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December 17, 1996
Doc No. 023801-1487-2
Job No. 023801

State of Nevada
Department of Conservation and Natural Resources
Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89706-0866

Attn: Ms. Catherine R. Pool, P.E.
RCRA Facilities Branch
Bureau of Waste Management

Re: Response to Notice of Deficiency, dated September 13, 1996
US Ecology, Inc. - Beatty, Nevada Facility
Permit No. NEV-HW002
RCRA Part B Renewal Application

Dear Ms. Pool:

HMA Environmental Services, Inc. (HMA), on behalf of US Ecology, Inc., is pleased to provide the attached responses to the above referenced Notice of Deficiency (NOD) dated September 13, 1996. Two copies of the attached information is provided for your use, distribution, and approval.

For clarity, we have stated the specific NOD in the same order as your letter and provided our response in the same order as presented. As required, additional information concerning specific NOD are included in the responses to these NOD.

As we discussed, I will resubmit the formal response to the NOD portion of this response after the State of Nevada Board of Professional Engineers and Land Surveyors sends me my Professional Engineers seal and number. According to Ms. Noni Johnson of the board, I have been approved as a professional engineer in the State of Nevada but my professional engineer number has not been assigned as of the date of this letter.

14503 Bammel-North Houston Road, Suite 100 ♦ Houston, TX 77014-1146 ♦ Telephone 281.440.5503 ♦ Facsimile 281.444.3376

We trust these responses adequately address you comments and look forward to your technical approval of the responses. If you have any questions pertinent to the content of this submission, please feel free to contact either Zaki Naser at (702) 553-2203 or Gary Horwitch of HMA at (281) 440-5503.

Sincerely,

HMA ENVIRONMENTAL SERVICES, INC.

Robert A. Decker, P.E.
Principal

Gary R. Horwitch, P.E.
President

cc: Zaki Naser — 2 copies
Don Brady — 2 copies
File

# RESPONSE TO COMMENTS
# US ECOLOGY, INC.
# NEVADA PERMIT NEV-HW002
# RCRA PART B RENEWAL APPLICATION

## Geotechnical Investigation Report Cell 12, Grant Environmental, July 14, 1996

**COMMENT 1:** **Pg 3-3** **This report utilizes a maximum horizontal acceleration (MHA) which has a 90% probability of not being exceeded within a 50 year period. NDEP is requiring the landfill design meet the design requirements for solid waste landfills in Nevada. Pursuant to 40 CFR 270.32(b) (2), the design must resist a MHA of 90% probability of not being exceeded within a 250 year period (see NAC 444.6793). Please re-run the slope stability models using a MHA value of 0.42g as reported by TRC in the Cell 12 design.**

**RESPONSE 1:** The slope stability models for the below grade excavation slopes and the above grade final slopes have been re-evaluated using a maximum horizontal acceleration (MHA) of 0.42g in accordance with Nevada Administrative Code (NAC) 444.6793. The stability of the slopes were evaluated for stability using the PCSTABL5M slope stability computer program. The typical model configurations for the various slopes and material types anticipated are included in Attachment 1 to this response document.

The upper soil stratum, in its present condition, has little to no cohesion value. To resist the forces from the 0.42g horizontal acceleration seismic loading condition, the upper stratum will be cement stabilized to a compressive strength of 2000 psf. The typical thickness and stabilized strength requirements for this upper stratum are detailed in Attachment 1. A copy of the critical slopes and minimum factors of safety for the seismic loading conditions, utilizing the stabilized upper stratum, are also included as part of Attachment 1 to this response. In all instances the below grade factor of safety exceeded 1.5 for static conditions and 1.0 for pseudostatic conditions.

**COMMENT 2:** **Pg 4-4** **Table 4-1 is not complete. Several values for the shallow strata (i.e. up to 30 feet) were not obtained for static and dynamic cases. These values are needed in order to approve the excavation slope.**

**RESPONSE 2:** A revised Table 4-1 indicating the minimum factor of safety for both pseudostatic and static conditions for the slopes being evaluated is included in Attachment 2 to this response.

