November 5, 2023

Mr. Clinton Chisler
Uranium Reclamation Coordinator
Mining Act Reclamation Program
Mining and Minerals Division
New Mexico Energy Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Responses to Comments on *Closeout/Closure Plan Mt. Taylor Mine,* Rio Grande Resources Corporation, Mt. Taylor Mine, Cibola County, New Mexico, Permit Tracking No. CI002RE

Dear Mr. Chisler,

Rio Grande Resources Corp. (RGR) received a letter, dated May 17, 2023, from the Mining and Minerals Division (MMD) of the Energy, Minerals and Natural Resources Department requesting responses to comments on the Closeout/Closure Plan Mt. Taylor Mine (CCP) dated June 2022 and Supplemental Submission of the 2022 Cost Estimate, dated June 18, 2022. The letter also requested RGR provide responses to comments provided by the New Mexico Environment Department (NMED) and MASE which were also included with the above referenced letter.

RGR respectfully submits its responses to the MMD comments dated May 17, 2023. RGR is completing its responses to the comments prepared by NMED (Mining Environmental Compliance, Surface Water Quality Bureau and Air Quality Bureau) and MASE, and will submit those to MMD shortly.

RGR previously responded to comments by New Mexico Office of State Engineer (NMOSE) and the New Mexico Department of Game and Fish (NMDGF). A supplemental information packet to NMOSE's comments is being sent to MMD via mail, due to its large volume of materials. This supplemental information packet contains additional information to address NMOSE's comments.

If you have any questions, please contact me at (505) 287-7971 or by email at bruce.norquist@ga.com. A hard-copy of this document is also being sent by mail.

Sincerely,

Bruce L. Norquist

Bruce Norquist
Facilities Manager, Mt. Taylor Mine
Rio Grande Resources Corporation

cc: Anne Maurer, NMED-MECS, via email

Responses by RGR to MMD's Comments in Letter Dated May 17, 2023

MMD's comments are in **bold** font. RGR's responses are provided in regular font.

1. **Section 1.3.5, page 6, para 2, states that shaft muck was found to meet the criteria of clean materials and was used for the construction of the disposal cell. Cite the data provided in the Updated CCP that was used to make this determination or provide the data used.**

RGR's response:

The data used to classify the shaft muck as a clean material is contained in Appendix D. It is attached here for convenient reference (Response No. 1 Attachment).

2. **Section 2.4.1, page 12-13, describes the shafts and conduits and the hydrologic separation of the mine water from the Point Lookout aquifer. See NMOSE comment memorandum dated November 15, 2022.**

RGR's response:

At the request of MMD, RGR submitted responses to the NMOSE comments on January 31, 2023. RGR has prepared a supplementary response to the NMOSE comments providing additional information that NMOSE was seeking. This supplementary information is large in volume and will be sent via mail.

Please note, NMOSE requested test information on the sulfate-resistance of cement, but RGR could not locate that information in its records. NMOSE also requested test information on shaft liner concrete permeability. RGR could not find that information in its records, either.

3. **Section 3.3.3, page22, includes the Capacitor Building and refers to Table 4.2 that does not have the Capacitor Building listed. Conversely, Table 4.2 lists the Firehouse but it is not listed in Section 3.3.3. MMD requests that both Section 3.3.3 and Table 4.2 be updated and revised, if needed.**

RGR's response:

The Capacitor Building is incorrectly listed in Section 3.3.3 as a structure to be retained for PMLU. RGR does not intend to retain the Capacitor Building for PLMU and will remove it. Section 3.3.3 will be revised in the final updated version of the 2022 CCP, after the technical review is completed. The Capacitor Building has been added to Table 4.2 (Response No. 3 Attachment).

The Fire Equipment Building (Fire House) structure has been removed. However, RGR desires to retain the concrete foundation slab for the PMLU for future storage of materials. This is correctly listed in Table 4.2. Please see the attached revised Table 4.2, which has been revised to reflect site closeout/closure conditions to date.

4. Section 4.2.1, page 26, should be updated, if necessary, along with Section 3.3.3 and Table 4.2. Section 4.2.2, page 27, states that demolished concrete may be placed in the disposal cell. MMD questions whether that practice would reduce the capacity of the disposal cell for contaminated materials. Please address.

RGR's response:

Generally, RGR assumes all materials on site are radiologically contaminated and intends to place those materials in the disposal cell.

For the proposed expansion of the disposal cell to 25 acres, it is believed there is sufficient capacity to contain all materials on site as well as possess reserve capacity for any contaminated materials yet to be identified.

RGR will make reasonable efforts to reduce the amount of materials destined to be placed in the disposal cell through characterization studies. Materials found to not be radiologically contaminated will be separated and buried as clean fill, or released from the site and recycled or properly disposed of.

With regard to concrete, radiological characterization is difficult to perform with certainty. Where concrete is identified to have been exposed to ore or contaminated waters, RGR will place it in the disposal cell. Where concrete is believed to be radiologically un-contaminated, RGR will further characterize it and either bury it in place, use it for clean fill, or use it for erosion protection around the site. If it is unsuitable for these purposes, it will be placed in the disposal cell.

RGR will update Sections 3.3.3, 4.2.1 and 4.2.2 and Table 4.2 prior to final technical review of the 2022 CCP. Table 4.2 has been updated to reflect the current state of closeout/closure and is attached (Response No. 3 Attachment).

5. Section 4.3.2, Shaft Plugging, pages 31-32, the proposed near surface shaft plugs were discussed at a meeting with RGR on January 5, 2023. An updated design is described in this section of the Updated CCP and shown in Appendix Please confirm RGR's proposal for the near surface shaft plugging.

RGR's response:

RGR confirms that the near-surface conceptual shaft plug designs, as discussed in Section 4.3.2 and presented in Appendix G are the designs proposed for plugging the shafts. Drawings and plans will be presented for approval prior to actual construction.

NMOSE imposed a requirement to plug the shafts in a manner similar to plugging and abandoning water wells in their comments regarding the updated CCP. Construction of a plug that addresses NMOSE's concerns will be complex, due to the depth and size of the shafts. RGR is investigating the concept of fully plugging the shafts and feasible options are being explored. This topic is separate from the near-surface shaft plugging concept proposed in Section 4.3.2 and Appendix G.

6. **Section 4.3.3, Well and Conduit Plugging, pages 32-34. Well plugging shall be in accordance with NMED and NMOSE requirements. Based on comments from NMED and NMOSE, some wells may be kept open and/or rehabilitated and used for groundwater monitoring and other uses approved by NMED and NMOSE.**

RGR's response:

RGR acknowledges MMD's comment and will plug and abandon the wells in accordance with NMED and NMOSE requirements. At this time, RGR is unsure of the specific wells that may be selected for groundwater monitoring. When plans for monitoring are approved by NMED, RGR will inform MMD of the wells to be plugged and abandoned and the wells intended to be preserved.

7. **Section 4.3.4, Surface Facilities Removal Pending, page 35, para. 4, and Appendix A, Sheet CL 16. RGR states that the treated water discharge pipeline will be removed and buried in the disposal cell. Appendix C, Technical Specifications, Section C.2 Buildings and Pipeline Demolition, provides technical specifications for the proposed pipeline demolition. RGR states that it is working with the USFS on plans for removal of the pipeline segments that cross USFS land. MMD requests that RGR keep MMD informed of plans developed with the USFS and provide detailed plans, if any, prior to the pipeline removal including the segments that cross private land and USFS land. MMD is also concerned about the placement and burial of the discharge pipeline segments in the disposal cell so that that the pipeline segments do not pose a risk to the clay liner or cause differential settlement within the disposal cell. Therefore, MMD requests additional information from RGR on the pipeline segment placement and burial in the disposal cell.**

RGR's response:

RGR acknowledges MMD's comment and will keep MMD informed of plans to remove the pipeline, prior to initiation of the removal project, as they develop.

Once the disposal cell expansion is approved and RGR develops construction plans, it will provide information on how and where the pipe will be placed in the disposal cell. Conceptually, it is anticipated that the pipe segments will be placed in trenches at the bottom of the disposal cell. First, RGR will place a layer of flowfill directly above the clay liner. Once the flowfill is sufficiently solidified, pipe segments will then be placed on top, by crane or excavator (not dumped or allowed to free-fall), thereby eliminating the risk of piercing the liner. Other materials will also be placed along with the pipe. After each layer of debris is completed, void spaces will then be filled with flowfill to minimize the risk of settlement. This practice was applied in the burial of mill debris at the Homestake Mill, with no detectable settlement in the three decades since.

Recent characterization work has indicated that much of the pipe may be releasable from the site. RGR is researching this option and will attempt to release as much of the pipe, if possible, to preserve disposal cell capacity.

8. **Section 4.3.4, Surface Facilities Removal Pending, page 35, para. 5, states that the mine hoists will be buried in the disposal cell. Are the mine hoists radiologically contaminated? Please address.**

RGR's response:

The Production Shaft hoist has been previously removed. Presently, two hoists remain on site, the Service Shaft hoist (Manway hoist) and the emergency hoist. Parts of these hoists are believed to be radioactive (e.g.: hoist ropes and drums). RGR will conduct a characterization study of the hoists and evaluate the feasibility of separating the clean portions from the contaminated ones. If economic to do so, any non-contaminated portions of the hoists will be removed from the site and recycled. The remainder will be placed in the disposal cell.

9. **Section 4.3.4, Surface Facilities Removal Pending, page 36, para. 1, states that clean debris may be placed down the shafts. MMD is concerned that debris placed down the shafts could negatively affect an eventual shaft closure plan and should be avoided until approved by MMD. Also, see the NMOSE Memorandum dated November 15, 2022 previously provided to RGR by MMD on November 21, 2022.**

RGR's response:

Placement of clean debris into the shafts was approved under Mine Permit (CI002RE, Rev. 13-2 and 2013 CCP). RGR is aware of the concerns of MMD and NMOSE, particularly as it may affect shaft closure plans. Should engineering designs require some sort of fill at the bottom of the shafts, to serve as a foundation to form a plug, RGR will propose a plan for MMD's approval, to place soft debris and soil or rock into the shaft.

10. **Section 4.4, Earthwork, page 36, para. 3, states that Borrow Area C is expected to be a source of clay soils. Provide or cite the existing borrow material characterization data for Borrow Area C. How will Borrow Area C be accessed and how will the access route and Borrow Area C be reclaimed?**

RGR's response:

The borrow material characterization data for Borrow Area C is contained in Appendix D and is attached in this response for ease of reference (Response No. 10 Attachment). The Borrow Soil Sample locations performed in 2014 are shown on Figure D.3.5-1. The results of analyses for the soil samples shown in Figure D.3.5-1 are summarized in Table D.3.5. The laboratory analysis is presented in the data that follows.

The original CCP soil survey locations are shown in Figure D.4-1 and the results of the sampling are presented in Table D.4.1. The test analysis follows the table.

A radiological survey was performed in April of 2012 and the results are shown in Drawing MT12-CL-03 (Response No. 10 Attachment). The units shown on Drawing MT12-CL-03 are gamma exposure rates of micro-R/hour (uR/hr). The "Post Reclamation Radiation Level (PRRL) is taken as 24.5 uR/hr, which is equivalent to 6.8 uCi/g Ra-226, the soil cleanup standard established in the 2016 MMD/NMED "Joint Guidance for the Cleanup and Reclamation of Existing Uranium Mining Operations in New Mexico." It can be seen that the gamma readings of the proposed Borrow Area C are mostly below the PRRL, except for the southern central region. This region is part of the "windblow contaminated area that will have to be remediated. If cover soil is excavated from the proposed Borrow Area C, any contaminated material will be removed before excavation proceeds.

The proposed access to Borrow Area C will be via the North gate of the MWTU area and bridge over Marquez Arroyo, with a short, graded dirt/gravel road into Borrow Area C (Response No. 22 Attachment). Please refer to RGR's responses to Comment #22, as Borrow Area C is discussed there as well.

Reclamation will be in accordance with plans for reclamation of the site, namely, grading to minimize water ponding, scarifying the ground and revegetating according to Appendix F.

11. **Section 4.4, Earthwork, page 36, para. 4, states that steep cut slopes in weak sedimentary rock or soil will be flattened to slope gradients not greater than 1H:1V. How will erosion be prevented on the slopes after reclamation?**

RGR's response:

This paragraph in section 4.4 pertains primarily to the cut slopes forming the near-vertical rock faces that are on the east side of the Service and Support area. These faces were excavated during the initial mine construction in the 1970's to provide space for the planned construction activities and operations. The dominant materials exposed in these faces are sandstones, claystones and shales and the primary concern of these slopes is safety.

The plan for reclamation of these slopes will be either cutting the slope back to a maximum 1H:1V slope or filling in front of the faces to a 3H:1V slope. If cutting of the slope is selected, the rubble generated by slope reduction will be very rocky and not readily erodible. In the scenario for backfilling against a steep slope, a rocky ungraded fill material would be preferable.

Once the slope is stabilized to a 1H:1V or flatter, a geocell or geogrid type geotextile material, such as Envirogrid® or Geoweb®, will be placed over the slope, to reduce erosion potential and promote natural revegetation. Terracing of the slopes may also be utilized, to help control runoff and promote vegetation. Depending on the nature of the slope (e.g.: more soil than rock), rock armoring may also be applied, such as rip-rap blanketing or rock mulch, similar to those applications on the waste rock pile.

12. **Section 4.4, Earthwork, page 37, para. 2, states that some of the NSWP sediments will be hauled to the disposal cell for placement and some will be used to construct berms of the expanded disposal cell. A MMD approved material handling plan should be provided to determine which sediments are clean and can be used in the berms versus being placed in the disposal cell.**

RGR's response:

The Ore Pad working surface materials and sediments in the NSWP contain pieces of low-grade uranium ore from previous mine production. Therefore, RGR considers all of the sediments in the NSWP and all of the Ore Pad working surface materials to be radiologically contaminated.

Because all of the materials are considered radiologically contaminated, RGR will not use these materials in the construction of the Disposal Cell berms.

A material handling plan will be presented for MMD approval after the disposal cell expansion is approved.

13. Section 4.4, Earthwork, page 37, para. 3, states that a small portion of the disposal cell will remain open until MWTU ponds 2 and 3 are ready for decommissioning. What part of the disposal cell will be left open and how will the open part of the disposal cell be safeguarded from erosion and exposure of radiological materials?

RGR's response:

After review and discussion of this topic, RGR has altered its plans of leaving the disposal cell open for any extended length of time after all contaminated materials have been placed. Instead, RGR will close the disposal upon completion of site remediation. Any contaminated materials subsequently encountered will be placed on top of the cell, within a new, smaller constructed containment cell.

RGR believes the 25-acre, full build-out configuration of the extended disposal cell will have excess capacity remaining after all anticipated contaminated materials and debris are remediated. As filling of the 25-acre disposal cell progresses, it is envisioned this fill process will occur in lifts shaped like flat-topped pyramids.

Once the site is remediated, there is expected to be a flat area on top of the disposal cell to place any subsequent contaminated materials on. A small containment cell will then be constructed on the flat surface, using the previously constructed cover as the bottom of the liner. The top 2-feet of soil will be pushed to the side, to create berms. Contaminated material will then be placed and a 4-foot cover placed above. The construction of the liner and cover of this smaller containment-cell" will be to the same standards as the primary disposal cell.

It may be decided that the top of the small containment cell may be left open for a predetermined amount of time, if additional material is to be placed. If the cover of the small containment cell is left open in anticipation of new contaminated material, a thin layer (e.g.: 1-foot) of non-compacted clean soil may be placed to protect the underlying contaminated material from weather or erosion.

Response No. 13 Attachment shows a conceptual plan view of the location of the small containment cell.

14. **Section 4.4, Earthwork, page 37, para. 4, states that Borrow Area C may be used as a source of borrow soil. See MMD comment 10, above.**

RGR's response:

Please refer to RGR's response to comment 10 above.

15. **Section 4.4, Earthwork, page 38, para. 1, states that the only soil contaminant of concern is radium arising from the mining operation. Would uranium and radon be contaminants of concern arising from the mining operation?**

RGR's response:

Both radium-226 and radon-222 are decay progenies of uranium-238 and are in varying states of equilibrium with uranium-238. (Because radon is a noble gas, it is not typically considered to be a "contaminant"). RGR has agreed to meet the soil cleanup criteria as defined in MMD/NMED's 2016 "Joint Guidance for the Cleanup and Reclamation of Existing Uranium Mining Operations in New Mexico", 5 pCi/g Ra-226 above background as a soil cleanup standard. Uranium-238 and radon-222 are important constituents to be concerned with, but these constituents would be mitigated along with the Ra-226 during cleanup, due to their relationships in the uranium decay chain. The wording in the cited paragraph could be stated differently.

Please note that the sentence preceding the one cited above states that the soil chemistry data "demonstrate the consistency of soil chemistry and physical properties of soils across the site." RGR intended to highlight its commitment that borrow soil will not be used if it exceeds the MMD's Joint Guidance standard for radium-226.

16. **Section 4.4.1, Disposal Cell and Expansion, page 38, para. 3, states that a clay liner, not less than 1.0 ft. of compacted clay soil, will be constructed under the disposal cell to provide additional protection for ground water. Please cite or refer to the compaction specifications and hydrologic characteristics of the compacted clay liner proposed for the expanded disposal cell liner.**

RGR's response:

General requirements for construction of the clay liner are found in C.4 "Earthwork" in Appendix C. The specifications used in the construction of the existing disposal cell liner and cover will be used in the construction of the liner and cover of the disposal cell expansion. Specifications are presented in both of the following QAQC reports and Response No. 16 Attachment:

- CONSTRUCTION QUALITY CONTROL DATA REPORT, DISPOSAL CELL LINER, MT TAYLOR MINE, FEBRUARY 2020
  - Specification No. MW-CB01-00, EARTHWORK FOR POND

RECONSTRUCTION, PHASE 1 REACTIVATION

- CONSTRUCTION QUALITY ASSURANCE REPORT (CQAR), WASTE ROCK PILE/ DISPOSAL CELL, MT TAYLOR MINE REACTIVATION, MAY 2021
  - Specification No. MW-CB01-00, EARTHWORK FOR POND RECONSTRUCTION

Specification No. MW-CB01-00, EARTHWORK FOR POND RECONSTRUCTION, was issued in 2018 and used in the construction of the waste pile and disposal cell and clay liner for the initial portion of the disposal cell. Despite its title, it was originally intended to be used for all earthwork on the site, with Section 2.2 specific to this work.

In June 2020, Specification No. MW-CB02-00, EARTHWORK FOR WASTE PILE AND DISPOSAL CELL COVER CONSTRUCTION, was prepared to address the remainder of the disposal cell construction and the loam cover over the clay radon barrier. In this specification, RGR made no changes to the radon-barrier clay soil properties, placement or compaction, but a seeding medium of loam soil was added after this requirement was issued by MMD (See Section 2.3.2).

The clay liner beneath the disposal cell was constructed from heavy clay materials excavated from Borrow Area A. The hydrologic properties measured were from Falling Head-Flexible Wall hydraulic conductivity tests. Results are in Response No. 16 Attachment.

No hydraulic conductivity tests have been run on the materials in Borrow Area C to date. Physical data (grain size, gradation, compaction tests and chemical) have been run on Borrow Area C, and can be found in the "Original Closeout Plan Soil Data" in Appendix D.4. Samples TP7 through TP11 were samples taken in Borrow Area C.

According to the approved DP-61, RGR is committed to achieving a maximum saturated hydraulic conductivity of $1x10^{-6}$ cm/s at 95% standard Proctor density. Those standards were used in constructing the existing disposal cell and will be applied to the expanded disposal cell liners and cover.

17. **Section 4.4.1, Disposal Cell and Expansion, page 38, para. 4, states that additional capacity will be available by excavating trenches under the disposal cell footprint and below existing grade for pipe, machinery and other materials. How will the materials placed in the trenches be separated from the clay-lined disposal cell above the trenches where contaminated will be placed?**

<u>RGR's response:</u>

The clay liner will be constructed on the floor of the pits or trenches. To protect the liner, a layer of flowfill will be placed above. Debris will then be placed on top in lifts of approximate 5 to 8-feet height. Once placed, each lift will be filled with flowfill. No additional clay liner is planned over the flowable fill, once in place. Subsequent lifts of contaminated materials will be placed directly above the flowfill layer.

18. **Section 4.4.1, Disposal Cell and Expansion, page 39, para. 2, states that the cover over the disposal cell will consist of a 2.0 ft. thick compacted clay layer and a 2.0 ft. thick growth media layer.**

RGR's response:

That is correct.

19. **Section 4.4.1, Disposal Cell and Expansion, page 39, para. 3, states that the final dimensions of the expanded closure [disposal] cell will not be known until mine closeout is complete. What is the capacity in cubic yards of the proposed expanded disposal cell assuming the proposed dimensions are achieved?**

RGR's response:

RGR prepared two expansion scenarios, 1) expand to 19.3-acre footprint and 2) expand to 25-acre footprint. The 25-acre expansion has been presented in the 2022 CCP. RGR estimated the currently identified volume of contaminated materials (debris and soil) to be approximately 326,000 cu. yds.

For the conceptual plan of the 19.3-acre footprint, expanding to the east and to the north and west of the Car Shop, the available capacity would be approximately 374,800 cu. yds. For conceptual plan of the full-buildout at the 25-acre footprint, the capacity would be approximately 942,500 cu. yds. The difference between the two scenarios is approximately 567,700 cu. yds. RGR believes that it will not fill to the final buildout footprint of 25-acres because it does not foresee that much uncontaminated material being generated during remediation of the site.

20. **Section 4.4.1, Disposal Cell and Expansion, page 40, para.1, states that the WRP characterization study showed that water infiltration is very low in the sandy waste rock. What is the predicted water infiltration rate through the 2.0 ft. thick vegetative growth media?**

RGR's response:

To date, RGR has only measured hydraulic conductivity for the compacted clay radon barrier. Infiltration rates in the growth medium (loam) will vary widely with temperature, precipitation, and evapotranspiration rates being the primary variables. RGR will measure the infiltration rate and provide the data in a supplemental data package.

21. Section 4.4.4, Affected Areas, page 41, para. 4, states that a radiation characterization study will be performed at Borrow Area B and any contaminated soil will be removed. Was a radiation characterization of Borrow Area B performed prior to excavating clay for the 2 ft. thick clay cap at the west and northwest slopes of the existing disposal cell? If so, what were the results?

RGR's response:

A radiation characterization study was not performed on the specific area where Borrow Area B is located, prior to excavation of the clay materials. Borrow Area B was opened in the third quarter of 2018 to provide the heavy clay materials for the construction of the radon barrier over the lower west slope of the waste rock pile after those materials were exhausted in Borrow Area A. Borrow Area B was selected as a source of the heavy clay materials based on prior site knowledge and qualified assumptions and judgement. No prior mining activities were conducted in Borrow Area B.

There was some prior gamma survey information conducted in the vicinity of Borrow Area B. Trinitech conducted a soil investigation of the areas west and north of the mine site in 2012 to investigate environmental dispersal of uranium from the Mt Taylor Mine. Sixteen soil samples were collected and analyzed along arroyos that drain the mine property. Gamma dose rates were also taken. This information is contained in Appendix D.2. The conclusions of the report indicated that no discernable dispersal of uranium from the mine property was observed.

Because "Borrow Area B" was not defined in 2012, there were no radiological surveys performed specific to that area. Four soil samples collected and analyzed in 2012 somewhat bound the Borrow Area B location: MTE-12 to the west, MTE-13 and -14 to the south and MTE-6 to the west (Figure labeled "April 23, 2012, Soil Sample Locations", Appendix D.2). Uranium concentrations were below 1 pCi/g except for MTE-13 (1.4 pCi/g). Radium-226 concentrations were below the background of 1.8 pCi/g except for MTE-13 (2.7 pCi/g). All radium-226 values were below the accepted soil cleanup standard (background +5 pCi/g) limit of 6.8 pCi/g. Further gamma dose rates of these four samples were less than the PRRL of 24 urem/hr. These four samples were biased towards drainages, where uranium dispersal from the mine would have been a higher probability.

22. Section 4.4.5, Excavation and Disposal of Contaminated Soil, page 42, para. 4, states that there is an approximately seven-acre area located north of the Marquez arroyo with windblown contaminated soils. Please show this area on a map along with the proposed Borrow Area C. Also, indicate the sampling results used to delineate the windblown contaminated Affected Area.

RGR's response:

The outline of the Windblown Area is shown along with the proposed "Borrow Area C" on the modified Figure 1-2 (see Response No. 22 Attachment). Figure 1-2 was originally included in the 2022 CCP. The attached modified Figure 1-2 shows two boundaries that define the Windblown Area, a large boundary and a smaller one inside. Also shown is a proposed access road for Borrow Area C.

The larger boundary defining the Windblown Area was drawn based on readings from an unshielded gamma detector during a radiological survey performed in 2021. This boundary encloses the gamma readings that were considered to be greater than background in 2021.

The smaller boundary defining the Windblown Area was drawn based on readings from an unshielded gamma detector during a follow up radiological survey performed in 2023. This smaller boundary encloses the gamma readings that were considered to be greater than background in the 2023 survey.

RGR commissioned the 2023 radiological survey because it believed the 2021 survey was unduly influenced by shine attributed to ore on the ore pad. In the 2023 radiological survey, an unshielded gamma meter was used over the large boundary, to verify the results of the 2021 survey (at a tighter transect coverage) and to identify locations for subsequent static scans and vertical profile soil sampling. As a note, the remainder of the ore stockpile was removed from the site by mid-2022.

To summarize the results of the 2023 study for the Windblown Area, 11 of the 12 surface soil samples showed Ra-226 below the 6.8 pCi/g investigation level (IL). The only location above the IL was WBSB-08 at 9.7 pCi/g. Evaluation of the results also show that the majority of contamination in the Windblown area is within the top 1-inch of soil.

The sampling data for the 2023 radiological survey is attached (Response No. 22 Attachment) as well as a map of the surface scan and soil sampling locations. The 2021 radiological survey of the Windblown Area was presented to RGR as a map of readings from the surface scan using an unshielded gamma detector. There was no data associated with the map, other than a legend of the readings. A gamma survey was performed in 2012 and the map with readings is attached (Response No. 22 Attachment) for reference.

23. Section 4.4.5, Excavation and Disposal of Contaminated Soil, page 43, para. 4, states that the Marquez Canyon arroyo and other areas surrounding the mine were sampled for Radium-226 and that background concentrations were found. See comment #22 above. If an area located to the north of Marquez Canyon arroyo was found to have windblown contamination, would the portion of Marquez canyon arroyo located between the mine area and the contaminated area north of the arroyo probably have windblown contamination?

<u>RGR's response:</u>

RGR assumes that Marquez Canyon Arroyo captured some of the windblown contamination and will investigate all of the area between its northern fenced boundary and the windblown area to identify the extent of any impacted areas, including Marquez Arroyo. Any contamination identified will be remediated and the contaminated soil placed in the disposal cell.

24. Section 4.4.6, Existing Waste Rock Pile Stabilization, page 45, para. 2, states that the regraded waste rock pile has a higher structural stability factor of safety (FS) than the original waste rock pile due to the lower height and flatter slopes of the regraded waste rock pile. What is the current structural FS for the regraded waste rock pile and what is the predicted structural FS for the proposed expanded

waste rock pile and disposal cell?

RGR's response:

The factor of safety for the currently constructed waste rock pile has not been calculated, nor has it been calculated for the proposed expansion. RGR will perform those calculations and provide them in a supplemental information packet.

25. **Section 4.4.6, Existing Waste Rock Pile Stabilization, page 45, para. 4, states that a soil cover over the waste rock is not needed to protect the waste rock from infiltration or leaching. However, radiologically contaminated materials other than waste rock such as sediments from the water treatment system ponds have been placed into the disposal cell. The leachability of these materials by infiltration of precipitation may be greater than the mine waste rock and it may be determined that a function of the cover is to restrict infiltration of precipitation.**

RGR's response:

RGR agrees that the function of the disposal cell cover does indeed restrict infiltration of precipitation.

26. **Section 4.4.6, Existing Waste Rock Pile Stabilization, page 45, para. 5, states that a 2.0 ft. thick compacted clay cover overlain by a minimum of 1.0 ft. of loam soil over the WRP and disposal cell will support a vegetative cover. MMD will require at least 2.0 ft. of vegetative cover material over the WRP and disposal cell, except that 18 inches of vegetative cover material may be allowed on certain portions of the west slope of the WRP (proposed in Section 4.5.2, Alternative to the VTPP, page 48). It should be noted where portions of the existing disposal cell are proposed to have less than a 2.0 ft. thick growth media cover.**

RGR's response:

RGR will revise paragraph 5 of section 4.4.6 (pg. 45) to include a sentence that says: "The cover to be constructed over the existing and expanded portions of the disposal cell will have a minimum 2-feet thick layer of compacted clay overlain by a minimum of a 2-ft thick growth-media layer. The only location that will deviate from this cover thickness will be the lower west slope, where 18-inches of growth media will be placed due to geometry restrictions."

27. **Section 4.4.6, Existing Waste Rock Pile Stabilization, page 46, para. 2, states that for purposes of closeout/closure planning and estimating, RGR assumes that all broken concrete generated by demolition meeting radiological standards will be used to apply to the WRP and diversion channels. MMD may require a contingency plan for an alternate source of rip rap materials in the event that the amount of useable demolished concrete is less than RGR estimates. MMD may require additional information on RGR's plan to used broken concrete on the surface of the disposal cell and WRP.**

RGR's response:

RGR acknowledges the comment. Characterization of the crushed concrete along with alternatives, such as basalt or limestone, will be discussed in a materials handling plan, to be approved by MMD, before it is used.

28. **Section 4.5, Revegetation, page 46, states that the SSWP bottom and areas where buildings and roads are retained will not be revegetated. MMD requires an erosion control plan for the PMLU areas that are not revegetated.**

RGR's response:

RGR will provide an updated erosion control plan for the PMLU areas after the CCP review is completed.

29. **Section 4.5, Revegetation, page 47, para. 2, states that RGR may use irrigation water to establish vegetation. Section 507.A of the Mining Act Rules requires re- establishment of a self-sustaining ecosystem following closure unless conflicting with the approved PMLU. A self-sustaining ecosystem as defined by Section 1.7.S.(2) of the Mining Act Rules requires that the reclaimed land is self-renewing without augmented seeding, amendments, or other assistance. Because of this requirement, irrigation of revegetated areas will only be permitted for the first three years after seeding.**

RGR's response:

RGR acknowledges the comment.

30. **Section 4.5.1, Vegetation Test Plot Plan (VTPP), and Section 4.5.2, Alternative to the VTPP, page 48, states that a test plot plan had previously been proposed by RGR but that due to the mine starting reclamation in 2020 and that RGR has committed to placement of a 2.0 ft. thick vegetative cover over the disposal cell clay cap, the need for a test plot program was eliminated. MMD concurs with RGR that the test-plot program will not be needed.**

RGR's response:

RGR acknowledges MMD's comment.

31. **Section 4.5.3, Revegetation Species, page 49, and Table 4.4, Seed Mix. MMD will provide comments on the revegetation species and seed mix in comments on Appendix F, Revegetation and Weed Management.**

RGR's response:

RGR acknowledges MMD's comment.

32. **Section 4.5.4, Other Revegetation Materials, page 50, para 1, states that Alfalfa (Medicago sativa) will be used for mulch if native grass hay is unavailable. In accordance with the MMD Guidance for Revegetation of Part 5 Existing Mines and Part 6 New Mines, December 2022, weed-seed free native grass hay is preferred for use as mulch.**

RGR's response:

RGR acknowledges MMD's comment. RGR will obtain advice from its vegetation expert and consult with MMD on the appropriate choice of hay to be used when the time comes to apply mulch.

33. **Section 4.5.5, Seed-Bed Preparation and Seeding, page 50, states that soil amendments will be applied on a location-specific basis. MMD discourages use of chemical fertilizers on revegetated areas as they may promote growth of weedy species.**

RGR's response:

RGR acknowledges MMD's comment. RGR will obtain advice from its vegetation expert on soil amendments and consult with MMD on the types to be used when revegetation activities begin.

34. **Section 4.5.7, Revegetation Success, pages 51-52, states that a technical standard based on NRCS range site descriptions is being proposed (Table 5.2). MMD will provide comments on the revegetation success in comments on Appendix F, Revegetation and Weed Management.**

RGR's response:

RGR acknowledges MMD's comment.

35. **Section 4.5.8, Management and Contingency Plan, page 52. MMD will provide comments on the management of the revegetated areas in comments on Appendix F, Revegetation and Weed Management.**

RGR's response:

RGR acknowledges MMD's comment.

36. **Section 4.6.1 Erosion Management, Protection of the Waste Rock Pile Surfaces, pages 52-54, states that previous RUSLE calculations for the WRP were performed for the original CCP submittal. The**

assumptions used in the RUSLE analysis included 350 ft. long, 20% slopes among other factors. Although the proposed reclaimed slopes of the expanded disposal cell will be approximately 5H:1V, MMD is concerned that the proposed uninterrupted slope lengths of over 450 feet on the north facing and east facing slopes as shown on Appendix B Drawing Sheet CL 09, CL 10, and CL 11 may require additional erosion protection including possible changes to the expanded disposal cell grading and drainage plan to include an additional terrace bench drain to the slope design. Please address.

RGR's response:

RGR acknowledges MMD's comment. RGR will construct additional terrace/drainage benches, as needed, to limit uninterrupted slope lengths to no more than 350 feet. Additional terrace/drainage benches will be incorporated into the construction design drawings and submitted to MMD for approval prior to construction, after the disposal cell expansion is approved.

37. **Section 4.6.1 Erosion Management, Protection of the Waste Rock Pile Surfaces, page 53, para. 2, states that screened, crushed concrete from the mine site may be used as a riprap layer to protect the lower portions of steeper slopes on the WRP from erosion. MMD believes that the concrete used in this application should be characterized for suitability for use as riprap before use on revegetated areas. This is something that will need to be discussed with more details from the operator.**

RGR's response:

RGR will conduct physical durability tests on the crushed concrete and perform chemical durability tests to assess leachability and leachate chemistry. Characterization of the crushed concrete along with alternatives, such as basalt or limestone, will be discussed in a materials handling plan, to be approved by MMD, before it is used.

38. **Section 4.6.1 Erosion Management, Protection of the Waste Rock Pile Surfaces, page 53, last para., states that basalt may be crushed and used in the case that sufficient suitable crushed concrete is not available for rip rap and that the reclamation cost estimate includes the cost for approx. 1,600 cubic yards of rip rap. The reclamation financial assurance may need to be adjusted based on the actual amount of rip rap needed for reclamation at the mine site.**

RGR's response:

RGR acknowledges MMD's comment and will adjust the cost estimate accordingly.

39. **Section 4.6.2 Erosion Management, Arroyos, pages 54-55 last para., and Appendix B Drawing Sheet CL 12 describes the erosion protection proposed for the south diversion channel. During an inspection by MMD on October 6, 2022, concrete blocks were observed being placed in the south diversion channel to reinforce it from stormwater flows. MMD requests an update to the proposed design of the south diversion channel, if needed, to reflect the placement of the concrete blocks at the south diversion channel.**

RGR's response:

RGR is working with a professional engineer at this time to redesign both the south and north diversion channels. These designs will be engineered to accommodate a 500-yr storm event.

Once the new designs are complete, RGR will submit them for MMD/NMED approval and then initiate construction. The observed concrete blocks are temporary and were placed as a temporary solution to minimize erosion from heavy rains. They will be removed once a design is approved and construction begins.

40. **Section 5.1.1, Ground Water Monitoring, Alluvial and Menefee Ground Water Monitoring, page 57, para. 2, states that the existing and future extraction wells will be connected to the NFM for transferring extracted water to the MWTU Pond #3. Please provide a schedule for this action to take place.**

RGR's response:

The North Force Main (NFM) was completed to MWTU Ponds 2 and 3 during the reactivation construction phase in 2018. Additionally, a pump line was installed from monitoring well WP-5 to the NFM. According to Condition 3 of DP-61 (2015), prior to discharge of water that does not comply with groundwater standards into pipelines, a mechanical integrity test shall be conducted per API 1110 and certified by a licensed New Mexico Professional Engineer. In 2020, after the MWTU Pond 3 upgrades were completed, a mechanical integrity test was performed on the NFM. Similarly in 2021, a mechanical integrity test was completed for the WP-5 pump line. Both lines passed the testing and a letter was sent to NMED regarding these tests. The lines were never put into operation because RGR was unsure if they required approval before being put into use.

At this time, the lines are still intact. An additional line remains to be run from the "WL" wells to the NFM, and the NFM vault requires a liner. Because the WP-5 pump line and NFM line have been idle for more than 180 days, they will have to be re-certified. With the onset of winter and freezing temperatures, integrity testing cannot be performed. RGR anticipates making the NFM and pump lines operational by June 2024.

41. **Section 5.5, Erosion Control and Monitoring, page 60-61, states that RGR will initiate and continue erosion monitoring after reclamation earthwork has been completed through the succeeding 12-year period. MMD Revision 22-1 will have specific erosion monitoring requirements and may require RGR to submit a post- closeout erosion monitoring plan for MMD review. MMD will also require an erosion mitigation plan for post-closeout erosion.**

RGR's response:

RGR acknowledges MMD's comment and will provide MMD with those plans after the disposal cell expansion is approved.

42. Section 5.6, Vegetation Monitoring, page 61, states that monitoring of revegetated areas will be conducted in accordance with the Revegetation and Weed Management Plan (Appendix F). MMD Revision 22-1 MMD will have specific vegetation monitoring requirements in addition to those provided in the RGR Updated CCP.

RGR's response:

RGR acknowledges MMD's comment.

43. Section 6, Closeout/Closure Schedule, page 62 and Figure 6-1. RGR states that the closeout/closure activities are estimated to take approximately 26 months. If practicable, please update the Closeout/Closure Schedule to account for closeout activities already completed or are currently in progress in 2023. Is the Closeout/Closure Schedule provided intended to start before or after the Updated CCP is approved by MMD?

RGR's response:

The primary change for 2023 will be the demolition of the Production Shaft headframe. RGR has been working on sorting the debris for possible release. An updated schedule will be provided in a supplemental information package.

The Closeout schedule is intended to start after the updated CCP and new permits are approved by MMD and NMED.

44. Section 7, Cost Estimate, page 62, para 1, cites several documents used in developing the Updated CCP cost Estimate (CE). MMD has updated its Guidance for Calculating Net Present Value of Reclamation Costs in November 2020. MMD also has a Guidance for Calculating Capital Indirect Costs for Mine Reclamation and Closure Cost Estimates dated June 2019. Both guidance's may be found on the MMD website at: https://www.emnrd.nm.gov/mmd/mining- act-reclamation-program/guidelines/. MMD recommends RGR review these guidance's and revise the CE as necessary.

RGR's response:

RGR acknowledges MMD's comment and agrees to review the guidance documents and revise the cost estimate after technical review of the CCP is completed.

45. Section 7, Cost Estimate, pages 62-63. MMD will require RGR to submit a final CE as part of a financial assurance proposal when MMD deems the Updated CCP technically approvable pursuant to 19.10.5.506.G NMAC.

RGR's response:

RGR acknowledges MMD's comment.

46. Section 7, Cost Estimate, pages 62-63. Since the FA for the closeout/closure plan is jointly held by MMD and NMED, NMED may have additional comments on the CE that will be included in the comments provided to MMD on the Updated CCP and NMED's separate comments on the application for renewal and modification of the DP-61.

RGR's response:

RGR acknowledges MMD's comment.

47. Section 7, Cost Estimate, Appendix E. MMD will provide comments on Appendix E separately later in this comment letter.

RGR's response:

RGR acknowledges MMD's comment.

48. Table 4.2, Mine Facility Disposition at Closeout. See MMD Comment #3 above.

RGR's response:

RGR acknowledges MMD's comment. Please refer to RGR's response to Comment #3.

49. Table 4.3, Earthwork Balance, Excavation – Contaminated Soil, lists Area C north of Marquez Arroyo (Including hotspots identified by EGR survey). Excavation -Clean Soils, lists Borrow Area A and C North of Marquez arroyo. Please show Area C and Borrow Area C on a map or drawing.

RGR's response:

"Area C" and "Borrow Area C" are one and the same. Please see the modified Figure 1-2 provided in Response No. 22 Attachment.

50. Please correct Table 4.4 to make it consistent with Table F.1. In addition, MMD will not accept broom snakeweed in the seed mix. Please substitute a difference native, non-invasive, shrub in its place in the seed mix.

RGR's response:

RGR's vegetation consultant has recommended Sanfoin as an alternative to Broom Snakeweed. Please refer to the revised attached seed mix tables (Response No. 50 Attachment).

51. **Appendix B Drawing Sheet CL 09, CL 10, and CL 11. See MMD Comment #36 above. Although the proposed reclaimed slopes of the expanded disposal cell will be approximately 5H:1V, MMD is concerned that the proposed uninterrupted slope lengths of over 450 feet on the north facing and east facing slopes may require additional erosion protection including possible changes to the expanded disposal cell grading and drainage plan to include an additional terrace bench drain to the slope design. Also, see MMD Comment #36 above.**

<u>RGR's response:</u>

Please see RGR's response to comment #36 above.

52. **Figure 6-1, Mt. Taylor Mine Closeout/Closure Plan Schedule. See MMD Comment #43 above.**

<u>RGR's response:</u>

Please see RGR's response to comment #43 above.

53. **Appendix B, Engineering Analyses, B. Hydrologic and Erosion Analyses, Slope Stability (SB-Slope) Analyses, 100-Year Storm Runoff and Resulting Peak Shear Stresses on Waste Rock Piles. The Allowable Shear Stress (psf) for a design simple slope of 80 ft. length and 0.33 gradient (3H:1V) is 0.02 psf. The calculated Shear Stress for this slope is 0.10 psf, exceeding the Allowable Shear Stress. Although the proposed expanded disposal cell slopes have a 5H:1V slope gradient, the uninterrupted slope lengths are approximately 450 long in some places. MMD requests that slope stability analyses be performed using the proposed expanded disposal cell slope dimensions. See MMD Comments #36 and 51 above.**

<u>RGR's response:</u>

RGR will perform the Slope Stability (SB-Slope) analysis and the "100-Year Storm Runoff and Resulting Peak Shear Stresses" for the proposed expanded disposal cell slope dimensions and will provide the results to MMD in a supplemental information package.

Please see RGR's response to comments #36 and #51 above. Once the final size of the disposal cell is determined, RGR will construct additional drainage benches to limit the uninterrupted slope length(s) to 350 feet maximum.

54. **Appendix C, Technical Specifications. MMD will initially require a Construction Quality Assurance Plan (CQAP) followed by a Construction Quality Assurance Report (CQAR) including a summary of work conducted, as-built drawings, photos, and demonstrate that the final design specifications**

were achieved.

RGR's response:

RGR acknowledges MMD's comment and will provide the requested CQAP's and CQAR's.

55. **Appendix C, Technical Specifications, Section C.1, Shaft Headframe and Collar Equipment Demolition, Subsection 2.2.4, Disposal and Salvage, states that some demolished materials may be placed down the shaft. See MMD Comment #9 above.**

RGR's response:

Please see RGR's response to comment #9 above.

56. **Appendix C, Technical Specifications, Section C.2, subsection 2.3, Treated Water Discharge Pipeline. See MMD Comment #7 above.**

RGR's response:

Please see RGR's response to comment #7 above.

57. **Appendix C, Technical Specifications, Table C.2.1, Facilities to be Removed. Please update, as needed, during the MMD technical review period prior to MMD deeming the Updated CCP technically approvable.**

RGR's response:

RGR will update Table C.2.1, as the facilities are removed, during the technical review period.

58. **Appendix C, Technical Specifications, Section C.3, Shaft Plugging and Backfill, page 1, states that non-rigid scrap materials from surface demolition may be disposed of in the shafts. See MMD Comments #9 and #55 above.**

RGR's response:

Please see RGR's response to comments #9 and #55 above.

59. **Appendix C, Technical Specifications, Section C.3, Shaft Plugging and Backfill, pages 1-2, refers to drawing CL 01, CL 05, and CL 06 in Appendix G. Reinforce Concrete Shaft Slab Closure Designs. See MMD Comment #5 above.**

RGR's response:

Please see RGR's response to comment #5 above.

60. **Appendix C, Technical Specifications, Section C.3, Shaft Plugging and Backfill, Section 2, Site Construction, subsection 2.2, Debris Disposal, pages 6-7. See MMD Comments #9, #55, and #58 above.**

RGR's response:

Please see RGR's response to comments #9, #55 and #58 above.

61. **Appendix C, Technical Specifications, Section C.3, Shaft Plugging and Backfill, subsection 2.3, Shaft Plug Construction. See MMD Comments #9, #55, and #58 above.**

RGR's response:

Please see RGR's response to comments #9, #55 and #58 above.

62. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.4, Construction of Soil Cover, page 8, para. 2, states that additional clean soil for use in cover construction may be obtained from other locations on the mine site. Prior to RGR obtaining addition soil cover material the proposed borrow area soil must be sampled and analyzed for chemical and physical characteristics and approved for use as cover material by MMD.**

RGR's response:

RGR acknowledges MMD's comment and will submit physical and chemical soil characteristics for any proposed new borrow areas, for MMD's approval before use.

63. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.5, Reshaping of Rock Walls and Slopes, page 8-9. Vertical slopes steeper than 1H:1V in competent bedrock or competent vadose zone may be left on a site-specific basis with MMD approval.**

RGR's response:

RGR acknowledges MMD's comment and will seek MMD approval for these slopes, on a site-specific basis.

64. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.6, Finish Grading, page 10, para 1. MMD recommends final slope grades that have a concave profile versus a convex profile to reduce erosion "nick points" from occurring.**

RGR's response:

RGR acknowledges MMD's comment and will attempt to construct concave sections within the slope at "nick-points", where practical or relevant. However, RGR wishes to avoid "ponding or accumulation of precipitation.

65. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.7.1, General Site Drainage, page 10 states that the primary means of controlling erosion by runoff will be grading. MMD believes that an integrated approach to prevent erosion includes re-vegetation and proper drainage designs including geomorphic designs is critical in erosion prevention of reclaimed areas.**

RGR's response:

RGR acknowledges MMD's comment and will include re-vegetation and drainage planning along with grading.

66. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.7.3, Crusher Fines, page 11, states that a 0.5 ft. thick layer of [concrete] crusher fines may be applied to certain areas of the WRP where revegetation may be inadequate to control erosion. MMD will consider proposals for using rip rap for erosion prevention and mitigation of revegetated areas on a case-by-case basis and considering site-specific conditions.**

RGR's response:

RGR acknowledges MMD's comment and will propose rip-rap uses for erosion mitigation on a site-specific basis, where needed.

67. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.7.4, Riprap, pages 11-12, states that rip rap will be placed in the South Diversion Channel for armoring the channel. MMD recommends that the rip rap be placed after geotextile and rip rap bedding material is placed and that the rip rap is of various sizes to enable it to be placed and compacted to reduce void spaces.**

RGR's response:

RGR acknowledges MMD's recommendation. RGR has engaged a licensed civil engineer, with expertise in floodplain and channel construction, to redesign the south diversion ditch. RGR will defer to the licensed engineer on the appropriate use of rip-rap.

68. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.7.5, Erosion Control Blanket, page 12, describes the placement of temporary erosion control blankets in certain circumstances for erosion protection on slopes. MMD recommends placing erosion blankets only for temporary erosion protection of slopes that have not been seeded and mulched.**

RGR's response:

RGR acknowledges MMD's comment. To date, RGR has used erosion control blankets for temporary slope protection as it awaits MMD approval for final vegetation and cover plans.

69. **Appendix C, Section C.4, Earthwork, Section 2, Site Construction, subsection 2.3, Seed-Bed Preparation and Seeding, page 7. MMD recommends seed application by drill-seeder followed by mulch application and crimping on surfaces that will allow the drill seeder to operate safely.**

RGR's response:

RGR acknowledges MMD's recommendation. Under the direction of its vegetation consultant, RGR will emphasize the utilization of a drill seeder, mulching and crimping techniques, where safe to do.

70. **Appendix C, Section C.5, Revegetation, Section 2, Site Construction, subsection 2.6, Mulching, page 9, states that Alfalfa (Medicago sativa) may be used as mulch if native grass mulch is unavailable. See MMD Comment #32 above.**

RGR's response:

Please see RGR's response to comment #32 above.

71. **Appendix C, Section C.5, Revegetation, Section 2, Site Construction, subsection 2.8, Monitoring, pages 9-10, state that annual survey of the revegetated areas will be performed. MMD will require that vegetation monitoring be in accordance with a MMD approved plan.**

RGR's response:

RGR acknowledges MMD's comment, vegetation monitoring will be performed in accordance with an approved plan.

72. **Appendix E, Closeout/Closure Cost Estimate, Section 1.1, Shaft Closures, page 1. Changes to this portion of the cost estimate may be required based on revisions to the shaft closures. See MMD Comment #5 above.**

RGR's response:

RGR acknowledges MMD's comment. Once conceptual plans for shaft closure are approved, RGR will then update the cost estimate accordingly. Please see responses to Comment #5 above.

73. **Appendix E, Closeout/Closure Cost Estimate, Section 1.3, Surface Facilities Demolition, pages 1-3. RGR has not included the demolition costs for facilities that have been demolished. MMD may allow a partial reduction in the cost estimate for facilities already demolished, while retaining a portion of the cost for final grading erosion control, revegetation and monitoring in the cost estimate.**

RGR's response:

RGR acknowledges MMD's comment. In this section, RGR has only reduced the cost line items for work completed. Costs for revegetation, final grading, erosion control and monitoring are included in sections 1.4, 1.5 and 1.6, based on the areal extent of disturbance.

74. **Appendix E, Closeout/Closure Cost Estimate, Section 1.4.4, Waste Pile/Disposal Cell Buildout Stabilization, page 4. MMD has provided comments on the proposed expanded disposal cell drainage (see Comments #36, and #51 above). If additional grading and stormwater terrace drains are required, the costs will need to be included in this section of the cost estimate.**

RGR's response:

RGR acknowledges MMD's comment. If it is found that additional grading and terrace drains are needed after performing slope stability calculations on the proposed disposal cell, RGR will include those costs in the next revision of the cost estimate, after the CCP is deemed technically approvable.

75. **Appendix E, Closeout/Closure Cost Estimate, Section 1.4.4, Waste Pile/Disposal Cell Buildout Stabilization, page 4. This portion of the cost estimate includes excavation of up to 87,120 cu. yds of cover soils from borrow areas. If Borrow Area C is utilized, additional costs for reclaiming the access route to Borrow Area C, excavation of borrow soils and reclamation of the borrow area should be included.**

RGR's response:

RGR acknowledges MMD's comment, and will include those costs if Borrow Area is anticipated to be utilized.

76. **Appendix E, Closeout/Closure Cost Estimate, Indirect Reclamation Costs (IRC). IRC totaled 37.5%. A previous cost estimate proposed by RGR for expansion of the disposal cell under MMD Modification 20-1 (3/25/2021) used a total IRC of 49.5%. Below is a comparison of IRC used for**

Mod. 20-1 and for Rev. 22-1:

	Modification 20-1 Cost Estimate	Revision 22-1 Cost Estimate
Mob. and Demob.	77. 4%	78. 3%
Contingencies	79. 15%	80. 10%
Engineering Redesign	81. 3%	82. 3%
Contractor Profit & Overhead	83. 15%	84. 10%
Contract Mgmt. Fee	85. 3%	86. 3%
MMD Procurement	87. 3%	88. 2%
Contractor Admin.	89. 2%	90. 2%
Perf. & Payment Bonds	91. 3%	92. 3%
Liability Insurance	93. 1.5%	94. 1.5%
Total IRC	95. 49.5%	96. 37.5%

Please explain the different IRC's used for Revision 22-1 versus Mod. 20-1.

The MMD Guidance for Calculating Capital Indirect Costs for Mine Reclamation and Closure Cost Estimates (June 2019) may be found at:

https://www.emnrd.nm.gov/mmd/wp- content/uploads/sites/5/June2019CapitalandO-MIndirectCosts_Guidance- Updated.pdf

RGR's response:

In the 20-1 Modification, RGR used the percentage values in the MMD guidance. In the 22-1 CCP cost estimate, RGR mostly followed the guidance, but proposed changes to a few specific line items:

- Mobilization/demobilization,
- Contingencies,
- Contractor Profit and Overhead and
- MMD procurement).

Based on RGR's recent experience, contractors did not account for mobilization/ demobilization separately in their bids, but included those costs in a lump-sum price. Thus, RGR reduced the guidance percentage by 1%.

Based on recent experiences at Mt Taylor, RGR's management proposed a 1% reduction of the guidance percentage for "MMD Procurement" because contractors often directly procure materials, supplies and services. Those contractor costs were found to be incorporated directly in the lump-sum bids, not as a separate line-item cost.

As for the contingency percentage listed in the guidance, RGR's management believed it was conservative and proposed a percentage reduction of 5%. RGR believes that project risks are lower than assumed in the guidance, given the level of planning and regulatory approvals.

With regard to contractor's overhead and profit listed in the guidance, RGR's management believed that 15% was conservative, given that Federal, State and many industry contracts often limit contractor profit to 10%. RGR's management proposed a 5% reduction to the contractor overhead and profit percentage listed in the guidance.

In the conclusions of the "guidance for Calculating Capital Indirect Costs for Mine Reclamation and Closure Cost Estimate", it states that "Based on the available data, the minimum indirect average cost is 33.5%, and the maximum is 62.3%. It further states that "…MMD establishes 34% plus 1.5% of the estimated labor costs as the minimum indirect cost for reclamation construction projects, which is reasonable and justifiable based on the data."

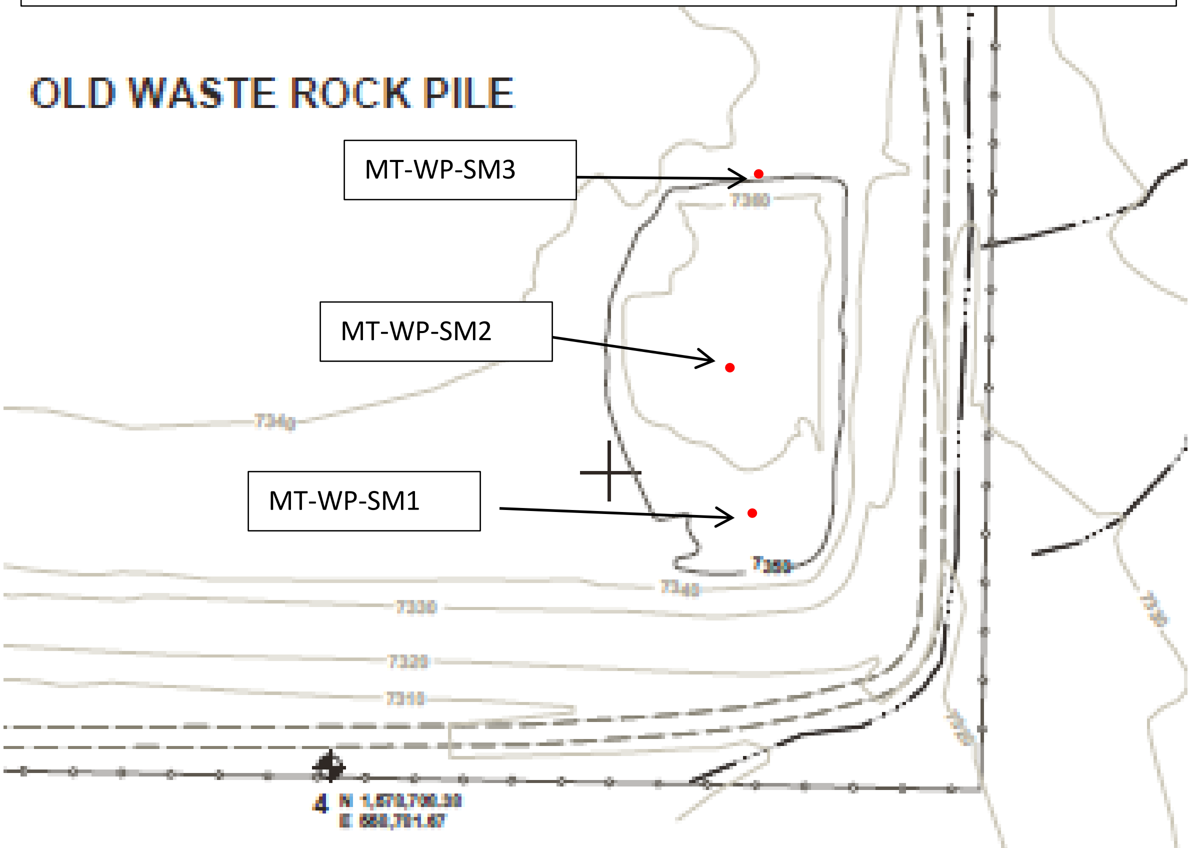
RGR desires to discuss the proposed percentage reductions with MMD during the technical review period.

Response No. 1 Attachment

Shaft Muck Criteria

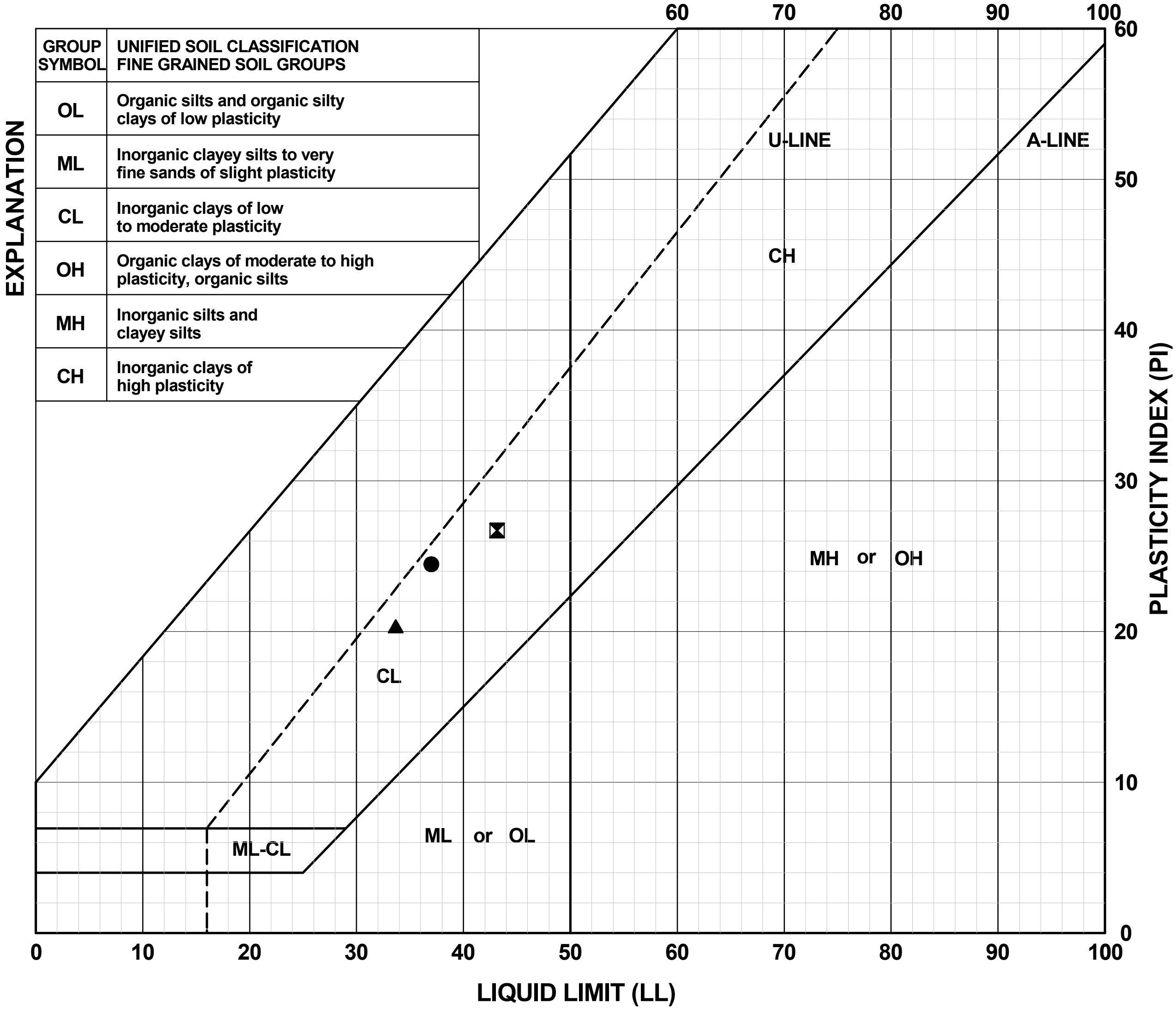
(Appendix D)

MT TAYLOR MINE SHAFT MUCK SAMPLE LOCATIONS – 5/18/2010



Bulk samples of shaft muck from Mt. Taylor Mine waste rock pile collected on 5/18/2012 by Alan Kuhn. Locations are approximate (+/- 50 ft) based on visual reference to slopes. Splits delivered 5/18/12 to Kleinfelder Albuquerque for grain size analysis and plasticity tests. Other splits left with RGR Mine office for shipment to Energy Labs for testing of U and Ra concentration.

ASTM D4318



	Specimen Identification		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
●	MT-WP-SM1	0.0	37	13	24
⧗	MT-WP-SM2	0.0	43	16	27
▲	MT-WP-SM3	0.0	34	13	21

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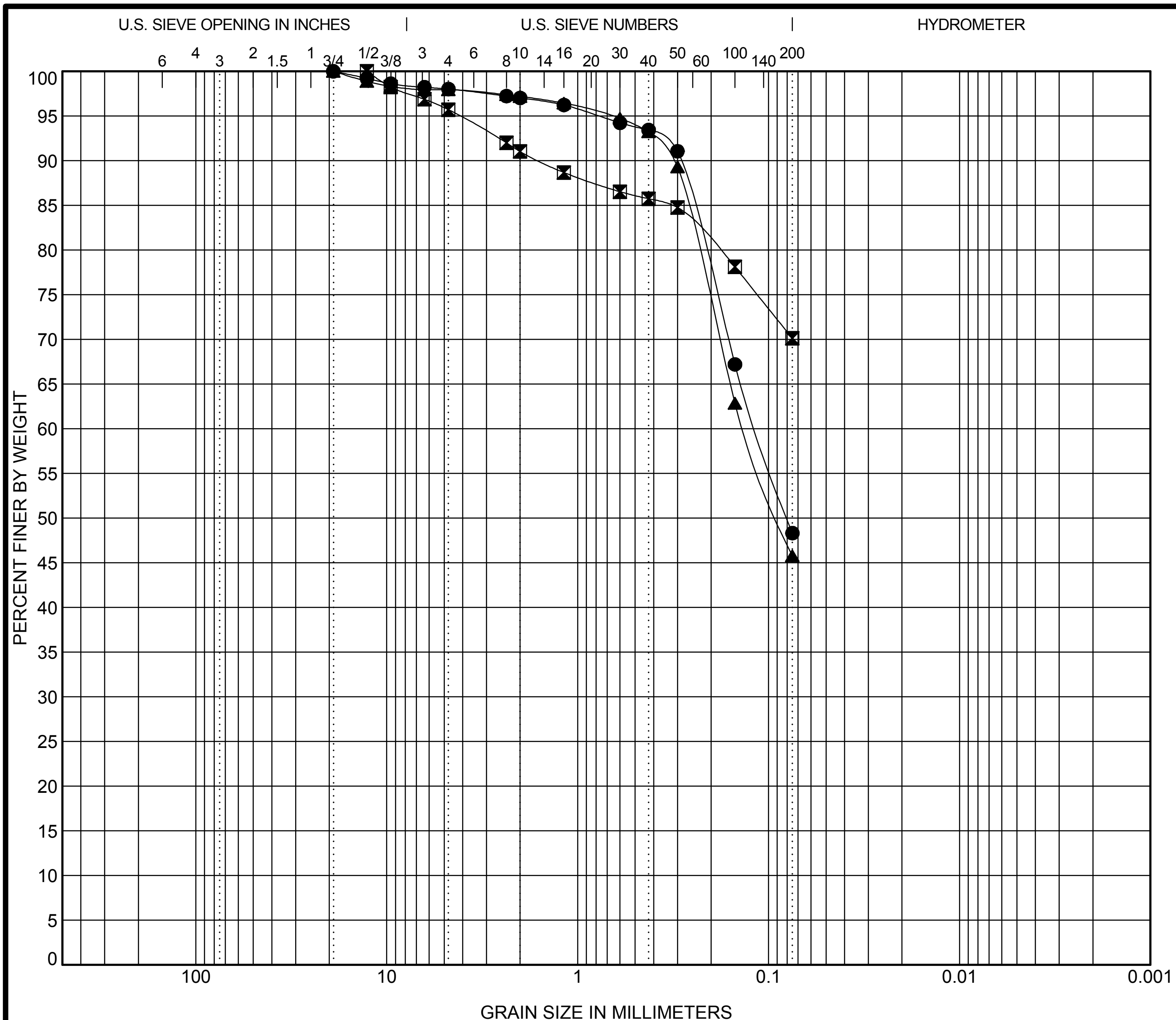
9019 Washington NE, Building A
Albuquerque, NM 87113

ATTERBERG LIMITS

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	MT-WP-SM1	0.0	19.05	0.115			2.0	49.7	48.3	
⧗	MT-WP-SM2	0.0	12.7				4.3	25.6	70.1	
▲	MT-WP-SM3	0.0	19.05	0.134			2.1	52.2	45.8	

ASTM D1140 ASTM C136

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GRAIN SIZE DISTRIBUTION

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450

SUMMARY OF LABORATORY ANALYSIS

Project: **Mount Taylor Mine: Settling Pond Evaluations** Location: **San Mateo, New Mexico**

Project Number: **96450**

Boring Number	Depth (ft.)	Soil Classification		Atterberg Limits		Sieve Analysis - Accumulative % Passing														Moisture Content (%)	Dry Density (pcf)	Unconfined Comp. Strength (psi)
		USCS	AASHTO	PI	LL	No. 200	No. 100	No. 50	No. 40	No. 30	No. 16	No. 10	No. 8	No. 4	3/8 in	1/2 in	3/4 in	1 in	1 1/2 in			
MT-WP-SM1	0.0 -	SC	A-6	24	37	48	67	91	93	94	96	97	97	98	99	99	100	--	--	5.9	--	--
MT-WP-SM2	0.0 -	CL	A-7-6	27	43	70	78	85	86	87	89	91	92	96	98	100	--	--	--	10.9	--	--
MT-WP-SM3	0.0 -	SC	A-6	21	34	46	63	89	93	95	96	97	97	98	98	99	100	--	--	3.0	--	--

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ANALYTICAL SUMMARY REPORT

July 05, 2012

Rio Grande Resources Corporation
PO Box 1150
Grants, NM 87020

Workorder No.: C12050924

Project Name: Mt. Taylor Mine

Energy Laboratories, Inc. Casper WY received the following 3 samples for Rio Grande Resources Corporation on 5/24/2012 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
C12050924-001	MT-WP-SM1	05/18/12 9:30	05/24/12	Soil	Digestion For RadioChemistry Radium 226 Uranium, Isotopic
C12050924-002	MT-WP-SM2	05/18/12 9:40	05/24/12	Soil	Same As Above
C12050924-003	MT-WP-SM3	05/18/12 10:00	05/24/12	Soil	Same As Above

The results as reported relate only to the item(s) submitted for testing. The analyses presented in this report were performed at Energy Laboratories, Inc., 2393 Salt Creek Hwy., Casper, WY 82601, unless otherwise noted. Radiochemistry analyses were performed at Energy Laboratories, Inc., 2325 Kerzell Lane, Casper, WY 82601, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

If you have any questions regarding these test results, please call.

Report Approved By:

Stephanie D Waldrop
Reporting Supervisor

Digitally signed by
Stephanie Waldrop
Date: 2012.07.05 16:09:59 -06:00

CLIENT: Rio Grande Resources Corporation
Project: Mt. Taylor Mine
Sample Delivery Group: C12050924

Report Date: 07/05/12

CASE NARRATIVE

ORIGINAL SAMPLE SUBMITTAL(S)
All original sample submittals have been returned with the data package.

SAMPLE TEMPERATURE COMPLIANCE: 4℃ (±2℃)
Temperature of samples received may not be considered properly preserved by accepted standards. Samples that are hand delivered immediately after collection shall be considered acceptable if there is evidence that the chilling process has begun.

GROSS ALPHA ANALYSIS
Method 900.0 for gross alpha and gross beta is intended as a drinking water method for low TDS waters. Data provided by this method for non potable waters should be viewed as inconsistent.

RADON IN AIR ANALYSIS
The desired exposure time is 48 hours (2 days). The time delay in returning the canister to the laboratory for processing should be as short as possible to avoid excessive decay. Maximum recommended delay between end of exposure to beginning of counting should not exceed 8 days.

SOIL/SOLID SAMPLES
All samples reported on an as received basis unless otherwise indicated.

ATRAZINE, SIMAZINE AND PCB ANALYSIS
Data for PCBs, Atrazine and Simazine are reported from EPA 525.2. PCB data reported by ELI reflects the results for seven individual Aroclors. When the results for all seven are ND (not detected), the sample meets EPA compliance criteria for PCB monitoring.

SUBCONTRACTING ANALYSIS
Subcontracting of sample analyses to an outside laboratory may be required. If so, ENERGY LABORATORIES will utilize its branch laboratories or qualified contract laboratories for this service. Any such laboratories will be indicated within the Laboratory Analytical Report.

BRANCH LABORATORY LOCATIONS
eli-b - Energy Laboratories, Inc. - Billings, MT
eli-g - Energy Laboratories, Inc. - Gillette, WY
eli-h - Energy Laboratories, Inc. - Helena, MT
eli-r - Energy Laboratories, Inc. - Rapid City, SD
eli-t - Energy Laboratories, Inc. - College Station, TX

CERTIFICATIONS:
USEPA: WY00002, Radiochemical WY00937; FL-DOH NELAC: E87641, Radiochemical E871017; California: 02118CA; Oregon: WY200001, Radiochemical WY200002; Utah: WY00002; Virginia: 00057; Washington: C836

ISO 17025 DISCLAIMER:
The results of this Analytical Report relate only to the items submitted for analysis.

ENERGY LABORATORIES, INC. - CASPER,WY certifies that certain method selections contained in this report meet requirements as set forth by the above accrediting authorities. Some results requested by the client may not be covered under these certifications. All analysis data to be submitted for regulatory enforcement should be certified in the sample state of origin. Please verify ELI's certification coverage by visiting www.energylab.com

ELI appreciates the opportunity to provide you with this analytical service. For additional information and services visit our web page www.energylab.com.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Rio Grande Resources Corporation
Project: Mt. Taylor Mine
Lab ID: C12050924-001
Client Sample ID: MT-WP-SM1

Report Date: 07/05/12
Collection Date: 05/18/12 09:30
DateReceived: 05/24/12
Matrix: Soil

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES							
Radium 226	0.7	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 precision (±)	0.08	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 MDC	0.04	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Uranium 234	0.6	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235	0.03	pCi/g-dry	U			E908.0	06/18/12 08:39 / dmf
Uranium 235 precision (±)	0.09	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238	0.6	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 precision (±)	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client:	Rio Grande Resources Corporation	**Report Date:**	07/05/12
Project:	Mt. Taylor Mine	**Collection Date:**	05/18/12 09:40
Lab ID:	C12050924-002	**DateReceived:**	05/24/12
Client Sample ID:	MT-WP-SM2	**Matrix:**	Soil

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES							
Radium 226	0.7	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 precision (±)	0.08	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 MDC	0.03	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Uranium 234	0.8	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235	0.1	pCi/g-dry	U			E908.0	06/18/12 08:39 / dmf
Uranium 235 precision (±)	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238	0.4	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 precision (±)	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client:	Rio Grande Resources Corporation	**Report Date:**	07/05/12
Project:	Mt. Taylor Mine	**Collection Date:**	05/18/12 10:00
Lab ID:	C12050924-003	**DateReceived:**	05/24/12
Client Sample ID:	MT-WP-SM3	**Matrix:**	Soil

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES							
Radium 226	1.1	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 precision (±)	0.09	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 MDC	0.03	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Uranium 234	1.1	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235	-0.02	pCi/g-dry	U			E908.0	06/18/12 08:39 / dmf
Uranium 235 precision (±)	0.09	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238	0.9	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Rio Grande Resources Corporation **Report Date:** 07/05/12

Project: Mt. Taylor Mine **Work Order:** C12050924

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0										Batch: R161002
Sample ID: LCS-33822		Laboratory Control Sample				Run: BERTHOLD 770-1_120612A				06/20/12 01:37
Radium 226		0.29	pCi/g-dry		60	70	130			S
- LCS response is outside of the acceptance range for this analysis. Since the MB, MS, and MSD are acceptable the batch is approved.										
Sample ID: MB-33822	3	Method Blank				Run: BERTHOLD 770-1_120612A				06/20/12 01:37
Radium 226		-0.003	pCi/g-dry							U
Radium 226 precision (±)		0.003	pCi/g-dry							
Radium 226 MDC		0.006	pCi/g-dry							
Sample ID: C12050924-003AMS		Sample Matrix Spike				Run: BERTHOLD 770-1_120612A				06/20/12 01:37
Radium 226		4.6	pCi/g-dry		72	70	130			
Sample ID: C12050924-003AMSD		Sample Matrix Spike Duplicate				Run: BERTHOLD 770-1_120612A				06/20/12 01:37
Radium 226		4.5	pCi/g-dry		71	70	130	2.5	23.8	

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

U - Not detected at minimum detectable concentration

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.

QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Rio Grande Resources Corporation **Report Date:** 07/05/12

Project: Mt. Taylor Mine **Work Order:** C12050924

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E908.0										Batch: R160930
Sample ID: C12050924-003AMS	2	Sample Matrix Spike				Run: EGG-ORTEC_120614A				06/18/12 08:39
Uranium 234		52.2	pCi/g-dry		115	70	130			
Uranium 238		53.1	pCi/g-dry		115	70	130			
Sample ID: C12050924-003AMSD	2	Sample Matrix Spike Duplicate				Run: EGG-ORTEC_120614A				06/18/12 08:39
Uranium 234		51.9	pCi/g-dry		110	70	130	0.6	28	
Uranium 238		54.9	pCi/g-dry		114	70	130	3.3	27.8	
Sample ID: LCS-33822	2	Laboratory Control Sample				Run: EGG-ORTEC_120614A				06/18/12 08:39
Uranium 234		2.52	pCi/g-dry		108	80	120			
Uranium 238		2.59	pCi/g-dry		109	80	120			
Sample ID: MB-33822	9	Method Blank				Run: EGG-ORTEC_120614A				06/18/12 08:39
Uranium 234		0.01	pCi/g-dry							U
Uranium 234 precision (±)		0.02	pCi/g-dry							
Uranium 234 MDC		0.03	pCi/g-dry							
Uranium 235		0.0009	pCi/g-dry							U
Uranium 235 precision (±)		0.01	pCi/g-dry							
Uranium 235 MDC		0.03	pCi/g-dry							
Uranium 238		0.007	pCi/g-dry							U
Uranium 238 precision (±)		0.01	pCi/g-dry							
Uranium 238 MDC		0.03	pCi/g-dry							

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

MDC - Minimum detectable concentration

U - Not detected at minimum detectable concentration

Standard Reporting Procedures

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Workorder Receipt Checklist

Rio Grande Resources Corporation — C12050924

Login completed by: Brian H. Cody
Date Received: 5/24/2012
Reviewed by: BL2000\kschroeder
Received by: kg
Reviewed Date: 5/25/2012
Carrier name: Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Container/Temp Blank temperature:	22.3℃		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

ENERGY LABORATORIES

PLEASE PRINT- Provide as much information as possible.

Page 1 of 2

Company Name: Rio Grande Resources Corporation - NM #C11115	Project Name, PWS, Permit, Etc. MT. TAYLOR MINE	Sample Origin State: NM	EPA/State Compliance: Yes ☑ No ☐
Report Mail Address: PO Box 1150 Grants, New Mexico 87020	Contact Name: Joe Lister - Mine Manage Phone/Fax: (505)287-7971	Email: joe.lister@riograndereso	Sampler: (Please Print) Joel Lister/AK
Invoice Address: Rio grande Resources Corporation PO Box 1150 Grants, new Mexico 87020	Invoice Contact & Phone: Joe Lister - Mine Managr	Purchase Order:	Quote/Bottle Order: Soil Samples

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

- ☐ DW
- ☐ GSA
- ☐ POTW/WWTP
- ☐ State: ______
- ☐ Other: ______
- ☐ A2LA
- ☐ EDD/EDT(Electronic Data) Format: ______
- ☐ LEVEL IV
- ☐ NELAC

Number of Containers
Sample Type: A W S V B O
Air Water Soils/Solids
Vegetation Bioassay Other

ANALYSIS REQUESTED

SEE ATTACHED

Normal Turnaround (TAT)

R U S H — Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: ups - 6
Cooler ID(s): B01
Receipt Temp 22.3 °C
On Ice: Yes No
Custody Seal Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Isotopic Uranium	Radium 226
1	MT - WP - SM1	05/18/12	09:30	soil	X	X
2	MT - WP - SM2	05/18/12	09:40	soil	X	X
3	MT - WP - SM3	05/18/12	10:00	soil	X	X
4						
5						
6						
7						
8						
9						
10						

LABORATORY USE ONLY

C12050924

Custody Record MUST be Signed

Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Joe Lister	05/22/12 09:19	Joe Lister			
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Sample Disposal: Return to Client:		Lab Disposal: XXXXX	Received by Laboratory:	Date/Time: 5-24-12 9:15	Signature: Kcs6:55

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

Response No. 3 Attachment

Table 4.2 (Revised)

Table 4.2 Mine Facility Disposition at Closeout

Facility Name	Facility Type	Dimensions	Disposition at Closeout Status as of April 2022		
			Remove Structure	Foundation	Retain for PMLU
Compressor Building	Steel frame and siding	40'4" X 40'2"x 16'	Removed (12/21)	Rubblized, to be removed	
York Chiller (Chill Water) Building	Steel frame and siding	100' X 50' X 30'	Removed (4/21)	Rubblize and Cover with Soil	temporary
Chiller Electrical Room	Steel frame and siding	30' x 20' x 30'	Removed (4/21)	Rubblized, to be removed	temporary
Pump Building (Chill Water Pump House)	Steel frame and siding	40' X 24' X 16'	Removed (12/21)	Rubblize and Cover with Soil	
Chlorine Building	Concrete Block	23' X 50'6" X 20'	Removed (8/21)	Rubblized, Cover with Soil	
Shaft Heating Building	Steel frame and siding	50' X 30' X J 6'	Removed (12/21)	Cover with Soil (Retain as part of Shaft Plug)	
Glycol Heat Exchanger	Steel frame and siding	50 X 30 X 16	Removed (10/20)	Retain for Storage	√
Cooling Tower	Steel frame and siding	75 X 25 X 25	Removed (12/21)	Rubblized, to be removed	
Hoist House	Steel frame and siding	162' X 120' X 40'			√
Guard House (Security Building)	Steel frame and siding	63' X 20'6" X 16'			√
Fire Equipment Building (Fire House)	Steel frame and siding	27' X 24' X 16'	Removed (3/21)	Retain for Storage	√
Service Building (Office and Warehouse)	Steel frame and siding	194' X 138' X 24'			√
Car (Maintenance) Shop	Steel frame and siding	150' X 100' X 30'	To Be Removed	Rubblize and Cover with Soil	
Carpenter Shop	Steel frame and siding	45' X 24' X 16'	Removed (10/20)	Rubblized and removed	
Electrical Building	Steel frame and siding	62' X 30' X 16'			√
Water Treatment and Boiler Building	Steel frame and siding	62' X 50' X 16'	Removed (9/20)	Rubblized and removed	
Core Storage Building	Steel frame and siding	100' X 38' X 16'	To Be Removed	Rubblize and Cover with Soil	
Fan Shop	Steel frame and siding	40' X 30' X 12'	To Be Removed	Rubblize and Cover with Soil	
Storage Buildings	Steel frame and siding	28' X 30' X 16'	Removed (12/21)	Retain for Hoist House area storage	√
Flocculant Treatment Facility	Steel frame and siding	30' X 23' X 12'	Removed (3/21)	Rubblized, to be removed	

Table 4.2 Mine Facility Disposition at Closeout

Facility Name	Facility Type	Dimensions	Disposition at Closeout Status as of April 2022		
			Remove Structure	Foundation	Retain for PMLU
Continued, page 2 of 3					
Barium Chloride Treatment Facility	Steel frame and siding	40' X 25' X 16'	Removed (3/21)	Rubblized, to be removed	
Ion Exchange Plant	Steel frame and siding	140' X 70' X 40'	To Be Removed	To be removed	
Portable building	Steel frame and siding	12' X 12' X 8'	Removed (11/20)	Removed (11/20)	
Fuel Pump House	Steel frame and siding	10' X 15' X 8'	Removed (4/21)	Rubblized and removed	
Access/utility tunnel	Concrete				√
Sanitary Treatment Plant	Concrete; steel	70' X 30' X 6'; 40' x 20' X 8'	To Be Removed		
Septic Tank and Leach Field	Various (Concrete, Plastic, Gravel)				√
Water Tank	Steel				√
Fuel Storage Tanks	Steel	5 x 30' x 6'	Removed (2/20)	Fill Excavation and Grade	
Phase I Water Wells*1	Steel casing and screen		Plug/ Abandon		√
Phase II Water Wells*2	Steel casing and screen		Plug/ Abandon		√
Phase III Water Wells*2	Steel casing and screen		Plug/ Abandon		√
Mine Vent Structure	Evase' (Steel), frame and Fan		Removed (1/22)	Break to below ground and backfill pits	
Conduits	11.5-inch diameter steel pipe	3100'-3200' deep	Plug/ Abandon		
Production Shaft Headframe	Structural steel	180' high	Removed 11/22	Cover with Soil (Retain as part of Shaft Plug)	
Production Shaft	Reinforced concrete liner	3300'	To be Plugged	Cover with Soil (Retain as part of Shaft Plug)	
Ore Loading Pad and Wash Bay	Steel, concrete	5,664 sf base, 400'x 4' x 1' walls	To Be Removed	Break to below ground and backfill pit	
Manway Shaft	Reinforced concrete liner	3300'	To be Plugged	Cover with Soil (Retain as part of Shaft Plug)	
Mine Car Rails	Steel (with wood and concrete ties)	6750'	Removed (2021)		
MWTU Pond 2*3	Double HDPE liner system	0.73 acres	To Be Removed	Hydraulic Structures to be Removed	

Table 4.2 Mine Facility Disposition at Closeout

Continued, Page 3 of 3

Facility Name	Facility Type	Dimensions	Disposition at Closeout Status as of April 2022		
			Remove Structure	Foundation	Retain for PMLU
MWTU Pond 3*3	Double HDPE liner system	0.93 acres	To Be Removed	Hydraulic Structures to be Removed	
MWTU ponds 1,4,5,6,7 8	Earthen basins and hydraulic control structures	various	To be Backfilled	Hydraulic Structures to be Removed (50% Removed 2021)	
MWTU Pump House and MCC	Steel frame and siding	20' x 12' x 8'	Removed (2021)	Removed (2021)	
Capacitor Building	Steel frame and siding	27' X 24' X 16'	To Be Removed	To be removed	
Treated Water Discharge Pipeline	24 inch diameter steel pipe, concrete trust blocks	4.3 miles	To Be Removed		
Ore Pad	Earthen pad	6.8 acres	To Be Removed, then regraded		
Ore Pad Storm Water Retention Pond	Earthen basin	0.9 acres	To Be Removed, then regraded		
South Storm Water Pond	Earthen basin	2.67 acres			√
Storm Drain System	Steel and concrete culverts	various			√

*1 Phase I wells to be Plugged and Abandoned (3 of 9 to be retained until Post-Closure Monitoring Program Completed)

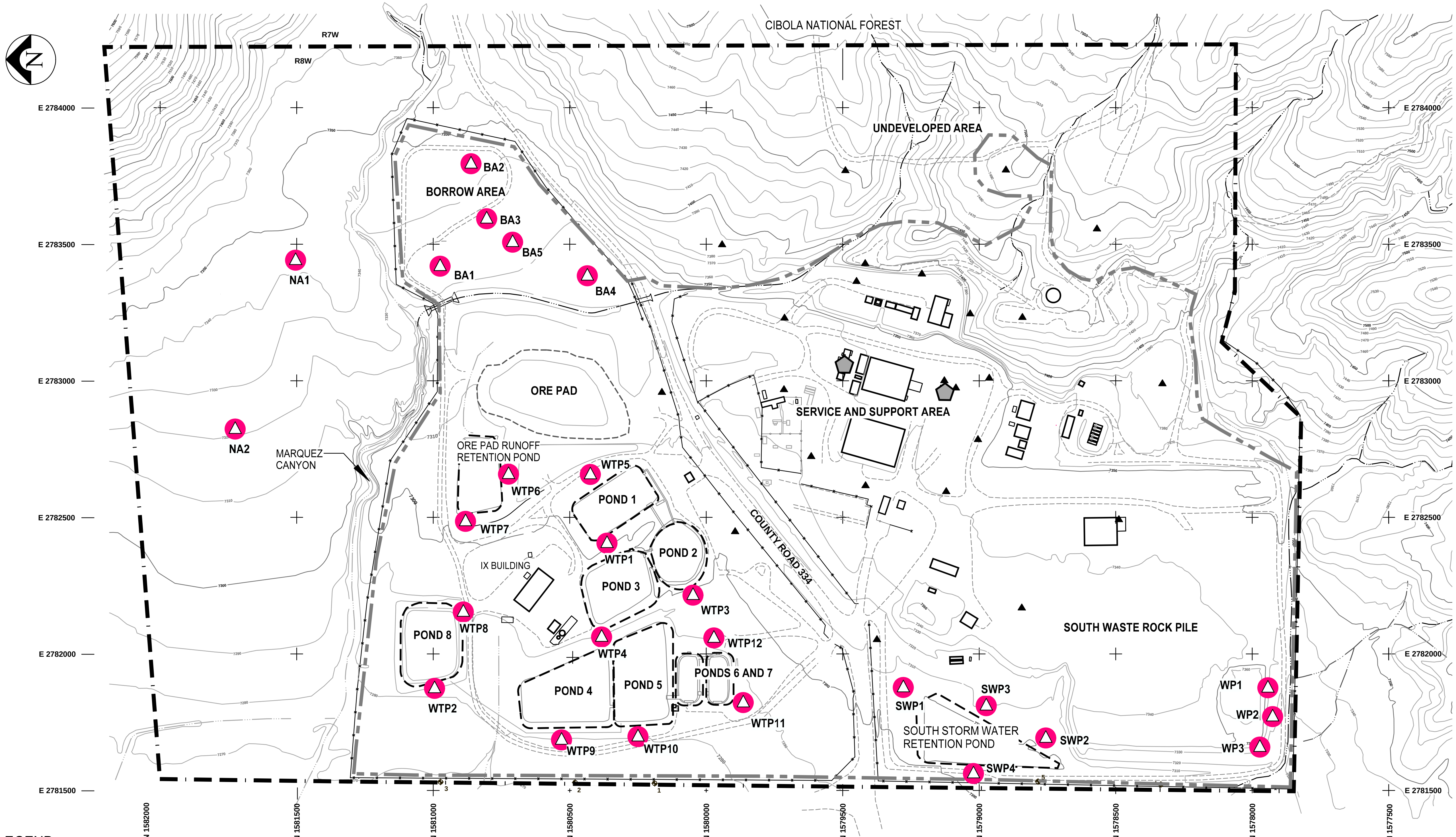
*2 Phase II and III Wells to be Plugged and Abandoned (6 of 14 to be retained until Post-Closure Monitoring Program Completed)

*3 MWTU Ponds 2 and 3 maintained until Abatement Plan and Post-Closure Monitoring Plan programs are completed

Response No. 10 Attachment

2014 Soil Data and Map for Borrow Area C

(Appendix D)



LEGEND

- DISTURBED AREA
- MINE SURFACE UNITS AREA
- DEWATERING WELLS
- PONDS
- SUPPORT BUILDINGS
- MINE SHAFT
- COVER SOIL BORROW SAMPLE LOCATIONS

0 200 400 FT

SCALE IN FEET

500' GRID = NAD 83 NEW MEXICO WEST

RIO GRANDE RESOURCES CORPORATION

MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By:

Alan Kuhn Associates LLC

Figure D.3.5-1

COVER SOIL BORROW SAMPLE LOCATIONS

Table D.3.5 Mt Taylor Mine Borrow Soil Chemistry

SAMPLE			PARAMETERS														
Number	Location		pH	Ee mmhos/cm 25 C	Saturation %	Texture **	SAR	Selenium mg/kg	Boron mg/kg	Acid/Base Potential (Modified Sobek), t/Kt	Nitrate-NO, (N) mg/kg	Phosphorus (P) mg/kg	Potassium (K) mg/kg	Rock Fragments	diameter in inches		
	N	E												(% volume)	3	3-10	10+
NA1	1581458	2783393	7.6	0.5	49.9	CL	0.82	ND	0.3		5	12	690	ND	_	_	_
NA2	1581612	2782830	7.7	0.6	52.9	CL	1.31	ND	0.2		4	9	740	ND	_	_	_
BA1	1581044	2783381	7.8	0.9	37.1	L	0.95	ND	0.2		13	9	420	ND	_	_	_
BA2	1580952	2783815	7.6	1.3	40.9	L	0.25	ND	0.2		40	11	710	ND	_	_	_
BA3	1580806	2783674	7.8	0.9	38.8	L	0.32	ND	0.1	15	12	8	390	ND	_	_	_
BA4	1580479	2783379	7.7	1.2	42.8	L	0.42	ND	0.1		35	12	660	ND	_	_	_
BA5	1580734	2783546	7.8	0.9	41.3	L	0.81	ND	0.2		22	10	560	ND	_	_	_
WTP1	1580355	2782406	7.9	0.8	43.0	L	0.69	ND	0.1	16	12	8	410	ND	_	_	_
WTP2	1580975	2781891	7.9	0.9	50.4	CL	1.44	ND	0.2	16	13	7	620	ND	_	_	_
WTP3	1580070	2782240	8.0	0.8	38.7	L	1.96	ND	0.2		7	7	320	ND	_	_	_
WTP4	1580371	2782099	7.6	1.3	43.4	CL	0.44	ND	0.1		28	12	500	ND	_	_	_
WTP5	1580391	2782654	7.9	1.0	43.8	L	1.32	0.1	0.2		23	8	410	ND	_	_	_
WTP6	1580717	2782644	8.2	0.9	33.7	SL	4.79	0.3	0.1		8	7	200	ND	_	_	_
WTP7	1580905	2782465	8.0	0.4	33.0	SL	0.51	ND	ND		3	5	160	ND	_	_	_
WTP8	1580908	2782189	8.0	0.8	48.9	CL	1.56	ND	0.2		2	8	520	ND	_	_	_
WTP9	1580534	2781744	8.1	0.5	40.6	L	1.06	ND	0.1		3	9	370	ND	_	_	_
WTP10	1580249	2781742	7.9	0.9	41.8	SCL	1.32	ND	0.2		10	6	450	ND	_	_	_
WTP11	1579913	2781835	8.3	0.6	38.7	SCL	5.23	ND	0.2		4	7	240	ND	_	_	_
WTP12	1579998	2782062	8.1	0.5	40.1	L	1.16	ND	0.1		5	8	420	ND	_	_	_
SWP1	1579327	2781913	7.7	1.0	34.4	L	0.21	ND	0.1		13	6	270	ND	_	_	_
SWP2	1578943	2781711	7.9	0.6	40.5	SCL	1.37	ND	0.2		2	6	180	ND	_	_	_
SWP3	1579122	2781861	8.0	0.6	43.7	CL	1.09	ND	ND		8	8	280	ND	_	_	_
SWP4	1579061	2781581	8.1	0.6	39.6	L	1.40	ND	0.2		7	7	280	ND	_	_	_
WP1	1577958	2781874	7.9	5.3	38.9	SCL	9.35	ND	ND		2	7	110	ND	_	_	_
WP2	1577952	2781769	7.8	6.4	38.0	SL	11.60	0.2	0.1	30	2	7	90	ND	_	_	_
WP3	1577967	2781668	8.0	5.2	52.6	CL	8.31	0.1	ND		2	5	190	ND	_	_	_

