

January 24, 2007

Mr. Ed Dexter, Program Director
Solid Waste Program
Maryland Department of the Environment
1800 Washington Boulevard, Suite 605
Baltimore, MD 21230-1719

RE: Chesapeake Terrace Rubble Landfill
Phase III Report Comments
1993-WRF-0225
Clarification Request

Dear Mr. Dexter:

We appreciate receipt of the Department's November 27, 2006 Comment Letter and look forward to provision of satisfactory response to each Comment, in view of the following.

- Magnitude of the project and the Department's concern regarding certain Landfill Design, Construction Management and Operational Issues (particularly with respect to Landfill Gas Management) requires expertise by others. The Owner has recently contracted Golder Associates Inc. (Golder), a consulting firm with extensive landfill experience, to respond to Landfill Gas issues and to assist with response to other issues (i.e., Slope Stability, Operations Plan preparation, QA/QC Plan preparation, etc.).
- The Department's goal to ensure that Chesapeake Terrace Rubble Landfill will be an environmentally sound solid waste disposal facility for the State of Maryland is shared by those the Owner has employed to perform tasks necessary to obtain Phase III approval.
- The goal the Owner, Century and Golder share is preparation of the forthcoming Phase III Report submittal, sufficient to substantially satisfy each of the Department's Comments.

We recognize and appreciate the enormity of the Department's regulatory responsibility regarding Construction, Operation and Inspection of all Solid Waste Management Facilities in the State of Maryland. The purpose of this Clarification Request Letter is not intended to prompt additional, unnecessary review by the Department, nor is it intended to receive the Department's approval for any aspect of Century's April 2005 Phase III Report Submittal, or Revised Permit Drawings and Exhibits submitted to the Department in August 2006.

Our interpretation of the Department's Comment Letter is that Major Issues to be addressed in the Phase III Report are:

- Provision of Construction as required to prevent Groundwater Seepage into any of the Landfill Cells
- Redesign of Liner System Drainage Layer (including Stability Calculations and Other Documentation) to Substantiate 2:1 Interior Slopes for the Landfill Cells

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- Stability Calculations and Other Documentation to Substantiate 3:1 Benched Slopes for Rubble Waste
- Substantiation of 2 Percent Cell Floor Grades and Groundwater Buffer at Cell Sumps
- Provision of Landfill Gas Management
- Illustration of Construction Sequence for Landfill Cells (Including Temporary Roads, Surface Runoff Features, Leachate Collection Features, etc.) Over the Life of the Facility

Several of the Department's Comments reference certain items (particularly items under General Comments A-5 and A-8) in Century's April 2005 and August 2006 Submittals, in a manner that evokes confusion regarding the status of the items (i.e., items that are acceptable items, deficient items, or missing items). Whereas substantial effort is required to address Major Issues listed above, Landfill Operations Issues and Other Issues referenced in the Department's Comment Letter, the purpose of this Clarification Request Letter (by virtue of the Department's response) is to eliminate confusion associated with interpretation of several of the Department's Comments.

To assist the Department's response for clarification regarding Comments listed hereinafter, descriptions from Century's April 2005 Phase III Report Submittal, and Submittal of August 2006 Revised Permit Drawings and Exhibits, are included as necessary. Unless indicated otherwise, all referenced Permit Drawings are 30 Sheets, dated August 2006. Certain Comments include reference to the manner in which we intend to amend Phase III Report Documents.

Per our January 9, 2007 telephone conversation, we are requesting Clarification for the following Comments. Descriptions for items contained in Century's April 2005 and August 2006 Submittals are included as needed. Clarification requests and features either added to Permit Drawings since our August 2006 meeting, or features that are intended to be added to Permit Drawings are in bold text.

COMMENT A-5

In several areas detailed below, design elements or construction practices were discussed in the text but not depicted in the plans, or vice versa. The final report should provide a coherent document that provides discussion and amplification of the plans, particularly in the area of how the features shown on the plans are to be constructed, and how operations are to proceed.

Design elements to construct the landfill are provided on the Permit Drawings as follows.

1. Three Stormwater Management/Sediment Basins were designed to discharge surface runoff for 2-year, 10-year, 25-year and 100-year storm events to less than surface runoff discharge for equivalent storm events prior to Landfill Construction (Sheets 21 through 30 of 30).
2. Perimeter Access Road was designed to provide continuous access around Landfill West and East Sections and Leachate Storage Areas (All Site Plan Views). Typical Section on Sheet 18 of 30 will be revised to indicate RC6 road surface.

