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March 10, 2021

Christine Poore
National Remedy Review Board Chair
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW, MC5204P
Washington, DC 20460

Re: NMED comments to the National Remedy Review Board on EPA's Proposed Plan for Homestake Mining Company Superfund Site, CERCLA # NMD007860935

Dear Ms. Poore:

The New Mexico Environment Department (NMED) appreciates Environmental Protection Agency (EPA) National Remedy Review Board (NRRB) attention on the Homestake Mining Company Superfund Site (Site). The NRRB review of the Site continues EPA's excellent efforts over the past few years to conduct a strong, science-based evaluation of the Site to inform critical decisions about future remediation efforts.

NMED's comments address the scope of the forthcoming Feasibility Study and the remedial alternatives. In addition, this letter summarizes NMED's position on the effectiveness of remedial efforts to date, the importance of background groundwater quality determinations, and how the Site is befitting of a regional approach. NMED provides recommendations for alternatives for EPA to consider as part of the Feasibility Study to ensure that the requirements of State law are met and that the sole source of drinking water for multiple communities and private well owners is protected for future generations. We also convey NMED's regulatory position on Institutional Controls, Alternative Abatement Standards, and Monitored Natural Attenuation.

Sincerely,

Jennifer Pruett Digitally signed by Jennifer Pruett
Date: 2021.03.10 14:59:00 -07'00'

James C. Kenney
Cabinet Secretary

Attachment (1)

Cc: David Gray, Acting Regional Administrator, EPA Region 6
Wren Stenger, Director, Superfund Division, EPA Region 6
Mark Purcell, Superfund Remedial Project Manager, EPA Region 6
Courtney Kerster, Director of Federal Affairs, Office of Governor Michelle Lujan Grisham
Maggie Hart Stebbins, New Mexico Natural Resources Trustee
Rebecca Roose, Director, NMED Water Protection Division
Kathryn Becker, NMED Assistant General Counsel and Tribal Liaison

New Mexico Environment Department Comments to
the National Remedy Review Board on the Homestake Mining Company Superfund Site
March 10, 2021

Outline

A. Regulatory Overview

The Homestake Mining Company Superfund Site (Site) has a long and complex regulatory history. The State of New Mexico provided regulatory oversight of uranium milling operations at the Site following transfer of oversight of the radioactive materials license to the NM Environmental Improvement Division (the precursor to NMED) from the Atomic Energy Commission in 1974. NMED maintained oversight of that license until 1986 when New Mexico transferred oversight and agreement state status for uranium mill licensing to the Nuclear Regulatory Commission (NRC). Pursuant to the Water Quality Control Commission (WQCC) Regulations,[1] NMED issued a groundwater discharge permit (DP-200) for the Homestake Mill Site in 1984. DP-200 remains in effect today and was most recently renewed in 2014.

HMC submitted a Groundwater Corrective Action Program (GCAP) to NRC to address groundwater remediation at the Site following transfer of uranium mill licensing from New Mexico to NRC. The GCAP was approved by NRC in 1989 under Radioactive Materials License SUA-1471 with review and comment by EPA and NMED. Since that time the remedial action continues pursuant to the 1989 GCAP and subsequent license amendments under NRC oversight. HMC submitted two subsequent GCAPs to the NRC, in 2006 and 2012, which EPA and NMED have reviewed but NRC has not approved. HMC developed a GCAP in December 2019 as a response to a Confirmatory Order issued by NRC on March 28, 2017 (Radioactive Materials License SUA-1471, Condition 44). HMC submitted an updated GCAP to NRC in November 2020 in response to NRC comments on the 2019 GCAP. While NRC action on the November 2020 GCAP is pending, the 1989 GCAP remains in effect.[2]

In 1983, EPA listed the Site on the Superfund National Priorities List at the request of the State of New Mexico. Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the site is divided into three Operable Units: OU1 -Tailing seepage and contamination of groundwater aquifers; OU2 - Mill decommissioning, surface soils, and tailing reclamation; and OU3 - Radon concentrations in neighboring subdivision. EPA signed the Record of Decision (ROD) for OU3 in 1989 with the final selected remedial action being No Further Action.

[1] WQCC Regulations for Ground and Surface Water Protection, 20.6.2 New Mexico Administration Code.
[2] Eventually, after all closure and remediation efforts are completed in accordance with the NRC license, NRC will transfer the Site to Department of Energy Legacy Management (DOE-LM) for long-term care.