**Cell 12 Design Report, TRC Environmental Solution, Inc., March 1996**

**COMMENT 3:** **Pg 2-1** **The results of the above required revised slope stability analysis must be reviewed for to determine the effect on the design of Cell 12. The results of this analysis shall be applied to the design of Cell 12 and any necessary revisions made. Also 0.42 shall be used in all pseudostatic stability analyses for the Cell 12 design.**

**RESPONSE 3:** As stated in Response No. 1, the stability analysis have been performed on all slope models using a pseudostatic stability analysis and a MHA of 0.42g. The general design configuration will remain unchanged from previous submittals. The only change will be the use of cement stabilization techniques for the upper non-cohesive soils. Refer to Attachment 1 for these stability analyses.

**COMMENT 4:** **Pg. 2-3** **[Bullet 3]-A stability analysis must be done on the 50' buffer between Trench 11 and 12.**

**RESPONSE 4:** A stability analysis has been performed for the "50' buffer" between proposed Cell 12 and existing Cell 11. This analysis is for the east wall. The results of this analysis are included in Attachment 1 to this response. The factor of safety for this analysis is 1.74 and 1.13 for static and pseudostatic conditions, respectively.

**COMMENT 5:** **Pg 2-4** **Provide justification for removing angular rock with a diameter greater than 1" from the sidewalls, but allowing rocks with a diameter of great than 6" in the operations layer cover soil.**

**RESPONSE 5:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 6:** **Pg. 2-4** **Define the size of the depression in the side wall which will require repair with gunite.**

**RESPONSE 6:** A depression in the side wall will require repair if the edges of the depression are sharp and abrupt or if the depression is of a depth that would cause over stressing of the geomembranes when loaded by landfilling operations. The methodology to determine potential overstressing of the geomembrane is included in Attachment 6 to this response.

**COMMENT 7:** **Pg. 3-1** **3.2.1.1, #3, Drawing 010 shows a 20' drainage swale on the west side but it does not appear that the east portion of the landfill has an equivalent drainage swale, please explain.**

**RESPONSE 7:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 8:** **Pg 3-3** **3.2.2, #5, [First bullet]-After settlement occurs and the weakest interface (i.e. the interface between the geonet and nontextured interface of the 100 mil HDPE) has slipped, explain the forces realized by each interface of the liner system.**

**RESPONSE 8:** Settlement will induce limited stresses in the liner system due to elongation of the components. The interface between the 100-mil HDPE and the geonet will allow for a gradual slippage to occur as settlement of the waste and subgrade occurs. The slippage will not express itself as a sporadic instantaneous movement but as a gradual progression. This gradual slippage, caused by strains of up to 4 percent, will allow the geotextile and the geonet to deform without inducing significant stresses and will prevent the settlement strains and stresses from being transferred to the lower liner components. Changes in forces in the liner component after slippage is as follows:

| Component | Forces |
|---|---|
| GCL | Unchanged |
| 80-mil HDPE Textured both sides | Unchanged |
| LDS Double-sided geocomposite | Unchanged |
| 100-mil HDPE Textured on outside | Unchanged |
| LCRS Slope Geonet | Reduced Stress after slippage |
| non-woven geotextile | Reduced Stress after slippage |

Attachment 8 presents a series of calculations for these forces.

**COMMENT 9:** **Pg 3-4** **3.2.2, #5, [Second bullet]-Compare the GCL manufacturer's requirements for subgrade conditions to the design subgrade specifications with respect to cohesion.**

**RESPONSE 9:** The anchor trench and frictional resistance along the side slope will provide support for the GCL. Therefore, cohesion is not an item of concern from the GCL manufacturer's stand point.

**COMMENT 10:** **Pg 3-4** **3.2.3, #1, The geonet is doubled at the toe of the slope. Is the flow expected to double in this area?**

**RESPONSE 10:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 11:** **Pg 3-6** **Exhibit C.5, Provide a peak shear stress for each interface in the liner system. Include a reference for each value, and provide the normal stress at which the each shear stress was obtained.**

**RESPONSE 11:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 12:** **Pg 3-7** **3.6-As required above, re-evaluate this section based on the revised evaluation of the excavated sideslope.**

**RESPONSE 12:** The stability analysis has been re-evaluated as discussed in Response No. 1 and included in Attachment 1.

