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Mr. David J. Ennis (via E-mail)
Permit Lead - Mining Act Reclamation Program
State of New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

Subject: Technical Comments on Supplemental Investigations Work Plan (Feb. 2018), St. Anthony Mine, Cibola County, New Mexico, Permit Tracking Number MK006RE

Dear Mr. Ennis:

UNC's response to your April 17, 2018 comments on the subject Work Plan are submitted here. We also reply to comments from the Environment Department; however, as a point of departure from your April 17, 2018 letter, UNC is not aware of any provision in NMAC §§ 19.10.5 for Environment Department involvement at this time or for the subject work plan. Our responses in bold type follow each of the italicized comments from your letter.

1. Please describe the purpose of the "geomorphic evaluation" and what is hoped to be achieved by collecting samples for particle-size and Atterberg limits. Is the purpose to assess the stability of materials so that an appropriate reclamation configuration can be designed?

The purpose of the "geomorphic evaluation" is to assess the stability of materials so that an appropriate reclamation configuration can be designed. Collecting geotechnical data supports the assessment.

2. The Workplan acknowledges on page 4.1 that the "radiologic contamination boundary was not identified in the 2007 Materials Characterization [Report]." MMD believes it critical to delineate this boundary for development of a Closure Plan for the site. However, the Workplan appears to propose delineation based on an "investigation level" of approximately 6.6 pCi/g Ra-226 (which is derived by 5.0 pCi/g + 1.6 pCi/g [background]). MMD believes the investigation level for delineation of contamination should be background levels. The Joint Guidance for the Cleanup and Reclamation of Existing Uranium Mining Operations in New Mexico (March 2016) states that the characterization work plan "should focus on the extent of surface soil contamination above background levels" and should be of a sufficient scope to allow for discrimination among impacted areas and "unimpacted areas reflecting background concentrations." It is MMD's opinion that the extent of contamination should be delineated based on an investigation level equivalent to background levels (i.e., counts per minute equivalent to 1.6 pCi/g). Please address.

UNC is conducting a characterization that will meet or exceed all requirements of the Mining Act Rules. UNC has not committed to a particular cleanup goal because, pursuant to the Mining Act and its implementing Rules, the appropriate goal depends upon the intended post-mining land use (See NMSA §§ 69-36-2, 69-36-11(B)(3); NMAC §§ 19.10.5.507(A), 19.10.1.7 P(5)). The St. Anthony Mine is located in a very remote, sparsely populated area with difficult access, and the current and anticipated land use is livestock grazing and wildlife habitat.

Although the Mining Act Rules do not require it, UNC voluntarily agreed to delineate any area within or adjacent to the mine permit area to the most conservative possible reclamation goal (see Section 2 of the *Joint Guidance*). This investigation level corresponds to an unrestricted residential land use scenario, and is inherently more stringent than the reclamation level necessary to support future livestock grazing and wildlife habitat at the site. Delineating to background levels would be even more stringent, and problematic in instances where other mines are located close enough together to mask a background determination, as would be the case here (see Response #5).

The *Joint Guidance* does not explain how or why background is a relevant reference point to demonstrate that implementation of the approved Closeout Plan will attain the levels necessary to support the designated post-mining land use, as contemplated in the Mining Act and its implementing regulations. There is no connection between background, on the one hand, and the levels necessary to support a designated post-mining land use, on the other.

UNC's position with respect to the *Joint Guidance* is set forth more fully in its response to MMD's comments on the Supplemental Closeout Plan for the Section 27 Mine, dated June 15, 2018.

3. The Workplan states that the gamma scan survey will be conducted on 30-foot transect spacing that will provide approximately 20 percent coverage of the ground surfaces. This frequency and total coverage appears low to adequately define the extent of surface contamination. EPA has successfully been performing continuous real-time gamma scans, which seems more appropriate to define the extent of contamination. Please address.

The supplemental characterization of the St. Anthony mine included a continuous gamma scan integrated with a real-time differential GPS for geo-locating the scan data. The gamma scan was performed at a scan rate of about three feet per second, along approximately 130 miles of 30-ft spaced transects over 370 acres resulting in approximately 164,000 gamma measurements. This resulted in an average gamma scan density of approximately 11 data points per 100 m², which is more than adequate to characterize the lateral extent of contamination for the Closeout design.

A 30-foot transect spacing, which provides at least 20 percent coverage of the ground surface, is adequate to define the lateral extent of surface contamination. The 20 percent coverage was determined based on a conservative detector field of view of six feet for gamma radiations from Ra-226 decay products. The actual detector field of view for Ra-226 is much more than six feet, resulting in higher scan coverage than 20 percent. Similar transect spacing for gamma scans for defining the lateral extent of contamination for investigation/Removal Site Evaluation is typically used under USEPA oversight at other uranium mine sites (e.g., on the Navajo Reservation). Under MARSSIM, a higher scan coverage, such as at 100%, is only used during final status surveys for Class 1 areas following a Removal Action, and 10% to 100% and judgmental coverage for Class 2 and Class 3 areas.