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3. Perimeter Ditches were designed to convey surface runoff discharge for 25-year storm event (Sheets 7 through 10 and 18 through 20 of 30)
4. Storm Drain Systems were designed to convey surface runoff discharge for 25-year storm event (Sheets 7 through 10, 19 and 20 of 30). Notes for construction, per "Anne Arundel County Standard Details for Construction", will be added.
5. Landfill Liner System Components were designed per COMAR 26.04.07.16(C)(3). Leachate Collection and Removal System was designed to convey Leachate collected in each of 16 Landfill Cell Sumps to one of two Leachate Storage Areas. Leachate Collection System Collection and Removal System Components are comprised of the following.
 - a. HDPE submersible pump carrier pipes (Sheets 5 through 10, and 14 through 16 of 30)
 - b. HDPE Force Mains (Sheets 5 through 10, 13 through 17, 19 and 20 of 30) - Based on data provided by Century (i.e., (1) leachate flow rate (2) horizontal and vertical distance between: Force Mains buried in Landfill Separation Berms and Force Mains buried in Perimeter Access Road shoulders; Force Mains buried in Perimeter Access Road shoulders and top of Leachate Storage Tanks, and (3) the manner in which the site's 5 Force Main Systems are connected), a Professional Engineer, representing the Pipe Manufacturer, calculated pipe size for the site's 5 Force Main Systems.
 - c. Submersible Pump - Based on data provided by Century (i.e., leachate flow rate, horizontal and vertical distance between Cell Sumps and Landfill Separation Berms, and all other data provided to the Pipe Manufacturer), a Professional Engineer, representing the Pump Manufacturer, recommended pumps to be used in each Cell Sump. Pumps for each Cell are tabulated on Sheet 15 of 30.
 - d. Leachate Storage Tanks, with Secondary Containment, will be constructed as shown on Site Plan Views associated with Leachate Collection System installation, and Sections on Sheet 13 of 30.

To properly respond to the Department's Comments, in addition to revisions to Phase III Report Volume 1 of 2, we anticipate substantial text additions. Although we do not anticipate revision to the Report's format, we will clarify and enhance its content with additional description, per the Department's request. Permit Drawings will be added, Details will be revised and added; Notations and Sheet Cross References will be enhanced, per the Department's request.

Clarification-- Is the above sufficient to satisfy Comment A-5? If not, please advise.

COMMENT A - 6

The shop drawings included in Appendix C lacked page numbering and detailed descriptions of the intended use. Please include these in the next submittal.

Clarification - In which Section is the referenced Appendix C located? Shop Drawings were not included in the Report.

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COMMENT A-8

All pertinent features must be shown on the drawings and the intended use clearly identified in the legend. This includes all leachate collection pipes, laterals, leachate storage tanks, sumps, pumps, pipe clean-outs, manholes, landfill cells and other features that are pertinent to the facility.

This Comment covers depiction of the majority of features associated with the entire Landfill Design. It is not understood why the depiction of leachate collection pipes, laterals, storage tanks, sumps, and pumps is not adequate as presented. These features are shown on plans, with labels and legends. Description of plan preparation for Permit Drawings associated with this Comment, as submitted following the August 2006 meeting at the Department follows below.

- Part 1 addresses plan views on Sheets 3 through 8 of 30;
- Part 2 addresses submersible pumps;
- Part 3 addresses force mains;
- Part 4 addresses other landfill features; and,
- Part 5 addresses Permit Drawings to be added, that will further clarify the intent of the Landfill Design.

Part 1 - To clarify grading requirements to construct the Landfill Cells (per verbal comments from the September 2005 meeting at the Department), 6 Permit Drawings (Sheets 3 through 8 of 30, submitted to the Department in August 2006) were created to replace Permit Drawing Sheets 3 and 4 of 24 ("West Section Cell Base Plan" and "East Section Cell Base Plan"), submitted to the Department in April 2005.

Sheets 3 and 4 of 30 show grading required to construct the Landfill Separation Berm and Cells at liner subgrade only. Cell Sumps are depicted, and pertinent items are shown on the Legend. To further clarify Cell Separation, symbols and labels for Cell Separation Berms will be added.

On Sheets 5 and 6 of 30, Leachate Collection System components (i.e., Submersible Pump Carrier Pipes, Pump Houses, Force Mains and Leachate Storage Areas) are added to features shown on Sheets 3 and 4. Cell Separation Berm symbols will be added.

On Sheets 7 and 8 of 30, grading required to construct Leachate Storage Areas, Landfill Perimeter Access Roads and Perimeter Ditches are added to features shown on Sheets 5 and 6. Per our August 2006 meeting at the Department, although only one entrance to the site is required, Grading and Sediment Control required to construct 3 Entrance Roads from County Roads to the Landfill Perimeter Access Road have been added to these Sheets. Each Entrance Road has sufficient width to queue rubble waste haulers. Truck Scales, Scale House, Maintenance Building and Truck Wheel Wash are shown for each Entrance Road. To enhance definition of grading requirements to construct these features, additional Sheets have been added to the Permit Drawings. A Section that describes site entrance features will be added to Phase III Report narrative.

