Department of Energy
Washington, DC 20585

September 8, 2014

Ms. Sara Jacobs, Remedial Project Manager
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
MC: SFD-6-2
San Francisco, CA 94105

Subject: U.S. Department of Energy Review of *Data Consolidation Letter by Dwyer Engineering LLC* and *Pre-Design and Natural Analog Studies Reports, Northeast Church Rock Mine Site Removal Action*

Dear Ms. Jacobs:

This letter provides U.S. Department of Energy's (DOE's) comments on the above-referenced letter and reports. This feedback is provided in response to a 2011 request from the U.S. Environmental Protection Agency (EPA) and the U.S. Nuclear Regulatory Commission (NRC) for DOE to participate in an interagency work group to review the design of a proposed repository which will contain waste from the Northeast Church Rock mine site (NECR mine site) at the Church Rock Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) Title II disposal site (Church Rock site). Due to the limited amount of time to perform a complete technical review of the reports, DOE may offer revised comments in coordination with NRC during the detailed phase of the design.

DOE reviewed Dwyer Engineering's data consolidation letter on June 25, 2014. This letter presents a proposed approach to determine if placing mine waste from the NECR mine site on top of 11(e)2 byproduct tailing cells at the Church Rock site may induce seepage from the tailings. Previous analysis conducted (Dwyer Engineering, 2011, 2013) depended on multiple assumptions due to a lack of current site data. To address this issue, geotechnical investigations were performed in late 2013 and new data from these investigations were used as the basis for the revised approach. DOE supports NRC's technical review and comments provided in its September 2, 2014, letter, *Technical Review of the Data Consolidation and Pre-Design Studies Reports for the United Nuclear Corporation Northeast Church Rock Mine Cleanup Project,* (enclosed). In particular, we agree with NRC's statement that the proposed modeling approach "should not be used to determine or quantify drainage/seepage rates resulting from the consolidation of mine waste collocated on the tailings impoundment at the mine site."

We also conducted an initial review of pre-design reports associated with EPA's approved NECR mine site removal action titled, *Pre-Design Studies, Northeast Church Rock Mine Site Removal Action, Church Rock Mill Site, July 17, 2014*, and, *Pre-Design Studies, Northeast Church Rock Mine Site Removal Action, Northeast Church Rock Mine Site, July 21, 2014.*

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DOE has a number of questions regarding the interpretation of data as well as with statements presented in the conclusions of the reports. For example, it is not clear if there is a commitment to develop a contingency factor for the capacity of the repository to account for any additional waste which could be encountered during the excavation process.

Finally, DOE received and reviewed the report titled, *Natural Analog Study of Cover Soil Borrow Sources Using a Tension Infiltrometer (August 20, 2014).* We believe the investigation conducted was thorough, methods were appropriate, and results will likely lead to an adequate disposal cell cover design. However, we suggest that a field expert characterize and classify the genesis and morphology of the analogs' soil profiles, and document relationships between in situ hydraulic properties and morphological features such as soil structure.

Please note that although DOE does not have authority for approving the final design, we would like to remind EPA and other stakeholders that we have agreed to perform long-term surveillance and maintenance (LTS&M) at the Church Rock site under the following conditions:

1) waste from the NECR mine site placed on the existing byproduct cells is, and will be, regulated under UMTRCA;
2) the collocation of waste from the NECR mine site will not affect the integrity of the existing byproduct cells;
3) DOE concerns expressed in 2002 regarding differential settlement and erosion at the Church Rock site are addressed; and
4) DOE acceptance of the Church Rock site for LTS&M is established through the NRC site transfer process.

We appreciate EPA's continued interest in DOE's participation in the interagency work group as we will eventually become responsible for LTS&M at the Church Rock site in accordance with UMTRCA.

Please call me at (970) 248-6042 if you have questions. Please address any correspondence to:

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

Sincerely,

Deborah Steckley
Site Manager

Enclosure

cc w/enclosure:
J. Brooks, EPA Region 6
C. Wetmore, EPA Region 9
T. McLaughlin, NRC
M. Norato, NRC
F. White, NN EPA
E. Dixon, NMED
L. Hauer, General Electric Company
R. Blickwedel, General Electric Company
L. Bush, United Nuclear Corporation

cc w/o enclosure:
A. Gil, DOE-LM (e)
A. Kleinrath, DOE-LM (e)
File: NCR 0030.20(A) (rc grand junction)

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 3, 2014

Mr. Lance Hauer
Remedial Project Manager
Corporate Environmental Programs
General Electric Company
640 Freedom Business Center
King of Prussia, PA 19406

SUBJECT: TECHNICAL REVIEW OF THE DATA CONSOLIDATION AND PRE-DESIGN STUDIES REPORTS FOR THE UNITED NUCLEAR CORPORATION NORTHEAST CHURCH ROCK MINE CLEANUP PROJECT

Dear Mr. Hauer:

By letter dated June 25, 2014, the U.S. Nuclear Regulatory Commission (NRC) acknowledges the receipt of the Data Consolidation letter report prepared by Dwyer Engineering LLC for the United Nuclear Corporation (UNC) Church Rock Mill and Northeast Church Rock (NECR) Mine sites in McKinley County, New Mexico [Agencywide Document Access and Management System (ADAMS) Accession Numbers (Nos.) ML14241A386; and ML14241A368]. The NRC staff completed the technical review and is providing general comment on this report (see Enclosure 1).