**COMMENT 13:** **Pg 3-7** **3.6.2, #1-Stability has been evaluated for Cell 12-A only. Stability analysis must be done on the other Phases before they can be permitted.**

**RESPONSE 13:** As stated in Response No. 1, the stability analyses have been performed on all slope models using a pseudostatic stability analysis and a MHA of 0.42g. The general design configuration will remain unchanged from previous submittals. The only change will be the use of cement stabilization techniques for the upper non-cohesive soils. Slopes analyzed include belowgrade slopes, abovegrade slopes, and intermediate waste slopes.

**COMMENT 14: Pg 3-7** **3.5.2, #2-List source for the chosen factor of safety. Other analyses did not achieve a factor of safety of 1.3, explain the disparity between factors of safety utilized in the Cell 12 design.**

**RESPONSE 14:** All static analyses achieved a factor of safety greater than 1.5 which is the minimum value established by the USEPA for this level of uncertainty.

**COMMENT 15: Pg 3-8** **3.6.2, #4-The static evaluation should use a MHA of 0.42g as stated above. Please justify and provide references for allowing any deformation at the design event.**

**RESPONSE 15:** As stated in Response No. 1, the stability analyses have been performed on all slope models using a pseudostatic stability analysis and a MHA of 0.42g. The static evaluations use a MHA of 0g. Based on the analysis included in Response No. 1, the seismic factor of safety is greater than 1.0. Therefore, no further response, regarding liner depressions is required.

**COMMENT 16: Pg 3-8** **Unexpected closure costs should include completion of the liner since the landfill may require closure after construction of just one or two phases.**

**RESPONSE 16:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**Exhibit C.1, Slope Stability Final Configuration**

**COMMENT 17: Pg C.1-4** **Assumption #2, Provide documentation of waste characteristics which show that the cohesion value of 300 psf is reasonable.**

**RESPONSE 17:** Attachment 17 includes information from several studies which, based upon our previous discussions with Ms. Catherine R. Pool, P.E., indicate the selected cohesion value of 500 psf is reasonable considering the type of waste received and stabilized at the Beatty Facility. Over 50 percent of the waste placed into the Beatty Facility has been stabilized with the addition of approximately 15 percent cement. This stabilized waste will provide the cohesive strength in excess of 500 psf.

**COMMENT 18: Pg C.1-4** **Assumption #3, The design requires native soil amendment to achieve a cohesion of 1000 psf. Table B on Pg C.1-5 lists the cohesion for native soils as also being 1000 psf at 175' out from the excavated sideslope. The Grant Environmental Report (see Figures 3.1-3.4) indicates that the cohesion of native soils in the top 19 feet is 0 psf. Provide a justification or explanation for using a cohesion value of 1000 psf for native soils a this far away from the sideslope.**

**RESPONSE 18:** These analyses have been re-evaluated utilizing a stabilized soil wedge and the native soil parameters. The analyses have been performed and are included in Attachment 1 to this response.

**COMMENT 19: Pg C.1-6** **NDEP will not accept a factor of safety of less than one (1) in the design of Cell 12. The design must be able to resist the MHA event without impacting the integrity of the liner. A factor of safety less than one indicates that the system will fail at the design event.**

**RESPONSE 19:** As discussed in the response to Comment 1, these analyses have been re-evaluated utilizing a MHA of 0.42g. In all cases, the factor of safety is greater than 1.0 using a MHA of 0.42g.

**COMMENT 20: Pg C.1-10** **The values calculated for displacement are standardized maximum displacement values. What is the margin of error associated with these values? Are these values the absolute maximum values theoretically possible with the given seismic event? Provide a range of values using worst case values in the evaluation.**

**RESPONSE 20:** A response to this comment is not required since a factor of safety greater than 1.0 has been achieved using a MHA of 0.42g and stabilization of Stratum I.

**COMMENT 21: Pg C.1-14** **If at the "design earthquake" (MHA 0.42g), there will be permanent displacement, provide an evaluation of the effect of this displacement on the liner system after displacement has occurred.**

**RESPONSE 21:** A response to this comment is not required since a factor of safety greater than 1.0 has been achieved using a MHA of 0.42g and stabilization of Stratum I.