Part 2 - Submersible pumps to be provided in each Landfill Cell, per the Pump Manufacturer's recommendation, are shown on "Cell Pump List" on Sheet 15 of 30. Based on verbal comments at

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the Department's September 2005 meeting, sump dimensions were revised, per depiction on Sheets 3 through 10 and 14 of 30, under August 2006 revisions. Based on August 2006 revisions, the Pump Manufacturer may revise "Cell Pump List" on Sheet 15 of 30. Narrative under Phase III Report Section 10.3.1, "Submersible Leachate Pump", will be revised accordingly.

Part 3 - Pipe clean-outs will be added to force mains at 400-foot maximum intervals, and check valves will be added as required to control leachate flow direction. Air release valves will be added at high points in force mains, per Force Main Profiles shown on Sheets 16 and 17 of 30, as applicable. Details for vaults and/or manholes to contain air release valves, check valves, and pipe clean-outs will be provided.

Part 4 - Wetland delineation per Baltimore District Corps of Engineers Permit (Corps) CENAB-OP-RW and Maryland Department of the Environment Water Quality Certificate (WQC) 91-WQ-0516 has been added on applicable Permit Drawing plan views. The only other features pertinent to the facility are 3 Stormwater Management/Sediment Basins, sediment control measures, and associated details shown on Sheets 19 through 30.

Part 5 - In addition to the above, numerous Permit Drawings will be added, as necessary to illustrate Intermediate Stages of Landfill Construction for each Landfill Cell (per the Sequence of Construction on Sheet 27 of 30), as specified under Comment C-23.

Clarification - As described above, the Permit Drawings submitted in August 2006 will be enhanced by additional description and additional Sheets. Response to this Comment does not appear to require revision to the Sheets that have been reviewed. If this is not the case, what specific plan revisions are required?

COMMENT B - 1(d)

Page 22 and elsewhere - You have proposed a clay plug inside the base of the interior landfill side slope to prevent groundwater seepage from entering the landfill's cell floor. Your proposal did not adequately address the engineering justifications for the performance of the clay plug or its capability in preventing groundwater seepage from entering the cell floor for the life of the landfill. Although the drainage system is estimated to produce 3.5 gallons per minute after the perched system is drained, no description of the manner in which this will be accomplished, the amount of water expected during the initial period, or the effect that this will have on construction is included. We are concerned that saturation of the clay over time may lead to softening or differential settlement in this area. The report must address the effectiveness of the clay plug in preventing groundwater buildup underneath the landfill, and the related stability of the liner system under load. It must also address in detail the means or methods of engineering remedies to be taken if problems are encountered with groundwater seepage entering the landfill's cell floor.

To resolve the issue regarding groundwater seepage entering the landfill cell floor, Golder, who has reviewed the Department's Comment Letter, Phase II and Phase III Reports, will interact with the consultants who estimated Groundwater Seepage and prepared the Clay Dam design. Initial reaction from Golder is that a Slurry Wall from ground surface to key

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into the underlying clay layer could equal or exceed the efficiency of the Clay Dam and Perched Water Interceptor combined.

Clarification - Is a slurry wall an acceptable option?

COMMENT B - 1(e)

Note 3 on drawing No. 3 of 30 states "depiction of the clay dam design as based on information provided by others" for the clay dam design. Also, the Clay Dam Detail on drawing No. 18 of 30 shows the clay dam to be constructed at the toe of the subbase slope while groundwater impinges on the top of the subgrade directly impacting the landfill's stability. The clay dam design lacks any groundwater modeling and groundwater volumes to rectify encountered problems. The proposed design is supposed to be based on site-specific conditions related to the construction of the cell floor rather than information gathered by others. The proposed design also lacks the required 3-foot groundwater buffer distance from the subgrade.

By virtue of Phase II Report approval, it was assumed that the Department had approved installation of the Clay Dam, shown on Permit Drawing Sheet 18 of 30. The phrase "By Others" (i.e., those responsible for Phase II Report preparation) was added to disclaim Century's responsibility for the Clay Dam design.

Clarification - After interaction between Golder and the consultant(s) who designed the Clay Dam, we anticipate that either a clay dam and/or slurry wall, supported by documentation to the Department's satisfaction, will be presented during the time frame required to respond to other Phase III Comments. If the Department agrees to this approach, we may have proper direction regarding detailing of the groundwater barrier(s) to be incorporated on the Permit Drawings and included in text description in the Phase III Report submittal. As Century Engineering, Inc. is not responsible for design of the groundwater barrier(s), "By Others" or specific reference to responsible parties, will be shown as necessary. Is the Department amenable to this approach?