** s=sand, si = silt, I= loam, c:= clay, g= gravel, cos= coarse sand, \Ifs = very fine sand vfsl = very fine sandy loam, sicl = silty, clay, loam

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

April 01, 2014

Alan Kuhn
Alan Kuhn Assoc LLC
13212 Manitoba Dr NE
Albuquerque, NM 87111
TEL: (505) 350-9188
FAX

RE: Mt. Taylor Mine OrderNo.: 1403621

Dear Alan Kuhn:

Hall Environmental Analysis Laboratory received 26 sample(s) on 3/14/2014 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 09:30
Lab ID:	B14031248-001	**DateReceived:**	03/18/14
Client Sample ID:	1403621-001A, NA-01 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	32	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	36	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	32	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.6	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	49.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.5	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.54	meq/L		0.05		SW6010B	03/27/14 20:48 / mas
Magnesium, sat. paste	0.99	meq/L		0.08		SW6010B	03/27/14 20:48 / mas
Sodium, sat. paste	1.09	meq/L		0.04		SW6010B	03/27/14 20:48 / mas
Sodium Adsorption Ratio (SAR)	0.82	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	03/27/14 12:00 / srm
Nitrate as N, KCL Extract	5	mg/kg		1		ASA33-8	03/27/14 10:46 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.3	mg/kg		0.1		SW6010B	03/28/14 03:37 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:37 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	690	mg/kg		10		SW6010B	03/27/14 18:59 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 09:00
Lab ID:	B14031248-002	**DateReceived:**	03/18/14
Client Sample ID:	1403621-002A, NA-02 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	30	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	40	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	30	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	14	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.7	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	52.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.82	meq/L		0.05		SW6010B	03/27/14 20:55 / mas
Magnesium, sat. paste	1.07	meq/L		0.08		SW6010B	03/27/14 20:55 / mas
Sodium, sat. paste	1.83	meq/L		0.04		SW6010B	03/27/14 20:55 / mas
Sodium Adsorption Ratio (SAR)	1.31	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	9	mg/kg		1		ASA24-5	03/27/14 12:04 / srm
Nitrate as N, KCL Extract	4	mg/kg		1		ASA33-8	03/27/14 10:48 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 03:45 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:45 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	740	mg/kg		10		SW6010B	03/27/14 19:06 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-003
Client Sample ID: 1403621-003A, BA-01 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 15:30
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	48	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	33	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	19	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	37.1	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.51	meq/L		0.05		SW6010B	03/27/14 21:02 / mas
Magnesium, sat. paste	1.10	meq/L		0.08		SW6010B	03/27/14 21:02 / mas
Sodium, sat. paste	1.73	meq/L		0.04		SW6010B	03/27/14 21:02 / mas
Sodium Adsorption Ratio (SAR)	0.95	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	9	mg/kg		1		ASA24-5	03/27/14 12:06 / srm
Nitrate as N, KCL Extract	13	mg/kg		1		ASA33-8	03/27/14 10:48 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 03:52 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:52 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	420	mg/kg		10		SW6010B	03/27/14 19:13 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-004
Client Sample ID: 1403621-004A, BA-02 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 15:35
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	36	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	20	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.6	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.3	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	8.27	meq/L		0.05		SW6010B	03/27/14 21:05 / mas
Magnesium, sat. paste	2.23	meq/L		0.08		SW6010B	03/27/14 21:05 / mas
Sodium, sat. paste	0.57	meq/L		0.04		SW6010B	03/27/14 21:05 / mas
Sodium Adsorption Ratio (SAR)	0.25	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	11	mg/kg		1		ASA24-5	03/27/14 12:07 / srm
Nitrate as N, KCL Extract	40	mg/kg		1		ASA33-8	03/27/14 10:49 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 03:56 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:56 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	710	mg/kg		10		SW6010B	03/27/14 19:22 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/30/13 15:40
Lab ID:	B14031248-005	**DateReceived:**	03/18/14
Client Sample ID:	1403621-005A, BA-03 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	46	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	34	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	20	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	6.66	meq/L		0.05		SW6010B	03/27/14 21:08 / mas
Magnesium, sat. paste	1.08	meq/L		0.08		SW6010B	03/27/14 21:08 / mas
Sodium, sat. paste	0.63	meq/L		0.04		SW6010B	03/27/14 21:08 / mas
Sodium Adsorption Ratio (SAR)	0.32	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	16	t/kt		0.1		Sobek Modifie	03/31/14 11:44 / srm
Acid Potential	1	t/kt		1		Sobek Modifie	03/31/14 11:44 / srm
Acid/Base Potential	15	t/kt				Sobek Modifie	03/31/14 11:44 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:09 / srm
Nitrate as N, KCL Extract	12	mg/kg		1		ASA33-8	03/27/14 10:50 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:00 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:00 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	390	mg/kg		10		SW6010B	03/27/14 19:26 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-006
Client Sample ID: 1403621-006A, BA-04 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 15:45
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	39	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	37	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.7	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	42.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.2	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	7.99	meq/L		0.05		SW6010B	03/27/14 21:12 / mas
Magnesium, sat. paste	1.92	meq/L		0.08		SW6010B	03/27/14 21:12 / mas
Sodium, sat. paste	0.94	meq/L		0.04		SW6010B	03/27/14 21:12 / mas
Sodium Adsorption Ratio (SAR)	0.42	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	03/27/14 12:10 / srm
Nitrate as N, KCL Extract	35	mg/kg		1		ASA33-8	03/27/14 10:51 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:04 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:04 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	660	mg/kg		10		SW6010B	03/27/14 19:29 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 12:45
Lab ID:	B14031248-007	**DateReceived:**	03/18/14
Client Sample ID:	1403621-007A, BA-05 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	40	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	36	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	41.3	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.83	meq/L		0.05		SW6010B	03/27/14 21:34 / mas
Magnesium, sat. paste	0.89	meq/L		0.08		SW6010B	03/27/14 21:34 / mas
Sodium, sat. paste	1.49	meq/L		0.04		SW6010B	03/27/14 21:34 / mas
Sodium Adsorption Ratio (SAR)	0.81	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	10	mg/kg		1		ASA24-5	03/27/14 12:11 / srm
Nitrate as N, KCL Extract	22	mg/kg		1		ASA33-8	03/27/14 10:51 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 04:42 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:42 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	560	mg/kg		10		SW6010B	03/26/14 15:59 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-008
Client Sample ID: 1403621-008A, WTP-01 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 15:20
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	43	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	31	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	26	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.0	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.8	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.27	meq/L		0.05		SW6010B	03/27/14 21:37 / mas
Magnesium, sat. paste	1.10	meq/L		0.08		SW6010B	03/27/14 21:37 / mas
Sodium, sat. paste	1.23	meq/L		0.04		SW6010B	03/27/14 21:37 / mas
Sodium Adsorption Ratio (SAR)	0.69	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	17	t/kt		0.1		Sobek Modifie	03/31/14 11:51 / srm
Acid Potential	1	t/kt		1		Sobek Modifie	03/31/14 11:51 / srm
Acid/Base Potential	16	t/kt				Sobek Modifie	03/31/14 11:51 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:13 / srm
Nitrate as N, KCL Extract	12	mg/kg		1		ASA33-8	03/27/14 10:52 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:46 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:46 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	400	mg/kg		10		SW6010B	03/26/14 16:03 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-009
Client Sample ID: 1403621-009A, WTP-02 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 14:50
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	33	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	35	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	32	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	50.4	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	4.63	meq/L		0.05		SW6010B	03/27/14 21:41 / mas
Magnesium, sat. paste	1.02	meq/L		0.08		SW6010B	03/27/14 21:41 / mas
Sodium, sat. paste	2.43	meq/L		0.04		SW6010B	03/27/14 21:41 / mas
Sodium Adsorption Ratio (SAR)	1.44	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	17	t/kt		0.1		Sobek Modifie	03/31/14 11:54 / srm
Acid Potential	1	t/kt		1		Sobek Modifie	03/31/14 11:54 / srm
Acid/Base Potential	16	t/kt				Sobek Modifie	03/31/14 11:54 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:14 / srm
Nitrate as N, KCL Extract	13	mg/kg		1		ASA33-8	03/27/14 10:53 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 04:50 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:50 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	620	mg/kg		10		SW6010B	03/26/14 16:06 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-010
Client Sample ID: 1403621-010A, WTP-03 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 15:15
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	32	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.8	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.79	meq/L		0.05		SW6010B	03/27/14 21:44 / mas
Magnesium, sat. paste	0.79	meq/L		0.08		SW6010B	03/27/14 21:44 / mas
Sodium, sat. paste	2.97	meq/L		0.04		SW6010B	03/27/14 21:44 / mas
Sodium Adsorption Ratio (SAR)	1.96	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:16 / srm
Nitrate as N, KCL Extract	7	mg/kg		1		ASA33-8	03/27/14 10:53 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 04:53 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:53 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	320	mg/kg		10		SW6010B	03/26/14 16:09 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/30/13 15:05
Lab ID:	B14031248-011	**DateReceived:**	03/18/14
Client Sample ID:	1403621-011A, WTP-04 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	43	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	28	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	8	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.6	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.4	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.3	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	8.07	meq/L		0.05		SW6010B	03/27/14 21:47 / mas
Magnesium, sat. paste	2.56	meq/L		0.08		SW6010B	03/27/14 21:47 / mas
Sodium, sat. paste	1.02	meq/L		0.04		SW6010B	03/27/14 21:47 / mas
Sodium Adsorption Ratio (SAR)	0.44	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	03/27/14 12:20 / srm
Nitrate as N, KCL Extract	28	mg/kg		1		ASA33-8	03/27/14 10:56 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:57 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:57 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	500	mg/kg		10		SW6010B	03/26/14 16:13 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 11:40
Lab ID:	B14031248-012	**DateReceived:**	03/18/14
Client Sample ID:	1403621-012A, WTP-06 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	58	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	25	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	17	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	14	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.2	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	33.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.84	meq/L		0.05		SW6010B	03/27/14 21:54 / mas
Magnesium, sat. paste	0.47	meq/L		0.08		SW6010B	03/27/14 21:54 / mas
Sodium, sat. paste	6.16	meq/L		0.04		SW6010B	03/27/14 21:54 / mas
Sodium Adsorption Ratio (SAR)	4.79	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:24 / srm
Nitrate as N, KCL Extract	8	mg/kg		1		ASA33-8	03/27/14 10:58 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:05 / mas
Selenium	0.3	mg/kg		0.1		SW6010B	03/28/14 05:05 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	200	mg/kg		10		SW6010B	03/26/14 16:19 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 11:35
Lab ID:	B14031248-013	**DateReceived:**	03/18/14
Client Sample ID:	1403621-013A, WTP-05 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	31	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.0	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.73	meq/L		0.05		SW6010B	03/27/14 22:01 / mas
Magnesium, sat. paste	1.46	meq/L		0.08		SW6010B	03/27/14 22:01 / mas
Sodium, sat. paste	2.50	meq/L		0.04		SW6010B	03/27/14 22:01 / mas
Sodium Adsorption Ratio (SAR)	1.32	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:26 / srm
Nitrate as N, KCL Extract	23	mg/kg		1		ASA33-8	03/27/14 10:58 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:13 / mas
Selenium	0.1	mg/kg		0.1		SW6010B	03/28/14 05:13 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	410	mg/kg		10		SW6010B	03/26/14 16:26 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 11:50
Lab ID:	B14031248-014	**DateReceived:**	03/18/14
Client Sample ID:	1403621-014A, WTP-07 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	61	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	22	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	17	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	16	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	33.0	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.4	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.09	meq/L		0.05		SW6010B	03/27/14 22:04 / mas
Magnesium, sat. paste	0.77	meq/L		0.08		SW6010B	03/27/14 22:04 / mas
Sodium, sat. paste	0.70	meq/L		0.04		SW6010B	03/27/14 22:04 / mas
Sodium Adsorption Ratio (SAR)	0.51	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	03/27/14 12:27 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA33-8	03/27/14 10:59 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 05:17 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:17 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	160	mg/kg		10		SW6010B	03/26/14 16:29 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-015
Client Sample ID: 1403621-015A, WTP-08 (a+b)

Report Date: 03/31/14
Collection Date: 03/13/14 12:15
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	40	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	31	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	48.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.8	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.77	meq/L		0.05		SW6010B	03/27/14 22:14 / mas
Magnesium, sat. paste	1.34	meq/L		0.08		SW6010B	03/27/14 22:14 / mas
Sodium, sat. paste	2.50	meq/L		0.04		SW6010B	03/27/14 22:14 / mas
Sodium Adsorption Ratio (SAR)	1.56	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:28 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:00 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:28 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:28 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	520	mg/kg		10		SW6010B	03/27/14 19:36 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 09:00
Lab ID:	B14031248-016	**DateReceived:**	03/18/14
Client Sample ID:	1403621-016A, WTP-09 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	32	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.1	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.6	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.5	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.73	meq/L		0.05		SW6010B	03/27/14 22:17 / mas
Magnesium, sat. paste	0.58	meq/L		0.08		SW6010B	03/27/14 22:17 / mas
Sodium, sat. paste	1.36	meq/L		0.04		SW6010B	03/27/14 22:17 / mas
Sodium Adsorption Ratio (SAR)	1.06	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	9	mg/kg		1		ASA24-5	03/27/14 12:30 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA33-8	03/27/14 11:00 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:32 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:32 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	370	mg/kg		10		SW6010B	03/27/14 19:42 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 10:15
Lab ID:	B14031248-017	**DateReceived:**	03/18/14
Client Sample ID:	1403621-017A, WTP-10 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	48	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	27	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	41.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	4.90	meq/L		0.05		SW6010B	03/27/14 22:20 / mas
Magnesium, sat. paste	1.02	meq/L		0.08		SW6010B	03/27/14 22:20 / mas
Sodium, sat. paste	2.26	meq/L		0.04		SW6010B	03/27/14 22:20 / mas
Sodium Adsorption Ratio (SAR)	1.32	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	03/27/14 12:31 / srm
Nitrate as N, KCL Extract	10	mg/kg		1		ASA33-8	03/27/14 11:01 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:36 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:36 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	450	mg/kg		10		SW6010B	03/27/14 19:46 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 10:35
Lab ID:	B14031248-018	**DateReceived:**	03/18/14
Client Sample ID:	1403621-018A, WTP-11 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	50	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	26	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	13	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.3	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	1.14	meq/L		0.05		SW6010B	03/27/14 22:24 / mas
Magnesium, sat. paste	0.39	meq/L		0.08		SW6010B	03/27/14 22:24 / mas
Sodium, sat. paste	4.57	meq/L		0.04		SW6010B	03/27/14 22:24 / mas
Sodium Adsorption Ratio (SAR)	5.23	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:33 / srm
Nitrate as N, KCL Extract	4	mg/kg		1		ASA33-8	03/27/14 11:02 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:40 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:40 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	240	mg/kg		10		SW6010B	03/27/14 19:49 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-019
Client Sample ID: 1403621-019A, WTP-12 (a+b)

Report Date: 03/31/14
Collection Date: 03/13/14 11:10
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	45	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	26	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	13	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.1	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.1	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.5	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.66	meq/L		0.05		SW6010B	03/27/14 22:27 / mas
Magnesium, sat. paste	0.63	meq/L		0.08		SW6010B	03/27/14 22:27 / mas
Sodium, sat. paste	1.48	meq/L		0.04		SW6010B	03/27/14 22:27 / mas
Sodium Adsorption Ratio (SAR)	1.16	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:34 / srm
Nitrate as N, KCL Extract	5	mg/kg		1		ASA33-8	03/27/14 11:22 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:43 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:43 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	420	mg/kg		10		SW6010B	03/27/14 19:52 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/12/14 09:00
Lab ID:	B14031248-020	**DateReceived:**	03/18/14
Client Sample ID:	1403621-020A, SWP-01 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	46	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	32	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	22	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	15	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.7	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	34.4	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.0	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	7.48	meq/L		0.05		SW6010B	03/27/14 22:30 / mas
Magnesium, sat. paste	1.70	meq/L		0.08		SW6010B	03/27/14 22:30 / mas
Sodium, sat. paste	0.45	meq/L		0.04		SW6010B	03/27/14 22:30 / mas
Sodium Adsorption Ratio (SAR)	0.21	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	03/27/14 12:35 / srm
Nitrate as N, KCL Extract	13	mg/kg		1		ASA33-8	03/27/14 11:23 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:47 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:47 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	270	mg/kg		10		SW6010B	03/27/14 20:02 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/12/14 09:10
Lab ID:	B14031248-021	**DateReceived:**	03/18/14
Client Sample ID:	1403621-021A, SWP-02 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	48	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	27	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.5	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.00	meq/L		0.05		SW6010B	03/27/14 22:34 / mas
Magnesium, sat. paste	1.29	meq/L		0.08		SW6010B	03/27/14 22:34 / mas
Sodium, sat. paste	2.00	meq/L		0.04		SW6010B	03/27/14 22:34 / mas
Sodium Adsorption Ratio (SAR)	1.37	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	03/27/14 12:40 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:25 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:51 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:51 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	180	mg/kg		10		SW6010B	03/27/14 20:05 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/12/14 09:15
Lab ID:	B14031248-022	**DateReceived:**	03/18/14
Client Sample ID:	1403621-022A, SWP-03 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	27	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	40	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	33	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	9	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.00	meq/L		0.05		SW6010B	03/27/14 22:40 / mas
Magnesium, sat. paste	0.93	meq/L		0.08		SW6010B	03/27/14 22:40 / mas
Sodium, sat. paste	1.52	meq/L		0.04		SW6010B	03/27/14 22:40 / mas
Sodium Adsorption Ratio (SAR)	1.09	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:44 / srm
Nitrate as N, KCL Extract	8	mg/kg		1		ASA33-8	03/27/14 11:27 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 05:59 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:59 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	280	mg/kg		10		SW6010B	03/27/14 20:12 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/12/14 09:30
Lab ID:	B14031248-023	**DateReceived:**	03/18/14
Client Sample ID:	1403621-023A, SWP-04 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	46	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.1	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	39.6	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.15	meq/L		0.05		SW6010B	03/27/14 22:53 / mas
Magnesium, sat. paste	1.42	meq/L		0.08		SW6010B	03/27/14 22:53 / mas
Sodium, sat. paste	2.12	meq/L		0.04		SW6010B	03/27/14 22:53 / mas
Sodium Adsorption Ratio (SAR)	1.40	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:45 / srm
Nitrate as N, KCL Extract	7	mg/kg		1		ASA33-8	03/27/14 11:28 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 06:14 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 06:14 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	260	mg/kg		10		SW6010B	03/27/14 20:19 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/31/13 09:00
Lab ID:	B14031248-024	**DateReceived:**	03/18/14
Client Sample ID:	1403621-024A, WP-01 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	58	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	22	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	20	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	8	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	5.3	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	24.4	meq/L		0.05		SW6010B	03/27/14 22:57 / mas
Magnesium, sat. paste	13.6	meq/L		0.08		SW6010B	03/27/14 22:57 / mas
Sodium, sat. paste	40.8	meq/L	D	0.07		SW6010B	03/27/14 22:57 / mas
Sodium Adsorption Ratio (SAR)	9.35	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:47 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:28 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 06:18 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 06:18 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	110	mg/kg		10		SW6010B	03/27/14 20:22 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-025
Client Sample ID: 1403621-025A, WP-02 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/31/13 09:10
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	58	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	24	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	18	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	7	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.0	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	6.4	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	25.7	meq/L		0.05		SW6010B	03/27/14 23:00 / mas
Magnesium, sat. paste	17.0	meq/L		0.08		SW6010B	03/27/14 23:00 / mas
Sodium, sat. paste	53.5	meq/L	D	0.1		SW6010B	03/27/14 23:00 / mas
Sodium Adsorption Ratio (SAR)	11.6	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	31	t/kt		0.1		Sobek Modifie	03/31/14 11:32 / srm
Acid Potential	0	t/kt		1		Sobek Modifie	03/31/14 11:32 / srm
Acid/Base Potential	30	t/kt				Sobek Modifie	03/31/14 11:32 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:48 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:29 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 06:22 / mas
Selenium	0.2	mg/kg		0.1		SW6010B	03/28/14 06:22 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	90	mg/kg		10		SW6010B	03/27/14 20:25 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/31/13 09:15
Lab ID:	B14031248-026	**DateReceived:**	03/18/14
Client Sample ID:	1403621-026A, WP-03 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	38	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	35	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	27	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	52.6	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	5.2	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	25.0	meq/L		0.05		SW6010B	03/27/14 23:03 / mas
Magnesium, sat. paste	14.7	meq/L		0.08		SW6010B	03/27/14 23:03 / mas
Sodium, sat. paste	37.0	meq/L	D	0.07		SW6010B	03/27/14 23:03 / mas
Sodium Adsorption Ratio (SAR)	8.31	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	03/27/14 12:50 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:30 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 06:26 / mas
Selenium	0.1	mg/kg		0.1		SW6010B	03/28/14 06:26 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	190	mg/kg		10		SW6010B	03/27/14 20:29 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA10-3								Batch: R221281	
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	0.490	mmhos/cm	0.10				4.0	30	
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	1.29	mmhos/cm	0.10				0.0	30	
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	0.570	mmhos/cm	0.10				1.7	30	
Lab ID: LCS-1403261515	Laboratory Control Sample				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	12.1	mmhos/cm	0.10	96	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Project: Not Indicated

Report Date: 03/31/14

Work Order: B14031248

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**ASA15-5**								Batch: R221435	
Lab ID:	**B14031248-002A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand		31	%	1.0				3.3	40	
Silt		40	%	1.0				0.0	40	
Clay		29	%	1.0				3.4	40	
Lab ID:	**B14031248-012A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand		58	%	1.0				0.0	40	
Silt		26	%	1.0				3.9	40	
Clay		16	%	1.0				6.1	40	
Lab ID:	**B14031248-022A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand		28	%	1.0				3.6	40	
Silt		39	%	1.0				2.5	40	
Clay		33	%	1.0				0.0	40	
Lab ID:	**LCS-1403311025**	Laboratory Control Sample				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand		42	%	1.0	102	50	150			
Silt		34	%	1.0	97	50	150			
Clay		24	%	1.0	100	50	150			
Lab ID:	**B14031248-002A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand		15	wt%	1				8.7	50	
Lab ID:	**B14031248-012A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand		15	wt%	1				10	50	
Lab ID:	**B14031248-022A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand		10	wt%	1				15	50	
Lab ID:	**LCS-1403311043**	Laboratory Control Sample				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand		8	wt%	1	105	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA24-5								Batch: 14031802-PS3	
Lab ID: LCS	Laboratory Control Sample				Run: FIA201-B_140331A			03/27/14 11:54	
Phosphorus, Olsen	11.7	mg/kg	1.0	87	50	150			
Lab ID: B14031248-001ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 12:02	
Phosphorus, Olsen	10.4	mg/kg	1.0				13	30	
Lab ID: B14031248-001AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 12:03	
Phosphorus, Olsen	21.6	mg/kg	1.0	93	50	150			
Lab ID: B14031248-011ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 12:21	
Phosphorus, Olsen	11.7	mg/kg	1.0				2.3	30	
Lab ID: B14031248-011AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 12:23	
Phosphorus, Olsen	23.3	mg/kg	1.0	108	50	150			
Lab ID: B14031248-021ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 12:41	
Phosphorus, Olsen	6.68	mg/kg	1.0				4.1	30	
Lab ID: B14031248-021AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 12:43	
Phosphorus, Olsen	16.6	mg/kg	1.0	97	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA33-8								Batch: 14032701-NNS2	
Lab ID: LCS	Laboratory Control Sample				Run: FIA201-B_140331A			03/27/14 10:43	
Nitrate as N, KCL Extract	7.92	mg/kg	1.0	107	50	150			
Lab ID: B14031248-001ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 10:46	
Nitrate as N, KCL Extract	4.90	mg/kg	1.0				1.2	30	
Lab ID: B14031248-001AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 10:47	
Nitrate as N, KCL Extract	10.5	mg/kg	1.0	105	50	150			
Lab ID: B14031248-011ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 10:56	
Nitrate as N, KCL Extract	29.4	mg/kg	1.0				3.3	30	
Lab ID: B14031248-011AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 10:57	
Nitrate as N, KCL Extract	35.1	mg/kg	1.0	127	50	150			
Method: ASA33-8								Batch: 14032702-NNS2	
Lab ID: B14031248-021ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 11:26	
Nitrate as N, KCL Extract	1.55	mg/kg	1.0				3.7	30	
Lab ID: B14031248-021AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 11:26	
Nitrate as N, KCL Extract	7.16	mg/kg	1.0	106	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASAM10-3.2								Batch: R221281	
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.70	s.u.	0.10				1.3	10	
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.70	s.u.	0.10				1.3	10	
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.90	s.u.	0.10				0.0	10	
Lab ID: LCS-1403261515	Laboratory Control Sample				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.00	s.u.	0.10	99	90	110			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Project: Not Indicated

Report Date: 03/31/14

Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: Calculation								Batch: R221435	
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Sodium Adsorption Ratio (SAR)	0.780	unitless	0.010				5.0	30	
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Sodium Adsorption Ratio (SAR)	0.430	unitless	0.010				2.3	30	
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Sodium Adsorption Ratio (SAR)	1.24	unitless	0.010				10.0	30	
Lab ID: LCS-1403311051	Laboratory Control Sample				Run: MISC-SOIL_140331A			03/31/14 10:51	
Sodium Adsorption Ratio (SAR)	13.8	unitless	0.010	106	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Project: Not Indicated

Report Date: 03/31/14

Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: Sobek Modified								Batch: R221454	
Lab ID: LCS-SOLO10171403311	Laboratory Control Sample				Run: MISC-SOIL_140331B			03/31/14 11:41	
Neutralization Potential	130	t/kt	0.10	118	50	200			
Acid Potential	3.3	t/kt	1.0	65	50	200			
Acid/Base Potential	120	t/kt		118	50	200			
The acid-base potential was calculated from the non-sulfate sulfur %									
Lab ID: B14031248-005A DUP	Sample Duplicate				Run: MISC-SOIL_140331B			03/31/14 11:48	
Neutralization Potential	14	t/kt	0.10				11	50	
Acid Potential	0.93	t/kt	1.0					50	
Acid/Base Potential	13	t/kt					11	50	
The acid-base potential was calculated from the non-sulfate sulfur %									

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW6010B**								Batch: 78479	
Lab ID:	**B14031248-011A DUP**	Sample Duplicate				Run: ICP201-B_140326A			03/26/14 16:16	
Potassium		500	mg/kg	10				1.0	50	
Lab ID:	**B14031248-012AMS2**	Sample Matrix Spike				Run: ICP201-B_140326A			03/26/14 16:23	
Potassium		3300	mg/kg	10	122	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental　　**Report Date:** 03/31/14

Project: Not Indicated　　**Work Order:** B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B									Batch: 78479
Lab ID: LCS-78479	Laboratory Control Sample				Run: ICP201-B_140327A				03/27/14 18:56
Potassium	300	mg/kg	10	100	50	150			
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 19:03
Potassium	690	mg/kg	10				0.1	50	
Lab ID: B14031248-002AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 19:09
Potassium	3600	mg/kg	10	114	70	130			
Lab ID: B14031248-015AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 19:39
Potassium	3400	mg/kg	10	117	70	130			
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 20:09
Potassium	190	mg/kg	10				2.9	50	
Lab ID: B14031248-022AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 20:15
Potassium	3100	mg/kg	10	114	70	130			
Method: SW6010B									Batch: 78522
Lab ID: LCS-78522	Laboratory Control Sample				Run: ICP201-B_140327A				03/27/14 20:45
Calcium, sat. paste	78.2	meq/L	0.050	100	50	150			
Magnesium, sat. paste	53.2	meq/L	0.082	107	50	150			
Sodium, sat. paste	112	meq/L	0.27	107	50	150			
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 20:52
Calcium, sat. paste	2.49	meq/L	0.050				2.0	30	
Magnesium, sat. paste	0.940	meq/L	0.082				5.1	30	
Sodium, sat. paste	1.02	meq/L	0.044				6.8	30	
Lab ID: B14031248-002AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 20:58
Calcium, sat. paste	7.74	meq/L	0.050	99	50	150			
Magnesium, sat. paste	9.49	meq/L	0.082	102	50	150			
Sodium, sat. paste	6.25	meq/L	0.044	102	50	150			
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 21:51
Calcium, sat. paste	8.41	meq/L	0.050				4.2	30	
Magnesium, sat. paste	2.65	meq/L	0.082				3.5	30	
Sodium, sat. paste	1.02	meq/L	0.044				0.1	30	
Lab ID: B14031248-012AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 21:57
Calcium, sat. paste	7.55	meq/L	0.050	94	50	150			
Magnesium, sat. paste	8.67	meq/L	0.082	100	50	150			
Sodium, sat. paste	10.4	meq/L	0.044	97	50	150			
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 22:37
Calcium, sat. paste	3.01	meq/L	0.050				0.4	30	

Qualifiers:

RL - Analyte reporting limit.　　ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental **Report Date:** 03/31/14
Project: Not Indicated **Work Order:** B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B									Batch: 78522
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 22:37
Magnesium, sat. paste	1.35	meq/L	0.082				4.8	30	
Sodium, sat. paste	1.83	meq/L	0.044				8.8	30	
Lab ID: B14031248-022AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 22:44
Calcium, sat. paste	8.01	meq/L	0.050	100	50	150			
Magnesium, sat. paste	9.48	meq/L	0.082	104	50	150			
Sodium, sat. paste	5.98	meq/L	0.044	102	50	150			
Method: SW6010B									Batch: 78478
Lab ID: LCS-78478	Laboratory Control Sample				Run: ICP203-B_140327A				03/28/14 03:33
Boron	2.34	mg/kg	0.10	94	70	150			
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: ICP203-B_140327A				03/28/14 03:41
Boron	0.261	mg/kg	0.10				12	30	
Selenium	ND	mg/kg	0.10					30	
Lab ID: B14031248-002AMS2	Sample Matrix Spike				Run: ICP203-B_140327A				03/28/14 03:48
Boron	4.12	mg/kg	0.10	98	70	130			
Selenium	3.91	mg/kg	0.10	98	70	130			
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: ICP203-B_140327A				03/28/14 05:01
Boron	0.147	mg/kg	0.10				5.0	30	
Selenium	ND	mg/kg	0.10					30	
Lab ID: B14031248-012AMS2	Sample Matrix Spike				Run: ICP203-B_140327A				03/28/14 05:09
Boron	4.04	mg/kg	0.10	98	70	130			
Selenium	4.19	mg/kg	0.10	97	70	130			
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP203-B_140327A				03/28/14 05:55
Boron	0.194	mg/kg	0.10				9.9	30	
Selenium	ND	mg/kg	0.10					30	
Lab ID: B14031248-022AMS2	Sample Matrix Spike				Run: ICP203-B_140327A				03/28/14 06:03
Boron	3.98	mg/kg	0.10	97	70	130			
Selenium	3.99	mg/kg	0.10	100	70	130			

Qualifiers:

RL - Analyte reporting limit. ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Project: Not Indicated

Report Date: 03/31/14

Work Order: B14031248

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**USDA27a**								Batch: R221435	
Lab ID:	**B14031248-001A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		49.6	%	0.10				0.6	20	
Lab ID:	**B14031248-011A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		45.0	%	0.10				3.6	20	
Lab ID:	**B14031248-021A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		40.6	%	0.10				0.2	20	
Lab ID:	**LCS-1403311051**	Laboratory Control Sample				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		37.1	%	0.10	98	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: ALAN KUHN ASSOC LLC   Work Order Number: 1403621   RcptNo: 1

Received by/date: 03/14/14

Logged By: Ashley Gallegos   3/14/2014 12:15:00 PM

Completed By: Ashley Gallegos   3/14/2014 12:47:27 PM

Reviewed By: 03/14/14

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐ — Not required
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐ — Not required
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ______ (<2 or >12 unless noted)
Adjusted? ______
Checked by: ______

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: ______ Date: ______
By Whom: ______ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: ______
Client Instructions: ______

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	13.1	Good	Not Present			

Chain-of-Custody Record

Client: ALAN KUHN ASSOCIATES

Mailing Address:

Phone #: (505) 350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush

Project Name: MT. TAYLOR MINE

Project #: BORROW Soil CHEMISTRY

Project Manager: ALAN KUHN

Sampler:

On Ice: ☐ Yes ☒ No

Sample Temperature: 13.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1403621	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
3-13-14	9:30	6"-12"	NA-01 (a+b)	2 Baggies	NONE	-001																
3-13-14	9:00	6"-12"	NA-02 (a+b)	2 Baggies	None	-002																
10-30-13	3:30	6-12"	BA-01 (a+b+c)	2 JAR + Bag		-003																
10-30-13	3:35	6-12"	BA-02 (a+b+c)	2 JARS + Bag		-004																
10-30-13	3:40	6-12"	BA-03 (a+b+c)	2 JARS + Bag		-005																
10-30-13	3:45	6-12"	BA-04 (a+b+c)	2 JARS + Bag		-006																
3-13-14	12:45	6-12"	BA-05 (A+B)	2 BAGS		-007																
10-30-13	3:20	6-12"	WTP-01 (a+b+c)	2 JARS + Bag		-008																
10-30-13	2:50	6-12"	WTP-02 (a+b+c)	2 JARS + Bag		-009																
10-30-13	3:15	6-12"	WTP-03 (a+b+c)	2 JARS + Bag		-010																
10-30-13	3:05	6-12"	WTP-04 (a+b+c)	2 JARS + Bag		-011																
						~~-012~~																

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/14/14	12:15	ED LOESCHE		03/14/14	1215
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: SEE WORK ORDER FOR TESTS

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: ALAN KUHN ASSOCIATES

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time:
☐ Standard ☐ Rush ______

Project Name: MT TAYLOR MINE BORROW SOIL Chemistry

Project #:

Project Manager: ALAN KUHN

Sampler:

On Ice: ☐ Yes ☒ No

Sample Temperature: 13.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1403621	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)						Air Bubbles (Y or N)
3-13-14	11:40	6-12"	WTP-06 (a+b)	2 BAGS	NONE	-01~~3~~2																	
3-13-14	11:35	6-12"	WTP-05 (a+b)	2 BAGS		-01~~4~~3																	
3-13-14	11:50	6-12"	WTP-07 (a+b)	2 BAGS		-01~~5~~4																	
3-13-14	12:15	6-12"	WTP-08 (a+b)	2 Bags		-01~~6~~5																	
3-13-14	9:00	6-12"	WTP-09 (a+b)	2 BAGS		-01~~7~~6																	
3-13-14	10:15	6-12"	WTP-10 (a+b)	2 BAGS		-01~~8~~7																	
3-13-14	10:35	6-12"	WTP-11 (a+b)	2 BAGS		-01~~9~~8																	
3-13-14	11:10	6-12"	WTP-12 (a+b)	2 BAGS		019 ~~020~~																	
3-12-14	9:00	6-12"	SWP-01 (a+b)	2 BAGS		-020 ~~021~~																	
3-12-14	9:10	6-12"	SWP-02 (a+b)	2 BAGS		-02~~2~~1																	
3-12-14	9:15	6-12"	SWP-03 (a+b)	2 BAGS		-02~~3~~2																	
3-12-14	9:30	6-12"	SWP-04 (a+b)	2 BAGS		-02~~4~~3																	

Date:	Time:	Relinquished by:	Received by:	Date	Time
3-14-14	12:15	Ed Wescher		03/14/14	1215
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: SEE WORK ORDER FOR TESTS

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: ALAN KUHN ASSOCIATES

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package: ☐ Standard ☐ Level 4 (Full Validation)

Accreditation ☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time: ☐ Standard ☐ Rush

Project Name: MT TAYLOR MINE BORROW SOIL Chemistry

Project #:

Project Manager: ALAN KUHN

Sampler:

On Ice: ☐ Yes ☒ No

Sample Temperature: 13.1

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1403621	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
10-31-13	9:00	6-12"	WP-01 (a+b+c)	2 JARS + BAG		-024																
10-31-13	9:10	6-12"	WP-02 (a+b+c)	2 JARS + BAG		-025																
10-31-13	9:15	6-12"	WP-03 (a+b+c)	2 JARS + BAG		-026																

Date:	Time:	Relinquished by:	Received by:	Date	Time
3-14-14	12:15	ED LOESCHER		03/14/14	1215
Date:	Time:	Relinquished by:	Received by:	Date	Time

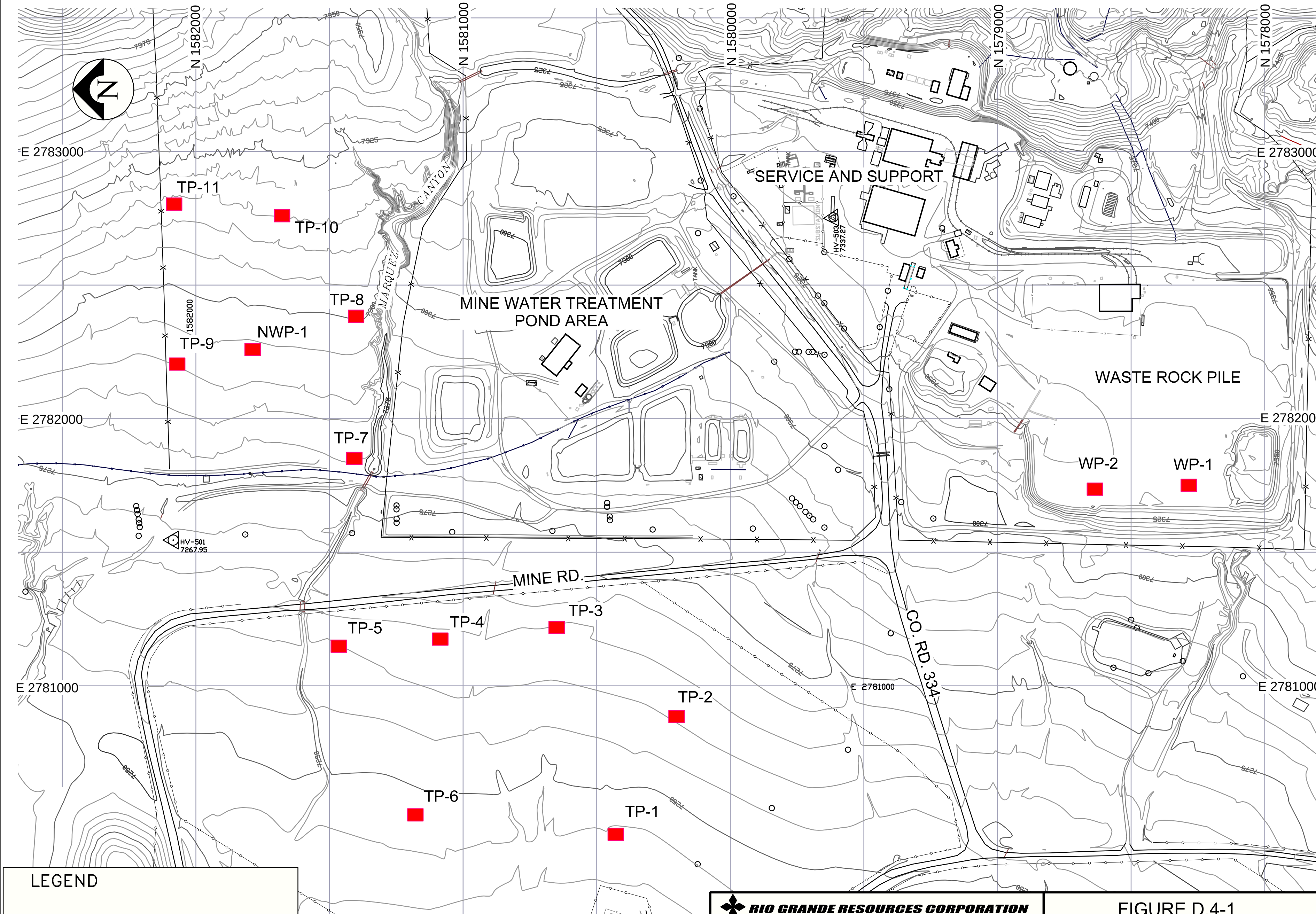
Remarks: SEE WORK ORDER

PARAMETERS	SAMPLE #S																							
	NA1	NA2	BA1	BA2	BA3	BA4	BA5	WTP1	WTP2	WTP3	WTP4	WTP5	WTP6	WTP7	WTP9	WTP10	WTP11	WTP12	SWP2	SWP3	SWP4	WP1	WP2	WP3
pH	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Ee mmhos/cm 25 C	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Saturation %	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Texture **	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
SAR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Selenium	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Boron	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Acid/Base Potential (Modified Sobek)					√			√	√														√	
Nitrate-NO, (N)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Phosphorus (P)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Potassium (K)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Rock Fragments																								
(% volume)																								
diameter in inches																								
3	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
3-10	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
10+	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Response No. 10 Attachment

Original (1998) Soil Data and Map for Borrow Area C

(Appendix D)



LEGEND

TEST PIT LOCATION

SITE BENCHMARK

0 250 500

SCALE IN FEET

RIO GRANDE RESOURCES CORPORATION

MOUNT TAYLOR MINE - San Mateo, NM 87020

Prepared By:

Alan Kuhn Associates LLC

FIGURE D.4-1

LOCATIONS OF TEST PITS FOR ORIGINAL CLOSEOUT PLAN

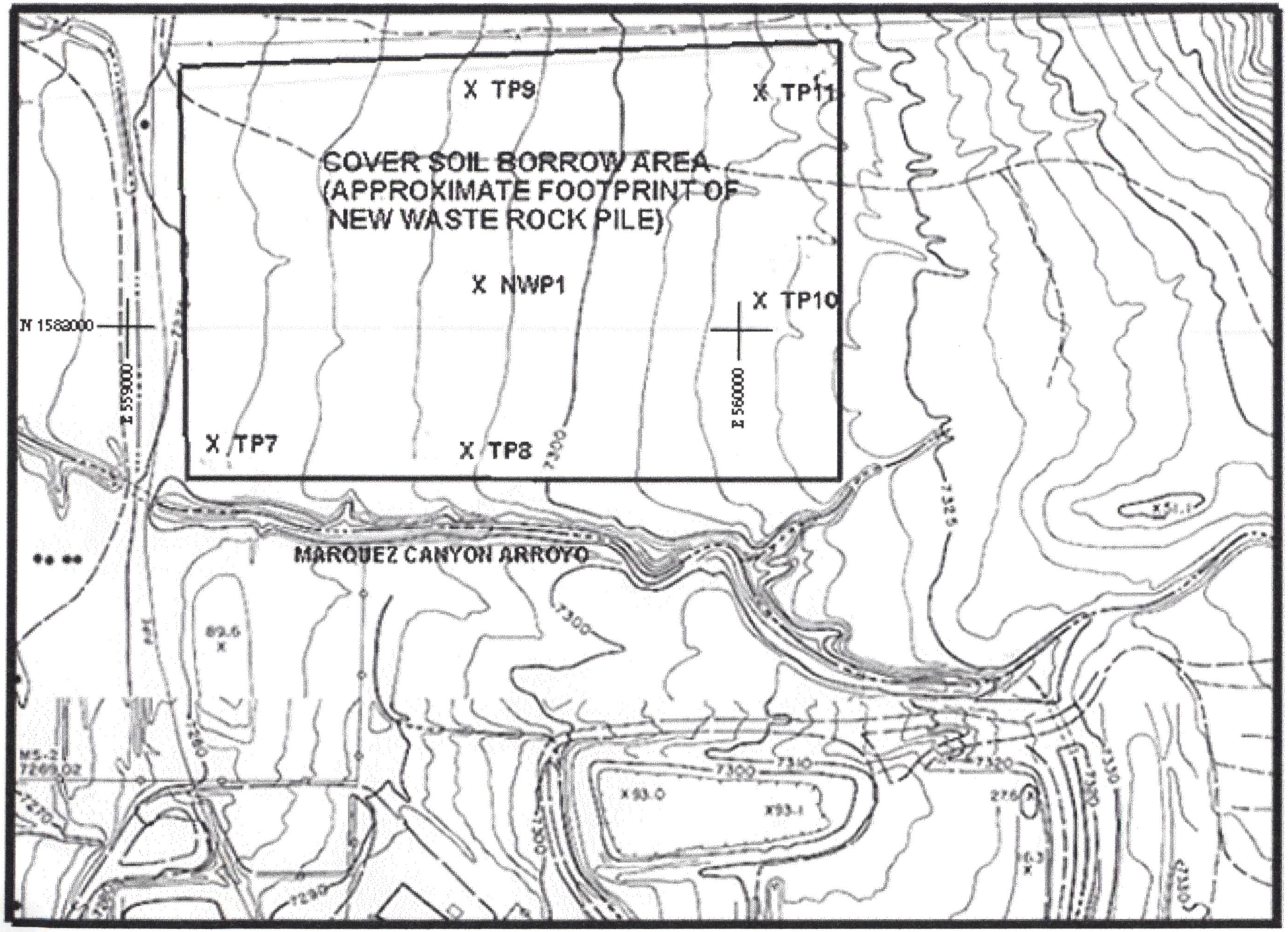


FIGURE A-1 LOCATIONS OF SOIL SAMPLES WITHIN DESIGNATED COVER SOIL BORROW AREA

V
&
A

Table D.4.1 Summary of Laboratory Test Data
(Original Closeout Plan Soil Data, Mt Taylor, December 1998)

Test Hole No.	Depth (Feet)	Unified Classi-fication	Natural Dry Density (pcf)	Natural Moisture Content (%)	Atterberg Limits		SIEVE ANALYSIS % PASSING BY WEIGHT										DESCRIPTION
					LL	PI	1½"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
TP1	-	-	-	-	38	18	-	-	-	-	-	100	99	96	79	66.4	CLAY, very sandy
TP2	-	-	-	-	28	11	-	-	100	99	98	97	96	91	60	45.3	SAND, very clayey
TP3	-	-	-	-	28	13	-	-	-	100	99	99	98	94	68	51.9	CLAY, very sandy
TP4A	-	-	-	-	39	21	-	-	-	-	100	99	97	94	80	69.4	CLAY, very sandy
TP4B	-	-	-	-	38	21	-	-	-	-	100	99	98	97	88	75.7	CLAY, very sandy
TP5	-	-	-	-	30	16	-	-	-	-	100	99	98	94	77	65.0	CLAY, very sandy
TP6	-	-	-	-	29	14	-	-	100	99	98	95	93	89	63	48.5	SAND, very clayey
TP7	-	-	-	-	38	21	-	-	-	-	100	99	96	92	76	67.3	CLAY, very sandy
TP8	-	-	-	-	37	20	-	-	-	-	100	99	97	94	78	63.3	CLAY, very sandy
TP9	-	-	-	-	44	26	-	-	-	-	-	100	99	97	90	79.5	CLAY, very sandy
TP10	-	-	-	-	34	19	-	-	-	100	99	99	98	95	82	72.8	CLAY, very sandy
TP11	-	-	-	-	44	25	-	-	-	-	-	100	99	97	90	80.3	CLAY, very sandy

Project No. 95-1-245
Table

Vinyard & Associates, Inc.
4415-D Hawkins, NE
Albuquerque, New Mexico 87109
(505) 345-1937
Geotechnical Engineering • Materials Testing • Environmental Engineering

November 6, 1995

AK GeoConsult, Inc.
13212 Manitoba Drive, NE
Albuquerque, NM 87111

Attn: Mr. Alan K. Kuhn, PhD, PE

Subject: Mt. Taylor Mine Soil Samples
V & A Project No. 95-1-245

Gentlemen:

Attached are copies of the Proctor, Sieve Analysis and Atterberg Limits Test Results for the Mt. Taylor Mine Soil Samples.

Should you have any questions regarding this data, please do not hesitate to call.

Sincerely,

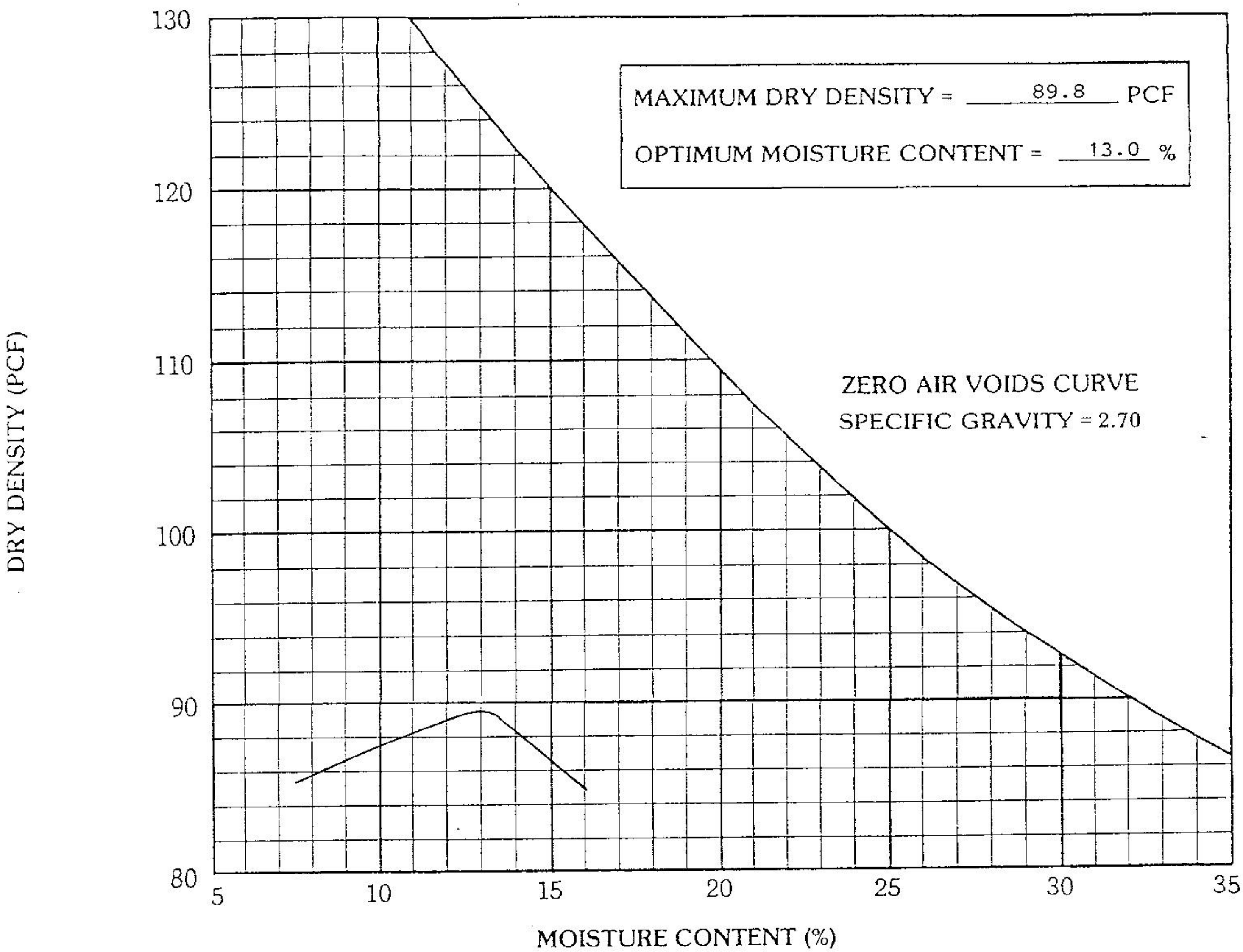
Martin D. Vinyard, PE

Attachments: Data Sheets (10)

cc: Addressee (1)

V & A

COMPACTION TEST RESULTS



SAMPLE LOCATION: TP-1

SOIL DESCRIPTION: CLAY, very sandy

UNIFIED SOIL CLASSIFICATION: (CL)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

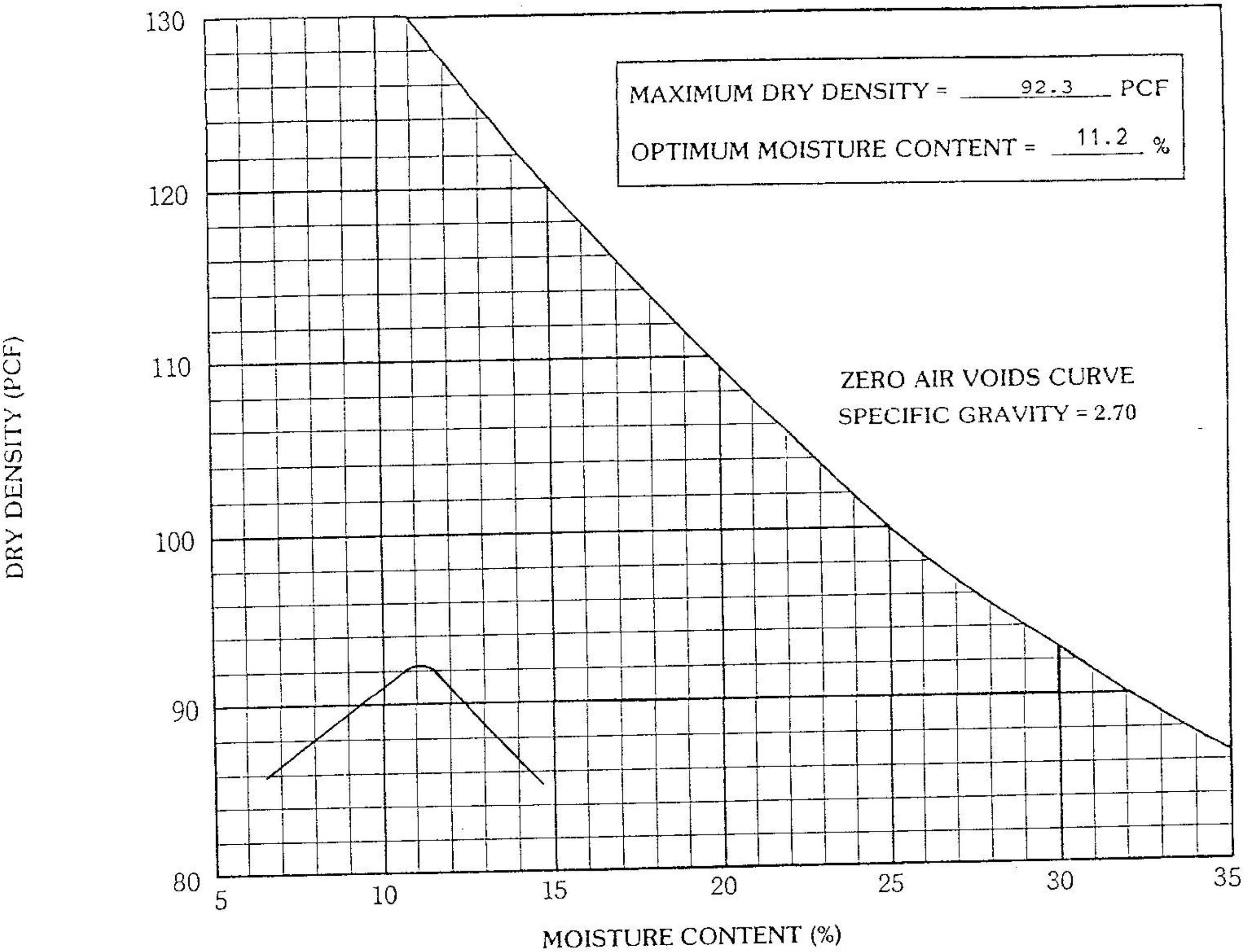
ATTERBERG LIMITS: LL 38 % PI 18 %

SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
					100	99	96	79	66.4

Project No: 95-1-245
Figure

V & A

COMPACTION TEST RESULTS



SAMPLE LOCATION: TP-4A

SOIL DESCRIPTION: CLAY, very sandy

UNIFIED SOIL CLASSIFICATION: (CL)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

ATTERBERG LIMITS: LL 39 % PI 21 %

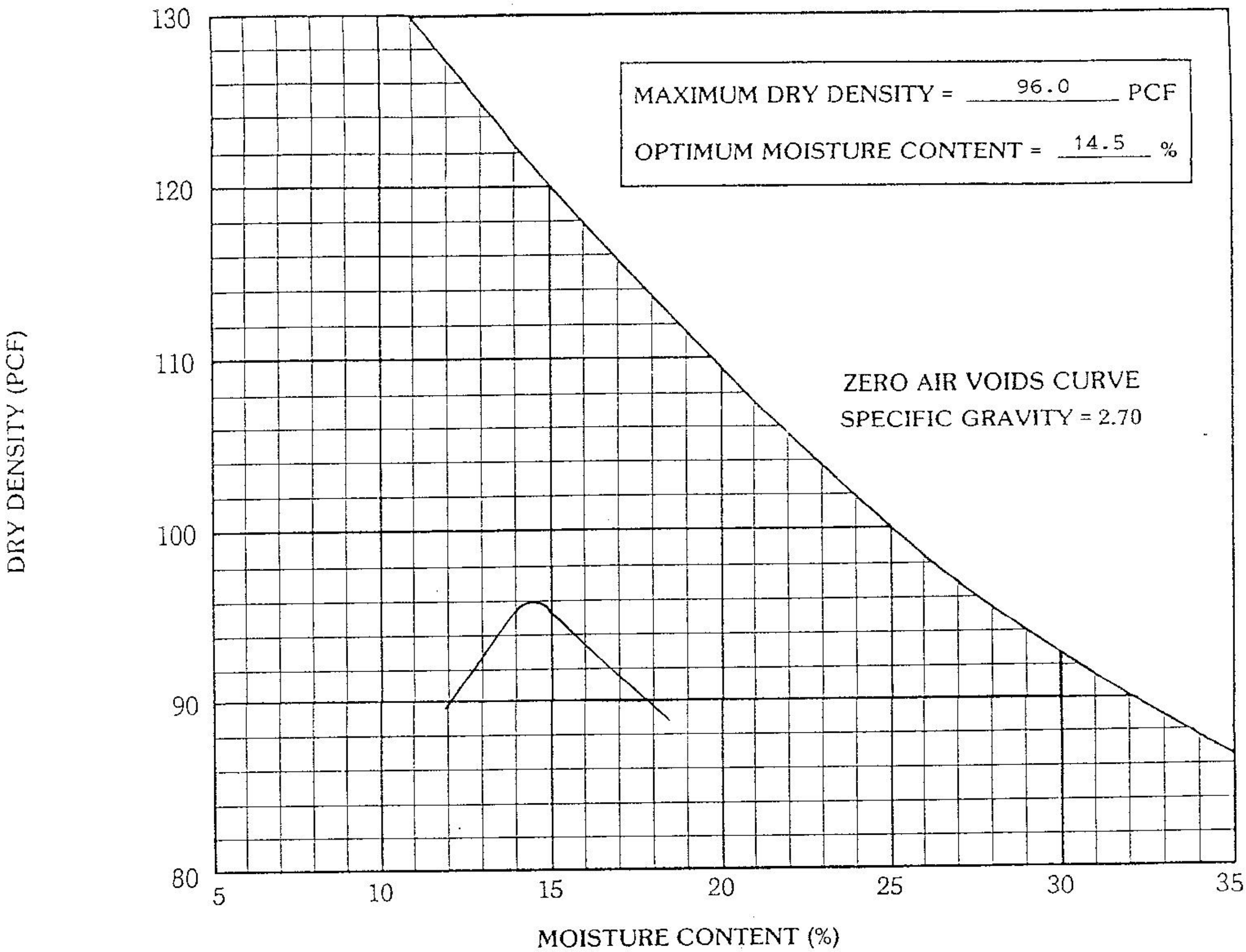
SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
				100	99	97	94	80	69.4

Project No: 95-1-245

Figure

V & A

COMPACTION TEST RESULTS



SAMPLE LOCATION: TP-6

SOIL DESCRIPTION: SAND, very clayey

UNIFIED SOIL CLASSIFICATION: (SC)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

ATTERBERG LIMITS: LL 29 % PI 14 %

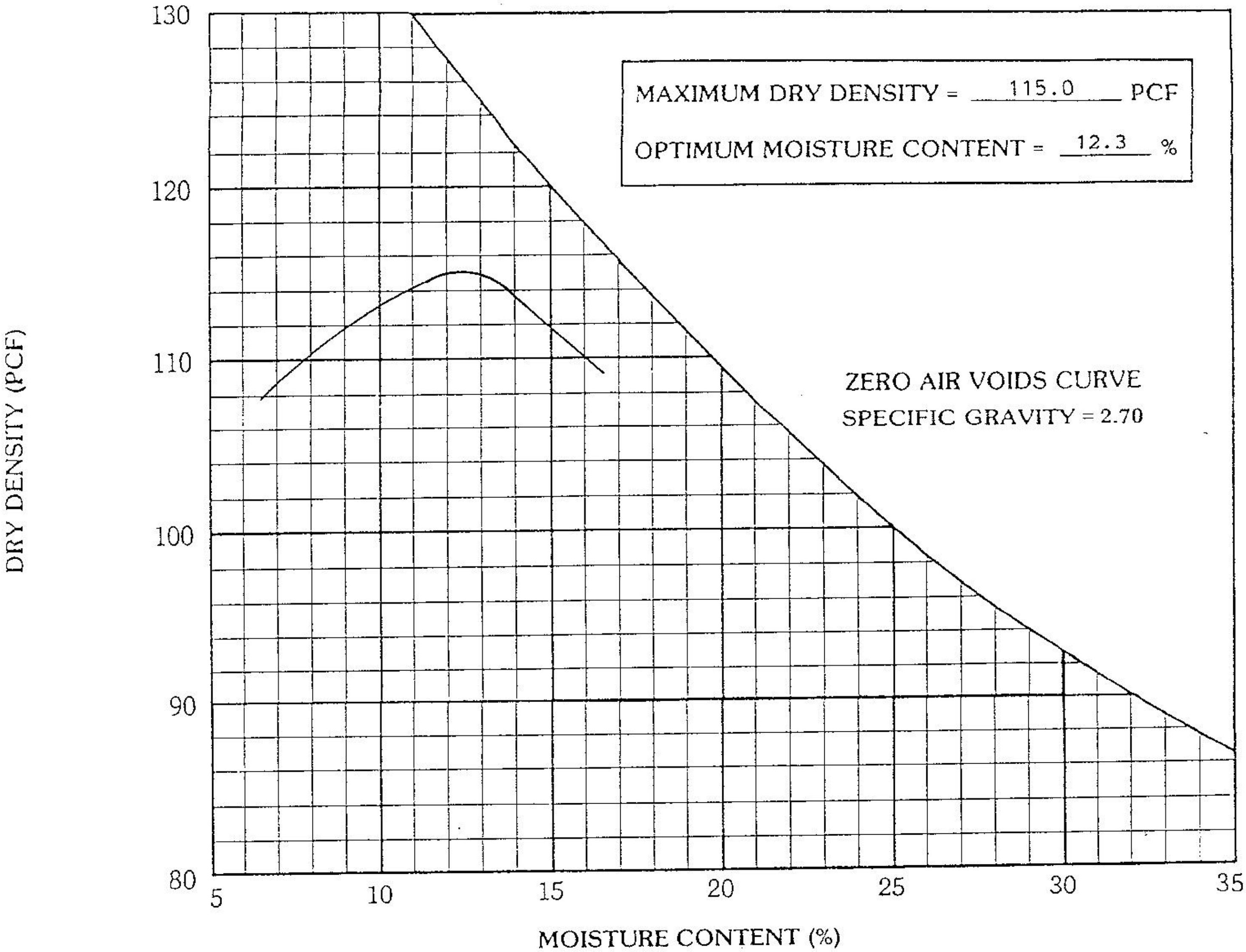
SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
		100	99	98	95	93	89	63	48.5

Project No: 95-1-245

Figure

V & A

COMPACTION TEST RESULTS



SAMPLE LOCATION: TP-7

SOIL DESCRIPTION: CLAY, very sandy

UNIFIED SOIL CLASSIFICATION: (CL)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

ATTERBERG LIMITS: LL 38 % PI 21 %

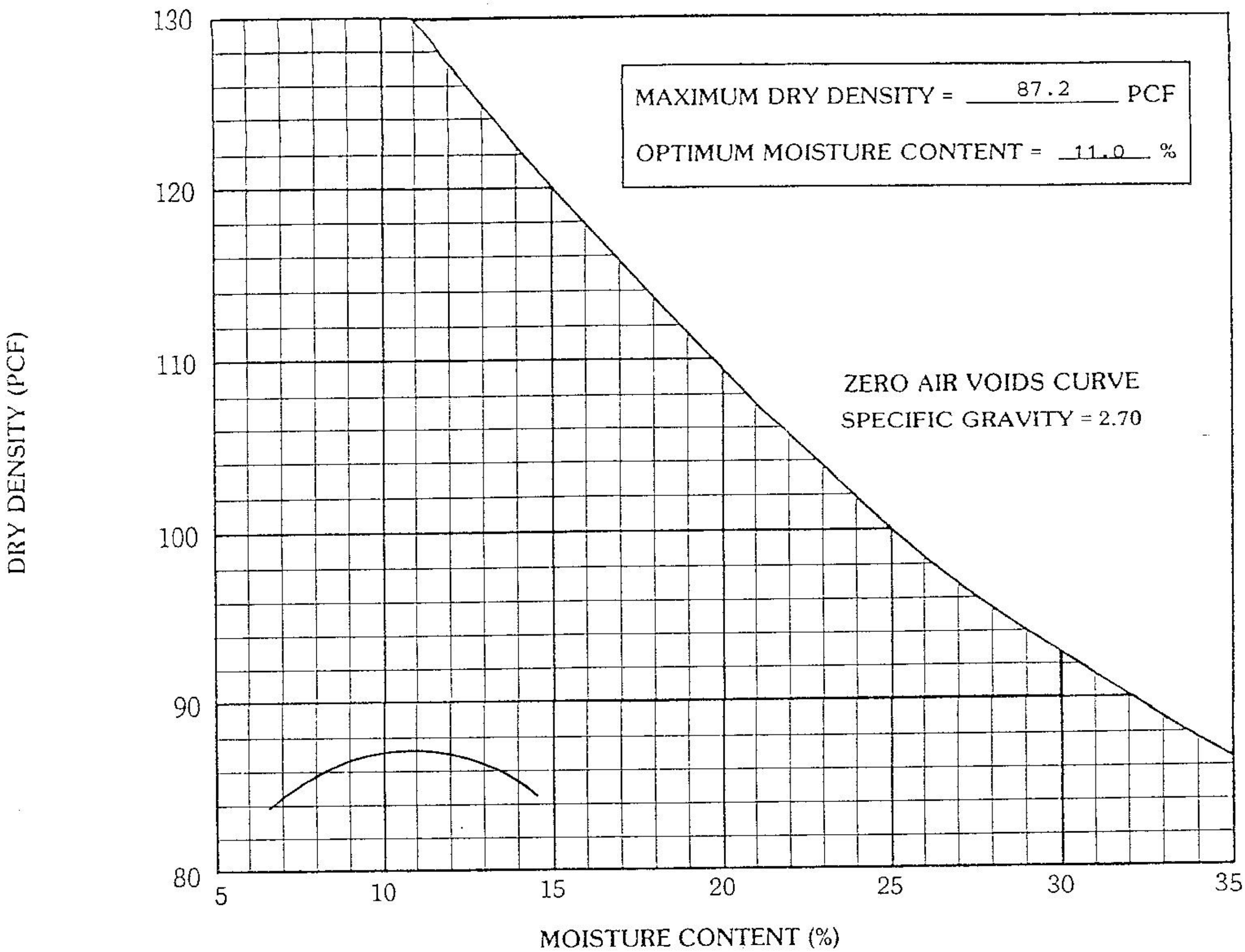
SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
				100	99	96	92	76	67.3

Project No: 95-1-245

Figure

COMPACTION TEST RESULTS

V & A



SAMPLE LOCATION: TP-8

SOIL DESCRIPTION: CLAY, very sandy

UNIFIED SOIL CLASSIFICATION: (CL)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

ATTERBERG LIMITS: LL 37 % PI 20 %

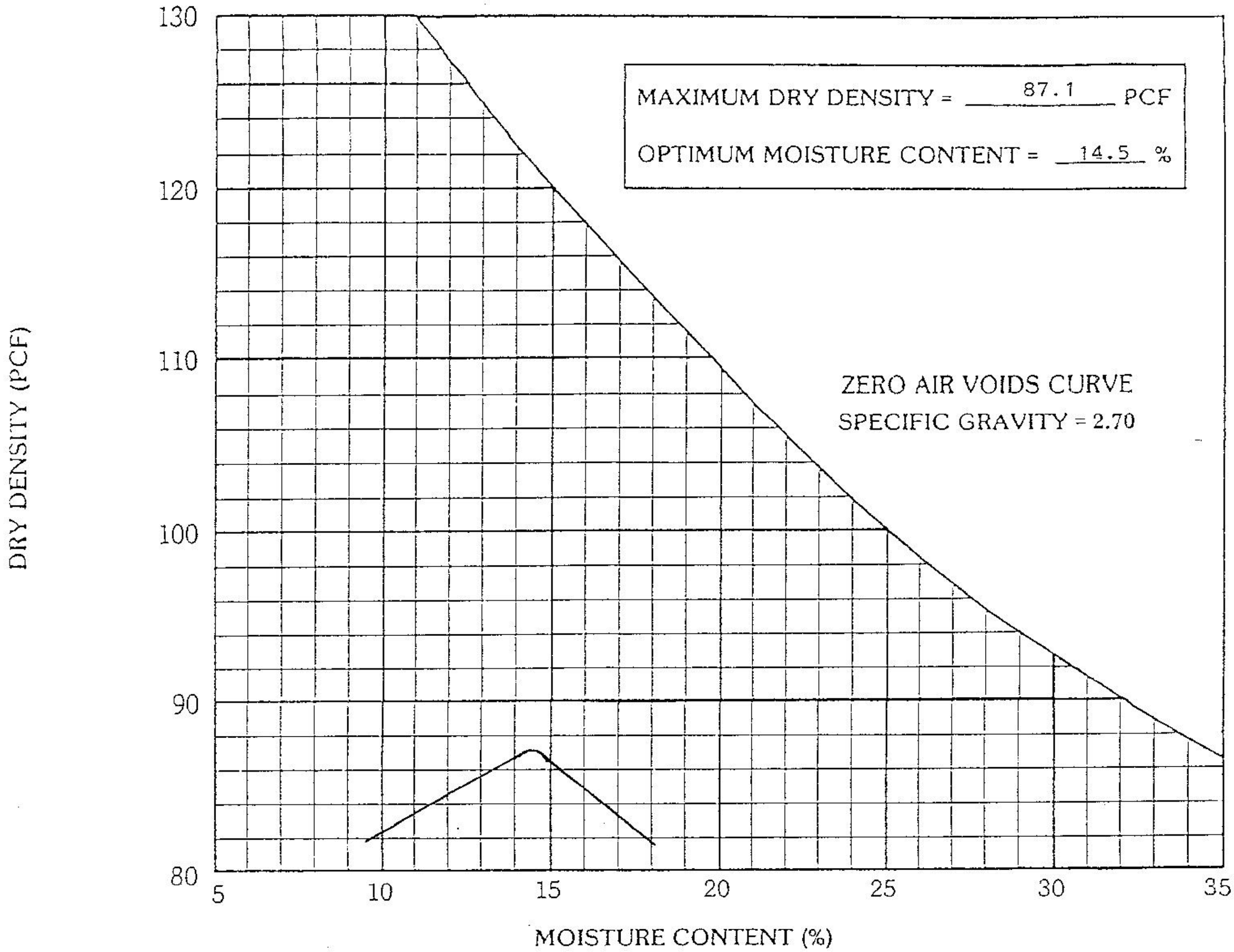
SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
				100	99	97	94	78	63.3

Project No: 95-1-245

Figure

V & A

COMPACTION TEST RESULTS



SAMPLE LOCATION: TP-9

SOIL DESCRIPTION: CLAY, very sandy

UNIFIED SOIL CLASSIFICATION: (CL)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

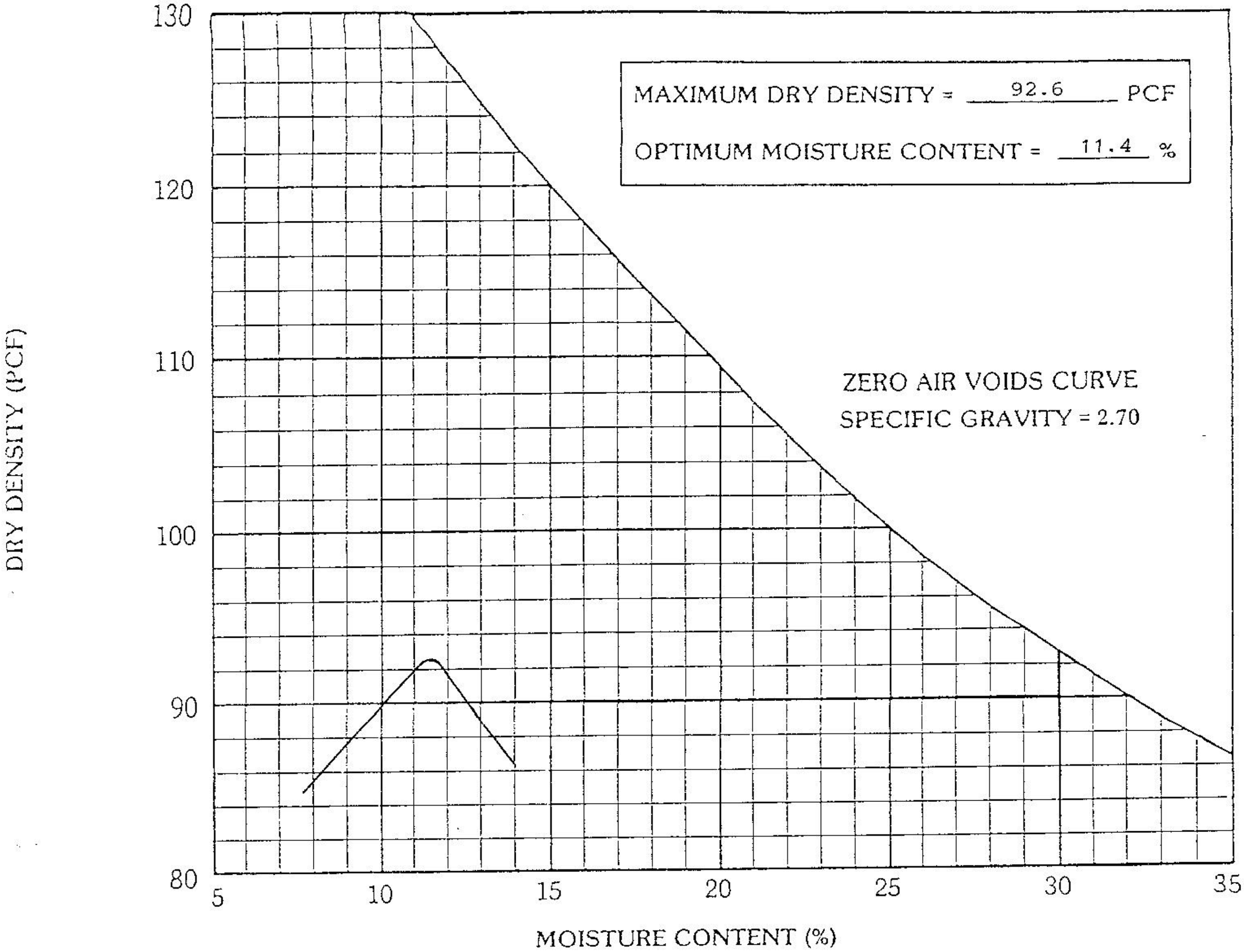
ATTERBERG LIMITS: LL 44 % PI 26 %

SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
					100	99	97	90	79.5

Project No: 95-1-245
Figure

V & A

COMPACTION TEST RESULTS



SAMPLE LOCATION: TP-10

SOIL DESCRIPTION: CLAY, very sandy

UNIFIED SOIL CLASSIFICATION: (CL)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

ATTERBERG LIMITS: LL 34 % PI 19 %

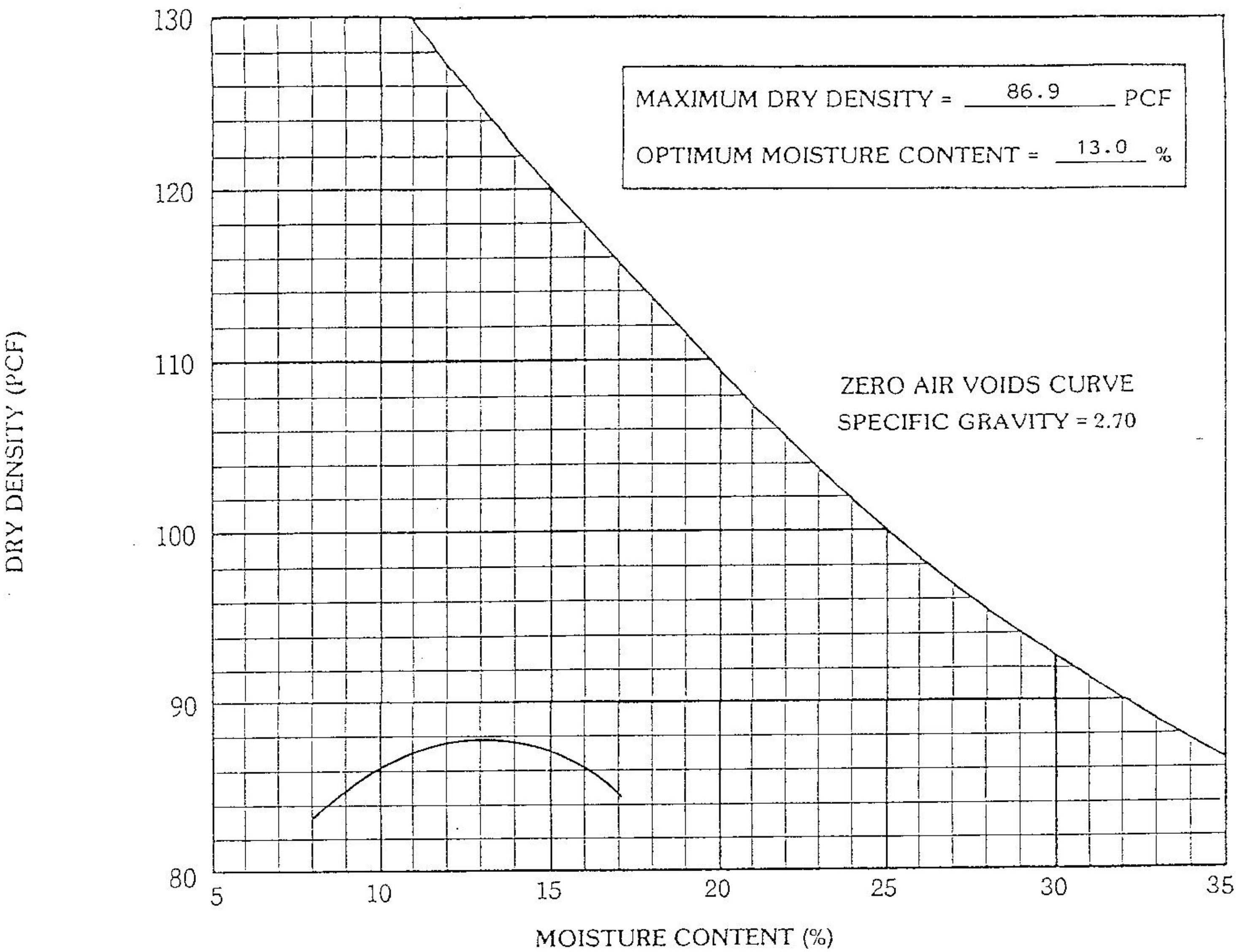
SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
			100	99	99	98	95	82	72.8

Project No: 95-1-245

Figure

V & A

COMPACTION TEST RESULTS



SAMPLE LOCATION: TP-11

SOIL DESCRIPTION: CLAY, sandy

UNIFIED SOIL CLASSIFICATION: (CL)

AASHTO SOIL CLASSIFICATION:

TEST METHOD: ASTM D-698

ATTERBERG LIMITS: LL 44 % PI 25 %

SIEVE ANALYSIS - % PASSING									
1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
					100	99	97	90	80.3

Project No: 95-1-245

Figure

V
&
A

SIEVE ANALYSIS TEST RESULTS

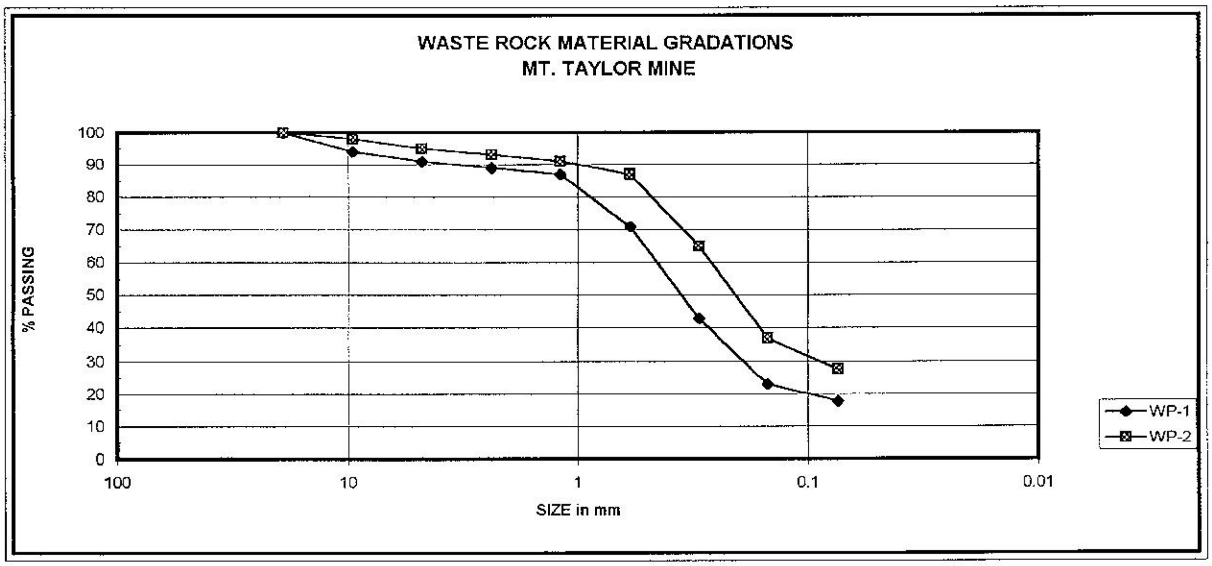
Sieve Size	Percent Passing Following Scalping over a 3/4" Sieve WP-1	WP-2
3/4"	100	100
3/8"	94	98
No. 4	91	95
No. 8	89	93
No. 16	87	91
No. 30	81	87
No. 50	43	65
No. 100	23	37
No. 200	17.8	27.7

WP-1	+ 3/4" material	= 2.7% of total sample weight
WP-2	+ 3/4" material	= 6.8% of total sample weight

WASTE ROCK CHARACTERISTICS
MT. TAYLOR MINE

SIZE GRADATIONS

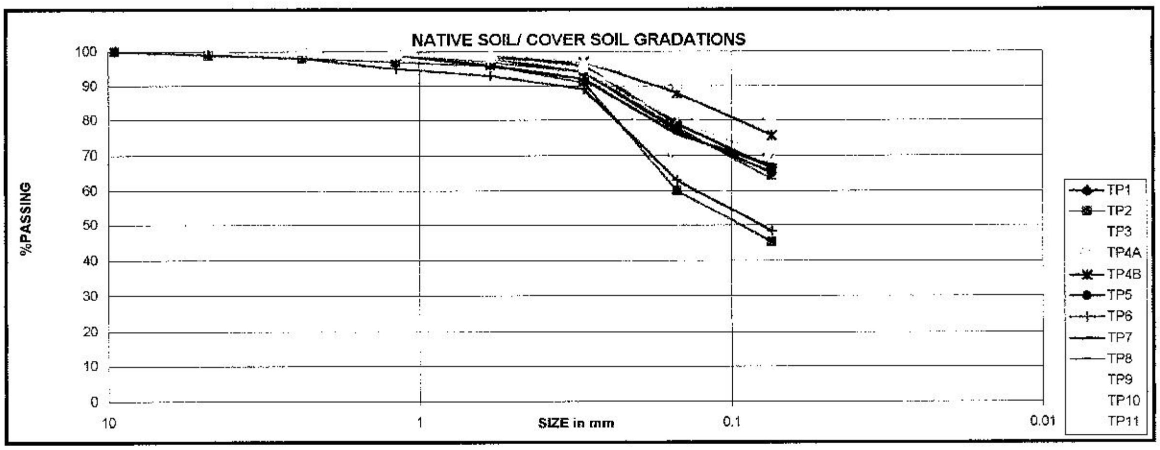
SIEVE #	SIZE in mm	% PASSING WP-1	WP-2
3/4"	19.1	100	100
3/8"	9.52	94	98
4	4.76	91	95
8	2.38	89	93
16	1.19	87	91
30	0.59	71	87
50	0.297	43	65
100	0.149	23	37
200	0.074	17.8	27.7



NATIVE SOIL - COVER SOIL CHARACTERISTICS
MT. TAYLOR MINE

SIZE GRADATIONS

SIEVE #	SIZE in mm	% PASSING FOR SAMPLE #:												
		TP1	TP2	TP3	TP4A	TP4B	TP5	TP6	TP7	TP8	TP9	TP10	TP11	AVERAGE
3/4"	19.1													
3/8"	9.52		100					100						100
4	4.76		99	100				99						99
8	2.38		98	99	100	100	100	98	100	100		100		99
16	1.19	100	97	99	99	99	99	95	99	99	100	99	100	99
30	0.59	99	96	98	97	98	98	93	96	97	99	98	99	97
50	0.297	96	91	94	94	97	94	89	92	94	97	95	97	94
100	0.149	79	60	68	80	88	77	63	76	78	90	82	90	78
200	0.074	66.4	45.3	51.9	69.4	75.7	65	48.5	67.3	63.3	79.5	72.6	80.3	65
USCS =		CL	SC	CL	CL	CL	CL	SC	CL	CL	CL	CL	CL	CL
LL =		38	28	28	39	38	30	29	38	37	44	34	44	36
PI =		18	11	13	21	21	16	14	21	20	26	19	25	19
d75 =		0.15	0.2	0.19	0.1	0.06	0.13	0.2	0.14	0.15	0.05	0.09	0.18	0.14

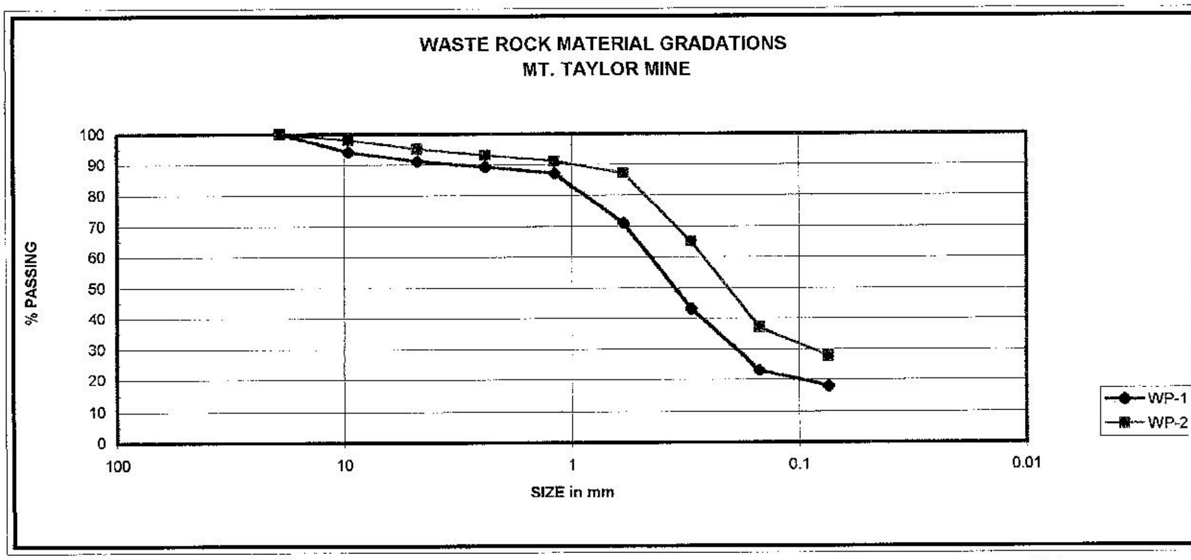


WASTE ROCK CHARACTERISTICS
MT. TAYLOR MINE

SIZE GRADATIONS

SIEVE #	SIZE in mm	% PASSING WP-1	WP-2	AVERAGE
3/4"	19.1	100	100	100
3/8"	9.52	94	98	96
4	4.76	91	95	93
8	2.38	89	93	91
16	1.19	87	91	89
30	0.59	71	87	79
50	0.297	43	65	54
100	0.149	23	37	30
200	0.074	17.8	27.7	23

d75 = 0.5mm
d50 = 0.3mm



Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client: Rio Grande Resources Corp.
Project: Mt. Taylor Mine
Sample ID: Composite
Lab ID: 0398S05459
Matrix:
Condition:

Date Received: 09/16/98
Date Reported: 09/17/98
Date Sampled: NG

Parameter	Analytical Result	Units		Units
PH	9.2	s.u.		
Solids - Total Dissolved	170	mg/L		
Nitrogen - Nitrate	0.17	mg/L		
Sulfate	11	mg/L		
Arsenic	0.013	mg/L		
Cadmium	<0.004	mg/L		
Chromium	<0.01	mg/L		
Iron	0.92	mg/L		
Lead	<0.05	mg/L		
Molybdenum	0.02	mg/L		
Selenium	0.034	mg/L		
Zinc	0.10	mg/L		

Reference: EPA - "Methods for Chemical Analysis of Water and Wastes (MCAWW)" - EPA/600/4-79-020 - March, 1983.

