Department of Energy
Washington, DC 20585

June 14, 2016

40-8902

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Deputy Director
Mail Stop T8-F5
Washington, DC 20555-0001

Subject: *Addendum to the approved Effects of Soil-Forming Processes on Cover Engineering Properties, Field Work Plan, Bluewater, New Mexico, Disposal Site*

Dear Mr. Parrot:

Enclosed is an Addendum to the previously approved field work plan for the joint U.S. Nuclear Regulatory Commission (NRC) /U.S. Department of Energy Office of Legacy Management (DOE-LM) cover study planned for the Bluewater, New Mexico, Disposal Site. This Addendum was the topic of the conference call held on June 2, 2016 between NRC, DOE-LM, and Navarro Research and Engineering. The Addendum and conference call pertained to original Bluewater disposal site cover design specifications, and the planned cover restoration approach in this study.

Please contact me at (970) 248-6073 if you have any questions. Please address any correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,

Richard P. Bush
UMTRCA Program Manager

Enclosure

cc w/enclosure:
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Sites\Bluewater\6-14-16 Bluewater Field Work Plan Addendum A (NRC).docx

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Appendixes

Addendum

Addendum A

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Addendum A

This addendum pertains primarily to *Effects of Soil-Forming Processes on Cover Engineering Properties, Field Work Plan Bluewater Disposal Site, New Mexico*, Section 1.2.10, "Repair the Radon Barrier (LMS Team, Geotechnical Subcontractor)." The plan is to follow the work plan as written. However, this addendum provides some additional detail and a path forward if meeting some of the original radon-barrier construction design specifications (primarily moisture content and/or compaction density) is not possible during cover restoration.

During cover restoration at the project's first study site (Falls City, Texas) in April 2016, measured moisture contents generally averaged about 5% lower than the optimal range in the specifications. Additional moisture and reworking did not improve that value, but rather degraded the soil structure. It was, however, possible to recondition and compact the disturbed radon-barrier to approximately the same in situ moisture contents and densities measured adjacent to the excavations. Moisture deficiencies in the restorations at Falls City prompted an internal fact finding effort with corrective actions. It was suspected that the localized forces and energy used by compaction equipment over a small area (approximately 1 m^2) exceeded the standard proctor range measured for that material. A corrective action was to develop a contingency plan or path forward to address the potential of moisture and density deficiencies before beginning additional similar work at other sites. Subsequent steps for the Bluewater Site were proposed and discussed via a conference call with site and task leads and subject matter experts from DOE, NRC, and LMS (Navarro Research and Engineering) on June 2, 2016. Conference call participants are listed below:

LMS	DOE	NRC
David Dander (Task Lead)	Debbie Barr (Site Lead)	Mark Fuhrmann (Project Lead)
Dick Johnson (Bluewater Site Lead)	Rich Bush (Program Manager)	Jack Parrot (Site Lead)
Mike Widdop (Falls City Site Lead)		Tom Nicholson (Sr. Level Advisor)
Dan Nordeen (Engineer)		Zahira Cruz (Geotechnical Engineer)

The following steps are now planned at the Bluewater site prior to and during post-study cover restoration to address potential conditions that may be encountered during efforts to meet the original design specification.

(1) During the initial day of radon-cover excavations the designated geotechnical testing subcontractor will perform at least one correlation dry-density and moisture-content test using Nuclear Methods (ASTM D-2922) and Sand Cone Method (ASTM D-1556). The subcontractor will then collect field samples to conduct laboratory tests that include (1) a standard proctor (ASTM D-698), (2) a modified proctor (ASTM D-1557), and (3) perform 3-5 in-situ dry density and initial moisture content tests on the undisturbed radon barrier.

(2) Once proctor results are available and field compaction testing on the first 12" thick lifts at 2 or 3 locations are completed, a conference call will be conducted to discuss the results of the field measurements and to determine the best path forward with respect to the remaining cover restoration. The call will include LMS (project engineer, field and site leads) as well as DOE and NRC representatives able to evaluate and concur, or non-concur, with any proposed field changes that may be necessary. If the initial tests show good correlation between the two methods and compaction of the initial 12" lifts pass the minimum requirements based on the standard proctor then cover restoration may

continue as specified in the original cover design. Conversely, if problems occur with correlation between the compaction test methods or compaction tests fail either in the dry density or moisture content region then the team will discuss the best path forward to restore the cover to satisfactory conditions.

(3) Cover restoration will continue using hand-held mechanical compaction equipment such as a jumping jack–style compactor on all subsequent 12-inch loose lifts per the original construction specifications unless otherwise specified by field changes agreed to as discussed above. The restored lifts will be tested using either a sand cone method (ASTM D-1556) or nuclear gauge method (ASTM D-2922/D-3017) if correlations agree or per the field change agreement as discussed above.

(4) Radon-barrier compaction testing for varying cover thickness will proceed as follows:

   a. Perform a minimum of one compaction test per test location in the first 12".

   b. Perform one additional compaction test per test location for 12"–60".

   c. Perform one additional compaction test per test location for thickness over 60".

(5) The moisture-density relationship of clayey soils requires the controlled addition of water so as not to exceed the optimum moisture content too quickly and miss the ability to achieve proper compaction. During cover restoration, additional care and time will be put forth to incrementally add smaller amounts of water by means of a mechanical drum mixer. The same volume of soils removed will be replaced and documented. As specified in the work plan Section 1.2.11, post-restoration radon flux measurements will be collected directly above each former excavation and future inspections will revisit these sites to look for and address any subsidence. Detailed notes, measurements, and photos will be taken to document all restoration activities and included in a post-restoration report for this site.

The potential exists for other field change needs due to unknown or unexpected conditions observed or experienced in the field, which is partially the basis for this study. Upon encountering an activity that may require deviation from the approved work plan, additional communication will be necessary between LMS, DOE, and NRC during this mobilization (this may include weekend correspondence with leads or alternates that can be arranged ahead of time) as follows:

- Identify the issue and potential resolution
- Redline the work plan section(s) with proposed field changes
- Initiate communication via conference call or email with engineers and leads from LMS with DOE and NRC representatives having authority to concur, or non-concur, with proposed field design changes
- Document the agreed-upon solution
- Include details in cover restoration completion report