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VULNERABILITY GUIDANCE

February 25, 1987

MEMORANDUM

SUBJECT: Applicability of Vulnerability Guidance

FROM: Arthur Day, Chief  
Technical Guidance Section

TO: Doug McCurry  
Residuals Management Branch, Region IV

During the question and answer period at the recent seminar on Land Disposal Technology, you asked whether the guidance on ground-water vulnerability was applicable to the RCRA permitting standards. I took your questions to refer to whether a permit should be denied solely because the facility is located in a vulnerable setting. My reply stated that the guidance was not intended to be a national siting policy, and that it was, in this sense, not applicable to the RCRA permitting standards. I believe that this response failed to fully convey the purpose of the guidance.

The intended use of the guidance by the RCRA permit writer is stated in Section 1.2 of the guidance (attached). You should carefully note that the guidance is applicable to the RCRA program in at least the following ways:

It provides the permit writer with a standardized method for assessing the adequacy of hydrogeologic aspects of a Part B application. An adequate site characterization is a permit application requirement, as explained in the so-called Phase I Location Guidance (note attached copy, see section 2.1). Adequate site characterization is needed for ensuring that ground-water monitoring wells are properly located.

Permit writers should consider requiring a contingent corrective action plan in permits issued to facilities in vulnerable settings, when such facilities are not already conducting corrective action. This is meant to

reduce the time between plume detection and response that is associated with permit modification. The TOT method also provides a trigger for more detailed review and evaluation by the permit writer. The results of this review may provide a basis for changes in design or operating practices.

The vulnerability definition can be used by a Region to prioritize site analyses, although the existing Facility Management Plan system would take precedent. It is also referenced in the guidance on Interim Status Impoundment Retrofitting Variances, under the "no migration" exemption.

It provides a framework for assessing leachate migration potential and impact along each of the three pathways of concern (i.e., water well, discharge to surface water, basement seepage). The last pathway has often been overshadowed by concern for water well protection.

Let me elaborate on these points. First, I recommend that you permit writers ensure that data on hydraulic conductivity are collected in accordance with the methods presented in Appendix A. This is important, because such information influences monitor well placement and corrective action plan design. These methods are about to also appear in SW-846. I also think that permit writers should approach their reviews of site characterization/monitorability using the flow net methods presented in Appendix B. Please note that the TEGD also recognizes the role of flow net analysis for this purpose. The vulnerability guidance recommends (pages 1-6) that an objective method that can reduce the number of negotiations with an applicant's site characterization be tested by installing additional piezometers (in order to verify a flow net), this is an applicant to reach closure on the adequacy of site characterization. Finally, the flow net methods will also help reveal to permit applicants and permit writers whether significant migration pathways exist beyond the aquifer contamination route; this can be particularly important where above-grade or shallow trench landfills are constructed in low-permeability sediments or rocks, such as in parts of the Atlantic and Gulf Coastal Plan.

I recognize that the analytical methods presented in the Guidance (such as flow nets) may be unfamiliar to many permit writers. I do not maintain that permit writers should evaluate flow nets for all of their projects. The method might be most immediately useful where site characterizations are in dispute. However, I think that you will find that a one-time effort made by your staff in applying these tools will be productive in the

longer term. I am pleased to note that one member of the EPA Science Advisory Board particularly praised Appendix B (flow nets) as the best discussion on this common geotechnical tool that he had seen for hazardous waste facility analysis.

As I mentioned in response to another question, OSW is developing additional location standards for TSDs, which we plan

to propose by 9/87. We are considering whether a "degree of vulnerability" concept should be incorporated into these standards. We are also considering incorporating the flow net verification concept described above as a site characterization performance requirement.

I hope that these comments clarify our earlier discussion. Please contact me at FTS-382-4680 if I can provide further information.

#### Attachments

cc: James Scarbrough  
Bob Tonetti  
Terry Grogan  
Suzanne Rudzinski  
Matt Hale