**COMMENT 22: Pg C.1-14 Provide documentation that a 12 inch displacement is allowed at the design earthquake. Provide documentation that a 12 inch displacement is acceptable in a hazardous waste landfill design.**

**RESPONSE 22:** A response to this comment is not required since a factor of safety greater than 1.0 has been achieved using a MHA of 0.42 g.

**COMMENT 23: Pg C.1-108 Provide documentation that the cohesion values for the interfaces between the soil and Texnet and between Texnet and 60 mil HDPE increase during a pseudostatic event.**

**RESPONSE 23:** The parameters used for analysis are the same for both static and pseudostatic analysis. The analysis was performed and is included in Attachment 23. The factor of safety for each interface in the final cover system is either greater than 1.5, or if less than 1.0, calculated displacements are less than 6 inches.

**COMMENT 24: Pg C.1-108 Provide a reference for where the value of 35 degrees for PHI came from for native soils.**

**RESPONSE 24:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 25: Pg C.1-108 NDEP will not accept a design that utilizes a pseudostatic safety factor of less than 1.**

**RESPONSE 25:** As discussed in the response to Comment 1, a factor of safety greater than 1.0 has been obtained for all slopes using a MHA of 0.42g and stabilization of Stratum I.

**C.2 Slope Stability Interim Configuration**

**COMMENT 26: Pg C.2-5 Not all the interfaces on the sideslope are evaluated. Provide interface strength parameters for the following interfaces 1) non-woven geotextile/ LCRS geonet, 2) GCL/ textured 80 mil HDPE, 3) GCL/ native soils.**

**RESPONSE 26:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 27: Pg C.2-5 Evaluate the slope stability of the interface between the doubled sections of the geonet at the toe of the slope.**

**RESPONSE 27:** The doubled sections of the geonet at the toe of the slope are actually the overlap areas consisting of the bottom geonet with 3 feet of runout up the side slope and side slope geonet with 3 feet of runout along the bottom. The stability of the side slope geonet is governed mostly by the anchor trench at the top of the slope. Minimal support is provided by frictional resistance along the below grade side slopes. Therefore, the overlap of the side slope and bottom geonet will not affect the overall below grade stability. The operational soil layer, when installed, will provide a buttress effect to the geonet.

**COMMENT 28: Pg C.2-5 Provide additional supporting documentation (e.g. manufacturers data) of the interface strength parameters for materials which have values obtained from Reference 1.**

**RESPONSE 28:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 29: Pg C.2-8 Bullet #1, The static factor of safety obtained is only 1.45, recommended FS for static is 1.5, justify using this safety factor.**

**RESPONSE 29:** The static slope stability has been re-evaluated using stabilization of Stratum I. All factors of safety for the revised static slope stability analyses are greater than 1.5. Details concerning the revised slope stability calculations are provided in Attachment 1.

**COMMENT 30: Pg C.2-8 Bullet #2, The design acceleration used is 0.2g, NDEP requires that the design resist (i.e. not fail) a 0.42g acceleration event as described above, re-evaluate the interim stability of the waste fill at the 0.42g event.**

**RESPONSE 30:** As discussed in the response to Comment 1, a factor of safety greater than 1.0 has been obtained for all slopes using a MHA of 0.42g and stabilization of Stratum I.

**C.3 Surficial Soil Improvement**

**COMMENT 31: Pg C.3-2** **The purpose needs to include specifying the dimensions of the soil amendments required to achieve stability. A depth of 20' is specified but no horizontal dimension is given.**

**RESPONSE 31:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**C.4 Settlement**

**COMMENT 32: Pg C.4-33** **The conclusion does not state whether 60 inches is an acceptable amount of settlement and does not describe the effect of this settlement on the integrity of the liners.**

**RESPONSE 32:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**C.5 Liner Stresses**

**COMMENT 33: Pg C.5-8** **Provide the reference for the value for the ultimate stress, $T_{ULT.}$ used for the geotextile, Reference 9 has three Trevira products only one of which appears to meet the 150 lb/in yield strength used in the calculations. The values used for these calculations must be specified in the design as the minimum product specifications which can be used for the actual construction.**