COMMENT B - 1(g)

The design for dikes and cut slopes should show the design layout with cross sections indicating the proposed grade and bearing elevations relative to the existing grade, along with details of the dikes and soil shear strength including all slope angles and dimensions.

Two dikes, referenced as Landfill Separation Berm and Cell Separation Berm on the Permit Drawings, are required to construct the landfill. "Sump To Pump House Section" on Sheet 14 of 30 is a typical section that shows construction requirements from the Sump in each Landfill Cell to the Pump House on the Landfill Separation Berm. The tabulation entitled "Cell Sump and Landfill Separation Berm Top Elevations" on Sheet 14 of 30 indicates proposed elevations and vertical height between top of Sump and top of Landfill Separation Berm for the entire landfill. "Cell Separation Section" is provided on Sheet 18 of 30. Cell Separation Berm symbols will be added to applicable Plan View Sheets. "Cell Separation Berm Section" configuration will be revised to indicate installation of liner for the Cell to be filled with rubble waste and welding of future liner for the adjacent Cell. The length of the Section will be extended to include minimum liner extension and travel way for traffic in the Future Cell.

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Clarification - Whereas side slope excavation in sump areas represent maximum excavation height for the entire landfill, it appears that addition of a column, labeled "Ex. Ground Elev." in the "Cell Sump and Landfill Separation Berm Top Elevations" tabulation, along with the liner subgrade plan views, should provide sufficient information for excavated side slope construction. Is this acceptable, and if not, at what specific locations are additional cross sections required? Also, for what specific components are "soil shear strength including all slope angles and dimensions" required?

COMMENT C - 5

Page 10-2, Section 10.1.3 and 4 - The HELP hydraulic model was used for estimating leachate volumes. However, although valuable for estimating long-term production in a landfill of significant thickness, this model does not provide a good estimate for "worst case" liquid volumes that would be encountered in an actual landfill environment. A more plausible "worst case" would occur following a heavy rain while the landfill cell is only partially filled with waste, but some waste is in the cell so the resulting liquid must be managed as leachate. This "worst case" scenario must be addressed in the operations manual, and either the pumps must be resized or alternative means for addressing the increased liquid volumes must be proposed.

Based on data provided by Century (see Phase III Report Section 10.3.1), a Professional Engineer, representing the Pump Manufacturer (Submersible Pump supplier for many landfills in Maryland, throughout the United States and internationally) recommended Pumps to be provided in each Landfill Cell Sump. It is anticipated that response to Comments C-37, C-38, C-39, C-40, C-45, C-46, C-48, C-49, C-52, C-57 and C-58 will be satisfied through interaction with EPG Companies (EPG). Response to Comment C-5 by EPG's Professional Engineer is verbatim "...suggest that you go to a larger pump size for the first six months, and then replace it with correct size pump. Then pull larger pump and use it on next new cell." Based on his Pump Recommendation for all Landfill Cells, the Pump Manufacturer will be requested to recommend the larger pump(s) to be used for each Landfill Cell during the first 6 months of rubble waste placement in the Cell.

Clarification - Is the above sufficient to satisfy Comment C-5? If not, please advise.

COMMENT C - 7

Section 12 - Sediment and erosion control calculations are noted, but the directions and notes provided in the Plans should be repeated here, particularly with respect to the phasing of tasks. The section lacks a discussion of stormwater management at the site. Instead, the plan references the wetland study presented in the Phase II Report. Please provide a detailed discussion of stormwater management features and capacities.

In a letter dated May 5, 2005, Arundel Soil Conservation District (AASCD) commented on Permit Drawings and "Stormwater Management and Sediment Control Computations" (Phase III Report Section 12.0, Appendix A), submitted to the Department, under a letter dated April 13, 2005. On October 10 and October 13, 2006, meetings were held with AASCD: to present Revised Permit Drawings submitted in the August 2006 meeting at the Department; to discuss AASCD's Comments; and to discuss requirements for additions of 3 Entrance Roads and Landfill Infrastructure, Landfill Sequence of Construction and all aspects associated with definition of Drainage Areas, and Hydrologic/Hydraulic computational

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methodology utilized to design the site's 3 Stormwater Management/Sediment Basins and Perimeter Ditches were discussed.

The Report entitled "Stormwater Management Computations for Chesapeake Terrace Rubble Landfill" under Phase III Report Section 12.0, Appendix A, provides a detailed description of computations used to determine capacities of Storm Drain Pipes, Perimeter Ditches and the 3 Basins to be constructed to meet the site's stormwater management and sediment control requirements. The title of the Report will be revised to reference all Site Drainage Features included therein, and all AASCD Comments will be satisfied. Additional Permit Drawings that illustrate Cell-By-Cell construction will show surface runoff flow arrows around Cell construction areas to the Basins, and flow arrows for clean surface runoff to be pumped from Cell excavations to the Basins, over the life of the facility. Additional description related to the above will be added in the Stormwater Management Report.

