State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Melanie A. Kenderdine
Cabinet Secretary Designate

Ben Shelton
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Mining and Minerals Division

Electronic Transmission

November 27, 2024

Sherry Burt-Kested, Environmental Services Manager
Freeport-McMoRan Tyron Inc.
P.O. Box 571
Tyrone, New Mexico 88065

RE: NM Mining and Minerals Division (MMD) and Agency Comments, Emma Project, Regular (Part 4) Exploration Permit Application, Permit No. GR095ER

Dear Ms. Burt-Kested,

Pursuant to §19.10.4.402 F. NMAC, the New Mexico Mining and Minerals Division (MMD) has determined that the Regular Exploration Permit Application (Application) submitted on July 31, 2024, is Administratively Complete. The application was submitted by Freeport-McMoRan (FMI) for its Emma Project and proposes to drill 34 boreholes and disturb a total of up to 60 acres of private property owned by FMI within the boundaries of the claim numbers identified in the application for exploration located approximately 10 miles south of Silver City, NM in Grant County New Mexico. The application has been distributed to the following agencies for technical comment. Please respond accordingly to the attached comments from these agencies.

- NM Environment Dept. (NMED)
- NM Dept. of Game and Fish (NMDGF)
- NM State Historic Preservation Office (SHPO)
- NM Office of the State Engineer (OSE)

The following Tribes have been notified of the Administratively Complete status of this application. All responses received from the Tribes below are included as an attachment to this letter.

- Acoma Pueblo
- Fort Sill Apache Tribe
- Hopi Tribe
- Isleta Pueblo

- Mescalero Apache Tribe
- Navajo Nation
- White Mountain Apache Tribe
- Zuni Pueblo

Public Comments for this application were received from three individuals in the community and are attached to this letter. All three individuals have requested a public hearing. Once this application is deemed Technically Complete, MMD will work with FMI to set up a date and time for the Public Hearing.

MMD Comments

1. As a general comment, any attachments or additional information referenced in an exploration application should be included in that specific application package and not referenced to other permits or applications that the operator may have with the MMD. Please provide such information in this application.
2. In the 2nd paragraph of the introduction to the project, it is mentioned that 0.3 acres of disturbance has been removed from the FA calculation because these roads were previously constructed. If these roads were constructed during any phase of the Emma B Exploration project, they should be included in this application as disturbance and covered by FA under this permit.
3. Additionally in the 2nd paragraph of the introduction it states that disturbance from new roads and pads will total 8 acres in the first phase. Because the existing roads being used in this project are from the previous Emma B Minimal Impact Exploration Project, these existing roads should also be included as disturbance for Phase 1 of this project. Please provide the length and width of all existing roads from the Emma B Project that will be used for Phase 1 of this project.
4. Provide separate acreage disturbances for the following three categories: drill pads, newly constructed roads, previously constructed roads to be used from the Emma-B Minimal Impact Project.
5. The 2nd and 3rd paragraphs of the introduction to the project describe how 8 acres of the 60 total acres are included in the first phase and that the remaining 52 acres of disturbance under the permit would include any subsequent phases, reclamation, and field fitting of roads and pads. MMD accepts the submitted maps regarding the first phase, however per §19.10.4.402 D.(5) NMAC, maps and details from any subsequent disturbance from future phases must be submitted to MMD as a modification to the permit or at the time of renewal for approval.
6. MMD understands that 60 acres of FA is being proposed for the project due to subsequent phases, reclamation, and field fitting of roads and pads, however, additional incidental disturbance amounts in the categories of reclamation and field fitting are limited to the current approved phase.

