60907

GERAGHTY & MILLER, INC.
Environmental Services

May 24, 1995

Ms. Melissa Whittington (3HW41)
Remedial Project Manager
U.S. Environmental Protection Agency, Region, III
841 Chestnut Building
Philadelphia, PA 19107

Re: Response to Comments From USEPA/MDE Regarding the Bush Valley Landfill Draft Feasibility Study Report.

Dear Ms. Whittington:

Geraghty & Miller, Inc., has prepared this letter on behalf of Harford County, Maryland, in response to the United States Environmental Protection Agency, Region III (USEPA) and the Maryland Department of Environment (MDE) comments regarding the Bush Valley Landfill Draft Feasibility Study Report (FS). We appreciated the opportunity to meet on April 24, 1995 with you and the other USEPA and MDE staff to discuss some of the issues regarding the Bush Valley Draft FS comments. The USEPA and MDE comments have been addressed and revisions to the FS are identified in the attached "redline" version of the document. Eight copies of the revised FS document (without "redline" markings) are also attached for your use and distribution.

Each of the USEPA comments that elicit a response were addressed in the revised FS Report. Several of the MDE comments elicit a response, but do not require modification to the FS; these comments are addressed individually in this letter. The USEPA and MDE comments request several revisions that Geraghty & Miller and Harford County do not agree with. During the April 24, 1995 meeting, these requested revisions were discussed, however, in some cases, consensus regarding the requested revision(s) was not reached. Geraghty & Miller and Harford County have chosen to revise the FS in accordance with the comments. However, we have also chosen to submit the following discussion which presents our intended approach to the Draft FS and our reasoning and justification as to why we disagree with several of the revisions.

180 Admiral Cochrane Drive, Suite 300 • Annapolis, Maryland 21401 • (410) 224-8771 • FAX (410) 224-4778

GENERAL RESPONSE TO USEPA AND MDE COMMENTS

NATURAL ATTENUATION

It is our belief that natural attenuation is an important process that is occurring at the Bush Valley Landfill Site for the following reasons:

- Probably the greatest, and least visible, value of wetlands is in their ability to maintain water quality and minimize damage from erosion and floods. The literature is full of references that document the ability of wetlands to improve water quality. The USEPA's published documents recognizes the water quality improvement capabilities of wetlands (EPA843-F-93-001b, March 1993, Wetlands Fact Sheet #2 - Values and Functions of Wetlands). The thick wetland vegetation causes surface water movement to slow and in the process, sediment drops. Suspended sediments and nutrients are the major pollutants entering Maryland's estuaries. Because many water pollutants, including nutrients and, organic and inorganic chemicals travel chemically bound to suspended particles, this settling of sediments can purify water effectively before the pollutants have traveled very far. Furthermore, wetland soils, which are high in silts, clays and organic material, are very active chemically and can readily attract and bind those dissolved nutrients and toxics not bound to suspended particles. This phenomenon also occurs in soils composed of silt, clay and organic material that are not directly associated with wetlands such as some of those soils located beneath and adjacent to the landfill. Once taken in by wetland soils, these pollutants are absorbed by wetland plants. This reduction of nutrients and toxics can be so effective, a number of municipalities locally and nationwide have incorporated either natural or man-made wetlands into their wastewater treatment systems as an alternative to expensive tertiary treatment facilities. A local municipality is even using created wetlands to treat municipal landfill leachate that is collected at the site.

- It is not our intention to suggest that natural attenuation is the one and only remedy for the Bush Valley Landfill Site. It is our intention to recognize that natural attenuation is occurring and is serving to limit the nature and extent of constituents that are migrating from the landfill. The analytical data supports the assertion that constituent concentrations are decreasing with distance, both horizontally and vertically from the landfill. It is our professional opinion that the physical, chemical and biological processes associated with natural attenuation are responsible for this water quality improvement. It is not necessary to quantify and document this effect to recognize that it is occurring. Regardless of the remedy selected, these valuable and beneficial processes will continue to occur and improve water quality and should be recognized as contributing to the remedy at the Site.