NRC and EPA have primacy over remediation efforts at the site, with NRC taking a lead role pursuant to a 1993 Memorandum of Understanding between the two federal agencies. In 2012 EPA announced that it would proceed with compiling the information necessary to issue RODs for OU1 and OU2. EPA has continued with the CERCLA process for OU1 and OU2, notwithstanding that the remedial investigation and remediation efforts have been underway for many years pursuant to the GCAP and NRC license. HMC has received EPA approval of the Remedial Investigation and has provided a draft Feasibility Study (FS) to EPA and NMED for review and comment.

B. History of Remediation Efforts

Efforts by HMC to contain and remediate contaminated groundwater at the Site have been ongoing since the mid-1970s, beginning with extraction and injection to maintain plume containment and slowly evolving to include extraction, injection, evaporation, and active treatment beginning in 1999. HMC began injecting water from the San Andres-Glorieta Aquifer (SAG) into the San Mateo Creek Alluvial Aquifer in 1977 to attempt to maintain hydraulic containment of the contaminated alluvial groundwater near and downgradient of the tailing impoundments. From 1977 until 1990 the primary strategy for remediation was hydraulic containment with dilution resulting from injection of potable water from the SAG. Although contaminated groundwater that was extracted during the active milling operations was processed in the mill for uranium removal, the waste stream from the mill discharged to the unlined tailing impoundments and subsequently back into groundwater. Significant expansion of HMC's injection line locations away from the tailing impoundments from 1977 through 2005 suggests the containment strategy was an ineffective patchwork of attempts to limit the spread of groundwater contamination. In 1990, coincident with cessation of milling operations, HMC constructed the first evaporation pond to dispose of contaminated groundwater. HMC added a second evaporation pond in 1996 to provide more disposal capacity to manage the volume of contaminated groundwater that the company was extracting. HMC then added a third evaporation pond in 2010 to dispose of highly contaminated groundwater that was being extracted and brine reject from a reverse osmosis (RO) treatment system.

From 2000 to 2012, in order to further manage an increased volume of extracted, contaminated groundwater, HMC land-applied contaminated groundwater blended with water from the SAG to meet site standards. HMC considered land application necessary to prevent further expansion of the groundwater plumes and stated this in the 2012 Corrective Action Plan submitted by HMC to NRC for approval. The need for land application of contaminated groundwater was the direct result of a lack of active treatment capacity and evaporative capacity to manage contaminated groundwater that was being extracted. The temporary permission granted by NMED to HMC for land application in 2012 required HMC to conduct an evaluation of treatment alternatives to replace land application of contaminated groundwater. Land application ceased in 2012 after NMED indicated it would not provide further approval of this activity. NRC did not take an active role in regulatory oversight of land application of contaminated groundwater over the 12-year period.

Although HMC states in the December 2020 draft FS that groundwater remediation efforts have been ongoing for over 40 years, it was not until 1999 that active treatment of contaminated groundwater was initiated when a 300 gallon per minute (gpm) RO treatment system began operation. In 2002, the RO treatment system capacity was increased to 600 gpm, but only operated at approximately 65% design capacity the first year. By 2004 the RO treatment system efficiency was reduced to approximately 50% of design capacity, and from 2005 through 2015 the system never operated above 50% design capacity.

In 2012, NMED engaged in negotiations with HMC to renew groundwater discharge permit 200 (DP-200). Although NRC, not NMED, was the lead agency for groundwater remediation, permit conditions in the 2014 DP-200 renewal provide a framework for HMC to accelerate groundwater remediation efforts. This included permit conditions for testing and implementing new treatment technologies, to implement upgrades to the existing 600 gpm RO treatment system to achieve maximum steady state design throughput, and to provide a schedule for expansion of RO treatment system capacity. DP-200 also includes a permit condition that authorizes construction of additional ponds to increase evaporative capacity.