7. The 4th paragraph of the introduction to the project mentions that reclamation will not take place until the entire project has been completed and it is determined that no additional boreholes are required. Furthermore it states that the project area may also be left un-reclaimed because the area is to be mined in accordance with Revision 21-1 to Permit No. GR010RE. Per §19.10.4.403 A. NMAC this approach will be possible, however, MMD will evaluate Revision 21-1 to the GR010RE mine permit and the reclamation status of exploration permit GR095ER at the time of renewal each year to determine whether or not reclamation needs to be initiated or not. Furthermore, all areas left un-reclaimed must be stabilized and protected with the appropriate BMP's to minimize erosion, especially off-site of the disturbed areas.
8. Section 2. Operation Ownership Information C, D and E: Provide the information referenced in these sections.
9. Section 2. Operation Ownership Information H. 7: Provide maps of the previously disturbed areas associated with permits GR079EM and GR083EM. Provide a map showing all monitoring well locations within the permit boundary. Additionally, please confirm whether or not items 1-10 in Section H of Section 2 are within the permit boundary. If any of these items are, then they must be presented in a map in the application.
10. Section 5. Reclamation and Operation Plan G.: Please confirm with OSE and provide the confirmation with MMD as to whether the plugging variance issued to Tyrone on 12/14/2010 is applicable to this exploration project.
11. Please provide the acreage for the Emma Proposed Permit Boundary indicated on the maps provided.
12. Because only 10,000 ft. of bonding is being provided for the exploration drill hole portion of the FA, only 10,000 ft. of open boreholes can be left un-plugged at one time. To move past the 10,000 ft. limit, approved OSE borehole plugging reports must be provided to MMD.
13. Attachment A: Please provide the remaining OSE POD's when available. MMD will need these prior to issuance of the permit.
14. Provide evidence of biological and cultural clearance for the referenced Emma Pit Revision 21-1Permit Area that is being applied to this application.
15. Section 8 B.: MMD recommends the use of berms and embankments on drill pads that will be left un-reclaimed for more than 6 months to help minimize erosion.

If you have any questions, please contact me at (505) 467-9589 or via e-mail at: clinton.chisler@emnrd.nm.gov.

Sincerely,

Clint Chisler, Permit Lead
Mining Act Reclamation Program (MARP)

cc: DJ Ennis, Program Manager, MARP
Raechel Roberts, Senior Environmental Scientist, Tyrone Mine

Attachments: State Agency Comments
Tribal Comments
Public Comments and request for hearing

Mine File (GR095ER)

MEMORANDUM

DATE: November 12, 2024

TO: Amber Rheubottom, Mining Environmental Compliance Section, Ground Water Quality Bureau, New Mexico Environment Department

FROM: Davena Crosley, Watershed Protection Section, Surface Water Quality Bureau, New Mexico Environment Department

SUBJECT: **Request for Comments, Emma Project, Regular (Part 4) Exploration Permit Application, Grant County, New Mexico Mining Act Permit No. GR095ER**

The New Mexico Environment Department (NMED)-Surface Water Quality Bureau (SWQB) received the subject request for comments on October 2, 2024. Freeport-McMoRan Inc. (FMI) submitted an application that proposes to drill 34, 5.5-inch diameter boreholes up to 2500 feet below ground surface on 33 drilling sites disturbing up to 60 acres of private property owned by FMI and within the approved permit area for the Emma-B Exploration Project. SWQB is providing the following comments pursuant to 19.10.4 New Mexico Administrative Code (NMAC):

The 2024 Emma Project includes drilling locations that are located approximately 200-ft from Oak Grove Creek and its tributaries. Oak Grove Creek and its tributaries are subject to New Mexico surface water quality standards at 20.6.4.13 NMAC and 20.6.4.98 NMAC and have designated uses for livestock watering, wildlife habitat, marginal warmwater aquatic life, and primary contact. Surface waters of the state shall be free of any water contaminant in such quantity and of such duration as may with reasonable probability injure human health, animal or plant life or property, or unreasonably interfere with the public welfare or the use of property (20.6.4.13 NMAC). Mine exploration activities that have the potential to contribute pollutants to waters of the state must be implemented with appropriate and reasonable Best Management Practices (BMPs) in order to prevent impacts to water quality. Any discharge of a water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property, must be reported to the Environment Department within twenty-four hours (20.6.2.1203 NMAC).

Appropriate and reasonable BMPs include, but are not limited to, the following:

- Freeport-McMoran Tyrone Inc., the operator, currently has National Pollutant Discharge Elimination System (NPDES) Multisector General Permit (MSGP) coverage under facility ID NMR053073. The operator should update the SWPPP for the facility to include exploration project area indicating any applicable changes in sector, stormwater monitoring, stormwater controls or BMPs as required by the NPDES permit.

- Spill clean-up materials such as absorbent pads must be available on-site at all times during road construction, site preparations, and drilling activities to address potential spills.

- Fuel, oil, hydraulic fluid, lubricants, and other petrochemicals must have a secondary containment system to prevent spills. Store these materials outside of the flood-prone zone.