Clarification - Is the above sufficient to satisfy Comment C-7? If not, please advise.

COMMENT C-- 8

Page 13-1, Section 13.1 - The report references a scale house, maintenance facilities, other features in a cursory manner with insufficient description, and these features are not reflected on the plans. The plans must describe and depict these features, as required by COMAR 26.04.07.16A(1) and (2).

Based on discussion during the August 2006 meeting at the Department, additional Permit Drawings have been added to depict grading and sediment control for construction of Landfill Entrance Roads. It is understood that the Department requires depiction of a single Entrance Road. At the Owner's request, 3 Entrance Roads are provided. Layout for each Entrance Road includes Landfill Infrastructure, comprised of a Scale House with a Truck Scale on each side, a 5,000 Square Feet Maintenance Building (50 feet wide by 100 feet long), and a Truck Wheel Wash. Notes on Permit Drawings and narrative description in the Phase III Report will describe rationale for depiction of 3 Entrance Roads, each with Landfill Infrastructure. Ultimately, only one Entrance Road and one Landfill Infrastructure may be constructed.

Clarification -- Landfill Infrastructure shown on Permit Drawings will define location and grading necessary to accommodate dimensional requirements for Landfill Infrastructure Construction. Are details for the interior of the Maintenance Building and/or Scale House required? Are details for the Truck Scale and/or Truck Wheel Wash required? If so, what level of detail is required?

COMMENT C-- 17

The West Section Perimeter Ditch on drawing No.2 of 3 drainage area map shows that all stormwater is directed to Basin No. 1. The proposed basin may not be adequate enough to handle all stormwater generated by this portion of the landfill. Please address the adequacy of the basin to handle all stormwater collected for this portion of the landfill. This also applies to the eastern section of the landfill depicted on drawing No.3 of 3 for Basins 2 and 3. Also, some of the sediment trap basins on the plan are not clear, partially shown, and obscured by heavy contours. To minimize confusion, please clearly depict complete sediment basins and profiles on

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a sheet for the designated cells to be served and address the adequacy of these basins during high storm events.

As referenced under Clarifications for Comments A-5 and C-7, Perimeter Ditches are shown on Permit Drawings, per computations in Phase III Report Section 12.0. Plans and Profiles for construction of the site's 3 Stormwater Management/Sediment Basins (designed to control 2-year, 10-year, 25-year, and 100-year storm events) are shown on Sheets 21, 22 and 23 of 30. Notations or Tabulations regarding cells to be served by each Basin will be added on Sheets 21, 22 and 23 of 30. A Drainage Area Exhibit that depicts the Basin Configurations and the Cells will also be added. One of the site's two Sediment Traps will be revised to accommodate construction of an Entrance Road. Sediment Traps Sheet 26 of 30 will be revised as necessary.

Clarification-- Is the above sufficient to satisfy Comment C-17? If not, please advise.

COMMENT C--20

On drawing Nos. 1 of 1 and 1 of 3 through 3 of 3, there is depicted a star with a note in the legend that says "Study Point". What was studied and why was this point selected for the study?

The "Study Point" for each Stormwater Management/Sediment Basin defines the outlet point for surface runoff from the drainage area under consideration. Drainage Areas to these points are used on TR-55 data sheets to compute runoff curve numbers. To compute discharge (cfs) from each Basin, runoff curve number, drainage area acreage and time of concentration (i.e., flow time for surface runoff at the most remote point in the Drainage Area to reach the "Study Point") are input into TR-20 Computer Model. Stormwater Management Report format will be changed to clarify the Report's content and revisions will be made, per AASCD Comments.

Clarification-- Is the above sufficient to satisfy Comment C-20? If not, please advise.

COMMENT C--21

Drawing No. 1 of 30, Title Sheet refers to drawing Nos. 3 of 30 and 4 of 30 as "Initial Grading Plan". Neither of these drawings show bottom liner system detail except for inadequately depicted base grading contours. Please address in the operation and maintenance manual, as well as depict on the drawings, the liner system detail cross sections, landfill side slope design, and sump pump specifications.

Liner Subgrade Plans for the Landfill are shown on Sheets 3 and 4 of 30. Cell Floors are all graded at 2 percent minimum slope. "2 %" labels are provided at Cell Drainage Divides, which are located at the centerline of Cell Separation Berms. Using Cell Separation Berm symbols for Cells 1 through 4 on Sheet 19 of 30, Cell Separation Berms will be added on Liner Subgrade Plans, and additional "2%" labels will be provided. Enlarged notations to reference Leachate Collection Details on Sheet 13 of 30, Plans and Sections for Leachate Collection Sumps on Sheet 14 of 30, and Pump House Plan and Section on Sheet 15 of 30, will be added on Sheets 3 and 4 of 30. The Operation and Maintenance Manual will address these Landfill features.