By 2016, HMC had doubled RO treatment system capacity to 1200 gpm, tested and constructed a 300 gpm zeolite treatment system, and subsequently constructed an additional 1200 gpm zeolite system to treat contaminated groundwater at the site to remove uranium. Despite these increases in treatment capacity, continued technical and engineering design setbacks at the Site have limited the volume of contaminated water HMC is treating. Limitations on treatment system throughput include undersized and inefficient RO pre-treatment systems, limitations in evaporative capacity to manage RO brine reject, and operational failures including piping malfunctions, algal blooms in the zeolite system, and liner failure in the collection and evaporation ponds. Treatment rates from the RO and zeolite treatment systems, which never reached capacity, steadily decreased from a combined maximum of approximately 900 gpm in 2016 to approximately 450 gpm in 2019. While NMED acknowledges that it is unrealistic to expect the RO and zeolite treatment systems to operate at 100% of design capacity, the data reflects ongoing failure by HMC to operate the system anywhere near maximum treatment capabilities.

Potable water from the SAG has been used extensively throughout the history of the containment and remediation efforts at the site. Beginning in 1977, water from the SAG was used for hydraulic containment by injection into the alluvial aquifer to reverse the gradient of groundwater flow back towards the tailing impoundment. Significant volumes of water from the SAG have also been used to dilute contaminated groundwater to meet site cleanup standards for land application and for injection to reverse groundwater gradients to drive contaminated water towards extraction wells. NMED included language in the 2014 DP-200 permit renewal intended to limit the use of SAG water solely for dilution of contaminated groundwater. Annual SAG water usage ranged from 400 million gallons to over 700 million gallons between 2000 and 2015 and dropped significantly following construction of additional RO and zeolite treatment capacity in 2016. Total SAG water usage for this twenty-year period, approximately half the time period of HMC groundwater withdrawals associated with the Site, is nearly nine billion gallons. Although the SAG is a highly productive aquifer, water levels have dropped significantly through the years and HMC has played a significant role in mining groundwater from the SAG. HMC maintains groundwater withdrawal in accordance with their water rights allocations.

In summary, while HMC has claimed to have made significant efforts to remediate contaminated groundwater aquifers at the site over the past 40 years, and further claims that achievement of state groundwater standards is not possible based on projection of past treatment efforts into the future, NMED maintains that HMC's efforts to date have never been optimized. For many years the remediation efforts operated with minimal to no treatment capacity and the strategy was more focused on dilution and containment rather than contaminant mass removal. Active treatment systems at the Site were non-existent prior to 1999 and have rarely operated at more than 50% capacity since construction and operation.

As explained in further detail below, NMED strongly believes that groundwater remediation would acheive greater success if all active treatment systems were operated at full capacity for extended periods of time, or if active treatment systems were expanded.

C. San Mateo Creek Basin Overview and Regional Context

The Site is located at the nexus of widespread impacts from legacy uranium mining and milling in the San Mateo Creek Basin (SMCB). Historic uranium mine dewatering and uranium mill discharges into Arroyo del Puerto from the Ambrosia Lake area to the north of the Site and mine water discharges into San Mateo Creek from the northeast have contaminated groundwater upgradient of the Site. This contaminated groundwater has traveled south in the San Mateo Creek Alluvium from the confluence with the Arroyo del Puerto and is likely responsible for elevated contaminant concentrations in wells such as DD, ND, P, and Q that were among those used to establish Site cleanup standards under the NRC license. Discharges from the HMC tailing impoundments have resulted in significant groundwater contamination beneath and downgradient of the Site. This groundwater contamination has comingled further downgradient with contamination from the Bluewater Mill site within the Rio San Jose Alluvial Aquifer. The SAG subcrops beneath the Rio San Jose Alluvial Aquifer, which means groundwater contamination in the Rio San Jose Alluvial Aquifer threatens the SAG and other downgradient users and aquifers.

It is imperative that the NRRB understand that the SAG is the sole remaining potable groundwater source in the lower part of the SMCB and is currently being used as a public water supply by the Village of Milan, the City of Grants, the Pueblo of Acoma, and by numerous private well owners. HMC has injected billions of gallons of water from the SAG and treated water over the past 40+ years to maintain a groundwater mound across the San Mateo Creek Alluvial Aquifer to reverse the groundwater gradient back towards the tailing impoundments. This hydraulic containment zone has effectively created a plug in the bottom of a funnel that holds impacted groundwater from decades of mining and milling discharges in the SMCB. Cessation of Site groundwater remediation efforts and elimination of this containment could have dire consequences for the remaining potable water sources in the region.