Reviewed By: ____________

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client: Rio Grande Resources Corp.
Project: Mt. Taylor Mine
Sample ID: WP #3 NW
Lab ID: 0398S04751
Matrix: Soil
Condition: Cool/Intact

Date Received: 08/20/98
Date Reported: 09/17/98
Date Sampled: 08/19/98
Time Sampled: 1000

Parameter	Analytical Result	Units	Units
Sulfur forms - Total	0.00	%	
Acid Base-TS	0.0	t/kt	
Neutralization Potential (NP)	10	t/kt	
Acid Base Potential-TS	10.2	t/kt	

Reference:

Reviewed By: ____________________

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**Rio Grande Resources Corp.**		
Project:	**Mt. Taylor Mine**		
Sample ID:	WP #1 SW	**Date Received:**	08/20/98
Lab ID:	0398S04749	**Date Reported:**	09/17/98
Matrix:	Soil	**Date Sampled:**	08/19/98
Condition:	Cool/Intact	**Time Sampled:**	0930

Parameter	Analytical Result	Units		Units
Sulfur forms - Total	0.01	%		
Acid Base-TS	0.31	t/kt		
Neutralization Potential (NP)	30	t/kt		
Acid Base Potential-TS	29.9	t/kt		

Reference:

Reviewed By: ____________________

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client: Rio Grande Resources Corp.
Project: Mt. Taylor Mine
Sample ID: WP #2 Center
Lab ID: 0398S04750
Matrix: Soil
Condition: Cool/Intact

Date Received: 08/20/98
Date Reported: 09/17/98
Date Sampled: 08/19/98
Time Sampled: 0945

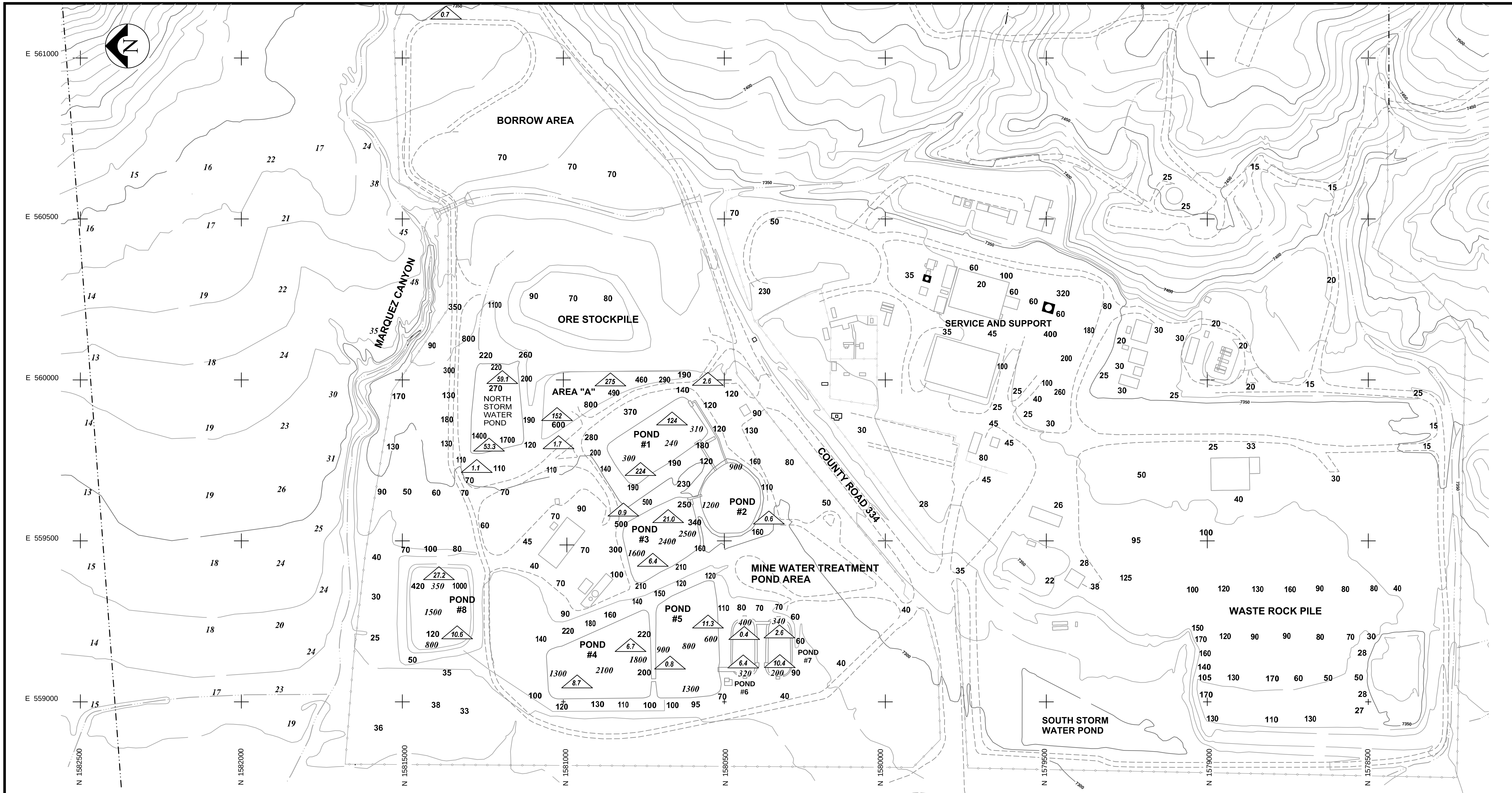
Parameter	Analytical Result	Units		Units
Sulfur forms - Total	0.03	%		
Acid Base-TS	0.94	t/kt		
Neutralization Potential (NP)	24	t/kt		
Acid Base Potential-TS	23.1	t/kt		

Reference:

Reviewed By: ____________________

Response No. 10 Attachment

Gamma and Soil Radium Sample Location Map for Borrow Area C



LEGEND

(triangle) 000	SOIL RADIUM READINGS (pCi/g) (Ra 226 IN 0–6 INCHES)
21	GAMMA READINGS APRIL 2012
38	GAMMA READINGS MAY 2002

NOTES

1. ALL SAMPLING LOCATIONS APPROXIMATE
2. SOIL SAMPLING IN MINE WATER TREATMENT PONDS APRIL 10, 2012
3. GAMMA RAY SURVEY MAY 23, 2002 READINGS IN uR/hr BACKGROUND +OR– 18 uR/hr
4. GAMMA RAY SURVEY APRIL 10, 2012 READINGS IN uR/hr BACKGROUND +OR– 12 uR/hr INSTRUMENT: Eberline PRM-7 #182,

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
A	2012 UPDATE	7-23-12	EL	AK	

RIO GRANDE RESOURCES CORPORATION
MOUNT TAYLOR MINE - Grants, NM 87020

Prepared By: Alan Kuhn Associates LLC	SIZE B	SCALE: 1"=300'
	DWG NO.	MT12-CL-03

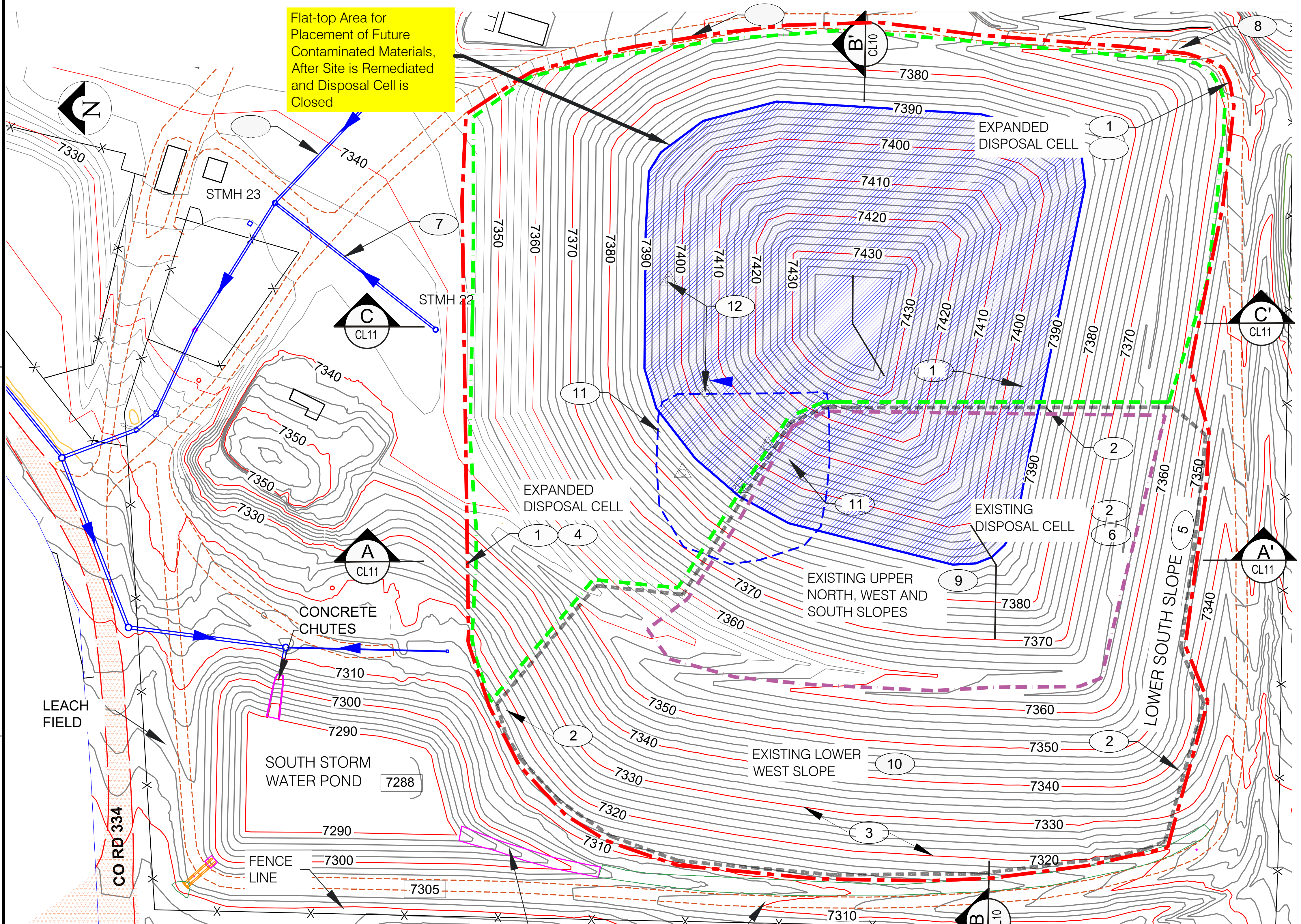
PROJECT TITLE: **MT. TAYLOR MINE CLOSEOUT/CLOSURE PLAN**

SHEET TITLE: Gamma And Soil Radium Sample Locations

REV A

Response No. 13 Attachment

Drawing of Location of Small Containment Cell After Closure of Primary Disposal Cell



NOTES:

1. EXPANDED DISPOSAL CELL. (SEE NOTE G.3)
2. WASTE ROCK PILE AND DISPOSAL CELL AS OF DECEMBER 2021 - (11.5 ACRES)
3. WASTE ROCK PILE SLOPES = 5H TO 1V
4. ALL NEW SLOPES = 24" THICK CLAY COVER (RADON BARRIER) AND 24" LOAM COVER (GROWTH MEDIA)
5. LOWER SOUTH SLOPE = CONSTRUCTED WITH CLEAN SOILS (NO COVER NEEDED).
6. EXISTING DISPOSAL CELL WITH 1' THICK CLAY LINER.
7. STORM DRAINAGE PIPES AND MANHOLES
8. EXISTING SERVICE ROADS
9. THE EXISTING UPPER NORTH, WEST AND SOUTH SLOPE COVER SOILS = 24" OF GROWTH MEDIA SOIL OVER 24" CLAY RADON BARRIER. (AS OF FEBRUARY 2022 THERE IS 18" GROWTH MEDIA OVER 24" CLAY)
10. THE EXISTING LOWER WEST SLOPE COVER SOILS = 18" OF GROWTH MEDIA SOIL OVER 24" CLAY RADON BARRIER. (AS OF FEBRUARY 2022 THERE IS 12" GROWTH MEDIA OVER 24" CLAY)
11. BURIED LAGOON AREA. FILL OVER THIS AREA IF NEEDED.
12. LAGOON MONITORING WELLS WILL BE ABANDONED AS APPROVED BY NMED.

LEGEND

- EXISTING CONTOURS
- 10' INTERVAL CONTOURS
- SERVICE ROADS
- DRAINAGE PIPES
- EXISTING DISPOSAL CELL (CLAY LINED)
- EXPANDED DISPOSAL CELL (CLAY LINED)
- EXISTING WASTE ROCK / DISPOSAL CELL (11.5 ACRES)
- WASTE ROCK PILE / DISPOSAL CELL FULL BUILDOUT (25 ACRES)
- BURIED LAGOON AREA

GENERAL NOTES:

G.1 FOR CONSTRUCTION, PLACEMENT, AND MATERIAL REQUIREMENTS SEE PROJECT EARTHWORK SPECIFICATIONS.

G.2 EXISTING SITE TOPOGRAPHY BASED ON SURVEY DATA BY S3 PERFORMED NOVEMBER 2020. CONTOUR INTERVALS = 2' VERTICAL.

G.3 EXPANSION OF THE DISPOSAL CELL TO 25 ACRES IS SHOWN FOR INFORMATION PURPOSES ONLY, ACTUAL SIZE AND SHAPE OF THE FINAL DISPOSAL CELL WILL DEPEND ON THE AMOUNT OF MINE DEBRIS AND CONTAMINATED SOILS ENCOUNTERED IN THE SITE CLEAN UP.

REV	DESCRIPTION	DATE	DRAWN BY	ENGINEER	APPROVED
A		11-3-23			

RIO GRANDE RESOURCES CORP.
MOUNT TAYLOR MINE - *San Mateo, NM*

Prepared By:
Drawn By:
PRINT SIZE: B
SCALE: As Shown

MT. TAYLOR MINE
2022 CLOSEOUT / CLOSURE PLAN

SHEET TITLE: FINAL GRADING PLAN - EXPANDED DISPOSAL CELL

SHEET NO. **CL 09b**
DWG NO.
REV

Response No. 16 Attachment

SPECIFICATION No. MW-CB01-00

EARTHWORK FOR POND RECONSTRUCTION
PHASE 1 REACTIVATION

SPECIFICATION No. MW-CB01-00

EARTHWORK FOR POND RECONSTRUCTION

PHASE 1 REACTIVATION

MOUNT TAYLOR MINE
CIBOLA COUNTY, NEW MEXICO

RIO GRANDE RESOURCES CORP.

REVISION 0

JANUARY, 2018

Prepared by

Alan Kuhn Associates, LLC

TABLE OF CONTENTS

LIST OF DRAWINGS

1. GENERAL

1.1 Project Description

Rio Grande Resources Corporation (RGR) is reactivating the Mount Taylor Mine that has been inactive since 1990. This underground uranium mine is located 1/2 mile northeast of the Village of San Mateo, Cibola County, New Mexico in Section 24, T13N, R8W, NMPM. The mine is accessible from New Mexico State Route 605, 23 miles north of Milan, NM.

As part of the reactivation activities and to satisfy current environmental standards and permit requirements, RGR will upgrade certain facilities including:

- Pond # 2, part of the Mine Water Treatment Unit (MWTU)
- Pond # 3, part of the Mine Water Treatment Unit (MWTU)
- South Storm Water Pond (SSWP)
- North, west and south slopes of the waste rock pile
- Initial portion of the waste disposal cell on the waste rock pile
- Storm water collection and drain pipes, culverts, manholes, and ditches
- Sanitary septic leach field

MWTU ponds will be lined with a three-part liner system consisting of two HDPE membranes (primary and secondary liners) and an HDPE geonet leak detection/drainage layer between the two membranes. Existing inlet and outlet hydraulic control structures will be upgraded with repairs and addition of concrete curbs and aprons for connection of geomembrane liners.

The SSWP will receive a clay liner constructed of locally available native clay soils selected by the Owner. When this liner is completed, a new inlet structure, an overflow structure, and a sediment/oil separator will be constructed.

To enlarge the SSWP, the existing pond will be deepened, its east side will be extended eastward and its north side will be extended northward, requiring abandonment of the existing leach field, which will be replaced with a new leach field. The north and west slopes of the waste rock pile will be reduced to 5H:1V slope to enable SSWP construction.

Contaminated sediment and soil will removed from MWTU ponds, the 0re pad runoff retention pond, and the SSWP, and ore and contaminated soil will be removed from the ore pad. The removed materials will be placed in the waste disposal cell on the top of the waste rock pile.

The storm water on a portion of the site is collected in storm water drains and presently discharged to the SSWP and Pond #2. Discharge of storm water presently going to Pond #2 will be redirected to the SSWP by changes to the storm water drain along the south side of the county road (#334) and addition of drain pipe, catch basins, and manholes.

1.2 Included Work

Include Work covered in this specification consists of:

a) Supply and mobilize/demobilize earthwork and supporting equipment.
b) Excavate and grade the north and west slopes of the mine waste pile to 5H:1V.
c) Construct the mine debris pit and the contaminated sediment disposal cell on the waste pile.
d) Remove mine debris exposed in waste pile excavation and place in the pit within the waste pile

e) Place the clay liner in the waste disposal cell, after the debris pit has been closed.
f) Excavate contaminated sediments from SSWP, the MWTU area and pond basins, including slopes, and place them in the waste pile disposal cell,
g) Excavate ore and contaminated sediment from the ore pad and dispose in the disposal cell.
h) Prepare the final pond #2 and #3 slopes and bottoms by excavation and fill to the design lines and grades
i) Place clay liner in the SSWP and clay underliner in MWTU ponds #2 and #3
j) Place soil cover on the disposal cell and waste pile.
k) Perform finish grading and ditching for improvement and maintenance of existing roads on site.
l) Support construction of new concrete hydraulic control structures, and
m) Support the HDPE liner contractor installing geomembrane liners in the MWTU ponds.

Related Work Performed by Others

- Radiological surveys and monitoring
- HDPE liner installation by a qualified subcontractor approved by the Owner
- Quality Control testing for earthwork..
- Initial and final land surveys of pond locations, lines, and grades.

1.3 Responsibilities

Rio Grande Resources Corporation (RGR), the "Owner", will evaluate bids and award all contracts for the Included Work (Section 1.2) and Related Work, will provide controlled access to the work site, will make construction water available at a location on the property, and will approve and make payment for work performed under this specification.

Alan Kuhn Associates (AKA), the "Engineer", will review or inspect and advise the Owner on the acceptance of the Included Work.

Contractor shall provide all equipment, materials, labor and supplies and perform all work necessary to accomplish the Included Work. Contractor shall be responsible for the safety of its job site and of all personnel and equipment that it employs on the job site.

Quality Control Contractor (QCC) contracted by the Owner will observe, measure, sample and perform soil tests to document the Contractor's compliance with this specification and the drawings. The Land Surveyor contracted by the Owner will establish local ground control for the Contractor to use in achieving the required lines, grades, and dimensions of the work.

The Radiological Consultant, an independent contractor to the Owner, will provide radiological survey and worker radiological health and safety support during removal and disposal of ore, pond sediments, and contaminated soil.

1.4 Definitions

Anchor trench – a shallow trench around the perimeter of a geomembrane-lined pond in which the outer end of the liner and backfill are placed to secure the liner.

Contaminated sediment: Soil and solid chemical precipitate containing radium concentrations above 6.8 pCi/g deposited from mine water during prior mine operations.

Compactors, heavy: Self-propelled or towed compaction machinery including rubber-tired rollers, tamping foot (sheep's foot) rollers, and smooth drum vibrating compactors weighing in excess of 5000 lbs. and controlled by mounted operator.

Compactors, light: Vibrating or tamping compactors weighing less than 5000 lbs. and controlled by a walk-behind operator.

Disposal cell: The area on the waste rock pile designated for disposal of radiologically contaminated soil and pond sediment.

Fines: Mineral particles (soil or tailings) passing the #200 U.S. Standard sieve; i.e. smaller than 0.075 mm grain size.

Foreign material: Any solid material that is not natural soil. Includes wood, iron and steel, plastic, rubber, glass, ceramic and concrete.

HDPE: High-density polyethylene geosynthetic material

Hydraulic control structure: Concrete or steel structure within the limits of the pond used to control water movement into or out of the pond

Job site: The location of the ponds as well as all access routes, borrow areas, equipment laydown locations and storage areas on Owner property used in Included Work.

Leak Detection and Collection System (LDCS): A sump and riser pipe hydraulically connected to the middle layer (geonet) of the geomembrane liner, used to monitor and removal water that leaks through the top liner.

Liner: A man-made barrier with very low permeability that blocks liquid flow from the evaporation pond, composed of natural or synthetic materials

Mine Water Treatment Unit (MWTU): Facilities located north of County Road 334 that receive, detain, treat and transfer mine water and other on-site water prior to discharge from the mine site.

Native soil, natural soil: Naturally-occurring alluvial or residual soils existing below and at ground surface around the job site; consisting of gravel, sand, silt and clay materials.

Rip rap (also riprap): Well- graded mixture of rock, broken concrete, or other durable material, dumped or hand placed to prevent erosion, scour, or sloughing due to surface water flow.

Sand: Mineral particles with grain sizes between #200 and #4 sieve (0.075 mm to about 5 mm).

Soil classification: Soil descriptions based on grain size distribution and plasticity in accordance with the Unified Soil Classification System (USCS). Classifications of soils in the pond area are:

GW – well-graded gravel

SW – well-graded sand

SP – poorly-graded sand with less than 5% fines

SM – silty sand composed of 12-50% silt fines and 50% more sand

SC – clayey sand composed of 12-50% clay fines and 50% more sand

SP-SM – sand with 5-12% silty fines

ML – more than 50% fines that classify as silt, according to reference b, and liquid limit less than 50

MH – same as ML except liquid limit 50 or more

CL – more than 50% fines that classify as clay, according to reference b, and liquid limit less than 50

CH – same as CL except liquid limit 50 or more

1.5 References

ACI Standard 318-11 Building Code Requirements for Structural Concrete and Commentary

ACI 350-06 Code Requirements for Environmental Engineering Concrete Structures

ASTM C39 / C39 –16 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

ASTM C94 / C94M - 15b Standard Specification for Ready-Mixed Concrete

ASTM-C150 Standard Specification for Portland Cement

ASTM C33 / C33M –16 Standard Specification for Concrete Aggregates

ASTM D422 - 63(1998) Standard Test Method for Particle-Size Analysis of Soils

ASTM D698-12e2 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lb/ft3 (600 kN-m/m3))

ASTM D2922 - 04 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

ASTM D3017 - 04 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

ASTM D4318-10e1 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

ASTM D4994-07 Standard Practice for Evaluation of Rock to be Use for Erosion Control

ASTM D5084 - 03 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall

National Engineering Handbook, Part 642 National Standard Material Specifications, Chapter 3, Material Specification 523—Rock for Riprap

1.6 List of Drawings

Drawings listed on the attached table “LIST OF DRAWINGS, EARTHWORK FOR POND RECONSTRUCTION” are incorporated into this specification by reference.

2 EXECUTION

The Contractor shall procure the equipment and materials necessary for all earthwork required by this specification and shall make them available on the work site when needed. The estimated quantities of materials are listed on the Bid Schedule, Rev. 0.

The Contractor shall perform the following work.

2.1 Site Preparation

The Contractor shall remove vegetation and foreign material from the areas of excavation and fill, as shown on the drawings, and dispose of non-salvaged material in the designated disposal area as directed by the Owner. Any pieces of foreign material that are too small to be individually handled by earthmoving equipment shall be removed by hand or excavated with the surrounding soil and placed in the disposal area.

The Contractor shall determine and mark the locations of buried utilities and other objects that could be damaged or disturbed by earthwork activities. Markings shall be made with bright-colored tape, paint, or barriers that will remain in place for the duration of the earthwork.

Prior to mobilization to the site, the Contractor shall have a Surface Water Pollution Prevention Plan (SWPPP) prepared by or under the direction of a Qualified SWPPP Developer and in accordance with EPA 833-B-09-002, *Developing Your Stormwater Pollution Prevention Plan.*

2.2 Waste Pile

2.2.1 Waste Pile Slopes

Before other excavation is initiated, the Contractor shall excavate and grade the north, west, and south slopes of the mine waste pile, as shown on Drawings GSSW-CB101-0 and GSSW-CB104-0, to reduce surface grades to 5H:1V. The excavated mine waste materials, consisting of waste rock (weathered rock and soil-size materials) as well as non-earth mine debris (broken concrete, metal, plastic, and timbers removed from the mine) shall be moved from the slopes to the top surface of the pile. Mine debris removed from the slopes shall be buried in a pit excavated into the waste rock, as described in Section 2.2.2 below. The finished 5H:1V slope surfaces shall be free of mine debris.

After the waste pile slopes have been re-shaped, the contractor shall place not less than 2.0 feet of clean soil cover on the re-shaped slope surfaces. Soil for this cover shall have USCS classification of CL, CH or SC may be obtained from the shaft muck pile located on the southwest corner of the waste pile, as shown on Drawing GSSW-CB104-0, and from other locations on the mine site approved by the Owner. The soil cover shall be placed in loose lifts of not more than eight (8) inches and compacted to not less than 90% maximum dry density per ASTM D 698. The top lift may include rock fragments up to three (3) inches.

2.2.2 Mine Debris Pit

In addition to waste rock removed from the mine, the waste pile contains debris consisting of timber, concrete, metal and plastic of various sizes and shapes that was removed from the mine and scattered throughout the waste pile. During excavation of the waste pile slopes to achieve design grade, mine debris will be encountered at and above the design grades of the waste pile.

Mine debris exposed during excavation of the waste pile slopes shall be removed for disposal in a pit to be located within the footprint of the waste disposal cell and below the bottom elevation of the clay liner of the disposal cell. The pit shall be no deeper than 10 feet below the base elevation of the clay liner unless approved by the Owner, and the southwest corner of the pit shall be at the southwest corner toe of the inside slope of the waste cell berm (see Drawing GSSW-CB104-00, Sheet SW06). The pit shall be expanded east and north from that point and shall be progressively excavated as needed to contain the mine debris. The area of the pit will depend on the amount of debris encountered, but the initial pit area is estimated to be 50 feet by 50 feet.

Mine debris shall be placed in the pit in loose lifts not to exceed 5.0 feet in depth. After a lift is placed, it shall be flooded with CLSM (flowable fill) per Section 2.4.1 of Specification GS-GC01-00. Each lift shall be covered with excavatable flowable fill (CLSM), which shall be left undisturbed for at least 24 hours to allow it to set before the next lift of debris is placed over it.

2.2.3 Disposal Cell on the Waste Pile

As the waste pile slopes are being excavated and graded, the Contractor shall construct the waste disposal cell on the top of the waste pile as the repository for ore removed from the ore pad, radiologically-contaminated soil and sediments removed from various locations on the mine site. The existing top surface of the waste pile slopes to the east at grades of less than 0.03, so only finish grading will be required on the surface prior to waste cell berm and liner construction.

The disposal cell, illustrated on Drawings GSSW-CB101-0, GSSW-CB104-0, GSSW-CB203-00, and GSSW-CB902-00 shall be located on the top of the waste pile and shall be enclosed initially on the west and south sides by berms constructed of waste rock excavated from the north and west slopes of the waste pile, as described in Section 2.2.1. The north and east side of the waste disposal cell shall be kept open, without a berm until RGR determines the location and dimensions of the north and east berms based on the actual volume of contaminated materials to be placed in the cell. The berms shall have 5H:1V outer slopes and 3H:1V inside slopes. The maximum dimensions of the bottom of the waste cell shall be approximately 200 feet by 300 feet initially, starting at the southwest corner, and will be expanded to a maximum of 370 feet by 520 feet as necessary, depending on the actual volume of ore, contaminated sediment, and soil that must be removed elsewhere on site.

To construct the west and south berms of the disposal cell, the waste rock excavated from the west and north waste pile slopes (Section 2.2.1) shall be placed in loose lifts not exceeding eight (8) inches along the alignments shown on Drawing GSSW-CS504-00 and to the lines and grades shown on Drawings GSSW-CB104-0, GSSW-CB203-00, and GSSW-CB204-00. Waste rock properties are variable but generally characterized as sandstone fragments in a sandy matrix (USCS soil classes SP, SM and SC), so the Contractor shall use compaction equipment and methods to achieve dry densities of not less than 100 pcf in each lift.

An earthen clay liner shall be placed across the base and inside slopes of the disposal cell. Clay soil for the liner shall be obtained from the shaft muck pile and from other on-site sources of clay approved by the Owner. Before placing the liner, the waste pile surface under the liner shall be compacted by not less than six passes of a compactor of not less than 45,000 lbs. operating weight. The compaction of the base and berm must be sufficient to support the required compaction of the overlying earthen clay liner. The liner shall consist of not less than one (1) foot of soil with USCS classification of SC, CL, or CH placed in loose lifts not exceeding eight (8) inches thickness and compacted to not less than 95% of maximum dry density per ASTM D 698.

2.3 Ore and Contaminated Sediment

2.3.1 Excavation of Ore, Contaminated Soil, and Sediment

A radiological survey has been performed that showed contamination (radium levels exceeding 6.8 pCi/g) to an average depth of 2.0 feet in the MWTU ponds and 4.0 feet in the South Storm Water Pond (SSWP). Lesser depths of contamination exist in the MWTU area outside of the pond basins Pond sediments and soil with radium levels exceeding the 6.8 pCi/g limit are considered to be contaminated. Sediments in <u>all</u> ponds and all soil exceeding the 6.8 pCi/g limit will be excavated and placed in the waste pile disposal cell. Note that the excavation in MWTU ponds, other than ponds #2 and #3, and in the ore pad runoff retention pond will be only that required to remove contaminated sediments and soil.

During excavation, radiological (gamma radiation) measurements will be conducted under the direction of a Certified Health Physicist (CHP) contracted directly by the Owner. These measurements will be made continuously to give the Contractor real-time direction on where and how much to excavate in the ore pad, pond areas and along drain pipe alignments. The Owner, supported by information from the CHP, will make the decision on when contaminated soil has been removed sufficiently to satisfy contamination removal objectives (6.8 pCi/g Ra-226 limit), and only after the Owner's decision will subsequent work be performed in each excavated area.

Approximately 60,000 tons (or 37,000 cubic yards) of uranium ore remain in place on the ore pad. The Contractor shall excavate this ore and the underlying contaminated soils after all other contaminated sediment and soil from other locations have been placed in the disposal cell.

2.3.2 Transport and Disposal of Ore and Contaminated Sediment

The Contractor shall transport ore and contaminated sediments and soil from the ore pad, ore pad runoff retention pond, MWTU ponds area, and the SSWP basin to the waste pile for immediate placement in the waste disposal cell after its clay liner has been constructed per Section 2.2.2 of this specification.

The contaminated soil and sediment shall be spread across the disposal cell in locations directed by the Owner and shall be placed in uniform lifts of not more than 10 inches loose thickness and immediately compacted by not less than four passes of a tamping foot compactor of not less than 20T operating weight before the next lift is placed.

The ore is presently covered by approximately 11,000 cubic yards of soil and is resting on an estimated 2750 cubic yards of contaminated soil. The ore removed from the ore pad shall be placed in a separate temporary ore storage chamber adjacent to the north side of the disposal cell. The existing ore cover soil may be salvaged and used for the chamber liner, but the contaminated ore pad soil shall be placed as the last lift(s) of the ore storage chamber.

The location and approximate dimensions of the ore storage chamber are shown on Drawings GSSW-CS504-0 (Sheet SW02), GSSW-CB101-0 (Sheet SW03), and GSSW-CB104-00 (Sheet SW06). The final clay-covered north slope of the disposal cell shall be the south limit of the ore chamber, and the disposal cell clay liner shall be extended north as necessary as the liner for the ore chamber. Ore shall be placed in lifts and compacted as required for waste rock in Section 2.2.3, progressively building the chamber from south to north. Once all ore and contaminated ore pad soil are placed in the ore chamber, the chamber surface shall be graded to final slopes not exceeding 5H:1V and covered with at least 2.0 feet of clay soil as required for waste pile slopes under Section 2.2.1.

2.4 Excavation of Non-contaminated Soil and Soft Rock

After removal of ore and contaminated sediments, the Contractor shall excavate non-contaminated soil and rock in the basins of Ponds #2 and #3 and the South Storm Water Pond (SSWP) where these materials remain above design excavation grade. As needed, the excavated non-contaminated soil may be used as fill to achieve design grades. The soil consists of alluvial and residual sand, silt and clay. The soft rock consists of shale, sandstone, siltstone and claystone of the Menefee Formation of the Mesaverde Group. Wherever this rock has been encountered below grade on the mine site, it has been excavated using standard earthmoving equipment, including rippers. Equipment and methods appropriate for small excavations shall be used to excavate the anchor trenches and leak detection sumps.

Only excavated, non-contaminated soil classified as SC, SM, CL or CH and free of vegetation or foreign material shall be used as fill in the specified fill work. The Contractor shall proof-roll the excavated surfaces to detect areas of loose soil. If such an area is found, the area shall be excavated to an appropriate depth, filled, and compacted to create a firm base for subsequent fill placement..

The volume of soil and rock excavated may exceed the volume of fill required to construct the pond; in this case excess excavated soil and rock shall be stockpiled at a location on the mine waste rock pile approved by the Owner. Excess excavated soil or rock that is judged by the Owner or the Engineer to be unacceptable for fill shall be stockpiled in locations within 1000 feet of the excavation as designated by the Owner for later use on the site.

2.5 Anchor Trenches

After MWTU Ponds #2 and #3 have been constructed to approved line and grade and the liner installation contractor is ready to place liner in the MWTU ponds, the Contractor shall excavate trenches around the perimeters of Ponds #2 and #3 for anchoring of the pond liner system, as shown on the drawings. The anchor trench shall be excavated by the earthwork contractor to the lines, grades, and widths shown on the construction drawings prior to liner system placement in the trench. The Owner shall verify that the anchor trench has been excavated according to construction drawings. Slightly rounded corners shall be provided in the trench where the geomembrane adjoins the trench so as to avoid sharp bends in the geomembrane. The plan view of the anchor trenches is shown on drawings MWP2-CX101-00 and MWP3-CX101-00. Details of the anchor trench construction are shown on drawing MW00-CX501-00.

As the HDPE liner is placed in the anchor trenches of the MWTU ponds, the Contractor shall backfill these trenches. The backfill shall be placed in 8-inch loose lifts and compacted by tamping or wheel rolling with light compactors. Each lift shall be moisture-conditioned, mixed, and compacted to achieve in-place dry density of not less than 90% of maximum dry density as determined by ASTM D 698. Care shall be taken when backfilling the trenches to prevent any damage to the geomembranes or geonet; the Contractor shall prevent contact between its earthwork equipment and the liner. If the liner is damaged by the Contractor, it shall be repaired immediately and before any additional backfilling or compaction is performed.

2.6 Hydraulic Structure Excavation and Backfill

2.6.1 Pond Structures

Concrete hydraulic structures for pond inlets, outlets, and water level controls exist in ponds #2 and #3 and will be retained for continued use. However, some components of the existing structures will be demolished and replaced, and some new structures will be constructed. In general, where existing components are removed, they shall be removed at the same time as contaminated sediment is removed, and the concrete debris shall be placed in the waste pile disposal cell and mixed with the contaminated sediment. After the demolished concrete and contaminated sediment have been removed and the backfill and clay underliner have been placed, the Contractor shall excavate the soil material necessary to set forms and place reinforcement required for the new concrete components and structures, as shown on Drawings MW00-CX501-00, MW00-CX504-00, MWP2-CX101-00, and MWP3-CX101-00.

2.6.2 Drainage Structures

Earthwork specific to drainage structure construction is addressed in Specification GS-GC02-00. The contractor shall excavate as necessary to remove drainage structures that will be eliminated or replaced and to enable construction of new drainage structures. The Contractor shall examine utility survey information provided by the Owner to ascertain the location, depth, configuration and size of existing underground cables, pipes, and other features that might be affected by excavation.

2.6.3 Backfill

The contractor shall backfill as necessary around hydraulic structures to establish the finish grades of soil adjacent to structures. See Section 2.7.2 for construction of clay liner over backfill. Backfill shall be soil with USCS classification of CL, CH, or SC. Backfill shall be placed in loose lifts not to exceed eight (8) inches and compacted to the same density as the adjacent compacted or natural soil. The limitations stated in Section 2.7 shall apply to backfill for hydraulic structures.

2.7 MWTU Ponds

2.7.1 Pond Subgrade Preparation

After removal of contaminated sediments from MWTU pond basins, the soil and soft rock in the basins of Ponds #2 and #3 shall be excavated where these materials remain above design subgrade. As needed, excavated non-contaminated soil may be used as fill to achieve design subgrades. Equipment and methods appropriate for small excavations shall be used to excavate the anchor trenches and leak detection sumps.

The Contractor shall excavate non-contaminated soil and rock or place fill as needed to achieve design subgrades shown on the drawings. Only excavated, non-contaminated soil classified as SC, SM, CL or CH and free of vegetation or foreign material shall be used as fill in the specified fill work. The Contractor shall proof-roll the excavated surfaces to detect areas of loose soil. If such an area is found, the area shall be excavated to an appropriate depth, filled, and compacted as specified below. The Contractor shall place fill to design subgrade elevations in the pond basins where removal of contaminated sediments required excavation below design subgrade or to establish the design pond slopes. The top 0.5 feet of fill may be the clay underliner, described in section 2.7.2.

No fill shall be placed on any surface that is saturated, frozen, or holding free water. No fill shall be placed that contains ice or frozen soil. Within the pond areas, ponded rainwater shall be removed. After any precipitation that causes ponding of water on any fill surface, the water shall be drained and the surface shall be allowed to dry, then scarified and recompacted before the next lift is placed. Throughout fill construction, the fill surface shall be maintained to facilitate runoff and prevent ponding.

Prior to placement of fill, including clay underliner, on any excavated surface, the ground surface shall be moisture-conditioned and compacted to achieve in-place dry density of not less than 90% of maximum dry density as determined by ASTM D 698 (Standard Proctor). The Owner, its Engineer, or its authorized QA/QC testing service will perform field tests to determine in-place densities and moisture contents of the compacted excavation surfaces. A minimum of one in-place density test for each 2000 yards of fill, or two tests for each pond, whichever is more, will be conducted. If any portion of the fill fails to meet the required density, that portion shall be recompacted until it achieves the minimum required density.

The Contractor shall moisture-condition, place and compact fill over the recompacted excavation surface to bring ground surface up to design subgrades, as shown on the drawings and as directed by the Owner. Soil used for fill up to the level of the clay underliner shall be uncontaminated and classified as SM, SC, CL, or CH; be free of visible vegetation or foreign material; and contain no particle larger than 3.0 inches except that within 6.0 inches of the finished liner subgrade surface no particle in the fill shall be larger 0.5 inch. The fill shall be placed in lifts of not more than eight inches loose thickness. The lifts shall be compacted to an average thickness of not more than six inches. Each lift shall be moisture-conditioned, mixed, and compacted to achieve in-place dry density of not less than 90% of maximum dry density as determined by ASTM D 698.

All excavated and filled surfaces of the liner subgrade shall be smooth, free of all foreign and organic material, sharp objects, or debris of any kind. These surfaces shall provide a firm, unyielding liner subgrade with no sharp changes or abrupt breaks in grade. Standing water or excessive moisture shall not be allowed.

Notwithstanding the foregoing liner subgrade requirements, the subgrade shall not be satisfactory until it has met the requirements of Specification MW-CX01-00, section 3.2, as documented on the Subgrade Surface Acceptance form in Appendix B of that specification.

2.7.2 Clay Underliner

After pond liner subgrade has been prepared as needed, the Contractor shall construct a clay underliner on the slopes and bottom of the MTWU ponds. This clay underliner, providing a bedding layer for the HDPE liner, shall consist of not less than 0.5 feet of locally available sandy clay or clay (Cl, CH soil) or clayey sand (SC soil) containing no particle larger than 0.5 inches and shall be compacted to not less than 90 percent Standard Proctor density (ASTM D-698).

After the clay underliner has been placed and compacted to bring ground surface up to liner grade in the MTWU ponds, as shown in the drawings,, the Contractor shall construct the modifications to the existing hydraulic control structures for each pond. Upon completion of the modifications to the hydraulic control structures, the Contractor shall complete the finish grading of the clay underliner so that there are no gaps in the contacts between the clay underliner and the hydraulic control structures.

The clay underliner surface shall be accepted as satisfactory if the foregoing criteria are achieved and the completed surface has:

1) No indentations greater than 1/2 inch deep
2) No irregularities in the surface (surface roughness) greater than 0.1 (ratio of height to least-width of any protrusion in the surface is less than 1 to 10, or 0.1), and
3) No visible foreign materials.

The clay underliner surface shall be tested for the three foregoing preparation criteria by the Owner, the Engineer, or the liner QC contractor at not fewer than 10 locations on the pond bottom and six locations on the slopes.

The clay underliner, once placed at specified compaction densities and moisture contents, shall have interface shear strength with the geomembrane material of not less than 20 degrees as determined by ASTM D 5321-02.

2.8 South Storm Water Pond (SSWP)

2.8.1 Pond Base Preparation

After excavating contaminated soils from the SSWP basin, the Contractor shall excavate as needed to achieve the design depths or backfill to the design depths over any over-excavated surfaces or areas of the site where the existing grades need to be raised. The fill shall be non-contaminated soil classified as SM, SC, CL, or CH that is free of visible vegetation or foreign material and contains no particle larger than 3.0 inches. The fill shall be placed in lifts of not more than eight (8) inches loose thickness. The lifts shall be compacted to an average thickness of not more than six (6) inches. Each lift shall be moisture-conditioned, mixed, and compacted to achieve in-place dry density of not less than 90% of maximum dry density as determined by ASTM D 698.

2.8.2 Clay Liner

The Contractor shall place 2.0 feet of clay liner over the pond side slopes and bottom, as shown on Drawings GSSW-CB102-00 and GSSW-CB103-00. Prior to placement of the first lift of clay liner soil, the ground surface shall be scarified.

The clay liner shall be constructed with borrow soils available within ½ mile of the pond location and approved by the Owner. The soils shall be classified as CL or CH soil and shall be free of radiological contamination and visible vegetation or foreign material and particles larger than 0.5 inch. The fill shall be placed in lifts of not more than eight (8) inches loose thickness. The lifts shall be compacted to an average thickness of not more than six (6) inches. Each lift shall be moisture-conditioned, mixed, and compacted to achieve in-place dry density of not less than 95% of maximum dry density as determined by ASTM D 698.

Once the liner is completed, the Contractor shall construct the hydraulic control structures as described in Specification GS-GC02-00 and on Drawings GSSW-CB901-00, GS00-GC104-00, GS00-GC116-00, GS00-GC118-00, GSSW-CS101-00, GSSW-CS201-00, GSSW-CS502-00, GSSW-CS503-00 and GSSW-CS505-00.

Following placement of the clay liner and construction of the hydraulic control structures (Specification No. GS-GC02-00) , the Contractor shall place 0.5 feet of uncontaminated granular or mixed-grain soil

(SC, SM. SP, SP-SM) as a protective cover over the clay liner except in the locations where hydraulic control structures will be constructed. The soil shall be obtained from a local source identified by the Owner. The soil shall be placed in a single lift and compacted by not less than five passes of a vibratory compactor.

2.8.3 Rip Rap

Rip rap shall be placed at discharge ends of storm water hydraulic control structures as shown in Drawings GSSW-CB102-00, GSSW-CB103-00, GSSW-CS201-00 and GSSW-CS501-00. Rip rap materials shall satisfy ASTM D4994-07, the National Engineering Handbook Material Specification 523 for Rock Type 2, and the following requirements:

- Hard and durable, able to resist breaking when struck with a hand-held hammer
- Dry unit weight of 150-175 pcf
- Absorption—Not more than 2 percent when tested per ASTM C 127
- Angular in shape with sharp, clean edges
- Approximately equal dimensions, with largest dimension no greater than three times the smallest dimension
- Maximum size (D_{100}) of riprap pieces not to exceed 2/3 the design thickness of the rip rap blanket
- D_{15} size of rip rap pieces not less than 3 inches

In general, basalt or limestone should be suitable rock types. Rock selected for rip rap use by the Contractor shall be approved by the Owner prior to being placed.

Prior to rip rap placement, the subgrade supporting the rip rap shall be covered with filter fabric, MIRAFI 500X or approved equal.

2.9 Service Roads

The contractor shall construct new service roadbeds or upgrade existing service roadbeds within the ponds areas of the mine site as shown on the drawings. High-use service roads are used on a daily basis to access operating facilities and to maintain site security. Low-use service roads are used less than daily on an as-needed basis.

New high-use service roads shall have a crown width of not less than 12 feet and up to 15 feet where space is available and without cut and fill to establish design grade. Shoulders shall be not steeper than 3H:1V. The maximum longitudinal grade shall be 2% unless otherwise shown on the drawings. Soft or wet soil in the road base course shall be excavated and replaced with dry soil. Existing high-use service roadbeds shall be upgraded as necessary, as shown on the drawings, to improve drainage and trafficability to the same standards as new high-use service roads.

Low-use service roads, both new and existing, shall be graded with cut and fill where needed to eliminate standing water and run-on from adjacent ground. Wet or soft soil shall be removed within the travel lane and replaced with dry soil.

The Contractor is not required to construct road base course or travel course, which will be constructed later by others.

3 QUALITY CONTROL

The Contractor shall take the measures necessary to achieve all requirements of this specification. These measures shall include, as a minimum, the following:

3.1 Supervision

During all times that the Contractor's equipment or personnel are performing Included Work on the job site, a Contractor supervisor shall be present to direct the work. The supervisor shall have experience, satisfactory to the Owner, in the type of work being executed. The supervisor shall have on-hand at all times a copy of the current revision of this specification and the drawings relevant to the work. The supervisor shall have the authority to make decisions for the Contractor in all matters related to this specification.

3.2 Line and Grade Control

The Contractor shall perform land surveying to determine that the specified lines and grades have been achieved in accordance with the limits established in this specification and the construction drawings. Ground control for surveys shall be based on established benchmarks and other control points on the Owner's property. Elevations, alignments and gradients shall be surveyed as often as necessary to control excavation and fill placement.

When the Contractor reports to the Owner that all Included Work has been completed, the Owner will perform an acceptance survey to determine if line and grade requirements have been satisfied. The Owner will survey the alignments and elevations and the slope gradients at intervals selected by the Owner.

3.3 Earthwork Field and Laboratory Testing

Testing of fill materials and in-place density and moisture will be performed by a qualified materials testing service contracted by the Owner. Field density of compacted fill shall be measured not less than once per 2000 c.y. by nuclear methods for density (ASTM D 2922) and moisture (ASTM D 3017). The fill material will be tested for moisture-density relationships and gradation/classification at least once per 5,000 c.y. of borrow soil. Additional tests may be required if the lift thickness is greater than was specified, if the fill material does not meet moisture content specifications, if the degree of compaction is questionable, or during adverse weather conditions.

If a defect is found in the fill material, a person from the Contractor's Quality Department shall determine the extent of the deficient area through additional testing, observations, record review, or other appropriate means. The Contractor shall correct the deficiency of the fill material.

4 DOCUMENTATION

4.1 Documentation by Contractor

The Contractor shall record and report, in a format acceptable to the Owner, the following information:

- Daily journal containing a list of equipment and materials used.
- Daily Work Summary listing all pay items and quantities. Submit by the start of the next working day.
- Survey notes for line and grade control (verbally report results immediately, and submit copy to the Owner within 24 hours).
- "As- built" drawing(s) of the completed work, at the same scales as the design drawings, which the Contractor may use as the bases for preparing its as-built drawings.
- Written notifications to the Owner of unexpected conditions, conditions that prevent conformance with specifications, disputes over acceptance of Contractor's work. Verbally

notify the Owner immediately upon discovery or identification, submit in writing within 24 hours.

- Written notification to the Owner of any lost-time injury of Contractor or subcontractor personnel.

4.2 Documentation by the Owner

The Owner will create and maintain the following documentation that relates to the Included Work:

- Field inspection notes of Contractor's performance, work accomplished, and variances from the specifications observed by the Owner.
- Records of all field and laboratory tests performed by the Owner and its testing service.
- Photographic and video records of the Included Work.
- Chronological record of notifications to the Contractor of variances from specifications, unacceptable work performance, discrepancies in payment quantities claimed by the Contractor, and all related resolutions thereto.
- Survey notes and calculations of the acceptance survey.
- As-built drawings of completed work submitted by the Contractor.

5 ACCEPTANCE AND WARRANTY

The Contractor shall provide warranty of all work required by or performed in accordance with this specification and as required by the Terms and Conditions of the Owner.

The Owner shall have sole discretion to accept in part or in full, or to reject in part or in full, the Contractor's materials or work. Acceptance or rejection will be based on the Owner's visual inspections and testing (including those of its Engineer and testing service) and quality control data required under this specification.

Upon identification of unacceptable materials or work, the Owner will notify the Contractor of the deficiency. The notification will include the location, extent, and description of the unacceptable materials or work. Before proceeding with other materials or additional work at that location, the Contractor shall correct the deficiency by bringing the materials or work into compliance with specifications and drawings to the satisfaction of the Owner. All work and materials required for such corrective actions shall be at the expense of the Contractor.

6 SCHEDULE

The Contractor shall complete the Included Work within 90 calendar days from notice to proceed. Weather conditions that prevent work on a specific task for an entire work day shall be accommodated by a day-for-day extension in the schedule of that and other directly affected tasks.

Response No. 16 Attachment

SPECIFICATION No. MW-CB02-00

EARTHWORK FOR WASTE PILE AND DISPOSAL CELL COVER CONSTRUCTION

SPECIFICATION No. MW-CB02-00

EARTHWORK FOR WASTE PILE AND DISPOSAL CELL COVER CONSTRUCTION

MOUNT TAYLOR MINE

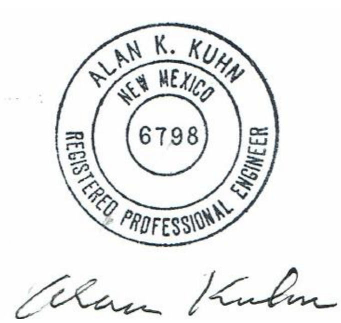
CIBOLA COUNTY, NEW MEXICO

RIO GRANDE RESOURCES CORP.

REVISION 0, JUNE 2020

Prepared by

Alan Kuhn Associates, LLC



6/26/2020

1. GENERAL

1.1 Project Description

Rio Grande Resources Corporation (RGR) is initiating closeout of the Mt Taylor Mine. This underground uranium mine is located 1/2 mile northeast of the Village of San Mateo, Cibola County, New Mexico in Section 24, T13N, R8W, NMPM. The mine is accessible from New Mexico State Route 605, 23 miles north of Milan, NM.

As part of the closeout activities and to satisfy current environmental standards and permit requirements, RGR is placing radiologically contaminated sediments and soils in the waste rock pile and placing a soil cover over these materials to retain them in place, attenuate radon gas, minimize infiltration of water into the waste rock and radiological sediments, and provide a soil medium for vegetation. A disposal cell containing the radiological sediments and soils excavated from elsewhere on the mine site is located within the waste rock pile footprint (Drawing sheet C 00). The existing waste rock pile/disposal cell consists of upper and lower slopes (Drawing sheet C 01).

The lower slopes are on the north, west and south sides of the pile (Drawing sheets C 02, C03). The lower north and west slopes have been covered with a 2.0 feet thick radon barrier of clay soil. The lower south slopes are constructed of clean soil (shaft muck) and need no additional cover. The upper slopes (disposal cell) consist of contaminated sediment and soils from the site cleanup (Drawing sheet C 04, C 05).

Two different kinds of cover soils will be placed. On the west and north lower slopes a 1.0 foot thick layer of loam soil will be placed over the existing radon cover. On the upper slopes (disposal cell) both 2.0 feet of clay and 1.0 foot of loam will be placed. The east slope will remain open and uncovered until additional radiological materials can be placed there, after which the final east slope will be covered as part of the final earthwork under a separate contract. Eastward expansion of the disposal cell and placement of cover soil on that expansion are not part of this contract.

This specification addresses the following scope of work:

- Excavate, haul, and place clean soil from designated borrow locations to the cover locations,
- Compact each lift to the required density,
- Grade the final cover surface to the required planarity,
- Apply rock mulch to the final surface, and
- Place erosion protection on drainage ditches.

1.2 Included Work

Included Work covered in this specification consists of:

a) Supply and mobilize/demobilize earthwork and supporting equipment,
b) Complete grading (re-shaping) of the upper slopes to 5H:1V or as needed to repair erosional damage to the existing surfaces,

c) Excavate and haul soils selected by the Owner from borrow pits (keeping to the borrow pit grading plans) and place in lifts on the slopes,
d) Compact each lift to the required density before placing the next lift,
e) Grade the final cover surface to the specified planarity,
f) Apply rock mulch to the final cover surfaces, and
g) Install erosion control material in drainage courses.

Related Work Performed by Others:

- Radiological surveys and monitoring
- Quality Control testing for earthwork.
- Land surveying in support of cover construction

1.3 Responsibilities

Rio Grande Resources Corporation (RGR), the "Owner", will evaluate bids and award all contracts for the Included Work (Section 1.2) and Related Work, will provide controlled access to the work site, will make construction water available at a location on the property, and will approve and make payment for work performed under this specification.

Alan Kuhn Associates LLC (AKA), the "Engineer", will review or inspect and advise the Owner on the acceptance of the Included Work.

Contractor shall provide all equipment, materials, labor and supplies and perform all work necessary to accomplish the Included Work in section 1.2. Contractor shall be responsible for the safety of its job site and of all personnel and equipment that it employs on the job site.

Quality Control Contractor (QCC) contracted by the Owner will observe, measure, sample and perform soil tests to document the Contractor's compliance with this specification and the drawings.

The Land Surveyor contracted by the Owner will establish construction layout for the Contractor to use in achieving the required lines, grades, and dimensions of the work.

The Radiological Consultant, an independent contractor to the Owner, will provide radiological survey and worker radiological health and safety support.

1.4 Definitions

Contaminated sediment: Solids including chemical precipitate containing radium concentrations above 6.8 pCi/g deposited from mine water during prior mine operations.

Contaminated soil: Native soil contaminated with radium and uranium through contact with ore, mine waste rock, mine water, and contaminated sediment.

Disposal cell: The area on the waste rock pile designated for disposal of radiologically contaminated soil and pond sediment.

Fines: Mineral particles (soil or tailings) passing the #200 U.S. Standard sieve; i.e. smaller than 0.075 mm grain size.

Foreign material: Any solid material that is not natural soil. Includes wood, iron and steel, plastic, rubber, glass, ceramic and concrete.

Native soil, natural soil: Naturally-occurring alluvial or residual soils existing below and at ground surface around the job site; consisting of gravel, sand, silt and clay materials.

Planarity: Approximation to a uniform planar surface as measured by the maximum amount of deviation (highs and lows) over a unit of length from the design surface along a transect.

Rip rap (also riprap): Well- graded mixture of rock, broken concrete, or other durable material, dumped or hand placed to prevent erosion, scour, or sloughing due to surface water flow.

Rock mulch: Crushed, durable rock with grain sizes from 1" to ¼ " and not more than 10% passing the -200 sieve.

Sand: Mineral particles with grain sizes between #200 and #4 sieve (0.075 mm to about 5 mm).

Slope, lower: Slopes of the waste pile, on which the west and north sides were previously covered by the clay radon barrier but requiring placement of loam (growth medium) cover under this contract.

Slope, upper: Slopes formed above the previously covered waste pile slopes and requiring both clay radon barrier and loam (growth medium) cover to be placed under this contract.

Soil classification: Soil descriptions based on grain size distribution and plasticity in accordance with the Unified Soil Classification System (USCS). Classifications of soils in the pond area are:

GW – well-graded gravel

SW – well-graded sand

SP – poorly-graded sand with less than 5% fines

SM – silty sand composed of 12-50% silt fines and 50% more sand

SC – clayey sand composed of 12-50% clay fines and 50% more sand

SP-SM – sand with 5-12% silty fines

ML – more than 50% fines that classify as silt, according to reference b, and liquid limit less than 50

MH – same as ML except liquid limit 50 or more

CL – more than 50% fines that classify as clay, according to reference b, and liquid limit less than 50

CH – same as CL except liquid limit 50 or more

1.5 References

AASHTO M288-17 Standard Specifications for Geotextiles

AASHTO T 96 Standard Method of **Test** for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

AASHTO T 104 Standard Method of **Test** for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

ASTM D422 - 63(1998) Standard Test Method for Particle-Size Analysis of Soils

ASTM D698-12e2 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lb/ft3 (600 kN-m/m3))

ASTM D2922 - 04 Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

ASTM D3017 - 04 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

ASTM D4318-10e1 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils

ASTM D4994-07 Standard Practice for Evaluation of Rock to be Use for Erosion Control

ASTM D5084 - 03 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall

National Engineering Handbook, Part 642 National Standard Material Specifications, Chapter 3, Material Specification 523—Rock for Riprap

Storm Water Pollution Prevention Plan, Rio Grande Resources Corporation, Mt Taylor Mine, San Mateo, New Mexico, Cibola County; Inspections Plus, 2019

TenCate Installation Guidelines, Geosynthetics Uses in Subsurface Drainage Applications, 2010

1.6 List of Drawings

Drawings listed below are incorporated into this specification by reference.

Sheet Number	Drawing Number	Sheet Title
C00	GS20-CB100-00	Overall Site Map and Drawing Index
C01	GS20-CB101-00	Site Plan
C02	GS20-CB102-00	Lower West Slope Grading Plan
C03	GS20-CB103-00	Lower South Slope Grading Plan
C04	GS20-CB104-00	Upper Slopes – Reshape Existing Grades
C05	GS20-CB105-00	Upper Slopes – Final Grading Plan
C06	GS20-CB106-00	Drainage Bench – Plan View
C07	GS20-CB107-00	Drainage Bench - Sections
C08	GS20-CB108-00	Borrow Area “A” – Grading Plan
C09	GS20-CB109-00	Borrow Area “B” – Grading Plan
C10	GS20-CB110-00	West Slope Details
C11	GS20-CB11-00	South Slope Details

2 EXECUTION

The Contractor shall provide the equipment and materials necessary for all earthwork required by this specification and shall make them available on the work site when needed. The estimated quantities of materials are listed on the Bid Schedule. The Contractor shall perform the following work.

2.1 Site Preparation

The Owner will remove vegetation and foreign material from the areas of excavation and fill, as needed to begin the earthwork. Any pieces of foreign material remaining after the Owner's site preparation shall be removed by the Contractor and placed in the disposal cell.

The Contractor shall determine and mark the locations of buried utilities and other objects that could be damaged or disturbed by earthwork activities. Markings shall be made with bright-colored tape, paint, or barriers that will remain in place for the duration of the earthwork.

The Contractor shall implement and maintain requirements of the Owner's Surface Water Pollution Prevention Plan (SWPPP) that was prepared by a Qualified SWPPP Developer and in accordance with EPA 833-B-09-002, *Developing Your Stormwater Pollution Prevention Plan.* The Contractor shall become familiar will the requirements of the SWPPP and shall be responsible for satisfying those requirements at all times. SWPPP requirements include control of runoff, silt fences and other measures to prevent release of sediment from the work sites.

2.2 Waste Pile and Disposal Cell Preparation

2.2.1 Waste Pile Slopes (Lower West and North Slopes)

In 2018, the north, west, and south slopes of the mine waste pile were reshaped to reduce surface grades to 5H:1V. The excavated mine waste materials, consisting of waste rock (weathered rock and soil-size materials) as well as non-earth mine debris (broken concrete, metal, plastic, and timbers removed from the mine) were removed from the slopes when exposed by excavation and buried in a pit excavated into the waste rock.. Despite these activities, some mine debris may remain at or near the surfaces of the waste pile slopes. If the Contractor encounters mine debris in the slope surfaces, it shall remove the debris for disposal off site or in a location on site identified by the Owner.

After the waste pile (lower) slopes were finish-graded, 2.0 feet of clay soil were placed on the west and north lower slopes and compacted to not less 90% of maximum dry density per Standard Proctor (ASTM D-698) standards. The south lower slope is composed of non-radiological shaft muck (clay loam soil) that was also compacted to the same standard. However, due to the length of time since that compaction was done, the surfaces of the clay cover on the north and west slopes shall be re-compacted again, immediately before placement of the loam cover, to ensure not less 90% of maximum dry density.

See Drawing sheets C 02 and C 03.

2.2.2 Disposal Cell Slopes

The waste disposal cell on the top of the waste pile was started in 2018 as the repository for radiologically-contaminated soil and sediments removed from various locations on the mine site. Its location and present extent are shown on Drawing sheets C 01, C 04 and C 05..

Properties of contaminated ponds sediments and soils placed in the disposal cell are variable but are more fine-grained and clayey that the waste rock and generally classified as clayey sand to sandy clay (USCS soil classes SM, SC and CL). During placement of the contaminated sediment and soil, the disposal cell slopes were constructed to approximately 5H:1V. Prior to cover placement, the Contractor shall grade the disposal cell north, west and south disposal cell (upper) slopes so that they are with +/- 3.0 inches of the design slope, as determined by land survey.

2.3 Cover Construction

The soil cover for the waste pile and disposal cell shall consist of two parts – a lower radon barrier consisting of 2.0 feet of clay soil and an upper growth medium consisting of 1.0 feet of loam.

2.3.1 Radon Barrier Cover

In 2018, a radon barrier cover of 2.0 feet of clay soil was placed on the north and west lower slopes of the waste pile, below the elevation of the disposal cell,. After shaping the disposal cell slopes as shown on Drawing sheets C04 and C 05, the Contractor shall extend the radon barrier cover over the disposal cell (upper) slopes.

The Contractor shall place a clay-soil radon barrier consisting of not less than 2.0 feet of clean soil cover on the north, west, and south slope surfaces of the disposal cell (upper slopes). The disposal cell radon barrier shall merge with the drainage bench detail and the new upper disposal cell radon barrier cover shall connect to the existing lower slope radon barrier without gaps or offsets (Drawing sheets C 06 and C 07).

Soil for this radon barrier cover shall have USCS classification of CL, CH or SC and can be obtained from locations on the mine site approved by the Owner. The radon barrier shall be constructed of these soils approved by RGR and placed in loose lifts not more than 8 inches thick and compacted to not less 90% of maximum dry density per Standard Proctor (ASTM D-698) standards.

The extent of the cover to be constructed under this specification is shown on Drawing sheets C 02 through C 07. As shown on the referenced drawings, the cover soils will not extend over the area of the top and east slope that will remain open for disposal cell expansion for additional contaminated sediment and soil, which will be excavated and placed in the open, eastern part of the disposal cell after RGR receives approval from regulatory agencies for disposal cell expansion.

2.3.2 Growth Medium

The growth medium shall be loam soil selected by RGR and available in borrow locations shown on Drawing sheets C 08 and C 09. The loam shall have USCS classifications of CL or SC containing 20-50% clay and not less than 50% sand. RGR and its QC contractor shall verify that the soil selected for growth medium meets these grain-size standards. The soil cover shall be placed in loose lifts of not more than eight (8) inches and compacted to *not more than* 90% maximum dry density per ASTM D 698. The top lift may include rock fragments up to three (3) inches.

The top surface of the loam cover shall be finished to the final grades as shown on the referenced drawings. The Contractor shall grade the top of the growth medium to ensure planarity. Planarity will be deemed adequate when the final surface of the loam cover does not extend vertically more than 3.0 inches above or below a 10-foot long straight edge (survey rod or 2 x 4 lumber) aligned perpendicular to the slope across the growth medium cover surface. The QC technician shall determine planarity at any location where planarity is in question but not less than once in every 100 ft. x 100 ft. area of the cover.

2.4 Erosion Protection

The Contractor shall procure and place geotextile and riprap in drainage courses at the toe of the south and west slopes of the waste pile and on the drainage bench and ramp of the waste pile (Drawing sheets C 01, C 07, C 10, and C 11).

2.4.1 Geotextile

The geotextile shall be Mirani TenCate 160N nonwoven or approved equal. It shall be deployed along the prepared subgrade of the bottoms of the drainage bench and the waste pile toe drain as shown on the drawings and installed in accordance with AASHTO M288-17 and its Survivability Class 2. If the 160N geotextile is used by the Contractor, installation shall be in accordance with TenCate Installation Guidelines. In any case, installation shall follow the guidelines of the manufacturer.

The subgrade of the geotextile shall be free of rocks larger the 2.0 inches, metal debris, plant material, or other foreign objects. The geotextile shall be deployed up-gradient, with each successive panel overlapping the next panel down-gradient by not let than 2.0 feet.

2.4.2 Riprap

The Contractor shall provide rocks or rough quarry stone, 4.0 inches to 8.0 inches in size, with no more than 60% wear in accordance with AASHTO T 96 and soundness loss of no more than 21, in accordance with AASHTO T 104 using a magnesium sulfate solution with a five (5)-cycle test duration. The rock shall be placed forming a continuous blanket over the geotextile at the locations and in thicknesses as shown on Drawings sheets C 06, C 07, C 10, and C 11.

3 QUALITY CONTROL

The Contractor shall take the measures necessary to achieve all requirements of this specification. These measures shall include, as a minimum, the following:

3.1 Supervision

During all times that the Contractor's equipment or personnel are performing Included Work on the job site, a Contractor supervisor shall be present to direct the work. The supervisor shall have experience, satisfactory to the Owner, in the type of work being executed. The supervisor shall have on-hand at all times a copy of the current revision of this specification and the drawings relevant to the work. The supervisor shall have the authority to make decisions for the Contractor in all matters related to this specification.

3.2 Line and Grade Control

RGR's contract land surveyor shall perform land surveying to determine that the specified lines and grades have been achieved in accordance with the limits established in this specification and the construction drawings. The surveyor will set blue-tops and other markers to guide the Contractor's earthwork. Ground control has been previously set based on established benchmarks and other control points on the Owner's property. Elevations, alignments and gradients will be surveyed as often as necessary to control excavation and fill placement.

When the Contractor reports to the Owner that all Included Work has been completed, the Owner will perform an acceptance survey to determine if line and grade requirements have been satisfied. The Owner's contract surveyor will survey the alignments and elevations and the slope gradients at intervals selected by the Owner.

3.3 Earthwork Field and Laboratory Testing

Testing of characteristics and in-place density and moisture will be performed by a qualified materials testing service contracted by the Owner. Field density of compacted fill shall be measured not less than once per 2000 c.y. by nuclear methods for density (ASTM D 2922) and moisture (ASTM D 3017). The cover soil material will be tested for moisture-density relationships and gradation/classification at least once per 5,000 c.y. of borrow soil. Additional tests may be required if the lift thickness is greater than was specified, if the fill material does not meet moisture content specifications, if the degree of compaction is questionable, or during adverse weather conditions.

If a defect is found in the cover soil material, a person from the Contractor's Quality Department shall determine the extent of the deficient area through additional testing, observations, record review, or other appropriate means. The Contractor shall correct the deficiency of the cover soil material.

4 DOCUMENTATION

4.1 Documentation by Contractor

The Contractor shall record and report, in a format acceptable to the Owner, the following information:

- Daily journal containing a list of equipment and materials used.
- Daily Work Summary listing all pay items and quantities. Submit by the start of the next working day.
- Written notifications to the Owner of unexpected conditions, conditions that prevent conformance with specifications, disputes over acceptance of Contractor's work. Verbally notify the Owner immediately upon discovery or identification, submit in writing within 24 hours.
- Written notification to the Owner of any lost-time injury of Contractor or subcontractor personnel.

4.2 Documentation by the Owner

The Owner will create and maintain the following documentation that relates to the Included Work:

- Field inspection notes of Contractor's performance, work accomplished, and variances from the specifications observed by the Owner.
- Survey records for line and grade control
- "As- built" drawing(s) of the completed work.
- Records of all field and laboratory tests performed by the Owner and its testing service.
- Photographic and video records of the Included Work.
- Chronological record of notifications to the Contractor of variances from specifications, unacceptable work performance, discrepancies in payment quantities claimed by the Contractor, and all related resolutions thereto.

5 ACCEPTANCE AND WARRANTY

The Contractor shall provide warranty of all work required by or performed in accordance with this specification and as required by the Terms and Conditions of the Owner.

The Owner shall have sole discretion to accept in part or in full, or to reject in part or in full, the Contractor's materials or work. Acceptance or rejection will be based on the Owner's visual inspections and testing (including those of its Engineer and testing service) and quality control data required under this specification.

Upon identification of unacceptable materials or work, the Owner will notify the Contractor of the deficiency. The notification will include the location, extent, and description of the unacceptable materials or work. Before proceeding with other work at that location, the Contractor shall correct the deficiency by bringing the materials or work into compliance with specifications and drawings to the satisfaction of the Owner. All work and materials required for such corrective actions shall be at the expense of the Contractor.

6 SCHEDULE

The Contractor shall complete the required work within 90 calendar days from notice to proceed. Weather conditions that prevent work on a specific task for an entire work day shall be accommodated by a day-for-day extension in the schedule of that and other directly affected tasks. The Contractor shall be penalized 1% of the payment for each day over 90 calendar days until completion of the earthwork.

Response No. 16 Attachment

Soil Data for Borrow Area A

Liner and Cover of Expanded Disposal Cell

RIO GRANDE RESOURCES CORPORATION

File #	
Mt Taylor Mine - Borrow Test Pit Log — Pit #	MT-Borrow

Location: Background borrow area | GPS N 35-20.724' | W 107-38.759'

Location Description: NE Corner of the Property in the main proposed borrow area.

Field Engineer: Stan Fitch / Ed Loescher | Excavation Method: Small Bobcat Backhoe

Date: April - 10-2012 8:50 am | Operator:

Weather and Moisture Conditions: Warm – Sunny – 60 to 70d

	Graphic Log	Sample #	Description (USCS, texture, density, color, moisture, odor, inclusions, etc.)
0			(0-24") Clayey Silt, some sand, trace roots gravel, brown
1			
2		MT -borrow Composite Sample 24"-66"	(24"- 66") Silty Sand with Clay, trace gravel, occasional gray sand seams, brown.
3			
4			
5			
			(66" – 72") Clayey Sand, with silt, trace roots and gravel, brown.
6			
7			
8			

Total Depth: 72" DEEP

Comments:

Part of the sample for sent for Geotechnical testing - Part for Environmental Testing.

Checked: | Date:

Approved: | Date:

SUMMARY OF LABORATORY ANALYSIS

Project: **Mount Taylor Mine: Settling Pond Evaluations** Location: **San Mateo, New Mexico**
Project Number: **96450**

Boring Number	Depth (ft.)	Soil Classification		Atterberg Limits		Sieve Analysis - Accumulative % Passing														Moisture Content (%)	Dry Density (pcf)	Unconfined Comp. Strength (psi)
		USCS	AASHTO	PI	LL	No. 200	No. 100	No. 50	No. 40	No. 30	No. 16	No. 10	No. 8	No. 4	3/8 in	1/2 in	3/4 in	1 in	1 1/2 in			
Borrow Area	2.0 - 5.5	CL	A-6	13	37	64	78	88	91	93	97	98	99	99	100	100	100	--	--	10.7	--	--
MT-1-F	0.0 - 0.5	SC	A-6	15	35	44	56	74	76	77	81	99	100	100	100	--	--	--	--	13.7	--	--
MT-2-D	0.0 - 0.5	CL	A-6	14	33	56	73	95	97	97	98	99	99	100	100	--	--	--	--	16.4	--	--
MT-3-F	0.0 - 0.5	CL	A-6	17	35	59	77	92	95	96	98	99	99	100	100	--	--	--	--	17.3	--	--
MT-4-F	0.0 - 0.5	CL	A-6	13	34	63	86	90	91	91	91	91	91	91	92	92	96	100	--	10.5	--	--
MT-5-F	0.0 - 0.5	CL	A-6	17	37	67	80	94	96	97	98	99	99	99	100	100	--	--	--	17.6	--	--
MT-7-C	0.0 - 0.5	CL	A-6	17	39	71	80	94	97	98	100	100	100	100	--	--	--	--	--	17.9	--	--
MT-8-F	0.0 - 0.5	SC	A-6	13	27	50	73	95	97	98	99	99	99	100	100	--	--	--	--	12.9	--	--
MT-OP-E	0.0 - 0.5	CL	A-6	12	31	63	79	95	97	98	99	99	99	100	100	--	--	--	--	10.3	--	--
MT-WP-SM1	0.0 -	SC	A-6	24	37	48	67	91	93	94	96	97	97	98	99	99	100	--	--	5.9	--	--
MT-WP-SM2	0.0 -	CL	A-7-6	27	43	70	78	85	86	87	89	91	92	96	98	100	--	--	--	10.9	--	--
MT-WP-SM3	0.0 -	SC	A-6	21	34	46	63	89	93	95	96	97	97	98	98	99	100	--	--	3.0	--	--

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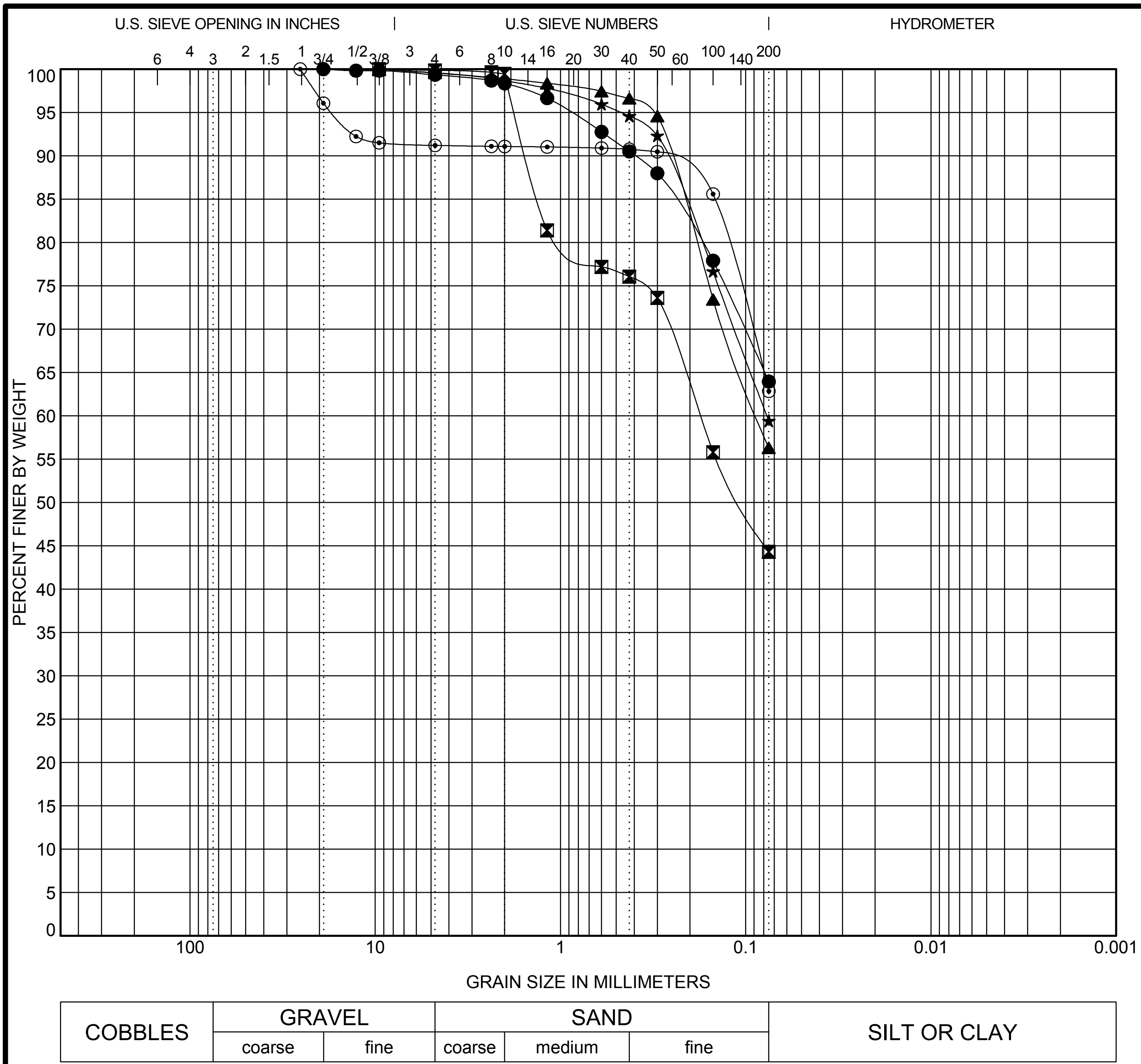

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	Borrow Area	2.0	19.05				0.7	35.4	63.9	
⊠	MT-1-F	0.0	9.525	0.177			0.1	55.6	44.3	
▲	MT-2-D	0.0	9.525	0.087			0.4	43.2	56.3	
★	MT-3-F	0.0	9.525	0.077			0.4	40.1	59.4	
⊙	MT-4-F	0.0	25.4				8.8	28.4	62.8	

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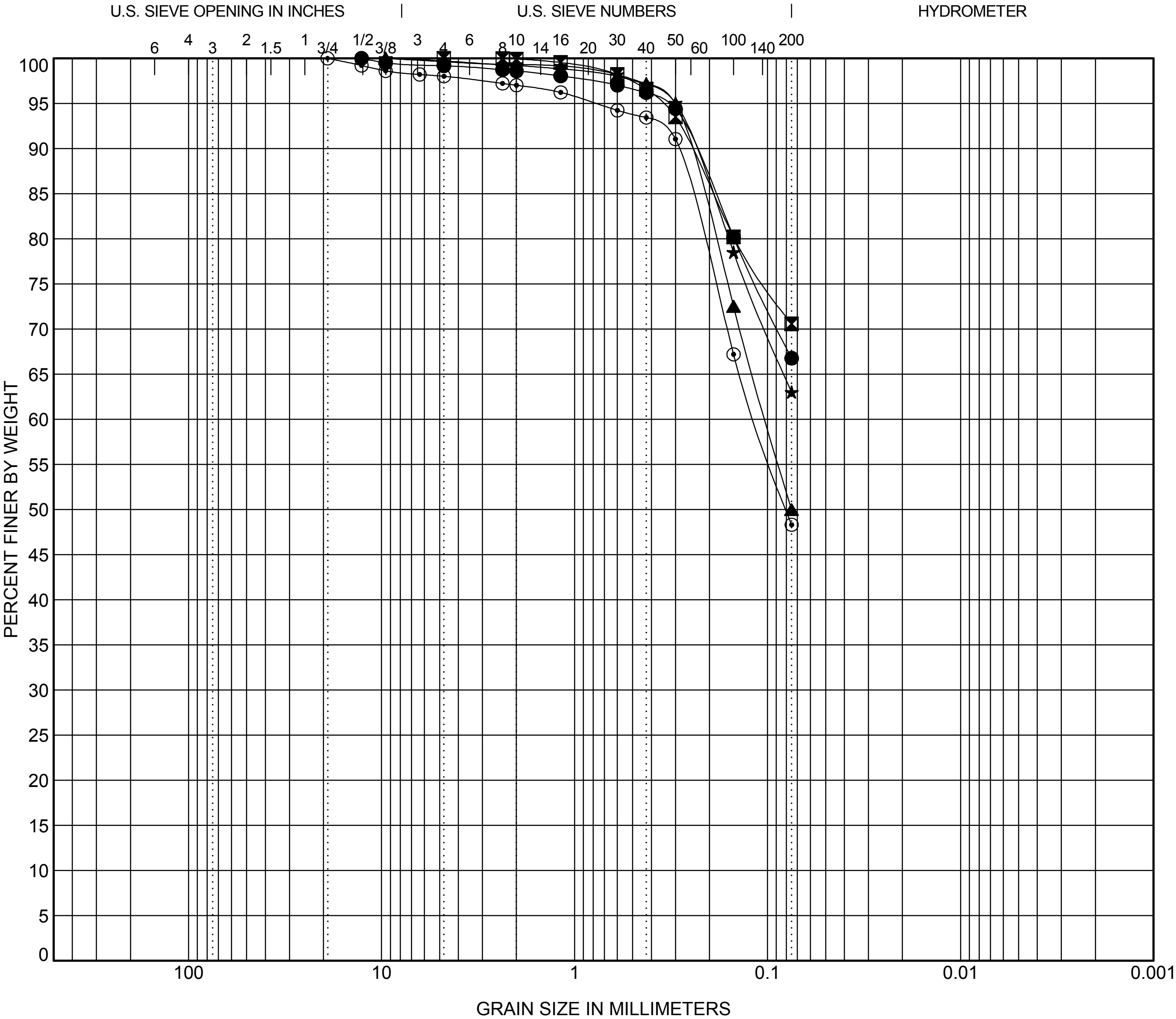
GRAIN SIZE DISTRIBUTION

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	MT-5-F	0.0	12.7				0.8	32.4	66.8	
⧗	MT-7-C	0.0	4.75				0.0	29.4	70.6	
▲	MT-8-F	0.0	9.525	0.102			0.3	49.7	50.0	
★	MT-OP-E	0.0	9.525				0.4	36.6	63.0	
⊙	MT-WP-SM1	0.0	19.05	0.115			2.0	49.7	48.3	

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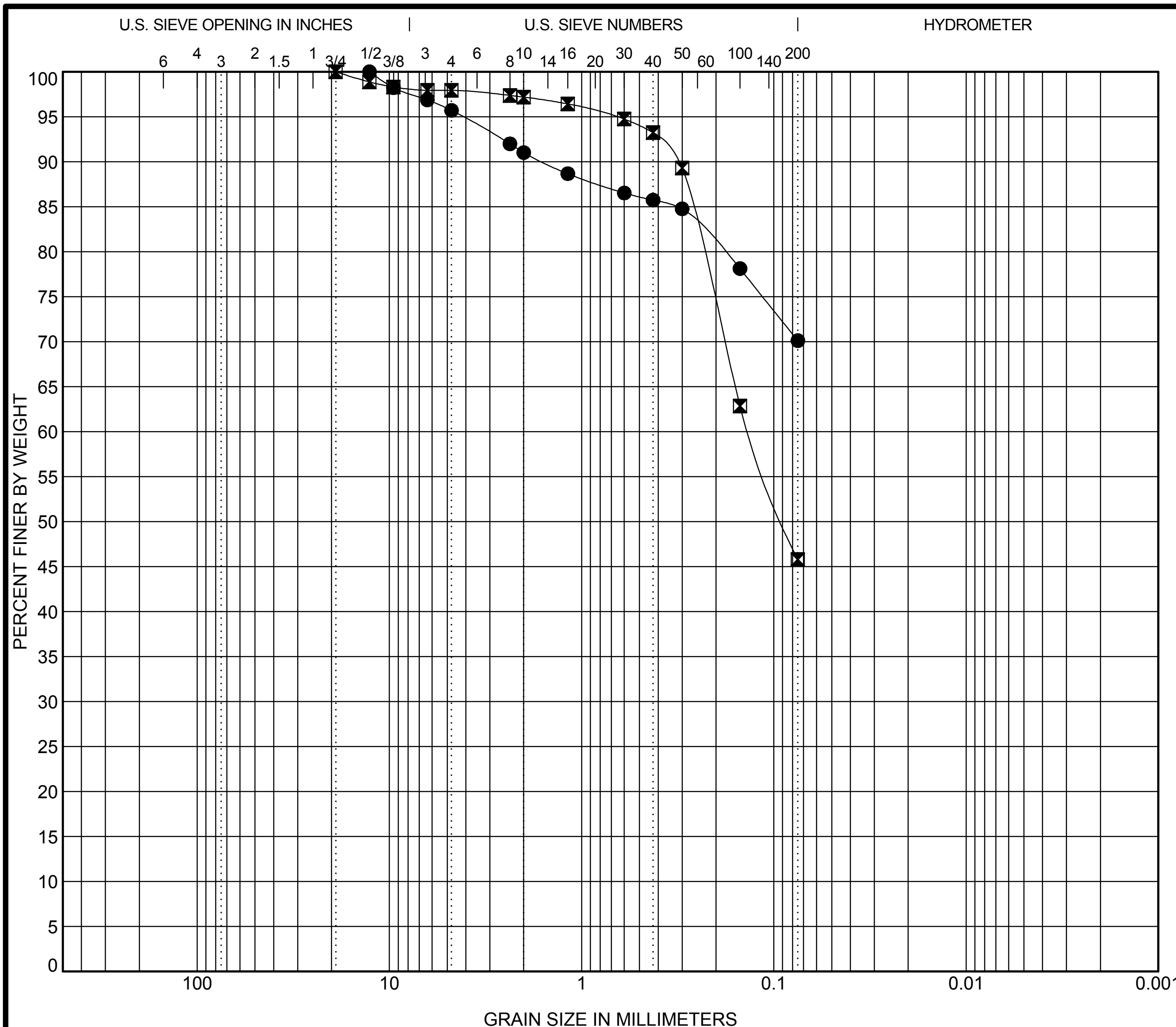
Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	MT-WP-SM2	0.0	12.7				4.3	25.6	70.1	
⊠	MT-WP-SM3	0.0	19.05	0.134			2.1	52.2	45.8	

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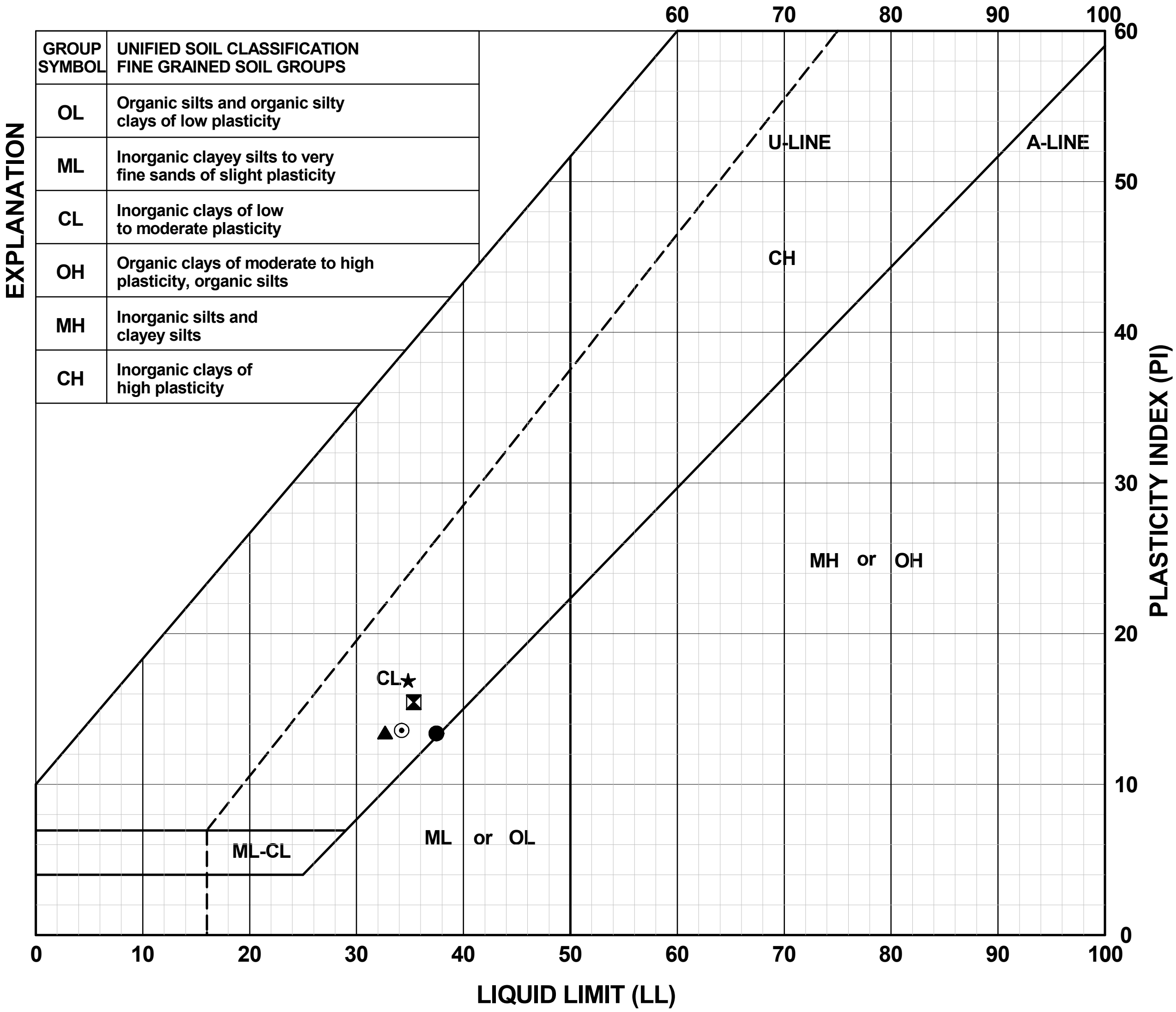
GRAIN SIZE DISTRIBUTION

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450

ASTM D4318



Specimen Identification		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
● Borrow Area	2.0	37	24	13
⧗ MT-1-F	0.0	35	20	15
▲ MT-2-D	0.0	33	19	14
★ MT-3-F	0.0	35	18	17
⊙ MT-4-F	0.0	34	21	13

