



North Carolina Department of Environment and Natural Resources
Division of Waste Management

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MEMORANDUM

Date: November 19, 2013
To: File
From: Adam Ulishney, Hydrogeologist
NCDENR-Division of Waste Management
Superfund Section
Inactive Hazardous Sites Branch
Re: Mary Chappell Site
NONCD0002832
TCE Potential for Vapor Intrusion

The Mary Chappell site is located a 1061 NC Highway 177 North in Hamlet, Richmond County, North Carolina. A private drinking water well at the Mary Chappell residence was found to be contaminated with trichloroethylene (TCE). Previous analytical test performed prior to June 2010 on water sampled from the Mary Chappell well detected TCE concentrations ranging from 25.7 to 70.6 micorgrams per liter (ug/l). In September 2010 the North Carolina Department of Environment and Natural Resources contracted S&ME to assess potential soil and groundwater contamination possibly originating on-site or coming from off-site sources.

On September 7, 8, 9, and 10, 2010 S&ME utilized a direct-push drilling technology to advance seven (7) soil borings at the site for the collection of soil and groundwater samples. Six (6) soil borings were installed to depths ranging from 39.90 feet below ground surface to 48.50 feet below ground surface, and one (1) boring to a deeper depth of 75.60 feet below ground surface. Termination depths were based on lithologic refusal. All borings, with the exception of the deep boring which was found to be dry, were converted into Type II temporary monitoring wells for collection of groundwater samples.

In summary, lithologic descriptions indicated that apparent confining layers exists at the site at a depth of 49 feet below ground surface. Analytical results for soil samples collected in the vadose zone above the shallow groundwater aquifer, from each boring, reported no detections of TCE above the laboratory method detection limit. In addition, groundwater samples collected from the temporary monitoring wells, screened within the shallow aquifer also reported no detections of TCE above the laboratory method detection limit.

A groundwater sample was collected from the private drinking water well located at the Mary Chappell residence. Analytical results reported a TCE concentration of 34ug/l within groundwater in this well and in excess of the NCAC 2L groundwater standard of 3ug/l, the USEPA drinking water MCL groundwater standard

of 5ug/l, and the NCDENR's Inactive Hazardous Waste Branch's vapor intrusion screening level of 1.2ug/l. It was also found that the Mary Chappell private drinking water well was apparently screened at a depth interval between 88.8 feet and 98.5 feet below top of casing, which is in an aquifer below the confining clay layers encountered at approximately 49 feet below ground surface.

Given the above information, the clean shallow zone (shallow aquifer and vadose zone soils) most likely act as a barrier to prevent vapors, specifically TCE in the deep groundwater zone, from reaching the unsaturated zone, and ultimately intruding into the overlying buildings. To address the ingestion of groundwater pathway, the NCDENR funded the installation of a water line in 2013, and connected the residence to this water line via the Bernard Allen Fund. In the near future, NCDENR intends to contact the owner of the residence for proper abandonment of the private water well located at the site.