D. Background Groundwater Quality

The current site cleanup standards established in the NRC license in 2006 were based on an analysis by HMC of upgradient groundwater conditions in the San Mateo Creek Alluvial Aquifer. Both NMED and EPA participated in review of the HMC background groundwater analysis prior to formalization of the site cleanup standards in the NRC license, which selected 0.16 mg/L uranium as the background level. The high uranium background concentrations established in the NRC license as site cleanup standards for the various aquifers were strongly influenced by one alluvial well (well DD) with high concentrations of uranium located on the extreme west side of the San Mateo Creek Alluvial Aquifer. Up to 90% of the cross-sectional area of the San Mateo Creek Alluvial Aquifer directly upgradient of the Site has uranium concentrations less than the drinking water Maximum Contaminant Level and WQCC groundwater standard of 0.03 mg/L. Despite this a background uranium concentration of 0.16 mg/L has been selected for the entire extent of the San Mateo Creek Alluvial Aquifer and the portions of the Rio San Jose Alluvial Aquifer contaminated by Site discharges.

Over the past several years, HMC, NMED, EPA, and consultants hired by Bluewater Valley Downstream Alliance/Multicultural Alliance for a Safe Environment carried out extensive investigations to further evaluate groundwater background chemistry at the Site. NMED worked closely with EPA during 2019 and 2020 to conduct a thorough evaluation of available data and conducted detailed geochemical modeling to accurately identify background groundwater chemistry upgradient of the Site. The preliminary results of these investigations demonstrate that the high levels of uranium in groundwater on the extreme west side of the San Mateo Creek Alluvial Aquifer upgradient of the Site is most likely a result of both historic mine water discharges and HMC's injection and extraction activities. More recent NMED analysis of background groundwater chemistry for the Chinle aquifers reveals further evidence that the background levels set in the 2006 NRC license are not based on the best available science. The 2006 background analysis included data from wells that did not exhibit stable trends or were in locations that suggest they had already been impacted by Site groundwater contamination resulting from mixing with contaminated San Mateo Creek Alluvial groundwater through subcrops.

Geochemical modeling, evaluation of groundwater water chemistry trends, and water level trends strongly suggest that mine water discharge from wet mines, operating from 1956 to 1982 in the upper portions of the SMCB, likely flowed over the ground surface to areas in proximity to well DD. This is a contributing factor to the high uranium concentrations in alluvial groundwater along the far western portion of the alluvial groundwater system.

In addition, manipulation of the San Mateo Creek Alluvial Aquifer by HMC over several decades, as a component of the remedial efforts at the Site, has resulted in a rising water table that has also played a role in the high uranium concentrations at well DD. Additional leaching of nitrate, selenium, sulfate, and other contaminants from the vadose zone is occurring as mine water discharges have infiltrated and mixed with native alluvial groundwater north of the Site. The NRRB should also note that investigation of the San Mateo Creek Alluvial Aquifer in the area of the Site in 1960 after just a few years of operation of the Homestake Mill showed significantly less saturation. At that time, the Large Tailing Impoundment was not yet constructed in its current configuration, and a groundwater mound had potentially been created from releases of water to the subsurface from the Small Tailing Impoundment. In large part, the alluvial aquifer that HMC is attempting to remediate has been greatly expanded in saturated thickness and areal extent due to a combination of discharges from HMC milling operations and remediation efforts. Modeling done by HMC as a component of the draft Technical Infeasibility (TI) Evaluation Report suggest that the natural flow path of groundwater in the San Mateo Creek Alluvial Aquifer is to the west, with little to no southward flow.

Uranium and selenium will remain mobile as alluvial groundwater recharges the Chinle Formation aquifers. With successful remediation of the San Mateo Creek Alluvial Aquifer, dilution and groundwater mixing should decrease dissolved concentrations of uranium, selenium, nitrate, and other contaminants in the Chinle aquifers. Molybdenum concentrations are below the WQCC standard of 1.0 mg/L in the alluvium and it is precipitating as the mineral powellite (calcium molybdate), which is an example of monitored natural attenuation.

Efforts to characterize the nature and extent of contamination from mine water discharges to the groundwater systems upgradient of HMC are underway pursuant to CERCLA, including investigation of the San Mateo Creek Alluvial Aquifer in the Central Study Area. This characterization work is being conducted by three potentially responsible parties (PRPs) including HMC, Rio Algom Mining LLC, and United Nuclear Corporation. These PRPs signed an Administrative Order on Consent with EPA in November 2019 to conduct a remedial investigation of groundwater impacts in the lower SMCB immediately upgradient of the Homestake Superfund Site. These PRPs operated wet mines in the SMCB that discharged mine dewatering water to Arroyo del Puerto and San Mateo Creek.