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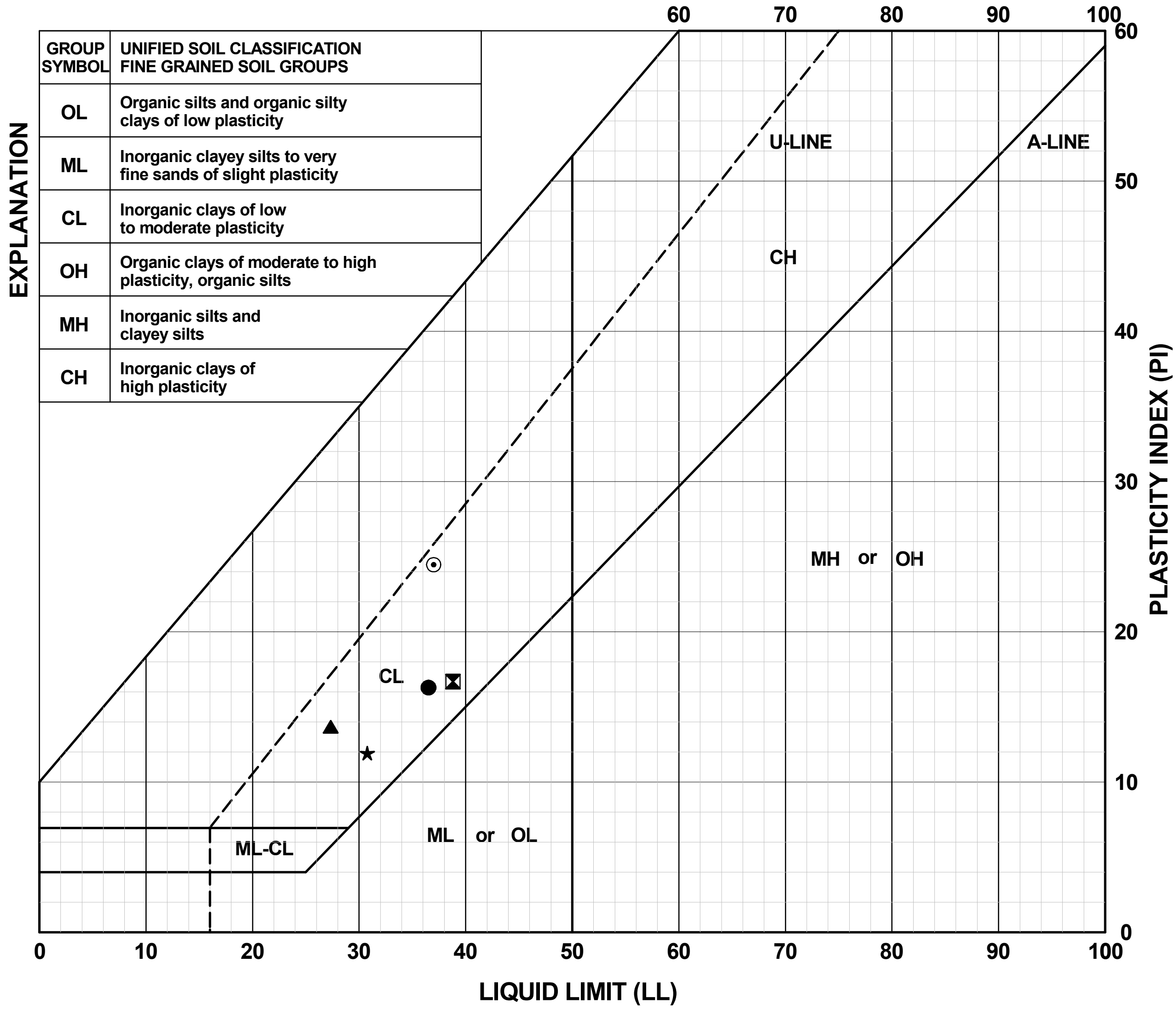
ATTERBERG LIMITS

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450

ASTM D4318



	Specimen Identification		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
●	MT-5-F	0.0	37	20	17
⧗	MT-7-C	0.0	39	22	17
▲	MT-8-F	0.0	27	14	13
★	MT-OP-E	0.0	31	19	12
⊙	MT-WP-SM1	0.0	37	13	24

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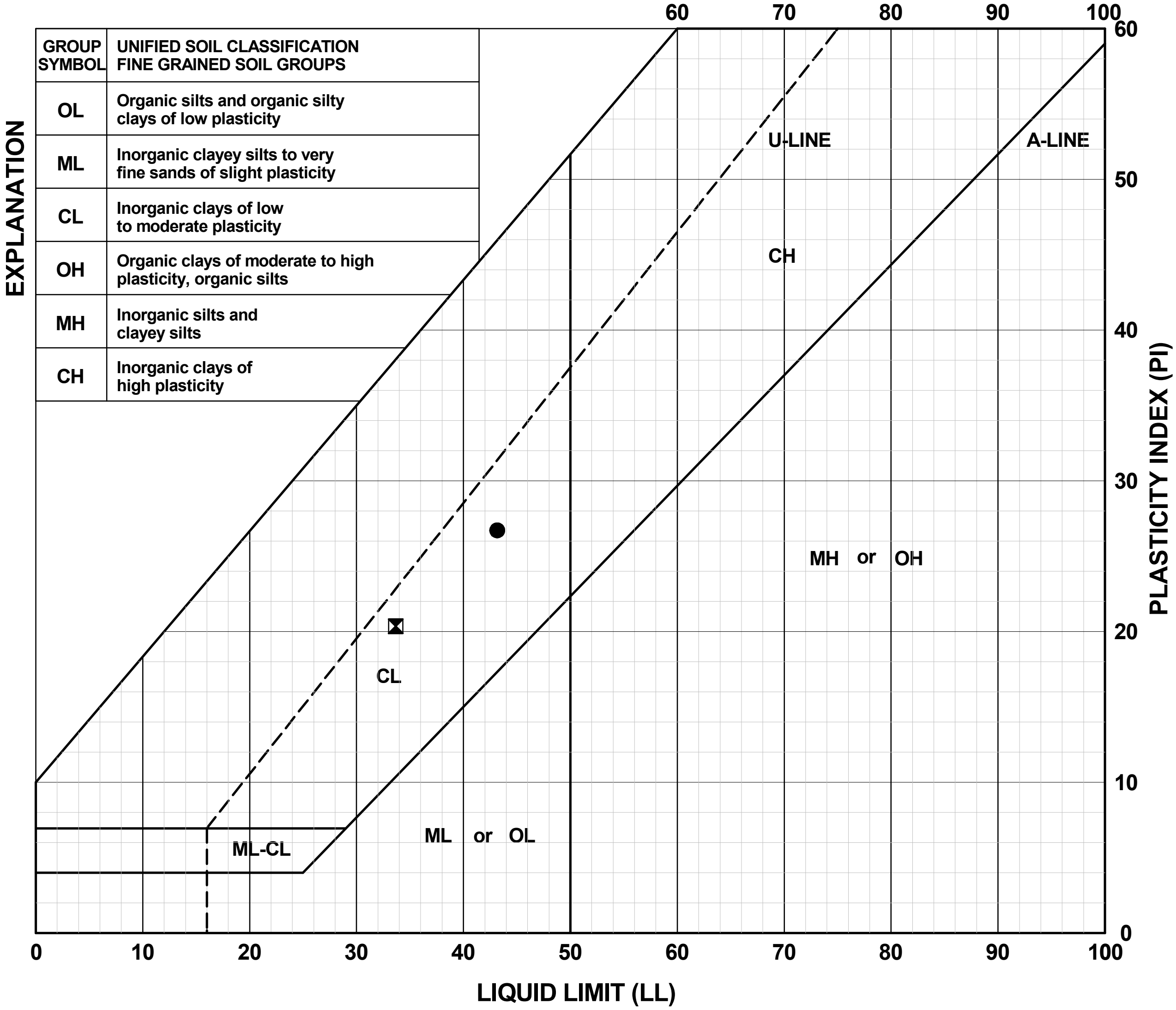
ATTERBERG LIMITS

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450

ASTM D4318



	Specimen Identification		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
●	MT-WP-SM2	0.0	43	16	27
⊠	MT-WP-SM3	0.0	34	13	21

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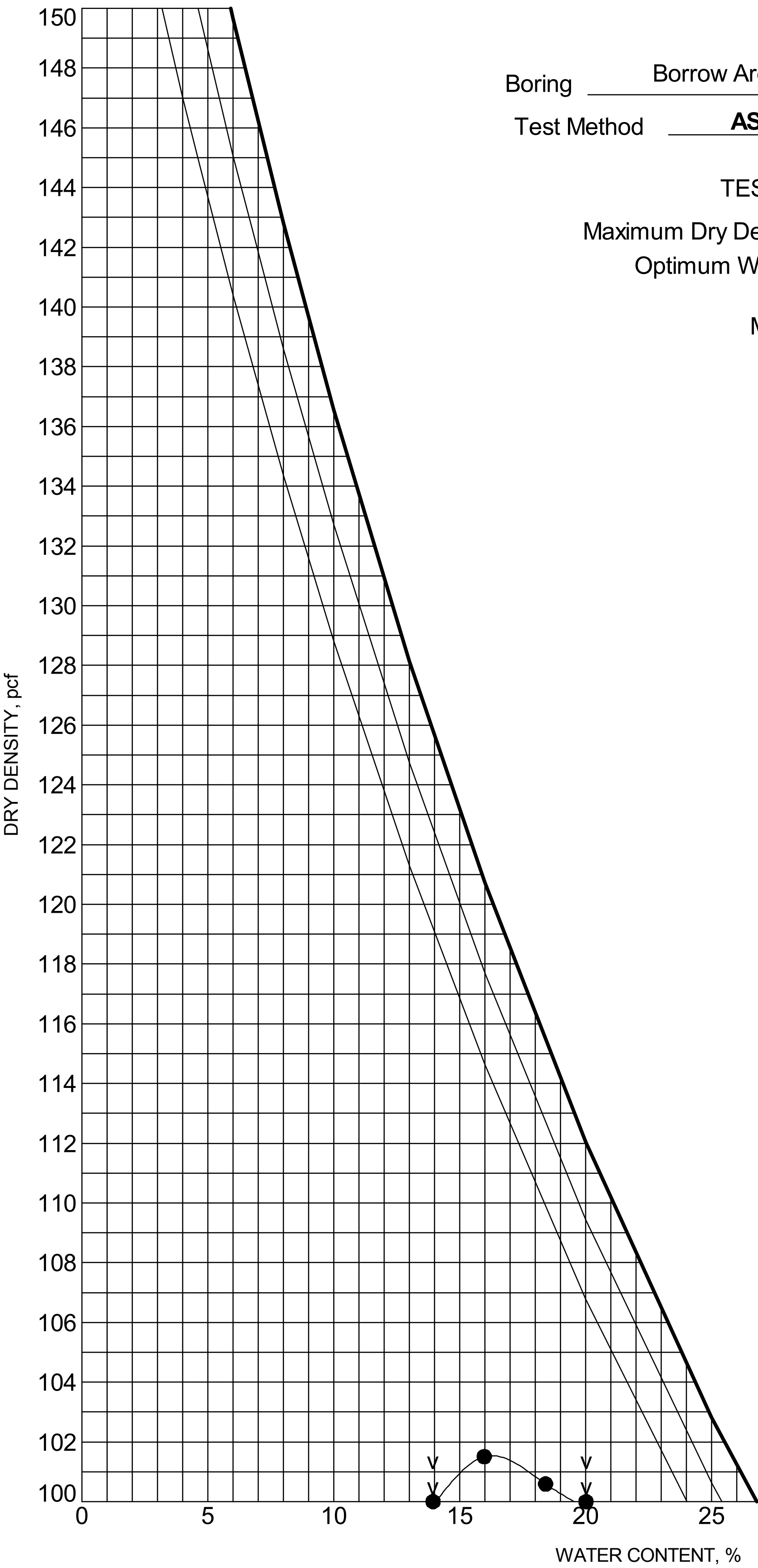
ATTERBERG LIMITS

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450



Boring Borrow Area Depth 2.0 - 5.5

Test Method **ASTM D1557 Method B**

TEST RESULTS

Maximum Dry Density **101.5 PCF**

Optimum Water Content **16.2 %**

MATERIAL DESCRIPTION

% clay or silt	63.9
% sand	35.4
% gravel	0.7
Liquid Limit	37
Plastic Limit	24
Plasticity Index	13

CURVES OF 100% SATURATION
FOR SPECIFIC GRAVITY EQUAL TO:

2.80

2.70

2.60

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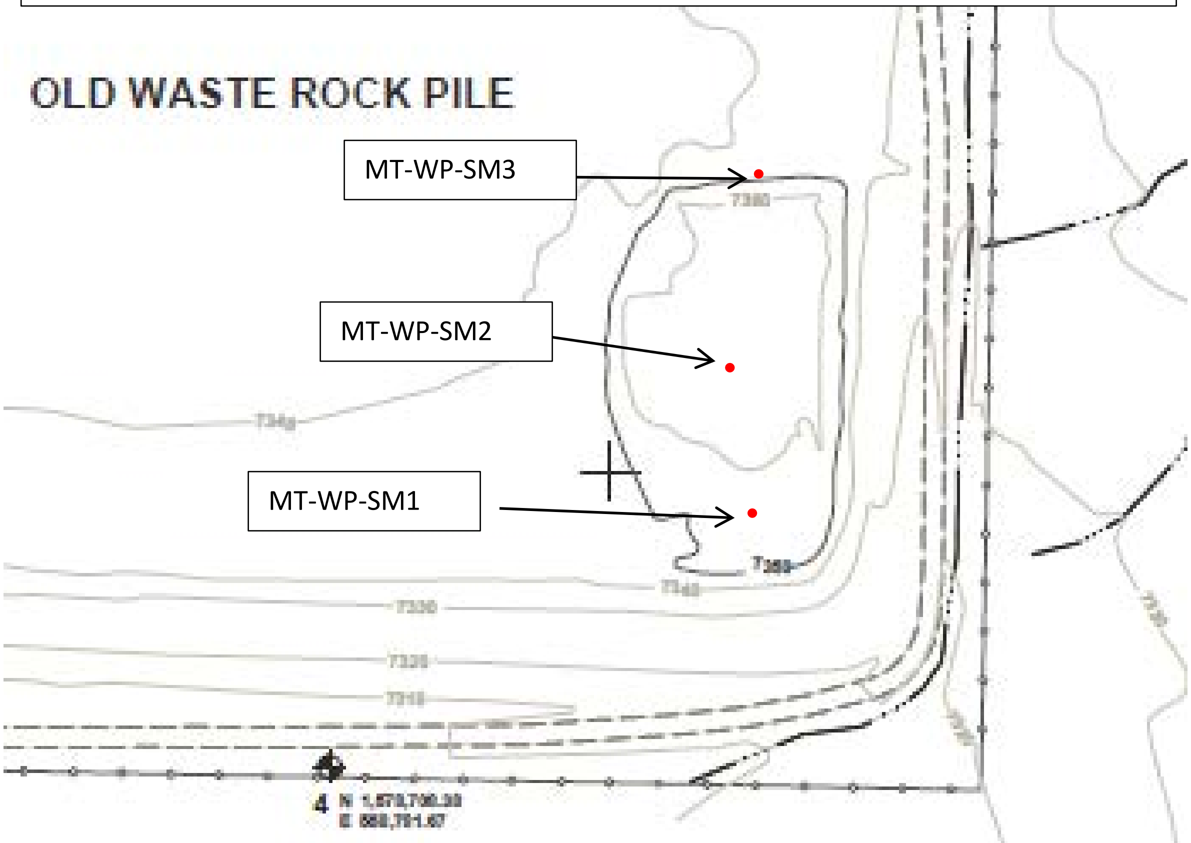
MOISTURE-DENSITY RELATIONSHIP

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

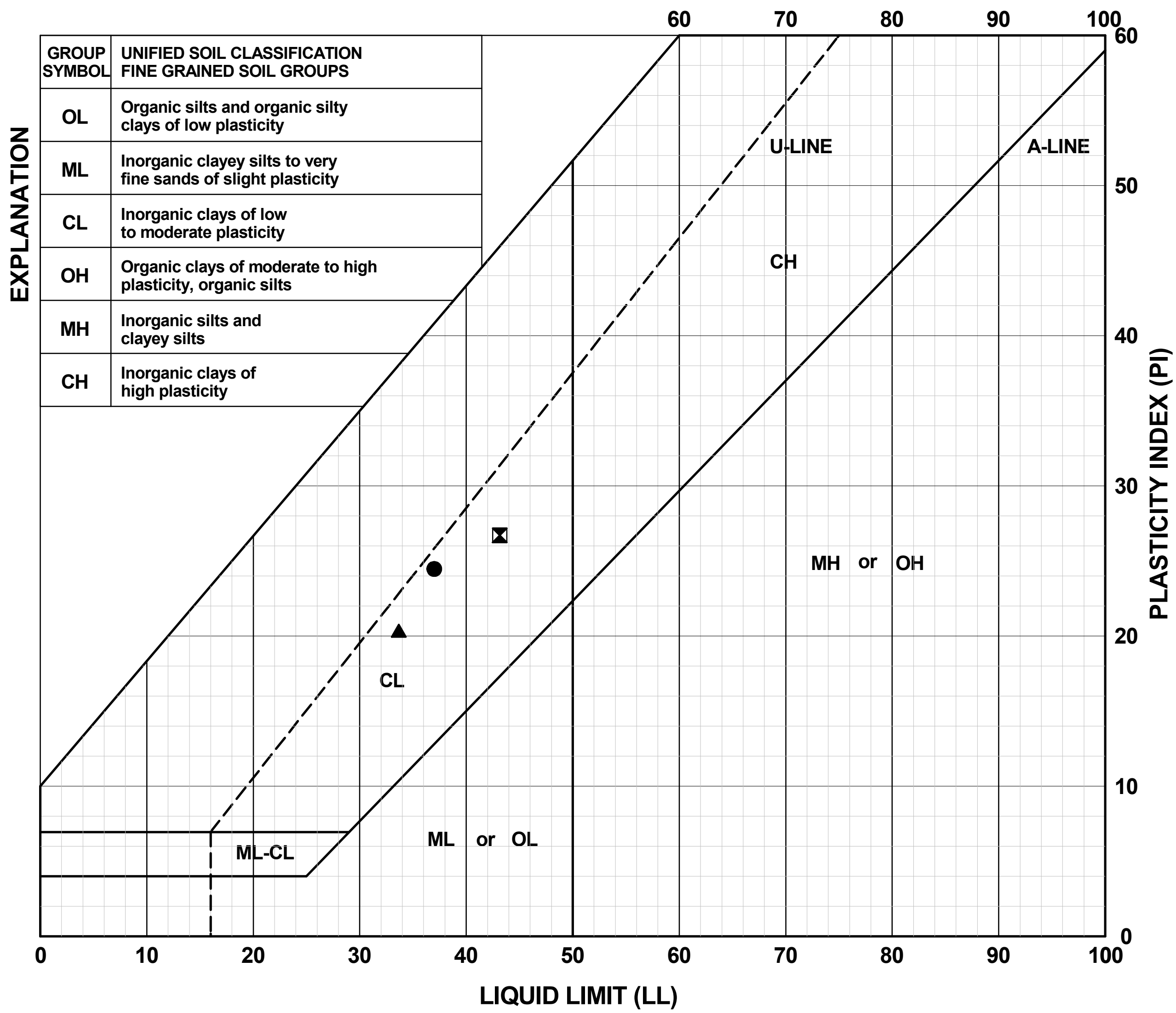
Project Number: 96450

MT TAYLOR MINE SHAFT MUCK SAMPLE LOCATIONS – 5/18/2010



Bulk samples of shaft muck from Mt. Taylor Mine waste rock pile collected on 5/18/2012 by Alan Kuhn. Locations are approximate (+/- 50 ft) based on visual reference to slopes. Splits delivered 5/18/12 to Kleinfelder Albuquerque for grain size analysis and plasticity tests. Other splits left with RGR Mine office for shipment to Energy Labs for testing of U and Ra concentration.

ASTM D4318



	Specimen Identification		Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)
●	MT-WP-SM1	0.0	37	13	24
⧗	MT-WP-SM2	0.0	43	16	27
▲	MT-WP-SM3	0.0	34	13	21

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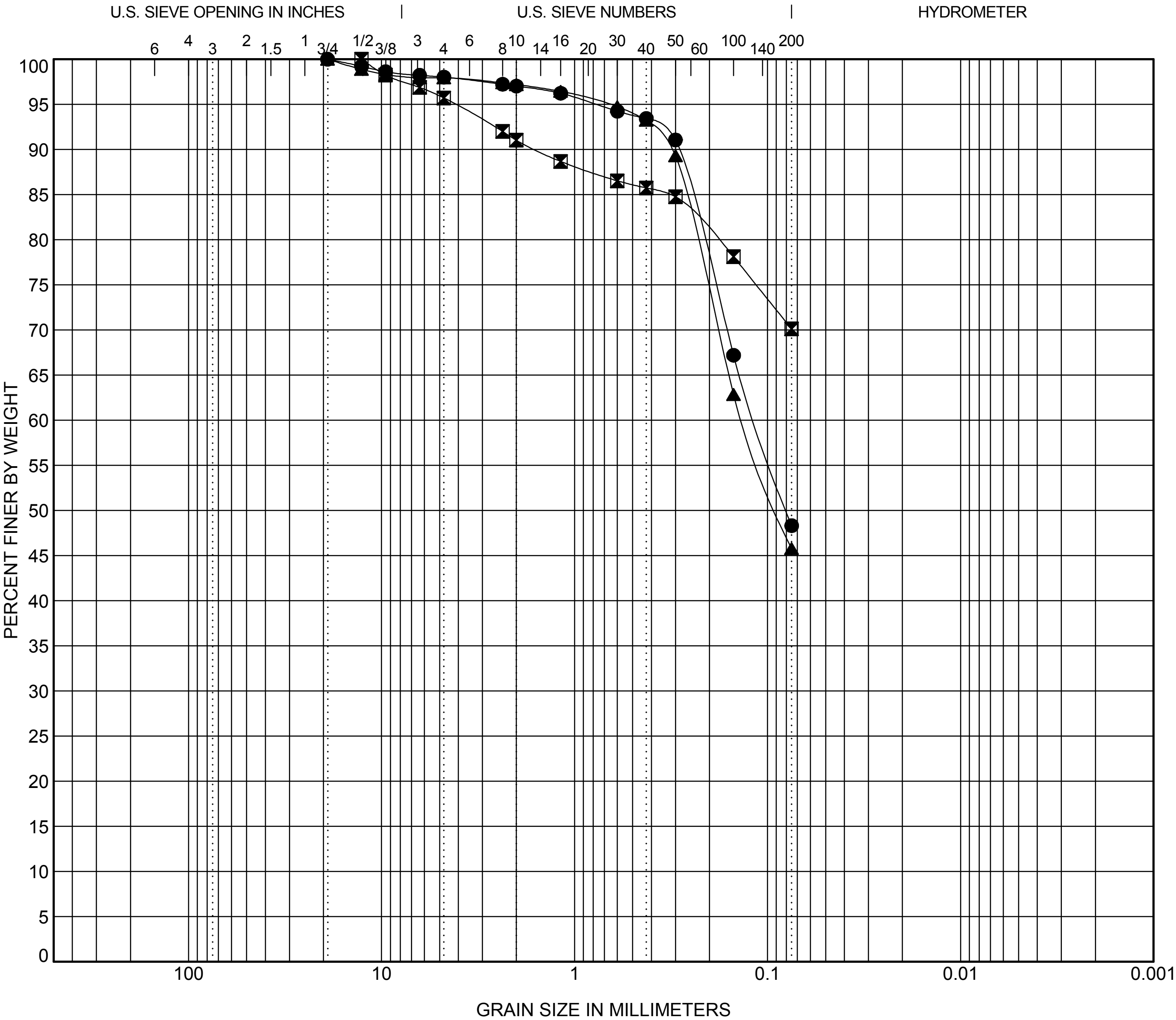
ATTERBERG LIMITS

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	MT-WP-SM1	0.0	19.05	0.115			2.0	49.7	48.3	
⊠	MT-WP-SM2	0.0	12.7				4.3	25.6	70.1	
▲	MT-WP-SM3	0.0	19.05	0.134			2.1	52.2	45.8	

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GRAIN SIZE DISTRIBUTION

Project: Mount Taylor Mine: Settling Pond Evaluations

Location: San Mateo, New Mexico

Project Number: 96450

SUMMARY OF LABORATORY ANALYSIS

Project: **Mount Taylor Mine: Settling Pond Evaluations** Location: **San Mateo, New Mexico**
Project Number: **96450**

Boring Number	Depth (ft.)	Soil Classification		Atterberg Limits		Sieve Analysis - Accumulative % Passing														Moisture Content (%)	Dry Density (pcf)	Unconfined Comp. Strength (psi)
		USCS	AASHTO	PI	LL	No. 200	No. 100	No. 50	No. 40	No. 30	No. 16	No. 10	No. 8	No. 4	3/8 in	1/2 in	3/4 in	1 in	1 1/2 in			
MT-WP-SM1	0.0 -	SC	A-6	24	37	48	67	91	93	94	96	97	97	98	99	99	100	--	--	5.9	--	--
MT-WP-SM2	0.0 -	CL	A-7-6	27	43	70	78	85	86	87	89	91	92	96	98	100	--	--	--	10.9	--	--
MT-WP-SM3	0.0 -	SC	A-6	21	34	46	63	89	93	95	96	97	97	98	98	99	100	--	--	3.0	--	--

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APPENDIX D.3

FIELD SAMPLING AND LABORATORY TEST DATA

Laboratory Test Results

See Appendix D cover sheet for other documents with data generated 2014-2022

TABLE 2
Soil Chemical Analytical Results - April 2012
Total Metals by SW 6010/SW 6020 and Radiochemistry by E903.0/RA-05
RIO GRANDE RESOURCES SOIL SAMPLING AND TESTING FOR CLOSEOUT PLAN
MT. TAYLOR MINE, SAN MATEO, NEW MEXICO

Sample ID	Location	Collection Depth (inches bgs)	Collection Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Radium 226	Radium 228	Selenium	Silver	Uranium
	CONCENTRATION			mg/L						pCi/g	pCi/g	mg/L		
Analytical Method				SW 6020	SW 6010B	SW 6010B	SW 6010B	SW 6020	SW 7470A	E903.0	RA-05	SW 6020	SW 6020	SW 6020
NMED SSL DAF 1				1.31E-02	3.01E+02	1.37E+00	9.86E+07	NA	5.71E-01	30[3]		9.65E-01	1.57E+00	4.93E+01
MT-4-D-S3 (48" B.G.)	**MT-4-D**	48	4/10/2012	0.003	0.88	<0.001	0.009	0.003	<0.002	6.7	0.8	0.020	<0.002 D	0.013 D
MT-4-E-S1 (0-4" B.G.)	**MT-4-E**	0-4	4/10/2012	0.034	34	<0.001	0.007	0.008	<0.002	8.7	1.5	0.15	<0.002 D	0.39 D
MT-4-E-S2 (10-12" B.G.)	**MT-4-E**	10-12	4/10/2012	0.005	0.22	<0.001	0.011	0.005	<0.002	4.8	0.4	0.072	<0.002 D	0.014 D
MT-4-E-S3 (36" B.G.)	**MT-4-E**	36	4/10/2012	0.003	0.13	<0.001	0.007	0.003	<0.002	2.9	0.7	0.026	0.003 D	0.0043 D
MT-4-E-S4 (48" B.G.)	**MT-4-E**	48	4/10/2012	0.005 B	0.06	<0.001	0.006	0.002	<0.002	6.2	0.4	0.011	<0.001	0.027
MT-4-F (6" B.G.)	**MT-4-F**	6	4/10/2012	0.005	<0.05	<0.001	<0.005	0.003	<0.002	0.8	1.0	0.002	<0.002 D	0.0027 D
MT-5-F (6" B.G.)	**MT-5-F**	6	4/10/2012	0.002	<0.05	<0.001	<0.005	0.001	<0.002	2.0	0.8	0.001	0.003 D	0.0029 D
MT-6-A-S1 (0-5" B.G.)	**MT-6-A**	0-5	4/10/2012	0.012	7.3	<0.001	0.007	0.016	<0.002	6.4	0.2	0.007	<0.001	0.044
MT-6-A-S2 (12-20" B.G.)	**MT-6-B**	12-20	4/10/2012	0.003 B	0.05	<0.001	0.007	<0.001	<0.002	0.4	0.1	0.15	<0.001	0.26 U
MT-6-B-S1 (8-10" B.G.)	**MT-6-B**	8-10	4/10/2012	0.004 B	0.05	<0.001	0.007	<0.001	<0.002	0.8	0.2	0.16	<0.001	0.26
MT-6-B-S2 (30" B.G.)	**MT-6-B**	30	4/10/2012	0.002 B	0.06	<0.001	<0.005	<0.001	<0.002	4.1	0.8	0.003	<0.001	0.014
MT-7-C (6" B.G.)	**MT-7-C**	6	4/10/2012	0.002	<0.05	<0.001	0.006	0.002	<0.002	0.6	0.8	<0.001	<0.002 D	0.0023 D
MT-8-F (6" B.G.)	**MT-8-F**	6	4/10/2012	0.001	0.05	0.001	0.005	0.001	0.002	-1000	-1000	0.001	0.002 D	0.0006 D
MT-A-C (6" B.G.)	**MT-A-C**	6	4/10/2012	0.003	<0.05	<0.001	<0.005	0.001	<0.002	1.7	0.5	0.044	<0.002 D	0.14
MT-Borrow/Background	**MT-Borrow**	24-66	4/10/2012	0.001	<0.05	<0.001	<0.005	<0.001	<0.002	0.7	0.7	0.001	<0.002 D	0.0007
MT-OP-C-S1 (0-6" B.G.)	**MT-OP-C**	0-6	4/10/2012	0.015	0.05	<0.001	0.010	0.001	<0.002	53.3	2.1	0.052	<0.001	1.8
MT-OP-C-S2 (20" B.G.)	**MT-OP-C**	20	4/10/2012	0.005	0.05	<0.001	0.007	0.002	<0.002	1.7	0.6	0.018	<0.002 D	0.14
MT-OP-C-S3 (48-50' B.G.	**MT-OP-C**	48-50	4/10/2012	0.004	<0.05	<0.001	<0.005	<0.001	<0.002	0.8	0.8	0.028	<0.002 D	0.049
MT-OP-C-S4 (72" B.G.)	**MT-OP-C**	72	4/10/2012	0.004	<0.05	<0.001	<0.005	<0.001	<0.002	1.5	0.6	0.025	<0.002 D	0.0064
MT-OP-D-S1 (0-6" B.G.)	**MT-OP-D**	0-6	4/10/2012	0.013	1.3	<0.001	0.007	0.008	<0.002	51.9	0.5	0.009	<0.002 D	0.23
MT-OP-D-S2 (48-50" B.G.	**MT-OP-D**	48-50	4/10/2012	0.001	0.05	<0.001	<0.005	<0.001	<0.002	1.9	0.6	0.005	<0.002 D	0.10
MT-OP-D-S3 (76" B.G.)	**MT-OP-D**	76	4/10/2012	0.006	0.11	<0.001	0.012	0.009	<0.002	0.6	0.5	0.002	<0.002 D	0.0034
MT-OP-E (6" B.G.)	**MT-OP-E**	6	4/10/2012	0.004	0.05	<0.001	0.006	0.003	<0.002	1.1	0.8	0.005	<0.002 D	0.0056

Notes:
bgs = below ground surface
mg/Kg = milligrams per killogram
DAF=Dilution Attenuation Factor
NA = No DAF values available, NMED 2012, rev6

Total metals concentrations should be compared to background soil sample concentrations before comparing to Soil Screening Levels (SSL). Only metal concentrations above background should be considered for comparison to SSLs.
NMED considers a DAF=20 to be protective of groundwater for a 0.5-acre source. SSL values are included for reference only, as they are applicable for reclamation, not for mines that are active or on stand-by status.
B = The analyte was detected in the method blank.
D = Reporting limit increased due to sample matrix.
U = Not detected at minimum detectable concentration.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client: Rio Grande Resources Corporation
Project: Mt. Taylor Mine Closure Plan
Lab ID: C12041044-009
Client Sample ID: MT-Borrow/Background

Revised Date: 07/10/12
Report Date: 06/13/12
Collection Date: 04/10/12 11:00
DateReceived: 04/20/12
Matrix: Sediment

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Filterable	No					SW1311	04/24/12 16:14 / dcj
METALS - SPLP EXTRACTABLE							
Arsenic	0.001	mg/L		0.001		SW6020	05/01/12 15:27 / cp
Barium	ND	mg/L		0.05		SW6020	05/01/12 15:27 / cp
Cadmium	ND	mg/L		0.001		SW6020	05/01/12 15:27 / cp
Chromium	ND	mg/L		0.005		SW6020	05/01/12 15:27 / cp
Lead	ND	mg/L		0.001		SW6020	05/01/12 15:27 / cp
Mercury	ND	mg/L		0.002		SW7470A	04/30/12 15:34 / rdw
Selenium	0.001	mg/L		0.001		SW6020	05/01/12 15:27 / cp
Silver	ND	mg/L	D	0.002		SW6020	05/01/12 15:27 / cp
Uranium	0.0007	mg/L	D	0.0006		SW6020	05/01/12 15:27 / cp
RADIONUCLIDES							
Radium 226	0.7	pCi/g-dry				E903.0	07/10/12 13:40 / trs
Radium 226 precision (±)	0.07	pCi/g-dry				E903.0	07/10/12 13:40 / trs
Radium 226 MDC	0.03	pCi/g-dry				E903.0	07/10/12 13:40 / trs
Radium 228	0.7	pCi/g-dry				RA-05	07/05/12 22:57 / gb
Radium 228 precision (±)	0.1	pCi/g-dry				RA-05	07/05/12 22:57 / gb
Radium 228 MDC	0.2	pCi/g-dry				RA-05	07/05/12 22:57 / gb

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
D - RL increased due to sample matrix.

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client:	Rio Grande Resources Corporation	**Report Date:**	07/05/12
Project:	Mt. Taylor Mine	**Collection Date:**	05/18/12 09:30
Lab ID:	C12050924-001	**DateReceived:**	05/24/12
Client Sample ID:	MT-WP-SM1	**Matrix:**	Soil

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES							
Radium 226	0.7	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 precision (±)	0.08	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 MDC	0.04	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Uranium 234	0.6	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235	0.03	pCi/g-dry	U			E908.0	06/18/12 08:39 / dmf
Uranium 235 precision (±)	0.09	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238	0.6	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 precision (±)	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client:	Rio Grande Resources Corporation	**Report Date:**	07/05/12
Project:	Mt. Taylor Mine	**Collection Date:**	05/18/12 09:40
Lab ID:	C12050924-002	**DateReceived:**	05/24/12
Client Sample ID:	MT-WP-SM2	**Matrix:**	Soil

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES							
Radium 226	0.7	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 precision (±)	0.08	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 MDC	0.03	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Uranium 234	0.8	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235	0.1	pCi/g-dry	U			E908.0	06/18/12 08:39 / dmf
Uranium 235 precision (±)	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238	0.4	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 precision (±)	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 MDC	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

LABORATORY ANALYTICAL REPORT

Prepared by Casper, WY Branch

Client:	Rio Grande Resources Corporation	**Report Date:**	07/05/12
Project:	Mt. Taylor Mine	**Collection Date:**	05/18/12 10:00
Lab ID:	C12050924-003	**DateReceived:**	05/24/12
Client Sample ID:	MT-WP-SM3	**Matrix:**	Soil

Analyses	Result	Units	Qualifier	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES							
Radium 226	1.1	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 precision (±)	0.09	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Radium 226 MDC	0.03	pCi/g-dry				E903.0	06/20/12 01:37 / dmf
Uranium 234	1.1	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 234 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235	-0.02	pCi/g-dry	U			E908.0	06/18/12 08:39 / dmf
Uranium 235 precision (±)	0.09	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 235 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238	0.9	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 precision (±)	0.3	pCi/g-dry				E908.0	06/18/12 08:39 / dmf
Uranium 238 MDC	0.2	pCi/g-dry				E908.0	06/18/12 08:39 / dmf

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
MDC - Minimum detectable concentration
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration

Response No. 16 Attachment

Laboratory Report for Alan Kuhn Associates LLC

July 2016

Laboratory Report for
Alan Kuhn Associates LLC

Mt Taylor Mine

July 1, 2016

Daniel B. Stephens & Associates, Inc.

4400 Alameda Blvd. NE, Suite C • Albuquerque, New Mexico 87113

July 1, 2016

Alan Kuhn
Alan Kuhn Associates LLC
13212 Manitoba Dr. NE
Albuquerque, NM 87111
(505) 350-9188

Re: DBS&A Laboratory Report for the Alan Kuhn Associates LLC Mt Taylor Mine Project

Dear Mr. Kuhn:

Enclosed is the report for the Alan Kuhn Associates LLC Mt Taylor Mine project samples. Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to Alan Kuhn Associates LLC and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
SOIL TESTING & RESEARCH LABORATORY

Joleen Hines
Joleen Hines
Laboratory Supervising Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
Soil Testing & Research Laboratory
4400 Alameda Blvd. NE, Suite C
Albuquerque, NM 87113
505-889-7752
FAX 505-889-0258

Summaries

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
BP16-1																X	X				X	X
BP16-1 (95%)	X	X				X	X	X		X	X			X								
BP16-2																X	X				X	X
BP16-3																X	X				X	X
BP16-3 (95%)	X	X				X	X	X		X	X			X								
BP16-4																X	X				X	X
BP16-5																X	X				X	X
BP16-5 (95%)	X	X				X	X	X		X	X			X								

[1] G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method
[2] CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall
[3] HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity
[4] DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer
[5] F = Fine (<4.75mm), C = Coarse (>4.75mm)

Notes

Sample Receipt:
Five samples, each in a full 5-gallon bucket, were received on April 28, 2016.

Sample Preparation and Testing Notes:
Each of the five samples was subjected to standard proctor compaction testing, particle size analysis, and Atterberg limits testing. Based on these results, three of the samples were chosen by the client for additional testing.

A portion of each of the three samples was remolded into a testing ring to target 95% of the respective maximum dry bulk density at the respective optimum moisture content, based on the standard proctor compaction test results. Each of these remolded sub-samples was subjected to initial properties analysis, saturation, and the hanging column and pressure chamber portions of the moisture retention testing. Secondary sub-samples were also prepared, using the same target remold parameters. The secondary sub-samples were then extruded from the testing ring and were subjected to saturated hydraulic conductivity testing via the flexible wall method. The actual percentage of maximum dry bulk density achieved was added to each remolded sub-sample ID.

Separate sub-samples were obtained for the dewpoint potentiometer and relative humidity chamber portions of the moisture retention testing.

Based on the proctor compaction method, material larger than 4.75mm was removed from the sample material prior to compaction and remolding. Oversize correction calculations are not presented since the fraction removed was less than 5% of the bulk sample mass in all cases.

Porosity calculations, and the particle diameter calculations in the hydrometer portion of the particle size analysis testing, are based on the use of an assumed specific gravity value of 2.65.

Volumetric water contents were adjusted for changes in volume, where applicable. Due to the irregularities formed on the sample surfaces during swelling, volume measurements obtained after the initial reading should be considered estimates.

Summary of Sample Preparation/Volume Changes

Sample Number	Proctor Data: Opt. Moist. Cont. (%, g/g)	Proctor Data: Max. Dry Density (g/cm^3)	Target Remold Parameters[1]: Moist. Cont. (%, g/g)	Target Remold Parameters[1]: Dry Bulk Density (g/cm^3)	Target Remold Parameters[1]: % of Max. Density (%)	Actual Remold Data: Moist. Cont. (%, g/g)	Actual Remold Data: Dry Bulk Density (g/cm^3)	Actual Remold Data: % of Max. Density (%)	Volume Change Post Saturation[2]: Dry Bulk Density (g/cm^3)	Volume Change Post Saturation[2]: % Volume Change (%)	Volume Change Post Saturation[2]: % of Max. Density (%)	Volume Change Post Drying Curve[3]: Dry Bulk Density (g/cm^3)	Volume Change Post Drying Curve[3]: % Volume Change (%)	Volume Change Post Drying Curve[3]: % of Max. Density (%)
BP-16-1 (95%)	16.6	1.75	16.6	1.66	95%	16.6	1.66	95.1%	1.63	+2.0%	93.3%	1.63	+1.8%	93.5%
BP-16-3 (95%)	16.4	1.75	16.4	1.66	95%	16.2	1.66	95.2%	1.65	+0.8%	94.4%	1.65	+0.8%	94.4%
BP-16-5 (95%)	18.9	1.65	18.9	1.56	95%	18.9	1.57	95.1%	1.55	+1.0%	94.2%	1.55	+0.9%	94.3%

[1]Target Remold Parameters: Provided by the client: 95% of maximum dry density at optimum moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

	Moisture Content						
	As Received		Remolded				
Sample Number	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
BP16-1 (95%)	NA	NA	16.6	27.5	1.66	1.94	37.3
BP16-3 (95%)	NA	NA	16.2	26.9	1.66	1.93	37.3
BP16-5 (95%)	NA	NA	18.9	29.6	1.57	1.86	40.9

NA = Not analyzed
--- = This sample was not remolded

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis: Constant Head Flexible Wall	Method of Analysis: Falling Head Flexible Wall
BP16-1 (95%)	3.0E-06	---		X
BP16-3 (95%)	6.6E-06	---		X
BP16-5 (95%)	5.2E-06	---		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
BP16-1 (95%)	0	39.2 ‡
	25	38.8 ‡
	73	37.7 ‡
	143	34.7 ‡
	337	32.2 ‡
	1938	22.3 ‡
	11932	17.7 ‡
	70468	12.3 ‡
	578125	7.4 ‡
	848426	6.7 ‡
BP16-3 (95%)	0	39.2 ‡
	25	39.0 ‡
	73	38.1 ‡
	143	34.2 ‡
	337	31.4 ‡
	2244	20.0 ‡
	13359	15.6 ‡
	103204	10.4 ‡
	589138	6.9 ‡
	848426	6.2 ‡
BP16-5 (95%)	0	42.3 ‡
	25	42.2 ‡
	73	40.8 ‡
	143	37.3 ‡
	337	35.0 ‡
	1734	24.0 ‡
	13971	16.9 ‡
	63432	12.2 ‡
	611268	7.0 ‡
	848426	6.4 ‡

‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
BP16-1 (95%)	0.0070	1.1954	0.00	39.44	---	---
BP16-3 (95%)	0.0073	1.2339	1.71	39.71	---	---
BP16-5 (95%)	0.0065	1.2140	0.00	42.69	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
BP16-1	0.00062	0.042	0.072	116	1.1	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-2	0.00065	0.040	0.063	97	0.91	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-3	0.00057	0.053	0.084	147	2.1	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-4	0.00070	0.043	0.066	94	1.8	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-5	0.00057	0.045	0.069	121	2.0	WS/H	Sandy lean clay s(CL)	Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
BP16-1	1.3	37.9	42.6	18.3
BP16-2	0.4	35.7	43.0	20.9
BP16-3	1.5	41.1	38.6	18.8
BP16-4	1.4	35.6	44.2	18.7
BP16-5	1.3	36.7	43.1	18.9

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
BP16-1	34	19	15	CL
BP16-2	33	19	14	CL
BP16-3	31	18	13	CL
BP16-4	34	18	16	CL
BP16-5	36	21	15	CL

--- = Soil requires visual-manual classification due to non-plasticity

Summary of Proctor Compaction Tests

Sample Number	Measured: Optimum Moisture Content (% g/g)	Measured: Maximum Dry Bulk Density (g/cm^3)	Oversize Corrected: Optimum Moisture Content (% g/g)	Oversize Corrected: Maximum Dry Bulk Density (g/cm^3)
BP16-1	16.6	1.75	---	---
BP16-2	17.6	1.70	---	---
BP16-3	16.4	1.75	---	---
BP16-4	17.0	1.71	---	---
BP16-5	18.9	1.65	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Initial Properties

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

	Moisture Content: As Received		Moisture Content: Remolded		Dry Bulk	Wet Bulk	Calculated
Sample Number	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Density (g/cm^3)	Density (g/cm^3)	Porosity (%)
BP16-1 (95%)	NA	NA	16.6	27.5	1.66	1.94	37.3
BP16-3 (95%)	NA	NA	16.2	26.9	1.66	1.93	37.3
BP16-5 (95%)	NA	NA	18.9	29.6	1.57	1.86	40.9

NA = Not analyzed
--- = This sample was not remolded

Daniel B. Stephens & Associates, Inc.

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-1 (95%)
Project Name:	Mt Taylor Mine
Depth:	NA

	As Received	Remolded
Test Date:	NA	20-May-16
Field weight of sample* (g):		562.40
Tare weight, ring (g):		133.44
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		367.98
Sample volume (cm^3):		221.38
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		16.6
Volumetric Moisture Content (% vol):		27.5
Dry bulk density (g/cm^3):		1.66
Wet bulk density (g/cm^3):		1.94
Calculated Porosity (% vol):		37.3
Percent Saturation:		73.9

Laboratory analysis by:	D. O'Dowd
Data entered by:	D. O'Dowd
Checked by:	J. Hines

Comments:

* Weight including tares

NA = Not analyzed

--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-3 (95%)
Project Name:	Mt Taylor Mine
Depth:	NA

	As Received	Remolded
Test Date:	NA	20-May-16
Field weight of sample* (g):		555.12
Tare weight, ring (g):		126.35
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		369.01
Sample volume (cm^3):		222.03
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		16.2
Volumetric Moisture Content (% vol):		26.9
Dry bulk density (g/cm^3):		1.66
Wet bulk density (g/cm^3):		1.93
Calculated Porosity (% vol):		37.3
Percent Saturation:		72.2

Laboratory analysis by:	D. O'Dowd
Data entered by:	D. O'Dowd
Checked by:	J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-5 (95%)
Project Name:	Mt Taylor Mine
Depth:	NA

	As Received	Remolded
Test Date:	NA	20-May-16
Field weight of sample* (g):		545.35
Tare weight, ring (g):		133.19
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		346.57
Sample volume (cm^3):		221.22
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		18.9
Volumetric Moisture Content (% vol):		29.6
Dry bulk density (g/cm^3):		1.57
Wet bulk density (g/cm^3):		1.86
Calculated Porosity (% vol):		40.9
Percent Saturation:		72.5

Laboratory analysis by:	D. O'Dowd
Data entered by:	D. O'Dowd
Checked by:	J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis: Constant Head Flexible Wall	Method of Analysis: Falling Head Flexible Wall
BP16-1 (95%)	3.0E-06	---		X
BP16-3 (95%)	6.6E-06	---		X
BP16-5 (95%)	5.2E-06	---		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job name:	Alan Kuhn Associates LLC
Job number:	NM16.0085.00
Sample number:	BP16-1 (95%)
Project name:	Mt Taylor Mine
Depth:	NA

Remolded or Initial Sample Properties

Initial Mass (g):	433.22
Diameter (cm):	6.101
Length (cm):	7.594
Area (cm^2):	29.23
Volume (cm^3):	222.00
Dry Density (g/cm^3):	1.67
Dry Density (pcf):	104.5
Water Content (%, g/g):	16.6
Water Content (%, vol):	27.8
Void Ratio (e):	0.58
Porosity (%, vol):	36.9
Saturation (%):	75.4

Post Permeation Sample Properties

Saturated Mass (g):	462.80
Dry Mass (g):	371.50
Diameter (cm):	6.200
Length (cm):	7.586
*Deformation (%)**:*	0.11
Area (cm^2):	30.19
Volume (cm^3):	229.01
Dry Density (g/cm^3):	1.62
Dry Density (pcf):	101.3
Water Content (%, g/g):	24.6
Water Content (%, vol):	39.9
Void Ratio(e):	0.63
Porosity (%, vol):	38.8
Saturation (%):*	102.8

Test and Sample Conditions

Permeant liquid used:	Tap Water
Sample Preparation:	☐ In situ sample, extruded ☑ Remolded Sample
Number of Lifts:	3
Split:	#4
Percent Coarse Material (%):	1.3
Particle Density(g/cm^3):	2.65 ☑ Assumed ☐ Measured
Cell pressure (PSI):	70.0
Influent pressure (PSI):	68.0
Effluent pressure (PSI):	68.0
Panel Used:	☐ G ☑ H ☐ I
Reading:	☐ Annulus ☑ Pipette

		Date/Time
B-Value (% saturation) prior to test*:	0.95	5/24/16 1450
B-Value (% saturation) post to test:	0.95	5/24/16 1550

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by:	D. O'Dowd
Data entered by:	D. O'Dowd
Checked by:	J. Hines

Daniel B. Stephens & Associates, Inc.

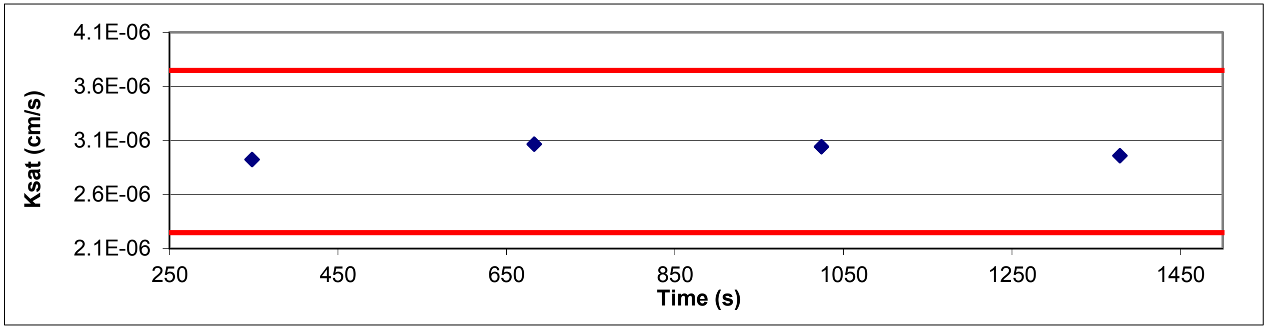
Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job name:	Alan Kuhn Associates LLC
Job number:	NM16.0085.00
Sample number:	BP16-1 (95%)
Project name:	Mt Taylor Mine
Depth:	NA

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
24-May-16	15:19:52	22.2	2.20	22.65	3.11	0.09	348	1.00	1%	3.08E-06	2.92E-06
24-May-16	15:25:40	22.2	2.30	22.55	3.08						
Test # 2:											
24-May-16	15:25:40	22.2	2.30	22.55	3.08	0.09	335	1.00	1%	3.23E-06	3.07E-06
24-May-16	15:31:15	22.2	2.40	22.45	3.05						
Test # 3:											
24-May-16	15:31:15	22.2	2.40	22.45	3.05	0.09	341	1.00	1%	3.21E-06	3.04E-06
24-May-16	15:36:56	22.2	2.50	22.35	3.02						
Test # 4:											
24-May-16	15:36:56	22.2	2.50	22.35	3.02	0.09	354	1.00	1%	3.12E-06	2.96E-06
24-May-16	15:42:50	22.2	2.60	22.25	2.99						

***Average Ksat* (cm/sec):** **3.00E-06**

Calculated Gravel Corrected Average Ksat (cm/sec): ---



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 2.25E-06

Ksat (+25%) (cm/s): 3.75E-06

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job name: Alan Kuhn Associates LLC
Job number: NM16.0085.00
Sample number: BP16-3 (95%)
Project name: Mt Taylor Mine
Depth: NA

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	431.18	*Saturated Mass (g):*	462.14	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.105	*Dry Mass (g):*	370.41	*Sample Preparation:*	☐ In situ sample, extruded
Length (cm):	7.594	*Diameter (cm):*	6.187		☑ Remolded Sample
Area (cm^2):	29.27	*Length (cm):*	7.594	*Number of Lifts:*	3
Volume (cm^3):	222.30	*Deformation (%)**:*	0.00	*Split:*	#4
Dry Density (g/cm^3):	1.67	*Area (cm^2):*	30.06	*Percent Coarse Material (%):*	1.5
Dry Density (pcf):	104.0	*Volume (cm^3):*	228.31	*Particle Density(g/cm^3):*	2.65 ☑ Assumed ☐ Measured
Water Content (%, g/g):	16.4	*Dry Density (g/cm^3):*	1.62	*Cell pressure (PSI):*	70.0
Water Content (%, vol):	27.3	*Dry Density (pcf):*	101.3	*Influent pressure (PSI):*	68.0
Void Ratio (e):	0.59	*Water Content (%, g/g):*	24.8	*Effluent pressure (PSI):*	68.0
Porosity (%, vol):	37.1	*Water Content (%, vol):*	40.2	*Panel Used:*	☐ G ☐ H ☑ I
Saturation (%):	73.6	*Void Ratio(e):*	0.63	*Reading:*	☐ Annulus ☑ Pipette
		Porosity (%, vol):	38.8		
		Saturation (%):*	103.6		

		Date/Time
B-Value (% saturation) prior to test*:	0.95	5/24/16 1453
B-Value (% saturation) post to test:	0.95	5/24/16 1555

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

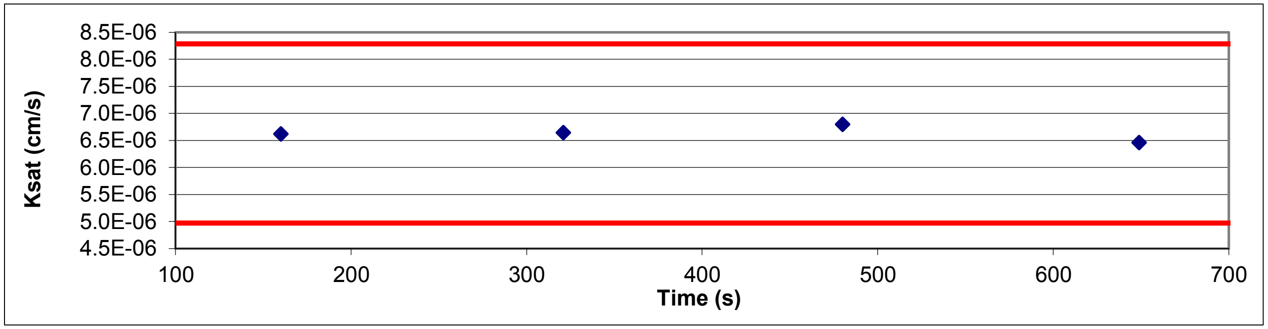
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job name: Alan Kuhn Associates LLC
Job number: NM16.0085.00
Sample number: BP16-3 (95%)
Project name: Mt Taylor Mine
Depth: NA

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
24-May-16	15:16:05	22.2	2.20	21.95	3.00	0.09	160	1.00	1%	6.97E-06	6.62E-06
24-May-16	15:18:45	22.2	2.30	21.85	2.97						
Test # 2:											
24-May-16	15:18:45	22.2	2.30	21.85	2.97	0.09	161	1.00	1%	7.00E-06	6.64E-06
24-May-16	15:21:26	22.2	2.40	21.75	2.94						
Test # 3:											
24-May-16	15:21:26	22.2	2.40	21.75	2.94	0.09	159	1.00	1%	7.16E-06	6.80E-06
24-May-16	15:24:05	22.2	2.50	21.65	2.91						
Test # 4:											
24-May-16	15:24:05	22.2	2.50	21.65	2.91	0.09	169	1.00	1%	6.81E-06	6.46E-06
24-May-16	15:26:54	22.2	2.60	21.55	2.88						

***Average Ksat* (cm/sec):** **6.63E-06**
Calculated Gravel Corrected Average Ksat (cm/sec): ---



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 4.97E-06

Ksat (+25%) (cm/s): 8.29E-06

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job name: Alan Kuhn Associates LLC
Job number: NM16.0085.00
Sample number: BP16-5 (95%)
Project name: Mt Taylor Mine
Depth: NA

Remolded or Initial Sample Properties

Initial Mass (g):	415.74
Diameter (cm):	6.105
Length (cm):	7.601
Area (cm^2):	29.27
Volume (cm^3):	222.50
Dry Density (g/cm^3):	1.57
Dry Density (pcf):	97.8
Water Content (%, g/g):	19.3
Water Content (%, vol):	30.2
Void Ratio (e):	0.69
Porosity (%, vol):	40.9
Saturation (%):	73.8

Post Permeation Sample Properties

Saturated Mass (g):	447.07
Dry Mass (g):	348.56
Diameter (cm):	6.180
Length (cm):	7.598
*Deformation (%)**:*	0.03
Area (cm^2):	30.00
Volume (cm^3):	227.92
Dry Density (g/cm^3):	1.53
Dry Density (pcf):	95.5
Water Content (%, g/g):	28.3
Water Content (%, vol):	43.2
Void Ratio(e):	0.73
Porosity (%, vol):	42.3
Saturation (%):*	102.2

Test and Sample Conditions

Permeant liquid used:	Tap Water
Sample Preparation:	☐ In situ sample, extruded
	☑ Remolded Sample
Number of Lifts:	3
Split:	#4
Percent Coarse Material (%):	1.3
Particle Density(g/cm^3):	2.65 ☑ Assumed ☐ Measured
Cell pressure (PSI):	70.0
Influent pressure (PSI):	68.0
Effluent pressure (PSI):	68.0
Panel Used:	☑ G ☐ H ☐ I
Reading:	☐ Annulus ☑ Pipette

		Date/Time
B-Value (% saturation) prior to test*:	1.00	5/24/16 1456
B-Value (% saturation) post to test:	1.00	5/24/16 1600

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

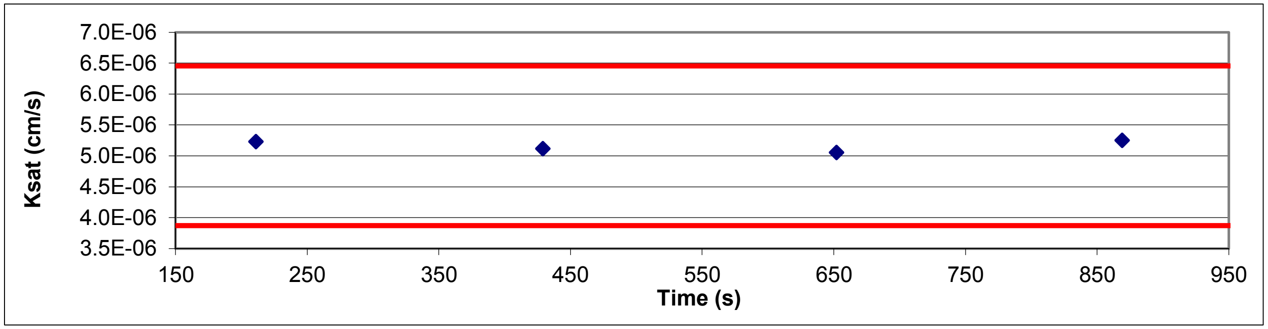
Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job name: Alan Kuhn Associates LLC
Job number: NM16.0085.00
Sample number: BP16-5 (95%)
Project name: Mt Taylor Mine
Depth: NA

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient ($\Delta H/\Delta L$)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
24-May-16	15:18:09	22.2	2.20	21.20	2.89	0.09	211	1.00	1%	5.51E-06	5.23E-06
24-May-16	15:21:40	22.2	2.30	21.10	2.86						
Test # 2:											
24-May-16	15:21:40	22.2	2.30	21.10	2.86	0.09	218	1.00	1%	5.39E-06	5.12E-06
24-May-16	15:25:18	22.2	2.40	21.00	2.83						
Test # 3:											
24-May-16	15:25:18	22.2	2.40	21.00	2.83	0.09	223	1.00	1%	5.33E-06	5.06E-06
24-May-16	15:29:01	22.2	2.50	20.90	2.80						
Test # 4:											
24-May-16	15:29:01	22.2	2.50	20.90	2.80	0.09	217	1.00	1%	5.54E-06	5.25E-06
24-May-16	15:32:38	22.2	2.60	20.80	2.77						

***Average Ksat* (cm/sec): 5.16E-06**

Calculated Gravel Corrected Average Ksat (cm/sec): ---



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 3.87E-06

Ksat (+25%) (cm/s): 6.46E-06

Moisture Retention Characteristics

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
BP16-1 (95%)	0	39.2 ‡
	25	38.8 ‡
	73	37.7 ‡
	143	34.7 ‡
	337	32.2 ‡
	1938	22.3 ‡
	11932	17.7 ‡
	70468	12.3 ‡
	578125	7.4 ‡
	848426	6.7 ‡
BP16-3 (95%)	0	39.2 ‡
	25	39.0 ‡
	73	38.1 ‡
	143	34.2 ‡
	337	31.4 ‡
	2244	20.0 ‡
	13359	15.6 ‡
	103204	10.4 ‡
	589138	6.9 ‡
	848426	6.2 ‡
BP16-5 (95%)	0	42.3 ‡
	25	42.2 ‡
	73	40.8 ‡
	143	37.3 ‡
	337	35.0 ‡
	1734	24.0 ‡
	13971	16.9 ‡
	63432	12.2 ‡
	611268	7.0 ‡
	848426	6.4 ‡

‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
BP16-1 (95%)	0.0070	1.1954	0.00	39.44	---	---
BP16-3 (95%)	0.0073	1.2339	1.71	39.71	---	---
BP16-5 (95%)	0.0065	1.2140	0.00	42.69	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Moisture Retention Data
Hanging Column / Pressure Plate
(Soil-Water Characteristic Curve)

Job Name:	Alan Kuhn Associates LLC	*Dry wt. of sample* (g):	367.98
Job Number:	NM16.0085.00	*Tare wt., ring* (g):	133.44
Sample Number:	BP16-1 (95%)	*Tare wt., screen & clamp* (g):	27.65
Project Name:	Mt Taylor Mine	*Initial sample volume* (cm^3):	221.38
Depth:	NA	*Initial dry bulk density* (g/cm^3):	1.66
		Assumed particle density (g/cm^3):	2.65
		Initial calculated total porosity (%):	37.27

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)	
Hanging column:	23-May-16	15:30	617.52	0	39.18	‡‡
	30-May-16	13:00	616.60	25.0	38.77	‡‡
	6-Jun-16	13:45	614.10	73.0	37.66	‡‡
	14-Jun-16	15:20	607.20	143.0	34.68	‡‡
Pressure plate:	29-Jun-16	10:17	601.67	337	32.23	‡‡

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	225.76	+1.98%	1.63	38.49
	25.0	225.76	+1.98%	1.63	38.49
	73.0	225.76	+1.98%	1.63	38.49
	143.0	225.26	+1.75%	1.63	38.36
Pressure plate:	337	225.26	+1.75%	1.63	38.36

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: BP16-1 (95%)

Initial sample bulk density (g/cm^3)*:* 1.66

Fraction of test sample used (<2.00mm fraction) (%): 97.87

Dry weight of dew point potentiometer sample* (g)*:* 162.79

Tare weight, jar (g)*:* 114.26

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Dew point potentiometer:	14-Jun-16	11:05	169.57	1938	22.34	‡
	2-Jun-16	8:56	168.17	11932	17.72	‡
	26-May-16	9:08	166.51	70468	12.25	‡
	25-May-16	9:36	165.03	578125	7.38	‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	1938	225.26	+1.75%	1.63	38.36
	11932	225.26	+1.75%	1.63	38.36
	70468	225.26	+1.75%	1.63	38.36
	578125	225.26	+1.75%	1.63	38.36

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡ Volume adjustments are applicable at this matric potential (see comment #1).

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: BP16-1 (95%)

Initial sample bulk density (g/cm^3)*:* 1.66
Fraction of test sample used (<2.00mm fraction) (%): 97.87

Dry weight of relative humidity box sample* (g)*:* 66.65
Tare weight (g)*:* 38.82

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Relative humidity box:	24-May-16	10:17	67.81	848426	6.69	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	848426	225.26	+1.75%	1.63	38.36

Comments:

[1] Applicable if the sample experienced volume changes during testing. ‘Volume Adjusted’ values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

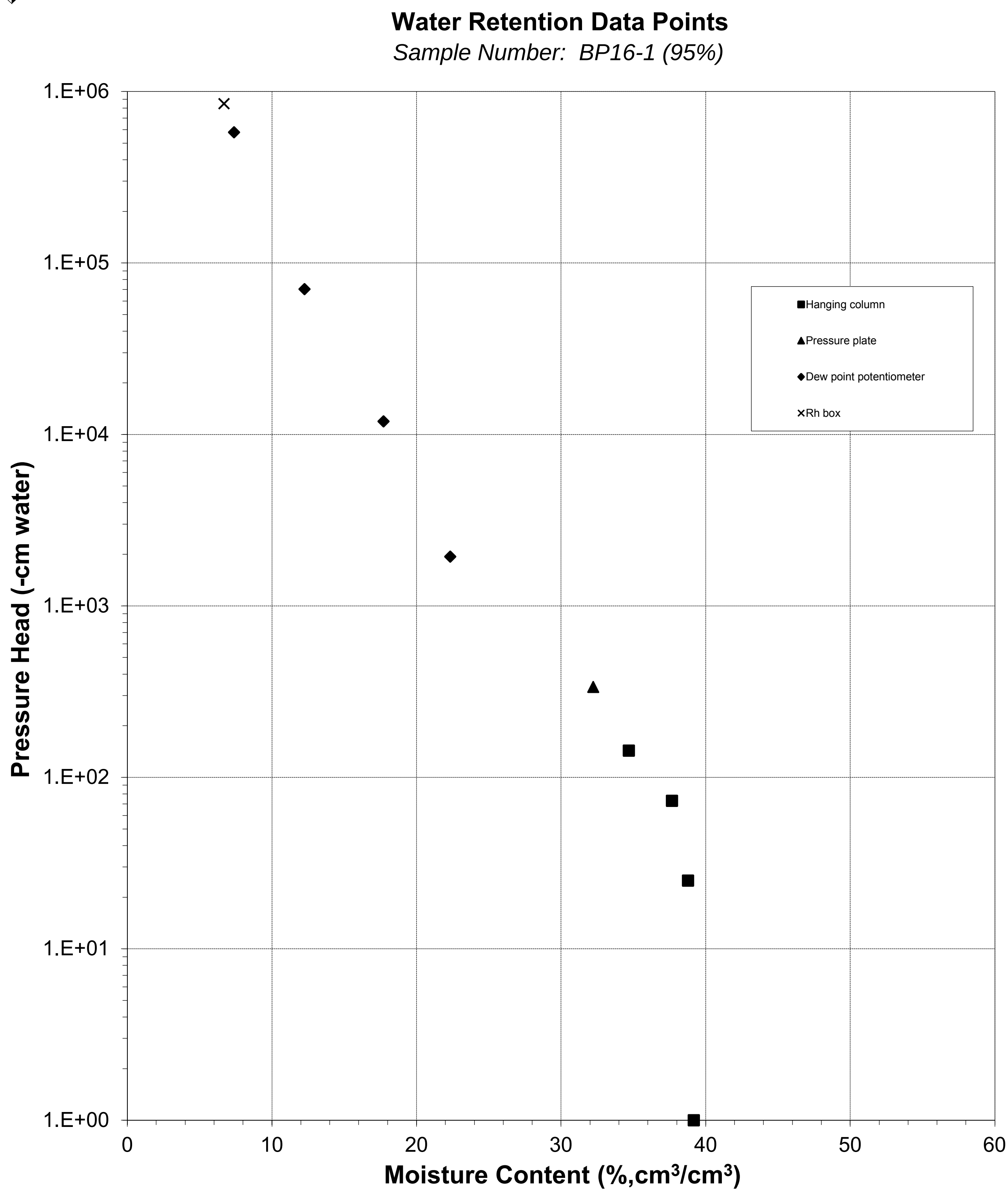
[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

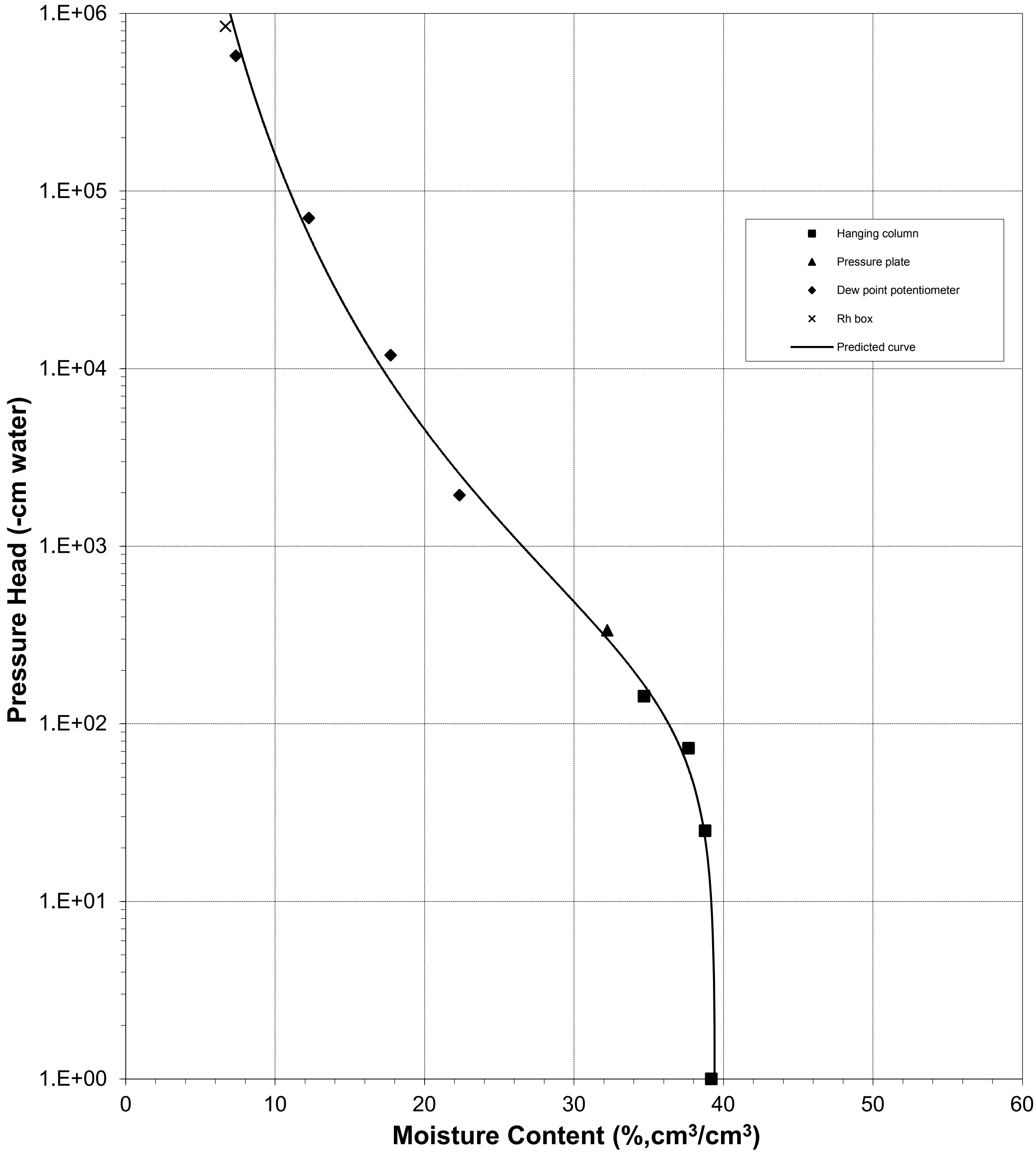
‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

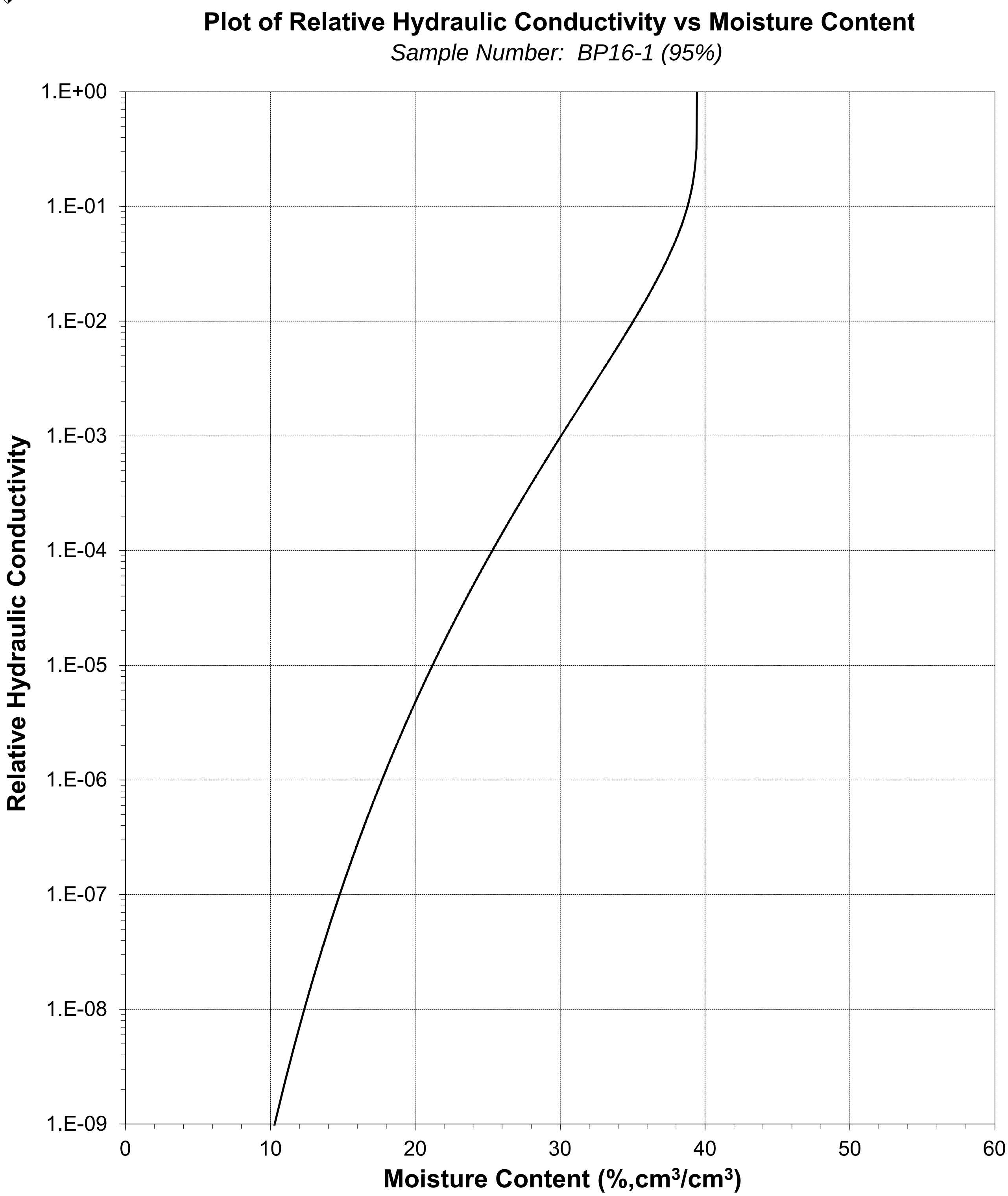
Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous


Water Retention Data Points
Sample Number: BP16-1 (95%)
Pressure Head (-cm water)
1.E+06
1.E+05
1.E+04
1.E+03
1.E+02
1.E+01
1.E+00
0
10
20
30
40
50
60
Moisture Content (%,cm³/cm³)
Hanging column
Pressure plate
Dew point potentiometer
Rh box

Predicted Water Retention Curve and Data Points

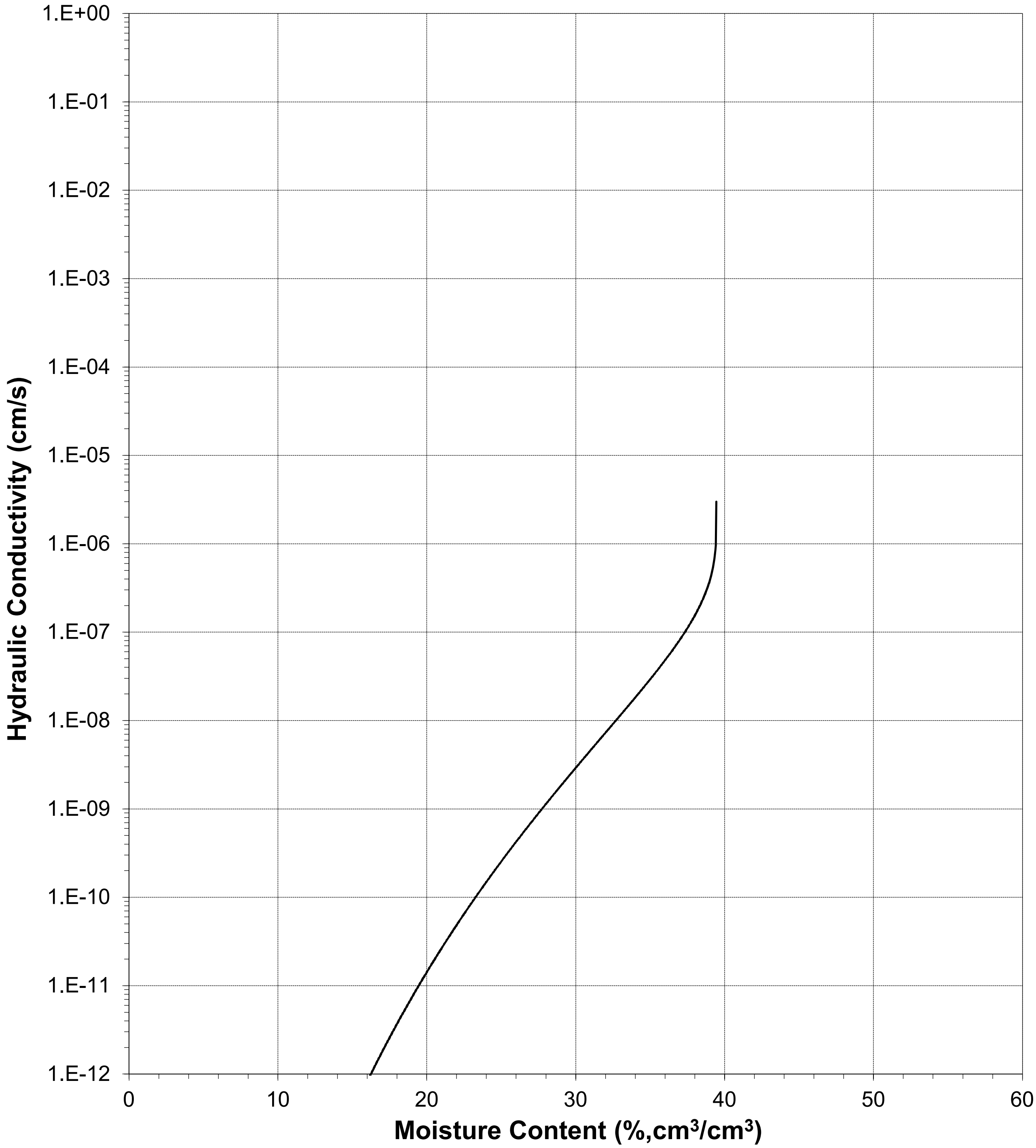
Sample Number: BP16-1 (95%)




Plot of Relative Hydraulic Conductivity vs Moisture Content
Sample Number: BP16-1 (95%)
Relative Hydraulic Conductivity
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
0
10
20
30
40
50
60
Moisture Content (%,cm3/cm3)

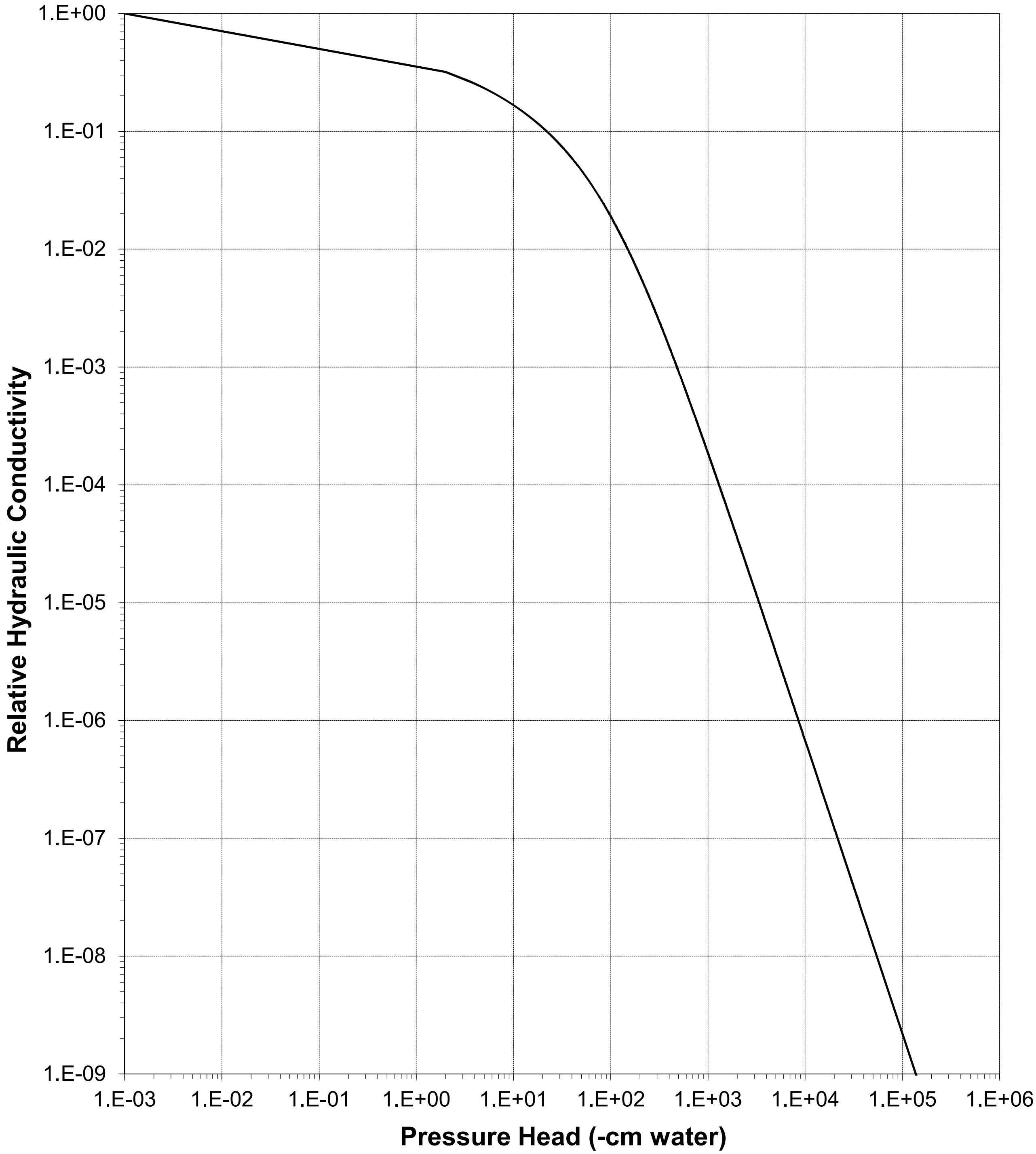
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: BP16-1 (95%)



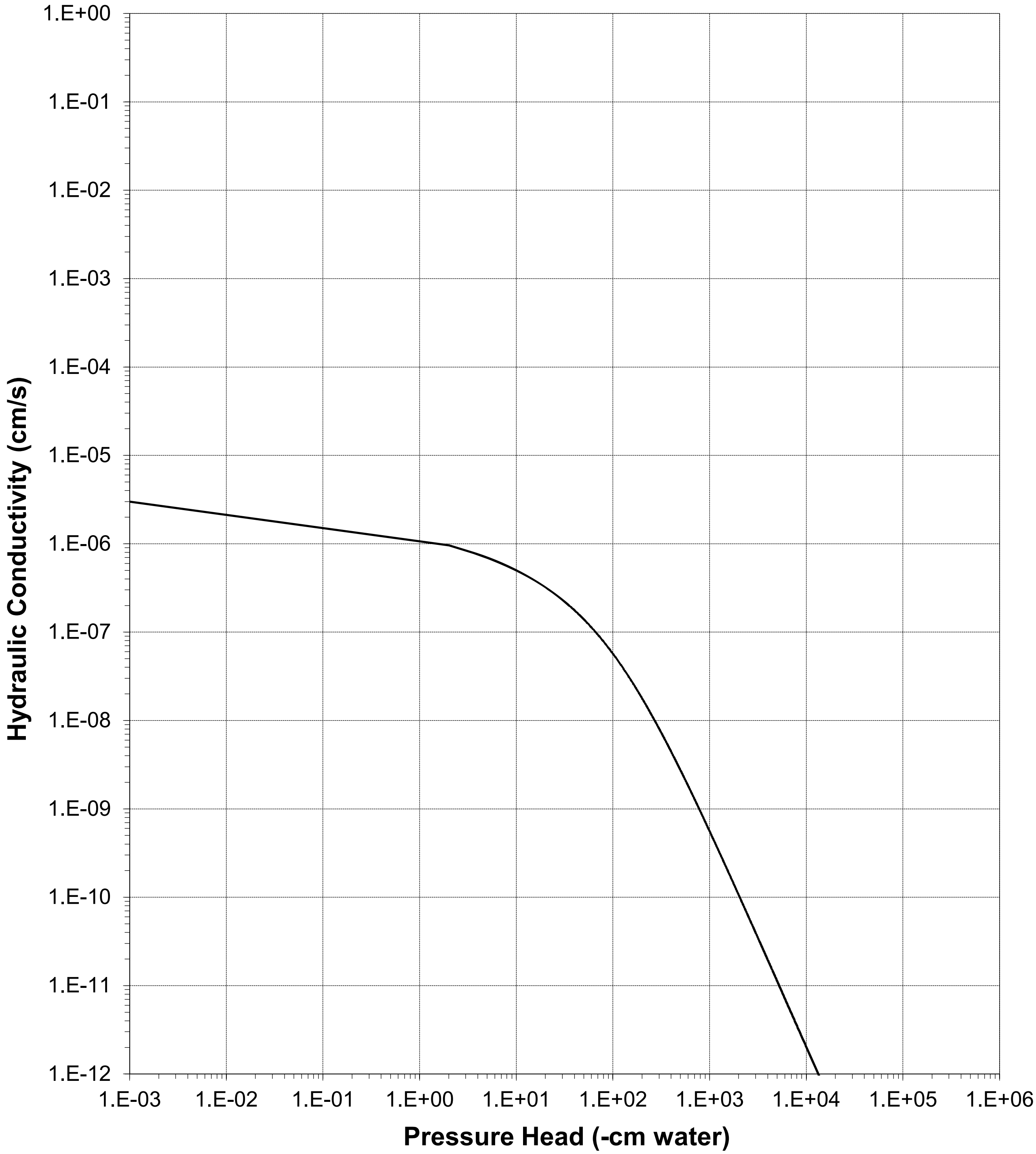
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: BP16-1 (95%)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: BP16-1 (95%)



Oversize Correction Data Sheet

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-1 (95%)
Project Name: Mt Taylor Mine
Depth: NA

Split (3/4", 3/8", #4): #4

	Coarse Fraction*	Fines Fraction**	Composite
Subsample Mass (g):	1.29	98.71	100.00
Mass Fraction (%):	1.29	98.71	100.00
Initial Sample θ_i			
Bulk Density (g/cm^3):	2.65	1.66	1.67
Calculated Porosity (% vol):	0.00	37.27	36.97
Volume of Solids (cm^3):	0.49	37.25	37.74
Volume of Voids (cm^3):	0.00	22.13	22.13
Total Volume (cm^3):	0.49	59.38	59.87
Volumetric Fraction (%):	0.81	99.19	100.00
Initial Moisture Content (% vol):	0.00	27.55	---
Saturated Sample θ_s			
Bulk Density (g/cm^3):	2.65	1.63	1.64
Calculated Porosity (% vol):	0.00	38.49	38.18
Volume of Solids (cm^3):	0.49	37.25	37.74
Volume of Voids (cm^3):	0.00	23.31	23.31
Total Volume (cm^3):	0.49	60.56	61.05
Volumetric Fraction (%):	0.80	99.20	100.00
Saturated Moisture Content (% vol):	0.00	39.44	---
Residual Sample θ_r			
Bulk Density (g/cm^3):	2.65	1.63	1.64
Calculated Porosity (% vol):	0.00	38.36	38.05
Volume of Solids (cm^3):	0.49	37.25	37.74
Volume of Voids (cm^3):	0.00	23.18	23.18
Total Volume (cm^3):	0.49	60.42	60.91
Volumetric Fraction (%):	0.80	99.20	100.00
Residual Moisture Content (% vol):	0.00	0.00	---
Ksat (cm/sec):	NM	3.0E-06	---

* = Porosity and moisture content of coarse fraction assumed to be zero.
** = Volume adjusted, if applicable. See notes on Moisture Retention Data pages.
NM = Not measured
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name:	Alan Kuhn Associates LLC	*Dry wt. of sample* (g):	369.01
Job Number:	NM16.0085.00	*Tare wt., ring* (g):	126.35
Sample Number:	BP16-3 (95%)	*Tare wt., screen & clamp* (g):	27.63
Project Name:	Mt Taylor Mine	*Initial sample volume* (cm^3):	222.03
Depth:	NA	*Initial dry bulk density* (g/cm^3):	1.66
		Assumed particle density (g/cm^3):	2.65
		Initial calculated total porosity (%):	37.28

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)	
Hanging column:	23-May-16	15:30	610.68	0	39.19	‡‡
	30-May-16	15:00	610.20	25.0	38.98	‡‡
	6-Jun-16	13:45	608.20	73.0	38.09	‡‡
	14-Jun-16	15:25	599.40	143.0	34.15	‡‡
Pressure plate:	27-Jun-16	10:05	593.13	337	31.35	‡‡

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	223.73	+0.76%	1.65	37.76
	25.0	223.73	+0.76%	1.65	37.76
	73.0	223.73	+0.76%	1.65	37.76
	143.0	223.73	+0.76%	1.65	37.76
Pressure plate:	337	223.73	+0.76%	1.65	37.76

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: BP16-3 (95%)

Initial sample bulk density (g/cm^3)*:* 1.66
Fraction of test sample used (<2.00mm fraction) (%): 97.77

Dry weight of dew point potentiometer sample* (g)*:* 160.96
Tare weight, jar (g)*:* 113.25

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Dew point potentiometer:	14-Jun-16	11:12	166.89	2244	20.04	‡‡
	2-Jun-16	9:05	165.57	13359	15.58	‡‡
	26-May-16	9:18	164.05	103204	10.44	‡‡
	25-May-16	9:42	162.99	589138	6.86	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	2244	223.73	+0.76%	1.65	37.76
	13359	223.73	+0.76%	1.65	37.76
	103204	223.73	+0.76%	1.65	37.76
	589138	223.73	+0.76%	1.65	37.76

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1).