Clarification-- Is the above sufficient to satisfy Comment C-21? If not, please advise.

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COMMENT C-22

Note 1 on drawing Nos. 3 of 30 and 4 of 30 "Cell Base Plan" for the proposed finished landfill states "Perimeter Finished Grade" and "Subgrade Geomembrane Liner"; this is confusing. Also, the drawings do not specify cell acreage; nor clearly depict the cell separation. This may result in inaccurate leachate volume calculations and pump specifications for the intended cell. Please clarify.

Permit Drawing Sheets 3 and 4 of 30 will be clarified per description under Comment C-21 above. Cell Acreage tabulations on Sheets 19 and 20 of 30 will be enlarged and copied on Sheets 3 and 4 of 30. If acceptable to the Department, Leachate Volumes will be computed per "worst case" scenario description under Comment C-5 above. Cell Separation Berm symbols will be added on Sheets 3 through 8 of 30.

Clarification-- Is the above sufficient to satisfy Comment C-22? If not, please advise.

COMMENT C-23

The drawings do not depict intermediate stages of landfill construction, including internal access roads and temporary construction entrances. Drawings that depict the landfill in various stages of construction are helpful in determining how the landfill will be constructed and accessed, as well as helping to determine where runoff will be pumped, which helps determine the required pump capacities, etc. Also, construction access roads and entries may require additional protection for liners and leachate collection system elements. Please clearly depict the proposed finished grade, subgrade, access roads, acreage of each cell and inter-cell berm separation on a clear sheet to minimize confusion, in addition to the map projecting these features onto the base topographic map as required by the regulation. The cell floor must show the required minimum 2% slope, and be graded to maintain this slope after anticipated settlement under the projected load.

Approximately 12 Permit Drawings will be added to illustrate Intermediate Stages of Landfill Construction, Cell-by-Cell, over the life of the facility. Landfill Sequence of Construction on Sheet 27 of 30 will be revised as necessary. Drainage to Stormwater Management/Sediment Basins will be shown for each Stage of Construction. Access Roads for each Construction Stage (with details as necessary, cross-referenced to the appropriate Permit Drawing) will be shown for each Intermediate Stage of Landfill Construction.

Configuration of Geomembrane Liner shown on "Cell Separation Berm Section" on Sheet 18 of 30 will be revised and the cross section will be extended to indicate adjacent Temporary Access Road and Temporary Drainage Ditch, if required. On each of the approximately 12 Permit Drawings to be added, only Existing Contours and Liner Subgrade Contours for the Cell or Cells to be constructed will be shown. Two Details for Temporary Access Roads will be employed. A Temporary Access Road in the Future Cell Area will be shown on the extended "Cell Separation Berm Section"; A Temporary Access Road in the Active Cell Area will be shown on a new Section. Tabulation with Cell Acreage for Cell(s) to be constructed will be provided on each Stage of Construction Permit Drawing. Maximum 2:1 cut or fill slopes from the hinge point of the flat area required to construct Temporary Access Roads in Future Cell Areas will be indicated on the Section.

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Cell floors will be constructed at minimum 2 percent slope, as shown on Sheets 3 and 4 of 30. "Hardin-Kight Associates, Inc. Geotechnical Assessment", under Phase III Report Section 9.0, Appendix D, contains Landfill Settlement Calculations, entitled "Appendix B - Settlement Calculation & Location Sketch". Calculations were performed in consideration of various Rubble Waste and Cover Soil Densities. As shown on Sheets 3 and 4 of 6, which consider the median density of 60 pounds per cubic foot, maximum Landfill Settlement of 0.467 foot occurs near the middle of the Landfill in Cell 1, Cell 4 and Cell 10. Maximum settlement in Cell Sumps is 0.267 foot in Cell 2. Based on these maximum settlement depths, in conjunction with consideration of slope length from Cell High Points to Cell Sumps, it is estimated that the change in the Constructed Cell Floor Slope at 2 percent, would be approximately 0.1 percent, which is negligible.

Clarification - Is the above sufficient to satisfy Comment C-23? If not, please advise.

COMMENT C-25

Drawings Nos. 1 of 2 and 3 of 30 show a crest in the middle of Cell 1 and 2 grading from an elevation of 108 to 111, a 2% slope, and sloping in both directions without any explanation in the text. This may create leachate build-up on the liner. Please address the purpose of this design and the reason behind it.

Crest elevation 110.1 between Cells 1 and 2 is correct. Crest elevation 107.2 between Cells 2 and 3 is mislabeled. The crest elevation between Cells 2 and 3 will be revised to indicate 108.6, which is the high point elevation that maintains 2 percent floor slope in Cells 2 and 3.