In summary, while joint efforts to identify new proposed background concentrations are ongoing, the NMED and EPA evaluation of the San Mateo Creek Alluvial Aquifer suggests the natural background of dissolved uranium was likely less than 0.05 mg/L prior to mine water discharges and HMC operations at the Site. The uranium concentration of 0.16 mg/L currently set as the site cleanup standard for the San Mateo Creek Alluvial Aquifer under the NRC license is reflective of impacts from the mine related discharges and Homestake activities mentioned above, and only applies to groundwater entering the Site on the far western margin. In general, other contaminants of concern for the Site follow this same pattern and uranium contamination is the driver for cleanup efforts. Natural background groundwater chemistry is important due to both a consideration of the Site relative to the CERCLA action being undertaken for the Central Study Area, and a consideration of groundwater flow paths and the extent of saturation at the time milling operations at the Site began. Revisiting background concentrations is also a critical factor for future EPA decision-making about the Site remedy in order to protect the SAG for present and future generations. NMED requests that site cleanup levels be reestablished by EPA to more accurately reflect recent analysis of background water quality and groundwater flow paths.

E. Scope of Feasibility Study

HMC provides a review and comparison of several remedial action alternatives in a December 2020 draft FS that has been submitted to EPA and NMED for review and comment. NMED has performed a preliminary review of the draft FS for preparation of this document for the NRRB process. Following more substantive review of the draft FS, NMED will provide detailed written comments to EPA.

OU2 (mill decommissioning, surface soils, and tailing reclamation): NMED is confident that remediation of the existing surface facilities will be adequately addressed through attainment of NRC license requirements that include capping the tailing impoundments to ensure no surface exposure to radioactive material and other contaminants in the tailing impoundments. The cover system required will also reduce percolation of precipitation into the underlying tailing materials to limit future release of contaminants from the tailing into the subsurface. The engineering controls being proposed are well-tested and likely to provide for long-term protection of human health and the environment from surface exposure. NMED agrees that placement of an engineered cover over the existing tailing along with restricting access is an appropriate remedial strategy for the Mill decommissioning, surface soils, and tailing reclamation operable unit.

OU1 (tailing seepage and contamination of groundwater aquifers): The issue of primary concern for NMED is identification of the proper long-term approach to remediate groundwater contamination that has migrated beyond the NRC license boundary and impacted multiple aquifers at the Site. Groundwater remediation strategies must ensure long-term protection of the SAG. The SAG is the primary water source in the region, and the sole remaining aquifer in the lower SMCB that contains potable water. Modeling alone is not protective, and predictive modeling over a period of hundreds of years is not a reliable means to ensure long-term protection.

In addition to the No Action and the Monitored Natural Attenuation alternatives, the draft FS includes three alternatives for OU1 based on operation of the existing remedial system for varying lengths of time. HMC argues that there are several technical considerations that are crucial to these remedial alternatives. Primary among those considerations put forth by HMC is that the Large Tailing Pile (LTP), the contaminated vadose zone, and alluvial system beneath the tailing impoundments will continue to discharge contaminants for hundreds of years, and that there is currently no available technology that can address the ongoing sources of contamination in the vadose zone and alluvial system beneath the LTP within a reasonable time frame. Following placement of a final cover system on the tailing impoundments, drain down of tailing pore water will become negligible over time. The remedial alternatives evaluated by HMC in the draft FS all propose to cease active pumping of contaminated groundwater within 18 to 50 years. HMC argues that because of the contaminant source that exists beneath the LTP, none of these alternatives will provide long-term protection of human health and the environment once the pumping systems are shut off.

For each of the proposed alternatives in the draft FS for OU1, protection of human health and the environment following shutdown of the remediation system extraction and injection wells is reliant on two factors: institutional controls and groundwater monitoring. Institutional controls would be maintained in perpetuity over a suggested Technical Infeasibility (TI) waiver area of approximately 5700 acres (9 square miles). The limits of the expansion of groundwater contamination following cessation of pumping activities is determined through groundwater modeling. Protection of human health and the environment outside the suggested TI waiver area is dependent on the accuracy of the groundwater modeling and long-term groundwater monitoring.