GROUNDWATER EXTRACTION WELLS

Geraghty & Miller has included alternatives in the FS which include the collection and treatment of groundwater. It is our professional opinion that the collection and treatment of groundwater is not appropriate as part of the remedy for the site. The groundwater extraction wells for Alternative 4a and 4b were proposed to be screened in the aquifer zone directly beneath the landfill for the following reasons:

- The USEPA and MDE comments state that the goal of a hypothetical groundwater extraction system at the Bush Valley Landfill should be to contain the plume of groundwater contamination and ensure that offsite migration is not occurring. Plume containment seeks to minimize the spread of the plume through hydraulic gradient control. The potential use and value of the groundwater beneath the site and downgradient of the site does not indicate that migration control is necessary or appropriate. Municipal water is available for both current and future residents, therefore, there is no demand for groundwater use and actual exposure to groundwater does not exist. Groundwater protection strategies generally differentiate groundwater on the basis of use and value. The most valuable function of the groundwater in the vicinity of the Bush Valley Landfill is that it discharges to and supports the adjacent tidal marsh. A groundwater extraction system designed to control migration may potentially have a negative affect on the adjacent tidal marsh, unless engineering controls can be designed to overcome the effect of impacting the groundwater discharge zone.

- The RI data indicates that the constituents migrating in the groundwater toward the marsh do not present a real risk to human health nor have they resulted in an unacceptable impact to the environment. Based on this conclusion a more appropriate approach for a hypothetical groundwater extraction system would include a limited response designed to reduce mobility, toxicity and/or the mass of constituents associated with the contaminated groundwater, until such time that the cap is effectively controlling leachate generation and migration. This approach is not designed to achieve aquifer restoration, but, would remove the largest mass of constituents associated with the landfill. The largest mass of constituents associated with the landfill are located in the groundwater beneath the landfill because it is close to the source and natural attenuation has had little time to reduce the constituent concentrations of groundwater beneath the landfill. The installation of a low-permeability cap will significantly reduce the generation of leachate, which is the source of groundwater contamination beneath the landfill. Therefore, in the interim (i.e., that is until the cap takes effect) groundwater extraction wells screened beneath the landfill could effectively reduce constituent concentrations near the source area. Extraction wells beneath the landfill would remove and extract groundwater which

reflects the highest constituent concentrations resulting in higher mass removal over a shorter period of time compared to wells located along the perimeter.

- It is recognized that there are inherent difficulties and hazards associated with drilling through municipal landfills. However, drilling within municipal landfills is commonly done to install gas vents and our experience indicates that the inherent hazards are manageable and do not outweigh the potential benefit.

- There are certainly situations where drilling within and particularly through municipal landfills could increase the nature and extent of contamination. For example, it would be unwise to drill through a confining layer beneath the solid waste and thereby introduce contamination to an underlying aquifer zone. However, at the Bush Valley Landfill Site, the bottom of the landfill is relatively close to the uppermost water bearing zone, and the detection of constituents in the groundwater adjacent to the landfill indicates that the underlying geology is not confining the leachate that is generated. There is the consideration that drilling through the landfill could create a pathway for leachate migration. The impact of drilling through the bottom of a landfill at less than ten locations with a hole that is approximately 12-inches in diameter would be inconsequential. A proper construction technique would place the screen within the landfill if leachate were mounding or in the water table below the bottom of the landfill and the hole through the bottom would be grouted closed above the screen. If leachate were to migrate through the hole into the underlying aquifer during well construction, it would be captured in the extraction well. The potential impact of opening several temporary holes through an unlined landfill over a 16-acre area would be inconsequential compared to the increase in mass removal over time that could be achieved.

- The response we received to locating extraction wells beneath the landfill at our April 24, 1995 meeting suggests that USEPA recognizes that there is some technical merit to installing extraction wells beneath the landfill. However, because it was suggested that this approach does not fit into the typical Superfund Remedy, and the USEPA accelerated ROD completion schedule, it can not be considered further. If this observation is true, the USEPA should strive to allow more flexibility in their Superfund process to allow for the consideration and implementation of innovative ideas instead of dismissing them for administrative reasons.

ACTIVE VERSUS PASSIVE GROUNDWATER TREATMENT

The USEPA comments indicate that the choice of passive or active groundwater treatment must be determined at the remedy selection stage and not during the remedial design stage. It is our opinion that groundwater collection and treatment is not appropriate for the Bush

Valley Landfill Site, however, groundwater treatment technologies were included in the FS Report at the request of USEPA. The issue of whether passive or active groundwater treatment is applicable was discussed during our April 24, 1995 meeting without reaching consensus. Geraghty & Miller and Harford County have chosen to modify the FS Report as requested, however, we offer the following observations for your consideration:

- The approach that Geraghty & Miller presented in the Draft FS Report proposes to define the need for active versus passive groundwater treatment as part of the remedial design process. It is our professional opinion that the available groundwater information adequately characterizes the nature and extent of constituents attributable to the Bush Valley Landfill sufficient to select an appropriate remedy. The RI data indicates that the highest concentration of total VOCs in the groundwater is approximately 300 ppb. This concentration would suggest that active treatment may be required. However, our experience indicates that a series of wells along the perimeter of a municipal landfill will draw groundwater of variable quality, and the real possibility exists that after mixing and volatilization associated with collecting the groundwater, total VOC concentrations may be reduced to levels below discharge requirements. Therefore, our interpretation of the data suggests that if a groundwater collection and treatment remedy were to be selected, pilot studies should be considered as part of the remedial design and construction.