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: BP16-3 (95%)

Initial sample bulk density (g/cm^3)*:* 1.66
Fraction of test sample used (<2.00mm fraction) (%): 97.77

Dry weight of relative humidity box sample* (g)*:* 77.30
Tare weight (g)*:* 39.93

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Relative humidity box:	24-May-16	10:17	78.73	848426	6.17	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	848426	223.73	+0.76%	1.65	37.76

Comments:

[1] Applicable if the sample experienced volume changes during testing. ‘Volume Adjusted’ values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

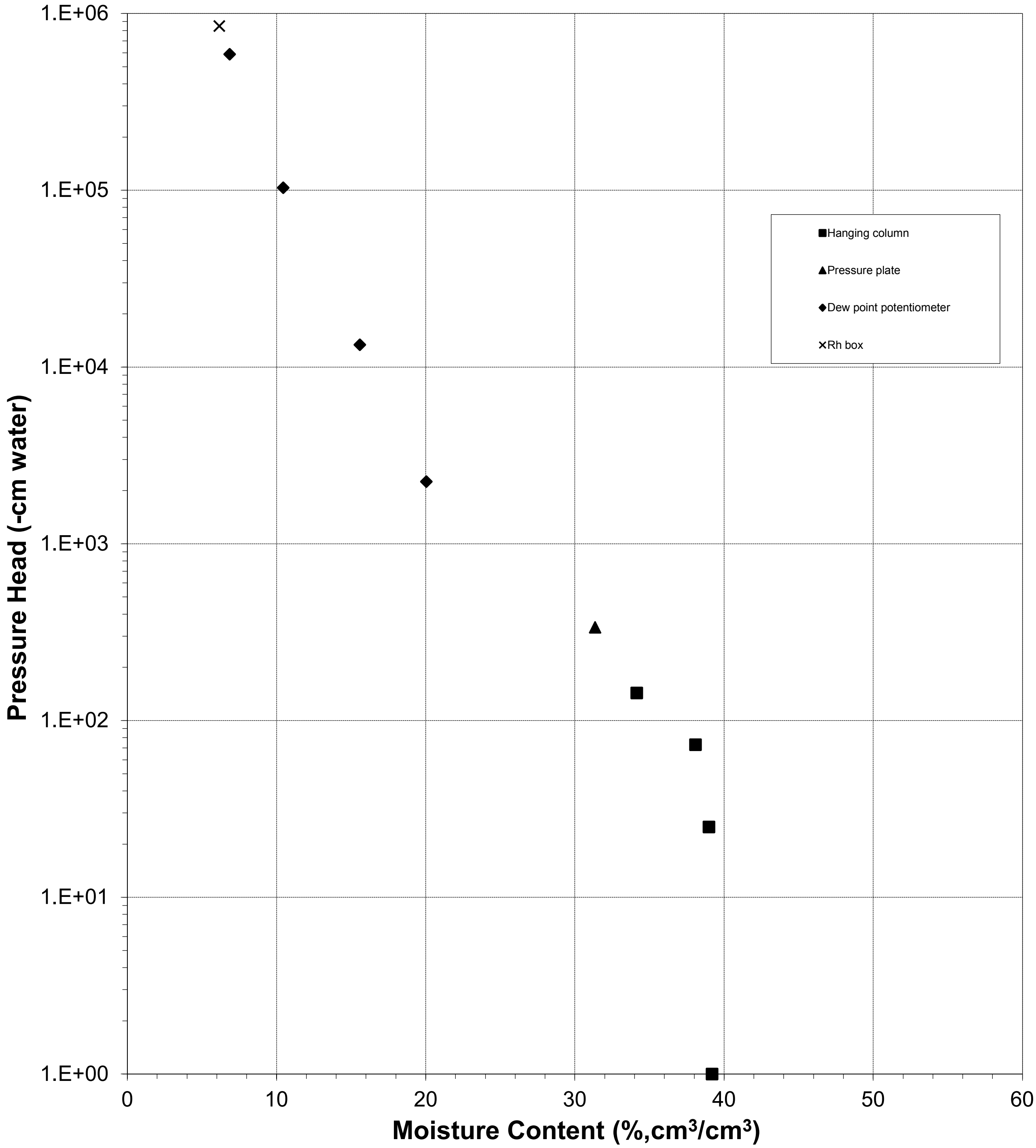
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Water Retention Data Points

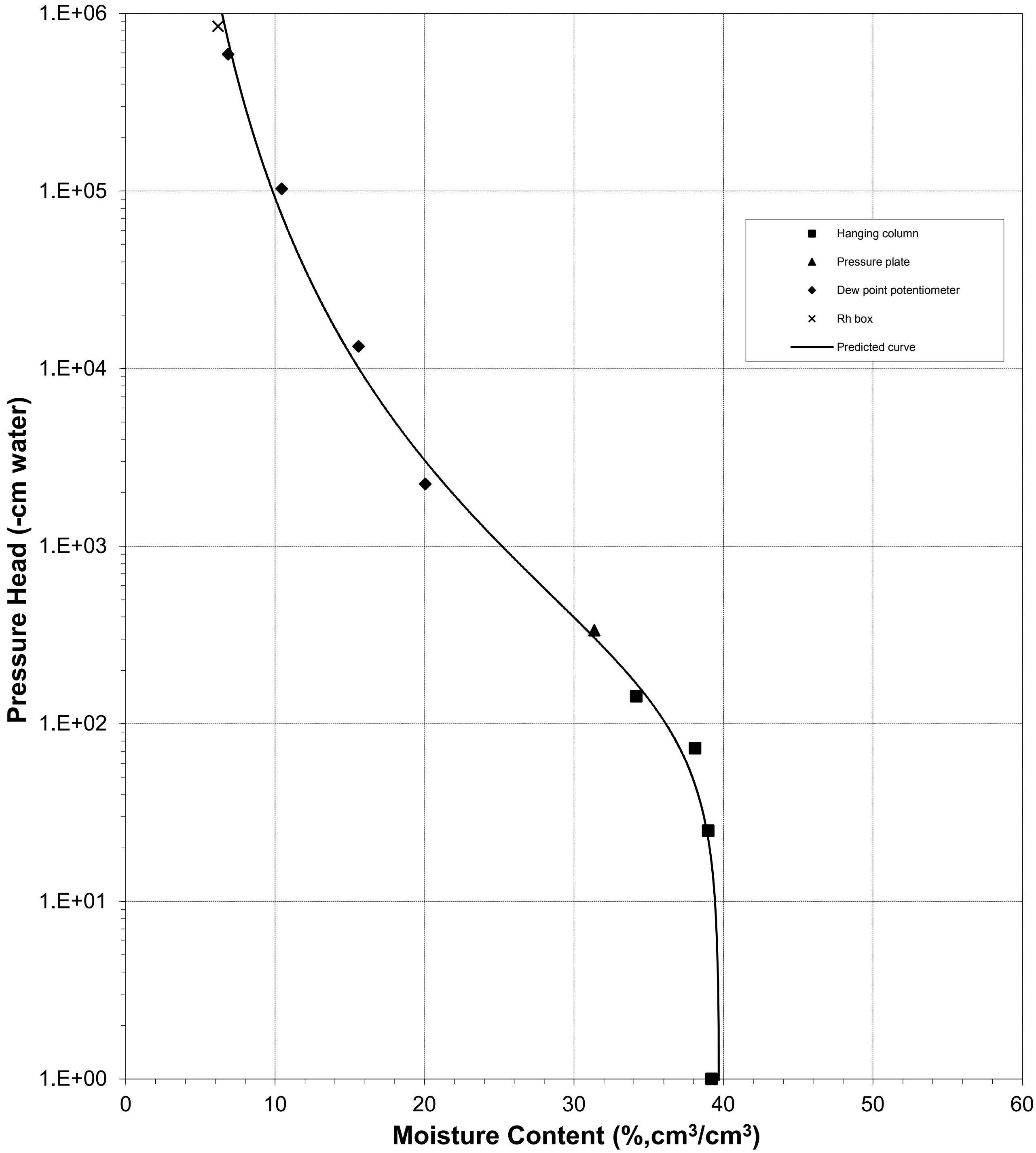
Sample Number: BP16-3 (95%)



Daniel B. Stephens & Associates, Inc.

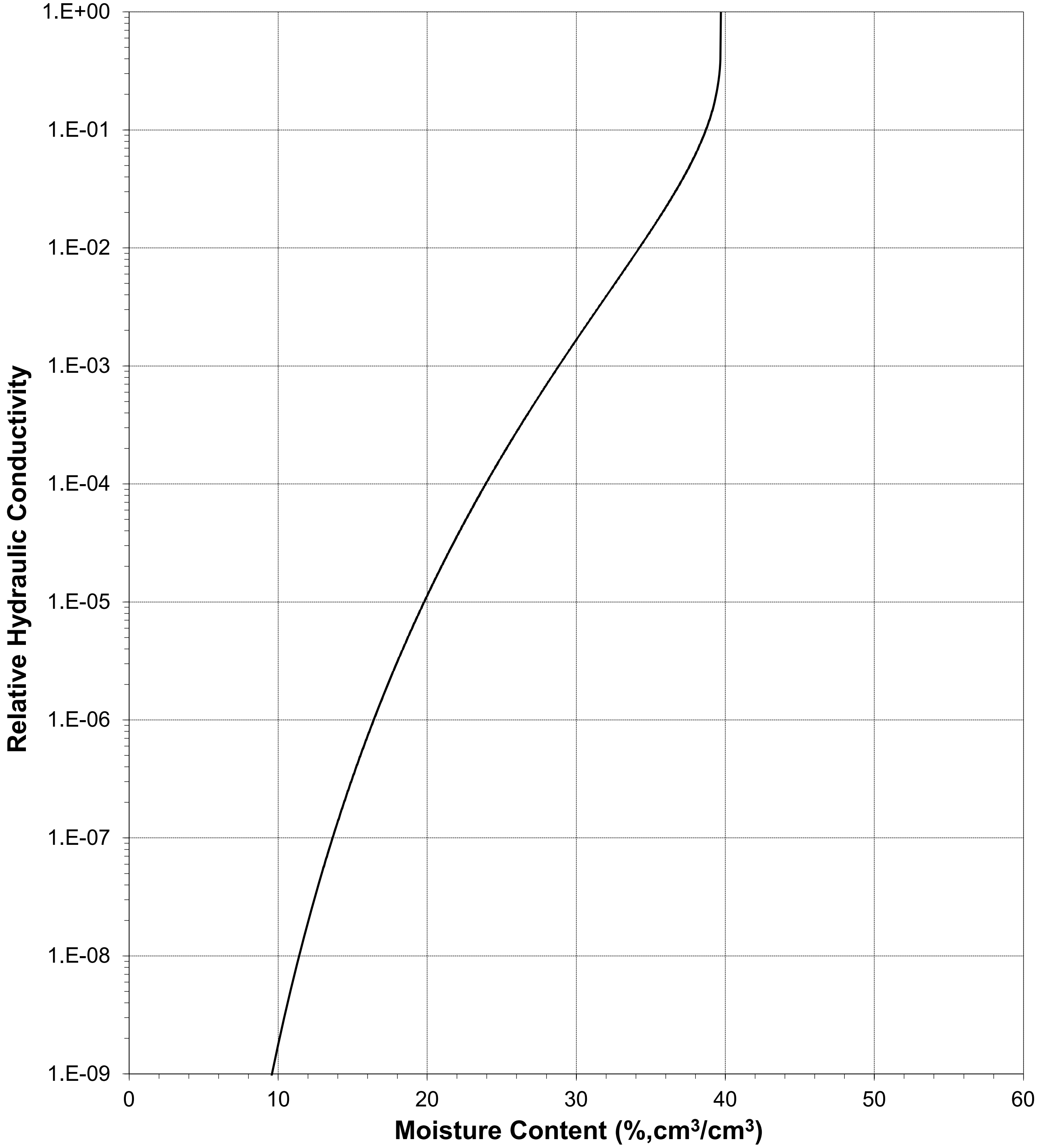
Predicted Water Retention Curve and Data Points

Sample Number: BP16-3 (95%)



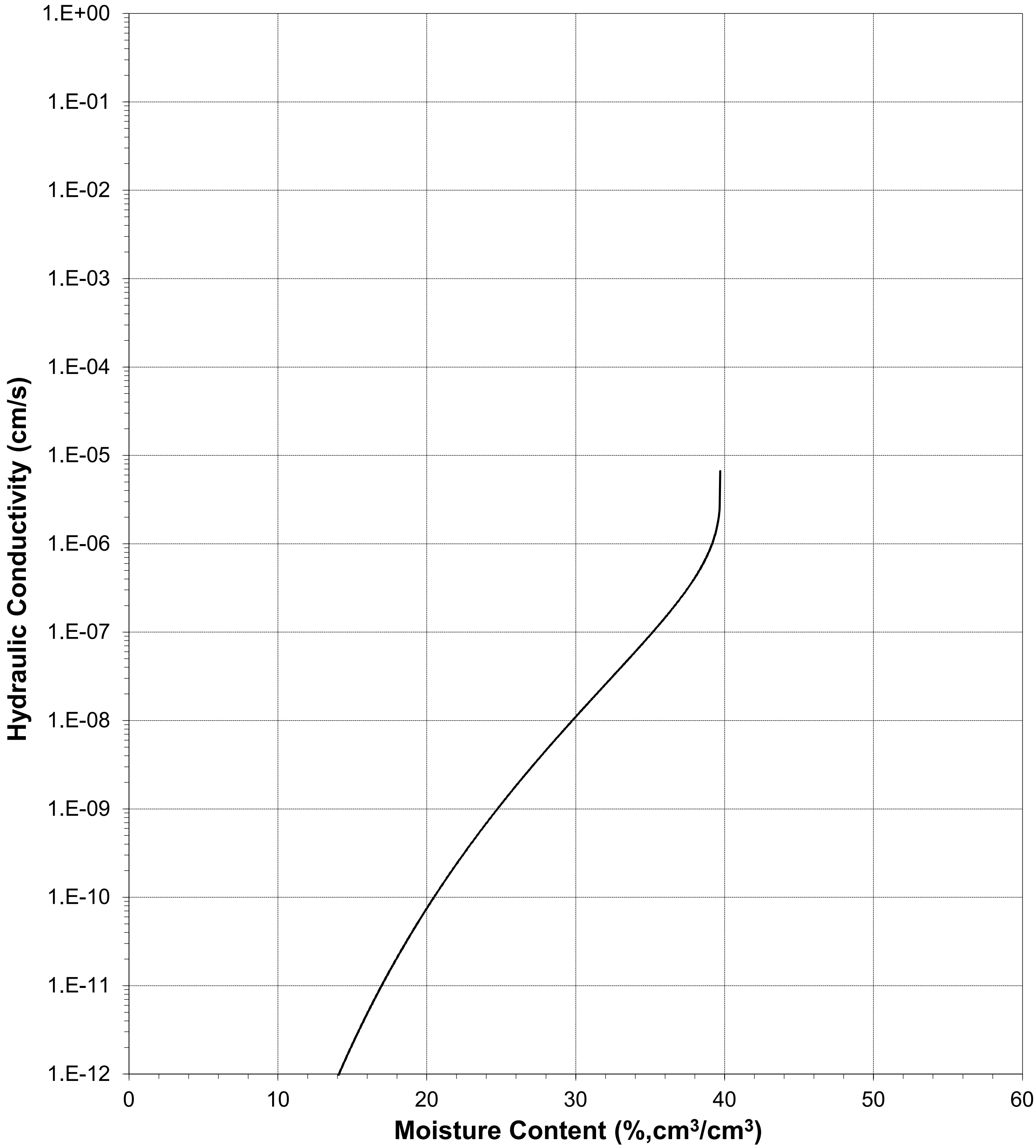
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: BP16-3 (95%)



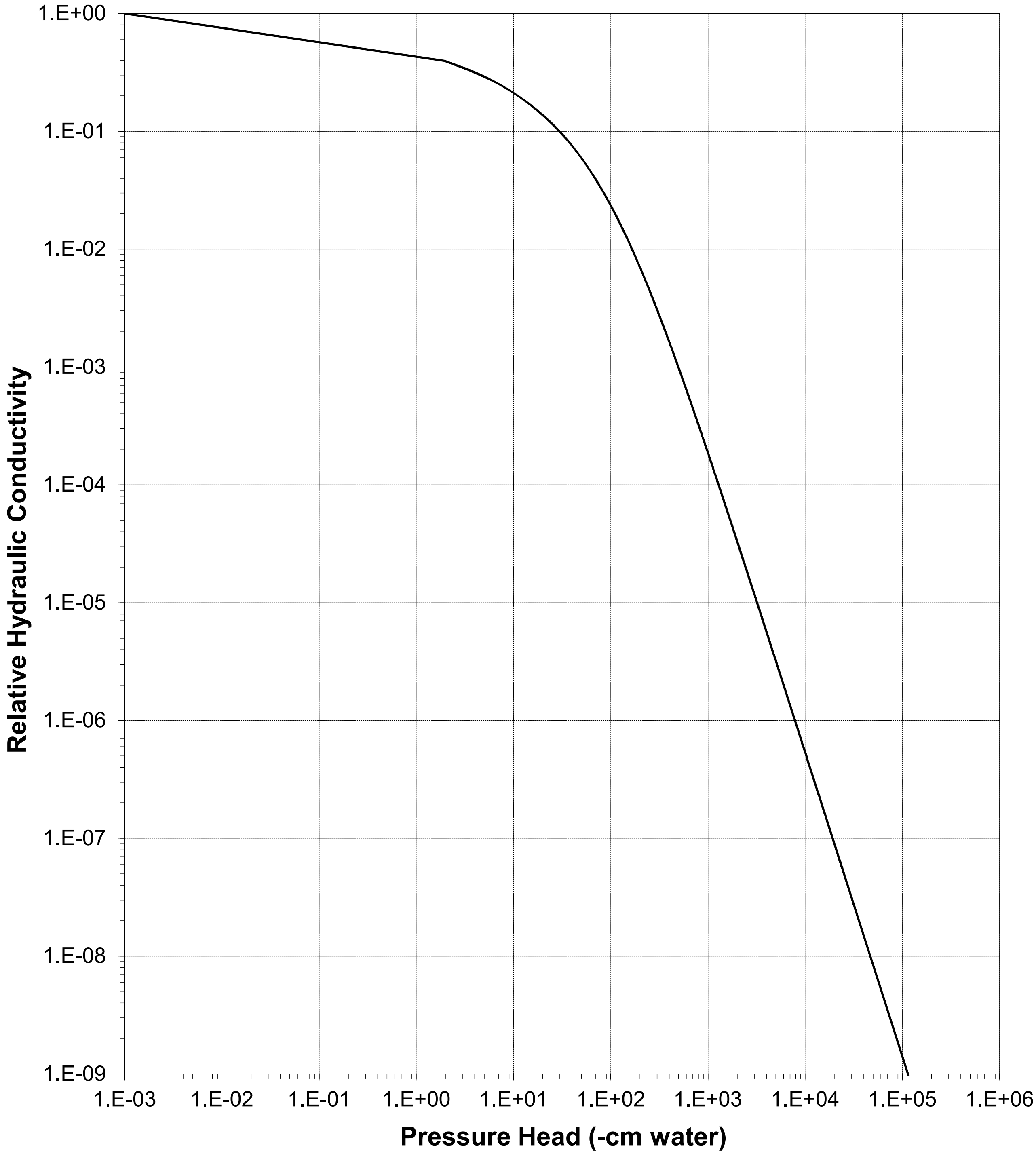
Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: BP16-3 (95%)



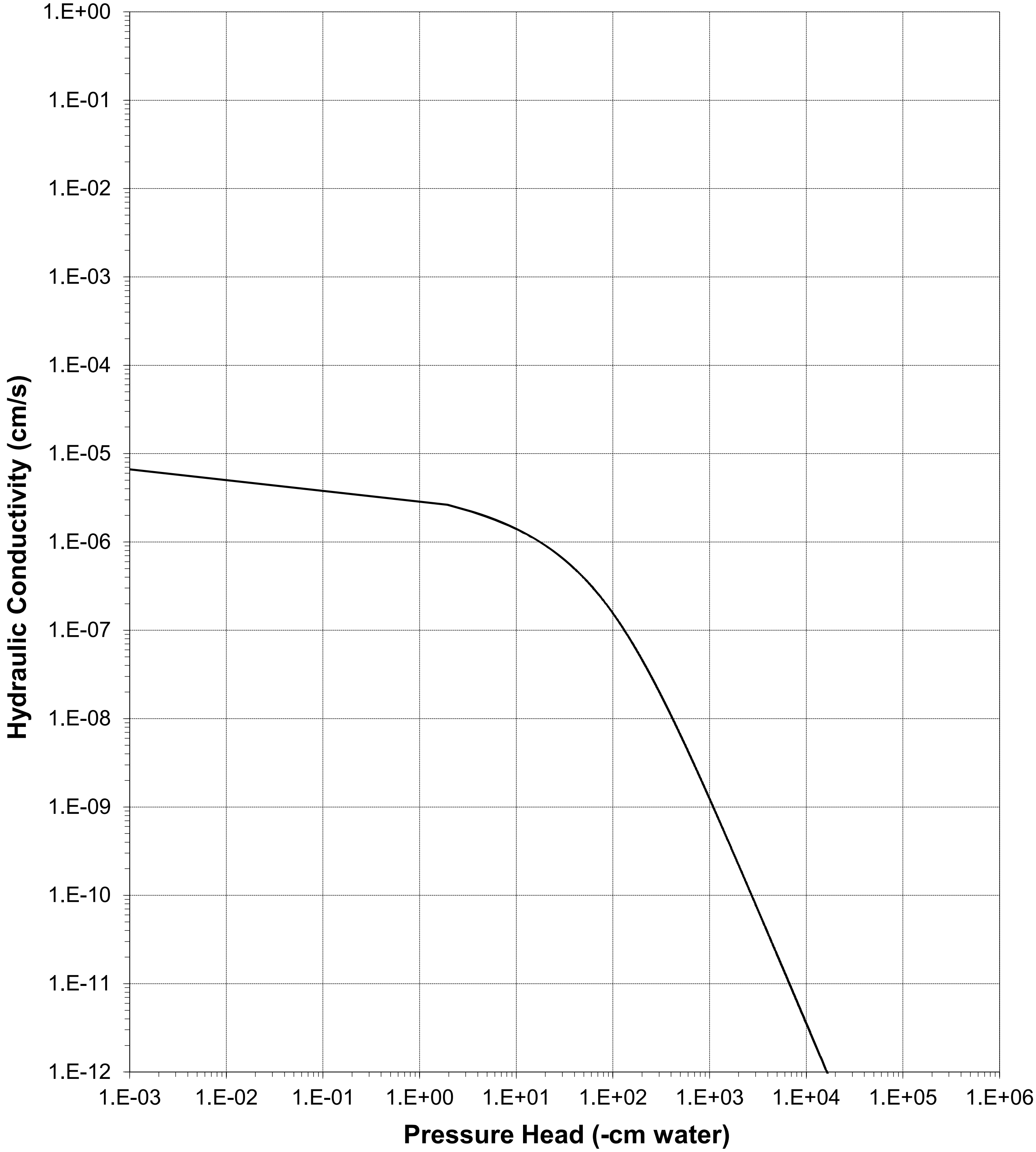
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: BP16-3 (95%)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: BP16-3 (95%)



Oversize Correction Data Sheet

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-3 (95%)
Project Name: Mt Taylor Mine
Depth: NA

Split (3/4", 3/8", #4): #4

	Coarse Fraction*	Fines Fraction**	Composite
Subsample Mass (g):	1.47	98.53	100.00
Mass Fraction (%):	1.47	98.53	100.00
Initial Sample θ_i			
Bulk Density (g/cm^3):	2.65	1.66	1.67
Calculated Porosity (% vol):	0.00	37.28	36.94
Volume of Solids (cm^3):	0.56	37.18	37.74
Volume of Voids (cm^3):	0.00	22.10	22.10
Total Volume (cm^3):	0.56	59.28	59.84
Volumetric Fraction (%):	0.93	99.07	100.00
Initial Moisture Content (% vol):	0.00	26.91	---
Saturated Sample θ_s			
Bulk Density (g/cm^3):	2.65	1.65	1.66
Calculated Porosity (% vol):	0.00	37.76	37.41
Volume of Solids (cm^3):	0.56	37.18	37.74
Volume of Voids (cm^3):	0.00	22.56	22.56
Total Volume (cm^3):	0.56	59.74	60.29
Volumetric Fraction (%):	0.92	99.08	100.00
Saturated Moisture Content (% vol):	0.00	39.71	---
Residual Sample θ_r			
Bulk Density (g/cm^3):	2.65	1.65	1.66
Calculated Porosity (% vol):	0.00	37.76	37.41
Volume of Solids (cm^3):	0.56	37.18	37.74
Volume of Voids (cm^3):	0.00	22.56	22.56
Total Volume (cm^3):	0.56	59.74	60.29
Volumetric Fraction (%):	0.92	99.08	100.00
Residual Moisture Content (% vol):	0.00	1.71	---
Ksat (cm/sec):	NM	6.6E-06	---

* = Porosity and moisture content of coarse fraction assumed to be zero.
** = Volume adjusted, if applicable. See notes on Moisture Retention Data pages.
NM = Not measured
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-5 (95%)
Project Name: Mt Taylor Mine
Depth: NA

Dry wt. of sample (g): 346.57
Tare wt., ring (g): 133.19
Tare wt., screen & clamp (g): 27.85
Initial sample volume (cm^3): 221.22
Initial dry bulk density (g/cm^3): 1.57
Assumed particle density (g/cm^3): 2.65
Initial calculated total porosity (%): 40.88

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content † (% vol)	
Hanging column:	23-May-16	15:40	601.99	0	42.26	‡‡
	30-May-16	15:00	601.80	25.0	42.17	‡‡
	6-Jun-16	13:45	598.80	73.0	40.83	‡‡
	14-Jun-16	15:30	590.80	143.0	37.28	‡‡
Pressure plate:	27-Jun-16	10:05	585.65	337	34.97	‡‡

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	223.35	+0.96%	1.55	41.45
	25.0	223.35	+0.96%	1.55	41.45
	73.0	223.35	+0.96%	1.55	41.45
	143.0	223.17	+0.88%	1.55	41.40
Pressure plate:	337	223.17	+0.88%	1.55	41.40

Comments:

1 Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

2 Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: BP16-5 (95%)

Initial sample bulk density (g/cm^3)*:* 1.57

Fraction of test sample used (<2.00mm fraction) (%): 97.69

Dry weight of dew point potentiometer sample* (g)*:* 160.79

Tare weight, jar (g)*:* 115.80

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Dew point potentiometer:	14-Jun-16	11:18	167.91	1734	24.01	‡‡
	2-Jun-16	9:10	165.81	13971	16.93	‡‡
	27-May-16	16:00	164.42	63432	12.24	‡‡
	25-May-16	9:50	162.88	611268	7.05	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	1734	223.17	+0.88%	1.55	41.40
	13971	223.17	+0.88%	1.55	41.40
	63432	223.17	+0.88%	1.55	41.40
	611268	223.17	+0.88%	1.55	41.40

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1).

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: BP16-5 (95%)

Initial sample bulk density (g/cm^3)*:* 1.57
Fraction of test sample used (<2.00mm fraction) (%): 97.69

Dry weight of relative humidity box sample* (g)*:* 81.26
Tare weight (g)*:* 38.03

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Relative humidity box:	24-May-16	10:17	83.09	848426	6.43	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	848426	223.17	+0.88%	1.55	41.40

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

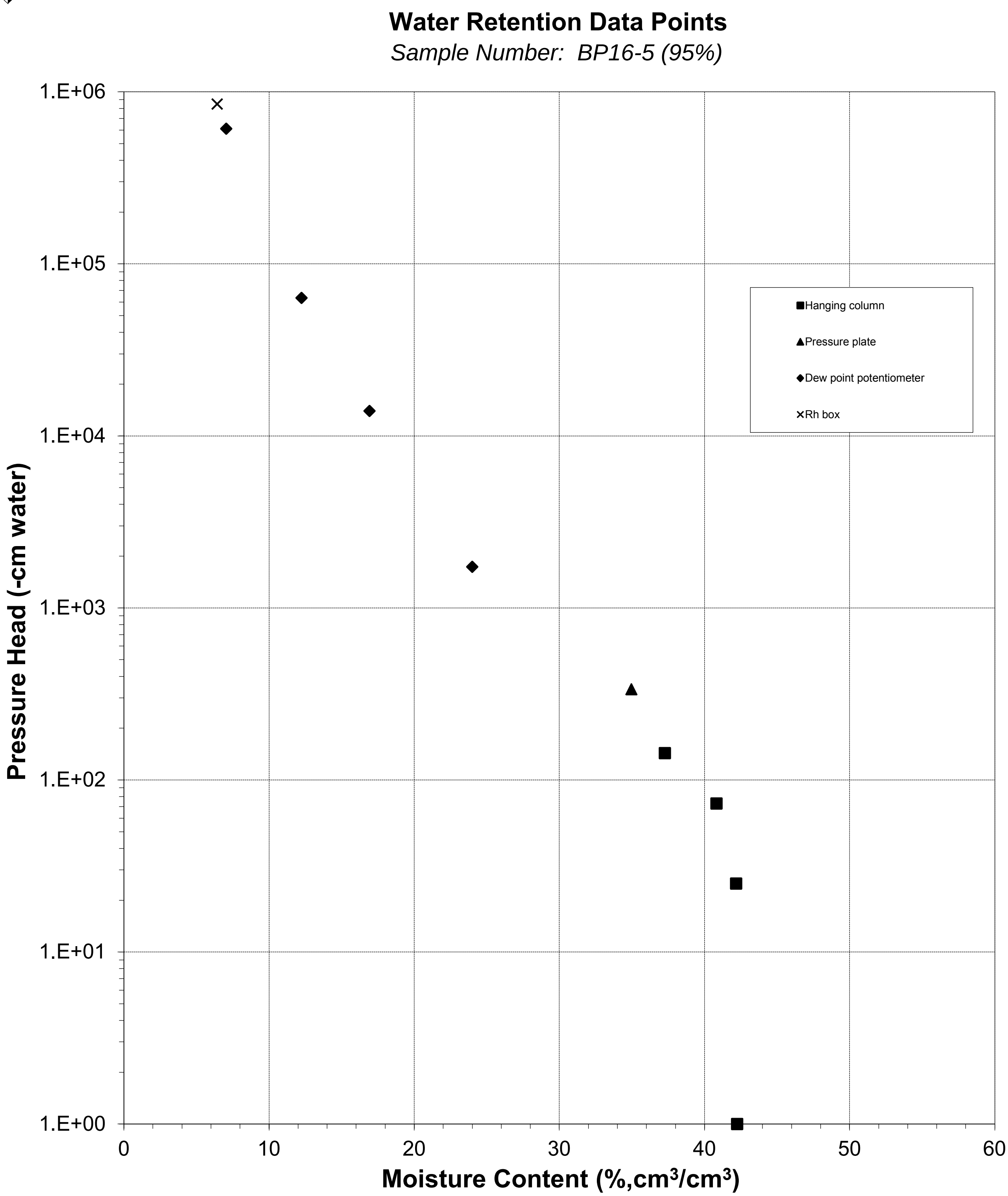
[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

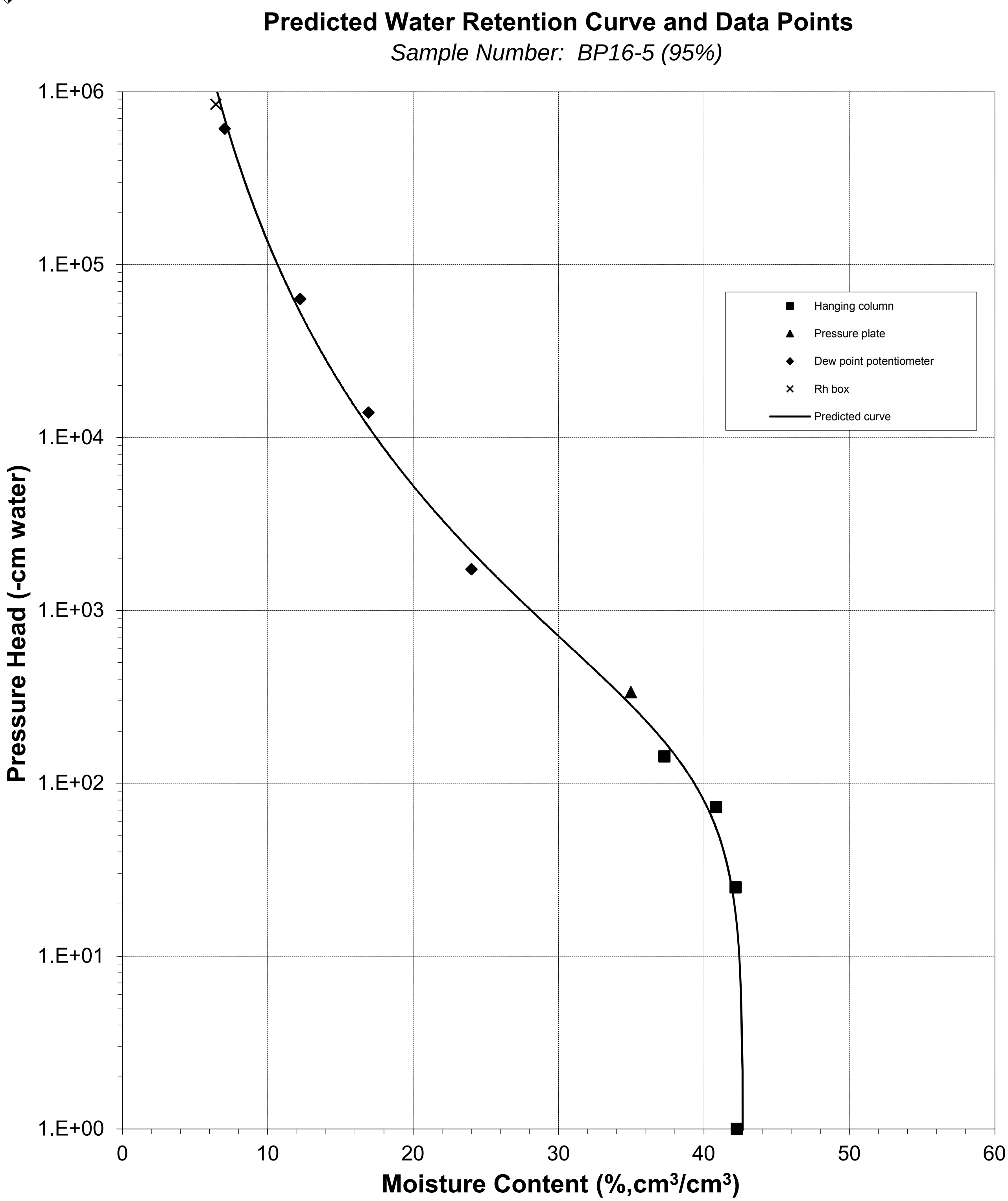
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

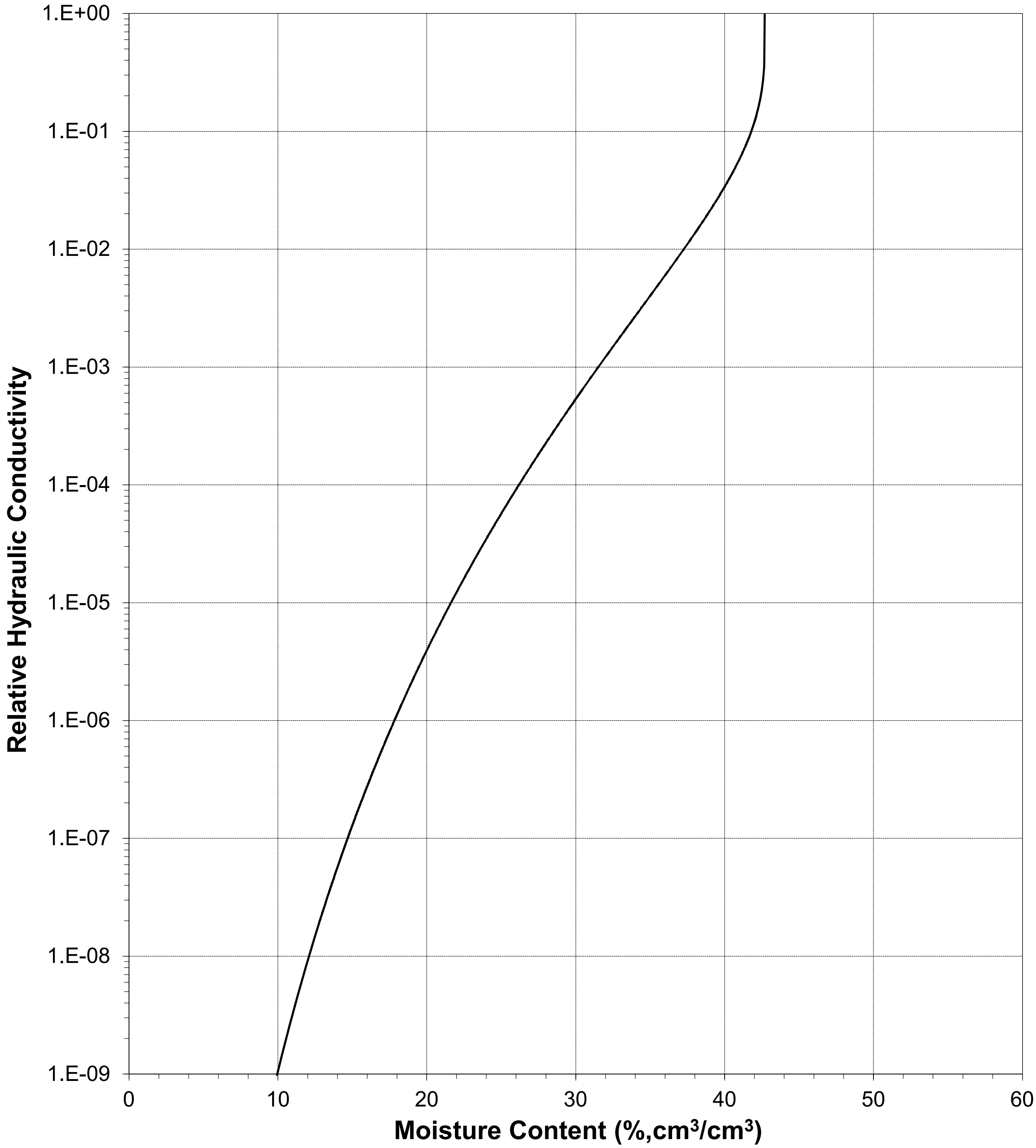


Water Retention Data Points
Sample Number: BP16-5 (95%)
Pressure Head (-cm water)
1.E+06
1.E+05
1.E+04
1.E+03
1.E+02
1.E+01
1.E+00
0
10
20
30
40
50
60
Moisture Content (%,cm³/cm³)
Hanging column
Pressure plate
Dew point potentiometer
Rh box


Predicted Water Retention Curve and Data Points
Sample Number: BP16-5 (95%)
Pressure Head (-cm water)
1.E+06
1.E+05
1.E+04
1.E+03
1.E+02
1.E+01
1.E+00
Moisture Content (%,cm3/cm3)
0
10
20
30
40
50
60
Hanging column
Pressure plate
Dew point potentiometer
Rh box
Predicted curve

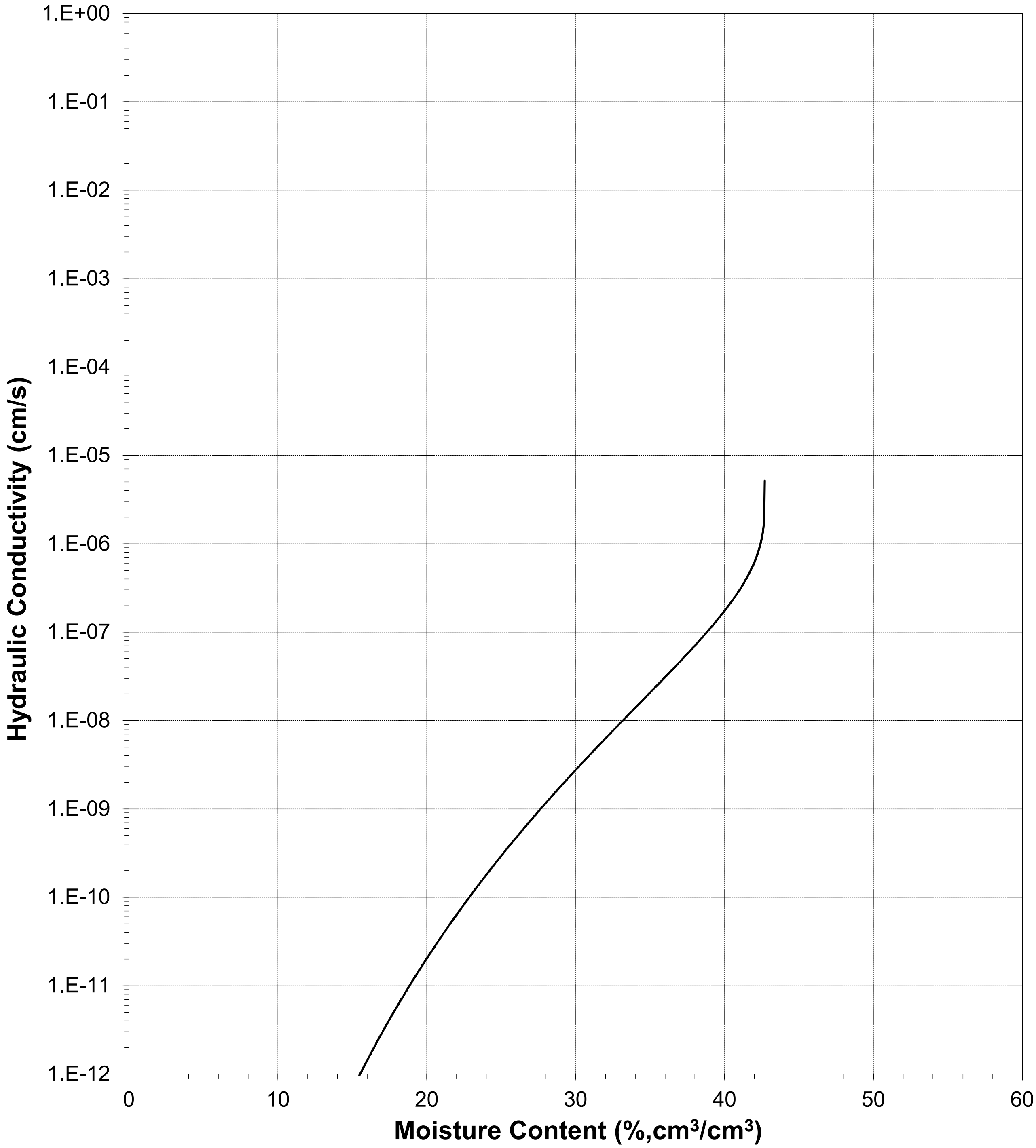
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: BP16-5 (95%)



Plot of Hydraulic Conductivity vs Moisture Content

Sample Number: BP16-5 (95%)



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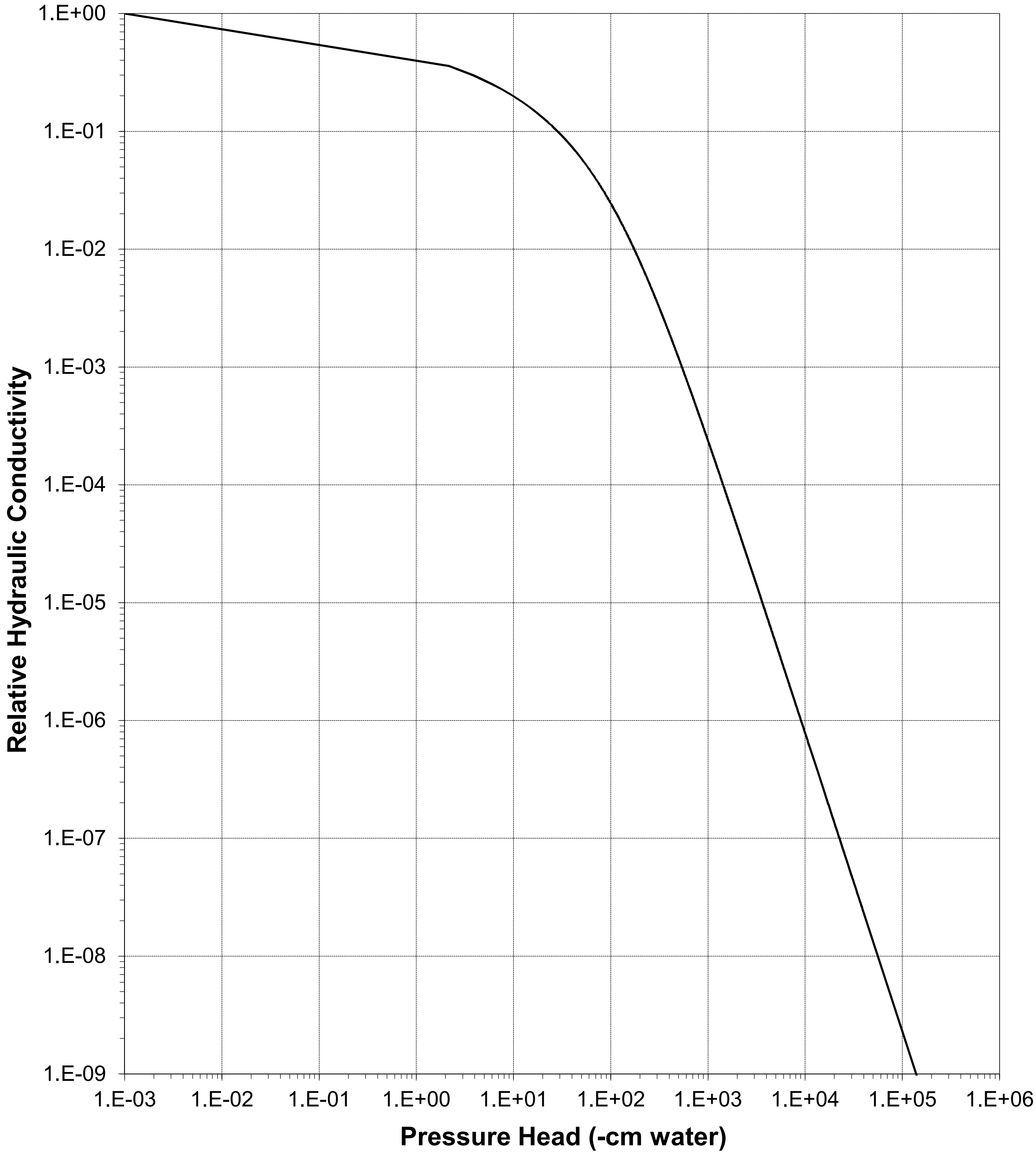
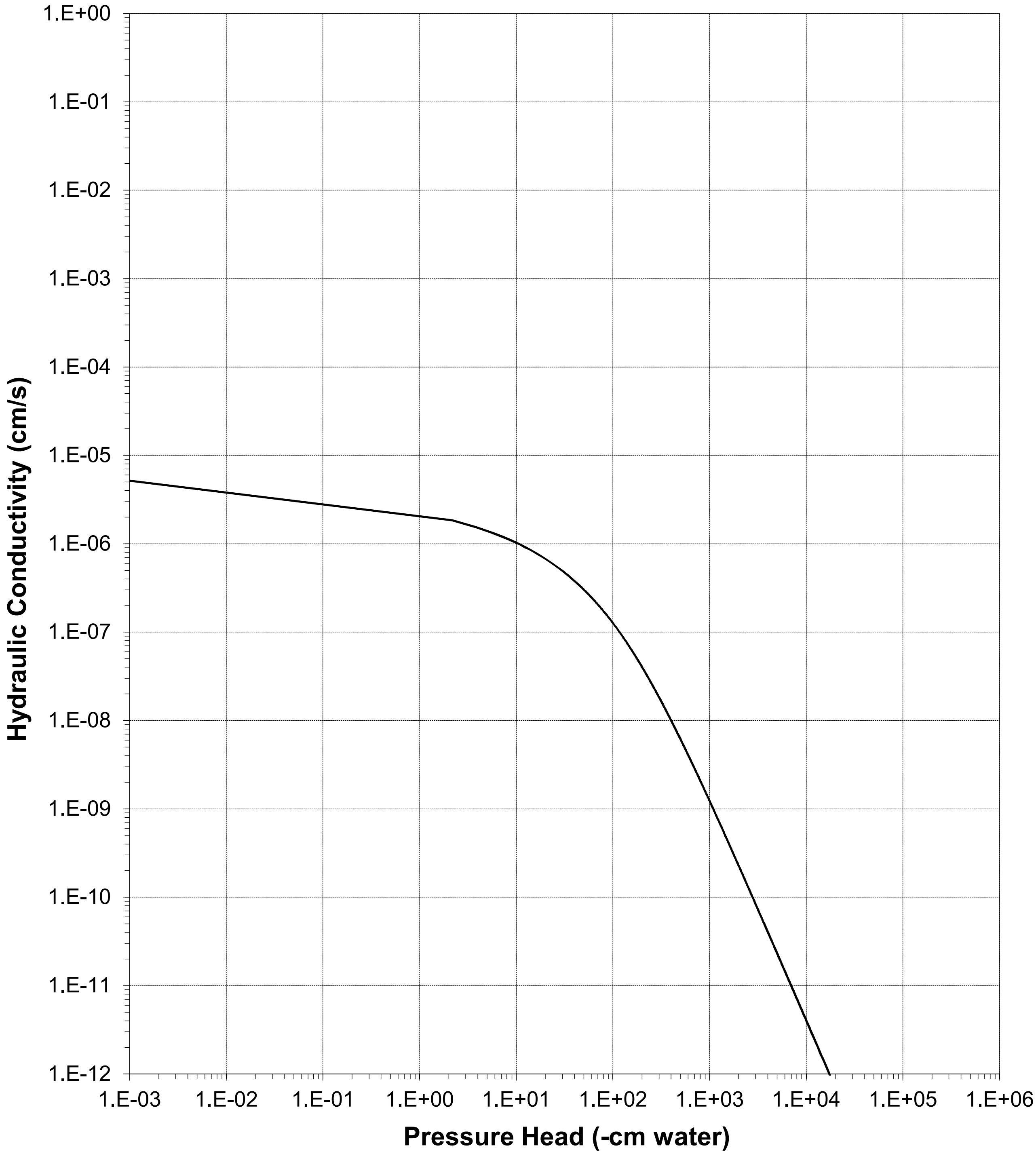
Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: BP16-5 (95%)



Plot of Hydraulic Conductivity vs Pressure Head

Sample Number: BP16-5 (95%)



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Oversize Correction Data Sheet

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-5 (95%)
Project Name:	Mt Taylor Mine
Depth:	NA
Split (3/4", 3/8", #4):	#4

	Coarse Fraction*	Fines Fraction**	Composite
Subsample Mass (g):	1.29	98.71	100.00
Mass Fraction (%):	1.29	98.71	100.00
Initial Sample θ_i			
Bulk Density (g/cm^3):	2.65	1.57	1.57
Calculated Porosity (% vol):	0.00	40.88	40.57
Volume of Solids (cm^3):	0.49	37.25	37.74
Volume of Voids (cm^3):	0.00	25.76	25.76
Total Volume (cm^3):	0.49	63.01	63.49
Volumetric Fraction (%):	0.77	99.23	100.00
Initial Moisture Content (% vol):	0.00	29.65	---
Saturated Sample θ_s			
Bulk Density (g/cm^3):	2.65	1.55	1.56
Calculated Porosity (% vol):	0.00	41.45	41.13
Volume of Solids (cm^3):	0.49	37.25	37.74
Volume of Voids (cm^3):	0.00	26.37	26.37
Total Volume (cm^3):	0.49	63.61	64.10
Volumetric Fraction (%):	0.76	99.24	100.00
Saturated Moisture Content (% vol):	0.00	42.69	---
Residual Sample θ_r			
Bulk Density (g/cm^3):	2.65	1.55	1.56
Calculated Porosity (% vol):	0.00	41.40	41.08
Volume of Solids (cm^3):	0.49	37.25	37.74
Volume of Voids (cm^3):	0.00	26.32	26.32
Total Volume (cm^3):	0.49	63.56	64.05
Volumetric Fraction (%):	0.76	99.24	100.00
Residual Moisture Content (% vol):	0.00	0.00	---
Ksat (cm/sec):	NM	5.2E-06	---

* = Porosity and moisture content of coarse fraction assumed to be zero.
** = Volume adjusted, if applicable. See notes on Moisture Retention Data pages.
NM = Not measured
--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: J. Hines
Checked by: C. Krous

Particle Size Analysis

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
BP16-1	0.00062	0.042	0.072	116	1.1	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-2	0.00065	0.040	0.063	97	0.91	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-3	0.00057	0.053	0.084	147	2.1	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-4	0.00070	0.043	0.066	94	1.8	WS/H	Sandy lean clay s(CL)	Loam	(Est)
BP16-5	0.00057	0.045	0.069	121	2.0	WS/H	Sandy lean clay s(CL)	Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
BP16-1	1.3	37.9	42.6	18.3
BP16-2	0.4	35.7	43.0	20.9
BP16-3	1.5	41.1	38.6	18.8
BP16-4	1.4	35.6	44.2	18.7
BP16-5	1.3	36.7	43.1	18.9

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#4 Split)

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-1
Project Name: Mt Taylor Mine
Depth: NA
Test Date: 9-May-16

Initial Dry Weight of Sample (g): 17492.77
Weight Passing #4 (g): 17266.68
Weight Retained #4 (g): 226.09
Weight of Hydrometer Sample (g): 75.14
Calculated Weight of Sieve Sample (g): 76.12

Shape: Rounded
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+4						
	3"	75	0.00	0.00	17492.77	100.00
	2"	50	0.00	0.00	17492.77	100.00
	1.5"	38.1	0.00	0.00	17492.77	100.00
	1"	25	0.00	0.00	17492.77	100.00
	3/4"	19.0	29.26	29.26	17463.51	99.83
	3/8"	9.5	87.24	116.50	17376.27	99.33
	4	4.75	109.59	226.09	17266.68	98.71
-4			(Based on calculated sieve wt.)			
	10	2.00	0.64	1.62	74.50	97.87
	20	0.85	0.72	2.34	73.78	96.92
	40	0.425	0.85	3.19	72.93	95.80
	60	0.250	3.50	6.69	69.43	91.21
	140	0.106	17.13	23.82	52.30	68.70
	200	0.075	5.98	29.80	46.32	60.85
	dry pan		2.06	31.86	44.26	
	wet pan			44.26	0.00	

d_{10} (mm): 0.00062
d_{16} (mm): 0.0014
d_{30} (mm): 0.0071
d_{50} (mm): 0.042
d_{60} (mm): 0.072
d_{84} (mm): 0.19

Median Particle Diameter --d_{50} (mm): 0.042
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 116
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.1
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.078

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Loam

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-1
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 5-May-16
Start Time: 7:30

Type of Water Used: DISTILLED
Reaction with H_2O_2: NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

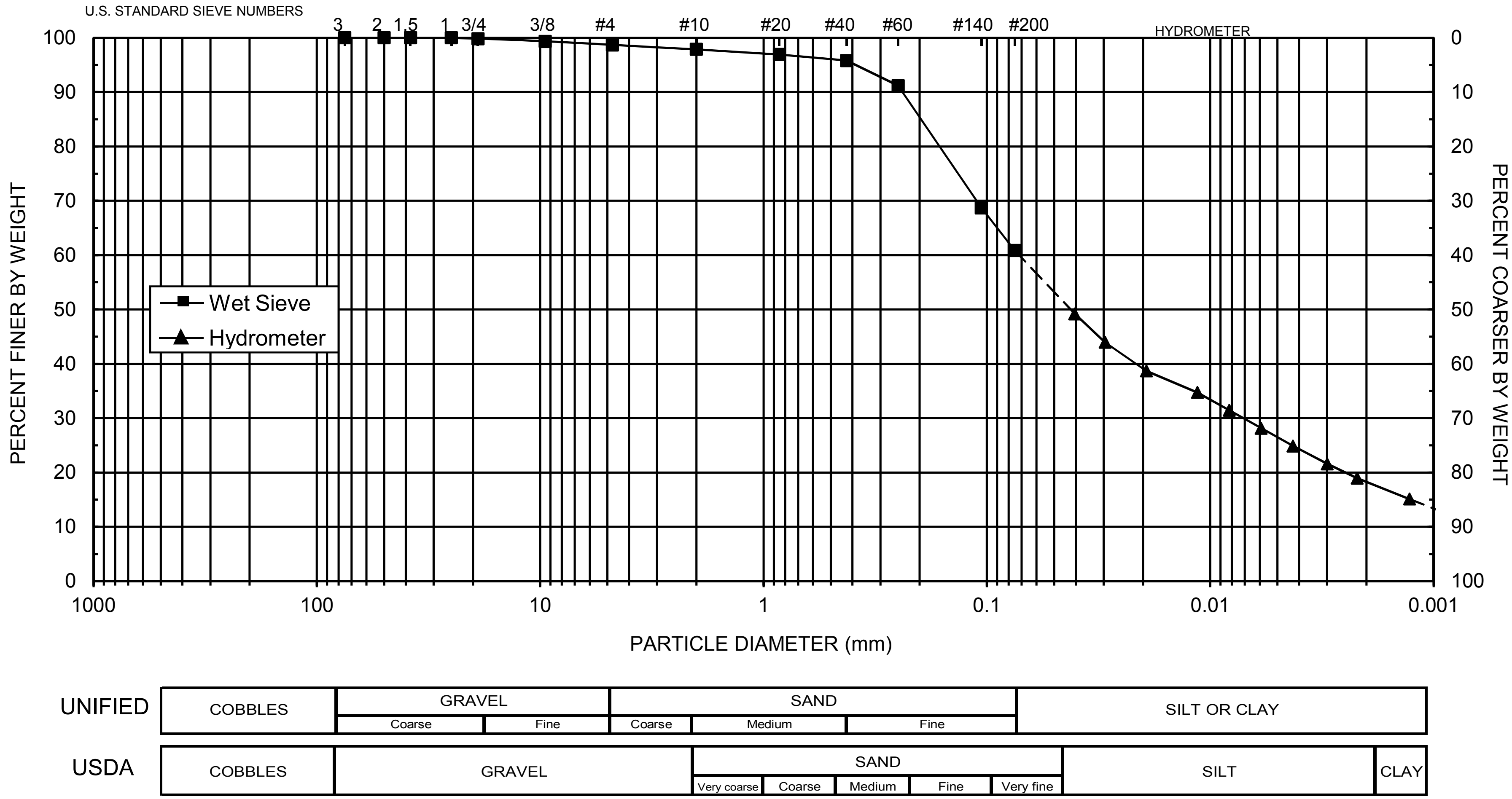
Initial Wt. (g): 75.14
Total Sample Wt. (g): 17492.77
Wt. Passing #4 (g): 17266.68

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
5-May-16	1	22.0	43.0	5.5	37.5	9.3	0.04045	49.9	49.2
	2	22.0	39.0	5.5	33.5	9.9	0.02960	44.5	44.0
	5	22.0	35.0	5.5	29.5	10.6	0.01933	39.2	38.7
	15	21.9	32.0	5.6	26.4	11.1	0.01143	35.2	34.7
	30	21.9	29.5	5.6	23.9	11.5	0.00823	31.9	31.4
	60	21.9	27.0	5.6	21.4	11.9	0.00592	28.5	28.2
	120	21.8	24.5	5.6	18.9	12.3	0.00426	25.2	24.9
	250	22.0	22.0	5.6	16.5	12.7	0.00300	21.9	21.6
	480	21.7	20.0	5.6	14.4	13.0	0.00220	19.2	18.9
6-May-16	1440	22.4	17.0	5.5	11.5	13.5	0.00128	15.3	15.1

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00062**	d_{30} = **0.0071**	d_{50} = **0.042**	d_{60} = **0.072**	C_u = **116**	C_c = **1.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
BP16-1	**NA**	**Sandy lean clay s(CL)**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

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Particle Size Analysis
Wet Sieve Data (#4 Split)

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-2
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 9-May-16

Initial Dry Weight of Sample (g): 23457.12
Weight Passing #4 (g): 23356.72
Weight Retained #4 (g): 100.40
Weight of Hydrometer Sample (g): 75.39
Calculated Weight of Sieve Sample (g): 75.71

Shape: Rounded
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+4						
	3"	75	0.00	0.00	23457.12	100.00
	2"	50	0.00	0.00	23457.12	100.00
	1.5"	38.1	0.00	0.00	23457.12	100.00
	1"	25	0.00	0.00	23457.12	100.00
	3/4"	19.0	0.00	0.00	23457.12	100.00
	3/8"	9.5	23.40	23.40	23433.72	99.90
	4	4.75	77.00	100.40	23356.72	99.57
-4			(Based on calculated sieve wt.)			
	10	2.00	0.62	0.94	74.77	98.75
	20	0.85	1.01	1.95	73.76	97.42
	40	0.425	1.01	2.96	72.75	96.09
	60	0.250	3.22	6.18	69.53	91.83
	140	0.106	15.52	21.70	54.01	71.33
	200	0.075	5.67	27.37	48.34	63.85
	dry pan		2.03	29.40	46.31	
	wet pan			46.31	0.00	

d_{10} (mm): 0.00065 d_{50} (mm): 0.040
d_{16} (mm): 0.0012 d_{60} (mm): 0.063
d_{30} (mm): 0.0061 d_{84} (mm): 0.18

Median Particle Diameter --d_{50} (mm): 0.040
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 97
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 0.91
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.074

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Loam

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

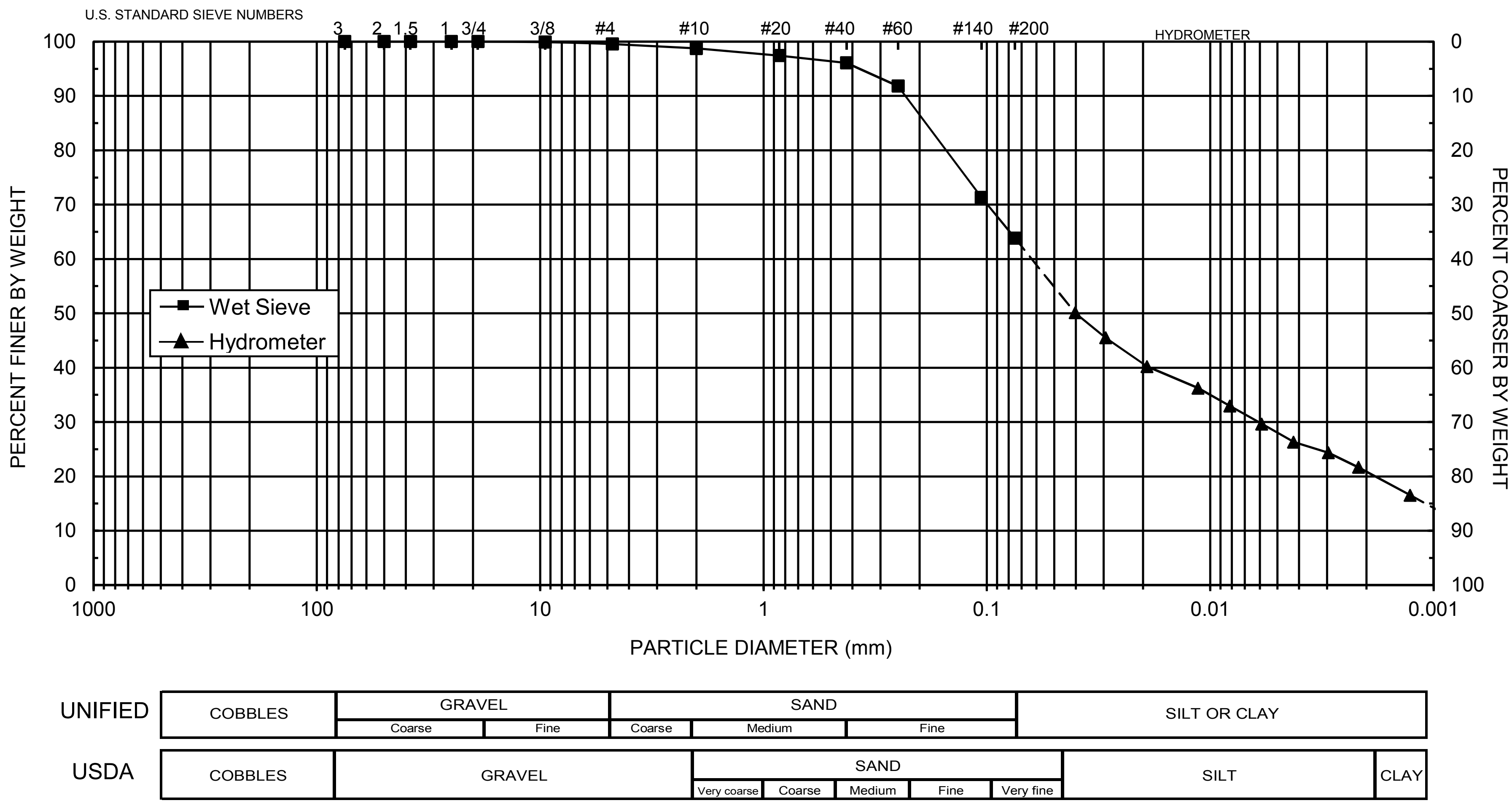
Job Name:	Alan Kuhn Associates LLC	*Type of Water Used:*	DISTILLED
Job Number:	NM16.0085.00	*Reaction with* H_2O_2*:*	NA
Sample Number:	BP16-2	*Dispersant*:*	$(NaPO_3)_6$
Project Name:	Mt Taylor Mine	*Assumed particle density:*	2.65
Depth:	NA	*Initial Wt. (g):*	75.39
Test Date:	4-May-16	*Total Sample Wt. (g):*	23457.12
Start Time:	7:36	*Wt. Passing #4 (g):*	23356.72

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
5-May-16	1	22.0	43.5	5.6	38.0	9.2	0.04029	50.3	50.1
	2	22.0	40.0	5.6	34.5	9.7	0.02937	45.7	45.5
	5	22.0	36.0	5.6	30.5	10.4	0.01919	40.4	40.2
	15	21.9	33.0	5.6	27.4	10.9	0.01134	36.4	36.2
	30	21.9	30.5	5.6	24.9	11.3	0.00817	33.1	32.9
	60	21.9	28.0	5.6	22.4	11.7	0.00588	29.8	29.6
	120	21.8	25.5	5.6	19.9	12.1	0.00424	26.4	26.3
	250	22.0	24.0	5.6	18.5	12.4	0.00296	24.5	24.4
	480	21.7	22.0	5.6	16.4	12.7	0.00217	21.8	21.7
6-May-16	1437	22.4	18.0	5.5	12.5	13.3	0.00128	16.6	16.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00065**	d_{30} = **0.0061**	d_{50} = **0.040**	d_{60} = **0.063**	C_u = **97**	C_c = **0.91**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
BP16-2	**NA**	**Sandy lean clay s(CL)**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

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Particle Size Analysis
Wet Sieve Data (#4 Split)

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-3
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 9-May-16

Initial Dry Weight of Sample (g): 17666.26
Weight Passing #4 (g): 17405.81
Weight Retained #4 (g): 260.45
Weight of Hydrometer Sample (g): 75.53
Calculated Weight of Sieve Sample (g): 76.66

Shape: Rounded
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+4						
	3"	75	0.00	0.00	17666.26	100.00
	2"	50	0.00	0.00	17666.26	100.00
	1.5"	38.1	0.00	0.00	17666.26	100.00
	1"	25	18.41	18.41	17647.85	99.90
	3/4"	19.0	34.09	52.50	17613.76	99.70
	3/8"	9.5	70.51	123.01	17543.25	99.30
	4	4.75	137.44	260.45	17405.81	98.53
-4			(Based on calculated sieve wt.)			
	10	2.00	0.58	1.71	74.95	97.77
	20	0.85	0.75	2.46	74.20	96.79
	40	0.425	0.90	3.36	73.30	95.62
	60	0.250	3.83	7.19	69.47	90.62
	140	0.106	19.18	26.37	50.29	65.60
	200	0.075	6.30	32.67	43.99	57.38
	dry pan		1.90	34.57	42.09	
	wet pan			42.09	0.00	

d_{10} (mm): 0.00057 d_{50} (mm): 0.053
d_{16} (mm): 0.0013 d_{60} (mm): 0.084
d_{30} (mm): 0.010 d_{84} (mm): 0.20

Median Particle Diameter --d_{50} (mm): 0.053
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 147
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 2.1
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.085

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Loam

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

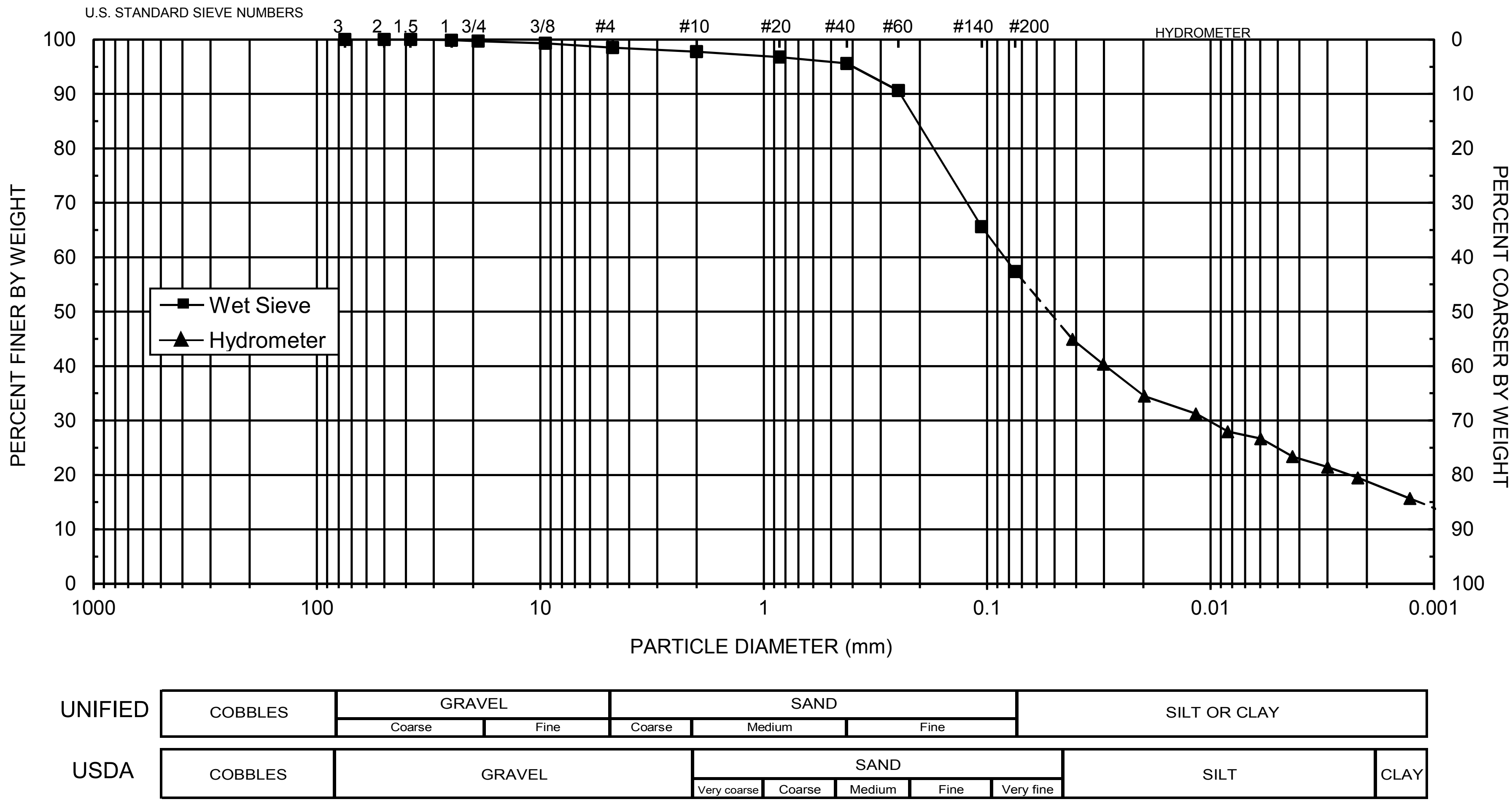
Job Name:	Alan Kuhn Associates LLC	*Type of Water Used:*	DISTILLED
Job Number:	NM16.0085.00	*Reaction with* H_2O_2*:*	NA
Sample Number:	BP16-3	*Dispersant*:*	$(NaPO_3)_6$
Project Name:	Mt Taylor Mine	*Assumed particle density:*	2.65
Depth:	NA	*Initial Wt. (g):*	75.53
Test Date:	5-May-16	*Total Sample Wt. (g):*	17666.26
Start Time:	7:42	*Wt. Passing #4 (g):*	17405.81

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
5-May-16	1	21.9	40.0	5.6	34.4	9.7	0.04156	45.6	44.9
	2	21.9	36.5	5.6	30.9	10.3	0.03024	41.0	40.4
	5	21.9	32.0	5.6	26.4	11.1	0.01980	35.0	34.5
	15	21.9	29.5	5.6	23.9	11.5	0.01164	31.7	31.2
	30	21.9	27.0	5.6	21.4	11.9	0.00838	28.4	28.0
	60	21.9	26.0	5.6	20.4	12.0	0.00596	27.1	26.7
	120	21.8	23.5	5.6	17.9	12.4	0.00430	23.7	23.4
	250	22.0	22.0	5.6	16.5	12.7	0.00300	21.8	21.5
	480	21.7	20.5	5.6	14.9	12.9	0.00219	19.8	19.5
6-May-16	1433	22.4	17.5	5.5	12.0	13.4	0.00128	15.9	15.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00057**	d_{30} = **0.010**	d_{50} = **0.053**	d_{60} = **0.084**	C_u = **147**	C_c = **2.1**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
BP16-3	**NA**	**Sandy lean clay s(CL)**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#4 Split)

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-4
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 9-May-16

Initial Dry Weight of Sample (g): 18465.11
Weight Passing #4 (g): 18198.77
Weight Retained #4 (g): 266.34
Weight of Hydrometer Sample (g): 75.55
Calculated Weight of Sieve Sample (g): 76.66

Shape: Rounded
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+4						
	3"	75	0.00	0.00	18465.11	100.00
	2"	50	0.00	0.00	18465.11	100.00
	1.5"	38.1	0.00	0.00	18465.11	100.00
	1"	25	0.00	0.00	18465.11	100.00
	3/4"	19.0	0.00	0.00	18465.11	100.00
	3/8"	9.5	86.74	86.74	18378.37	99.53
	4	4.75	179.60	266.34	18198.77	98.56
-4			(Based on calculated sieve wt.)			
	10	2.00	0.80	1.91	74.75	97.51
	20	0.85	0.87	2.78	73.88	96.38
	40	0.425	1.02	3.80	72.86	95.05
	60	0.250	3.48	7.28	69.38	90.51
	140	0.106	14.90	22.18	54.48	71.07
	200	0.075	6.23	28.41	48.25	62.94
	dry pan		3.05	31.46	45.20	
	wet pan			45.20	0.00	

d_{10} (mm): 0.00070 d_{50} (mm): 0.043
d_{16} (mm): 0.0014 d_{60} (mm): 0.066
d_{30} (mm): 0.0091 d_{84} (mm): 0.19

Median Particle Diameter --d_{50} (mm): 0.043
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 94
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 1.8
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.078

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Loam

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-4
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 5-May-16
Start Time: 7:48

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

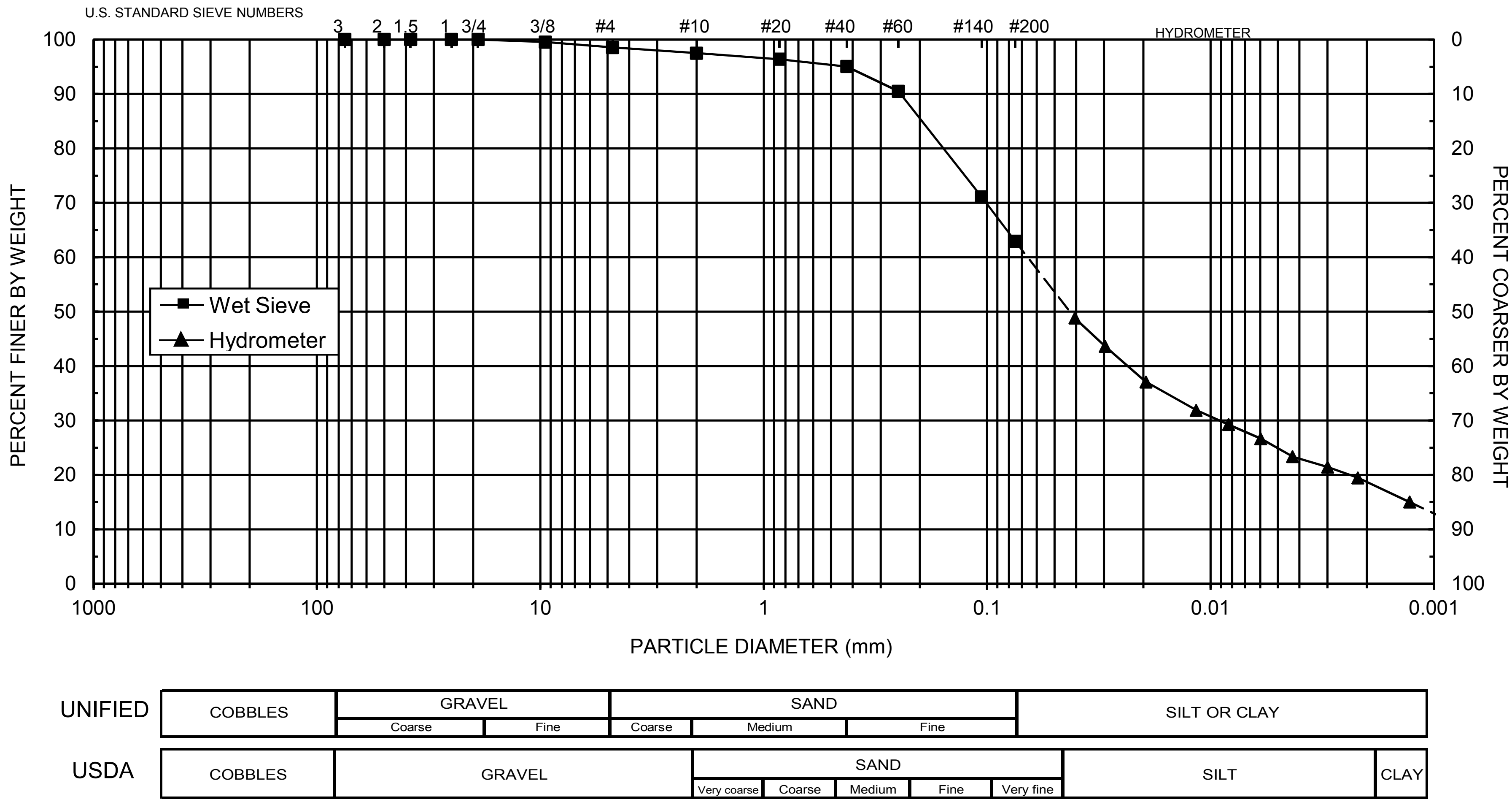
Initial Wt. (g)*:* 75.55
Total Sample Wt. (g)*:* 18465.11
Wt. Passing #4 (g): 18198.77

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
5-May-16	1	21.9	43.0	5.6	37.4	9.3	0.04049	49.6	48.8
	2	21.9	39.0	5.6	33.4	9.9	0.02963	44.3	43.6
	5	21.9	34.0	5.6	28.4	10.7	0.01950	37.6	37.1
	15	21.9	30.0	5.6	24.4	11.4	0.01160	32.3	31.9
	30	21.9	28.0	5.6	22.4	11.7	0.00832	29.7	29.3
	60	21.9	26.0	5.6	20.4	12.0	0.00596	27.1	26.7
	120	21.8	23.5	5.6	17.9	12.4	0.00430	23.7	23.4
	250	22.0	22.0	5.6	16.5	12.7	0.00300	21.8	21.5
	480	21.7	20.5	5.6	14.9	12.9	0.00219	19.7	19.5
6-May-16	1429	22.4	17.0	5.5	11.5	13.5	0.00129	15.2	15.0

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00070**	d_{30} = **0.0091**	d_{50} = **0.043**	d_{60} = **0.066**	C_u = **94**	C_c = **1.8**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
BP16-4	**NA**	**Sandy lean clay s(CL)**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

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Particle Size Analysis
Wet Sieve Data (#4 Split)

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-5
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 9-May-16

Initial Dry Weight of Sample (g): 17495.18
Weight Passing #4 (g): 17269.61
Weight Retained #4 (g): 225.57
Weight of Hydrometer Sample (g): 75.19
Calculated Weight of Sieve Sample (g): 76.17

Shape: Rounded
Hardness: Soft

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+4						
	3"	75	0.00	0.00	17495.18	100.00
	2"	50	0.00	0.00	17495.18	100.00
	1.5"	38.1	0.00	0.00	17495.18	100.00
	1"	25	0.00	0.00	17495.18	100.00
	3/4"	19.0	0.00	0.00	17495.18	100.00
	3/8"	9.5	108.70	108.70	17386.48	99.38
	4	4.75	116.87	225.57	17269.61	98.71
-4			(Based on calculated sieve wt.)			
	10	2.00	0.78	1.76	74.41	97.69
	20	0.85	1.06	2.82	73.35	96.30
	40	0.425	0.91	3.73	72.44	95.10
	60	0.250	2.94	6.67	69.50	91.24
	140	0.106	16.31	22.98	53.19	69.83
	200	0.075	5.96	28.94	47.23	62.00
	dry pan		2.53	31.47	44.70	
	wet pan			44.70	0.00	

d_{10} (mm): 0.00057
d_{16} (mm): 0.0013
d_{30} (mm): 0.0089
d_{50} (mm): 0.045
d_{60} (mm): 0.069
d_{84} (mm): 0.19

Median Particle Diameter --d_{50} (mm): 0.045
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 121
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 2.0
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.079

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Loam

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-5
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 5-May-16
Start Time: 7:54

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

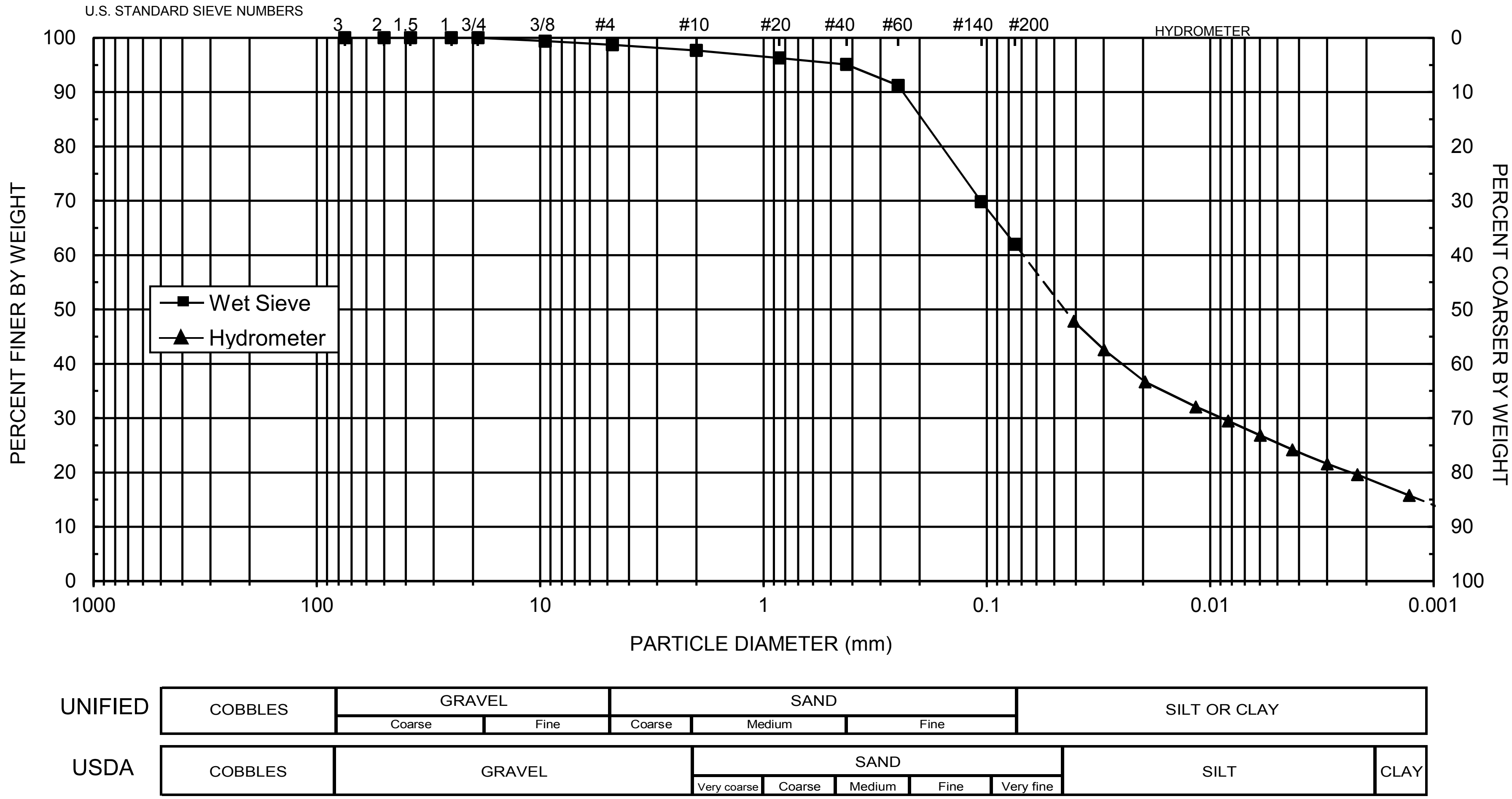
Initial Wt. (g): 75.19
Total Sample Wt. (g): 17495.18
Wt. Passing #4 (g): 17269.61

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
5-May-16	1	21.9	42.0	5.6	36.4	9.4	0.04085	48.5	47.8
	2	21.9	38.0	5.6	32.4	10.1	0.02987	43.1	42.6
	5	21.9	33.5	5.6	27.9	10.8	0.01957	37.2	36.7
	15	21.9	30.0	5.6	24.4	11.4	0.01160	32.5	32.1
	30	22.0	28.0	5.6	22.5	11.7	0.00831	29.9	29.5
	60	21.9	26.0	5.6	20.4	12.0	0.00596	27.2	26.8
	120	21.7	24.0	5.6	18.4	12.4	0.00428	24.5	24.2
	250	22.0	22.0	5.6	16.5	12.7	0.00300	21.9	21.6
	480	21.7	20.5	5.6	14.9	12.9	0.00219	19.8	19.6
6-May-16	1426	22.4	17.5	5.5	12.0	13.4	0.00128	16.0	15.8

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00057**	d_{30} = **0.0089**	d_{50} = **0.045**	d_{60} = **0.069**	C_u = **121**	C_c = **2.0**

SAMPLE NUMBER	DEPTH	ASTM CLASSIFICATION	USDA CLASSIFICATION
BP16-5	**NA**	**Sandy lean clay s(CL)**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Atterberg Limits/
Identification of Fines

Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
BP16-1	34	19	15	CL
BP16-2	33	19	14	CL
BP16-3	31	18	13	CL
BP16-4	34	18	16	CL
BP16-5	36	21	15	CL

--- = Soil requires visual-manual classification due to non-plasticity

Atterberg Limits

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-1
Project Name:	Mt Taylor Mine
Depth:	NA
Test Date:	5-May-16

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	26	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	133.49	120.99	120.83
Weight of pan plus dry soil (g)	129.55	118.42	118.71
Weight of pan (g):	117.48	110.99	112.68
Gravimetric moisture content (% g/g):	32.64	34.59	35.16
Liquid Limit:	34		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.02	125.01
Weight of pan plus dry soil (g)	117.99	123.95
Weight of pan (g):	112.73	118.33
Gravimetric moisture content (% g/g):	19.58	18.86
Plastic Limit:	19	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	34
Plastic Limit:	19
Plasticity Index:	15
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Atterberg Limits

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-2
Project Name:	Mt Taylor Mine
Depth:	NA
Test Date:	5-May-16

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	27	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.04	121.86	123.53
Weight of pan plus dry soil (g)	120.84	119.56	121.39
Weight of pan (g):	114.02	112.60	115.29
Gravimetric moisture content (% g/g):	32.26	33.05	35.08
Liquid Limit:	33		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.09	122.80
Weight of pan plus dry soil (g)	122.05	121.78
Weight of pan (g):	116.69	116.38
Gravimetric moisture content (% g/g):	19.40	18.89
Plastic Limit:	19	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	33
Plastic Limit:	19
Plasticity Index:	14
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-3
Project Name:	Mt Taylor Mine
Depth:	NA
Test Date:	5-May-16

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	27	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	121.59	127.48	125.86
Weight of pan plus dry soil (g)	119.12	124.62	123.19
Weight of pan (g):	110.57	115.31	114.95
Gravimetric moisture content (% g/g):	28.89	30.72	32.40
Liquid Limit:	31		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	122.59	123.48
Weight of pan plus dry soil (g)	121.51	122.51
Weight of pan (g):	115.61	117.24
Gravimetric moisture content (% g/g):	18.31	18.41
Plastic Limit:	18	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	31
Plastic Limit:	18
Plasticity Index:	13
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-4
Project Name:	Mt Taylor Mine
Depth:	NA
Test Date:	5-May-16

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	25	17
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.78	123.28	129.12
Weight of pan plus dry soil (g)	121.04	120.69	126.09
Weight of pan (g):	112.67	113.15	117.68
Gravimetric moisture content (% g/g):	32.74	34.35	36.03
Liquid Limit:	34		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	123.47	124.27
Weight of pan plus dry soil (g)	122.36	123.06
Weight of pan (g):	116.39	116.43
Gravimetric moisture content (% g/g):	18.59	18.25
Plastic Limit:	18	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	34
Plastic Limit:	18
Plasticity Index:	16
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name:	Alan Kuhn Associates LLC
Job Number:	NM16.0085.00
Sample Number:	BP16-5
Project Name:	Mt Taylor Mine
Depth:	NA
Test Date:	5-May-16

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	25	18
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	123.44	123.06	127.84
Weight of pan plus dry soil (g)	121.59	120.31	124.40
Weight of pan (g):	116.15	112.60	115.17
Gravimetric moisture content (% g/g):	34.01	35.67	37.27
Liquid Limit:	36		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	120.05	122.10
Weight of pan plus dry soil (g)	118.92	120.91
Weight of pan (g):	113.45	115.14
Gravimetric moisture content (% g/g):	20.66	20.62
Plastic Limit:	21	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	36
Plastic Limit:	21
Plasticity Index:	15
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction

Summary of Proctor Compaction Tests

Sample Number	Measured: Optimum Moisture Content (% g/g)	Measured: Maximum Dry Bulk Density (g/cm^3)	Oversize Corrected: Optimum Moisture Content (% g/g)	Oversize Corrected: Maximum Dry Bulk Density (g/cm^3)
BP16-1	16.6	1.75	---	---
BP16-2	17.6	1.70	---	---
BP16-3	16.4	1.75	---	---
BP16-4	17.0	1.71	---	---
BP16-5	18.9	1.65	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Daniel B. Stephens & Associates, Inc.