- Process water must be contained within a closed-loop system or lined pits. A discharge of process water may require a discharge permit from NMED or the U.S. Environmental Protection Agency, or both.

- Drilling cores and drilling mud must be collected and disposed of properly.

- Pressure wash and/or steam clean all mobile equipment used in the project area before the start of the project and inspect daily for leaks. A written log of inspections and maintenance should be completed.

- The use of overland travel and site selection, design, and construction of drill pads, reserve pits, and roads should comply with the guidelines described in the Bureau of Land Management "Gold Book" [1]. Suspend construction, maintenance activities, or off-road travel during periods when the soil is too wet to adequately support heavy equipment without causing surface disturbance. The operator should commit to repair any surface disturbance they caused.

- Implement Best Management Practices to prevent direct impacts to watercourses, including springs, wetlands, and arroyos. For temporary surface disturbances during exploration and reclamation activities, the operator should implement erosion control measures that are designed, constructed and maintained using professionally recognized standards (e.g., Natural Resource Conservation Service standards or the Bureau of Land Management "Gold Book").

- The applicant should ensure that stormwater entering the project area ("run-on") is diverted from soil storage piles and should place piles uphill of excavations when possible.

- Roads, pads, and other facility structures should be set back a minimum of 100 feet from any watercourses, including springs, wetlands, and arroyos.

[1] https://www.blm.gov/programs/energy-and-minerals/oil-and-gas/operations-and-production/the-gold-book

Electronic Transmission

MEMORANDUM

Date: November 12, 2024

To: David Ennis, Program Manager, Mining Act Reclamation Program

Through: Amber Rheubottom, Acting Mining Act Coordinator, Mining Environmental Compliance Section (MECS)

From: Davena Crosley, Surface Water Quality Bureau (SWQB)
Sufi Mustafa, Air Quality Bureau (AQB)
Sean Madden (MECS)

Subject: **New Mexico Environment Department (NMED) Comments, Emma Project, Grant County, New Mexico, Mining Act Permit No. GR095ER**

The New Mexico Environment Department (NMED) received correspondence from the Mining and Minerals Division (MMD) September 25, 2024, requesting that NMED review and provide comments on the above-referenced MMD permitting action. Pursuant to the Mining Act, the is an exploration project. MMD requested comments on the application within 60 days of receipt of the request for comments.

Background

Freeport-McMoRan Tyrone Inc., (Applicant) requested to drill 34 boreholes up to 2,500 feet below ground surface, over a 60-acre disturbance area.

Air Quality Bureau

The AQB comments are attached.

Surface Water Quality Bureau

The SWQB comments are attached.

Mining Environmental Compliance Section

MECS Does not have any comments.

NMED Summary Comment

NMED has determined the proposed activities will be protective of the environment if done in accordance with the approved permits and pollution controls as presented.

If you have any questions, please contact Amber Rheubottom at (505) 660-2379.

cc: Joseph Fox, Program Manager, NMED-MECS
Brad Reid, Copper Team Lead, NMED-MECS
Sean Madden, NMED-MECS
Shelly Lemon, Bureau Chief, NMED-SWQB
Cindy Hollenberg , Acting Bureau Chief, NMED-AQB
Clint Chisler, EMNRD-MARP

MEMORANDUM

DATE: October 27, 2024

TO: Amber Rheubottom, Acting Mining Act Team Leader, Mining Environmental Compliance Section, NMED

FROM: Sufi Mustafa, Staff Manager, Air Dispersion Modeling and Emission Inventory Section, Air Quality Bureau.

Request for Review and Comment, Emma Project, Exploration Permit, Grant County, New Mexico Mining Act Permit No. GR095ER

The New Mexico Air Quality Bureau (AQB) has completed its review of the above-mentioned mining project. Pursuant to the New Mexico Mining Act Rules, the AQB provides the following comments.

Details

Freeport-McMoRan Tyrone Inc. (Tyrone) received approval for a minimal impact exploration permit, Emma-B, on August 08, 2019, under the permit No. GR083EM. Tyrone applied for three modifications to this permit (Modification 20-1, Modification 21-1, and Modification 22-1) and received approval from the Mining and Minerals Division (MMD). A termination report was also submitted for this minimal impact project in July of 2024.

Pursuant to 19. I 0.4.402, Tyrone is requesting to conduct the remainder of the mineral exploration in the Emma Expansion area under a new Part 4 Exploration Permit.