MIGRATION OF CONSTITUENTS

Section 5 - Nature and Extent of the RI discusses the nature and extent of migration of VOCs with distance from the landfill. The data indicates that VOCs are decreasing with distance from the landfill in the horizontal and vertical direction. GM2-LSS which is immediately adjacent to the south side of the landfill had a total VOC concentration of 306 ppb. GM3 which is downgradient of GM2-LSS (i.e., parallel and directly along the direction of VOC migration) and away from the landfill had a total VOC concentration of 150 ppb. This information indicates that VOC concentrations are decreasing with distance in the horizontal direction. At monitoring well location GM2 and GM4, total VOCs were not detected at either location in the wells installed in the deeper portion of the lower sand zone. This information indicates that VOC concentrations are decreasing with distance in the vertical direction. It is our professional opinion that the decrease in constituent concentrations with distance from the landfill is due to natural attenuation. Please see Section 5 - Nature and Extent of the RI for a detailed explanation of the migration of VOCs with distance from the landfill.

SPECIFIC RESPONSE TO USEPA COMMENTS

Page 3, General Comment IX - General comment IX suggests that aerial infrared photography of the BVL area may aid in determining wetland/marsh sampling locations for the long-term monitoring program and that this idea was initially proposed by EPA. Infrared photography could indicate differences in vegetation patterns or fluctuations in surface water temperatures related to migration of landfill constituents. However, the RI data suggests that differences in vegetation patterns and water temperatures are not apparent at the BVL Site and that infrared photography may provide limited additional information. The ecological inventory has demonstrated that visual differences in vegetation patterns adjacent to and away from the landfill could not be observed. Black and white aerial photography of the Site does not indicate differences in vegetation patterns adjacent to and away from the landfill. In addition, Geraghty & Miller compared groundwater temperatures in monitoring wells next to the site and in piezometers at locations moving away from the site and found no measurable difference.

Page 3, General Comment X - On December 31, 1990, Harford County entered into an Administrative Order on Consent with the United States Environmental Protection Agency, Region III for preparation of a Remedial Investigation/Feasibility Study of the Bush Valley Landfill.

SPECIFIC RESPONSE TO MDE COMMENTS

Page 3, General Comment 2 - Many of the MDE specific comments ask for further explanation regarding RI type information that has already been presented in the RI. The number of comments of this nature, suggests that the commentors are not familiar with the RI and expect that the FS should provide the same level of detail that is provided in the RI Report. The FS Report format provides an overview of the background information (which is consistent with the guidance documents) and is intended to provide a summary of the RI Report. The entire RI Report is applicable to the FS and is attached by reference and the reader should have the RI Report available when reviewing the FS; although the documents are stand alone, they rely upon and compliment each other. In response to this comment, the FS has been modified to provide more detailed RI information including tables and figures and the reader is referred to the RI Report for a review of detailed information, if necessary.

Page 2, Comment 2 - The RI states that the Bush Valley Landfill is estimated to extend 25 feet below the ground surface to the west and south to within 5 feet of the water table. As stated in the RI this is an estimation or an approximation. There are no as-builts for the landfill and this statement is intended to provide the reader with an approximation of construction dimensions. For those areas (which are limited) of the site where the water table would be close to the waste if the depth of the landfill were 25 feet, it is expected that the depth of waste is most likely less than 25 feet. It is not believed that the landfill contents are in the water table. Typically,

operators excavating trenches with bulldozers (which is how the Bush Valley Landfill was constructed) were limited in depth to zone several feet above the water table as saturated sediments associated with the groundwater table would not support the weight of the bulldozers.