Proctor Compaction Data

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-1
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 3-May-16

As Received Moisture Content (% g/g): NA

Split (3/4", 3/8", #4): #4
Mass of coarse material (g): 226.09
Mass of fines material (g): 17266.68
Mold weight (g): 4209
Mold volume (cm^3): 942.64

Compaction Method: Standard A
Preparation Method: Dry
Type of Rammer: Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	5951	941.78	868.35	266.54	1.65	12.20
2	6048	818.16	739.30	209.63	1.70	14.89
3	6121	847.46	758.36	208.60	1.75	16.21
4	6122	782.54	693.07	207.41	1.71	18.42
5	6086	761.64	667.82	213.71	1.65	20.66

Soil Fractions

Coarse Fraction (% g/g): 1.3
Fines Fraction (% g/g): 98.7

Properties of Coarse Material

Assumed particle density (g/cm^3): 2.65
Assumed Initial Moisture Content (% g/g): 0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

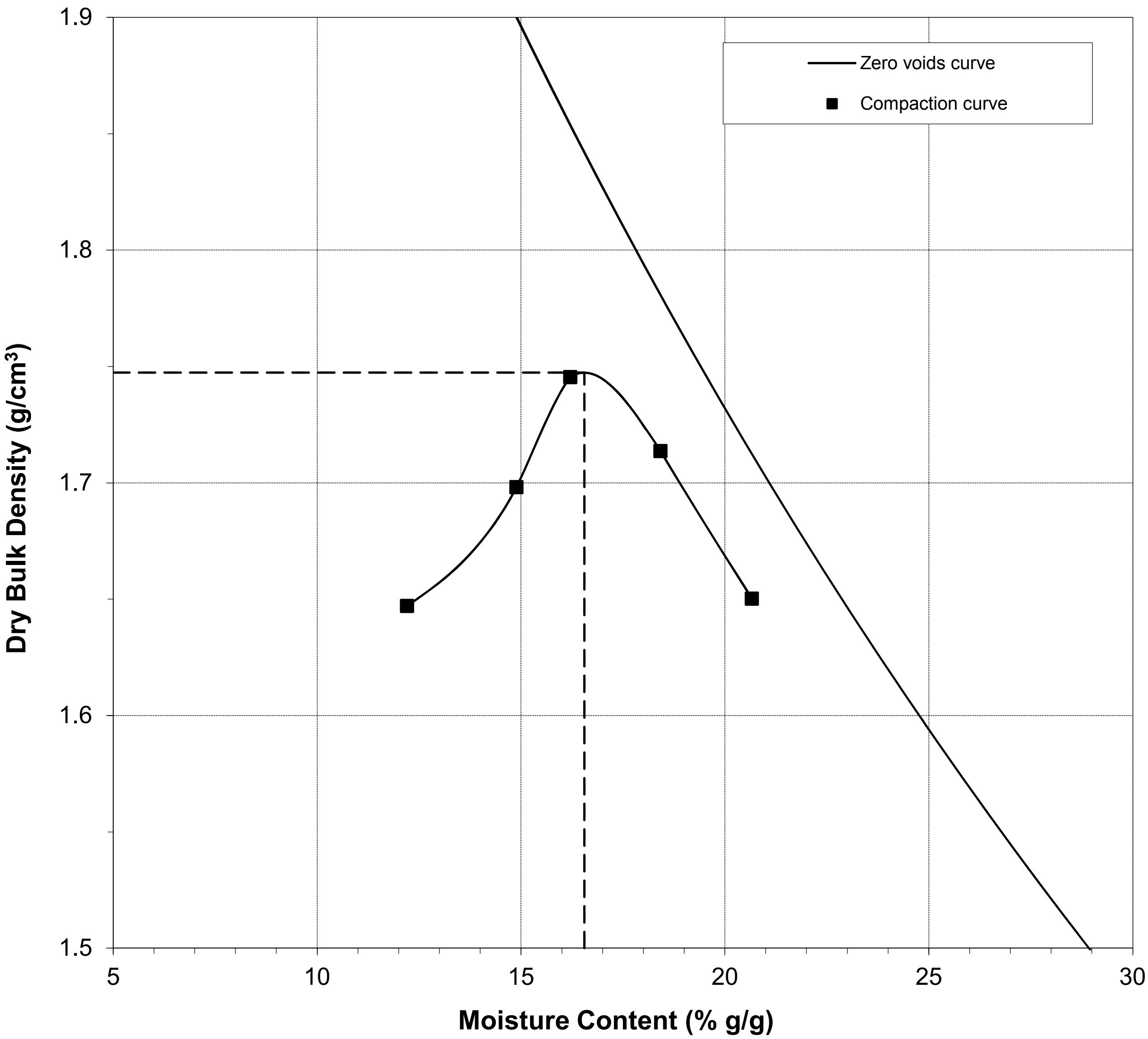
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: BP16-1

	Measured	Corrected
Optimum Moisture Content (% g/g):	16.6	---
Maximum Dry Bulk Density (g/cm³):	1.75	---

Test Date: 3-May-16



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data

Job Name:	Alan Kuhn Associates LLC	*Split (3/4", 3/8", #4):*	#4
Job Number:	NM16.0085.00	*Mass of coarse material* (g):	100.40
Sample Number:	BP16-2	*Mass of fines material* (g):	23356.72
Project Name:	Mt Taylor Mine	*Mold weight (g):*	4209
Depth:	NA	*Mold volume* (cm^3):	942.64
Test Date:	3-May-16	*Compaction Method:*	Standard A
		Preparation Method:	Dry
As Received Moisture Content (% g/g):	NA	*Type of Rammer:*	Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	5979	815.94	747.18	260.78	1.65	14.14
2	6045	830.08	745.72	210.04	1.68	15.75
3	6098	890.75	785.36	207.67	1.69	18.24
4	6090	855.15	756.70	259.50	1.67	19.80
5	6048	877.52	765.88	265.78	1.59	22.32

Soil Fractions		Properties of Coarse Material	
Coarse Fraction (% g/g):	0.4	*Assumed particle density* (g/cm^3):	2.65
Fines Fraction (% g/g):	99.6	*Assumed Initial Moisture Content (% g/g):*	0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

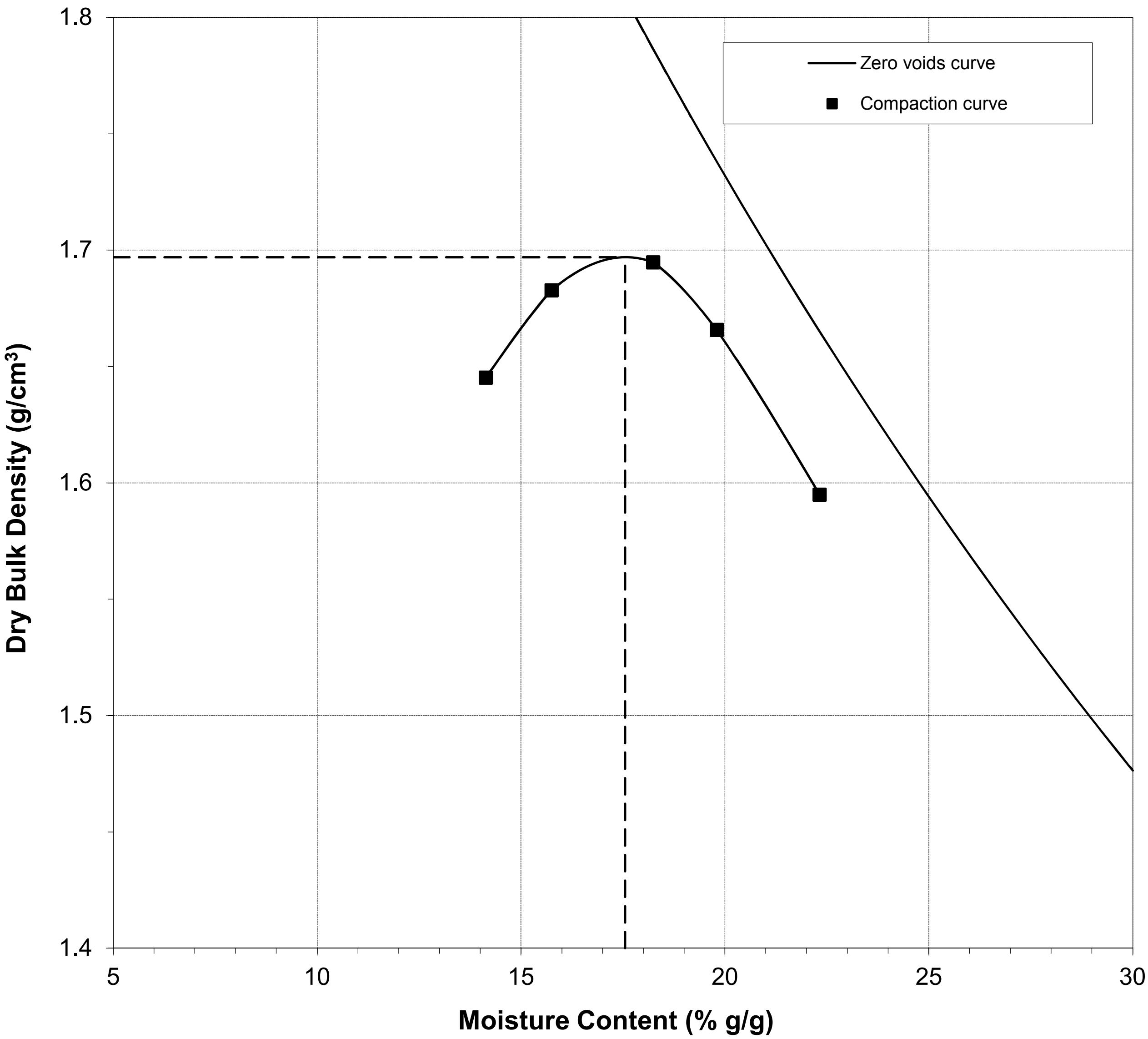
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: BP16-2

	Measured	Corrected
Optimum Moisture Content (% g/g):	17.6	---
Maximum Dry Bulk Density (g/cm^3):	1.70	---

Test Date: 3-May-16



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data

Job Name:	Alan Kuhn Associates LLC	*Split (3/4", 3/8", #4):*	#4
Job Number:	NM16.0085.00	*Mass of coarse material (g):*	260.45
Sample Number:	BP16-3	*Mass of fines material (g):*	17405.81
Project Name:	Mt Taylor Mine	*Mold weight (g):*	4209
Depth:	NA	*Mold volume (cm^3):*	942.64
Test Date:	3-May-16	*Compaction Method:*	Standard A
		Preparation Method:	Dry
As Received Moisture Content (% g/g):	NA	*Type of Rammer:*	Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	5987	901.18	829.55	210.00	1.69	11.56
2	6054	958.26	868.00	212.72	1.72	13.77
3	6126	906.05	815.63	265.32	1.75	16.43
4	6127	840.02	745.03	212.88	1.73	17.85
5	6090	730.20	642.92	210.95	1.66	20.21

Soil Fractions		Properties of Coarse Material	
Coarse Fraction (% g/g):	1.5	*Assumed particle density (g/cm^3):*	2.65
Fines Fraction (% g/g):	98.5	*Assumed Initial Moisture Content (% g/g):*	0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

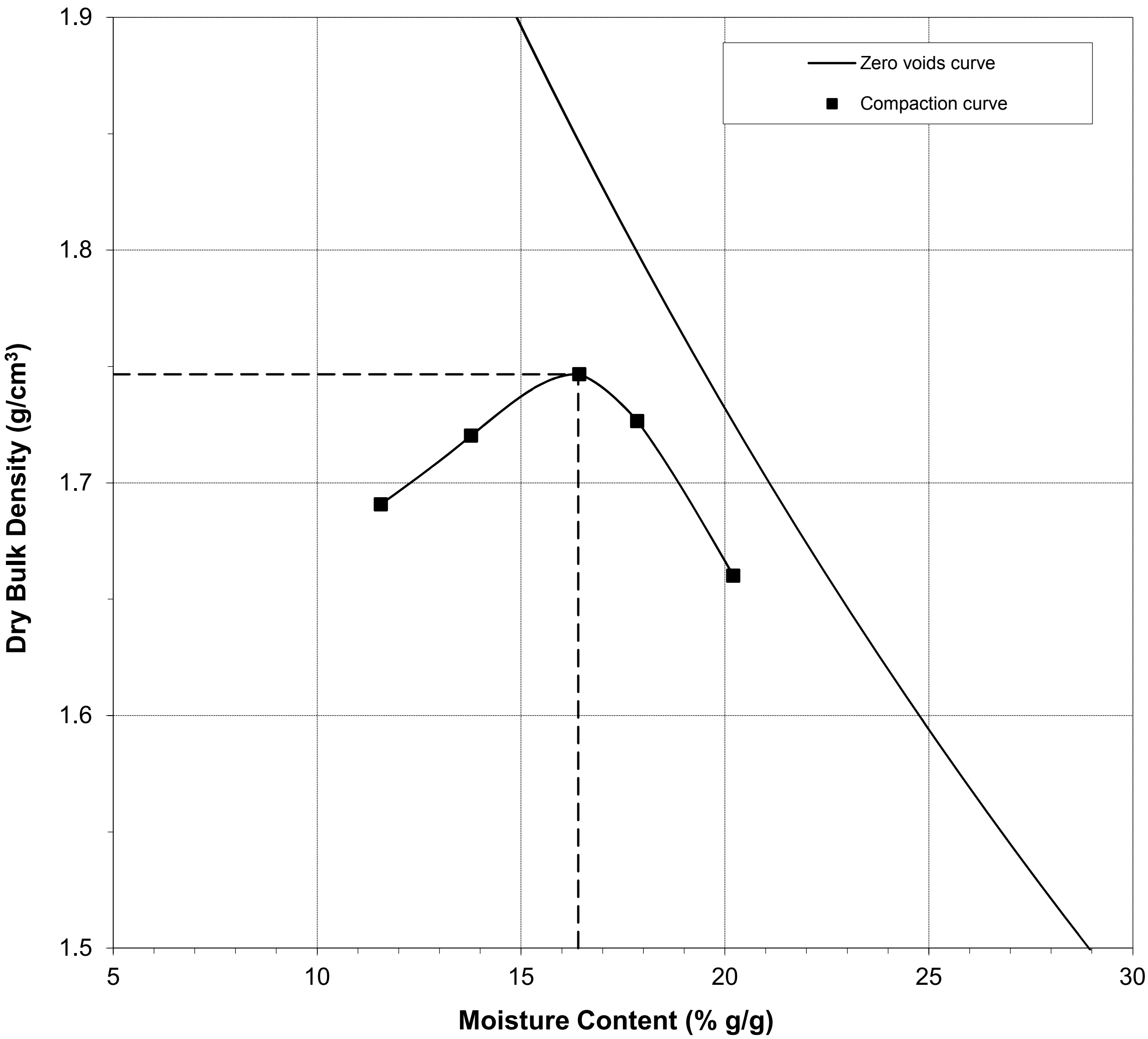
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: BP16-3

	Measured	Corrected
Optimum Moisture Content (% g/g):	16.4	---
Maximum Dry Bulk Density (g/cm^3):	1.75	---

Test Date: 3-May-16



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data

Job Name: Alan Kuhn Associates LLC
Job Number: NM16.0085.00
Sample Number: BP16-4
Project Name: Mt Taylor Mine
Depth: NA

Test Date: 3-May-16

As Received Moisture Content (% g/g): NA

Split (3/4", 3/8", #4): #4
Mass of coarse material (g): 266.34
Mass of fines material (g): 18198.77
Mold weight (g): 4209
Mold volume (cm^3): 942.64

Compaction Method: Standard A
Preparation Method: Dry
Type of Rammer: Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	5911	784.80	722.18	213.44	1.61	12.31
2	5998	855.11	781.31	264.34	1.66	14.28
3	6085	833.49	752.02	258.84	1.71	16.52
4	6105	792.51	699.63	208.70	1.69	18.92
5	6076	887.11	779.01	263.22	1.64	20.96

Soil Fractions

Coarse Fraction (% g/g): 1.4
Fines Fraction (% g/g): 98.6

Properties of Coarse Material

Assumed particle density (g/cm^3): 2.65
Assumed Initial Moisture Content (% g/g): 0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

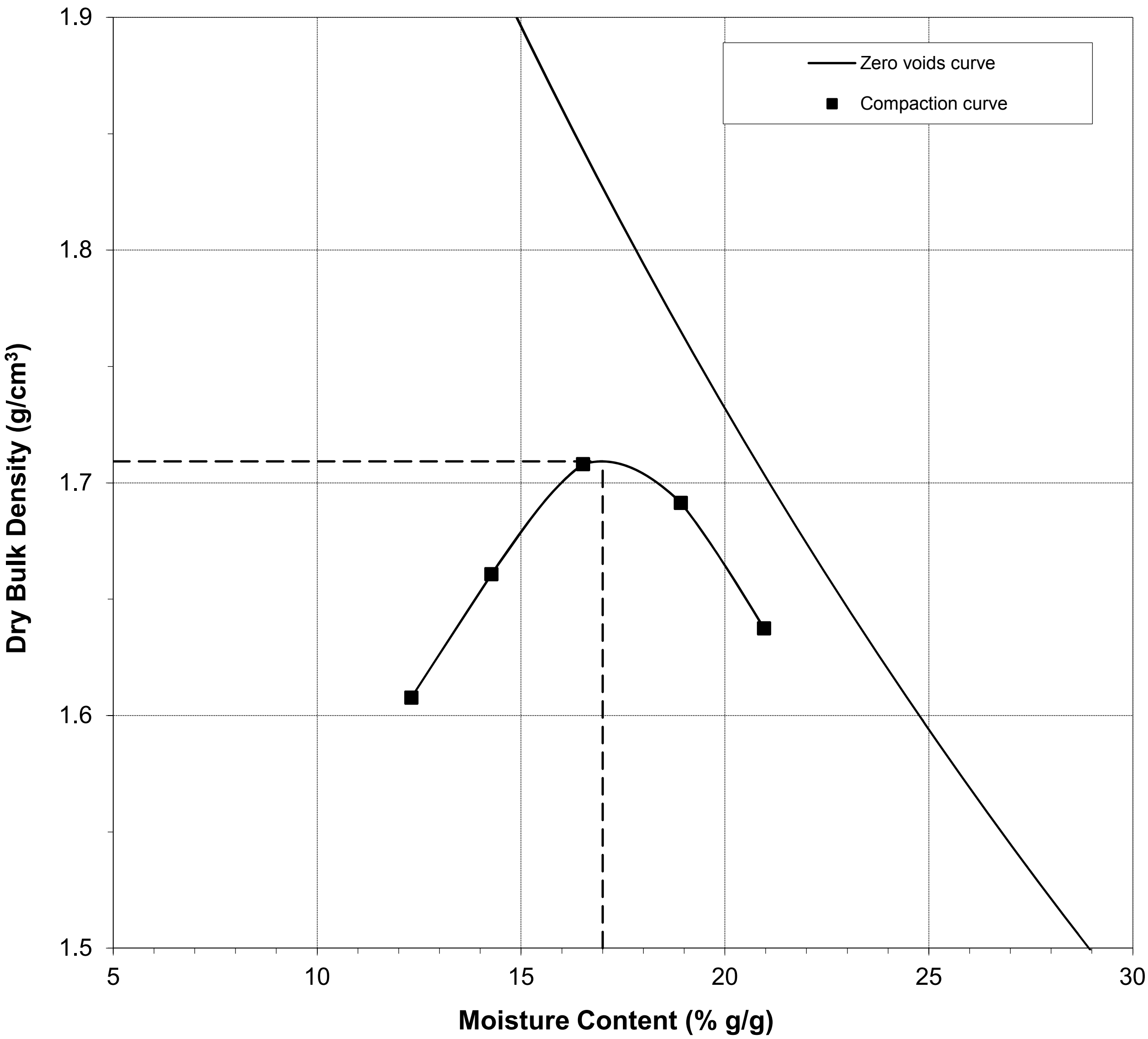
Daniel B. Stephens & Associates, Inc.

Proctor Compaction Data Points with Fitted Curve

Sample Number: BP16-4

	Measured	Corrected
Optimum Moisture Content (% g/g):	17.0	---
Maximum Dry Bulk Density (g/cm^3):	1.71	---

Test Date: 3-May-16



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data

Job Name:	Alan Kuhn Associates LLC	*Split (3/4", 3/8", #4):*	#4
Job Number:	NM16.0085.00	*Mass of coarse material (g):*	225.57
Sample Number:	BP16-5	*Mass of fines material (g):*	17269.61
Project Name:	Mt Taylor Mine	*Mold weight (g):*	4209
Depth:	NA	*Mold volume (cm^3):*	942.64
Test Date:	3-May-16	*Compaction Method:*	Standard A
		Preparation Method:	Dry
As Received Moisture Content (% g/g):	NA	*Type of Rammer:*	Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	5978	848.63	762.53	208.49	1.62	15.54
2	6027	936.86	841.24	294.40	1.64	17.49
3	6065	898.95	794.83	271.60	1.64	19.90
4	6043	963.58	839.10	268.47	1.60	21.81
5	6008	970.46	835.04	268.53	1.54	23.90

Soil Fractions

Coarse Fraction (% g/g): 1.3
Fines Fraction (% g/g): 98.7

Properties of Coarse Material

Assumed particle density (g/cm^3): 2.65
Assumed Initial Moisture Content (% g/g): 0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

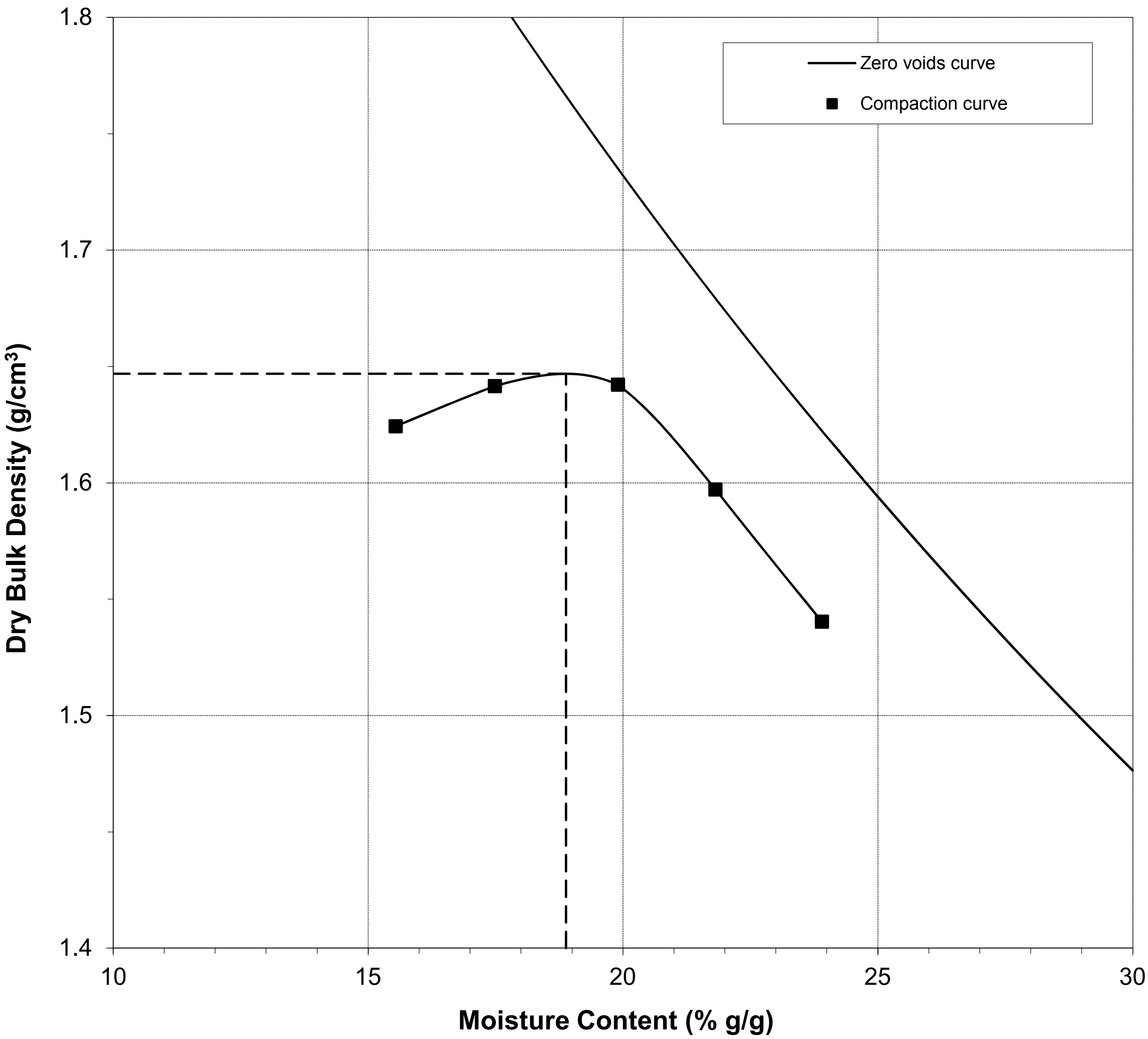
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: BP16-5

	Measured	Corrected
Optimum Moisture Content (% g/g):	18.9	---
Maximum Dry Bulk Density (g/cm³):	1.65	---

Test Date: 3-May-16



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Laboratory Tests and Methods

Tests and Methods

Dry Bulk Density:	ASTM D7263
Moisture Content:	ASTM D7263, ASTM D2216
Calculated Porosity:	ASTM D7263
Saturated Hydraulic Conductivity: Falling Head Rising Tail: (Flexible Wall)	ASTM D5084
Hanging Column Method:	ASTM D6836 (modified apparatus)
Pressure Plate Method:	ASTM D6836 (modified apparatus)
Water Potential (Dewpoint Potentiometer) Method:	ASTM D6836
Relative Humidity (Box) Method:	Campbell, G. and G. Gee. 1986. Water Potential: Miscellaneous Methods. Chp. 25, pp. 631-632, in A. Klute (ed.), Methods of Soil Analysis. Part 1. American Society of Agronomy, Madison, WI; Karathanasis & Hajek. 1982. Quantitative Evaluation of Water Adsorption on Soil Clays. SSA Journal 46:1321-1325
Moisture Retention Characteristics & Calculated Unsaturated Hydraulic Conductivity:	ASTM D6836; van Genuchten, M.T. 1980. A closed-form equation for predicting the hydraulic conductivity of unsaturated soils. SSSAJ 44:892-898; van Genuchten, M.T., F.J. Leij, and S.R. Yates. 1991. The RETC code for quantifying the hydraulic functions of unsaturated soils. Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Ada, Oklahoma. EPA/600/2091/065. December 1991
Particle Size Analysis:	ASTM D422
USCS (ASTM) Classification:	ASTM D422, ASTM D2487
USDA Classification:	ASTM D422, USDA Soil Textural Triangle
Atterberg Limits:	ASTM D4318
Standard Proctor Compaction:	ASTM D698
Coarse Fraction (Gravel) Correction (calc):	ASTM D4718; Bouwer, H. and Rice, R.C. 1984. Hydraulic Properties of Stony Vadose Zones. Groundwater Vol. 22, No. 6

Response No. 16 Attachment

BORROW SAMPLE LOCATIONS

April 2014

Table D.3.5 Mt Taylor Mine Borrow Soil Chemistry

SAMPLE			PARAMETERS														
Number	Location		pH	Ee mmhos/cm 25 C	Saturation %	Texture **	SAR	Selenium mg/kg	Boron mg/kg	Acid/Base Potential (Modified Sobek), t/Kt	Nitrate-NO, (N) mg/kg	Phosphorus (P) mg/kg	Potassium (K) mg/kg	Rock Fragments	diameter in inches		
	N	E												(% volume)	3	3-10	10+
NA1	1581460	2783390	7.6	0.5	49.9	CL	0.82	ND	0.3		5	12	690	ND	_	_	_
NA2	1581612	2782830	7.7	0.6	52.9	CL	1.31	ND	0.2		4	9	740	ND	_	_	_
BA1	1580980	2783420	7.8	0.9	37.1	L	0.95	ND	0.2		13	9	420	ND	_	_	_
BA2	1580880	2783790	7.6	1.3	40.9	L	0.25	ND	0.2		40	11	710	ND	_	_	_
BA3	1580800	2783590	7.8	0.9	38.8	L	0.32	ND	0.1	15	12	8	390	ND	_	_	_
BA4	1580430	2783350	7.7	1.2	42.8	L	0.42	ND	0.1		35	12	660	ND	_	_	_
BA5	1580734	2783546	7.8	0.9	41.3	L	0.81	ND	0.2		22	10	560	ND	_	_	_
WTP1	1580380	2782410	7.9	0.8	43.0	L	0.69	ND	0.1	16	12	8	410	ND	_	_	_
WTP2	1581000	2781880	7.9	0.9	50.4	CL	1.44	ND	0.2	16	13	7	620	ND	_	_	_
WTP3	1580050	2782220	8.0	0.8	38.7	L	1.96	ND	0.2		7	7	320	ND	_	_	_
WTP4	1580390	2782060	7.6	1.3	43.4	CL	0.44	ND	0.1		28	12	500	ND	_	_	_
WTP5	1580391	2782654	7.9	1.0	43.8	L	1.32	0.1	0.2		23	8	410	ND	_	_	_
WTP6	1580717	2782644	8.2	0.9	33.7	SL	4.79	0.3	0.1		8	7	200	ND	_	_	_
WTP7	1580905	2782465	8.0	0.4	33.0	SL	0.51	ND	ND		3	5	160	ND	_	_	_
WTP8	1580908	2782189	8.0	0.8	48.9	CL	1.56	ND	0.2		2	8	520	ND	_	_	_
WTP9	1580534	2781744	8.1	0.5	40.6	L	1.06	ND	0.1		3	9	370	ND	_	_	_
WTP10	1580249	2781742	7.9	0.9	41.8	SCL	1.32	ND	0.2		10	6	450	ND	_	_	_
WTP11	1579913	2781835	8.3	0.6	38.7	SCL	5.23	ND	0.2		4	7	240	ND	_	_	_
WTP12	1579998	2782062	8.1	0.5	40.1	L	1.16	ND	0.1		5	8	420	ND	_	_	_
SWP1	1579327	2781913	7.7	1.0	34.4	L	0.21	ND	0.1		13	6	270	ND	_	_	_
SWP2	1578943	2781711	7.9	0.6	40.5	SCL	1.37	ND	0.2		2	6	180	ND	_	_	_
SWP3	1579122	2781861	8.0	0.6	43.7	CL	1.09	ND	ND		8	8	280	ND	_	_	_
SWP4	1579061	2781581	8.1	0.6	39.6	L	1.40	ND	0.2		7	7	280	ND	_	_	_
WP1	157950	2781870	7.9	5.3	38.9	SCL	9.35	ND	ND		2	7	110	ND	_	_	_
WP2	1577930	2781770	7.8	6.4	38.0	SL	11.60	0.2	0.1	30	2	7	90	ND	_	_	_
WP3	1577980	2781660	8.0	5.2	52.6	CL	8.31	0.1	ND		2	5	190	ND	_	_	_

** s=sand, si = silt, I= loam, c:= clay, g= gravel, cos= coarse sand, \Ifs = very fine sand vfsl = very fine sandy loam, sicl = silty, clay, loam

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

April 01, 2014

Alan Kuhn
Alan Kuhn Assoc LLC
13212 Manitoba Dr NE
Albuquerque, NM 87111
TEL: (505) 350-9188
FAX

RE: Mt. Taylor Mine OrderNo.: 1403621

Dear Alan Kuhn:

Hall Environmental Analysis Laboratory received 26 sample(s) on 3/14/2014 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-001
Client Sample ID: 1403621-001A, NA-01 (a+b)

Report Date: 03/31/14
Collection Date: 03/13/14 09:30
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	32	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	36	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	32	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.6	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	49.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.5	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.54	meq/L		0.05		SW6010B	03/27/14 20:48 / mas
Magnesium, sat. paste	0.99	meq/L		0.08		SW6010B	03/27/14 20:48 / mas
Sodium, sat. paste	1.09	meq/L		0.04		SW6010B	03/27/14 20:48 / mas
Sodium Adsorption Ratio (SAR)	0.82	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	03/27/14 12:00 / srm
Nitrate as N, KCL Extract	5	mg/kg		1		ASA33-8	03/27/14 10:46 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.3	mg/kg		0.1		SW6010B	03/28/14 03:37 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:37 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	690	mg/kg		10		SW6010B	03/27/14 18:59 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 09:00
Lab ID:	B14031248-002	**DateReceived:**	03/18/14
Client Sample ID:	1403621-002A, NA-02 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	30	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	40	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	30	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	14	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.7	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	52.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.82	meq/L		0.05		SW6010B	03/27/14 20:55 / mas
Magnesium, sat. paste	1.07	meq/L		0.08		SW6010B	03/27/14 20:55 / mas
Sodium, sat. paste	1.83	meq/L		0.04		SW6010B	03/27/14 20:55 / mas
Sodium Adsorption Ratio (SAR)	1.31	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	9	mg/kg		1		ASA24-5	03/27/14 12:04 / srm
Nitrate as N, KCL Extract	4	mg/kg		1		ASA33-8	03/27/14 10:48 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 03:45 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:45 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	740	mg/kg		10		SW6010B	03/27/14 19:06 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/30/13 15:30
Lab ID:	B14031248-003	**DateReceived:**	03/18/14
Client Sample ID:	1403621-003A, BA-01 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	48	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	33	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	19	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	37.1	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.51	meq/L		0.05		SW6010B	03/27/14 21:02 / mas
Magnesium, sat. paste	1.10	meq/L		0.08		SW6010B	03/27/14 21:02 / mas
Sodium, sat. paste	1.73	meq/L		0.04		SW6010B	03/27/14 21:02 / mas
Sodium Adsorption Ratio (SAR)	0.95	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	9	mg/kg		1		ASA24-5	03/27/14 12:06 / srm
Nitrate as N, KCL Extract	13	mg/kg		1		ASA33-8	03/27/14 10:48 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 03:52 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:52 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	420	mg/kg		10		SW6010B	03/27/14 19:13 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-004
Client Sample ID: 1403621-004A, BA-02 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 15:35
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	36	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	20	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.6	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.3	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	8.27	meq/L		0.05		SW6010B	03/27/14 21:05 / mas
Magnesium, sat. paste	2.23	meq/L		0.08		SW6010B	03/27/14 21:05 / mas
Sodium, sat. paste	0.57	meq/L		0.04		SW6010B	03/27/14 21:05 / mas
Sodium Adsorption Ratio (SAR)	0.25	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	11	mg/kg		1		ASA24-5	03/27/14 12:07 / srm
Nitrate as N, KCL Extract	40	mg/kg		1		ASA33-8	03/27/14 10:49 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 03:56 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 03:56 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	710	mg/kg		10		SW6010B	03/27/14 19:22 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/30/13 15:40
Lab ID:	B14031248-005	**DateReceived:**	03/18/14
Client Sample ID:	1403621-005A, BA-03 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	46	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	34	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	20	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	6.66	meq/L		0.05		SW6010B	03/27/14 21:08 / mas
Magnesium, sat. paste	1.08	meq/L		0.08		SW6010B	03/27/14 21:08 / mas
Sodium, sat. paste	0.63	meq/L		0.04		SW6010B	03/27/14 21:08 / mas
Sodium Adsorption Ratio (SAR)	0.32	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	16	t/kt		0.1		Sobek Modifie	03/31/14 11:44 / srm
Acid Potential	1	t/kt		1		Sobek Modifie	03/31/14 11:44 / srm
Acid/Base Potential	15	t/kt				Sobek Modifie	03/31/14 11:44 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:09 / srm
Nitrate as N, KCL Extract	12	mg/kg		1		ASA33-8	03/27/14 10:50 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:00 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:00 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	390	mg/kg		10		SW6010B	03/27/14 19:26 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental		**Report Date:**	03/31/14
Project:	Not Indicated		**Collection Date:**	10/30/13 15:45
Lab ID:	B14031248-006		**DateReceived:**	03/18/14
Client Sample ID:	1403621-006A, BA-04 (a+b+c)		**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	39	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	37	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.7	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	42.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.2	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	7.99	meq/L		0.05		SW6010B	03/27/14 21:12 / mas
Magnesium, sat. paste	1.92	meq/L		0.08		SW6010B	03/27/14 21:12 / mas
Sodium, sat. paste	0.94	meq/L		0.04		SW6010B	03/27/14 21:12 / mas
Sodium Adsorption Ratio (SAR)	0.42	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	03/27/14 12:10 / srm
Nitrate as N, KCL Extract	35	mg/kg		1		ASA33-8	03/27/14 10:51 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:04 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:04 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	660	mg/kg		10		SW6010B	03/27/14 19:29 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 12:45
Lab ID:	B14031248-007	**DateReceived:**	03/18/14
Client Sample ID:	1403621-007A, BA-05 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	40	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	36	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	41.3	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.83	meq/L		0.05		SW6010B	03/27/14 21:34 / mas
Magnesium, sat. paste	0.89	meq/L		0.08		SW6010B	03/27/14 21:34 / mas
Sodium, sat. paste	1.49	meq/L		0.04		SW6010B	03/27/14 21:34 / mas
Sodium Adsorption Ratio (SAR)	0.81	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	10	mg/kg		1		ASA24-5	03/27/14 12:11 / srm
Nitrate as N, KCL Extract	22	mg/kg		1		ASA33-8	03/27/14 10:51 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 04:42 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:42 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	560	mg/kg		10		SW6010B	03/26/14 15:59 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/30/13 15:20
Lab ID:	B14031248-008	**DateReceived:**	03/18/14
Client Sample ID:	1403621-008A, WTP-01 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	43	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	31	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	26	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.0	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.8	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.27	meq/L		0.05		SW6010B	03/27/14 21:37 / mas
Magnesium, sat. paste	1.10	meq/L		0.08		SW6010B	03/27/14 21:37 / mas
Sodium, sat. paste	1.23	meq/L		0.04		SW6010B	03/27/14 21:37 / mas
Sodium Adsorption Ratio (SAR)	0.69	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	17	t/kt		0.1		Sobek Modifie	03/31/14 11:51 / srm
Acid Potential	1	t/kt		1		Sobek Modifie	03/31/14 11:51 / srm
Acid/Base Potential	16	t/kt				Sobek Modifie	03/31/14 11:51 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:13 / srm
Nitrate as N, KCL Extract	12	mg/kg		1		ASA33-8	03/27/14 10:52 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:46 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:46 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	400	mg/kg		10		SW6010B	03/26/14 16:03 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-009
Client Sample ID: 1403621-009A, WTP-02 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 14:50
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	33	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	35	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	32	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	50.4	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	4.63	meq/L		0.05		SW6010B	03/27/14 21:41 / mas
Magnesium, sat. paste	1.02	meq/L		0.08		SW6010B	03/27/14 21:41 / mas
Sodium, sat. paste	2.43	meq/L		0.04		SW6010B	03/27/14 21:41 / mas
Sodium Adsorption Ratio (SAR)	1.44	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	17	t/kt		0.1		Sobek Modifie	03/31/14 11:54 / srm
Acid Potential	1	t/kt		1		Sobek Modifie	03/31/14 11:54 / srm
Acid/Base Potential	16	t/kt				Sobek Modifie	03/31/14 11:54 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:14 / srm
Nitrate as N, KCL Extract	13	mg/kg		1		ASA33-8	03/27/14 10:53 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 04:50 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:50 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	620	mg/kg		10		SW6010B	03/26/14 16:06 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-010
Client Sample ID: 1403621-010A, WTP-03 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/30/13 15:15
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	32	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.8	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.79	meq/L		0.05		SW6010B	03/27/14 21:44 / mas
Magnesium, sat. paste	0.79	meq/L		0.08		SW6010B	03/27/14 21:44 / mas
Sodium, sat. paste	2.97	meq/L		0.04		SW6010B	03/27/14 21:44 / mas
Sodium Adsorption Ratio (SAR)	1.96	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:16 / srm
Nitrate as N, KCL Extract	7	mg/kg		1		ASA33-8	03/27/14 10:53 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 04:53 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:53 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	320	mg/kg		10		SW6010B	03/26/14 16:09 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/30/13 15:05
Lab ID:	B14031248-011	**DateReceived:**	03/18/14
Client Sample ID:	1403621-011A, WTP-04 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	43	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	28	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	8	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.6	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.4	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.3	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	8.07	meq/L		0.05		SW6010B	03/27/14 21:47 / mas
Magnesium, sat. paste	2.56	meq/L		0.08		SW6010B	03/27/14 21:47 / mas
Sodium, sat. paste	1.02	meq/L		0.04		SW6010B	03/27/14 21:47 / mas
Sodium Adsorption Ratio (SAR)	0.44	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	12	mg/kg		1		ASA24-5	03/27/14 12:20 / srm
Nitrate as N, KCL Extract	28	mg/kg		1		ASA33-8	03/27/14 10:56 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 04:57 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 04:57 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	500	mg/kg		10		SW6010B	03/26/14 16:13 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 11:40
Lab ID:	B14031248-012	**DateReceived:**	03/18/14
Client Sample ID:	1403621-012A, WTP-06 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	58	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	25	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	17	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	14	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.2	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	33.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.84	meq/L		0.05		SW6010B	03/27/14 21:54 / mas
Magnesium, sat. paste	0.47	meq/L		0.08		SW6010B	03/27/14 21:54 / mas
Sodium, sat. paste	6.16	meq/L		0.04		SW6010B	03/27/14 21:54 / mas
Sodium Adsorption Ratio (SAR)	4.79	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:24 / srm
Nitrate as N, KCL Extract	8	mg/kg		1		ASA33-8	03/27/14 10:58 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:05 / mas
Selenium	0.3	mg/kg		0.1		SW6010B	03/28/14 05:05 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	200	mg/kg		10		SW6010B	03/26/14 16:19 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-013
Client Sample ID: 1403621-013A, WTP-05 (a+b)

Report Date: 03/31/14
Collection Date: 03/13/14 11:35
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	31	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.0	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	5.73	meq/L		0.05		SW6010B	03/27/14 22:01 / mas
Magnesium, sat. paste	1.46	meq/L		0.08		SW6010B	03/27/14 22:01 / mas
Sodium, sat. paste	2.50	meq/L		0.04		SW6010B	03/27/14 22:01 / mas
Sodium Adsorption Ratio (SAR)	1.32	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:26 / srm
Nitrate as N, KCL Extract	23	mg/kg		1		ASA33-8	03/27/14 10:58 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:13 / mas
Selenium	0.1	mg/kg		0.1		SW6010B	03/28/14 05:13 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	410	mg/kg		10		SW6010B	03/26/14 16:26 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-014
Client Sample ID: 1403621-014A, WTP-07 (a+b)

Report Date: 03/31/14
Collection Date: 03/13/14 11:50
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	61	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	22	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	17	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	16	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	33.0	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.4	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.09	meq/L		0.05		SW6010B	03/27/14 22:04 / mas
Magnesium, sat. paste	0.77	meq/L		0.08		SW6010B	03/27/14 22:04 / mas
Sodium, sat. paste	0.70	meq/L		0.04		SW6010B	03/27/14 22:04 / mas
Sodium Adsorption Ratio (SAR)	0.51	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	03/27/14 12:27 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA33-8	03/27/14 10:59 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 05:17 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:17 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	160	mg/kg		10		SW6010B	03/26/14 16:29 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-015
Client Sample ID: 1403621-015A, WTP-08 (a+b)

Report Date: 03/31/14
Collection Date: 03/13/14 12:15
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	40	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	31	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	48.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.8	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.77	meq/L		0.05		SW6010B	03/27/14 22:14 / mas
Magnesium, sat. paste	1.34	meq/L		0.08		SW6010B	03/27/14 22:14 / mas
Sodium, sat. paste	2.50	meq/L		0.04		SW6010B	03/27/14 22:14 / mas
Sodium Adsorption Ratio (SAR)	1.56	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:28 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:00 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:28 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:28 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	520	mg/kg		10		SW6010B	03/27/14 19:36 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 09:00
Lab ID:	B14031248-016	**DateReceived:**	03/18/14
Client Sample ID:	1403621-016A, WTP-09 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	44	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	32	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.1	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.6	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.5	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.73	meq/L		0.05		SW6010B	03/27/14 22:17 / mas
Magnesium, sat. paste	0.58	meq/L		0.08		SW6010B	03/27/14 22:17 / mas
Sodium, sat. paste	1.36	meq/L		0.04		SW6010B	03/27/14 22:17 / mas
Sodium Adsorption Ratio (SAR)	1.06	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	9	mg/kg		1		ASA24-5	03/27/14 12:30 / srm
Nitrate as N, KCL Extract	3	mg/kg		1		ASA33-8	03/27/14 11:00 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:32 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:32 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	370	mg/kg		10		SW6010B	03/27/14 19:42 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 10:15
Lab ID:	B14031248-017	**DateReceived:**	03/18/14
Client Sample ID:	1403621-017A, WTP-10 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	48	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	27	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	11	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	41.8	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.9	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	4.90	meq/L		0.05		SW6010B	03/27/14 22:20 / mas
Magnesium, sat. paste	1.02	meq/L		0.08		SW6010B	03/27/14 22:20 / mas
Sodium, sat. paste	2.26	meq/L		0.04		SW6010B	03/27/14 22:20 / mas
Sodium Adsorption Ratio (SAR)	1.32	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	03/27/14 12:31 / srm
Nitrate as N, KCL Extract	10	mg/kg		1		ASA33-8	03/27/14 11:01 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:36 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:36 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	450	mg/kg		10		SW6010B	03/27/14 19:46 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	03/13/14 10:35
Lab ID:	B14031248-018	**DateReceived:**	03/18/14
Client Sample ID:	1403621-018A, WTP-11 (a+b)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	50	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	26	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	24	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	13	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.3	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	1.14	meq/L		0.05		SW6010B	03/27/14 22:24 / mas
Magnesium, sat. paste	0.39	meq/L		0.08		SW6010B	03/27/14 22:24 / mas
Sodium, sat. paste	4.57	meq/L		0.04		SW6010B	03/27/14 22:24 / mas
Sodium Adsorption Ratio (SAR)	5.23	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:33 / srm
Nitrate as N, KCL Extract	4	mg/kg		1		ASA33-8	03/27/14 11:02 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:40 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:40 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	240	mg/kg		10		SW6010B	03/27/14 19:49 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-019
Client Sample ID: 1403621-019A, WTP-12 (a+b)

Report Date: 03/31/14
Collection Date: 03/13/14 11:10
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	45	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	26	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	13	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.1	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.1	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.5	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	2.66	meq/L		0.05		SW6010B	03/27/14 22:27 / mas
Magnesium, sat. paste	0.63	meq/L		0.08		SW6010B	03/27/14 22:27 / mas
Sodium, sat. paste	1.48	meq/L		0.04		SW6010B	03/27/14 22:27 / mas
Sodium Adsorption Ratio (SAR)	1.16	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:34 / srm
Nitrate as N, KCL Extract	5	mg/kg		1		ASA33-8	03/27/14 11:22 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:43 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:43 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	420	mg/kg		10		SW6010B	03/27/14 19:52 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-020
Client Sample ID: 1403621-020A, SWP-01 (a+b)

Report Date: 03/31/14
Collection Date: 03/12/14 09:00
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	46	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	32	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	22	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	15	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.7	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	34.4	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	1.0	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	7.48	meq/L		0.05		SW6010B	03/27/14 22:30 / mas
Magnesium, sat. paste	1.70	meq/L		0.08		SW6010B	03/27/14 22:30 / mas
Sodium, sat. paste	0.45	meq/L		0.04		SW6010B	03/27/14 22:30 / mas
Sodium Adsorption Ratio (SAR)	0.21	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	03/27/14 12:35 / srm
Nitrate as N, KCL Extract	13	mg/kg		1		ASA33-8	03/27/14 11:23 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 05:47 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:47 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	270	mg/kg		10		SW6010B	03/27/14 20:02 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-021
Client Sample ID: 1403621-021A, SWP-02 (a+b)

Report Date: 03/31/14
Collection Date: 03/12/14 09:10
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	48	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	27	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	40.5	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.00	meq/L		0.05		SW6010B	03/27/14 22:34 / mas
Magnesium, sat. paste	1.29	meq/L		0.08		SW6010B	03/27/14 22:34 / mas
Sodium, sat. paste	2.00	meq/L		0.04		SW6010B	03/27/14 22:34 / mas
Sodium Adsorption Ratio (SAR)	1.37	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	6	mg/kg		1		ASA24-5	03/27/14 12:40 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:25 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 05:51 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:51 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	180	mg/kg		10		SW6010B	03/27/14 20:05 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

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LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental		**Report Date:**	03/31/14
Project:	Not Indicated		**Collection Date:**	03/12/14 09:15
Lab ID:	B14031248-022		**DateReceived:**	03/18/14
Client Sample ID:	1403621-022A, SWP-03 (a+b)		**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	27	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	40	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	33	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	9	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	43.7	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.00	meq/L		0.05		SW6010B	03/27/14 22:40 / mas
Magnesium, sat. paste	0.93	meq/L		0.08		SW6010B	03/27/14 22:40 / mas
Sodium, sat. paste	1.52	meq/L		0.04		SW6010B	03/27/14 22:40 / mas
Sodium Adsorption Ratio (SAR)	1.09	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	8	mg/kg		1		ASA24-5	03/27/14 12:44 / srm
Nitrate as N, KCL Extract	8	mg/kg		1		ASA33-8	03/27/14 11:27 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 05:59 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 05:59 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	280	mg/kg		10		SW6010B	03/27/14 20:12 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-023
Client Sample ID: 1403621-023A, SWP-04 (a+b)

Report Date: 03/31/14
Collection Date: 03/12/14 09:30
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	46	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	29	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	25	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	12	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	L					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.1	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	39.6	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	0.6	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	3.15	meq/L		0.05		SW6010B	03/27/14 22:53 / mas
Magnesium, sat. paste	1.42	meq/L		0.08		SW6010B	03/27/14 22:53 / mas
Sodium, sat. paste	2.12	meq/L		0.04		SW6010B	03/27/14 22:53 / mas
Sodium Adsorption Ratio (SAR)	1.40	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:45 / srm
Nitrate as N, KCL Extract	7	mg/kg		1		ASA33-8	03/27/14 11:28 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.2	mg/kg		0.1		SW6010B	03/28/14 06:14 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 06:14 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	260	mg/kg		10		SW6010B	03/27/14 20:19 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-024
Client Sample ID: 1403621-024A, WP-01 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/31/13 09:00
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	58	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	22	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	20	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	8	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SCL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.9	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.9	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	5.3	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	24.4	meq/L		0.05		SW6010B	03/27/14 22:57 / mas
Magnesium, sat. paste	13.6	meq/L		0.08		SW6010B	03/27/14 22:57 / mas
Sodium, sat. paste	40.8	meq/L	D	0.07		SW6010B	03/27/14 22:57 / mas
Sodium Adsorption Ratio (SAR)	9.35	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:47 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:28 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 06:18 / mas
Selenium	ND	mg/kg		0.1		SW6010B	03/28/14 06:18 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	110	mg/kg		10		SW6010B	03/27/14 20:22 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: B14031248-025
Client Sample ID: 1403621-025A, WP-02 (a+b+c)

Report Date: 03/31/14
Collection Date: 10/31/13 09:10
DateReceived: 03/18/14
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	58	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	24	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	18	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	7	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	SL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	7.8	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	38.0	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	6.4	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	25.7	meq/L		0.05		SW6010B	03/27/14 23:00 / mas
Magnesium, sat. paste	17.0	meq/L		0.08		SW6010B	03/27/14 23:00 / mas
Sodium, sat. paste	53.5	meq/L	D	0.1		SW6010B	03/27/14 23:00 / mas
Sodium Adsorption Ratio (SAR)	11.6	unitless		0.01		Calculation	03/31/14 10:51 / srm
ACID-BASE ACCOUNTING							
Neutralization Potential	31	t/kt		0.1		Sobek Modifie	03/31/14 11:32 / srm
Acid Potential	0	t/kt		1		Sobek Modifie	03/31/14 11:32 / srm
Acid/Base Potential	30	t/kt				Sobek Modifie	03/31/14 11:32 / srm
The acid-base potential was calculated from the non-sulfate sulfur %							
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	7	mg/kg		1		ASA24-5	03/27/14 12:48 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:29 / srm
CACL2 EXTRACTABLE METALS							
Boron	0.1	mg/kg		0.1		SW6010B	03/28/14 06:22 / mas
Selenium	0.2	mg/kg		0.1		SW6010B	03/28/14 06:22 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	90	mg/kg		10		SW6010B	03/27/14 20:25 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client:	Hall Environmental	**Report Date:**	03/31/14
Project:	Not Indicated	**Collection Date:**	10/31/13 09:15
Lab ID:	B14031248-026	**DateReceived:**	03/18/14
Client Sample ID:	1403621-026A, WP-03 (a+b+c)	**Matrix:**	Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS							
Coarse Fragments	ND	%		2		ASA15-5	03/24/14 16:08 / srm
Sand	38	%		1		ASA15-5	03/31/14 10:25 / srm
Silt	35	%		1		ASA15-5	03/31/14 10:25 / srm
Clay	27	%		1		ASA15-5	03/31/14 10:25 / srm
Very Fine Sand	10	wt%		1		ASA15-5	03/31/14 10:43 / srm
Texture	CL					ASA15-5	03/31/14 10:25 / srm
- C = Clay, S = Sand(y), Si = Silt(y), L = Loam(y)							
SATURATED PASTE							
pH, sat. paste	8.0	s.u.		0.1		ASAM10-3.2	03/26/14 15:15 / srm
Saturation	52.6	%		0.1		USDA27a	03/31/14 10:51 / srm
Conductivity, sat. paste	5.2	mmhos/cm		0.1		ASA10-3	03/26/14 15:15 / srm
Calcium, sat. paste	25.0	meq/L		0.05		SW6010B	03/27/14 23:03 / mas
Magnesium, sat. paste	14.7	meq/L		0.08		SW6010B	03/27/14 23:03 / mas
Sodium, sat. paste	37.0	meq/L	D	0.07		SW6010B	03/27/14 23:03 / mas
Sodium Adsorption Ratio (SAR)	8.31	unitless		0.01		Calculation	03/31/14 10:51 / srm
CHEMICAL CHARACTERISTICS							
Phosphorus, Olsen	5	mg/kg		1		ASA24-5	03/27/14 12:50 / srm
Nitrate as N, KCL Extract	2	mg/kg		1		ASA33-8	03/27/14 11:30 / srm
CACL2 EXTRACTABLE METALS							
Boron	ND	mg/kg		0.1		SW6010B	03/28/14 06:26 / mas
Selenium	0.1	mg/kg		0.1		SW6010B	03/28/14 06:26 / mas
METALS, AMMONIUM ACETATE EXTRACTABLE							
Potassium	190	mg/kg		10		SW6010B	03/27/14 20:29 / mas

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Project: Not Indicated

Report Date: 03/31/14

Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA10-3								Batch: R221281	
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	0.490	mmhos/cm	0.10				4.0	30	
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	1.29	mmhos/cm	0.10				0.0	30	
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	0.570	mmhos/cm	0.10				1.7	30	
Lab ID: LCS-1403261515	Laboratory Control Sample				Run: MISC-SOIL_140326A			03/26/14 15:15	
Conductivity, sat. paste	12.1	mmhos/cm	0.10	96	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA15-5								Batch: R221435	
Lab ID: B14031248-002A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand	31	%	1.0				3.3	40	
Silt	40	%	1.0				0.0	40	
Clay	29	%	1.0				3.4	40	
Lab ID: B14031248-012A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand	58	%	1.0				0.0	40	
Silt	26	%	1.0				3.9	40	
Clay	16	%	1.0				6.1	40	
Lab ID: B14031248-022A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand	28	%	1.0				3.6	40	
Silt	39	%	1.0				2.5	40	
Clay	33	%	1.0				0.0	40	
Lab ID: LCS-1403311025	Laboratory Control Sample				Run: MISC-SOIL_140331A			03/31/14 10:25	
Sand	42	%	1.0	102	50	150			
Silt	34	%	1.0	97	50	150			
Clay	24	%	1.0	100	50	150			
Lab ID: B14031248-002A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand	15	wt%	1				8.7	50	
Lab ID: B14031248-012A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand	15	wt%	1				10	50	
Lab ID: B14031248-022A DUP	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand	10	wt%	1				15	50	
Lab ID: LCS-1403311043	Laboratory Control Sample				Run: MISC-SOIL_140331A			03/31/14 10:43	
Very Fine Sand	8	wt%	1	105	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA24-5								Batch: 14031802-PS3	
Lab ID: LCS	Laboratory Control Sample				Run: FIA201-B_140331A			03/27/14 11:54	
Phosphorus, Olsen	11.7	mg/kg	1.0	87	50	150			
Lab ID: B14031248-001ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 12:02	
Phosphorus, Olsen	10.4	mg/kg	1.0				13	30	
Lab ID: B14031248-001AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 12:03	
Phosphorus, Olsen	21.6	mg/kg	1.0	93	50	150			
Lab ID: B14031248-011ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 12:21	
Phosphorus, Olsen	11.7	mg/kg	1.0				2.3	30	
Lab ID: B14031248-011AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 12:23	
Phosphorus, Olsen	23.3	mg/kg	1.0	108	50	150			
Lab ID: B14031248-021ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 12:41	
Phosphorus, Olsen	6.68	mg/kg	1.0				4.1	30	
Lab ID: B14031248-021AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 12:43	
Phosphorus, Olsen	16.6	mg/kg	1.0	97	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASA33-8								Batch: 14032701-NNS2	
Lab ID: LCS	Laboratory Control Sample				Run: FIA201-B_140331A			03/27/14 10:43	
Nitrate as N, KCL Extract	7.92	mg/kg	1.0	107	50	150			
Lab ID: B14031248-001ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 10:46	
Nitrate as N, KCL Extract	4.90	mg/kg	1.0				1.2	30	
Lab ID: B14031248-001AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 10:47	
Nitrate as N, KCL Extract	10.5	mg/kg	1.0	105	50	150			
Lab ID: B14031248-011ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 10:56	
Nitrate as N, KCL Extract	29.4	mg/kg	1.0				3.3	30	
Lab ID: B14031248-011AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 10:57	
Nitrate as N, KCL Extract	35.1	mg/kg	1.0	127	50	150			
Method: ASA33-8								Batch: 14032702-NNS2	
Lab ID: B14031248-021ADUP	Sample Duplicate				Run: FIA201-B_140331A			03/27/14 11:26	
Nitrate as N, KCL Extract	1.55	mg/kg	1.0				3.7	30	
Lab ID: B14031248-021AMS	Sample Matrix Spike				Run: FIA201-B_140331A			03/27/14 11:26	
Nitrate as N, KCL Extract	7.16	mg/kg	1.0	106	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: ASAM10-3.2								Batch: R221281	
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.70	s.u.	0.10				1.3	10	
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.70	s.u.	0.10				1.3	10	
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.90	s.u.	0.10				0.0	10	
Lab ID: LCS-1403261515	Laboratory Control Sample				Run: MISC-SOIL_140326A			03/26/14 15:15	
pH, sat. paste	7.00	s.u.	0.10	99	90	110			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Project: Not Indicated

Report Date: 03/31/14

Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: Calculation									Batch: R221435
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: MISC-SOIL_140331A				03/31/14 10:51
Sodium Adsorption Ratio (SAR)	0.780	unitless	0.010				5.0	30	
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: MISC-SOIL_140331A				03/31/14 10:51
Sodium Adsorption Ratio (SAR)	0.430	unitless	0.010				2.3	30	
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: MISC-SOIL_140331A				03/31/14 10:51
Sodium Adsorption Ratio (SAR)	1.24	unitless	0.010				10.0	30	
Lab ID: LCS-1403311051	Laboratory Control Sample				Run: MISC-SOIL_140331A				03/31/14 10:51
Sodium Adsorption Ratio (SAR)	13.8	unitless	0.010	106	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: Sobek Modified								Batch: R221454	
Lab ID: LCS-SOLO10171403311	Laboratory Control Sample				Run: MISC-SOIL_140331B			03/31/14 11:41	
Neutralization Potential	130	t/kt	0.10	118	50	200			
Acid Potential	3.3	t/kt	1.0	65	50	200			
Acid/Base Potential	120	t/kt		118	50	200			
The acid-base potential was calculated from the non-sulfate sulfur %									
Lab ID: B14031248-005A DUP	Sample Duplicate				Run: MISC-SOIL_140331B			03/31/14 11:48	
Neutralization Potential	14	t/kt	0.10				11	50	
Acid Potential	0.93	t/kt	1.0					50	
Acid/Base Potential	13	t/kt					11	50	
The acid-base potential was calculated from the non-sulfate sulfur %									

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental

Project: Not Indicated

Report Date: 03/31/14

Work Order: B14031248

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**SW6010B**								Batch: 78479	
Lab ID:	**B14031248-011A DUP**	Sample Duplicate				Run: ICP201-B_140326A			03/26/14 16:16	
Potassium		500	mg/kg	10				1.0	50	
Lab ID:	**B14031248-012AMS2**	Sample Matrix Spike				Run: ICP201-B_140326A			03/26/14 16:23	
Potassium		3300	mg/kg	10	122	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental
Project: Not Indicated

Report Date: 03/31/14
Work Order: B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B									Batch: 78479
Lab ID: LCS-78479	Laboratory Control Sample				Run: ICP201-B_140327A				03/27/14 18:56
Potassium	300	mg/kg	10	100	50	150			
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 19:03
Potassium	690	mg/kg	10				0.1	50	
Lab ID: B14031248-002AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 19:09
Potassium	3600	mg/kg	10	114	70	130			
Lab ID: B14031248-015AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 19:39
Potassium	3400	mg/kg	10	117	70	130			
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 20:09
Potassium	190	mg/kg	10				2.9	50	
Lab ID: B14031248-022AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 20:15
Potassium	3100	mg/kg	10	114	70	130			
Method: SW6010B									Batch: 78522
Lab ID: LCS-78522	Laboratory Control Sample				Run: ICP201-B_140327A				03/27/14 20:45
Calcium, sat. paste	78.2	meq/L	0.050	100	50	150			
Magnesium, sat. paste	53.2	meq/L	0.082	107	50	150			
Sodium, sat. paste	112	meq/L	0.27	107	50	150			
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 20:52
Calcium, sat. paste	2.49	meq/L	0.050				2.0	30	
Magnesium, sat. paste	0.940	meq/L	0.082				5.1	30	
Sodium, sat. paste	1.02	meq/L	0.044				6.8	30	
Lab ID: B14031248-002AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 20:58
Calcium, sat. paste	7.74	meq/L	0.050	99	50	150			
Magnesium, sat. paste	9.49	meq/L	0.082	102	50	150			
Sodium, sat. paste	6.25	meq/L	0.044	102	50	150			
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 21:51
Calcium, sat. paste	8.41	meq/L	0.050				4.2	30	
Magnesium, sat. paste	2.65	meq/L	0.082				3.5	30	
Sodium, sat. paste	1.02	meq/L	0.044				0.1	30	
Lab ID: B14031248-012AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 21:57
Calcium, sat. paste	7.55	meq/L	0.050	94	50	150			
Magnesium, sat. paste	8.67	meq/L	0.082	100	50	150			
Sodium, sat. paste	10.4	meq/L	0.044	97	50	150			
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 22:37
Calcium, sat. paste	3.01	meq/L	0.050				0.4	30	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental **Report Date:** 03/31/14
Project: Not Indicated **Work Order:** B14031248

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B									Batch: 78522
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP201-B_140327A				03/27/14 22:37
Magnesium, sat. paste	1.35	meq/L	0.082				4.8	30	
Sodium, sat. paste	1.83	meq/L	0.044				8.8	30	
Lab ID: B14031248-022AMS2	Sample Matrix Spike				Run: ICP201-B_140327A				03/27/14 22:44
Calcium, sat. paste	8.01	meq/L	0.050	100	50	150			
Magnesium, sat. paste	9.48	meq/L	0.082	104	50	150			
Sodium, sat. paste	5.98	meq/L	0.044	102	50	150			
Method: SW6010B									Batch: 78478
Lab ID: LCS-78478	Laboratory Control Sample				Run: ICP203-B_140327A				03/28/14 03:33
Boron	2.34	mg/kg	0.10	94	70	150			
Lab ID: B14031248-001A DUP	Sample Duplicate				Run: ICP203-B_140327A				03/28/14 03:41
Boron	0.261	mg/kg	0.10				12	30	
Selenium	ND	mg/kg	0.10					30	
Lab ID: B14031248-002AMS2	Sample Matrix Spike				Run: ICP203-B_140327A				03/28/14 03:48
Boron	4.12	mg/kg	0.10	98	70	130			
Selenium	3.91	mg/kg	0.10	98	70	130			
Lab ID: B14031248-011A DUP	Sample Duplicate				Run: ICP203-B_140327A				03/28/14 05:01
Boron	0.147	mg/kg	0.10				5.0	30	
Selenium	ND	mg/kg	0.10					30	
Lab ID: B14031248-012AMS2	Sample Matrix Spike				Run: ICP203-B_140327A				03/28/14 05:09
Boron	4.04	mg/kg	0.10	98	70	130			
Selenium	4.19	mg/kg	0.10	97	70	130			
Lab ID: B14031248-021A DUP	Sample Duplicate				Run: ICP203-B_140327A				03/28/14 05:55
Boron	0.194	mg/kg	0.10				9.9	30	
Selenium	ND	mg/kg	0.10					30	
Lab ID: B14031248-022AMS2	Sample Matrix Spike				Run: ICP203-B_140327A				03/28/14 06:03
Boron	3.98	mg/kg	0.10	97	70	130			
Selenium	3.99	mg/kg	0.10	100	70	130			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Hall Environmental **Report Date:** 03/31/14

Project: Not Indicated **Work Order:** B14031248

Analyte		Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method:	**USDA27a**								Batch: R221435	
Lab ID:	**B14031248-001A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		49.6	%	0.10				0.6	20	
Lab ID:	**B14031248-011A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		45.0	%	0.10				3.6	20	
Lab ID:	**B14031248-021A DUP**	Sample Duplicate				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		40.6	%	0.10				0.2	20	
Lab ID:	**LCS-1403311051**	Laboratory Control Sample				Run: MISC-SOIL_140331A			03/31/14 10:51	
Saturation		37.1	%	0.10	98	50	150			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: ALAN KUHN ASSOC LLC   Work Order Number: 1403621   RcptNo: 1

Received by/date: 03/14/14

Logged By: Ashley Gallegos   3/14/2014 12:15:00 PM

Completed By: Ashley Gallegos   3/14/2014 12:47:27 PM

Reviewed By: 03/14/14

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Client

Log In

4. Was an attempt made to cool the samples? Yes ☐ No ☑ NA ☐
   Not required
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☐ No ☑ NA ☐
   Not required
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: ______ (<2 or >12 unless noted)
Adjusted? ______
Checked by: ______

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: ______ Date: ______
By Whom: ______ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: ______
Client Instructions: ______

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	13.1	Good	Not Present			

Chain-of-Custody Record

Client: ALAN KUHN ASSOCIATES

Mailing Address:

Phone #: (505) 350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ______

☐ EDD (Type) ______

Turn-Around Time:
☐ Standard ☐ Rush ______

Project Name: MT. TAYLOR MINE

Project #: BORROW SOIL CHEMISTRY

Project Manager: ALAN KUHN

Sampler:
On Ice: ☐ Yes ☒ No
Sample Temperature: 13.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1403621	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
3-13-14	9:30	6"-12"	NA-01 (a+b)	2 Baggies	NONE	-001																
3-13-14	9:00	6"-12"	NA-02 (a+b)	2 Baggies	None	-002																
10-30-13	3:30	6-12"	BA-01 (a+b+c)	2 JAR + Bag		-003																
10-30-13	3:35	6-12"	BA-02 (a+b+c)	2 JARS + Bag		-004																
10-30-13	3:40	6-12"	BA-03 (a+b+c)	2 JARS + Bag		-005																
10-30-13	3:45	6-12"	BA-04 (a+b+c)	2 JARS + Bag		-006																
3-13-14	12:45	6-12"	BA-05 (A+B)	2 BAGS		-007																
10-30-13	3:20	6-12"	WTP-01 (a+b+c)	2 JARS + Bag		-008																
10-30-13	2:50	6-12"	WTP-02 (a+b+c)	2 JARS + Bag		-009																
10-30-13	3:15	6-12"	WTP-03 (a+b+c)	2 JARS + Bag		-010																
10-30-13	3:05	6-12"	WTP-04 (a+b+c)	2 JARS + Bag		-011																
						~~-012~~																

Date:	Time:	Relinquished by:	Received by:	Date	Time
3/14/14	12:15	ED LOESCHE		03/14/14	1215
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: SEE WORK ORDER FOR TESTS

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: ALAN KUHN ASSOCIATES

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush

Project Name: MT TAYLOR MINE BORROW SOIL Chemistry

Project #:

Project Manager: ALAN KUHN

Sampler:

On Ice: ☐ Yes ☒ No

Sample Temperature: 13.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	~~Matrix~~ Depth	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1403621
3-13-14	11:40	6-12"	WTP-06 (a+b)	2 BAGS	NONE	-01~~3~~2
3-13-14	11:35	6-12"	WTP-05 (a+b)	2 BAGS	↓	-01~~4~~3
3-13-14	11:50	6-12"	WTP-07 (a+b)	2 BAGS	↓	-01~~5~~4
3-13-14	12:15	6-12"	WTP-08 (a+b)	2 Bags	↓	-01~~6~~5
3-13-14	9:00	6-12"	WTP-09 (a+b)	2 BAGS	↓	-01~~7~~6
3-13-14	10:15	6-12"	WTP-10 (a+b)	2 BAGS	↓	-01~~8~~7
3-13-14	10:35	6-12"	WTP-11 (a+b)	2 Bags	↓	-018
3-13-14	11:10	6-12"	WTP-12 (a+b)	2 BAGS	↓	019 ~~020~~
3-12-14	9:00	6-12"	SWP-01 (a+b)	2 BAGS	↓	-020 ~~021~~
3-12-14	9:10	6-12"	SWP-02 (a+b)	2 BAGS	↓	-02~~2~~1
3-12-14	9:15	6-12"	SWP-03 (a+b)	2 Bags	↓	-02~~3~~2
3-12-14	9:30	6-12"	SWP-04 (a+b)	2 BAGS	↓	-02~~4~~3

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)

Date:	Time:	Relinquished by:	Received by:	Date	Time
3-14-14	12:15	[signature] Ed Wescher	[signature]	03/14/14	1215
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: SEE WORK ORDER FOR TESTS

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: ALAN KUHN ASSOCIATES

Mailing Address:

Phone #: 505-350-9188

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other ________

☐ EDD (Type) ________

Turn-Around Time:
☐ Standard ☐ Rush ________

Project Name: MT TAYLOR MINE BORROW SOIL Chemistry

Project #:

Project Manager: ALAN KUHN

Sampler:

On Ice: ☐ Yes X No

Sample Temperature: 13.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1403621	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
10-31-13	9:00	6-12"	WP-01 (a+b+c)	2 JARS + BAG		-024																
10-31-13	9:10	6-12"	WP-02 (a+b+c)	2 JARS + BAG		-025																
10-31-13	9:15	6-12"	WP-03 (a+b+c)	2 JARS + BAG		-026																

Date:	Time:	Relinquished by:	Received by:	Date	Time
3-14-14	12:15	ED LOESCHER	[signature]	03/14/14	1215
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: SEE WORK ORDER

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

	SAMPLE #S																							
PARAMETERS	NA1	NA2	BA1	BA2	BA3	BA4	BA5	WTP1	WTP2	WTP3	WTP4	WTP5	WTP6	WTP7	WTP9	WTP10	WTP11	WTP12	SWP2	SWP3	SWP4	WP1	WP2	WP3
pH	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Ee mmhos/cm 25 C	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Saturation %	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Texture **	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
SAR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Selenium	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Boron	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Acid/Base Potential (Modified Sobek)					√			√	√														√	
Nitrate-NO, (N)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Phosphorus (P)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Potassium (K)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Rock Fragments																								
(% volume)																								
diameter in inches																								
3	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
3-10	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
10+	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Response No. 16 Attachment

Laboratory Report for Alan Kuhn Associates, LLC

April 2018

MT TAYLOR MINE SOIL SAMPLE LOCATIONS 2/12/2018

NAD 83 NM West Grid

Sample Number	Description	Depth	Northing	Easting	Elevation
MT18-1	Top of Shaft Muck Pile	0-1'	1578092	2781760	7356
MT18-2	Top of Shaft Muck Pile	0-1'	1578025	2781871	7368
MT18-3	North Side of Shaft Muck Pile	0-1'	1578117	2781829	7345
MT18-4	Borrow Area	0-1'	1580684	2783437	7337
MT18-5	Borrow Area	0-1'	1580672	2783374	7336
MT18-6	Borrow Area	0-1'	1580799	2783412	7339

Samples collected by AKA and EL Services 2-12-2018

5 gal Buckets

Laboratory Report for

Alan Kuhn Associates, LLC

Mt. Taylor Mine, PO# AKA-DBSA-3

April 17, 2018

Daniel B. Stephens & Associates, Inc.

4400 Alameda Blvd. NE, Suite C • Albuquerque, New Mexico 87113

April 17, 2018

Alan Kuhn
Alan Kuhn Associates, LLC
13212 Manitoba Dr. NE
Albuquerque, NM 87111
(505) 350-9188

Re: DBS&A Laboratory Report for the Alan Kuhn Associates, LLC Mt. Taylor Mine, PO# AKA-DBSA-3 Project

Dear Mr. Kuhn:

Enclosed is the report for the Alan Kuhn Associates, LLC Mt. Taylor Mine, PO# AKA-DBSA-3 project samples. Please review this report and provide any comments as samples will be held for a maximum of 30 days. After 30 days samples will be returned or disposed of in an appropriate manner.

All testing results were evaluated subjectively for consistency and reasonableness, and the results appear to be reasonably representative of the material tested. However, DBS&A does not assume any responsibility for interpretations or analyses based on the data enclosed, nor can we guarantee that these data are fully representative of the undisturbed materials at the field site. We recommend that careful evaluation of these laboratory results be made for your particular application.

The testing utilized to generate the enclosed report employs methods that are standard for the industry. The results do not constitute a professional opinion by DBS&A, nor can the results affect any professional or expert opinions rendered with respect thereto by DBS&A. You have acknowledged that all the testing undertaken by us, and the report provided, constitutes mere test results using standardized methods, and cannot be used to disqualify DBS&A from rendering any professional or expert opinion, having waived any claim of conflict of interest by DBS&A.

We are pleased to provide this service to Alan Kuhn Associates, LLC and look forward to future laboratory testing on other projects. If you have any questions about the enclosed data, please do not hesitate to call.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.
SOIL TESTING & RESEARCH LABORATORY

Joleen Hines

Joleen Hines
Laboratory Manager

Enclosure

Daniel B. Stephens & Associates, Inc.
Soil Testing & Research Laboratory
4400 Alameda Blvd. NE, Suite C
Albuquerque, NM 87113
505-889-7752
FAX 505-889-0258

Summaries

Summary of Tests Performed

Laboratory Sample Number	Initial Soil Properties[1]			Saturated Hydraulic Conductivity[2]			Moisture Characteristics[3]								Particle Size[4]			Specific Gravity[5]		Air Perm-eability	Atterberg Limits	Proctor Compaction
	G	VM	VD	CH	FH	FW	HC	PP	FP	DPP	RH	EP	WHC	K_{unsat}	DS	WS	H	F	C			
MT18-1																X	X				X	X
MT18-2																X	X				X	X
MT18-3																X	X				X	X
MT18-4																X	X				X	X
MT18-4 (95%)	X	X				X	X	X		X	X			X								
MT18-5																X	X				X	X
MT18-5 (95%)	X	X				X	X	X		X	X			X								
MT18-6																X	X				X	X
MT18-6 (95%)	X	X				X	X	X		X	X			X								

[1] G = Gravimetric Moisture Content, VM = Volume Measurement Method, VD = Volume Displacement Method

[2] CH = Constant Head Rigid Wall, FH = Falling Head Rigid Wall, FW = Falling Head Rising Tail Flexible Wall

[3] HC = Hanging Column, PP = Pressure Plate, FP = Filter Paper, DPP = Dew Point Potentiometer, RH = Relative Humidity Box, EP = Effective Porosity, WHC = Water Holding Capacity, Kunsat = Calculated Unsaturated Hydraulic Conductivity

[4] DS = Dry Sieve, WS = Wet Sieve, H = Hydrometer

[5] F = Fine (<4.75mm), C = Coarse (>4.75mm)

Notes

Sample Receipt:
Six samples, each in a full 5-gallon bucket, were hand delivered on February 13, 2018. Four of the sample buckets were received with lids and the remaining two samples did not have lids. All samples arrived in good order.

Sample Preparation and Testing Notes:
Each sample was subjected to standard proctor compaction testing, Atterberg limits testing and particle size analysis.

A portion of three of the samples was remolded into a testing ring to target 95% of the respective maximum dry bulk density at the respective optimum moisture content, based on the standard proctor compaction test results. Each of these remolded sub-samples was subjected to initial properties analysis, saturation, and the hanging column and pressure chamber portions of the moisture retention testing. Secondary sub-samples were also prepared, using the same target remold parameters. The secondary sub-samples were then extruded from the testing rings and were subjected to saturated hydraulic conductivity testing via the flexible wall method. The actual percentage of maximum dry bulk density achieved was added to each sub-sample ID.

Separate sub-samples were obtained for the dewpoint potentiometer and relative humidity chamber portions of the moisture retention testing.

Based on the standard proctor compaction method, particles larger than 4.75mm were removed from the bulk material prior to remolding the sub-samples. Oversize correction calculations are not provided because the removed fraction is less than 5% of the bulk sample mass.

Porosity calculations, and the particle diameter calculations in the hydrometer portion of the particle size analysis testing, are based on the use of an assumed specific gravity value of 2.65.

Volumetric water contents were adjusted for changes in volume, where applicable. Due to the irregularities formed on the sample surfaces during swelling, volume measurements obtained after the initial reading should be considered estimates.

Summary of Sample Preparation/Volume Changes

	Proctor Data		Target Remold Parameters[1]			Actual Remold Data			Volume Change Post Saturation[2]			Volume Change Post Drying Curve[3]		
Sample Number	Opt. Moist. Cont. (%, g/g)	Max. Dry Density (g/cm^3)	Moist. Cont. (%, g/g)	Dry Bulk Density (g/cm^3)	% of Max. Density (%)	Moist. Cont. (%, g/g)	Dry Bulk Density (g/cm^3)	% of Max. Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Max. Density (%)	Dry Bulk Density (g/cm^3)	% Volume Change (%)	% of Max. Density (%)
MT18-4 (95%)	16.1	1.71	16.1	1.63	95%	16.2	1.63	94.9%	1.60	+1.5%	93.5%	1.60	+1.6%	93.4%
MT18-5 (95%)	14.8	1.82	14.8	1.73	95%	14.7	1.73	95.2%	1.70	+2.0%	93.3%	1.70	+1.8%	93.5%
MT18-6 (95%)	16.6	1.71	16.6	1.63	95%	17.0	1.62	94.7%	1.60	+1.4%	93.4%	1.61	+0.6%	94.1%

[1]Target Remold Parameters: Provided by the client: 95% of maximum dry bulk density at optimum moisture content.

[2]Volume Change Post Saturation: Volume change measurements were obtained after saturated hydraulic conductivity testing.

[3]Volume Change Post Drying Curve: Volume change measurements were obtained throughout hanging column and pressure plate testing. The 'Volume Change Post Drying Curve' values represent the final sample dimensions after the last pressure plate point.

Notes:

"+" indicates sample swelling, "-" indicates sample settling, and "---" indicates no volume change occurred.

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

	Moisture Content						
	As Received		Remolded				
Sample Number	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Gravimetric (%, g/g)	Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
MT18-4 (95%)	NA	NA	16.2	26.4	1.63	1.89	38.6
MT18-5 (95%)	NA	NA	14.7	25.4	1.73	1.98	34.7
MT18-6 (95%)	NA	NA	17.0	27.6	1.62	1.90	38.8

NA = Not analyzed
--- = This sample was not remolded

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis: Constant Head Flexible Wall	Method of Analysis: Falling Head Flexible Wall
MT18-4 (95%)	4.4E-05	---		X
MT18-5 (95%)	1.6E-07	---		X
MT18-6 (95%)	2.3E-05	---		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
MT18-4 (95%)	0	40.3 ‡
	17	40.3 ‡
	59	40.1 ‡
	125	35.8 ‡
	337	32.1 ‡
	25189	15.1 ‡
	83930	11.5 ‡
	426990	7.8 ‡
	848426	6.3 ‡
MT18-5 (95%)	0	36.6 ‡
	55	36.6 ‡
	153	34.9 ‡
	337	32.0 ‡
	1530	29.6 ‡
	21110	16.9 ‡
	115339	11.6 ‡
	329905	9.0 ‡
	848426	6.7 ‡
MT18-6 (95%)	0	40.2 ‡
	24	40.0 ‡
	79	37.8 ‡
	153	34.9 ‡
	337	33.0 ‡
	21620	15.8 ‡
	82604	11.6 ‡
	424951	7.8 ‡
	848426	6.3 ‡

‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
MT18-4 (95%)	0.0075	1.2000	0.00	40.82	---	---
MT18-5 (95%)	0.0014	1.2266	0.00	36.06	---	---
MT18-6 (95%)	0.0065	1.2010	0.00	40.26	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
MT18-1	0.00069	0.097	0.13	188	1.9	WS/H	Silty sand (SM)	Sandy Loam	(Est)
MT18-2	0.00024	0.047	0.071	296	1.2	WS/H	Sandy silt s(ML)	Loam	(Est)
MT18-3	0.00049	0.010	0.030	61	0.33	WS/H	Lean clay with sand (CL)s	Clay Loam	(Est)
MT18-4	0.00025	0.061	0.084	336	5.8	WS/H	Sandy lean clay s(CL)	Sandy Loam	(Est)
MT18-5	0.00045	0.060	0.078	173	1.8	WS/H	Sandy lean clay s(CL)	Sandy Loam	(Est)
MT18-6	0.00020	0.053	0.073	365	4.8	WS/H	Sandy lean clay s(CL)	Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
MT18-1	4.3	50.1	29.6	16.0
MT18-2	1.9	36.7	38.6	22.9
MT18-3	1.7	19.2	50.2	28.9
MT18-4	1.8	40.4	39.6	18.2
MT18-5	0.8	40.1	40.3	18.8
MT18-6	0.8	38.3	42.0	18.9

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
MT18-1	---	---	---	ML
MT18-2	---	---	---	ML
MT18-3	39	17	22	CL
MT18-4	31	18	13	CL
MT18-5	32	19	13	CL
MT18-6	33	18	15	CL

--- = Soil requires visual-manual classification due to non-plasticity

Summary of Proctor Compaction Tests

	Measured		Oversize Corrected	
Sample Number	Optimum Moisture Content (% g/g)	Maximum Dry Bulk Density (g/cm^3)	Optimum Moisture Content (% g/g)	Maximum Dry Bulk Density (g/cm^3)
MT18-1	14.8	1.80	---	---
MT18-2	19.5	1.67	---	---
MT18-3	18.9	1.67	---	---
MT18-4	16.1	1.71	---	---
MT18-5	14.8	1.82	---	---
MT18-6	16.6	1.71	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

NR = Not requested

NA = Not applicable

Initial Properties

Summary of Initial Moisture Content, Dry Bulk Density Wet Bulk Density and Calculated Porosity

Sample Number	Moisture Content: As Received Gravimetric (%, g/g)	Moisture Content: As Received Volumetric (%, cm^3/cm^3)	Moisture Content: Remolded Gravimetric (%, g/g)	Moisture Content: Remolded Volumetric (%, cm^3/cm^3)	Dry Bulk Density (g/cm^3)	Wet Bulk Density (g/cm^3)	Calculated Porosity (%)
MT18-4 (95%)	NA	NA	16.2	26.4	1.63	1.89	38.6
MT18-5 (95%)	NA	NA	14.7	25.4	1.73	1.98	34.7
MT18-6 (95%)	NA	NA	17.0	27.6	1.62	1.90	38.8

NA = Not analyzed

--- = This sample was not remolded

Daniel B. Stephens & Associates, Inc.

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-4 (95%)
Date/Time Sampled:	2/12/18 215
Site:	Mt. Taylor Mine

	As Received	Remolded
Test Date:	NA	28-Feb-18
Field weight of sample* (g):		564.99
Tare weight, ring (g):		142.54
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		363.43
Sample volume (cm^3):		223.35
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		16.2
Volumetric Moisture Content (% vol):		26.4
Dry bulk density (g/cm^3):		1.63
Wet bulk density (g/cm^3):		1.89
Calculated Porosity (% vol):		38.6
Percent Saturation:		68.5

Laboratory analysis by:	D. O'Dowd
Data entered by:	A. Bland
Checked by:	J. Hines

Comments:

* Weight including tares

NA = Not analyzed

--- = This sample was not remolded

Daniel B. Stephens & Associates, Inc.