Clarification - Is the above sufficient to satisfy Comment C-25? If not, please advise.

COMMENT C-26

Drawings for the cell floor plan are confusing with too many features drawn on the map. Please show only the proposed base grade contours for Cell Nos. 1 through 10 and the minimum 2 % slope necessary to facilitate movement of leachate towards the leachate collection system on these drawings. Additional drawings may be added to depict other features.

Sheets 3 and 4 of 30 show only Liner Subgrade and Landfill Separation Berm Contours. To clarify proposed 2 percent cell floor grades for each Cell, additional 2 percent slope labels will be added on Sheets 3 through 8 of 30.

Clarification - Is the above sufficient to satisfy Comment C-26? If not, please advise.

COMMENT C-29

The pump design lacked typical sum profile and section detail, liner pipe penetration and pipe connection detail. Please add these details.

Sections A-A through C-C on the "Leachate Collection Sump and Pump House Plan" on Sheet 14 of 30, depict Sump construction in each direction, and through the 2:1 side slope between the Sump and Pump House. There are no proposed liner penetrations.

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As shown on all relevant Landfill Plan Views and the "Pump House Plan" on Sheet 15 of 30, 2 Submersible Pump Carrier Pipes are provided for each Landfill Cell. Flexible Hose from each Pump, by means of a disconnect centered in the Pump Carrier Pipe (as shown on Sheet 15 of 30 Section A-A) will be connected to Stainless Steel Pipes in the Pump House. Each Stainless Steel Pipe Run includes 2 valves as shown, and a 90-degree elbow that directs leachate flow to the Double Wall HDPE Force Main Lateral Tee, situated on pipe supports attached to the lower floor of the Pump House.

As shown on "Force Main Lateral Plan" on Sheet 15 of 30, Force Main Lateral continues through the Pump House wall to the tee connected to the Force Main Trunk Line buried in the Perimeter Access Road shoulder. Force Main Lateral Profiles below the "Force Main Lateral Plan" indicate the vertical distance between the Top of Landfill Separation Berm and Bottom of Perimeter Ditch adjacent to the Perimeter Access Road shoulder.

Plan and Profiles for 5 Force Main Trunk Lines that convey leachate from all Landfill Cells to Leachate Storage Tanks are shown on Sheet 16 of 30. Cell Sumps, Submersible Pump Carrier Pipes, Pump House and Force Main Laterals are also depicted. Plan and Profile Labels for Force Main Trunk Lines (i.e., FORCE MAIN #1, FORCE MAIN #2, etc.) will be revised to include 'TRUNK LINE' (i.e., FORCE MAIN TRUNK LINE # 1, FORCE MAIN TRUNK LINE #2, etc.). "Plan Notes" and "Profile Notes" will be reviewed and revised as necessary to clarify depiction and requirements for construction of all components associated with Leachate Force Main installation. "Plan Legend" will be revised accordingly. Air Release valve and vault will be added at Force Main Trunk Line high points. Check valves and vaults will be added as required to control leachate flow direction. Cleanout and vault will be added at 400 feet maximum intervals along each Force Main Trunk Line. Details for Air Release Valve and Vault, Check Valve and Vault, and Cleanout Valve and Vault will be provided.

Per Notes and Details on the Permit Drawings, Force Main Trunk Lines buried in Perimeter Access Road shoulders will have 3.5 feet minimum cover. Enlarged Profiles that depict Force Main Trunk Line installation from points of divergence in Perimeter Access Road shoulders to Leachate Storage Tanks are provided on Sheet 17 of 30. Profiles of Force Main Trunk Line at Storm Drain Crossings are also provided.

Clarification - Is the above sufficient to satisfy Comment C-29? If not, please advise.

COMMENT C - 30

The leachate collection system design must address the ability of the proposed leachate removal system to effectively remove leachate from the bottom of the landfill during worst case, high storm scenarios and over the life of the landfill. The report must address methods of testing the leachate head on the liner to insure that at all times it does not exceed the 1-foot regulatory limit.

Each Help Model Run in Section Phase III Report Section 10.0 indicates less than 1-foot head on the liner. Pump Manufacturer's equipment will monitor leachate head on the liner.

Clarification - Is the above sufficient to satisfy Comment C-30? If not, please advise.

Mr. Ed Dexter
1993-WRF-0225
January 24, 2007

COMMENT C - 31

The leachate main force header lacked leachate pipe flow calculations to justify the design. The design must prevent excessive full pipe flow or pipe angle deflection to insure free leachate movement through the pipe without scouring, etc.