**RESPONSE 33:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 34: Pg C.5-8** **Provide justification for using the factor of safety of 4 for the geonet allowable stress, Reference 10 lists typical safety factors as 10-100.**

**RESPONSE 34:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 35: Pg C.5-11 Table 1 is incomplete, values are needed for the ultimate stress, $T_{ULT.}$ for the geonet and the GCL.**

**RESPONSE 35:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 36: Pg C.5-18 Provide a more detailed description of how $F_U$ and $F_L$ are calculated.**

**RESPONSE 36:** Friction forces $F_U$ and $F_L$ were calculated using free body diagram analysis specific to runout calculations. Attachment 36 provides detailed in formation concerning the liner system components and the derivation of the friction force values.

**COMMENT 37: Pg C.6-6 Provide a reference for the assumption that $K_0$=0.5.**

**RESPONSE 37:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 38: Pg C.6-10 Provide manufacturer's data which confirms the values used for Table 1.**

**RESPONSE 38:** Attachment 38 contains manufacturer's data and reference sources confirming values used in Table 1.

**C.7 Sump and Riser Design**

**COMMENT 39: Pg C.7-7 Justify the use of the dry density of the waste to determine the overburden load.**

**RESPONSE 39:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

## C.8 LCRS Flow Capacity and Pump Sizing

**COMMENT 40: Pg C.8-1 The design of the LCRS must ensure that the head on the primary liner does not exceed 1 foot.**

**RESPONSE 40:** The United States Environmental Protection Agency (USEPA) Hydrologic Evaluation of Landfill Performance (HELP) Model Version 3, developed for the USEPA in September 1994, was used to evaluate the performance of the leachate collection system. Daily rainfall, runoff, evapo-transpiration, vertical seepage, and lateral drainage through the various soil layers were simulated using the HELP model. The model produces output identifying the input data and tables of average annual totals, average monthly totals, and peak daily totals for various simulation parameters.

The HELP model was used to simulate 30 years of leachate generation based on synthetically generated climatological data for Las Vegas, Nevada. Las Vegas, Nevada was selected as the closest location for which HELP model default synthetic precipitation data is available.

Peak leachate head on the primary liner system will occur after the minimum initial thickness of waste (2 ft of select waste as protective cover) has been placed over the cell. As indicated on Drawing No. NV-161-PMT-010 (see Attachment 40), the maximum distance and minimum grades between the leachate collection pipes are as follows:

| Cell Designation | Maximum Distance Between Leachate Collection Pipes | Minimum Slope Between Leachate Collection Pipes |
|---|---|---|
| Cell 12A | 110 ft | 1.0 percent |
| Cell 12B | 150 ft | 2.0 percent |
| Cell 12C | 100 ft | 1.0 percent |

As indicated in the following table the maximum depth of leachate above the primary liner system is as follows:

| Cell Designation | Maximum Leachate Depth (inches) |
|---|---|
| Cell 12A | 0.118 |

| Cell Designation | Maximum Leachate Depth (inches) |
|---|---|
| Cell 12B | 0.096 |
| Cell 12C | 0.114 |

As indicated in the above referenced table, the maximum leachate depth is 0.118 inches which is less than the regulatory requirement of 12 inches.

**COMMENT 41: Pg C.8-2** **The design of the LCRS assumes that run-off from the sideslopes is intercepted and directed away from the LCRS. This should be included in the design specifications, materials chosen and interceptor shown on the design drawings or the volume of run-off needs to be included in the design of the LCRS.**

**RESPONSE 41:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, the design drawings will be modified in the final submittal to indicate that the runoff from the side slopes will be intercepted and directed away from the LCRS.

Additionally, calculations were performed to determine the size of the pump which would be required to remove the runoff. These calculations were based on the largest cell, Cell 12A. As indicated in the calculations provided in Attachment 41, a 135 gpm pump is required to remove the runoff from the largest cell. A portable pump, with a minimum rating of 135 gpm will be maintained at the facility during operation of Cells 12A, 12B, and 12C.