4. The Workplan states that "no significant contamination above the investigation level [6.6 pCi/g] is expected beyond the permit boundary" but proposes that "if any portion of the permit

boundary, including the arroyo bed, exceeds the investigation level, a step-out gamma scan will be performed until gamma radiation levels below the investigation level are detected." Similar to comment #1 above, MMD believes that the investigation level proposed in the Workplan is too high to adequately delineate contamination, especially along the permit boundary. The Workplan should commit to delineation of contamination to background levels even if this extends beyond the permit boundary.

See Response to #2.

5. The area proposed for supplemental investigation (generally described as the permit boundary minus the pits and piles that have already been previously characterized) does not appear to capture all areas of potential surface contamination. As examples, potential surface contamination appears visible in the following locations (based on aerial images available on Google Earth):

- a. A triangular shaped area northwest of the crusher/stockpile area;
 - b. The area north and northwest of the "topsoil north" pile;
 - c. The area between "shaft access road" and the fenceline to the north;
 - d. The access road to the St. Anthony mine site, which appears to potentially be partially constructed with mine waste;
 - e. An area south of Pit 1 along a 2-track road;
- Please address.

The supplemental characterization covers the 5 described areas. For the record, item "e.", the "area south of Pit 1 along a 2-track road" is not within the mine permit area because it was not mined or otherwise operated by UNC. Prior to UNC's operations, records indicate an underground mine in that location (the Climax Mine). UNC never operated in that area. UNC's supplemental characterization was expanded into that area because it may be a potential borrow source that was only recently considered viable, and this is UNC's only reason to perform any characterization or reclamation in that area. UNC's underground operations were confined to the area identified as the West Shaft Area. This presents another reason not to seek the measurement of "background" as a characterization goal for this mine because of the nearby mining operations of others.

6. Section 4.3.2.1 of the Workplan states that up to 30 locations will be sampled and Section 4.3.3 states that approximately 15 sample locations from the site will be used to correlate gamma measurements to Ra-226 results. Section 4.3.3 states that "the correlation will meet an R2 value of at least 0.8." Is the 0.8 a minimum value that will be obtained, even if more than 15 samples have to be analyzed?

Yes, a coefficient of determination of 0.8 will be met even if more than 15 data collection points are needed.

Response to Comments from the Environment Department

A formal response from UNC to NMED comments is not required or planned, but the input has been helpful. By way of example, UNC expects its future Closeout Plan to meet the stated requirements that are contained in the Surface Water Quality Bureau (SWQB) Memo, dated 4/3/2018. This will be a useful reference as the reclamation design proceeds. While a determination of compliance with environmental laws is not required under State law for this work, the SWQB nonetheless makes a determination that the supplemental characterization work is expected to comply with surface water laws. The Air Quality Bureau (AQB) comments, dated 3/26/2018, are similarly constructed to make the determination that the proposed characterization work is expected to comply with all federal and state laws pertaining to air

quality, and it helpfully reminds UNC of the potential air laws to consider while designing Closeout Plan actions.

The purpose of the proposed work was to support specific aspects of the reclamation design. It was not intended to serve any purpose with respect to Water Quality Act compliance or the *Proposed Findings of Fact, Conclusion of Law, and Final Order in the Matter of The Petition for Alternative Abatement Standards for the Former St. Anthony Mine, Cibola County in the State of New Mexico* (Final Order), and so it is not appropriate to review it in those contexts.

UNC's plans with respect to the Final Order are separate, and will be handled separately with NMED. Finding-of-Fact no. 68 confirms that the site characterization that was conducted under the Water Quality Act was extensive, and sufficient to warrant AASs. The alternate abatement standards and Final Order were issued on the basis that the underlying characterization data were complete for groundwater. The pilot stabilization study is the next phase of work needed to implement the Final Order and meet the obligations and conditions in the approved Stage 2 Abatement Plan. Intera will be contacting the GWQB with respect to these obligations and conditions.

With respect to the Closeout Plan and Finding-of-Fact no. 67, MMD will consult with NMED to enable a certification that the Closeout Plan's authorized activities will meet applicable environmental laws at the appropriate time. The supplemental characterization work is not the Closeout Plan. To the extent that the Ground Water Quality Bureau (GWQB) believes it should review the characterization work for compliance with ground water laws, then UNC must presume that the GWQB expects the plan's execution to comply with the law even though (unlike the SWQB and AQB) it did not expressly say so. UNC expects that the GWQB would have cited examples of how it did not comply with the law if there were any.

Finding-of-Fact no. 67 is a shorthand version of the more complete language of the Mining Act, Section 69-36-7.P (2) wherein the permit holder "shall provide to the director a written determination from the secretary of environment stating that the permit applicant has demonstrated that the *activities to be permitted or authorized* (italic added for emphasis) will be expected to achieve compliance with all applicable air, water quality and other environmental standards if carried out as described". UNC is of the understanding that the work to be performed in the supplemental characterization work plan does not constitute the "activities to be permitted or authorized". Those things will be the subject of the Closeout Plan rather than this supplemental materials characterization work plan.

Sincerely,



Roy Blickwedel

Senior Project Manager – Remediation

GE Global Operations – EHS

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