Based on data provided by Century, a Professional Engineer, representing the Pipe Manufacturer, prepared calculations and recommended pipe size for the site's 5 Force Main Systems, under the original April, 2005 submittal (see Phase III Report, Section 10.0, Appendix C). Force Main Systems originally located in the Landfill Separation Berm, under April 2005 Permit Drawings, were relocated to the Perimeter Access Road shoulder, by means of Force Main Laterals from the Pump House. Based on this realignment, the Pipe Manufacturer's Professional Engineer will be requested to prepare calculations per new data (i.e., revised elevations and pipe distance differences for Force Main runs between Pump Stations on the Landfill Separation Berm and Leachate Storage Tanks, etc.). Pipe Manufacturer will be requested to address any specific issues (i.e., scouring, etc.) as requested by the Department.

Clarification - Is the above sufficient to satisfy Comment C-31? If not, please advise.

COMMENT C - 32

A 6-inch leachate force main is proposed to be buried around the landfill at an elevation more than 30 feet higher than the sumps. Please address the effectiveness of this design for easy access for maintenance and for free movement of leachate to the storage tank over the life of the landfill.

Per discussion regarding the April, 2005 Phase III Report submittal at the September, 2005 meeting at the Department's office, to alleviate any potential access problem for Force Main maintenance, the Force Main was relocated. Per subsequent meeting with a Contractor experienced in Landfill Construction, at which access by construction equipment for Force Main maintenance along the entire Force Main length was discussed, Force Main Laterals were added at each Pump Station, and Force Main Trunk Lines were relocated in Perimeter Access Road shoulders, as shown on August 2006 revised Permit Drawings. To ensure free movement of leachate to Storage Tanks over the life of the Landfill, Force Main Clean-outs will be provided.

Clarification - Is the above sufficient to satisfy Comment C-32? If not, please advise.

COMMENT C - 34

Drawing No. 13 of 30, Cell Liner Detail, fails to depict the required 2 feet of compacted clay subbase with a maximum permeability of 1×10^{-7} cm/sec, geomembrane liner specifications, or the 2-ft leachate drainage layer with a permeability of 1×10^{-3} cm/sec or greater.

Specific components for the liner system are indicated in Notes above "Cell Liner Detail" on Sheet 13 of 30. Two-foot Drainage/Protective layer is # 57 or #67 washed gravel, with greater permeability than 0.001 cm/s. Two-foot Clay Subbase has maximum permeability of 0.00001 cm/s. Labels for liner system materials will be added on the Detail.

Clarification - Is the above sufficient to satisfy Comment C-34? If not, please advise.

Mr. Ed Dexter
1993-WRF-0225
January 24, 2007

COMMENT C - 41

Drawing Nos. 3 of 30 through 17 of 30 showing bottom liner system details and the landfill subgrade, including the Clay Dam Detail on Drawing No. 18 of 30, should be depicted based on the anticipated maximum occurrence of the water table, to demonstrate the minimum 3-foot buffer separation between the highest observed/anticipated groundwater table and the subgrade.

Clay Dam will be investigated, per Clarification Requests under Comments B-1(d) and B-1(e). Sumps (after Landfill Settlement) are designed to be 3 feet minimum above highest anticipated groundwater (taken from the approved Phase II Report). All other Cell Floor Grades, which are based on 2 Percent minimum slope from the Cell Sumps, will have greater than 3 feet buffer from highest anticipated groundwater. Two Exhibits that indicate highest anticipated groundwater contours transposed on Liner Subgrade Plans (as presented at our August 2006 meeting) and a tabulation that indicates Settled Bottom of 2-Feet Clay Subbase Elevation and Highest Anticipated Groundwater Elevation at each Cell Sump will be added to the Permit Drawings. Description related to the 3-Feet required buffer between the Liner System and Groundwater will be included in a new Section in the Phase III Report.

Clarification - Is the above sufficient to satisfy Comment C-41? If not, please advise.

COMMENT C - 54

The plan shows the proposed leachate storage tanks (No.1 and No.2) are inside the fill area. Please address this discrepancy.

Leachate Collection Plans on Sheets 6 and 7 of 30 indicate limit of grading required to construct the Landfill Cells and the Leachate Storage Tanks. Tanks are not within the fill area.

Clarification-- Is the above sufficient to satisfy Comment C-54? If not, please advise.

Under the Owner's approval, Century and Golder will proceed with tasks associated with addressing Comments in the Department's November 27, 2006 Letter. Per our January 9, 2007 telephone conversation, prior to submitting our revised Phase III Report, we will request a meeting to present to the Department, revised and additional Permit Drawings and Exhibits, at substantial completion. Drawings will then be revised per the Department's verbal comments, and incorporated into the Revised Phase III Report Submittal.

At your earliest convenience, your response to Clarifications under Comments B-1(d) and B-1(e) would be appreciated.

We appreciate your attention regarding this matter. If you have any questions please contact me.

Sincerely,

Michael N. Armstrong
Michael N. Armstrong, P. E.
cc: Steve Fleischman