**COMMENT 42: Pg C.8-5** **Does the design provide any protection (e.g. geotextile around the pipes) for the slots in the 3" pipe to prevent clogging?**

**RESPONSE 42:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 43: Pg C.8-25** **Calculate the flow capacity for the gravel in the sump to ensure the gravel can transmit the flow entering the sump.**

**RESPONSE 43:** As indicated in the calculations included in Attachment 43 to this response, the flow capacity of the gravel is approximately 106 gpm, which is greater than the required flow capacity of 3.6 gpm indicated in Table 1 (see the response to Comment 44).

**COMMENT 44: Pg C.8-25 Show the maximum flow which can be transmitted into each sump for a 24 hour period on Table 1.**

**RESPONSE 44:** The maximum flow which can be transmitted to each leachate collection sump has been calculated and is noted in the revised table presented as part of this response. This maximum flow includes flow from the double sided geocomposite and the LCRS pipes as indicated in the calculations presented in Attachment 44. Additionally, the peak daily leachate generation was determined for each cell from the HELP modeling presented in the response to Comment 40 (see calculations included in Attachment 44).

As indicated in the following table, the available flow capacity to each leachate collection sump is substantially greater than the required flow capacity to each leachate collection sump.

| Cell Designation | Cell Area (acre) | Leachate Collection Sump Required Capacity (gal/day) | Leachate Collection Sump Available Capacity (gal/day) |
|---|---|---|---|
| 12A | 3.49 | 5,161 | 98,088 |
| 12B | 2.45 | 4,436 | 98,147 |
| 12C | 2.87 | 4,391 | 98,088 |

**COMMENT 45: Pg C.9-3 Show the maximum flow capacity which can be transmitted to each sump in a 24 hour period on Table 1.**

**RESPONSE 45:** The maximum flow which can be transmitted to each leak detection sump has been calculated and is presented in the following table. This maximum flow includes flow from the geonet which is limited by the leak detection sump permittee. Additionally, the required peak leak detection flow rate was calculated based on the ALR for the cell with a factor of safety of 2.0. As indicated in the following table, the available capacity of each leak detection sump is substantially greater than the required capacity.

| Cell | Total Cell Area (acre) | Leak Detection Sump Required Capacity (gal/day) | Leak Detection Sump Available Capacity (gal/day) |
|---|---|---|---|
| 12A | 3.49 | 1,396 | 1,531 |
| 12B | 2.45 | 980 | 2,062 |
| 12C | 2.87 | 1,148 | 1,531 |

**COMMENT 46: Pg C.9-4** **Designing the sump to be able to pump only 200 GPAD does not meet the intent of the regulations. The regulations require that the LDS be able to remove the volume of leachate which will maintain the head on the liner at less than one foot. If the sump can only handle 200 GPAD and the LDS can deliver 400 GPAD, then leachate will begin to back up on the drainage layer which is unacceptable.**

**RESPONSE 46:** As indicated in the response to Comment 45, the available daily leak detection sump capacity is greater than the required daily leak detection sump capacity. Therefore, the leak detection sump capacity will not cause leachate to back up on the drainage layer.

**Exhibit D MTR Equivalency Demonstration**

**COMMENT 47: NDEP responded in a letter dated June 4, 1996, to the minimum technology requirements (MTR) section of the Cell 12 Design. US Ecology responded to NDEP comment in a letter dated July 9, 1996. US Ecology proposed to install the GCL mat above a 36" of select soil compacted to a density that will achieve a hydraulic conductivity of 1 x $10^{-5}$ cm/sec. NDEP finds that this design is equivalent to the MTR for the bottom.**

**RESPONSE 47:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.

**COMMENT 48: The MTR does not provide a demonstration that the side slopes do not require the same cation exchange capacity as the bottom. Please provide justification for this design specification.**

**RESPONSE 48:** Leachate heads for the bottom liner is 0.1 feet and the side slope liner is 0.00005 feet. The differing cation exchange capacities exist because the steep cell side slopes have no potential to experience fluid head buildup and therefore, do not require the compacted soil layer. Attachment 48 provides details regarding the MTR Equivalency Demonstration.

**COMMENT 49: The MTR must be revised to incorporate the final liner configuration.**

**RESPONSE 49:** As discussed in the telephone conference call with Ms. Catherine R. Pool, P.E., RCRA Facilities Branch, Bureau of Waste Management, no additional response is required for this comment.