The NRC also acknowledges the receipt of the July 18, 2014, letter and attached documents entitled "Pre-Design Studies Report, Northeast Church Rock Removal Action, McKinley County, Church Mill Site, July 17, 2014" and "Pre-Design Studies Report, Northeast Church Rock Removal Action, McKinley County, Northeast Church Rock Mine Site, July 21, 2014" (ADAMS Accession Nos. ML14225A025; ML14225A023; ML14224A293; and ML14244A291). These reports represent the compilation of data collected during the Fall-2013 insitu sampling program at both the NECR Mine and UNC Mill sites. Based on the NRC's staff technical review of these pre-design studies reports, we have no comment at this time. However, the NRC reserves the right to offer comments on these reports as the NECR Mine cleanup project progresses further into the detailed phase of the design.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's ADAMS. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

If you have any questions, please contact the newly assigned Project Manager, Mr. Thomas McLaughlin at (301) 415-5869, or by e-mail, Thomas.McLaughlin@nrc.gov.

Sincerely,

Lydia W. Chang, Branch Chief
Special Project Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 40-8907
License No.: SUA-1475

Enclosure 1: NRC Staff comment on the
June 2014 Consolidation Field Data Letter

cc: UNC Church Rock Distribution List

U.S. Nuclear Regulatory Commission's Review of the New Proposed Modeling Approach to Evaluate the Effects of Mill Tailings Consolidation at the Church Rock Site, Consolidation Field Data Letter, dated June 25, 2014, from Dwyer Engineering LLC to the US Environmental Protection Agency-Region 9

General Comment

The U.S. Nuclear Regulatory Commission (NRC) staff view is that the new proposed modeling approach outlined in the Consolidated Data Letter [Agencywide Document Access and Management System (ADAMS) Accession Nos. ML14241A368; and ML14241A386], to evaluate the effects of mill tailings consolidation at the United Nuclear Corporation (UNC) Church Rock Mill site, will not accurately calculate potential increased drainage rates due to tailings consolidation from placement of mine spoils on the existing impoundment. The assumption in the proposed methodology is that if the tailings remain unsaturated after consolidation due to mine waste placement, water will not be forced from the tailings as a result of consolidation. Thus, if the tailings material is found to be less than 100 percent saturated, then the material volume has available pore space, which can be filled by water as the profile consolidates. This proposed modelling approach also assumes that only when saturated conditions are reached will consolidation induce water flow from the tailings. Therefore, no additional evaluation is required to address unsaturated flow modeling.

The NRC staff disagrees with the aforementioned assumptions because unsaturated flow does exist, and this is a well-documented hydrogeological occurrence during groundwater recharge. For example, after a large rainstorm event, a coarse-grained unsaturated zone may have rainwater drain to an aquifer in a relatively short amount of time. However, for fine-grained sediments in an unsaturated zone, drainage may take a much longer time and may not be dependent on full saturated conditions. A similar situation occurs in mill tailings, which are relatively saturated during their original deposition. Drainage rates are higher during the initial phase, but drainage from the fine-grained tailings does not cease when unsaturated conditions occur; instead, the drainage rate slowly decreases. It is possible that the current existing mill tailings at Church Rock are still draining at a very slow rate. The NRC staff believes that calculations based on current conditions are critical in determining if consolidation will cause an increased rate of drainage. If increased drainage rates are identified and quantified, further evaluations would be necessary to determine if constituent concentrations in the groundwater would exceed applicable groundwater protection standards at the designated points of compliance.

Based on the NRC's staff evaluation, the newly proposed modeling approach is flawed and should not be used to determine or quantify drainage/seepage rates resulting from the consolidation of mine waste collocated on the tailings impoundment at the UNC Mill Site. In previous letters dated May 16, 2013, and October 24, 2013 [ADAMS Accession Nos. ML13126A259; and ML13309A626], the NRC staff also provided comments on four additional major areas of potential future concern and these included: differential settlement, damage due to seismic activity, breaks/cracks outside repository perimeter, and instability due to seepage and low permeability zones. Given that the design of the enhanced tailings impoundment have not yet been finalized, no details related to these major concerns are required at this time. However, it is the NRC's staff expectation that these outstanding technical issues be considered as part of any future revised and/or proposed methodology for a comprehensive model during the design phase of the Northeast Church Rock Mine project.