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-5 (95%)
Date/Time Sampled:	2/12/18 215
Site:	Mt. Taylor Mine

	As Received	Remolded
Test Date:	NA	28-Feb-18
Field weight of sample* (g):		583.88
Tare weight, ring (g):		142.50
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		384.86
Sample volume (cm^3):		222.49
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		14.7
Volumetric Moisture Content (% vol):		25.4
Dry bulk density (g/cm^3):		1.73
Wet bulk density (g/cm^3):		1.98
Calculated Porosity (% vol):		34.7
Percent Saturation:		73.2

Laboratory analysis by:	D. O'Dowd
Data entered by:	J. Hines
Checked by:	C. Krous

Comments:

* Weight including tares

NA = Not analyzed

--- = This sample was not remolded

Data for Initial Moisture Content, Bulk Density, Porosity, and Percent Saturation

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-6 (95%)
Date/Time Sampled:	2/12/18 225
Site:	Mt. Taylor Mine

	As Received	Remolded
Test Date:	NA	28-Feb-18
Field weight of sample* (g):		569.24
Tare weight, ring (g):		143.84
Tare weight, pan/plate (g):		0.00
Tare weight, other (g):		0.00
Dry weight of sample (g):		363.61
Sample volume (cm^3):		224.06
Assumed particle density (g/cm^3):		2.65
Gravimetric Moisture Content (% g/g):		17.0
Volumetric Moisture Content (% vol):		27.6
Dry bulk density (g/cm^3):		1.62
Wet bulk density (g/cm^3):		1.90
Calculated Porosity (% vol):		38.8
Percent Saturation:		71.1

Laboratory analysis by:	D. O'Dowd
Data entered by:	A. Bland
Checked by:	J. Hines

Comments:

* Weight including tares
NA = Not analyzed
--- = This sample was not remolded

Saturated Hydraulic Conductivity

Summary of Saturated Hydraulic Conductivity Tests

Sample Number	K_{sat} (cm/sec)	Oversize Corrected K_{sat} (cm/sec)	Method of Analysis: Constant Head Flexible Wall	Method of Analysis: Falling Head Flexible Wall
MT18-4 (95%)	4.4E-05	---		X
MT18-5 (95%)	1.6E-07	---		X
MT18-6 (95%)	2.3E-05	---		X

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-4 (95%)
Date/ Time Sampled: 2/12/18 215
Site: Mt. Taylor Mine

Remolded or Initial Sample Properties		Post Permeation Sample Properties		Test and Sample Conditions	
Initial Mass (g):	422.01	*Saturated Mass (g):*	454.99	*Permeant liquid used:*	Tap Water
Diameter (cm):	6.110	*Dry Mass (g):*	363.7	*Sample Preparation:*	☐ In situ sample, extruded
Length (cm):	7.625	*Diameter (cm):*	6.126		☑ Remolded Sample
Area (cm^2):	29.32	*Length (cm):*	7.642	*Number of Lifts:*	3
Volume (cm^3):	223.57	*Deformation (%)**:*	0.22	*Split:*	#4
Dry Density (g/cm^3):	1.63	*Area (cm^2):*	29.47	*Percent Coarse Material (%):*	1.81
Dry Density (pcf):	101.6	*Volume (cm^3):*	225.25	*Particle Density(g/cm^3):*	2.65 ☑ Assumed ☐ Measured
Water Content (%, g/g):	16.0	*Dry Density (g/cm^3):*	1.61	*Cell pressure (PSI):*	85.0
Water Content (%, vol):	26.1	*Dry Density (pcf):*	100.8	*Influent pressure (PSI):*	80.0
Void Ratio (e):	0.63	*Water Content (%, g/g):*	25.1	*Effluent pressure (PSI):*	80.0
Porosity (%, vol):	38.6	*Water Content (%, vol):*	40.5	*Panel Used:*	☐ A ☐ B ☑ C
Saturation (%):	67.5	*Void Ratio(e):*	0.64	*Reading:*	☑ Annulus ☑ Pipette
		Porosity (%, vol):	39.1		
		Saturation (%):*	103.7		

	Value	Date/Time
B-Value (% saturation) prior to test*:	0.97	3/9/18 943
B-Value (% saturation) post to test:	0.97	3/9/18 1230

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

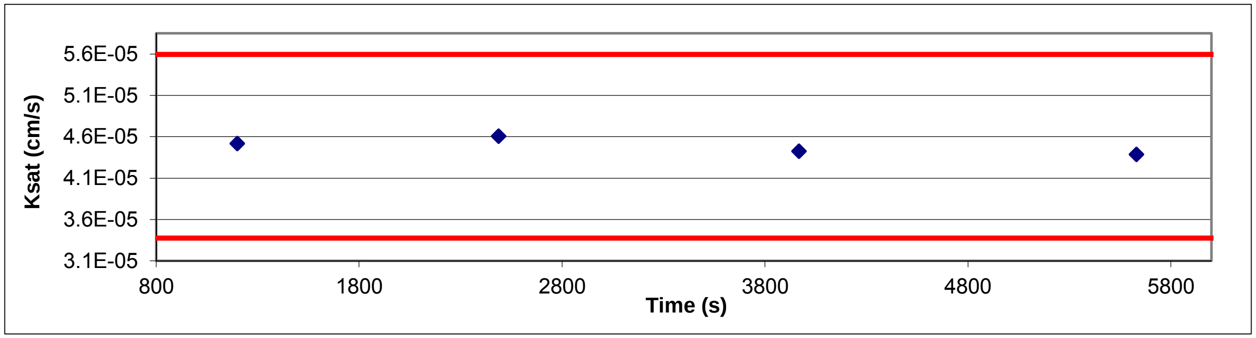
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-4 (95%)
Date/ Time Sampled: 2/12/18 215
Site: Mt. Taylor Mine

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient (ΔH/ΔL)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
09-Mar-18	10:39:18	20.2	6.50	18.50	1.81	2.39	1200	1.00	8%	4.50E-05	4.47E-05
09-Mar-18	10:59:18	20.3	7.00	18.00	1.66						
Test # 2:											
09-Mar-18	10:59:18	20.3	7.00	18.00	1.66	2.39	1287	1.00	9%	4.59E-05	4.56E-05
09-Mar-18	11:20:45	20.4	7.50	17.50	1.51						
Test # 3:											
09-Mar-18	11:20:45	20.4	7.50	17.50	1.51	2.39	1480	1.00	10%	4.41E-05	4.38E-05
09-Mar-18	11:45:25	20.4	8.00	17.00	1.36						
Test # 4:											
09-Mar-18	11:45:25	20.4	8.00	17.00	1.36	2.39	1664	1.00	11%	4.39E-05	4.34E-05
09-Mar-18	12:13:09	20.6	8.50	16.50	1.21						

***Average Ksat* (cm/sec):** **4.43E-05**
Calculated Gravel Corrected Average Ksat (cm/sec): ---



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 3.33E-05

Ksat (+25%) (cm/s): 5.54E-05

Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-5 (95%)
Date/ Time Sampled: 2/12/18 215
Site: Mt. Taylor Mine

Remolded or Initial Sample Properties

Initial Mass (g):	440.59
Diameter (cm):	6.101
Length (cm):	7.603
Area (cm^2):	29.23
Volume (cm^3):	222.27
Dry Density (g/cm^3):	1.74
Dry Density (pcf):	108.4
Water Content (%, g/g):	14.2
Water Content (%, vol):	24.7
Void Ratio (e):	0.53
Porosity (%, vol):	34.5
Saturation (%):	71.4

Post Permeation Sample Properties

Saturated Mass (g):	470.94
Dry Mass (g):	385.8
Diameter (cm):	6.200
Length (cm):	7.626
*Deformation (%)**:*	0.31
Area (cm^2):	30.19
Volume (cm^3):	230.25
Dry Density (g/cm^3):	1.68
Dry Density (pcf):	104.6
Water Content (%, g/g):	22.1
Water Content (%, vol):	37.0
Void Ratio(e):	0.58
Porosity (%, vol):	36.8
Saturation (%):*	100.6

Test and Sample Conditions

Permeant liquid used:	Tap Water
Sample Preparation:	[ ] In situ sample, extruded [x] Remolded Sample
Number of Lifts:	3
Split:	#4
Percent Coarse Material (%):	0.77
Particle Density(g/cm^3):	2.65 [x] Assumed [ ] Measured
Cell pressure (PSI):	85.0
Influent pressure (PSI):	81.0
Effluent pressure (PSI):	79.0
Panel Used:	[x] A [ ] B [ ] C
Reading:	[ ] Annulus [x] Pipette

		Date/Time
B-Value (% saturation) prior to test*:	0.95	3/9/18 935
B-Value (% saturation) post to test:	0.95	3/9/18 1610

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

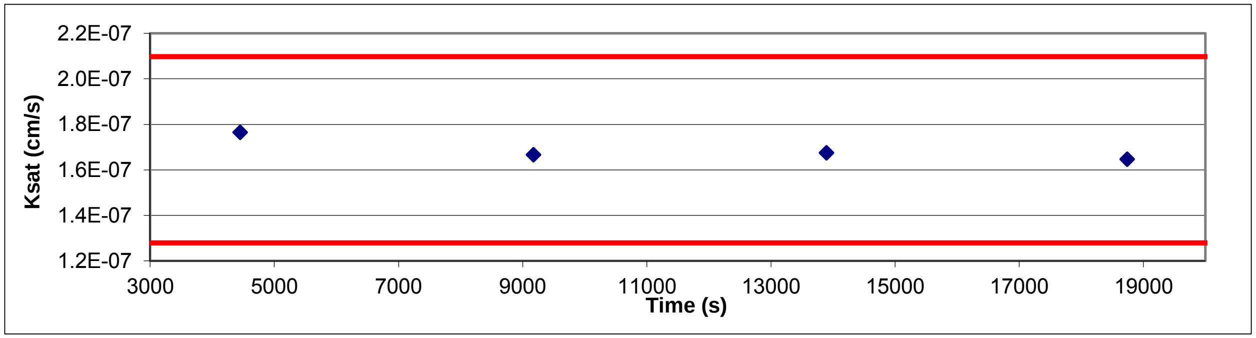
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-5 (95%)
Date/ Time Sampled: 2/12/18 215
Site: Mt. Taylor Mine

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient ($\Delta H/\Delta L$)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
09-Mar-18	10:51:39	20.3	3.00	23.50	21.55	0.43	4449	1.00	1%	1.73E-07	1.71E-07
09-Mar-18	12:05:48	20.6	3.50	23.00	21.40						
Test # 2:											
09-Mar-18	12:05:48	20.6	3.50	23.00	21.40	0.43	4723	1.00	1%	1.64E-07	1.62E-07
09-Mar-18	13:24:31	20.8	4.00	22.50	21.25						
Test # 3:											
09-Mar-18	13:24:31	20.8	4.00	22.50	21.25	0.43	4724	1.00	1%	1.66E-07	1.62E-07
09-Mar-18	14:43:15	20.8	4.50	22.00	21.10						
Test # 4:											
09-Mar-18	14:43:15	20.8	4.50	22.00	21.10	0.43	4840	1.00	1%	1.63E-07	1.60E-07
09-Mar-18	16:03:55	20.8	5.00	21.50	20.94						

***Average Ksat* (cm/sec):** **1.64E-07**
Calculated Gravel Corrected Average Ksat (cm/sec): ---



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.23E-07

Ksat (+25%) (cm/s): 2.05E-07

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-6 (95%)
Date/ Time Sampled: 2/12/18 225
Site: Mt. Taylor Mine

Remolded or Initial Sample Properties

Initial Mass (g):	425.22
Diameter (cm):	6.096
Length (cm):	7.666
Area (cm^2):	29.19
Volume (cm^3):	223.74
Dry Density (g/cm^3):	1.64
Dry Density (pcf):	102.2
Water Content (%, g/g):	16.1
Water Content (%, vol):	26.4
Void Ratio (e):	0.62
Porosity (%, vol):	38.2
Saturation (%):	69.0

Post Permeation Sample Properties

Saturated Mass (g):	456.34
Dry Mass (g):	366.16
Diameter (cm):	6.127
Length (cm):	7.679
*Deformation (%)**:*	0.17
Area (cm^2):	29.48
Volume (cm^3):	226.40
Dry Density (g/cm^3):	1.62
Dry Density (pcf):	101.0
Water Content (%, g/g):	24.6
Water Content (%, vol):	39.8
Void Ratio(e):	0.64
Porosity (%, vol):	39.0
Saturation (%):*	102.2

Test and Sample Conditions

Permeant liquid used:	Tap Water
Sample Preparation:	☐ In situ sample, extruded ☑ Remolded Sample
Number of Lifts:	3
Split:	#4
Percent Coarse Material (%):	0.80
Particle Density(g/cm^3):	2.65 ☑ Assumed ☐ Measured
Cell pressure (PSI):	85.0
Influent pressure (PSI):	80.0
Effluent pressure (PSI):	80.0
Panel Used:	☐ A ☑ B ☐ C
Reading:	☐ Annulus ☑ Pipette

		Date/Time
B-Value (% saturation) prior to test*:	0.96	3/9/18 930
B-Value (% saturation) post to test:	0.97	3/9/18 1225

* Per ASTM D5084 percent saturation is ensured (B-Value ≥ 95%) prior to testing, as post test saturation values may be exaggerated or skewed during depressurizing and sample removal.
**Percent Deformation: based on initial sample length and post permeation sample length.

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

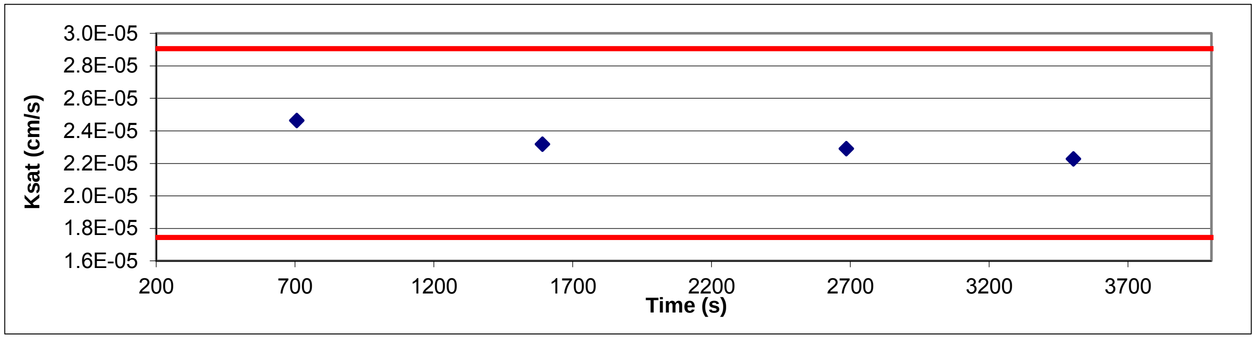
Daniel B. Stephens & Associates, Inc.

Saturated Hydraulic Conductivity
Flexible Wall Falling Head-Rising Tail Method

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-6 (95%)
Date/ Time Sampled: 2/12/18 225
Site: Mt. Taylor Mine

Date	Time	Temp (°C)	Influent Pipette Reading	Effluent Pipette Reading	Gradient ($\Delta H/\Delta L$)	Average Flow (cm^3)	Elapsed Time (s)	Ratio (outflow to inflow)	Change in Head (Not to exceed 25%)	k_{sat} T°C (cm/s)	k_{sat} Corrected (cm/s)
Test # 1:											
09-Mar-18	10:03:43	20.0	11.50	18.50	1.05	0.43	706	1.00	14%	2.46E-05	2.46E-05
09-Mar-18	10:15:29	20.1	12.00	18.00	0.90						
Test # 2:											
09-Mar-18	10:15:29	20.1	12.00	18.00	0.90	0.43	885	1.00	17%	2.32E-05	2.32E-05
09-Mar-18	10:30:14	20.2	12.50	17.50	0.75						
Test # 3:											
09-Mar-18	10:30:14	20.2	12.50	17.50	0.75	0.43	1094	1.00	20%	2.30E-05	2.29E-05
09-Mar-18	10:48:28	20.2	13.00	17.00	0.60						
Test # 4:											
09-Mar-18	10:48:28	20.2	13.00	17.00	0.60	0.26	818	1.00	15%	2.24E-05	2.23E-05
09-Mar-18	11:02:06	20.3	13.30	16.70	0.51						

***Average Ksat* (cm/sec):** **2.32E-05**
Calculated Gravel Corrected Average Ksat (cm/sec): ---



ASTM Required Range (+/- 25%)

Ksat (-25%) (cm/s): 1.74E-05

Ksat (+25%) (cm/s): 2.91E-05

Moisture Retention Characteristics

Summary of Moisture Characteristics of the Initial Drainage Curve

Sample Number	Pressure Head (-cm water)	Moisture Content (%, cm^3/cm^3)
MT18-4 (95%)	0	40.3 ‡‡
	17	40.3 ‡‡
	59	40.1 ‡‡
	125	35.8 ‡‡
	337	32.1 ‡‡
	25189	15.1 ‡‡
	83930	11.5 ‡‡
	426990	7.8 ‡‡
	848426	6.3 ‡‡
MT18-5 (95%)	0	36.6 ‡‡
	55	36.6 ‡‡
	153	34.9 ‡‡
	337	32.0 ‡‡
	1530	29.6 ‡‡
	21110	16.9 ‡‡
	115339	11.6 ‡‡
	329905	9.0 ‡‡
	848426	6.7 ‡‡
MT18-6 (95%)	0	40.2 ‡‡
	24	40.0 ‡‡
	79	37.8 ‡‡
	153	34.9 ‡‡
	337	33.0 ‡‡
	21620	15.8 ‡‡
	82604	11.6 ‡‡
	424951	7.8 ‡‡
	848426	6.3 ‡‡

‡‡ Volume adjustments are applicable at this matric potential (see data sheet for this sample).

Summary of Calculated Unsaturated Hydraulic Properties

Sample Number	α (cm^{-1})	N (dimensionless)	θ_r (% vol)	θ_s (% vol)	Oversize Corrected θ_r (% vol)	Oversize Corrected θ_s (% vol)
MT18-4 (95%)	0.0075	1.2000	0.00	40.82	---	---
MT18-5 (95%)	0.0014	1.2266	0.00	36.06	---	---
MT18-6 (95%)	0.0065	1.2010	0.00	40.26	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Daniel B. Stephens & Associates, Inc.

Moisture Retention Data
Hanging Column / Pressure Plate
(Soil-Water Characteristic Curve)

Job Name:	Alan Kuhn Associates, LLC	*Dry wt. of sample* (g):	363.43
Job Number:	DB18.1068.00	*Tare wt., ring* (g):	142.54
Sample Number:	MT18-4 (95%)	*Tare wt., screen & clamp* (g):	27.73
Date/Time Sampled:	2/12/18 215	*Initial sample volume* (cm^3):	223.35
Site:	Mt. Taylor Mine	*Initial dry bulk density* (g/cm^3):	1.63
		Assumed particle density (g/cm^3):	2.65
		Initial calculated total porosity (%):	38.60

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)	
Hanging column:	9-Mar-18	14:00	624.99	0	40.26	‡‡
	16-Mar-18	15:40	625.50	17.0	40.33	‡‡
	23-Mar-18	12:00	624.77	59.0	40.12	‡‡
	30-Mar-18	10:00	614.85	125.0	35.76	‡‡
Pressure plate:	10-Apr-18	15:30	606.48	337	32.07	‡‡

Volume Adjusted Data[1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change[2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	226.75	+1.52%	1.60	39.52
	17.0	227.60	+1.90%	1.60	39.74
	59.0	227.01	+1.64%	1.60	39.59
	125.0	226.95	+1.61%	1.60	39.57
Pressure plate:	337	226.95	+1.61%	1.60	39.57

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: MT18-4 (95%)

Initial sample bulk density (g/cm^3)*:* 1.63
Fraction of test sample used (<2.00mm fraction) (%): 97.49

Dry weight of dew point potentiometer sample* (g)*:* 158.02
Tare weight, jar (g)*:* 109.60

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Dew point potentiometer:	20-Mar-18	10:30	162.72	25189	15.14	‡‡
	16-Mar-18	14:05	161.60	83930	11.53	‡‡
	12-Mar-18	11:15	160.44	426990	7.81	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	25189	226.95	+1.61%	1.60	39.57
	83930	226.95	+1.61%	1.60	39.57
	426990	226.95	+1.61%	1.60	39.57

Dry weight of relative humidity box sample* (g)*:* 56.72
Tare weight (g)*:* 31.75

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content † (% vol)	
Relative humidity box:	14-Mar-18	14:00	57.73	848426	6.32	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	848426	226.95	+1.61%	1.60	39.57

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

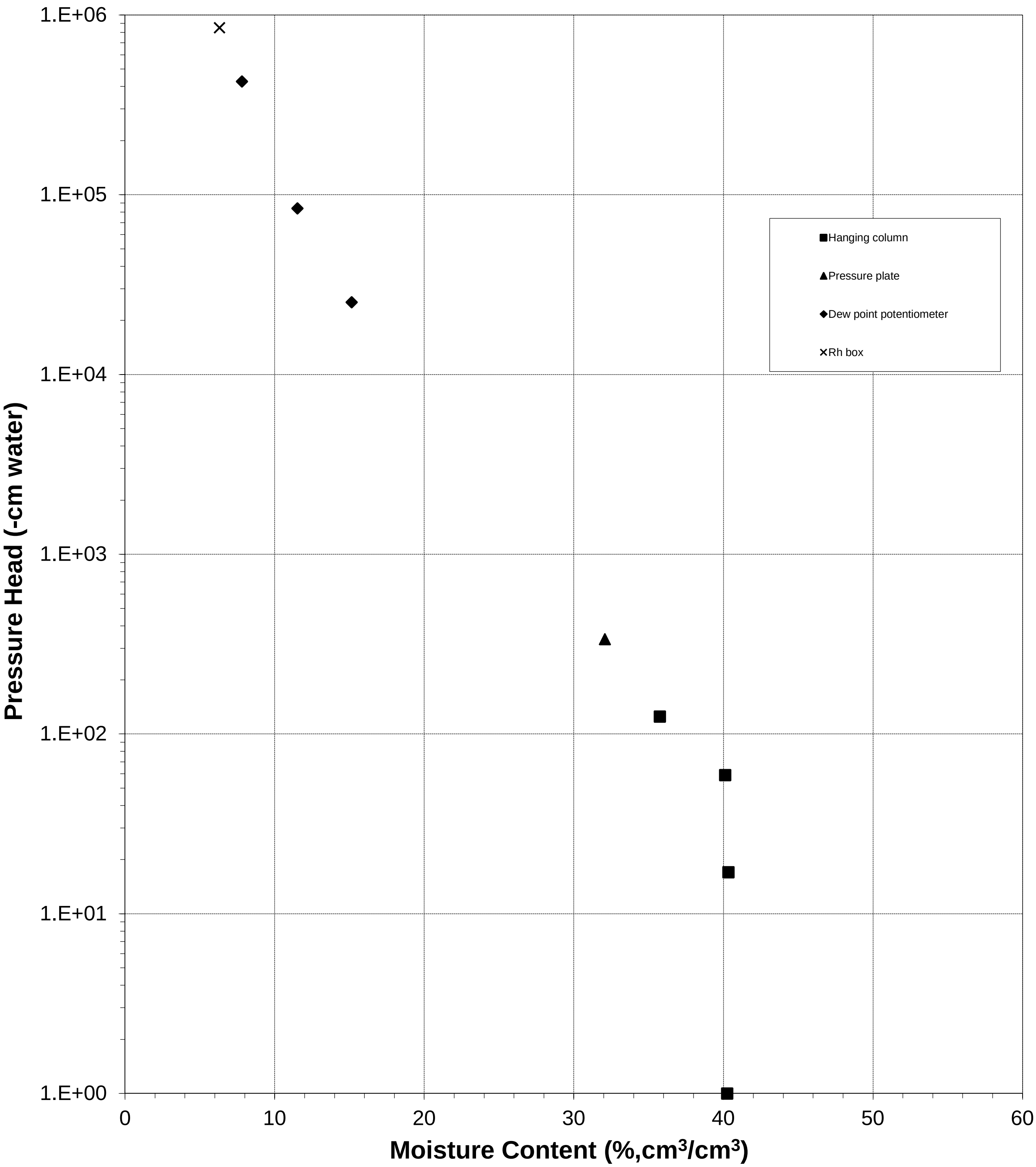
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: M. Garcia/A. Bland/ M. Garcia
Data entered by: C. Krous
Checked by: J. Hines

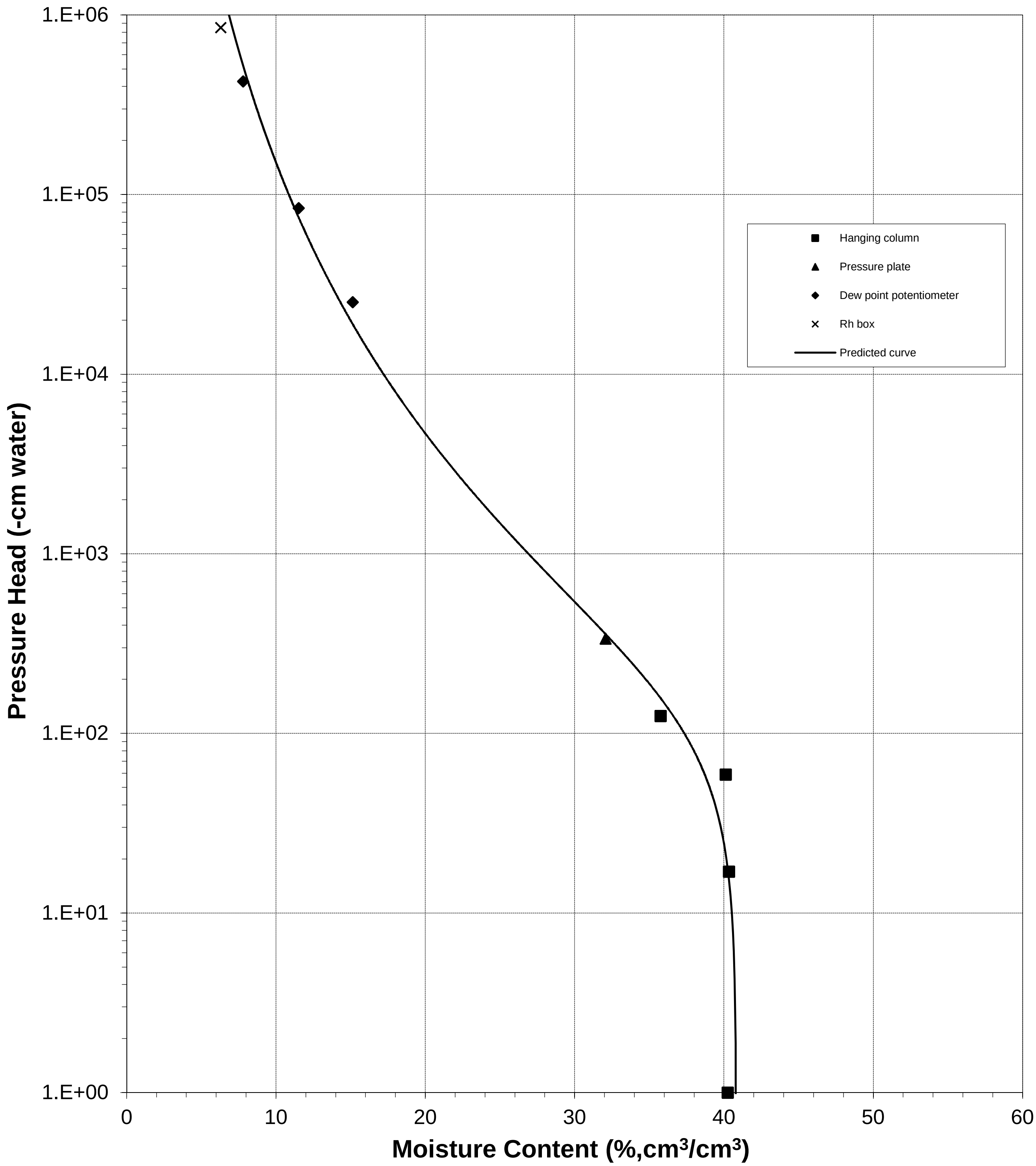
Water Retention Data Points

Sample Number: MT18-4 (95%)



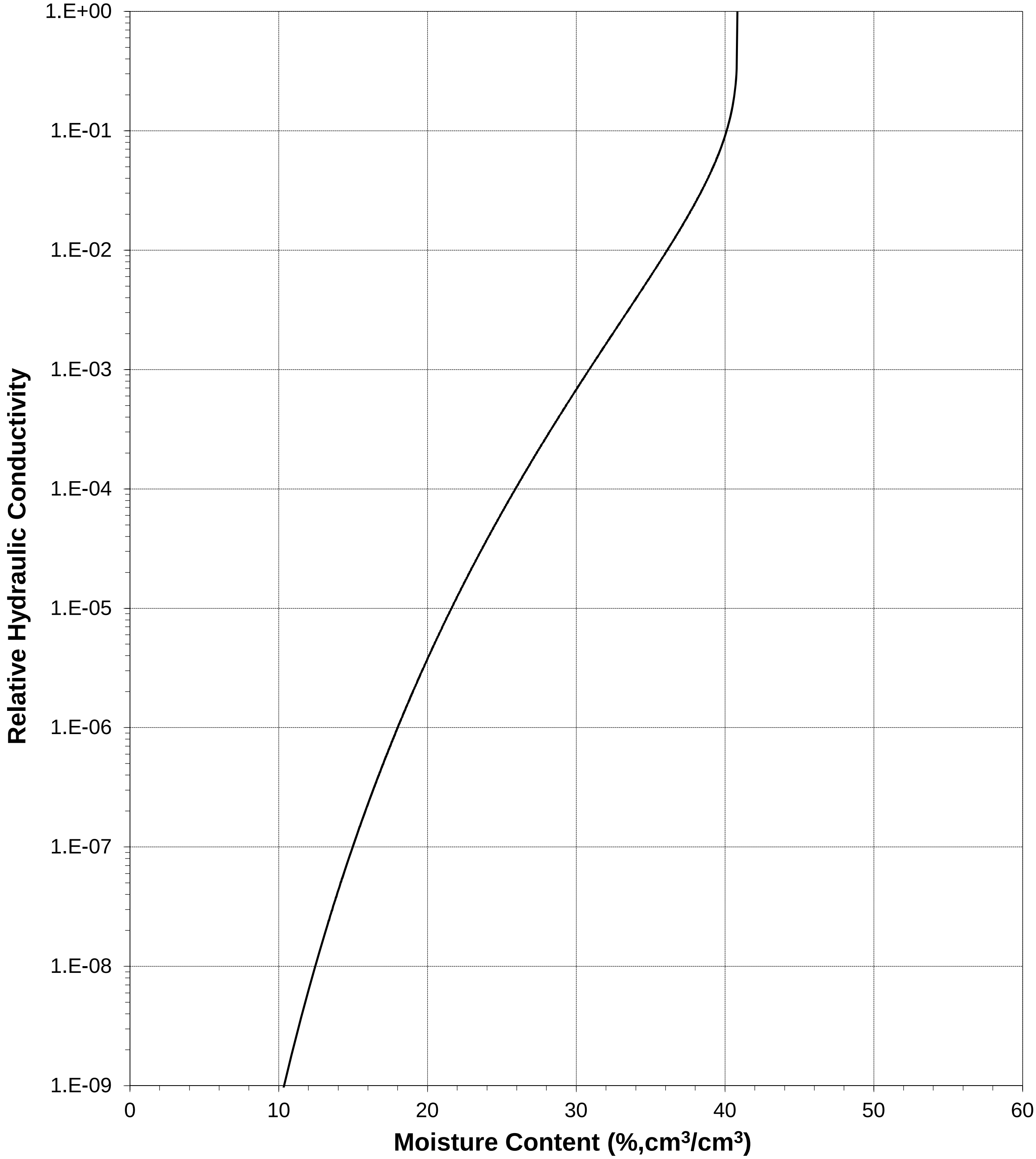
Predicted Water Retention Curve and Data Points

Sample Number: MT18-4 (95%)



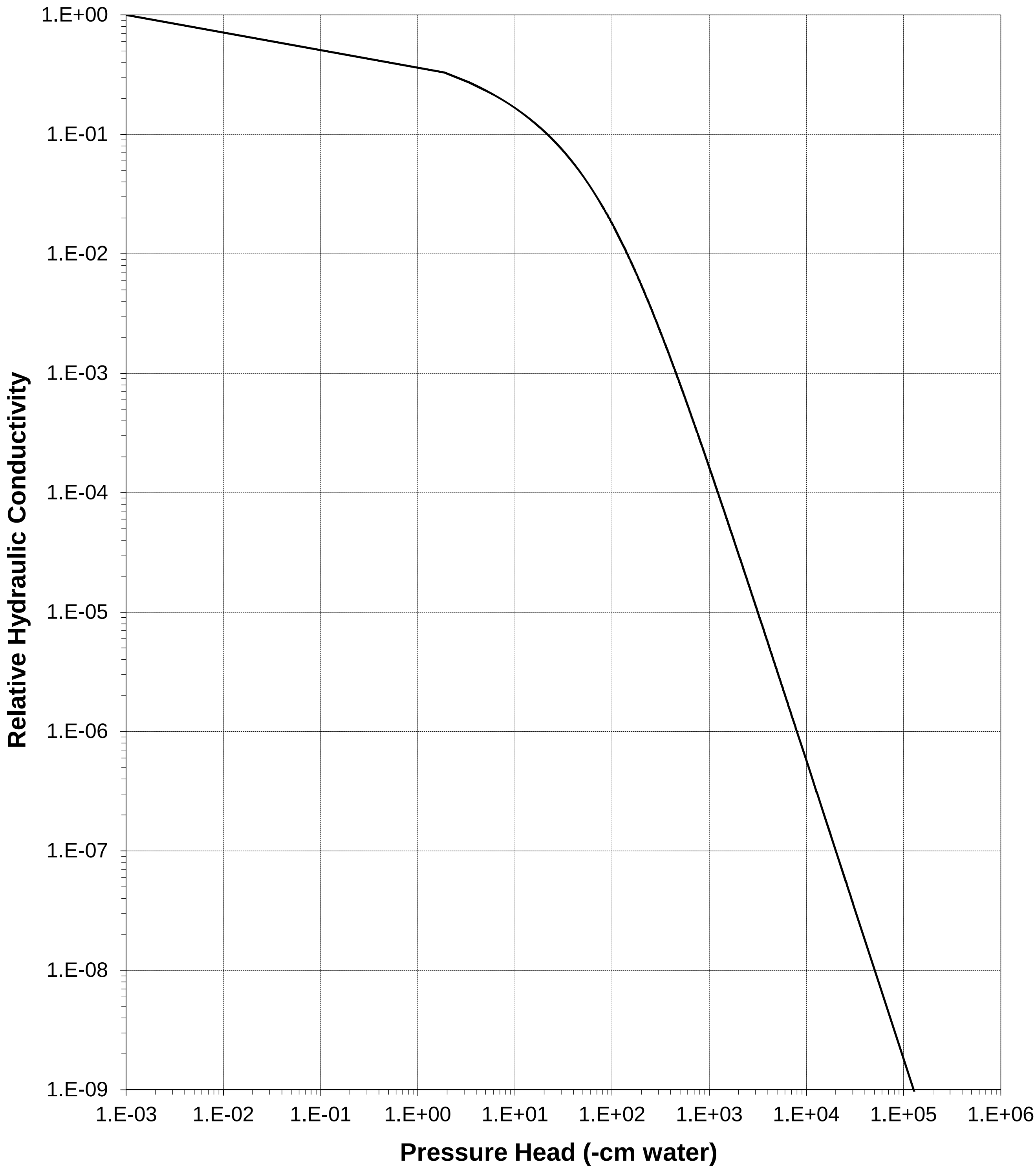
Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: MT18-4 (95%)



Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: MT18-4 (95%)



Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name:	Alan Kuhn Associates, LLC	*Dry wt. of sample* (g):	384.86
Job Number:	DB18.1068.00	*Tare wt., ring* (g):	142.50
Sample Number:	MT18-5 (95%)	*Tare wt., screen & clamp* (g):	25.25
Date/Time Sampled:	2/12/18 215	*Initial sample volume* (cm^3):	222.49
Site:	Mt. Taylor Mine	*Initial dry bulk density* (g/cm^3):	1.73
		Assumed particle density (g/cm^3):	2.65
		Initial calculated total porosity (%):	34.72

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)	
Hanging column:	9-Mar-18	14:00	635.70	0	36.60	‡‡
	16-Mar-18	15:45	635.92	55.0	36.61	‡‡
	23-Mar-18	12:00	631.96	153.0	34.90	‡‡
Pressure plate:	2-Apr-18	16:15	625.10	337	32.01	‡‡
	13-Apr-18	16:25	619.55	1530	29.56	‡‡

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	226.99	+2.03%	1.70	36.02
	55.0	227.58	+2.29%	1.69	36.18
	153.0	227.34	+2.18%	1.69	36.12
Pressure plate:	337	226.47	+1.79%	1.70	35.87
	1530	226.47	+1.79%	1.70	35.87

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: MT18-5 (95%)

Initial sample bulk density (g/cm^3)*:* 1.73
Fraction of test sample used (<2.00mm fraction) (%): 98.36

Dry weight of dew point potentiometer sample* (g)*:* 157.00
Tare weight, jar (g)*:* 112.66

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)	
Dew point potentiometer:	23-Mar-18	9:45	161.47	21110	16.86	‡‡
	20-Mar-18	10:50	160.07	115339	11.59	‡‡
	16-Mar-18	14:40	159.40	329905	9.03	‡‡

Volume Adjusted Data[1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change[2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	21110	226.47	+1.79%	1.70	35.87
	115339	226.47	+1.79%	1.70	35.87
	329905	226.47	+1.79%	1.70	35.87

Dry weight of relative humidity box sample* (g)*:* 57.45
Tare weight (g)*:* 39.42

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)	
Relative humidity box:	14-Mar-18	14:00	58.18	848426	6.75	‡‡

Volume Adjusted Data[1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change[2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	848426	226.47	+1.79%	1.70	35.87

Comments:

[1] Applicable if the sample experienced volume changes during testing. ‘Volume Adjusted’ values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

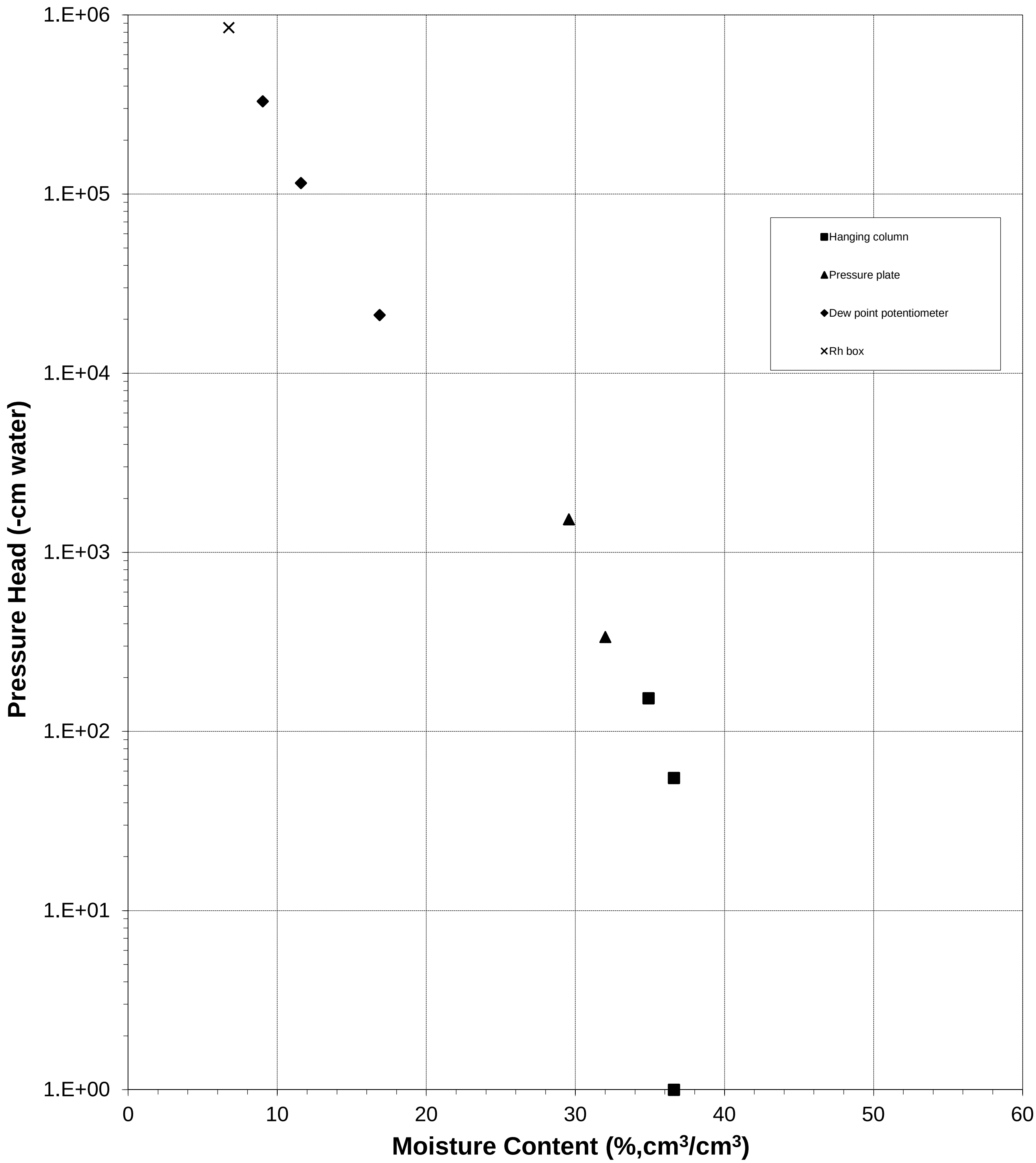
‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: M. Garcia/A. Bland/ M. Garcia
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

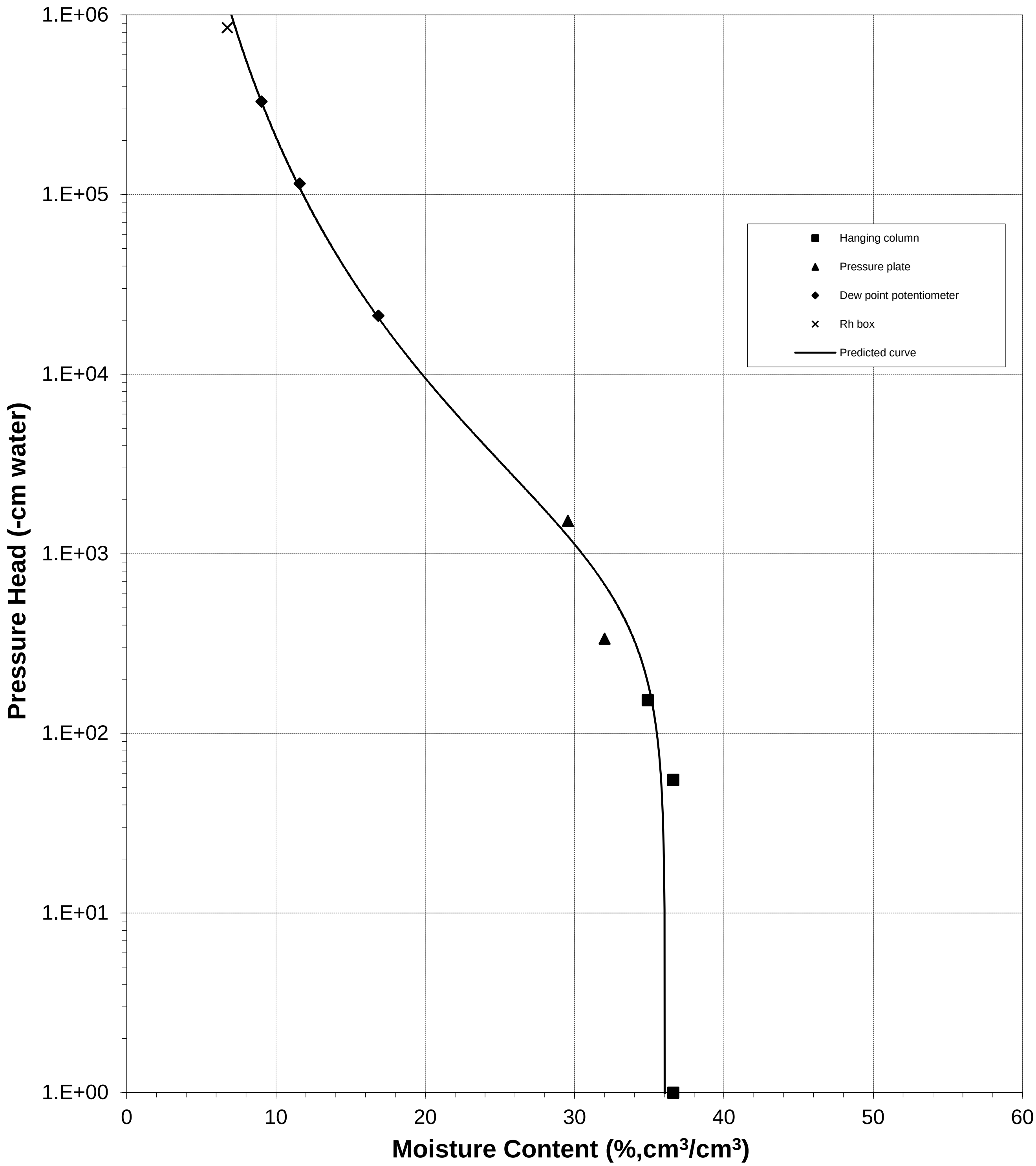
Water Retention Data Points

Sample Number: MT18-5 (95%)



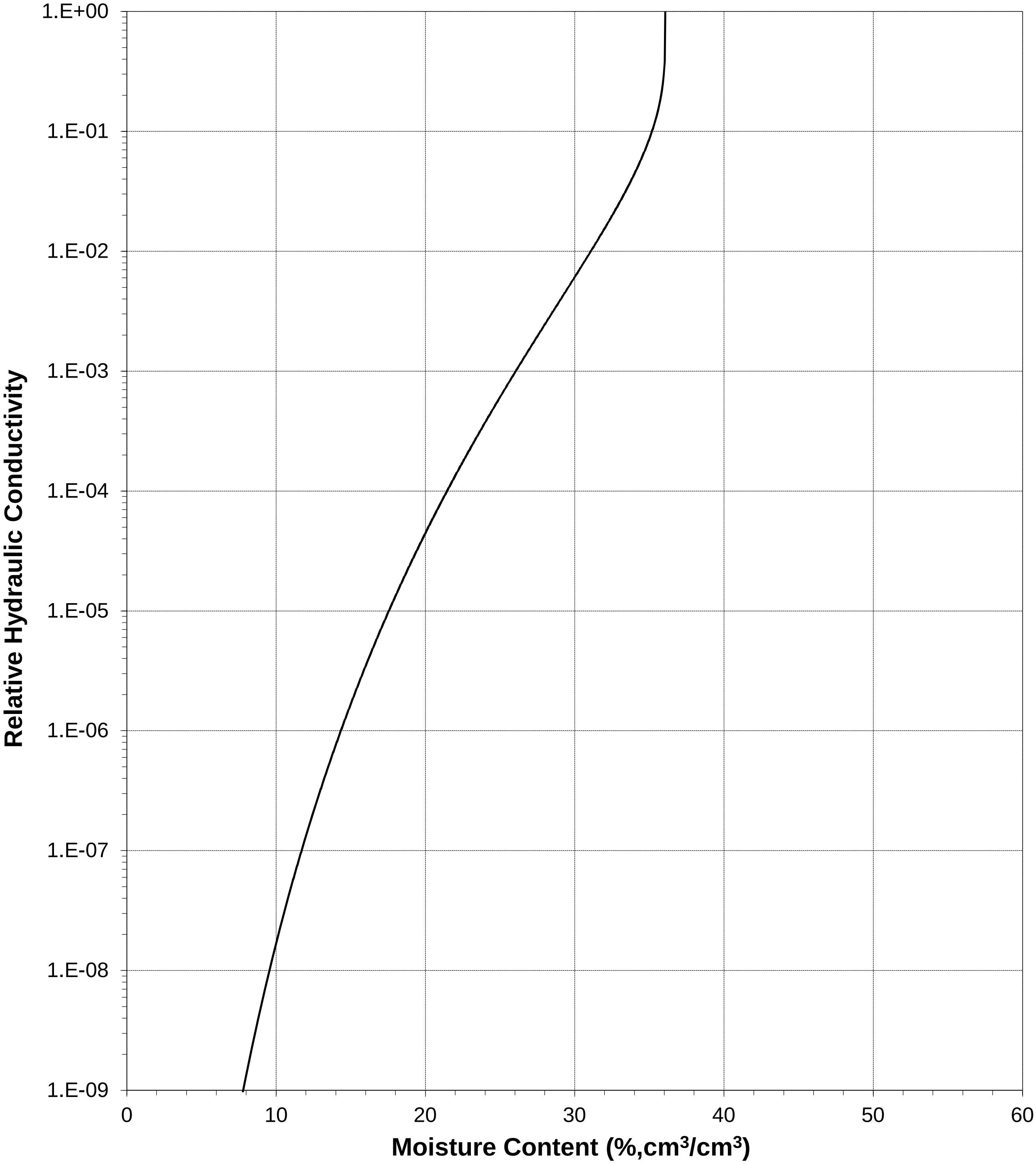
Predicted Water Retention Curve and Data Points

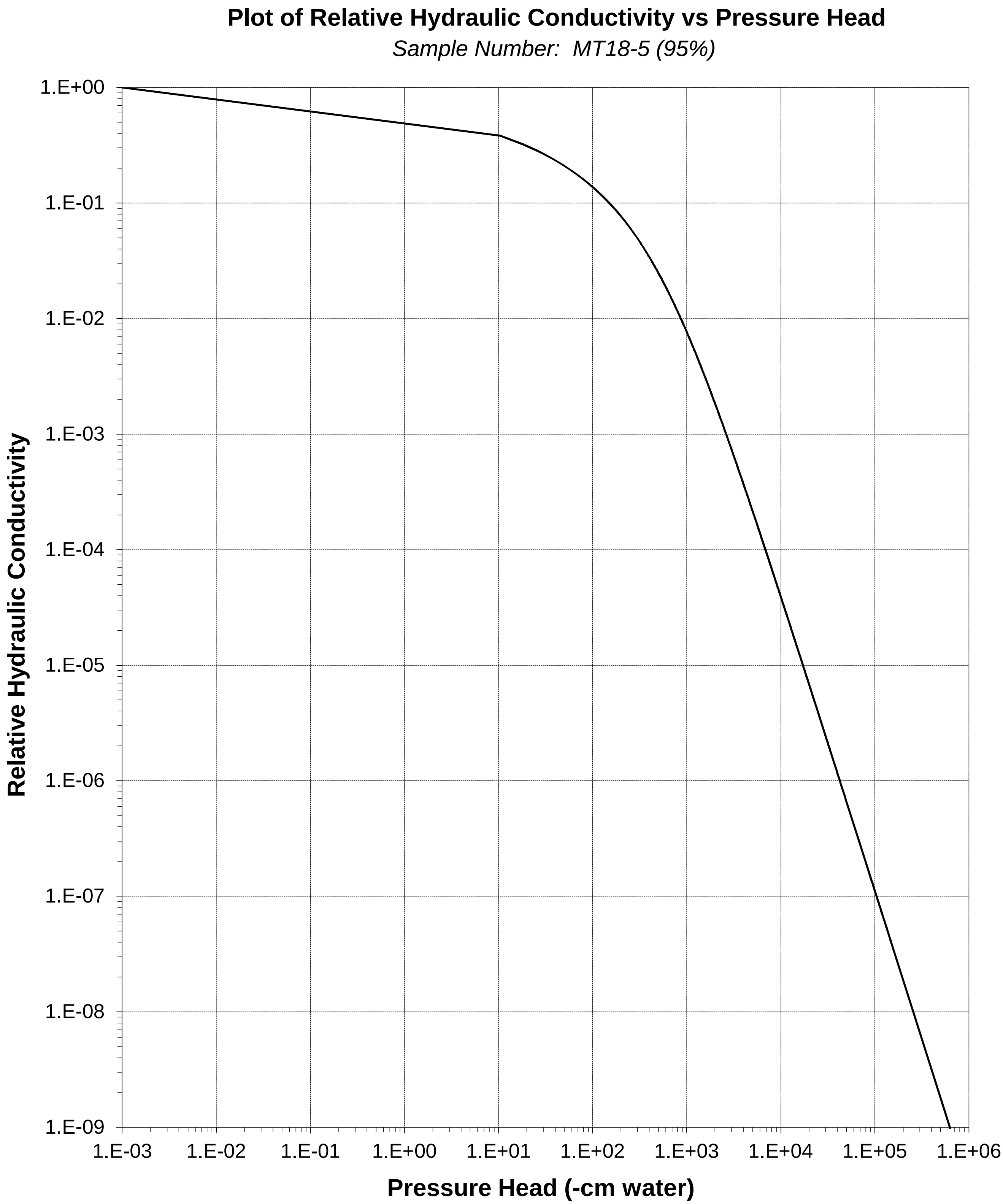
Sample Number: MT18-5 (95%)



Plot of Relative Hydraulic Conductivity vs Moisture Content

Sample Number: MT18-5 (95%)




Plot of Relative Hydraulic Conductivity vs Pressure Head
Sample Number: MT18-5 (95%)
Relative Hydraulic Conductivity
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
1.E-03
1.E-02
1.E-01
1.E+00
1.E+01
1.E+02
1.E+03
1.E+04
1.E+05
1.E+06
Pressure Head (-cm water)

Daniel B. Stephens & Associates, Inc.

Moisture Retention Data

Hanging Column / Pressure Plate

(Soil-Water Characteristic Curve)

Job Name:	Alan Kuhn Associates, LLC	*Dry wt. of sample* (g):	363.61
Job Number:	DB18.1068.00	*Tare wt., ring* (g):	143.84
Sample Number:	MT18-6 (95%)	*Tare wt., screen & clamp* (g):	27.67
Date/Time Sampled:	2/12/18 225	*Initial sample volume* (cm^3):	224.06
Site:	Mt. Taylor Mine	*Initial dry bulk density* (g/cm^3):	1.62
		Assumed particle density (g/cm^3):	2.65
		Initial calculated total porosity (%):	38.76

	Date	Time	Weight* (g)	Matric Potential (-cm water)	Moisture Content† (% vol)	
Hanging column:	9-Mar-18	1:00	626.55	0	40.24	‡‡
	16-Mar-18	15:45	626.01	24.0	40.01	‡‡
	23-Mar-18	12:00	620.46	79.0	37.79	‡‡
	30-Mar-18	10:00	613.77	153.0	34.89	‡‡
Pressure plate:	10-Apr-18	15:35	609.48	337	32.98	‡‡

Volume Adjusted Data [1]

	Matric Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calculated Porosity (%)
Hanging column:	0.0	227.19	+1.39%	1.60	39.60
	24.0	227.19	+1.39%	1.60	39.60
	79.0	225.82	+0.78%	1.61	39.24
	153.0	225.44	+0.61%	1.61	39.14
Pressure plate:	337	225.44	+0.61%	1.61	39.14

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent each of the volume change measurements obtained after saturated hydraulic conductivity testing and throughout hanging column/pressure plate testing. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

† Assumed density of water is 1.0 g/cm^3

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Technician Notes:

Laboratory analysis by: D. O'Dowd
Data entered by: C. Krous
Checked by: J. Hines

Moisture Retention Data

Dew Point Potentiometer / Relative Humidity Box

(Soil-Water Characteristic Curve)

Sample Number: MT18-6 (95%)

Initial sample bulk density (g/cm^3)*:* 1.62
Fraction of test sample used (<2.00mm fraction) (%): 98.30

Dry weight of dew point potentiometer sample* (g)*:* 161.34
Tare weight, jar (g)*:* 115.59

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)	
Dew point potentiometer:	23-Mar-18	9:45	165.89	21620	15.77	‡‡
	21-Mar-18	10:10	164.69	82604	11.59	‡‡
	16-Mar-18	14:15	163.59	424951	7.80	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Dew point potentiometer:	21620	225.44	+0.61%	1.61	39.14
	82604	225.44	+0.61%	1.61	39.14
	424951	225.44	+0.61%	1.61	39.14

Dry weight of relative humidity box sample* (g)*:* 66.23
Tare weight (g)*:* 47.61

	Date	Time	Weight* (g)	Water Potential (-cm water)	Moisture Content† (% vol)	
Relative humidity box:	14-Mar-18	14:00	66.97	848426	6.28	‡‡

Volume Adjusted Data [1]

	Water Potential (-cm water)	Adjusted Volume (cm^3)	% Volume Change [2] (%)	Adjusted Density (g/cm^3)	Adjusted Calc. Porosity (%)
Relative humidity box:	848426	225.44	+0.61%	1.61	39.14

Comments:

[1] Applicable if the sample experienced volume changes during testing. 'Volume Adjusted' values represent the volume change measurements obtained after the last hanging column or pressure plate point. "---" indicates no volume changes occurred.

[2] Represents percent volume change from original sample volume. A '+' denotes measured sample swelling, a '-' denotes measured sample settling, and '---' denotes no volume change occurred.

* Weight including tares

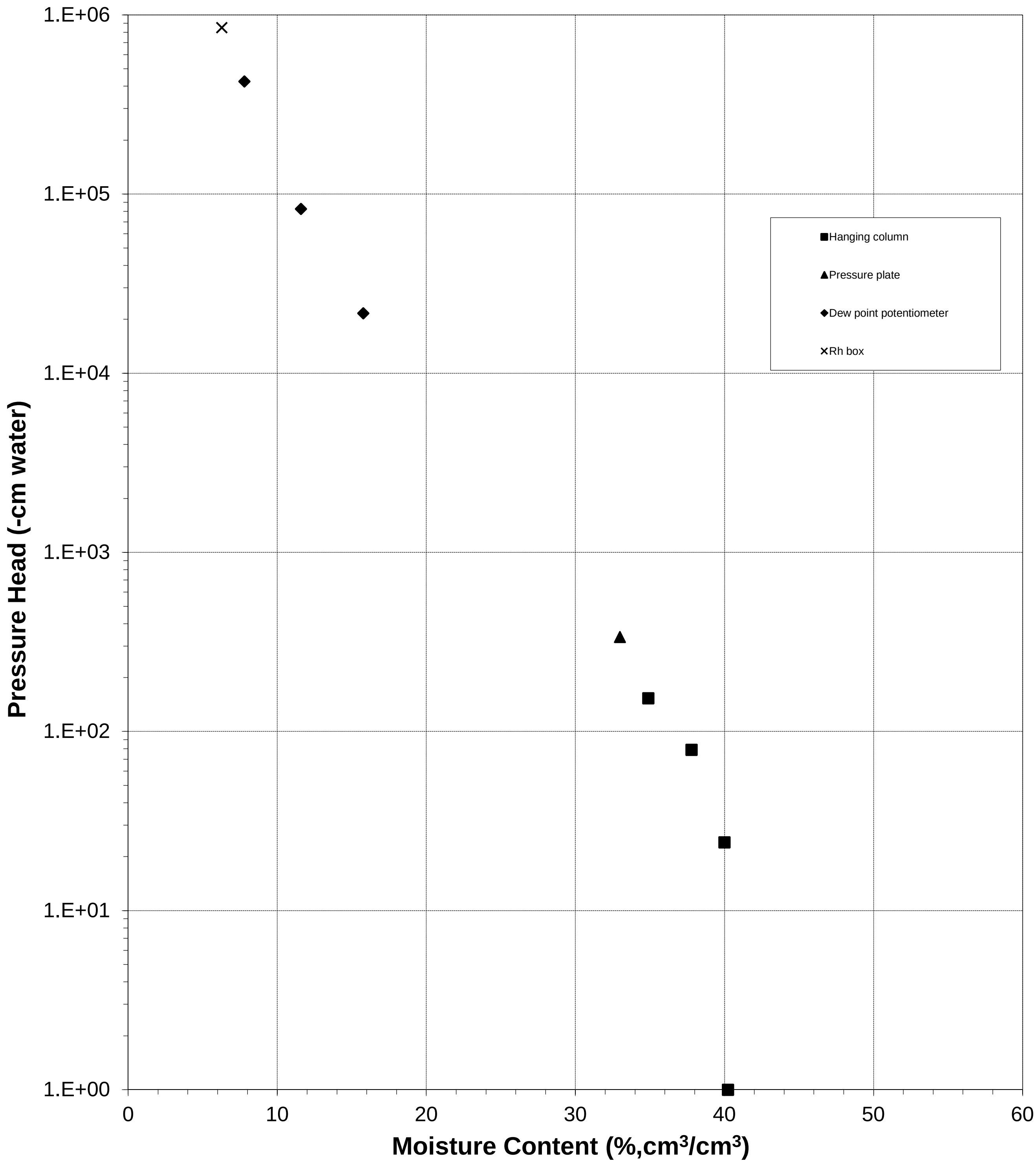
† Adjusted for >2.00mm (#10 sieve) material not used in DPP/RH testing. Assumed moisture content of material >2.00mm is zero, and assumed density of water is 1.0 g/cm^3.

‡‡ Volume adjustments are applicable at this matric potential (see comment #1). Changes in volume, if applicable, are estimated based on obtainable measurements of changes in sample length and diameter.

Laboratory analysis by: M. Garcia/A. Bland/ M. Garcia
Data entered by: C. Krous
Checked by: J. Hines

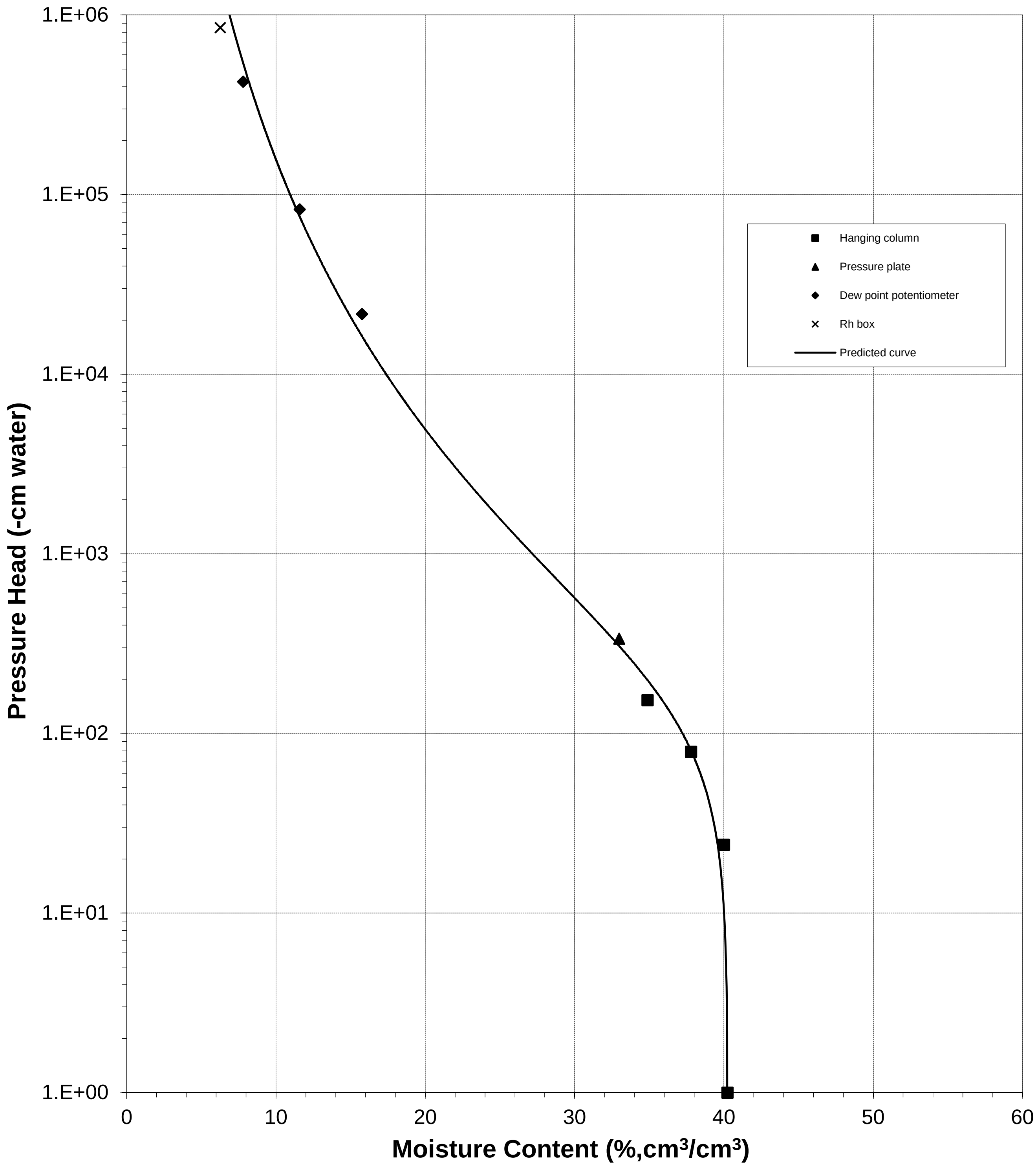
Water Retention Data Points

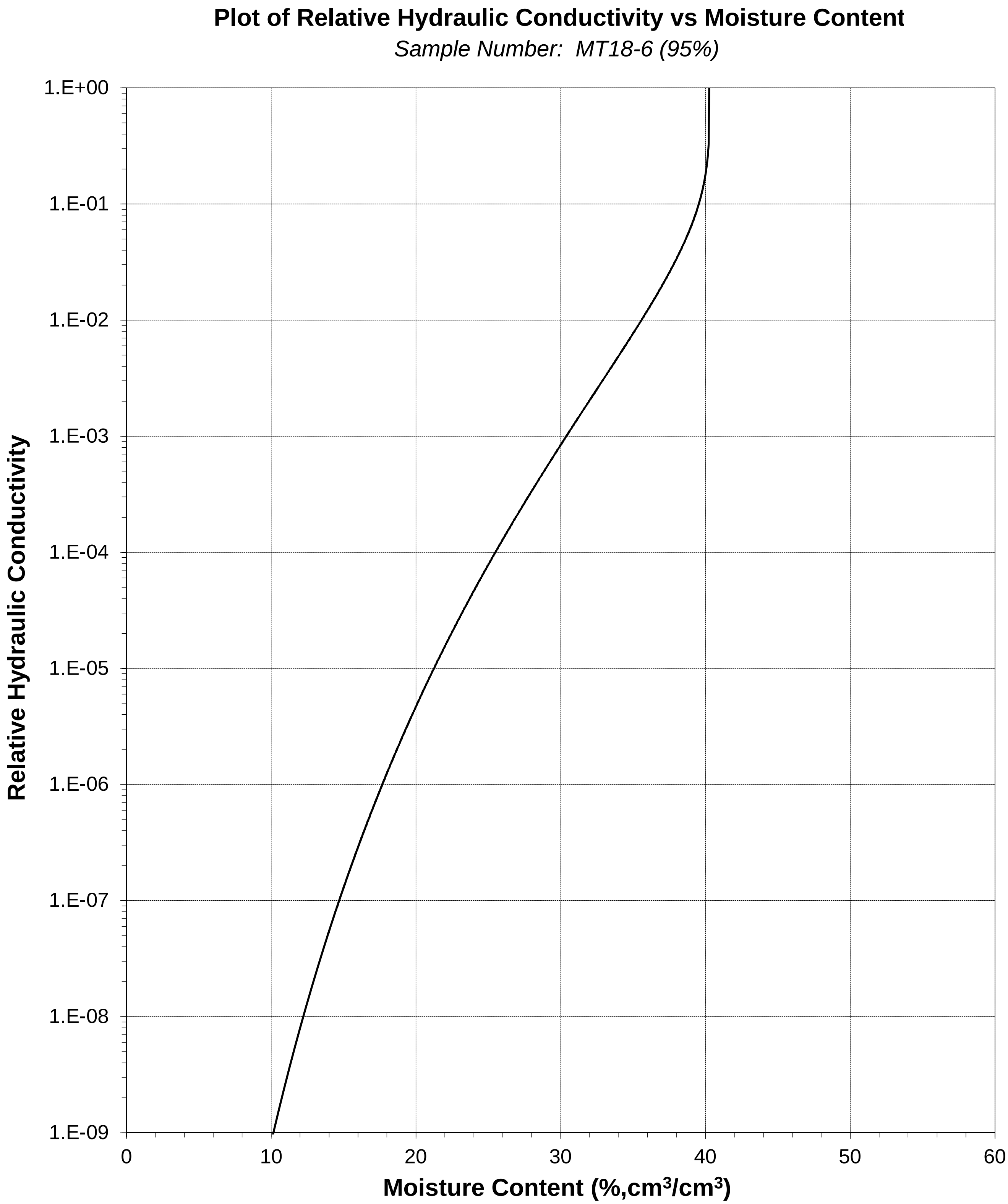
Sample Number: MT18-6 (95%)



Predicted Water Retention Curve and Data Points

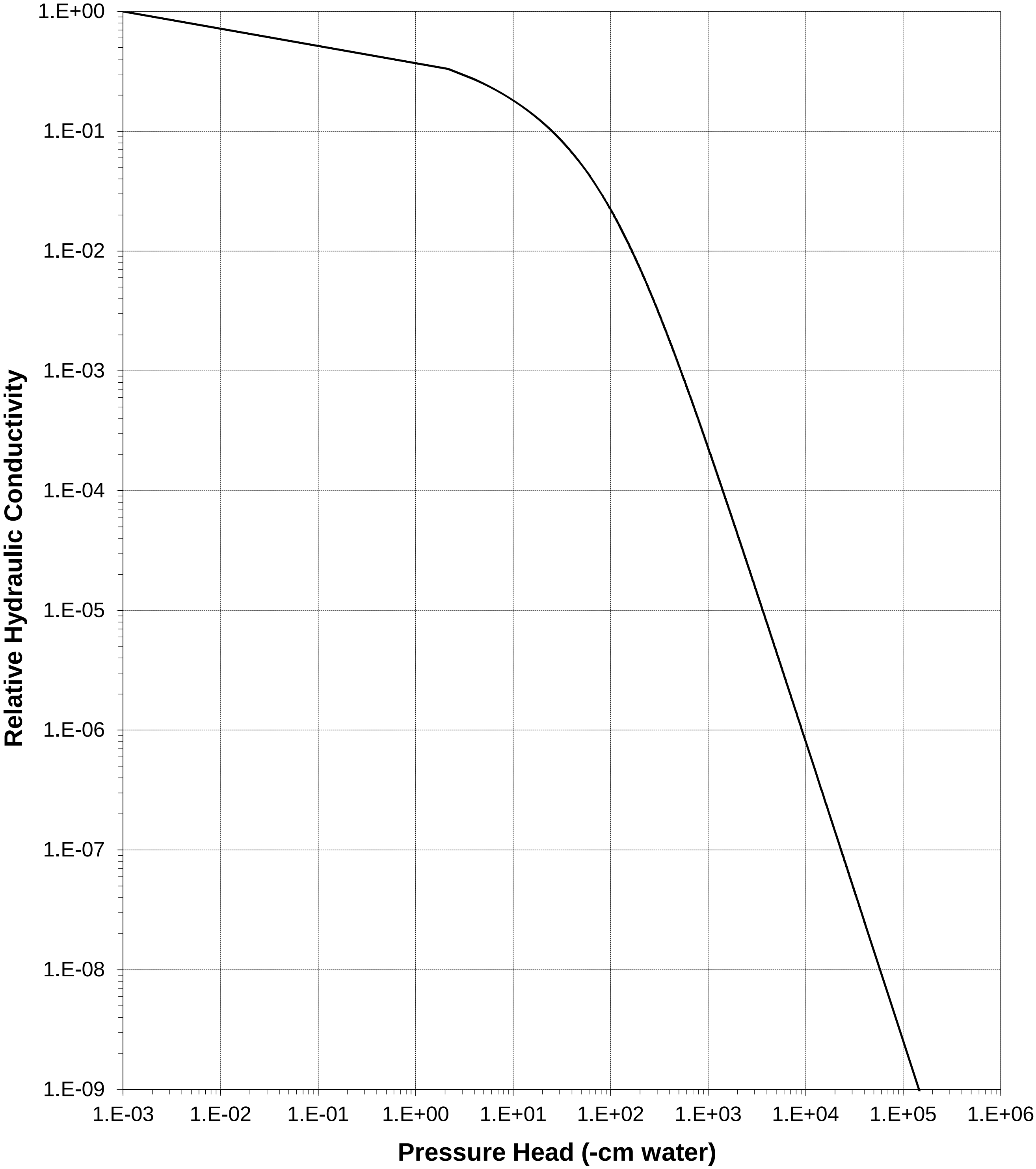
Sample Number: MT18-6 (95%)




Plot of Relative Hydraulic Conductivity vs Moisture Content
Sample Number: MT18-6 (95%)
Relative Hydraulic Conductivity
1.E+00
1.E-01
1.E-02
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
0
10
20
30
40
50
60
Moisture Content (%,cm3/cm3)

Plot of Relative Hydraulic Conductivity vs Pressure Head

Sample Number: MT18-6 (95%)



Particle Size Analysis

Summary of Particle Size Characteristics

Sample Number	d_{10} (mm)	d_{50} (mm)	d_{60} (mm)	C_u	C_c	Method	ASTM Classification	USDA Classification	
MT18-1	0.00069	0.097	0.13	188	1.9	WS/H	Silty sand (SM)	Sandy Loam	(Est)
MT18-2	0.00024	0.047	0.071	296	1.2	WS/H	Sandy silt s(ML)	Loam	(Est)
MT18-3	0.00049	0.010	0.030	61	0.33	WS/H	Lean clay with sand (CL)s	Clay Loam	(Est)
MT18-4	0.00025	0.061	0.084	336	5.8	WS/H	Sandy lean clay s(CL)	Sandy Loam	(Est)
MT18-5	0.00045	0.060	0.078	173	1.8	WS/H	Sandy lean clay s(CL)	Sandy Loam	(Est)
MT18-6	0.00020	0.053	0.073	365	4.8	WS/H	Sandy lean clay s(CL)	Loam	(Est)

d_{50} = Median particle diameter

Est = Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

$$C_u = \frac{d_{60}}{d_{10}}$$

$$C_c = \frac{(d_{30})^2}{(d_{10})(d_{60})}$$

DS = Dry sieve

H = Hydrometer

WS = Wet sieve

† Greater than 10% of sample is coarse material

Percent Gravel, Sand, Silt and Clay*

Sample Number	% Gravel (>4.75mm)	% Sand (<4.75mm, >0.075mm)	% Silt (<0.075mm, >0.002mm)	% Clay (<0.002mm)
MT18-1	4.3	50.1	29.6	16.0
MT18-2	1.9	36.7	38.6	22.9
MT18-3	1.7	19.2	50.2	28.9
MT18-4	1.8	40.4	39.6	18.2
MT18-5	0.8	40.1	40.3	18.8
MT18-6	0.8	38.3	42.0	18.9

*USCS classification does not classify clay fraction based on particle size. USDA definition of clay (<0.002mm) used in this table.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-1
Date/Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 21-Feb-18

Initial Dry Weight of Sample (g): 19383.34
Weight Passing #10 (g): 18419.24
Weight Retained #10 (g): 964.11
Weight of Hydrometer Sample (g): 55.53
Calculated Weight of Sieve Sample (g): 58.44

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	19383.34	100.00
	2"	50	0.00	0.00	19383.34	100.00
	1.5"	38.1	169.85	169.85	19213.49	99.12
	1"	25	222.49	392.34	18991.00	97.98
	3/4"	19.0	131.48	523.82	18859.52	97.30
	3/8"	9.5	175.97	699.79	18683.55	96.39
	4	4.75	135.62	835.41	18547.93	95.69
	10	2.00	128.70	964.11	18419.24	95.03
-10			(Based on calculated sieve wt.)			
	20	0.85	0.30	3.21	55.23	94.51
	40	0.425	0.74	3.95	54.49	93.25
	60	0.250	4.20	8.15	50.29	86.06
	140	0.106	20.18	28.33	30.11	51.53
	200	0.075	3.47	31.80	26.64	45.59
	dry pan		0.37	32.17	26.27	
	wet pan			26.27	0.00	

d_{10} (mm): 0.00069 d_{50} (mm): 0.097
d_{16} (mm): 0.0020 d_{60} (mm): 0.13
d_{30} (mm): 0.013 d_{84} (mm): 0.24

Median Particle Diameter --d_{50} (mm): 0.097
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 188
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.9
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.11

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines (visual method): ML

ASTM Soil Classification: Silty sand (SM)
USDA Soil Classification: Sandy Loam

Laboratory analysis by: Z. Calhoun
Data entered by: C. Krous
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

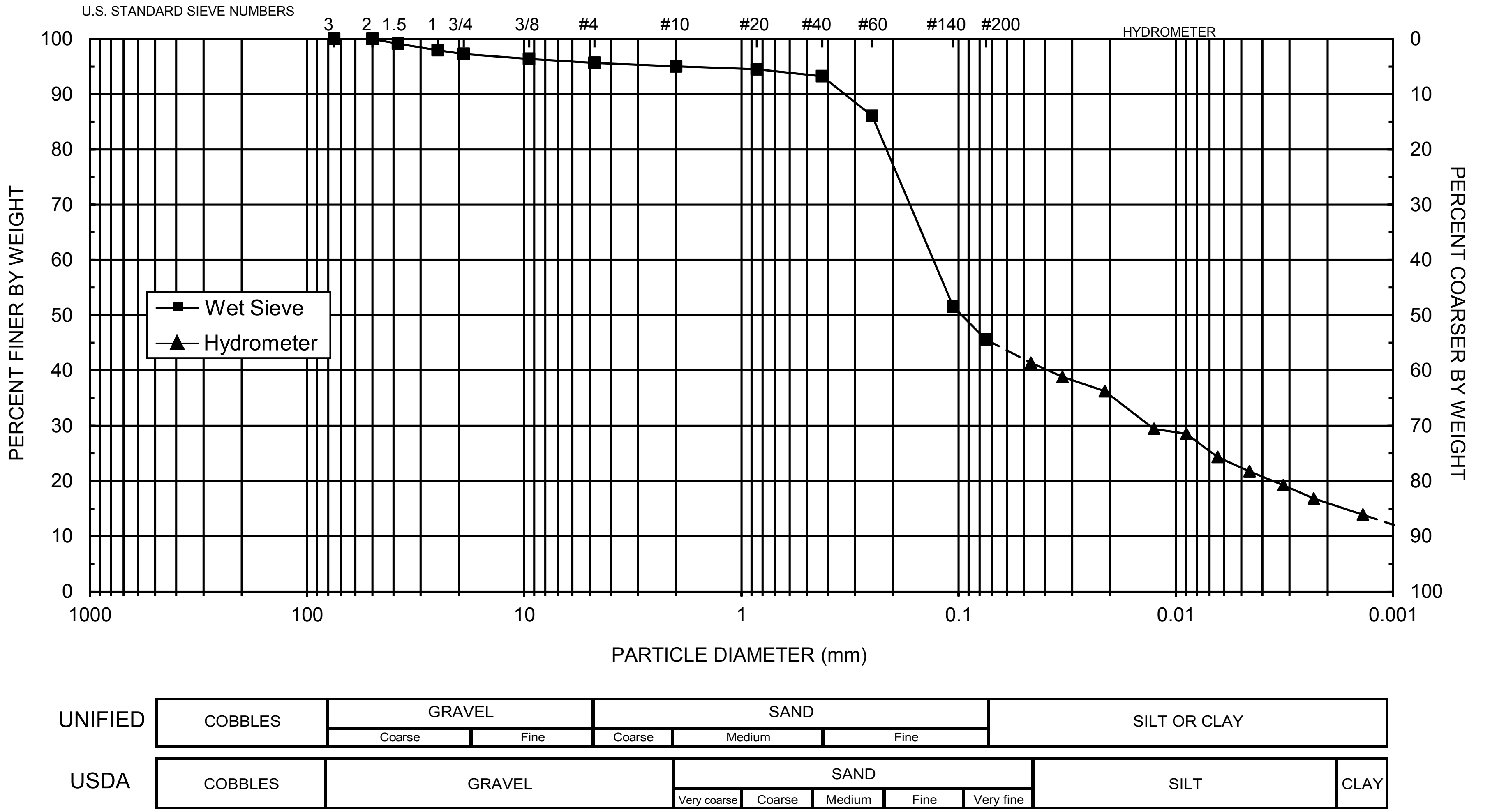
Job Name:	Alan Kuhn Associates, LLC	*Type of Water Used:*	DISTILLED
Job Number:	DB18.1068.00	*Reaction with* H_2O_2*:*	NA
Sample Number:	MT18-1	*Dispersant*:*	$(NaPO_3)_6$
Date/Time Sampled:	2/12/18 200	*Assumed particle density:*	2.65
Site:	Mt. Taylor Mine	*Initial Wt. (g):*	55.53
Test Date:	20-Feb-18	*Total Sample Wt. (g):*	19383.34
Start Time:	9:00	*Wt. Passing #10 (g):*	18419.24

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-18	1	18.6	31.0	6.8	24.2	11.2	0.04647	43.6	41.4
	2	18.6	29.5	6.8	22.7	11.5	0.03322	40.9	38.8
	5	18.6	28.0	6.8	21.2	11.7	0.02123	38.2	36.3
	15	18.6	24.0	6.8	17.2	12.4	0.01260	31.0	29.4
	30	18.6	23.5	6.8	16.7	12.4	0.00894	30.1	28.6
	60	18.7	21.0	6.8	14.2	12.9	0.00641	25.6	24.3
	120	18.7	19.5	6.8	12.7	13.1	0.00458	22.9	21.8
	250	18.9	18.0	6.8	11.2	13.3	0.00320	20.2	19.2
	478	19.3	16.5	6.7	9.8	13.6	0.00232	17.7	16.8
21-Feb-18	1419	18.3	15.0	6.9	8.1	13.8	0.00138	14.6	13.9

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: M. Garcia
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00069**	d_{30} = **0.013**	d_{50} = **0.097**	d_{60} = **0.13**	C_u = **188**	C_c = **1.9**

SAMPLE NUMBER	SITE	ASTM CLASSIFICATION	USDA CLASSIFICATION
MT18-1	**Mt. Taylor Mine**	**Silty sand (SM)**	**Sandy Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-2
Date/Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 21-Feb-18

Initial Dry Weight of Sample (g): 17177.31
Weight Passing #10 (g): 16759.61
Weight Retained #10 (g): 417.69
Weight of Hydrometer Sample (g): 52.81
Calculated Weight of Sieve Sample (g): 54.13

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	17177.31	100.00
	2"	50	0.00	0.00	17177.31	100.00
	1.5"	38.1	0.00	0.00	17177.31	100.00
	1"	25	81.09	81.09	17096.22	99.53
	3/4"	19.0	67.80	148.89	17028.42	99.13
	3/8"	9.5	95.91	244.80	16932.51	98.57
	4	4.75	73.85	318.65	16858.66	98.14
	10	2.00	99.04	417.69	16759.61	97.57
-10			(Based on calculated sieve wt.)			
	20	0.85	0.24	1.56	52.57	97.12
	40	0.425	0.28	1.84	52.29	96.61
	60	0.250	2.38	4.22	49.91	92.21
	140	0.106	13.50	17.72	36.41	67.27
	200	0.075	3.13	20.85	33.28	61.49
	dry pan		0.60	21.45	32.68	
	wet pan			32.68	0.00	

d_{10} (mm): 0.00024 d_{50} (mm): 0.047
d_{16} (mm): 0.00064 d_{60} (mm): 0.071
d_{30} (mm): 0.0045 d_{84} (mm): 0.19

Median Particle Diameter --d_{50} (mm): 0.047
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 296
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.2
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.079

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines (visual method): ML

ASTM Soil Classification: Sandy silt s(ML)
USDA Soil Classification: Loam

Laboratory analysis by: Z. Calhoun
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-2
Date/Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 20-Feb-18
Start Time: 9:06

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
*Dispersant**:* $(NaPO_3)_6$
Assumed particle density: 2.65

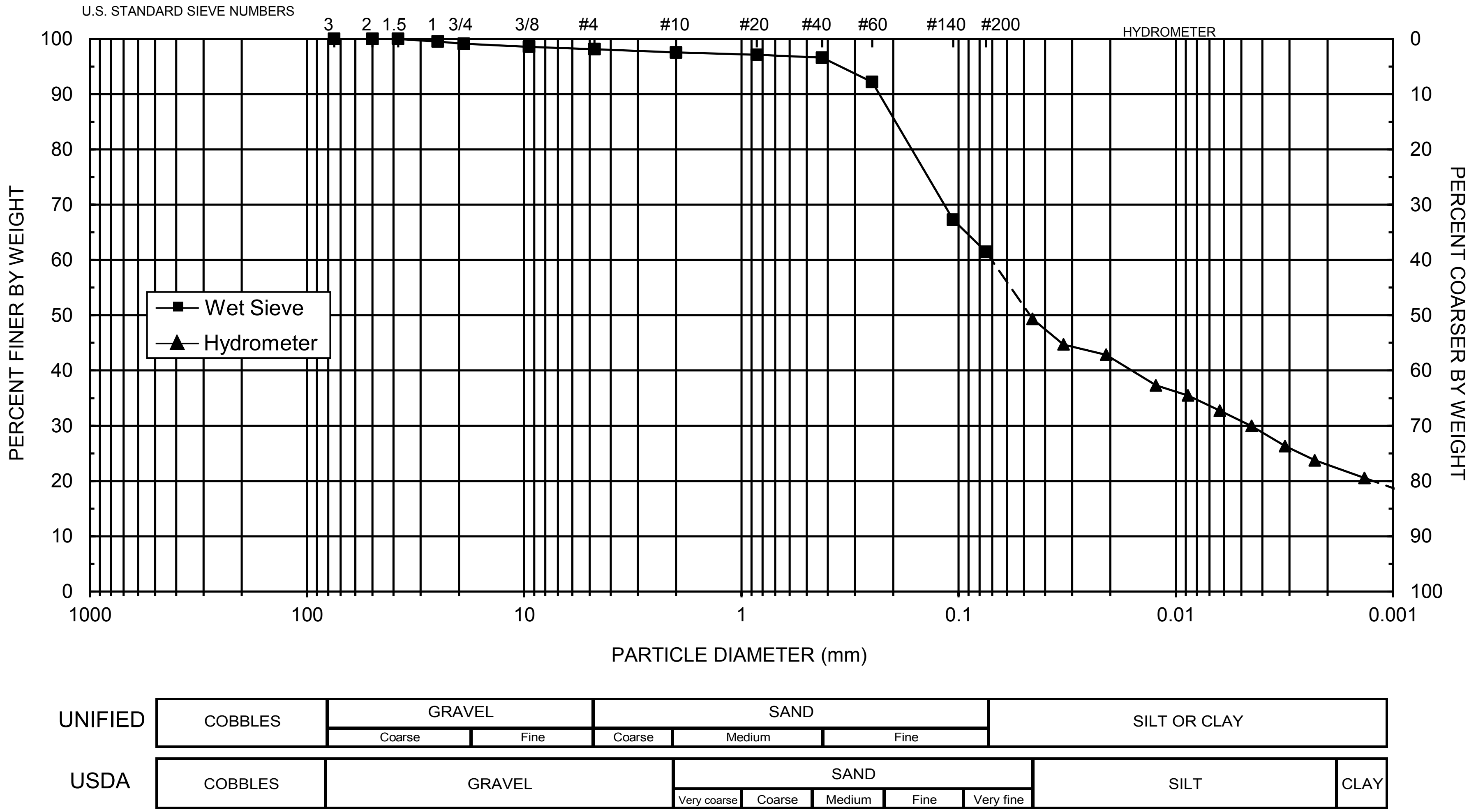
Initial Wt. (g)*:* 52.81
Total Sample Wt. (g)*:* 17177.31
Wt. Passing #10 (g): 16759.61

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-18	1	18.6	33.5	6.8	26.7	10.8	0.04561	50.5	49.3
	2	18.6	31.0	6.8	24.2	11.2	0.03286	45.8	44.7
	5	18.6	30.0	6.8	23.2	11.4	0.02093	43.9	42.8
	15	18.6	27.0	6.8	20.2	11.9	0.01234	38.2	37.3
	30	18.7	26.0	6.8	19.2	12.0	0.00878	36.4	35.5
	60	18.7	24.5	6.8	17.7	12.3	0.00627	33.5	32.7
	120	18.7	23.0	6.8	16.2	12.5	0.00448	30.7	29.9
	250	18.9	21.0	6.8	14.2	12.9	0.00314	27.0	26.3
	473	19.3	19.5	6.7	12.8	13.1	0.00229	24.3	23.7
21-Feb-18	1414	18.3	18.0	6.9	11.1	13.3	0.00135	21.1	20.5

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: M. Garcia
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00024**	d_{30} = **0.0045**	d_{50} = **0.047**	d_{60} = **0.071**	C_u = **296**	C_c = **1.2**

SAMPLE NUMBER	SITE	ASTM CLASSIFICATION	USDA CLASSIFICATION
MT18-2	**Mt. Taylor Mine**	**Sandy silt s(ML)**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

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Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-3
Date/Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 21-Feb-18

Initial Dry Weight of Sample (g): 19312.16
Weight Passing #10 (g): 18941.44
Weight Retained #10 (g): 370.71
Weight of Hydrometer Sample (g): 52.53
Calculated Weight of Sieve Sample (g): 53.56

Shape: Angular
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	19312.16	100.00
	2"	50	0.00	0.00	19312.16	100.00
	1.5"	38.1	238.63	238.63	19073.53	98.76
	1"	25	0.00	238.63	19073.53	98.76
	3/4"	19.0	17.38	256.01	19056.15	98.67
	3/8"	9.5	36.79	292.80	19019.36	98.48
	4	4.75	31.24	324.04	18988.12	98.32
	10	2.00	46.67	370.71	18941.44	98.08
-10			(Based on calculated sieve wt.)			
	20	0.85	0.23	1.26	52.30	97.65
	40	0.425	0.21	1.47	52.09	97.26
	60	0.250	0.96	2.43	51.13	95.47
	140	0.106	6.67	9.10	44.46	83.01
	200	0.075	2.09	11.19	42.37	79.11
	dry pan		0.29	11.48	42.08	
	wet pan			42.08	0.00	

d_{10} (mm): 0.00049 d_{50} (mm): 0.010
d_{16} (mm): 0.00077 d_{60} (mm): 0.030
d_{30} (mm): 0.0022 d_{84} (mm): 0.11

Median Particle Diameter --d_{50} (mm): 0.010
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 61
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 0.33
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.040

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Lean clay with sand (CL)s
USDA Soil Classification: Clay Loam

Laboratory analysis by: Z. Calhoun
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-3
Date/Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 20-Feb-18
Start Time: 9:12

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

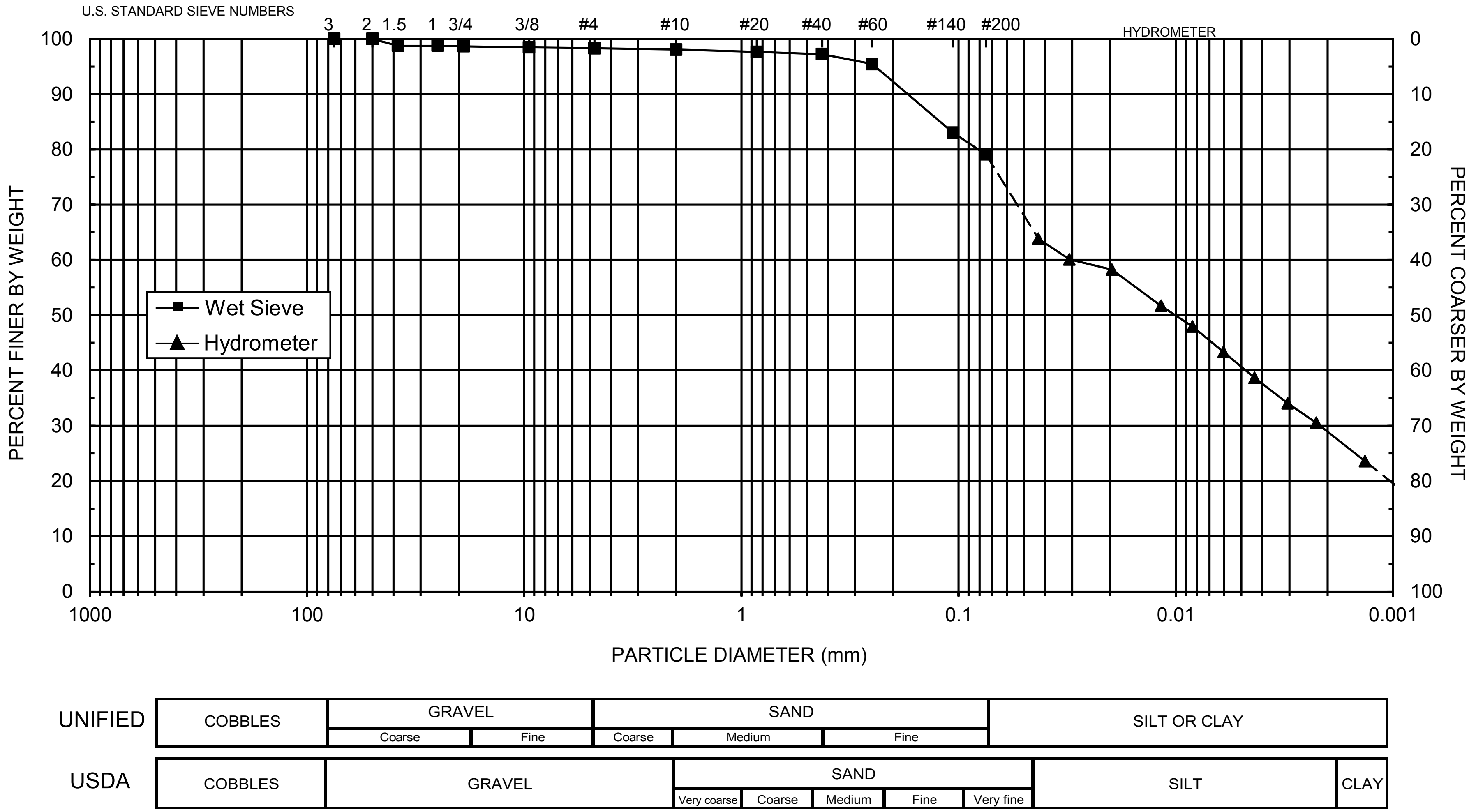
Initial Wt. (g): 52.53
Total Sample Wt. (g): 19312.16
Wt. Passing #10 (g): 18941.44

