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LETTER AND COMMENTS FROM U S DEPARTMENT OF THE INTERIOR REGARDING  
NOTICE OF DEFICIENCY MEMORANDUM PHASE I ACTIVITIES SITE 11 NSB KINGS BAY  
GA  
9/9/1995  
U S DEPARTMENT OF THE INTERIOR



# United States Department of the Interior

GEOLOGICAL SURVEY  
Water Resources Division  
Peachtree Business Center, Suite 130  
3039 Amwiler Road  
Atlanta, Georgia 30360-2824

September 9, 1995

Mr Anthony B Robinson  
Environmental Division  
Southern Division  
Facilities Engineering Command  
2155 Eagle Dr  
P O Box 190010  
Charleston, S.C. 29419-9010

Dear Sir:

Enclosed please find the requested technical review of comments included in the Notice of Deficiency (NOD) memorandum submitted by the Georgia Department of Natural Resources, and the response matrix provided by ABB Environmental Services (ABB-ES). Also, included are technical comments regarding specific parts of the Interim Measure Phase I Activities. Evaluation and Recommendations Report, Site 11, NSB and modifications prepared by ABB-ES.

- Based on available data, neither the 'cone of depression/zone of influence' nor the 'capture zone' can be determined. Water-level data are far too sparse in the vicinity of the recovery wells to estimate the size of the area where flow reversal has been created by pumping of the recovery wells. In addition, because ground-water levels declined more than 1.0 foot over the entire study area between April and May 1994, the area affected by pumping cannot be determined. If continuous(ambient/regional) water levels were available for the period of measurement, then, and only then could the effect of recovery well pumping be determined. The present level of data collection is inadequate to interpret the aquifer volume affected by recovery well pumping.
- Available ABB-ES data were used to replot the potentiometric surface for the time period of May 1994. This potentiometric surface was similar to that constructed from January and April 1994 data. The effect of recovery well pumping could not be observed on the shape or gradient of the potentiometric surface.
- Because of data inadequacy, areas identified by Georgia EPD where 'flow by' may be occurring are speculative. The potentiometric map generated by ABB-ES for the May 1994 period (fig. 2-10) is presumably hypothetical. Data have not been produced by ABB-ES that would allow duplication of this map. For this reason, the validity of this

aquifer-surface configuration is questionable. Understanding the shape and gradient of the potentiometric surface is critical to furthering the understanding of both ground-water flow directions and flow rates. Accurate estimates of direction and rate are extremely important components for developing a ground-water flow model, as well as identifying areas that would optimize the Navy's ground-water recovery effort. Additional recovery wells should not be sited until an accurate potentiometric surface is constructed.

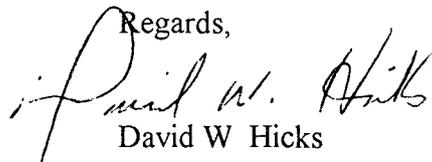
- The map showing ground-water flow lines (fig 2-11) was constructed using the hypothetical potentiometric surface map (fig 2-10) and does not accurately depict flow directions within the aquifer. This map should be redrawn using appropriate water-level data.
- Chemical concentration data presented by ABB-ES for well KBA-11-16 in the response matrix are not conclusive. The presented graph shows concentrations for selected constituents for four sampling-time periods. The graph shows significant concentration declines for three compounds, 2-Butanone, Acetone, and 4-Methyl-2-pentanone, between January 1994 and September 1994. These declines are inferred to be in response to the operation of the recovery well system. However, upon inspection, these three compounds were found to be similar in that each is highly soluble in water and each has a very short half-life. A rough calculation of the chemical decay indicates that the concentration of these compounds would have been at the reported level as a function of time rather than remediation. Thus, the data do not confirm the effectiveness of the recovery system, nor the implied conclusion that well KBA-11-16 is in an area where the transport from the landfill is being intercepted or remediated.

#### **CONCLUSIONS/RECOMMENDATIONS:**

- Observation well areal coverage is too sparse to describe the potentiometric surface of the surficial aquifer with adequate resolution to approximate directions of ground-water flow in the vicinity of the recovery wells. If Georgia EPD requires the generation of a flow net to evaluate the effectiveness of the recovery system, additional monitoring wells must be installed downgradient of the recovery wells.
- Additional observation wells should be installed at selected sites at a radii of 1,500 and 2,000 feet from the centroid of the recovery wells. Using water-level data from these observation wells, the zone of influence may be determined and a head gradient may be projected to the model study area boundary.
- Install a continuous water-level recorder on several observation wells. At least one well outside the zone of influence and one well within the zone of influence. Obtain rainfall records from NSB Kings Bay operations. If no records available, install

tipping-bucket rain gage on site. Water-level response to rainfall (recharge) must be evaluated in order for a recharge versus head relationship to be developed.

- Collect borehole geophysical logs in several existing monitoring wells and in all newly drilled wells. Geophysical logs will be correlated with existing drillers logs to develop a hydrologic framework for the aquifer system.
- Collect synoptic water-level data from all monitoring wells. Data will be used to construct an accurate potentiometric surface for the aquifer whereby ground-water flow lines can be approximated. Hopefully, these data will be sufficient for the Navy to make generalized estimates of the effectiveness of the recovery system and determine areas where additional recovery wells may be beneficial.
- Subsequent to the installation of the additional wells and collection of the above referenced data, the development of the ground-water flow model can be initiated.

Regards,  
  
David W Hicks  
Hydrologist