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February 11, 2000

Mr. James M. Gamble, P.G.
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Response to Section Comments
Site Hydrogeologic Report
White Oak Subtitle D Landfill, Haywood County, North Carolina
MESCO Project No. G98010.5

Dear Mr. Gamble:

The following are responses to your letter dated November 4, 1999 pertaining to the site hydrogeologic report for the White Oak Subtitle D Landfill in Haywood County, North Carolina.

Section Comment

Rule .1623(a)(4)(E) had not been satisfied because there were questions about slug tests used to determine some aquifer properties. The questions were about well characteristics used in equations and the relevance of the estimates because of low initial drawdown. Municipal Engineering conducted new slug tests and evaluated them with more realistic well characteristics. However, it does not appear that they addressed the issues of low initial drawdown. The wells did not stress the aquifer enough yet were included in the evaluation. The Section could not find where the effects of that low drawdown were addressed in the text of the report. Therefore, without some additional explanation, the Section will not accept the slug test results from wells P-6, P-9, P2-1, and P2-2. The slug test results should be removed from the evaluation and not considered in estimating the properties of the aquifer.

The slug test results from the piezometers P-9, P2-1 and P2-2 were already excluded in the calculation of the average hydraulic conductivity for the fractured bedrock unit, which was mentioned briefly in the footnote on page 9 of the second submittal dated October 18, 1999. Municipal Engineering Services Company, P.A. (MESCO) conducted additional slug test on piezometers P-6 and P-9 in order to address the issue of low initial drawdown prior

to the second submittal, and the results were included therein. The slug test result from P-6 was incorporated in the calculation of the average conductivity for the fractured bedrock unit as the test successfully achieved sufficient initial drawdown. The slug test on P-9, however, failed to achieve your desirable amount of initial drawdown due to an exceptionally high recharge rate. As such, the resulting data from this well was not used for the characterization of the bedrock. This submittal includes a summary of the well/piezometer construction records with updated slug test data as part of the Appendix B.

Section Comment

The requirements of Rule .1623(a)(8) were not satisfied because groundwater movement at the site had not been adequately addressed. This is most evident in the bedrock aquifer where flow occurs along fractures. The thrust of the revision is that the bedrock can be considered as a porous media. As such, the direction of groundwater flow can be estimated from the direction of the hydraulic gradient. This is true in only the crudest sense. Assertions of equivalent porous media are useful for general discussions of groundwater movement. This very basic description of an aquifer is occasionally sufficient to determine site suitability. However, this general understanding is not sufficient under some circumstances. One such instance is where the applicant does not control the property to the discharge feature. Haywood County does not control the property to the discharge feature on the southern portion of the site. Therefore this basic level of understanding will not suffice.

As per the comment made by the Section, we have concluded that the theory does not necessarily apply to the extreme southern portion of the site. One question that was raised during our meeting with Mr. Gamble was the accuracy in the positioning of the hydraulic divide. In the first submittal, it was defined based on the available hydraulic head data, which suggested that the divide be located slightly to the north of the existing ridgeline. An additional investigation was conducted in the area surrounding the ridgeline with 14 new piezometers[1] in order to define the location of the divide with greater accuracy.

A potentiometric map was created based on measured head values from all available wells and piezometers in the vicinity of the ridgeline, and is included in this submittal as Plate 4B. This map suggests that the hydraulic divide is in fact positioned nearly below the topographic high. With this information, it is a safe assumption that the groundwater flow in this particular area typically follows the surface topography, and that the area north of the defined hydraulic divide be suitable for landfill development. All necessary adjustments to cell layout and phasing will be made to avoid placement of waste in the area south of the hydraulic divide.

Section Comment

The Section has determined that the current level of investigation is not sufficient to determine if the southern portion of the property is suitable for

[1]Five of these piezometers were installed as part of the design hydrogeologic study for phase 1.

landfill development. Haywood County may choose to continue pursuing suitability of that portion of the property. Please note that additional investigation will not ensure that the entire property will eventually be considered suitable. It is possible that additional investigation will show questionable areas in the southern portion of the site to be unsuitable. Any adjustments to cell layout and phasing will need to be reflected on drawings in both the engineering and hydrogeologic portions of the application.

As pointed out in the previous part of this response, all necessary changes will be made to ensure that the land south of the hydraulic divide be not used for waste disposal.

Please feel free to contact me at 919.772.5393 should you have any questions regarding the contents of this report.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

Kohei Yoshida

Kohei Yoshida
Hydrogeologist

Enclosures

cc: Mr. Jack Horton, County Manager
Mr. Rick Honeycutt, Assistant County Manager
Mr. Joe Walker, Solid Waste Director
Dr. Edward S. Custer, Jr., P.G.