



Environmental Science and Hydrogeology

HIGGINS ENVIRONMENTAL ASSOCIATES, INC.

*19 Elizabeth Street
Amesbury, Massachusetts 01913*

April 29, 2004

Mr. Mark F. Tolman, Director
Newburyport Board of Health
60 Pleasant Street
Newburyport, Massachusetts 01950

Re: **Document Review**
Initial Site Assessment/Comprehensive Site Assessment Scope of Work
Crow Lane Landfill
HEA Project Number 03057

Dear Mr. Tolman:

Higgins Environmental Associates, Inc. (HEA) has prepared this letter to summarize our review of a December 5, 2003 Initial Site Assessment (ISA) and Comprehensive Site Assessment (CSA) Scope of Work, and a March 11, 2004 Supplemental ISA document prepared by GZA GeoEnvironmental, Inc. (GZA) for New Ventures Associates, LLC (NVLLC). It is important to note that these documents were not provided to the City of Newburyport until April 7, 2004.

In summary, HEA is of the opinion that an initial CSA task should include a geophysical survey to assess the location of existing subsurface leachate outbreaks, combined with an assessment of bedrock topography and fracture trends. The locations of soil boring and wells should be based on the findings of this initial task.

Additional comments and details are summarized as follows:

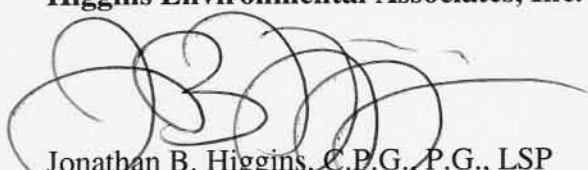
1. To HEA's knowledge and contrary to the report, the Department of Environmental (DEP) actually does have approved Zone II well head protection areas. The ISA information should be corrected accordingly. Surface water supply protection areas should also be referenced in the ISA.
 2. Contrary to a statement by GZA, there are at least two farms proximate to the landfill, a horse farm and McGraf's farm off Low Street. Both of these are Chapter 61A (agricultural) land.
 3. The ISA stated that underlying bedrock and low permeability soils mean that "infiltration is minimal". This statement is not supported by information provided by GZA. GZA's test pit logs indicate that solid wastes are located directly on bedrock. The CSA should include obtaining information to actually define hydrogeologic conditions.
 4. Contaminant migration also visibly occurs to the south, as evidenced by a leachate outbreak, and not solely to the west and northwest as indicated by GZA in the ISA. The CSA scope of work should include an initial geophysical task to determine the location of subsurface leachate outbreaks (EM or electrical resistivity surveys). Particularly as bedrock topography and fractures may play a significant role in contaminant migration. An initial fracture trace analysis and more in depth evaluation of bedrock topography is also appropriate. Soil borings and wells should be situated based on this information.
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Mr. Mark Tolman
April 29, 2004
Page 2 of 2

5. It should be noted that historic sand and gravel mining operation, prior to land filling, likely removed the "low permeability" soil above bedrock, as confirmed by several of GZA's test pit logs where solid waste was noted as directly on bedrock. As such, it is not adequately justified to infer, as GZA has, that contamination of bedrock is unlikely (Task 2.3 CSA scope) and further, that ground water sampling of bedrock wells will not be warranted. The CSA should specifically include ground water sampling within bedrock. In addition, overburden wells should be installed so long as sufficient, five feet or greater, thicknesses of soil are present. Overburden ground water occurrence may be strongly related to seasonal fluctuations.
6. Permeability testing should be performed in bedrock wells. GZA may chose to use packer tests, but some measure of relative permeability should be assessed.
7. A provision for an additional surface water/sediment sampling location should be included in the CSA Scope. Where and when this sample set is collected should be based solely at the discretion of the City of Newburyport or the Department. The actual locations of the four currently proposed samples should include field concurrence by Newburyport's Conservation Commission or HEA acting on their behalf. Like the Department, HEA is of the opinion that additional surface water/sediment samples should be collected within wetlands immediately abutting the western side of the landfill. GZA has indicated that there may not be enough sediment in this area. Based on our direct observations and GZA's own reference to "swamp deposits" in this area, HEA disagrees. The timing for sample collection should be coordinated with Newburyport's Conservation Commission.
8. Ground water sampling methods were not specified. HEA recommends the use of low flow sampling procedures without filtering. Oxidation reduction potential should be monitored in addition to other parameters during sampling. GZA should be required to notify the Department and City of Newburyport prior to drilling or sampling, and a provision for split samples made with the City. Well screens and low flow sampling intervals should be situated so as to intercept the most likely zone of contamination present at each location.
9. Soil sampling for laboratory analysis should be included at each location.

If you have any questions regarding this letter, please give me a call.

Sincerely,
Higgins Environmental Associates, Inc.



Jonathan B. Higgins, C.P.G., P.G., LSP
Principal Hydrogeologist

cc: John Carrigan, DEP
Tracy Peter, Newburyport Conservation Administrator