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-18	1	18.6	41.0	6.8	34.2	9.6	0.04294	65.1	63.8
	2	18.6	39.0	6.8	32.2	9.9	0.03088	61.3	60.1
	5	18.6	38.0	6.8	31.2	10.1	0.01969	59.4	58.2
	15	18.6	34.5	6.8	27.7	10.6	0.01169	52.7	51.7
	30	18.7	32.5	6.8	25.7	11.0	0.00839	48.9	48.0
	60	18.7	30.0	6.8	23.2	11.4	0.00604	44.2	43.3
	120	18.7	27.5	6.8	20.7	11.8	0.00434	39.4	38.7
	250	18.9	25.0	6.8	18.2	12.2	0.00306	34.7	34.1
	468	19.3	23.0	6.7	16.3	12.5	0.00225	31.1	30.5
21-Feb-18	1409	18.3	19.5	6.9	12.6	13.1	0.00134	24.0	23.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: M. Garcia
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00049**	d_{30} = **0.0022**	d_{50} = **0.010**	d_{60} = **0.030**	C_u = **61**	C_c = **0.33**

SAMPLE NUMBER	SITE	ASTM CLASSIFICATION	USDA CLASSIFICATION
MT18-3	**Mt. Taylor Mine**	**Lean clay with sand (CL)s**	**Clay Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-4
Date/Time Sampled: 2/12/18 215
Site: Mt. Taylor Mine

Test Date: 21-Feb-18

Initial Dry Weight of Sample (g): 16564.49
Weight Passing #10 (g): 16149.38
Weight Retained #10 (g): 415.10
Weight of Hydrometer Sample (g): 56.13
Calculated Weight of Sieve Sample (g): 57.57

Shape: Rounded
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	16564.49	100.00
	2"	50	0.00	0.00	16564.49	100.00
	1.5"	38.1	150.75	150.75	16413.74	99.09
	1"	25	36.33	187.08	16377.41	98.87
	3/4"	19.0	11.13	198.21	16366.28	98.80
	3/8"	9.5	39.08	237.29	16327.20	98.57
	4	4.75	62.46	299.75	16264.74	98.19
	10	2.00	115.35	415.10	16149.38	97.49
-10			(Based on calculated sieve wt.)			
	20	0.85	0.47	1.91	55.66	96.68
	40	0.425	0.74	2.65	54.92	95.39
	60	0.250	2.79	5.44	52.13	90.55
	140	0.106	14.92	20.36	37.21	64.63
	200	0.075	3.92	24.28	33.29	57.82
	dry pan		0.29	24.57	33.00	
	wet pan			33.00	0.00	

d_{10} (mm): 0.00025 d_{50} (mm): 0.061
d_{16} (mm): 0.0011 d_{60} (mm): 0.084
d_{30} (mm): 0.011 d_{84} (mm): 0.20

Median Particle Diameter --d_{50} (mm): 0.061
Uniformity Coefficient, Cu --[d_{60}/d_{10}] (mm): 336
Coefficient of Curvature, Cc --[$(d_{30})^2/(d_{10}*d_{60})$] (mm): 5.8
Mean Particle Diameter --[$(d_{16}+d_{50}+d_{84})/3$] (mm): 0.087

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Sandy Loam

Laboratory analysis by: Z. Calhoun
Data entered by: C. Krous
Checked by: J. Hines

Particle Size Analysis
Hydrometer Data

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-4
Date/Time Sampled: 2/12/18 215
Site: Mt. Taylor Mine

Test Date: 20-Feb-18
Start Time: 9:18

Type of Water Used: DISTILLED
Reaction with H_2O_2*:* NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

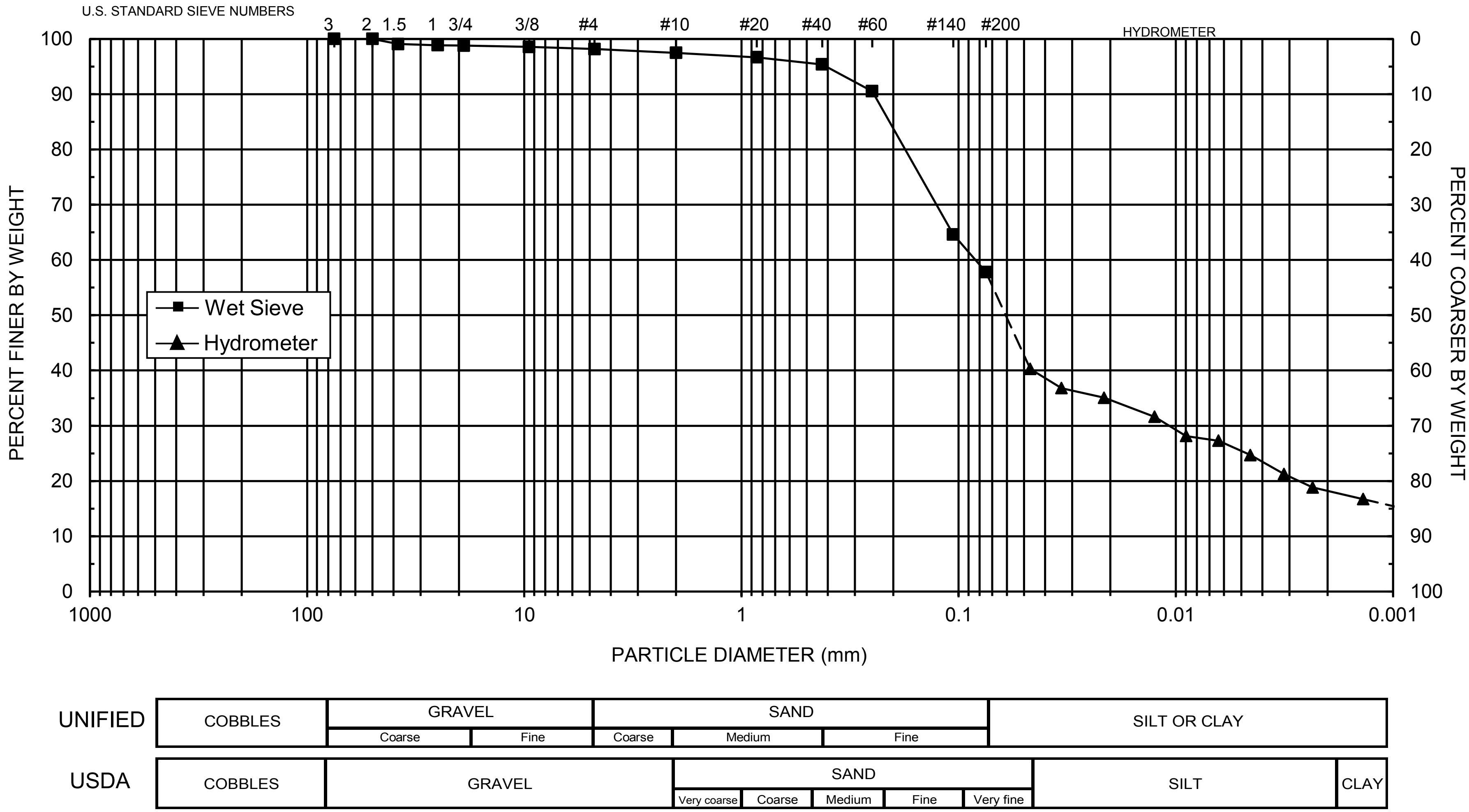
Initial Wt. (g): 56.13
Total Sample Wt. (g): 16564.49
Wt. Passing #10 (g): 16149.38

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-18	1	18.6	30.0	6.8	23.2	11.4	0.04681	41.3	40.3
	2	18.6	28.0	6.8	21.2	11.7	0.03357	37.8	36.8
	5	18.6	27.0	6.8	20.2	11.9	0.02138	36.0	35.1
	15	18.7	25.0	6.8	18.2	12.2	0.01251	32.4	31.6
	30	18.7	23.0	6.8	16.2	12.5	0.00896	28.9	28.1
	60	18.7	22.5	6.8	15.7	12.6	0.00635	28.0	27.3
	120	18.7	21.0	6.8	14.2	12.9	0.00454	25.3	24.7
	250	18.9	19.0	6.8	12.2	13.2	0.00318	21.8	21.3
	463	19.3	17.5	6.7	10.8	13.4	0.00234	19.3	18.8
21-Feb-18	1404	18.3	16.5	6.9	9.6	13.6	0.00137	17.1	16.7

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: M. Garcia
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00025**	d_{30} = **0.011**	d_{50} = **0.061**	d_{60} = **0.084**	C_u = **336**	C_c = **5.8**

SAMPLE NUMBER	SITE	ASTM CLASSIFICATION	USDA CLASSIFICATION
MT18-4	**Mt. Taylor Mine**	**Sandy lean clay s(CL)**	**Sandy Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name:	Alan Kuhn Associates, LLC	*Initial Dry Weight of Sample (g):*	17911.15
Job Number:	DB18.1068.00	*Weight Passing #10 (g):*	17617.56
Sample Number:	MT18-5	*Weight Retained #10 (g):*	293.59
Date/Time Sampled:	2/12/18 215	*Weight of Hydrometer Sample (g):*	54.09
Site:	Mt. Taylor Mine	*Calculated Weight of Sieve Sample (g):*	54.99
Test Date:	21-Feb-18	*Shape:*	Rounded
		Hardness:	Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	17911.15	100.00
	2"	50	0.00	0.00	17911.15	100.00
	1.5"	38.1	0.00	0.00	17911.15	100.00
	1"	25	0.00	0.00	17911.15	100.00
	3/4"	19.0	13.39	13.39	17897.76	99.93
	3/8"	9.5	59.64	73.03	17838.12	99.59
	4	4.75	65.44	138.47	17772.68	99.23
	10	2.00	155.12	293.59	17617.56	98.36
-10			(Based on calculated sieve wt.)			
	20	0.85	0.73	1.63	53.36	97.03
	40	0.425	0.81	2.44	52.55	95.56
	60	0.250	2.50	4.94	50.05	91.01
	140	0.106	13.44	18.38	36.61	66.57
	200	0.075	4.11	22.49	32.50	59.10
	dry pan		0.95	23.44	31.55	
	wet pan			31.55	0.00	

d_{10} (mm):	0.00045	d_{50} (mm):	0.060
d_{16} (mm):	0.0012	d_{60} (mm):	0.078
d_{30} (mm):	0.0079	d_{84} (mm):	0.20

Median Particle Diameter --d_{50} (mm): 0.060

Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 173

Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 1.8

Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.087

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Sandy Loam

Laboratory analysis by: Z. Calhoun
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

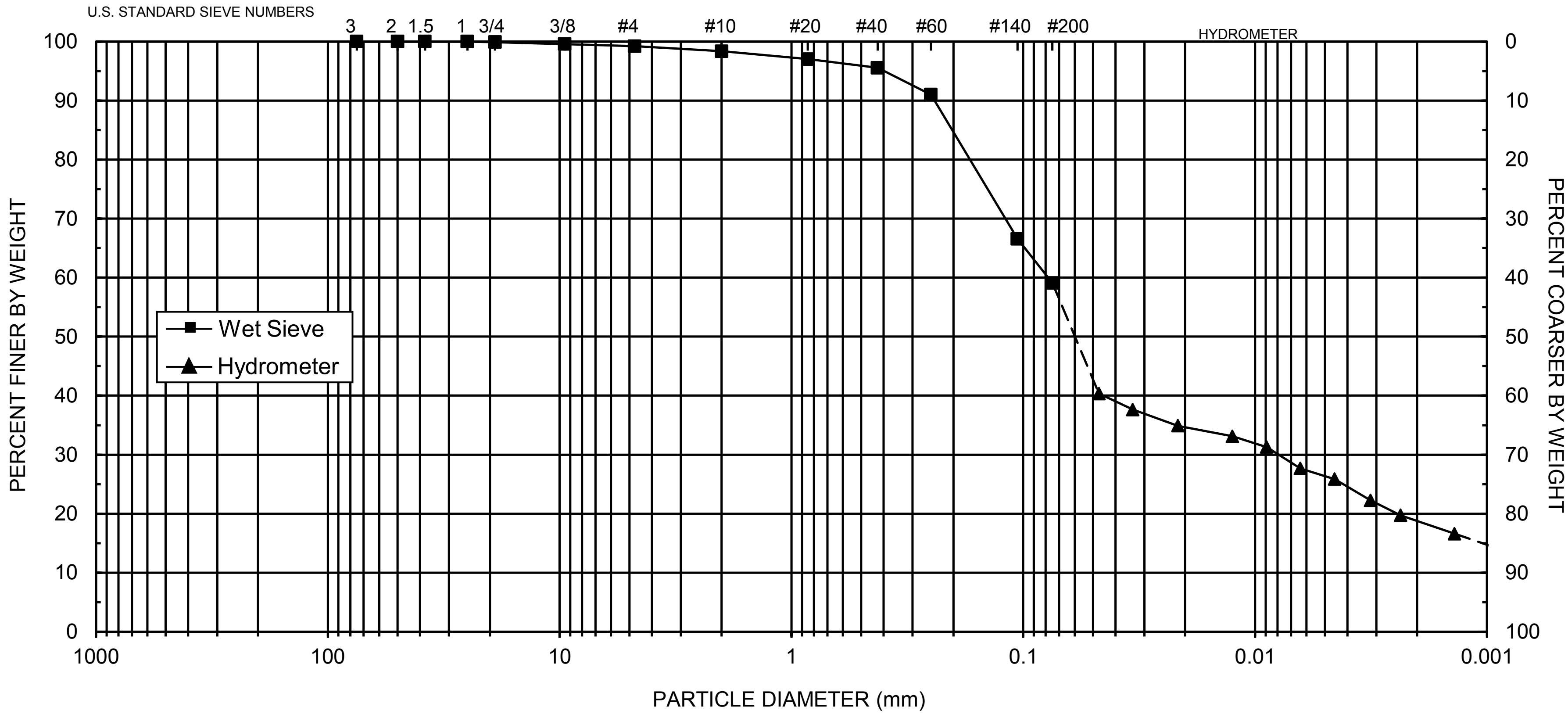
Job Name:	Alan Kuhn Associates, LLC	*Type of Water Used:*	DISTILLED
Job Number:	DB18.1068.00	*Reaction with* H_2O_2:	NA
Sample Number:	MT18-5	*Dispersant*:*	$(NaPO_3)_6$
Date/Time Sampled:	2/12/18 215	*Assumed particle density:*	2.65
Site:	Mt. Taylor Mine	*Initial Wt. (g):*	54.09
Test Date:	20-Feb-18	*Total Sample Wt. (g):*	17911.15
Start Time:	9:24	*Wt. Passing #10 (g):*	17617.56

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-18	1	18.6	29.0	6.8	22.2	11.5	0.04714	41.0	40.4
	2	18.6	27.5	6.8	20.7	11.8	0.03369	38.3	37.6
	5	18.6	26.0	6.8	19.2	12.0	0.02153	35.5	34.9
	15	18.7	25.0	6.8	18.2	12.2	0.01251	33.6	33.1
	30	18.7	24.0	6.8	17.2	12.4	0.00890	31.8	31.3
	60	18.7	22.0	6.8	15.2	12.7	0.00637	28.1	27.7
	120	18.7	21.0	6.8	14.2	12.9	0.00454	26.3	25.8
	250	18.9	19.0	6.8	12.2	13.2	0.00318	22.6	22.3
	458	19.3	17.5	6.7	10.8	13.4	0.00236	20.0	19.7
21-Feb-18	1398	18.3	16.0	6.9	9.1	13.7	0.00138	16.9	16.6

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: M. Garcia
Data entered by: C. Krous
Checked by: J. Hines



UNIFIED	COBBLES	GRAVEL		SAND			SILT OR CLAY	
		Coarse	Fine	Coarse	Medium	Fine		

USDA	COBBLES	GRAVEL	SAND					SILT	CLAY
			Very coarse	Coarse	Medium	Fine	Very fine		

d_{10} = **0.00045**	d_{30} = **0.0079**	d_{50} = **0.060**	d_{60} = **0.078**	C_u = **173**	C_c = **1.8**

SAMPLE NUMBER	SITE	ASTM CLASSIFICATION	USDA CLASSIFICATION
MT18-5	**Mt. Taylor Mine**	**Sandy lean clay s(CL)**	**Sandy Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

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Particle Size Analysis
Wet Sieve Data (#10 Split)

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-6
Date/Time Sampled: 2/12/18 225
Site: Mt. Taylor Mine

Test Date: 21-Feb-18

Initial Dry Weight of Sample (g): 17128.30
Weight Passing #10 (g): 16837.69
Weight Retained #10 (g): 290.61
Weight of Hydrometer Sample (g): 57.17
Calculated Weight of Sieve Sample (g): 58.16

Shape: Rounded
Hardness: Hard and durable

Test Fraction	Sieve Number	Diameter (mm)	Wt. Retained	Cum Wt. Retained	Wt. Passing	% Passing
+10						
	3"	75	0.00	0.00	17128.30	100.00
	2"	50	0.00	0.00	17128.30	100.00
	1.5"	38.1	0.00	0.00	17128.30	100.00
	1"	25	0.00	0.00	17128.30	100.00
	3/4"	19.0	23.31	23.31	17104.99	99.86
	3/8"	9.5	35.39	58.70	17069.60	99.66
	4	4.75	77.97	136.67	16991.63	99.20
	10	2.00	153.94	290.61	16837.69	98.30
-10			(Based on calculated sieve wt.)			
	20	0.85	0.49	1.48	56.68	97.46
	40	0.425	0.70	2.18	55.98	96.26
	60	0.250	2.47	4.65	53.51	92.01
	140	0.106	13.75	18.40	39.76	68.37
	200	0.075	4.35	22.75	35.41	60.89
	dry pan		0.70	23.45	34.71	
	wet pan			34.71	0.00	

d_{10} (mm): 0.00020 d_{50} (mm): 0.053
d_{16} (mm): 0.00095 d_{60} (mm): 0.073
d_{30} (mm): 0.0084 d_{84} (mm): 0.19

Median Particle Diameter --d_{50} (mm): 0.053
Uniformity Coefficient, Cu --$[d_{60}/d_{10}]$ (mm): 365
Coefficient of Curvature, Cc --$[(d_{30})^2/(d_{10}*d_{60})]$ (mm): 4.8
Mean Particle Diameter --$[(d_{16}+d_{50}+d_{84})/3]$ (mm): 0.081

Note: Reported values for d_{10}, C_u, C_c, and soil classification are estimates, since extrapolation was required to obtain the d_{10} diameter

Classification of fines: CL

ASTM Soil Classification: Sandy lean clay s(CL)
USDA Soil Classification: Loam

Laboratory analysis by: Z. Calhoun
Data entered by: C. Krous
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Particle Size Analysis
Hydrometer Data

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-6
Date/Time Sampled: 2/12/18 225
Site: Mt. Taylor Mine

Test Date: 20-Feb-18
Start Time: 9:30

Type of Water Used: DISTILLED
Reaction with H_2O_2: NA
Dispersant:* $(NaPO_3)_6$
Assumed particle density: 2.65

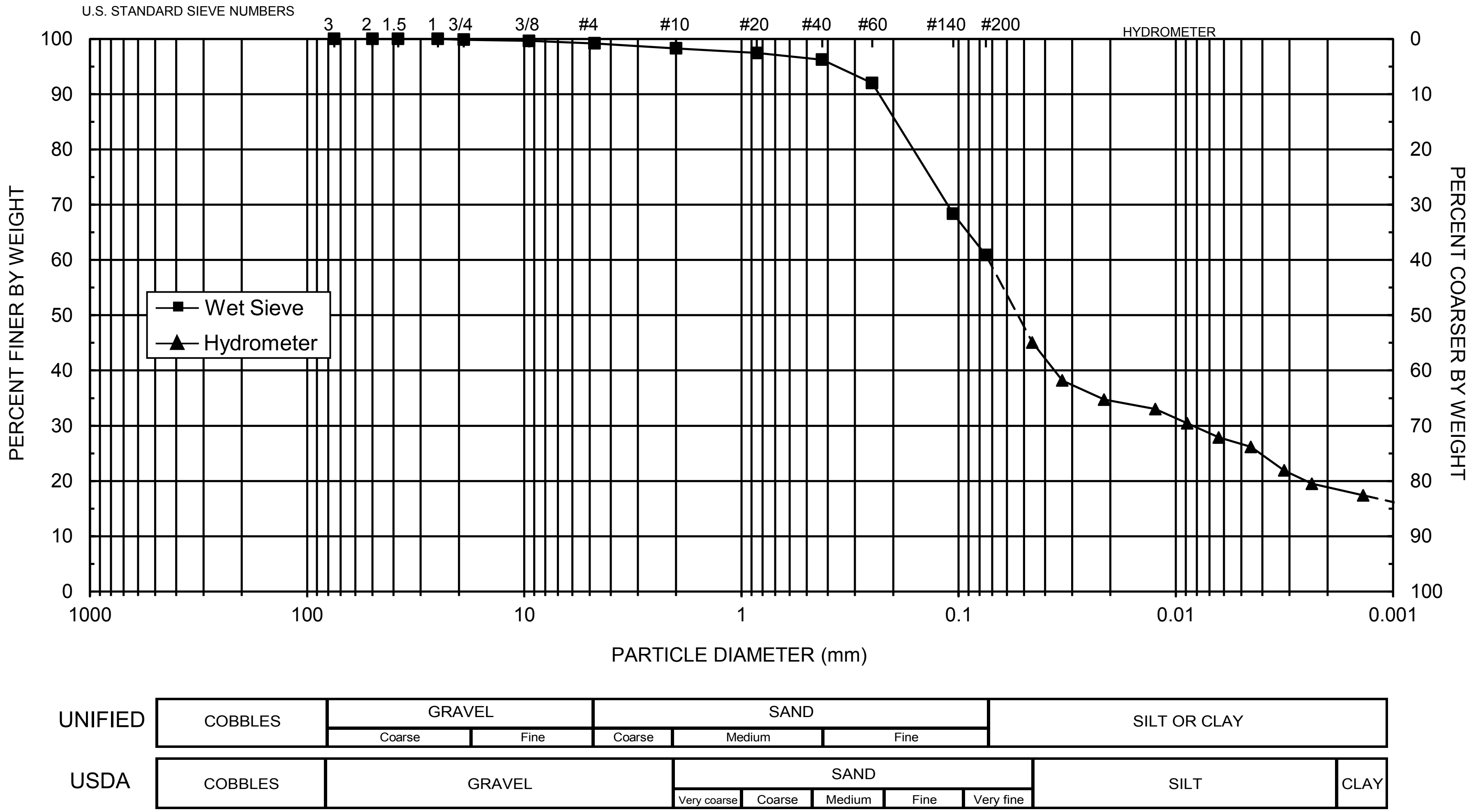
Initial Wt. (g): 57.17
Total Sample Wt. (g): 17128.30
Wt. Passing #10 (g): 16837.69

Date	Time (min)	Temp (°C)	R (g/L)	R_L (g/L)	R_{corr} (g/L)	L (cm)	D (mm)	P (%)	% Finer
20-Feb-18	1	18.7	33.0	6.8	26.2	10.9	0.04576	45.8	45.1
	2	18.7	29.0	6.8	22.2	11.5	0.03331	38.8	38.2
	5	18.7	27.0	6.8	20.2	11.9	0.02137	35.3	34.7
	15	18.7	26.0	6.8	19.2	12.0	0.01242	33.6	33.0
	30	18.7	24.5	6.8	17.7	12.3	0.00887	31.0	30.5
	60	18.7	23.0	6.8	16.2	12.5	0.00633	28.4	27.9
	120	18.7	22.0	6.8	15.2	12.7	0.00451	26.6	26.2
	250	18.9	19.5	6.8	12.7	13.1	0.00317	22.3	21.9
	453	19.3	18.0	6.7	11.3	13.3	0.00236	19.8	19.5
21-Feb-18	1393	18.3	17.0	6.9	10.1	13.5	0.00137	17.7	17.4

Comments:

* Dispersion device: mechanically operated stirring device

Laboratory analysis by: M. Garcia
Data entered by: C. Krous
Checked by: J. Hines



d_{10} = **0.00020**	d_{30} = **0.0084**	d_{50} = **0.053**	d_{60} = **0.073**	C_u = **365**	C_c = **4.8**

SAMPLE NUMBER	SITE	ASTM CLASSIFICATION	USDA CLASSIFICATION
MT18-6	**Mt. Taylor Mine**	**Sandy lean clay s(CL)**	**Loam**

Note: Reported values for d_{10}, C_u, C_c, and ASTM classification are estimates, since extrapolation was required to obtain the d_{10} diameter

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Atterberg Limits/ Identification of Fines

Summary of Atterberg Tests

Sample Number	Liquid Limit	Plastic Limit	Plasticity Index	Classification
MT18-1	---	---	---	ML
MT18-2	---	---	---	ML
MT18-3	39	17	22	CL
MT18-4	31	18	13	CL
MT18-5	32	19	13	CL
MT18-6	33	18	15	CL

--- = Soil requires visual-manual classification due to non-plasticity

Daniel B. Stephens & Associates, Inc.

Atterberg Limits

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-1
Date/Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 21-Feb-18

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---

Liquid Limit: ---

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---

Plastic Limit: ---

Results

Percent of Sample Retained on #40 Sieve: See Sieve

Liquid Limit: ---
Plastic Limit: ---
Plasticity Index: ---

Classification (Visual Method): ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-1
Date/ Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 21-Feb-18

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample: Dark Grayish Brown (2.5Y 4/2)
Odor: None
Moisture Condition: Moist
HCl Reaction: Strong

Preliminary Identification:

Dry Strength: Low
Dilatency: Rapid
Toughness: Low
Plasticity: Non-plastic

Identification of Inorganic Fine Grained Soils:

Silt (ML)

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-2
Date/Time Sampled:	2/12/18 200
Site:	Mt. Taylor Mine
Test Date:	21-Feb-18

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:			
Pan number:			
Weight of pan plus moist soil (g):			
Weight of pan plus dry soil (g)			
Weight of pan (g):			
Gravimetric moisture content (% g/g):	---	---	---
Liquid Limit:	---		

Plastic Limit

	Trial 1	Trial 2
Pan number:		
Weight of pan plus moist soil (g):		
Weight of pan plus dry soil (g)		
Weight of pan (g):		
Gravimetric moisture content (% g/g):	---	---
Plastic Limit:	---	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	---
Plastic Limit:	---
Plasticity Index:	---
Classification (Visual Method):	ML

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Data for Description and Identification of Fines
(Visual-Manual Procedure)

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-2
Date/ Time Sampled:	2/12/18 200
Site:	Mt. Taylor Mine
Test Date:	21-Feb-18

Visual-manual classification of material passing the #40 sieve in lieu of Atterberg analysis due to non-plasticity:

Descriptive Information:

Color of Moist Sample:	Dark Grayish Brown (2.5Y 4/2)
Odor:	None
Moisture Condition:	Moist
HCl Reaction:	Strong

Preliminary Identification:

Dry Strength:	Low
Dilatency:	Rapid
Toughness:	Low
Plasticity:	Non-plastic

<u>Identification of Inorganic Fine Grained Soils:</u>

Silt (ML)

Laboratory analysis by:	D. O'Dowd
Data entered by:	D. O'Dowd
Checked by:	J. Hines

Daniel B. Stephens & Associates, Inc.

Atterberg Limits

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-3
Date/Time Sampled:	2/12/18 200
Site:	Mt. Taylor Mine
Test Date:	21-Feb-18

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	35	28	20
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	126.18	128.96	131.14
Weight of pan plus dry soil (g)	122.51	125.77	126.31
Weight of pan (g):	112.72	117.66	114.38
Gravimetric moisture content (% g/g):	37.49	39.33	40.49
Liquid Limit:	39		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	126.65	122.43
Weight of pan plus dry soil (g)	125.58	121.35
Weight of pan (g):	119.33	115.17
Gravimetric moisture content (% g/g):	17.12	17.48
Plastic Limit:	17	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	39
Plastic Limit:	17
Plasticity Index:	22
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by:	D. O'Dowd
Data entered by:	D. O'Dowd
Checked by:	J. Hines

Atterberg Limits

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-4
Date/Time Sampled:	2/12/18 215
Site:	Mt. Taylor Mine
Test Date:	21-Feb-18

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	23	15
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	130.99	124.39	131.26
Weight of pan plus dry soil (g)	127.52	121.38	126.56
Weight of pan (g):	116.04	111.84	112.24
Gravimetric moisture content (% g/g):	30.23	31.55	32.82
Liquid Limit:	31		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	119.88	118.47
Weight of pan plus dry soil (g)	118.71	117.25
Weight of pan (g):	112.38	110.58
Gravimetric moisture content (% g/g):	18.48	18.29
Plastic Limit:	18	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	31
Plastic Limit:	18
Plasticity Index:	13
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-5
Date/Time Sampled:	2/12/18 215
Site:	Mt. Taylor Mine
Test Date:	21-Feb-18

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	34	27	16
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	125.20	125.51	132.76
Weight of pan plus dry soil (g)	122.24	122.41	128.64
Weight of pan (g):	112.54	112.97	116.65
Gravimetric moisture content (% g/g):	30.52	32.84	34.36
Liquid Limit:	32		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	130.77	121.65
Weight of pan plus dry soil (g)	129.58	120.47
Weight of pan (g):	123.40	114.25
Gravimetric moisture content (% g/g):	19.26	18.97
Plastic Limit:	19	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	32
Plastic Limit:	19
Plasticity Index:	13
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Atterberg Limits

Job Name:	Alan Kuhn Associates, LLC
Job Number:	DB18.1068.00
Sample Number:	MT18-6
Date/Time Sampled:	2/12/18 225
Site:	Mt. Taylor Mine
Test Date:	21-Feb-18

Liquid Limit

	Trial 1	Trial 2	Trial 3
Number of drops:	32	26	19
Pan number:	LL1	LL2	LL3
Weight of pan plus moist soil (g):	127.92	128.90	135.50
Weight of pan plus dry soil (g)	125.05	125.46	130.76
Weight of pan (g):	116.10	115.14	117.04
Gravimetric moisture content (% g/g):	32.07	33.33	34.55
Liquid Limit:	33		

Plastic Limit

	Trial 1	Trial 2
Pan number:	PL1	PL2
Weight of pan plus moist soil (g):	124.92	120.91
Weight of pan plus dry soil (g)	123.63	119.70
Weight of pan (g):	116.57	113.16
Gravimetric moisture content (% g/g):	18.27	18.50
Plastic Limit:	18	

Results

Percent of Sample Retained on #40 Sieve:	See Sieve
Liquid Limit:	33
Plastic Limit:	18
Plasticity Index:	15
Classification:	CL

Comments:

--- = Soil requires visual-manual classification due to non-plasticity
* = 1-point method requested by client

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction

Summary of Proctor Compaction Tests

Sample Number	Measured Optimum Moisture Content (% g/g)	Measured Maximum Dry Bulk Density (g/cm^3)	Oversize Corrected Optimum Moisture Content (% g/g)	Oversize Corrected Maximum Dry Bulk Density (g/cm^3)
MT18-1	14.8	1.80	---	---
MT18-2	19.5	1.67	---	---
MT18-3	18.9	1.67	---	---
MT18-4	16.1	1.71	---	---
MT18-5	14.8	1.82	---	---
MT18-6	16.6	1.71	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass
NR = Not requested
NA = Not applicable

Proctor Compaction Data

Job Name:	Alan Kuhn Associates, LLC	*Split (3/4", 3/8", #4):*	#4
Job Number:	DB18.1068.00	*Mass of coarse material* (g):	835.41
Sample Number:	MT18-1	*Mass of fines material* (g):	18547.93
Date/Time Sampled:	2/12/18 200	*Mold weight (g):*	4371
Site:	Mt. Taylor Mine	*Mold volume* (cm^3):	944.58
Test Date:	20-Feb-18	*Compaction Method:*	Standard A
		Preparation Method:	Dry
As Received Moisture Content (% g/g):	NA	*Type of Rammer:*	Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	6126	387.91	350.62	6.42	1.68	10.83
2	6214	374.41	333.20	6.41	1.73	12.61
3	6308	428.84	376.12	6.40	1.79	14.26
4	6318	450.30	386.56	6.46	1.77	16.77
5	6251	414.05	349.61	6.49	1.68	18.78

<u>Soil Fractions</u>

Coarse Fraction (% g/g): 4.3
Fines Fraction (% g/g): 95.7

<u>Properties of Coarse Material</u>

Assumed particle density (g/cm^3)*:* 2.65
Assumed Initial Moisture Content (% g/g): 0.0

<u>Oversize Corrected Values for Dry Bulk Density and Moisture Content</u>

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

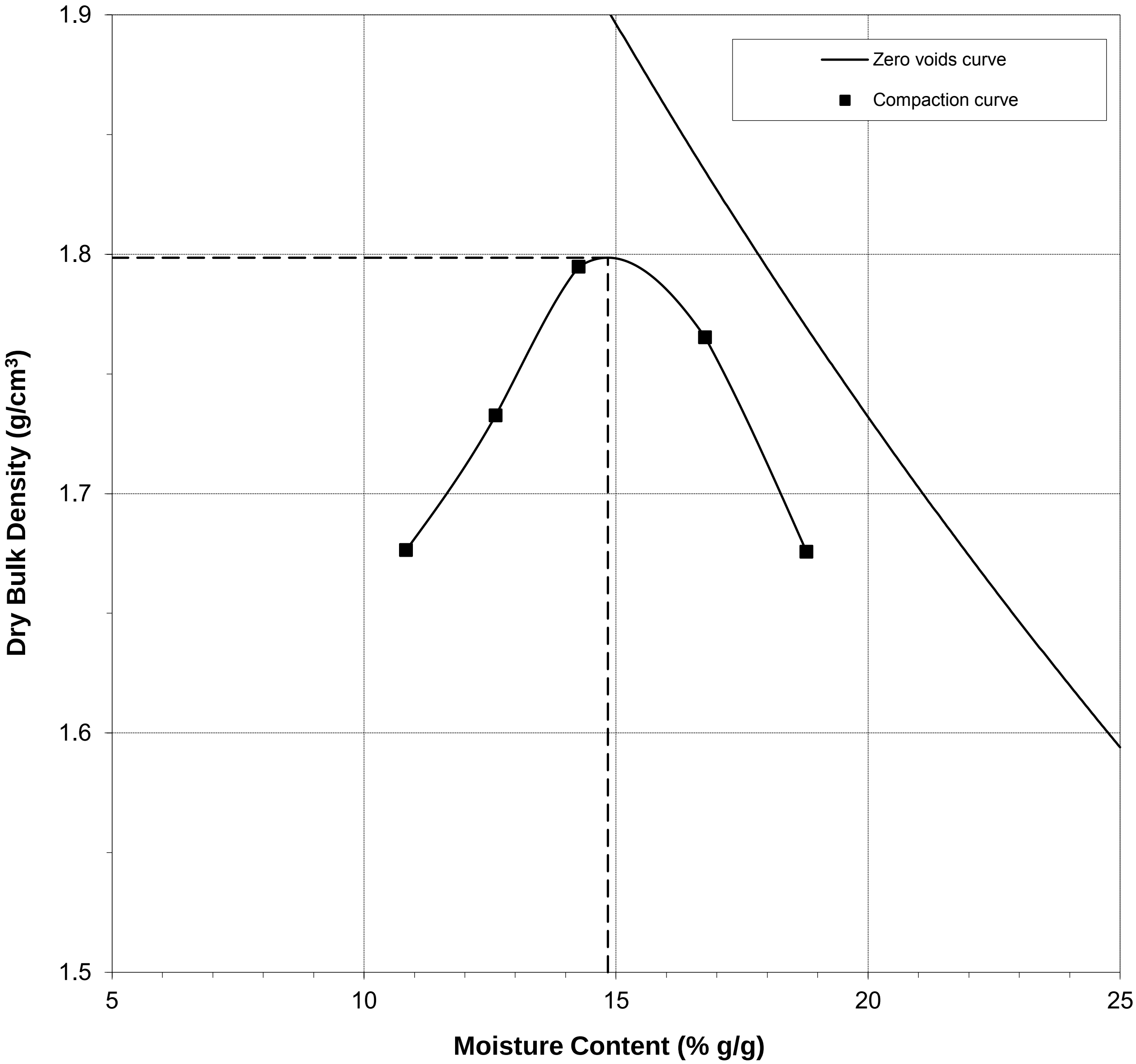
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: MT18-1

	Measured	Corrected
Optimum Moisture Content (% g/g):	14.8	---
Maximum Dry Bulk Density (g/cm^3):	1.80	---

Test Date: 20-Feb-18



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-2
Date/Time Sampled: 2/12/18 200
Site: Mt. Taylor Mine

Test Date: 20-Feb-18

As Received Moisture Content (% g/g): NA

Split (3/4", 3/8", #4): #4
Mass of coarse material (g): 318.65
Mass of fines material (g): 16858.66
Mold weight (g): 4371
Mold volume (cm^3): 944.58

Compaction Method: Standard A
Preparation Method: Dry
Type of Rammer: Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	6109	1071.11	968.15	286.64	1.60	15.11
2	6188	377.98	323.19	6.46	1.64	17.30
3	6251	982.59	865.84	267.97	1.67	19.53
4	6235	994.51	869.96	291.68	1.62	21.54
5	6173	1081.86	931.62	300.05	1.54	23.79

<u>Soil Fractions</u>

Coarse Fraction (% g/g): 1.9
Fines Fraction (% g/g): 98.1

<u>Properties of Coarse Material</u>

Assumed particle density (g/cm^3): 2.65
Assumed Initial Moisture Content (% g/g): 0.0

<u>Oversize Corrected Values for Dry Bulk Density and Moisture Content</u>

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

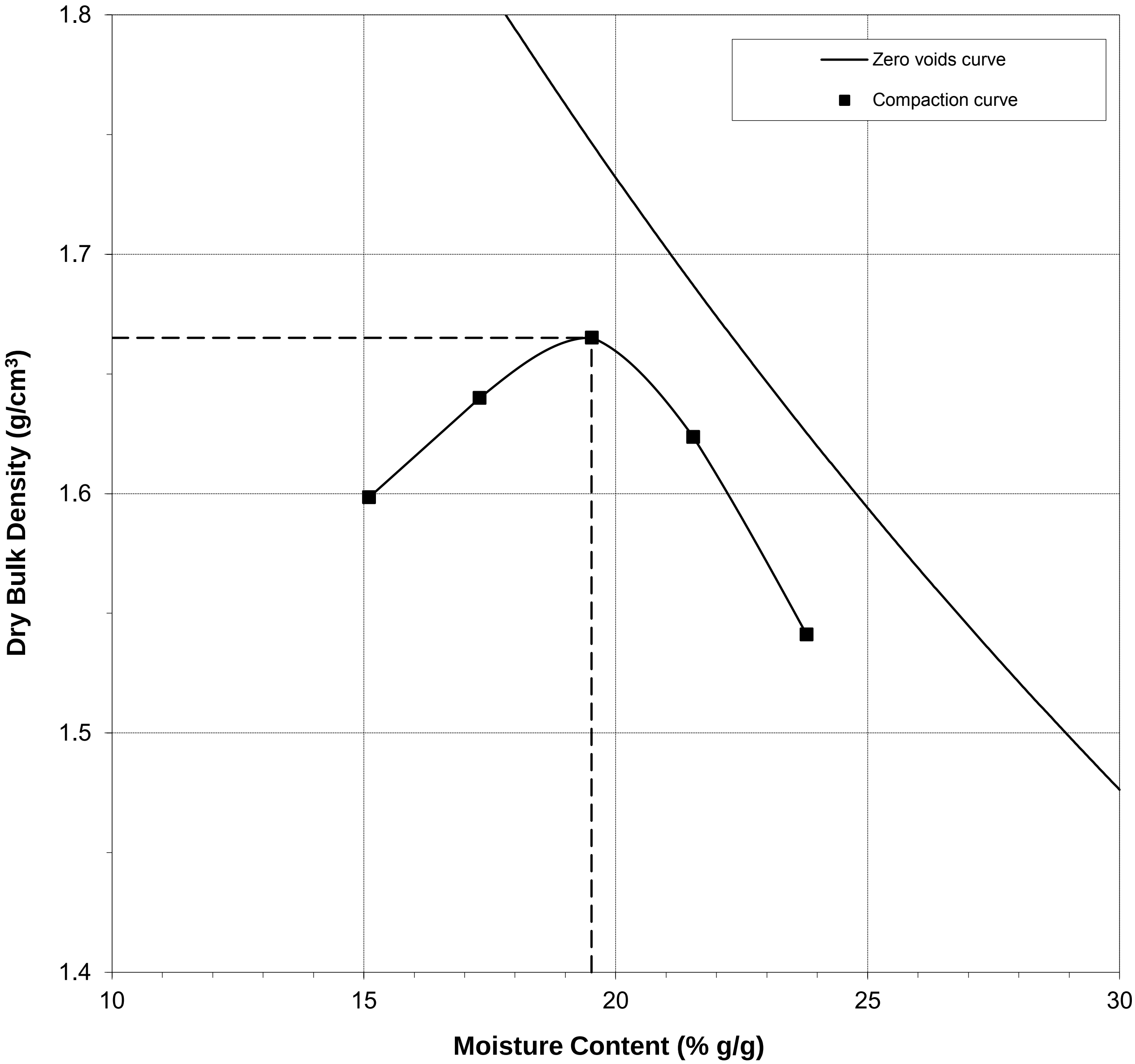
Daniel B. Stephens & Associates, Inc.

Proctor Compaction Data Points with Fitted Curve

Sample Number: MT18-2

	Measured	Corrected
Optimum Moisture Content (% g/g):	19.5	---
Maximum Dry Bulk Density (g/cm^3):	1.67	---

Test Date: 20-Feb-18



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data

Job Name:	Alan Kuhn Associates, LLC	*Split (3/4", 3/8", #4):*	#4
Job Number:	DB18.1068.00	*Mass of coarse material* (g):	324.04
Sample Number:	MT18-3	*Mass of fines material* (g):	18988.12
Date/Time Sampled:	2/12/18 200	*Mold weight (g):*	4371
Site:	Mt. Taylor Mine	*Mold volume* (cm^3):	944.58
Test Date:	20-Feb-18	*Compaction Method:*	Standard A
		Preparation Method:	Dry
As Received Moisture Content (% g/g):	NA	*Type of Rammer:*	Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	6065	420.69	371.02	6.43	1.58	13.62
2	6138	414.09	358.78	6.48	1.62	15.70
3	6237	405.08	342.80	6.44	1.67	18.52
4	6251	419.72	349.85	6.44	1.65	20.35
5	6190	438.43	359.10	6.48	1.57	22.50

Soil Fractions		Properties of Coarse Material	
Coarse Fraction (% g/g):	1.7	*Assumed particle density* (g/cm^3):	2.65
Fines Fraction (% g/g):	98.3	*Assumed Initial Moisture Content (% g/g):*	0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

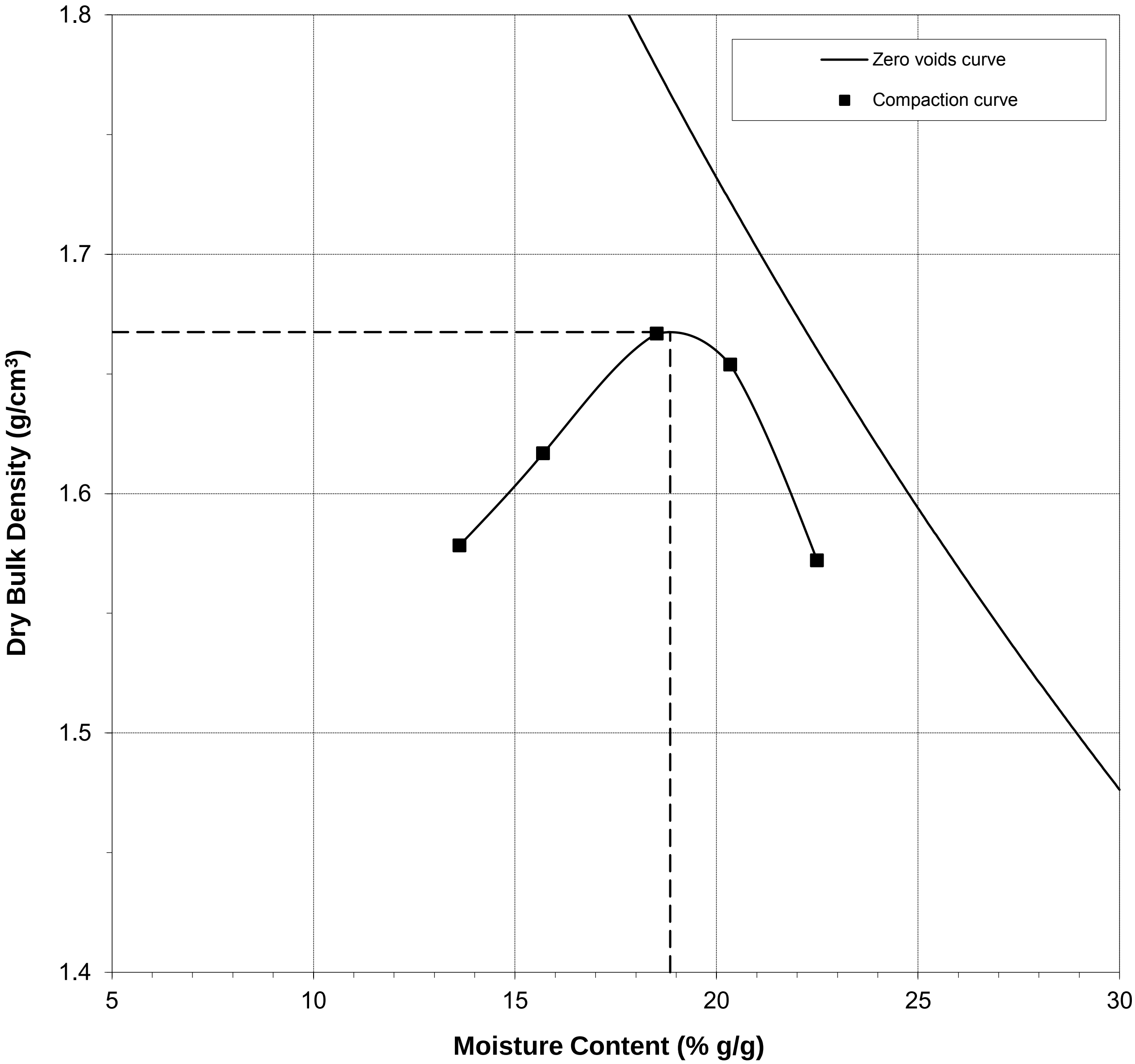
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: MT18-3

	Measured	Corrected
Optimum Moisture Content (% g/g):	18.9	---
Maximum Dry Bulk Density (g/cm^3):	1.67	---

Test Date: 20-Feb-18



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Proctor Compaction Data

Job Name:	Alan Kuhn Associates, LLC	*Split (3/4", 3/8", #4):*	#4
Job Number:	DB18.1068.00	*Mass of coarse material (g):*	299.75
Sample Number:	MT18-4	*Mass of fines material (g):*	16264.74
Date/Time Sampled:	2/12/18 215	*Mold weight (g):*	4371
Site:	Mt. Taylor Mine	*Mold volume (cm^3):*	944.58
Test Date:	20-Feb-18	*Compaction Method:*	Standard A
		Preparation Method:	Dry
As Received Moisture Content (% g/g):	NA	*Type of Rammer:*	Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	6087	352.86	316.48	6.48	1.63	11.74
2	6173	395.79	348.68	6.43	1.68	13.76
3	6251	338.54	292.50	6.45	1.71	16.10
4	6261	478.19	405.42	6.43	1.69	18.24
5	6231	463.94	387.84	6.47	1.64	19.95

<u>Soil Fractions</u>

Coarse Fraction (% g/g): 1.8
Fines Fraction (% g/g): 98.2

<u>Properties of Coarse Material</u>

Assumed particle density (g/cm^3): 2.65
Assumed Initial Moisture Content (% g/g): 0.0

<u>Oversize Corrected Values for Dry Bulk Density and Moisture Content</u>

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

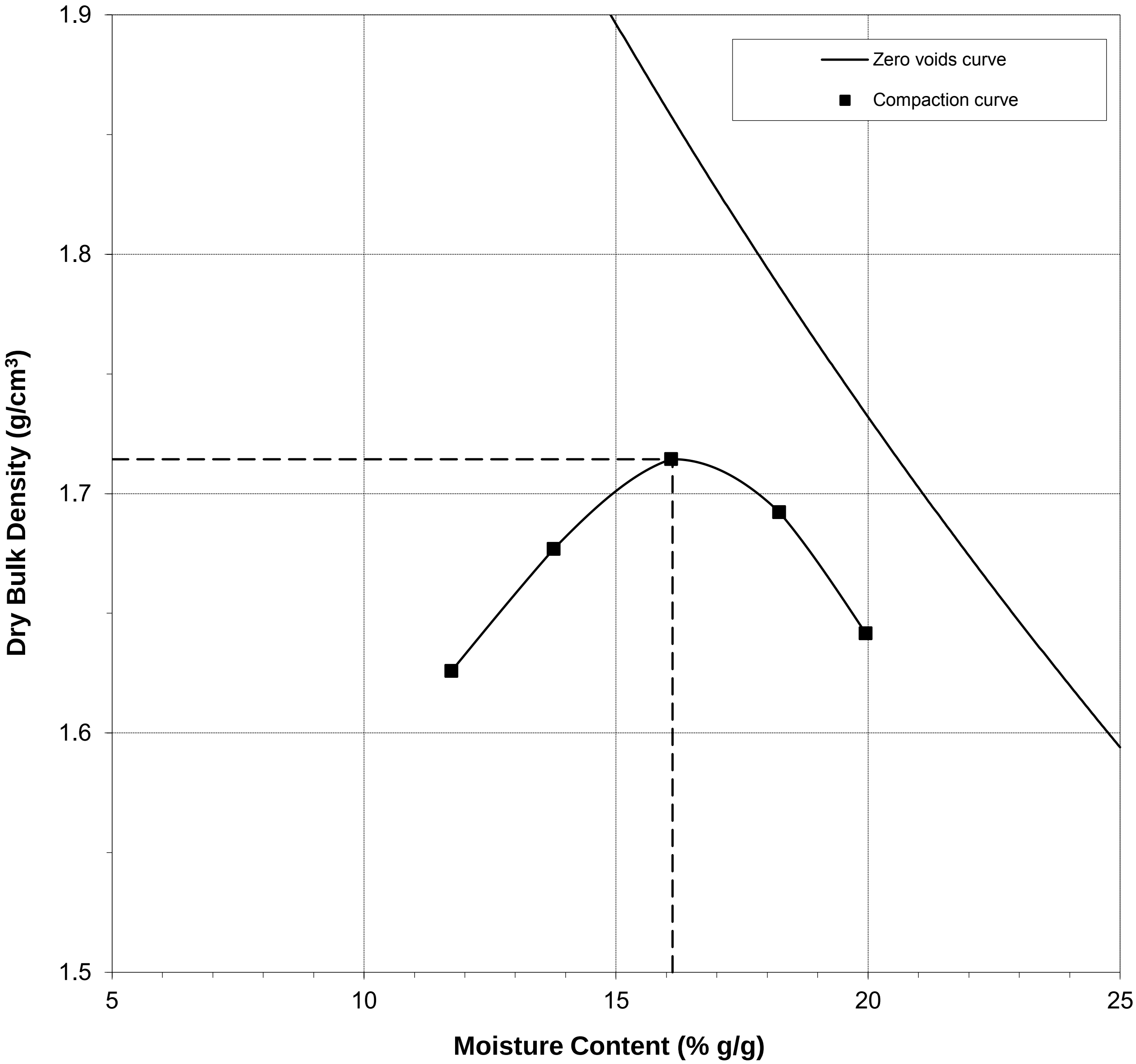
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: MT18-4

	Measured	Corrected
Optimum Moisture Content (% g/g):	16.1	---
Maximum Dry Bulk Density (g/cm^3):	1.71	---

Test Date: 20-Feb-18



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Daniel B. Stephens & Associates, Inc.

Proctor Compaction Data

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-5
Date/Time Sampled: 2/12/18 215
Site: Mt. Taylor Mine

Test Date: 19-Feb-18

As Received Moisture Content (% g/g): NA

Split (3/4", 3/8", #4): #4
Mass of coarse material (g)*:* 138.47
Mass of fines material (g)*:* 17772.68
Mold weight (g): 4371
Mold volume (cm^3)*:* 944.58

Compaction Method: Standard A
Preparation Method: Dry
Type of Rammer: Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	6050	346.71	314.13	6.48	1.61	10.59
2	6217	396.18	352.63	6.45	1.74	12.58
3	6343	400.09	349.22	6.45	1.82	14.84
4	6275	388.08	332.84	6.46	1.72	16.93
5	6236	385.97	325.39	6.49	1.66	19.00

Soil Fractions

Coarse Fraction (% g/g): 0.8
Fines Fraction (% g/g): 99.2

Properties of Coarse Material

Assumed particle density (g/cm^3)*:* 2.65
Assumed Initial Moisture Content (% g/g): 0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

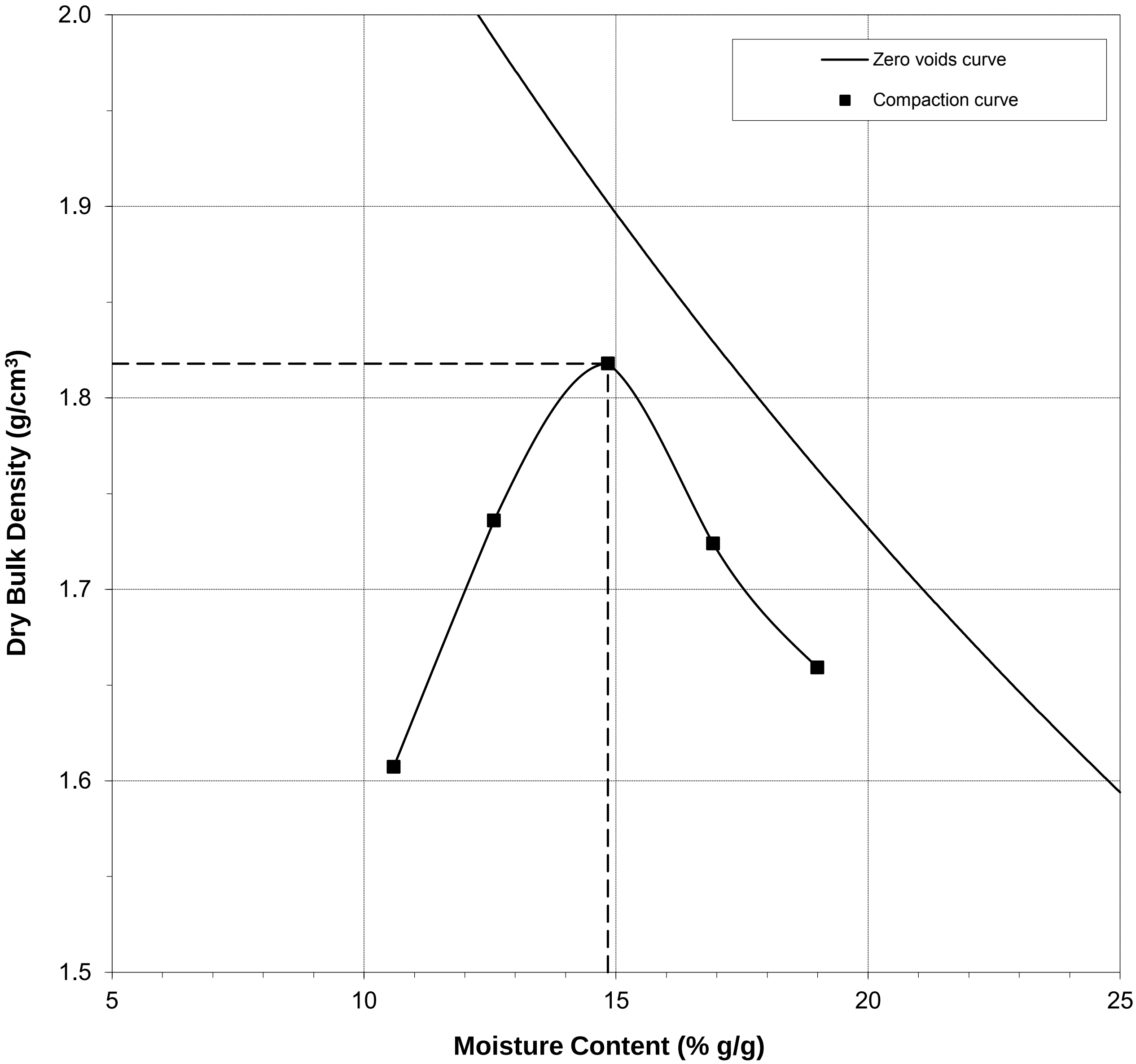
Daniel B. Stephens & Associates, Inc.

Proctor Compaction Data Points with Fitted Curve

Sample Number: MT18-5

	Measured	Corrected
Optimum Moisture Content (% g/g):	14.8	---
Maximum Dry Bulk Density (g/cm^3):	1.82	---

Test Date: 19-Feb-18



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data

Job Name: Alan Kuhn Associates, LLC
Job Number: DB18.1068.00
Sample Number: MT18-6
Date/Time Sampled: 2/12/18 225
Site: Mt. Taylor Mine

Test Date: 19-Feb-18

As Received Moisture Content (% g/g): NA

Split (3/4", 3/8", #4): #4
Mass of coarse material (g)*:* 136.67
Mass of fines material (g)*:* 16991.63
Mold weight (g): 4371
Mold volume (cm^3)*:* 944.58

Compaction Method: Standard A
Preparation Method: Dry
Type of Rammer: Mechanical

Trial	Weight of Mold and Compacted Soil (g)	Weight of Container and Wet Soil (g)	Weight of Container and Dry Soil (g)	Weight of Container (g)	Dry Bulk Density (g/cm^3)	Moisture Content (% g/g)
1	6097	339.47	303.30	6.45	1.63	12.18
2	6173	322.65	282.94	6.47	1.67	14.36
3	6250	376.06	324.54	6.49	1.71	16.20
4	6265	356.51	302.47	6.46	1.70	18.26
5	6233	366.19	304.79	6.42	1.63	20.58

Soil Fractions

Coarse Fraction (% g/g): 0.8
Fines Fraction (% g/g): 99.2

Properties of Coarse Material

Assumed particle density (g/cm^3)*:* 2.65
Assumed Initial Moisture Content (% g/g): 0.0

Oversize Corrected Values for Dry Bulk Density and Moisture Content

Trial	Dry Bulk Density of Composite (g/cm^3)	Moisture Content of Composite (% g/g)
1	---	---
2	---	---
3	---	---
4	---	---
5	---	---

--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

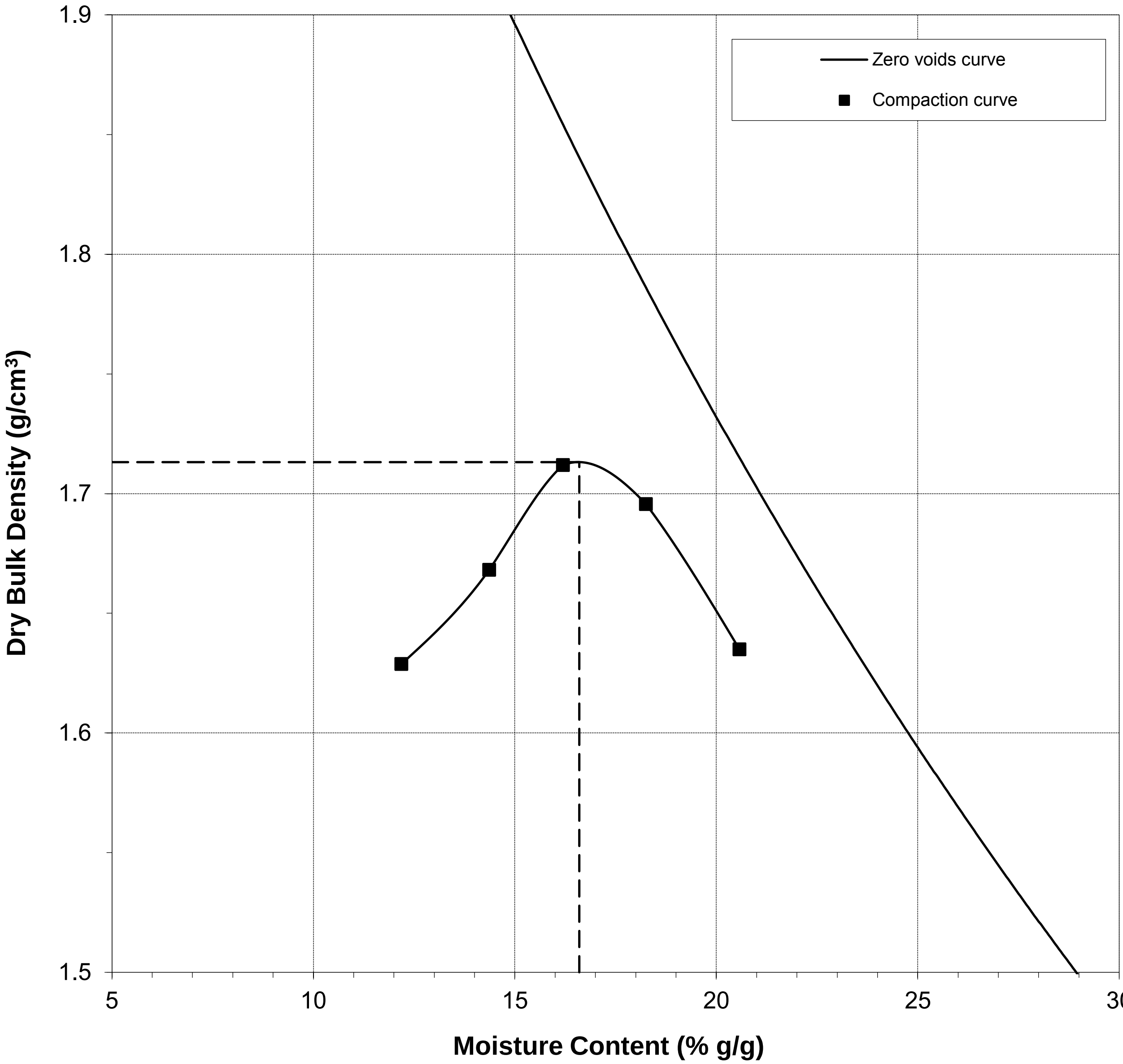
Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Proctor Compaction Data Points with Fitted Curve

Sample Number: MT18-6

	Measured	Corrected
Optimum Moisture Content (% g/g):	16.6	---
Maximum Dry Bulk Density (g/cm^3):	1.71	---

Test Date: 19-Feb-18



--- = Oversize correction is unnecessary since coarse fraction < 5% of composite mass

Laboratory analysis by: D. O'Dowd
Data entered by: D. O'Dowd
Checked by: J. Hines

Laboratory Tests and Methods

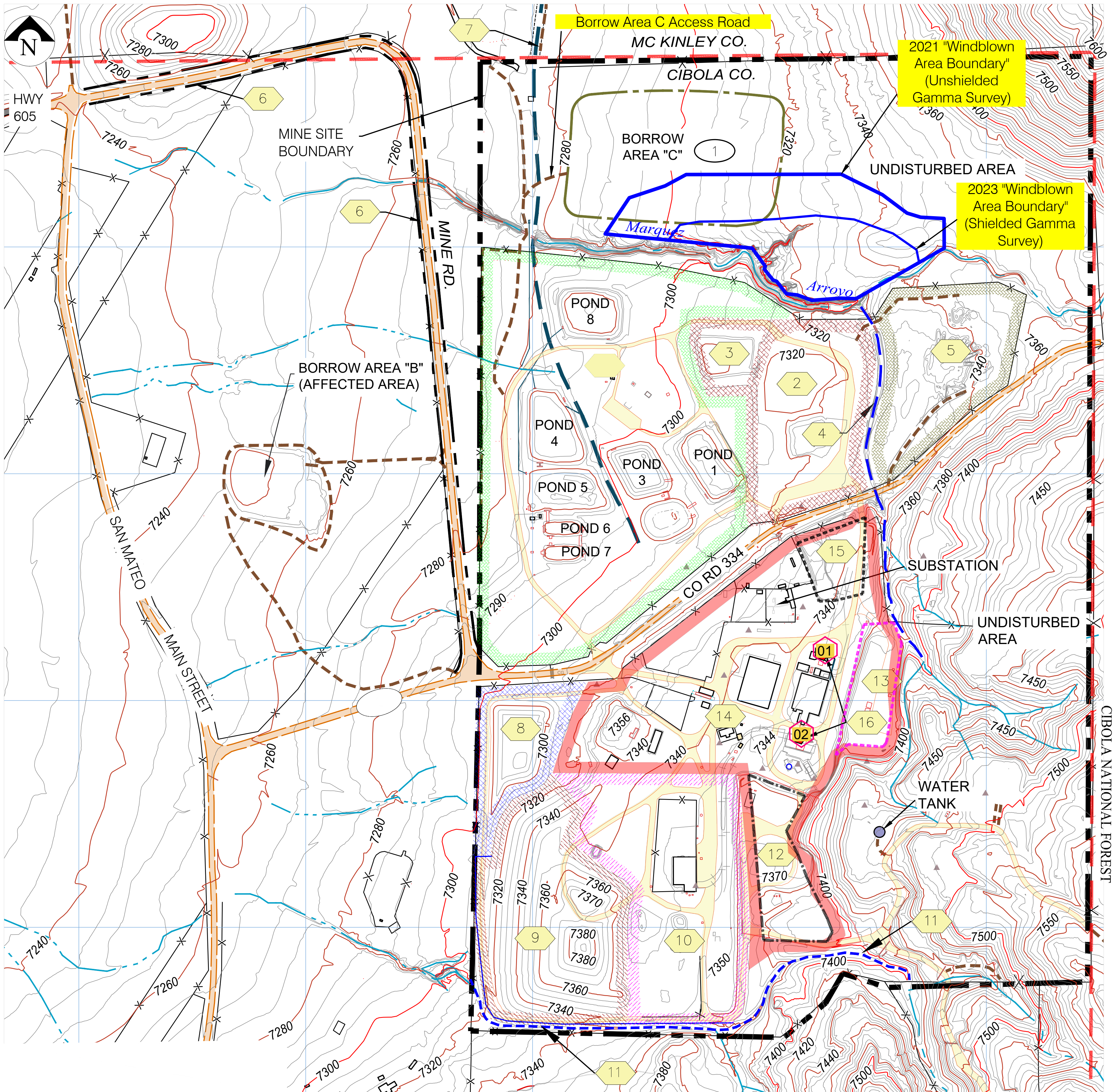
Tests and Methods

Dry Bulk Density:	ASTM D7263
Moisture Content:	ASTM D7263, ASTM D2216
Calculated Porosity:	ASTM D7263
Saturated Hydraulic Conductivity: Falling Head Rising Tail: (Flexible Wall)	ASTM D5084
Hanging Column Method:	ASTM D6836 (modified apparatus)
Pressure Plate Method:	ASTM D6836 (modified apparatus)
Water Potential (Dewpoint Potentiometer) Method:	ASTM D6836
Relative Humidity (Box) Method:	Campbell, G. and G. Gee. 1986. Water Potential: Miscellaneous Methods. Chp. 25, pp. 631-632, in A. Klute (ed.), Methods of Soil Analysis. Part 1. American Society of Agronomy, Madison, WI; Karathanasis & Hajek. 1982. Quantitative Evaluation of Water Adsorption on Soil Clays. SSA Journal 46:1321-1325
Moisture Retention Characteristics & Calculated Unsaturated Hydraulic Conductivity:	ASTM D6836; van Genuchten, M.T. 1980. A closed-form equation for predicting the hydraulic conductivity of unsaturated soils. SSSAJ 44:892-898; van Genuchten, M.T., F.J. Leij, and S.R. Yates. 1991. The RETC code for quantifying the hydraulic functions of unsaturated soils. Robert S. Kerr Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Ada, Oklahoma. EPA/600/2091/065. December 1991
Particle Size Analysis:	ASTM D7928, ASTM D6913
USCS (ASTM) Classification:	ASTM D7928, ASTM D6913, ASTM D2487
USDA Classification:	ASTM D7928, ASTM D6913, USDA Soil Textural Triangle
Atterberg Limits:	ASTM D4318
Visual-Manual Description:	ASTM D2488
Standard Proctor Compaction:	ASTM D698

Response No. 22 Attachment

Figure 1-2 (Modified)

(Appendix D)



MINE UNITS AND OTHER AREAS

1	MINE WATER TREATMENT AREA	9	EXISTING WASTE ROCK PILE / DISPOSAL CELL
2	ORE PAD	10	DISPOSAL CELL EXPANSION AREA
3	ORE PAD RUNOFF RETENTION POND	11	SOUTH DIVERSION CHANNEL
4	NORTH DIVERSION CHANNEL	12	COMPRESSOR BENCH AREA
5	BORROW AREA "A"	13	CHILLER BENCH AREA
6	MINE ACCESS ROAD	14	SERVICE AND SUPPORT AREA
7	TREATED WATER DISCHARGE PIPELINE	15	OLD ORE LOADING AREA
8	SOUTH STORM WATER POND	01 16	MINE SHAFTS

LEGEND

- MINE SITE BOUNDARY
- SECTION 24 BOUNDARY
- PUBLIC GRAVEL ROADS
- MINE GRAVEL ROADS
- DIRT / RANCH ROADS
- MINE BUILDINGS (PRIOR TO REMOVAL ACTIVITIES)
- 20' CONTOURS
- 5' CONTOURS
- DRAINAGE PATHWAYS

NOTES:

1 BORROW AREA "C" IS A POTENTIAL SOURCE OF ADDITIONAL CLEAN FILL SOILS IF NEEDED

GENERAL NOTES:

G.1 THE MINE PERMIT AREA INCLUDES THE RIGHT OF WAY ALONG THE TREATED WATER DISCHARGE PIPELINE AND A 50' WIDE CORRIDOR FOR AN ACCESS ROAD. (SEE FIGURE 1-3)

G.2 AFFECTED AREAS INCLUDE BUT ARE NOT LIMITED TO BORROW AREA "B". EVALUATION OF OTHER POSSIBLE AFFECTED AREAS IS ONGOING.

G.3 THIS DRAWING SHOWS THE SITE CONDITIONS AS OF APRIL 2022. SEE FIGURE 1-2B AND TABLE 4.2 FOR DETAILED FACILITY DISPOSITION INFORMATION.

G.4 TOPOGRAPHY BASED ON A 2012 AERIAL SURVEY BY THOMAS R. MANN AND ASSOCIATES AND 2021 SURVEYS BY SOUTHWEST SURVEYING SOLUTIONS (S3).

RIO GRANDE RESOURCES CORP.
MOUNT TAYLOR MINE - *San Mateo, NM*

FIGURE 1-2
MINE SITE AND AFFECTED AREAS

Response No. 22 Attachment

Surface and Subsurface Soil Radiologic Characterization, Windblown Area, Data Tables and Map

AVM, 2023

Figure 2
Mt. Taylor Mine Site
Windblown and Ore Pad Area Soil Sample/Test Pit Locations
and April 2023 Surface Gamma Scan Survey

AVM Environmental Services, Inc.

Legend

Ra-226 pCi/g

- <1.8 pCi/g
- 1.9 - 6.8 pCi/g
- 6.9 - 10.0 pCi/g
- 10.1 - 20.0 pCi/g
- 20.1 - 30.0 pCi/g
- 30.1 - 40.0 pCi/g
- >40.1 pCi/g
- North Controlled Fence
- Soil Radiologic Characterization Area
- Soil Sample/Test Pit (>6.8 Ra-226 pCi/g RCC Depth) Location

Note: Ra-226 pCi/g is determined from surface soil gamma radiation scan using 2x2 NaI detector and Site specific gamma radiation level (cpm) correlation.

Table 2
Static Gamma Radiation Survey at Soil Sampling/Test Pit Locations

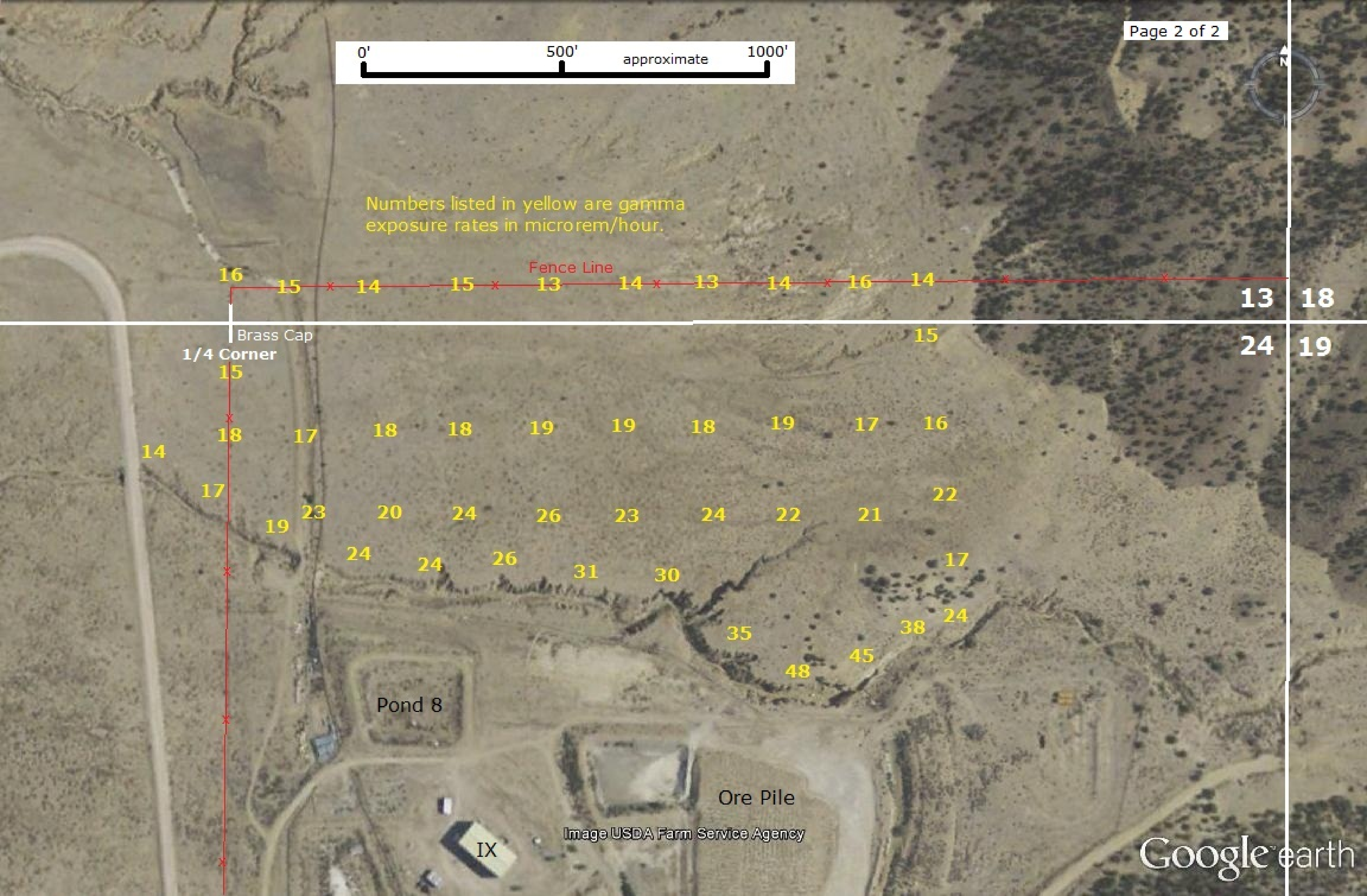
Survey Date	Survey Point ID/Description	Survey Point Coordinate NAD83 StatePlane NM West, Feet		Static Gamma Radiation Survey: Bare 2x2 NaI Detector		Static Gamma Radiation Survey: Collimated (0.5" Pb) 2x2 NaI Detector		Gamma Exposure Rate µR/hr
		Northing	Easting	CPM	Estimated Ra-226 pCi/g	CPM	Estimated Ra-226 pCi/g	
05/17/23	WBSB-01	1,581,413	2,782,866	26,897	6.1	6,297	1.7	33
05/17/23	WBSB-02	1,581,390	2,782,444	26,749	6.1	6,350	1.7	33
05/17/23	WBSB-03	1,581,356	2,783,329	24,529	4.9	6,073	1.3	31
05/17/23	WBSB-04	1,581,339	2,782,706	30,064	7.7	6,069	1.3	37
05/17/23	WBSB-05	1,581,329	2,783,062	31,828	8.6	6,945	2.7	41
05/17/23	WBSB-06	1,581,271	2,782,942	35,410	10.4	7,288	3.3	47
05/17/23	WBSB-07	1,581,187	2,783,253	37,965	11.7	8,183	4.7	47
05/17/23	WBSB-08	1,581,164	2,782,988	55,849	20.6	11,042	9.3	70
05/31/23	WBSB-09	1,581,254	2,782,870	36,491	10.9	6,599	2.1	44
05/31/23	WBSB-10	1,581,263	2,783,140	34,898	10.1	7,286	3.2	48
05/31/23	WBSB-11	1,581,277	2,783,335	29,002	7.2	6,602	2.2	34
05/31/23	WBSB-12	1,581,228	2,782,908	40,341	12.9	7,153	3.0	55
05/31/23	OPSB-01	1,580,834	2,782,884	2,328,550	1157	716,621	1138	2,100
05/31/23	OPSB-02	1,580,812	2,783,138	505,097	245	160,357	248	650
05/31/23	OPSB-03	1,580,599	2,783,013	700,063	343	247,434	387	900
05/31/23	OPSB-04	1,580,328	2,782,874	408,698	197	133,199	205	450
05/31/23	OPSB-05	1,580,386	2,783,136	446,083	216	156,044	241	450
05/30/23	MCSB-01	1,579,585	2,783,019	35,807	10.6	10,538	8.5	41
05/30/23	MCSB-02	1,579,573	2,783,167	34,096	9.7	9,678	7.1	39
05/30/23	MCSB-03	1,579,343	2,782,883	34,019	9.7	9,832	7.3	39
05/30/23	MCSB-04	1,579,317	2,783,098	34,656	10.0	10,811	8.9	40
05/24/23	MCSB-05	1,579,183	2,782,702	52,231	18.8	14,892	15	65
05/24/23	MCSB-06	1,579,162	2,783,064	31,976	8.7	8,548	5.3	37
05/24/23	MCSB-07	1,579,040	2,783,010	52,974	19.2	18,511	21	65
05/23/23	MCSB-08	1,578,849	2,782,249	107,010	46.2	39,626	55.0	125
05/23/23	MCSB-09	1,578,850	2,782,582	28,188	6.8	8,193	4.7	33
05/23/23	MCSB-10	1,578,758	2,782,444	39,814	12.6	12,984	12	43
05/22/23	MCSB-11	1,578,611	2,782,258	53,106	19.2	18,055	20	60
05/22/23	MCSB-12	1,578,521	2,782,569	29,299	7.3	9,090	6.1	33
05/22/23	MCSB-13	1,578,301	2,782,557	21,952	3.7	6,254	1.6	25
05/23/23	MCSB-14	1,578,278	2,782,258	21,642	3.5	6,366	1.8	25
05/18/23	MCSB-15	1,578,214	2,782,398	48,059	16.7	15,633	17	51
05/18/23	MCSB-16	1,578,084	2,782,313	30,445	7.9	11,069	9.3	33
05/18/23	MCSB-17	1,578,085	2,782,599	18,059	1.7	5,891	1.0	19
05/18/23	MCSB-18	1,578,071	2,782,424	17,170	1.3	5,046	<0.6	19
05/31/23	MCSB-19	1,578,837	2,782,317	69,850	27.6	24,522	31	80
05/31/23	MCSB-20	1,578,650	2,782,298	55,167	20.3	18,497	21	65

Table 3
Windblown Area Surface and Subsurface Soil Sample Field Ex-Situ Gamma Screening and Vendor Laboratory Results Summary

Sampling Data					Field Soil Screening Data							Laboratory Data			
Sample ID	Sample Depth (ft)	Sample Date	Sample Time	Description	Screen Date	Sample Weight grams	609 (559-669) Kev Gross Counts CP5M	CPM	6.6 pCi/g Ra-226 Reference Soil CPM	Soil Gamma Screening Estimated Ra-226 pCi/g	SSL (< or >)	Sample Sent to Lab	Ra-226 pCi/g	Error Estimate pCi/g	MDC pCi/g
WBSB-01 0-6"	0.5	5/17/2023	855	Light brown alluvium, sandy-loam	5/17/2023	3000	1406	281	536	2.5	<	Y	0.9	0.1	0.1
WBSB-01 1'-1.5'	1.5	5/17/2023	906	Brown silty clay	5/17/2023	3000	1244	249	536	2.1	<	N	-	-	-
WBSB-02 0-6"	0.5	5/17/2023	815	Light brown alluvium, sandy-loam	5/17/2023	3000	1577	315	536	3.0	<	Y	1.5	0.1	0.1
WBSB-02 1'-1.5'	1.5	5/17/2023	820	Brown silty clay	5/17/2023	2958	1008	204	536	1.5	<	N	-	-	-
WBSB-03 0-6"	0.5	5/17/2023	942	Light brown alluvium, sandy-loam	5/17/2023	3000	2039	408	536	4.3	<	Y	3.2	0.2	0.1
WBSB-03 1'-1.5'	1.5	5/17/2023	948	Brown silty clay	5/17/2023	3000	1136	227	536	1.8	<	N	-	-	-
WBSB-04 0-6"	0.5	5/17/2023	835	Light brown alluvium, sandy-loam	5/17/2023	3000	1521	304	536	2.9	<	Y	1.5	0.1	0.1
WBSB-04 1'-1.5'	1.5	5/17/2023	845	Brown silty clay	5/17/2023	2840	1189	251	536	2.1	<	N	-	-	-
WBSB-05 0-6"	0.5	5/17/2023	920	Light brown alluvium, sandy-loam	5/17/2023	3000	1747	349	536	3.5	<	Y	2.1	0.2	0.1
WBSB-05 1'-1.5'	1.5	5/17/2023	930	Brown silty clay	5/17/2023	2835	1086	230	536	1.8	<	N	-	-	-
WBSB-06 0-6"	0.5	5/17/2023	1054	Light brown alluvium, sandy-loam	5/17/2023	3000	1406	281	536	2.5	<	Y	1.3	0.1	0.1
DSSB-01			WBSB-06 0-6" Field QA/QC Duplicate								<	Y	1.1	0.1	0.1
WBSB-06 1'-1.5'	1.5	5/17/2023	1100	Brown silty clay	5/17/2023	2876	1004	209	536	1.5	<	N	-	-	-
WBSB-07 0-6"	0.5	5/17/2023	1014	Light brown alluvium, sandy-loam	5/17/2023	3000	2272	454	536	5.0	≤	Y	3.7	0.2	0.1
WBSB-07 1'-1.5'	1.5	5/17/2023	930	Brown silty clay	5/17/2023	3000	1082	216	536	1.6	<	N	-	-	-
WBSB-08 0-6"	0.5	5/17/2023	1034	Light brown alluvium, sandy-loam	5/17/2023	3000	4140	828	536	10.2	>	Y	9.7	0.3	0.2
WBSB-08 1'-1.5'	1.5	5/17/2023	1042	Brown silty clay	5/17/2023	3000	1118	224	536	1.7	<	Y	0.9	0.1	0.1
WBSB-09 0-6"	0.5	5/31/2023	825	Light brown alluvium, sandy-loam	5/31/2023	3000	1393	279	536	2.5	<	Y	1.2	0.1	0.1
WBSB-09 6-12"	1	5/31/2023	835	Brown silty clay	5/31/2023	3000	1170	234	536	1.9	<	N	-	-	-
WBSB-10 0-6"	0.5	5/31/2023	910	Light brown alluvium, sandy-loam	5/31/2023	3000	2217	443	536	4.8	<	Y	3.5	0.2	0.1
WBSB-10 6-12"	1	5/31/2023	915	Brown loam/roots	5/31/2023	3000	1380	276	536	2.5	<	N	-	-	-
WBSB-11 0-6"	0.5	5/31/2023	935	Light brown alluvium, sandy-loam	5/31/2023	3000	1959	392	536	4.1	<	Y	2.7	0.2	0.1
WBSB-11 6-12"	1	5/31/2023	940	Sandstone/sand	5/31/2023	2008	1053	315	536	3.0	<	N	-	-	-
WBSB-12 0-1"	0.08	5/31/2023	850	Light brown alluvium, sandy-loam	5/31/2023	3000	1736	347	536	3.5	<	Y	2.0	0.2	0.1
WBSB-12 2-6"	0.5	5/31/2023	900	Brown loam/ sandy	5/31/2023	3000	1117	223	536	1.7	<	Y	1.0	0.1	0.1

Response No. 22 Attachment

2012 Gamma Survey (Exposure Rate, uR/Hr) of the Windblown Area



0'
500'
approximate
1000'
N
Numbers listed in yellow are gamma exposure rates in microrem/hour.
Fence Line
16
15
14
15
13
14
13
14
16
14
13
18
24
19
Brass Cap
1/4 Corner
15
15
14
18
17
18
18
19
19
18
19
17
16
17
19
23
20
24
26
23
24
22
21
22
24
24
26
31
30
17
35
38
24
45
48
Pond 8
Ore Pile
IX
Image USDA Farm Service Agency
Google earth

Response No. 50 Attachment

Table 4.4 Seed Mix: Selected Species and Planting Rates

Table 4.4[1] Seed Mix: Selected Species and Planting Rates

1. Western wheatgrass *(Agropyron smithii)* - Rate: 6 PLS/ft^2
   Cool season native perennial grass, reproduces from seeds and rhizomes, growth starts when daytime temperatures reach 12-13 C, grows in dry, rocky soils.
2. Winterfat *(Ceratoides /anata)* - Rate: 2 PLS/ft^2
3. Blue grama, Galleta, Spike Muhly *(Boute/oua gracilis)** - Rate: 6.0-6.5 PLS/ft^2
   Warm season native perennial grass, reproduces from seed, tillers, and rhizomes, growth starts May- June, and grows on rock slopes.
4. Vine Mesquite – Rate: 2 PLS/ft^2
5. Alkali Sacaton *(Sporobolus airoides)* - Rate: 3 PLS/ft^2
6. Rabbitbrush, Sanfoin – Rate: 2 PLS/ft^2
7. Fourwing saltbush *(Atriplex canescens)* - Rate: 2 PLS/ft^2
   Evergreen native perennial shrub, reproduces from seeds, grows on grassy uplands, excellent reclamation species.
8. Forb-(Globemallow) *(Sphaeralcea fend/en)* - Rate: 2 PLS/ft^2
9. Forb-(Narrowleaf Penstemon) *(Penstemon angustifo/ia)* - Rate: 2 PLS/ft^2
10. Bottlebrush Squirreltail - Rate: 2 PLS/ft^2
11. Other-(Perennial flower mix) as available, African Daisy, Cornflower, Perennial Gaillardia, Annual Gaillardia, Black-eyed Susan, Evening Primrose, Baby's Breath, Sweet William, Blue Flax, Shasta Daisy, Sweet Alyssum, Corn Poppy, California Poppy, Catchfly, Wall Flower, Siberian, Rocky Mtn. Penstemon, Prairie Coneflower, Spurred Snapdragon, Plains Coneflower, Purple Coneflower - Rate: 6-8 lb./acre

* Black grama may be substituted for these species. Other variations and substitutions may be made based on cost and availability of seed at the time of closeout.

All seed must be certified, weed-free, and each bag must have attached to it a complete label with certification information. Seed labels or copies of seed labels will be submitted to MMD within 90-calendar days after seeding.

Note 1: Table Revised October 31, 2023

Response No. 50 Attachment

2012 Soil Data and Maps for Borrow Area C

(Appendix F)

Table F.1[1] Seed Mix: Selected Species and Planting Rates

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1. Cool Season Grass-Western wheatgrass *(Agropyron smithii)* - Rate: 6 PLS/ft^2
2. Forb-Winterfat *(Ceratoides /anata)* - Rate: 2 PLS/ft^2
3. Warm Season Grass-Blue grama, Galleta, Spike Muhly *(Boute/oua gracilis)* - Rate: 6.0-6.5 PLS/ft^2*****
4. Warm Season Grass-Vine Mesquite - Rate: 2 PLS/ft^2
5. Warm Season Grass-Alkali Sacaton *(Sporobolus airoides)* - Rate: 3 PLS/ft^2
6. Forb-Rabbitbrush, Sanfoin – Rate: 2 PLS/ft^2
7. Forb-Fourwing saltbush *(Atriplex canescens)* - Rate: 2 PLS/ft^2
8. Forb-(Globemallow) *(Sphaeralcea fend/en)* - Rate: 2 PLS/ft^2
9. Forb-(Narrowleaf Penstemon) *(Penstemon angustifo/ia)* - Rate: 2 PLS/ft^2
10. Cool Season Grass-Bottlebrush Squirreltail - Rate: 2 PLS/ft^2
11. Other-(Perennial flower mix) as available, African Daisy, Cornflower, Perennial Gaillardia, Annual Gaillardia, Black-eyed Susan, Evening Primrose, Baby's Breath, Sweet William, Blue Flax, Shasta Daisy, Sweet Alyssum, Corn Poppy, California Poppy, Catchfly, Wall Flower, Siberian, Rocky Mtn. Penstemon, Prairie Coneflower, Spurred Snapdragon, Plains Coneflower, Purple Coneflower - Rate: 6-8 lb./acre

* Black grama may be substituted for these species. Other variations and substitutions may be made based on cost and availability of seed at the time of closeout.

All seed must be certified, weed-free, and each bag must have attached to it a complete label with certification information. Seed labels or copies of seed labels will be submitted to MMD within 90-calendar days after seeding.

Note 1: Table Revised October 31, 2023