NMED questions whether the predictive model results for OU1 can be used to ensure long-term protection of groundwater resources. The modelling effort that provides a prediction 200 years into the future is calibrated using less than 20 years of data. In order to have confidence in the results of this type of groundwater model, predictions should be limited to a time period not to exceed two to three times the length of the calibration period. NMED acknowledges that the HMC model is well-calibrated; however, the validity of the predictive model is questionable for multiple reasons. In particular, the calibration period has different stresses (i.e., changes in pumping and extraction rates and locations) and the current system used for calibration has potentially different boundary conditions and hydrologic properties than those likely to exist during the predictive period. In such a case, NMED asserts that EPA, NRC and others must exercise caution when making long-term decisions based on the data provided.[3] Long-term monitoring and monitored natural attenuation provide a "hope for the best" approach that is simply unacceptable to NMED.

As mentioned in Footnote 2, DOE-LM assumes responsibility for long-term monitoring and maintenance of uranium mill sites. DOE-LM's mandate does not include requirements or funding to remediate groundwater contamination outside of the long-term care boundary. The Bluewater Mill Site is one such site where groundwater contamination exists outside of the long-term care boundary and DOE-LM has limited means to address this contamination. In addition, there is no apparent consideration for future land use for the area being proposed for a TI waiver by HMC. Much of the land within this area was historically productive farmland. HMC states in the draft TI waiver report that they own 74% of the land within the proposed TI waiver area, but the bulk of the land not owned by HMC lies within residential subdivisions with individual homeowners. The negative impact on the quality of life of those individuals who wish to remain in their homes while being surrounded by a TI waiver area subject to federal control is likely to be substantial.

Given the potential for contamination to migrate downgradient to the Rio San Jose Alluvial Aquifer and to areas where the SAG and other aquifer systems exist, coupled with the uncertainties associated with modeling and monitored natural attenuation, NMED urges EPA to expand the FS scoping to include all of the following.

1) Evaluate alternatives that include pump and treat to reduce existing groundwater contamination in the San Mateo Creek Alluvial Aquifer that is present outside of the NRC license boundary to contaminant levels below those determined to be naturally occurring by NMED and EPA pursuant to ongoing geochemistry analysis by both agencies. Treatment to lower contaminant levels reduces the reliance on modeling to demonstrate long-term protection of downgradient aquifers including the SAG.

[3] Ahmed Hassan, "A Validation Process for the Groundwater Flow and Transport Model of the Faultless Nuclear Test at Central Nevada Test Area." Submitted to Nevada Site Office National Nuclear Security Administration, U.S. Department of Energy, Las Vegas, Nevada (January 2003).

2) Evaluate alternatives that create a hydraulic capture zone through groundwater extraction within the license boundary, coupled with achievement of groundwater standards in the San Mateo Creek Alluvial Aquifer outside of the license boundary. This alternative contemplates active capture to maintain long-term hydraulic containment of ongoing sources beneath the tailing impoundment instead of injection of potable water to create a groundwater mound. Maintaining long-term hydraulic capture through extraction will significantly reduce the strain on remaining potable water sources in the region and eliminates the reliance on modeling to demonstrate long-term protection of downgradient aquifers including the SAG.

3) Consider long-term pump and treat options beyond 50 years to maintain containment of groundwater contamination within the current NRC license boundary. Evaluation of long-term pump and treat systems should include consideration for providing treated water for industrial or other uses to offset previous, current, and future use of the SAG. Long-term containment of contaminated groundwater across the San Mateo Creek Alluvial Aquifer at the Site will also significantly reduce the risk posed by upgradient contamination from legacy mine and mill discharges in the SMCB.

   It is not an unusual requirement for groundwater treatment to extend for a period of 100 years or more to address contaminated groundwater contamination from mine operations. The Chino Mine and Tyrone Mine, both copper mines in southwest New Mexico, are required to construct and operate treatment systems for a minimum of 100 years to contain contamination associated with mine operations and the open pit capture zone. The Questa Mine Superfund Site in northern New Mexico is subject to similar requirements for long-term groundwater containment and treatment. Financial assurance is in place to cover costs associated with these long-term containment strategies, and the net present value of the long-term costs to reclaim and remediate these sites are similar to or greater than those predicted for the Site by HMC in the draft FS. Numerous other examples exist of mine sites in the western United States with requirements for long-term water treatment beyond 50 years.

