamination is still present at TNT Area A despite extensive decontamination and soil removal which were performed following closure of the facility.

The methods of disposal of waste materials during operation of the plant produced an extremely heterogeneous and discontinuous pattern of distribution of explosives residues in the soils. Dames & Moore believes that it is unlikely that the vertical and horizontal extent of contamination can be reasonably established at any of the TNT areas without extensive investigations.

The concentrations detected in the soil samples were compared to the risk-based screening criteria developed by EPA Region III for industrial and residential scenarios. Results were compared for 900 individual tests (nine compounds for which values were available for 100 samples). Eight samples, less than 1 percent, had

concentrations above the industrial scenario screening level. Of these, only six were surface samples. Fifteen samples, 1.7 percent, had concentrations above the residential screening criteria.

Dames & Moore recommends that a site-specific risk assessment be performed to establish that additional investigation leading to remediation is warranted for the TNT areas, based on current and projected future uses of the site. Dames & Moore believes that the results of 100 samples collected for this investigation provide an adequate data set for a risk analysis.

In the event it is decided to perform additional investigations at the TNT areas, Dames & Moore strongly recommends that the footprints of the former structures be surveyed based on the available site plans. Sampling sites for this investigation were based on roughly approximated building locations. It is possible that the low levels of nitroaromatics detected at so few locations in TNT Area C resulted more from the sampling locations than an actual lack of contamination. Surveying the footprints of the former structures would, in our opinion, probably increase the likelihood that contamination would be detected.

## **GROUNDWATER**

The groundwater investigation performed at the PBOW as part of this investigation was designed as a preliminary investigation. As is discussed in Section 6 of this report and in the Sitewide Groundwater Investigation Report, the hydrogeologic regime at the site has not been adequately delineated. Additional information is needed to assess the seasonal variation in the groundwater flow patterns in both the overburden and bedrock hydrostratigraphic units; to evaluate the vertical component of flow between the overburden and the bedrock and the resulting potential for contaminant transport to the bedrock aquifer; and to characterize the groundwater quality, particularly with respect to nitroaromatics.

## **Groundwater Quality**

In order to evaluate groundwater quality, Dames & Moore recommends that the groundwater chemistry data from this investigation be confirmed by additional sampling and laboratory analysis. Because groundwater in the overburden in some areas is present seasonally, such sampling should be scheduled for late winter or early spring when water would be expected to be present in most of the overburden wells at the site. Dames & Moore recommends that, at a minimum, two additional rounds of groundwater samples be collected with approximately 3 months between sampling events.

## **Groundwater Flow Regime**

In order to characterize the groundwater flow regime, Dames & Moore recommends that the following activities be performed, at a minimum.

1. An additional bedrock groundwater monitoring well should be installed at TNT Area B. The recommended location for this well is on the north side of TNT Area B near overburden well MK-MW17. Low levels of nitroaromatics were detected in well MK-MW17 during this investigation.
2. In order to evaluate the vertical component of flow between the overburden and bedrock hydrostratigraphic units, well pairs (one well screened in the overburden and one bedrock well installed as an open hole) should be installed. Installation of a bedrock well near overburden well MK-MW17 at TNT Area B provides a well pair in TNT Area B. Dames & Moore recommends that a third bedrock well be installed at TNT Area A, located near overburden well DM-MW10. Low levels of explosives residues were detected in this well. Dames & Moore also recommends that a fifth overburden well be installed at TNT Area C, near bedrock well BED-MW13. Low levels of nitroaromatics were detected in well BED-MW13.
3. A program of regular monthly water level measurements should be instituted at the site in order to establish seasonal variations in water table fluctuations and groundwater flow conditions.
4. If groundwater contamination of the bedrock aquifer is confirmed, aquifer testing should be performed to evaluate groundwater flow parameters in each of the hydrostratigraphic units at the site. Knowledge of the groundwater flow parameters is necessary for further assessment of the

direction and rate (both horizontal and vertical) of groundwater movement. This assessment will be necessary to adequately evaluate potential remediation methods.