Page 3, Comment 4 - The materials encountered in the soil borings in the vicinity of the Bynum Run Sewer were predominantly silty clay material. The available information does not indicate the properties of the materials used to backfill the sewer line. The design drawings specify that no compaction requirements are necessary based on the location of the line and that it would not need to support regular vehicle traffic. Therefore the design drawings specify that "on-site" materials were to be used. There are no as-builts, however, the available information suggests that backfill was not imported and that soils removed from the excavation were used as backfill. See Section 4.1 of the RI Report for a detailed discussion regarding the determination that the Bynum Run Sewer Interceptor has little potential to act as a preferred migration pathway for constituents migrating from the Bush Valley Landfill.

Page 3, Comments 5 - To our knowledge the documentation that states that "water was observed in the trench" does not specify the depth or location of the trench, or the source of the water.

Page 3, Comment 6 - The RI Report (see Section 4.3 Groundwater Usage - Water Supplies) provides a detailed discussion of the available information regarding the numbers of persons using groundwater and the source of the water being used. Additional information other than what is presented in the RI Report would require a door to door survey.

Page 4, Comment 7 - The sentence on page 1-19 does not "assume that bis(2-ethylhexyl)phthalate is not site-related" but states that it may likely be a laboratory contaminant. If this constituent were detected in the field blank or a lab blank the sample would have been flagged with a "B" indicating that the positive detection may be the result of contamination. However, the QA/QC procedures used in the field and laboratory are indicators and do not provide a "fool proof" means of identifying field or lab contamination. It is quite possible to have a positive detection, particularly for bis(2-ethyhexyl)phthalate that is not identified as contamination by a lab or field blank particularly for bis(2-ethylhexyl)phthalate. Bis(2-ethylhexyl)phthalate is associated with most plastic products which include sampling gloves and laboratory containers. Therefore, as a caution to the reader, the detection of bis(2-ethylhexyl)phthalate was identified as potentially not being site-related.

Page 4, Comment 8 - See USEPA comments Page 1 Major Issue II. Because the potential sources of air constituents (if site-related) would be the landfill contents, gas, or leachate, and these areas have been selected for other reasons as areas to be addressed under the remedial action objectives, no further air studies were warranted at this time. Potential risk to on-site workers and near-by residents during the remedial action phase would be characterized and managed, as necessary, as part of the Health and Safety Plan for the remedial action.

Page 4, Comment 10 - Page 1-23 discusses total VOCs at individual well locations and Table 5-3 presents maximum VOC concentrations by individual constituent for a given location. No discrepancy could be identified as the two are not directly comparable.

Page 4, Comment 11 - The concentrations detected for nickel reported in the third paragraph are for dissolved nickel and correspond directly to the values presented in the raw data tables presented in Volume 4 of 5. The concentrations presented in Table 5-3 for dissolved nickel correspond directly to the text. The concentrations on Figures 5-4 represent the highest concentration detected between total and dissolved analysis among all three sampling events and are not directly comparable to Table 5-3. No discrepancies could be identified

Page 4, Comment 12 - See **MIGRATION OF CONSTITUENTS** in Response to USEPA comments above.

Page 5, Comment 14 - See Section 5.2.9 Marsh Sediment in the RI for a detailed explanation of the interpretation of the marsh sediment sample results.

Page 8, Comment 29 - It is not necessary to know the amount of gas being produced by the landfill and the chemical content of the gases being produced by the landfill in order to develop and select a remedial alternative that will adequately address human and environmental risk caused by landfill gas. It is necessary to understand the quality and quantity of gas being produced by the landfill in order to adequately design an appropriate treatment technology that will adequately address human and environmental risk. The current quality and quantity of gas being produced today will be different than when a cap is installed. Therefore, the landfill gas collection and treatment approach is to collect the landfill gas passively and discharge the gas to the atmosphere via vents. When the system is constructed and is operating, if the concentration of gas being discharged passively requires additional treatment, then the system can be upgraded to an active treatment system at that time. It should be recognized that some pre-design data will need to be collected to adequately design and size the piping for the gas collection system.

Page 10, Comment 47 - At the request of USEPA cost figures associated with the implementation of the landfill gas treatment system do not include costs associated with active treatment of the gas.

Page 10, Comment 49 - See response to Page 10, Comment 47.

Page 11, Comment 53 - See response to Page 10, Comment 47.

If you have any questions or need additional information, please feel free to contact us.

Very truly yours,

GERAGHTY & MILLER, INC.

J. Michael Dant
Senior Hydrogeologist

J. M. Dant for
Mark E. Wagner
Senior Associate

JMD/MEW/jmd
cc: Frank Henderson (HC)
Dan Pazdersky (HC)
Jefferson Blomquist (HC)

g:\prjcts\bvl\corresp\wh052495.doc