4) This is the appropriate time to evaluate a regional approach to the disposition of the Site relative to other legacy uranium mining and milling impacts. The Site sits at the nexus of basin wide impacts as discussed above and the future remediation strategy should be evaluated in a basin wide context. A treatment system is in place and the Site activities are currently preventing downgradient migration of groundwater contaminated by legacy mining and milling activities towards potable water supplies. HMC is one of the PRPs associated with the upgradient contamination that has likely also impacted the Site. Future remedial strategies for the Site will directly impact remedial strategies for both upgradient and downgradient contamination, and ultimately any solution needs to consider the comingled impacts.

F. NMED'S Regulatory Position

In conjunction with all the technical comments above, NMED points to several relevant provisions that support the State's regulatory position for future remedial action at the Site.

i. Institutional Controls

NMED disagrees with alternatives that contemplate institutional controls (ICs) to determine future use of groundwater in New Mexico. NMED opposes the use of ICs for such purposes for several reasons.

ICs should be a supplement to, not a substitute for, active remediation. ICs can serve a useful purpose in certain circumstances, but that purpose is a narrow one. ICs are appropriate as a temporary measure where groundwater has become contaminated and despite active abatement measures it will take a significant period of time to abate that groundwater contamination until it meets standards. However, once remediation cleanup goals are achieved, the ICs would be removed. Likewise, ICs might be used where groundwater has become contaminated and the WQCC has approved alternate abatement standards after determining that achieving standards is technically infeasible. In these narrow circumstances, it makes sense to try to restrict access to that water through ICs imposed by the New Mexico Office of the State Engineer (OSE) or other government agency having such authority.

Furthermore, the use of ICs is problematic due to the following: 1) ICs often do not work[4]; 2) ICs often are not enforceable[5]; and 3) ICs are contrary to the purposes of the WQA, which dictates active response measures for cleaning up groundwater and institutional controls are not a substitute for active remediation.

Despite the shortcomings with ICs, they can be helpful in limiting access to contaminated groundwater while abatement is ongoing. NMED has consistently used ICs only for implementing cleanup requirements under the WQA and other New Mexico laws. In New Mexico, groundwater is a public natural resource and not private property.

ii. Alternate Abatement Standards

The WQA and the WQCC Regulations require that all groundwater in the State with a concentration of less than 10,000 mg/L of total dissolved solids is protected, except in the rare instance where the discharger can demonstrate that certain locations are not places of withdrawal of water for present or reasonably foreseeable future use. The WQCC Regulations expressly provide for alternate abatement standards under certain circumstances. 20.6.2.4103.F NMAC. Should HMC decide to pursue alternate abatement standards, HMC would file a petition with the WQCC.

iii. Monitored Natural Attenuation

Inorganic contaminants persist in the subsurface and are not degraded or destroyed by natural attenuation processes (a major component for considering MNA) and continue to migrate. Therefore, the State of New Mexico does not consider monitored natural attenuation to be an active remedial approach for metal contaminants in groundwater. As previously stated, HMC is considering an exceptionally large area for a TI waiver to accommodate monitored natural attention. The approach relies on a long-term modeling effort to demonstrate long-term protection of human health and the environment. This is not an acceptable approach to ensure protection of New Mexico's precious groundwater resources. Moreover, when relying on natural attenuation processes for site remediation, EPA prefers processes that degrade or destroy contaminants. Also, EPA generally expects that monitored natural attenuation will only be appropriate for sites that have a low potential for contaminant migration and the plume is shrinking or stable. Decreasing concentrations in the groundwater plumes should not be solely the result of plume migration and dilution. The NRRB should note that monitored natural attenuation is not a "presumptive" or "default" remediation alternative, but rather should be fully evaluated and compared to other viable remediation methods (including other innovative technologies) during the FS phase leading to the selection of a remedy (see OSWER Directive 9200.4-17P).

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[4] *See, e.g.,* Government Accountability Office, *Hazardous Waste Sites: Improved Effectiveness of Controls at Sites Could Better Protect the Public* (GAO 05-163 Jan. 2005).

[5] Id. at page 33.

G. Conclusion

In closing, NMED appreciates EPA Region 6's close coordination with the State over the past few years to develop a greater shared understanding of the physical characteristics of the Site, including background uranium concentrations, and evaluating alternative remedial options for the Site. NMED thanks the National Remedy Review Board and EPA Region 6 for taking these comments into consideration for Feasibility Study scoping, the Proposed Plan, and ROD development for OU1 and OU2.