This phase of the project will consist of drilling thirty-four (34) boreholes on a total of thirty-three (33) drill pads. A number of pads will be partially constructed on existing roads for a total of 0.3 acres, which was removed from the disturbance total in the permit application. Drill holes EM_16 and EM_18 will be drilled from the same pad. A number of new roads will

be constructed as well. The associated pads and new roads of the first phase will generate approximately eight (8) acres of surface disturbance. Tyrone has also included approximately fifty-two (52) acres of disturbance that could be created through subsequent phases, reclamation, field fitting roads and pads, and any other unforeseen circumstances that may occur. As previously discussed, because roads and pads may need to be adjusted in the field, the 60 acres of disturbance could occur anywhere with the proposed Emma permit boundary line.

Air Quality Requirements

The New Mexico Mining Act of 1993 states that "Nothing in the New Mexico Mining Act shall supersede current or future requirements and standards of any other applicable federal or state law." Thus, the applicant is expected to comply with all requirements of federal and state laws pertaining to air quality.

20.2.15 NMAC, *Pumice, Mica and Perlite Processing.* Including 20.2.15.110 NMAC, *Other Particulate Control:* "The owner or operator of pumice, mica or perlite process equipment shall not permit, cause, suffer or allow any material to be handled, transported, stored or disposed of or a building or road to be used, constructed, altered or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne."

Paragraph (1) of Subsection A of 20.2.72.200 NMAC, *Application for Construction, Modification, NSPS, and NESHAP - Permits and Revisions*, states that air quality permits must be obtained by:

"Any person constructing a stationary source which has a potential emission rate greater than 10 pounds per hour or 25 tons per year of any regulated air contaminant for which there is a National or New Mexico Ambient Air Quality Standard. If the specified threshold in this subsection is exceeded for any one regulated air contaminant, all regulated air contaminants with National or New Mexico Ambient Air Quality Standards emitted are subject to permit review."

Further, Paragraph (3) of this subsection states that air quality permits must be obtained by:

"Any person constructing or modifying any source or installing any equipment which is subject to 20.2.77 NMAC, *New Source Performance Standards*, 20.2.78 NMAC, *Emission Standards for Hazardous Air Pollutants*, or any other New Mexico Air Quality Control Regulation which contains emission limitations for any regulated air contaminant."

Also, Paragraph (1) of Subsection A of 20.2.73.200 NMAC, *Notice of Intent*, states that:

"Any owner or operator intending to construct a new stationary source which has a potential emission rate greater than 10 tons per year of any regulated air contaminant or 1 ton per year of lead shall file a notice of intent with the department."

The above is not intended to be an exhaustive list of all requirements that could apply. The applicant should be aware that this evaluation does not supersede the requirements of any current federal or state air quality requirement.

Fugitive Dust

Air emissions from this project should be evaluated to determine if an air quality permit is required pursuant to 20.2.72.200.A NMAC (e.g. 10 lb/hour or 25 TPY). Fugitive dust is a common problem at mining sites and this project will temporarily impact air quality as a result of these emissions. However, with the appropriate dust control measures in place, the increased levels should be minimal. Disturbed surface areas, within and adjacent to the project area, should be reclaimed to avoid long-term problems with erosion and fugitive dust. EPA's *Compilation of Air Pollutant Emission Factors, AP-42, "Miscellaneous Sources"* lists a variety of control strategies that can be included in a comprehensive facility dust control plan. A few possible control strategies are listed below:

Paved roads: covering of loads in trucks to eliminate truck spillage, paving of access areas to sites, vacuum sweeping, water flushing, and broom sweeping and flushing.

Material handling: wind speed reduction and wet suppression, including watering and application of surfactants (wet suppression should not confound track out problems).

Bulldozing: wet suppression of materials to "optimum moisture" for compaction.

Scraping: wet suppression of scraper travel routes.

Storage piles: enclosure or covering of piles, application of surfactants.

Miscellaneous fugitive dust sources: watering, application of surfactants or reduction of surface wind speed with windbreaks or source enclosures.

Recommendation

The Air Quality Bureau does not have any objection to this project.

This written evaluation does not supersede the applicability of any forthcoming state or federal regulations.

If you have any questions, please contact me at 505 629 6186.

Michelle Lujan Grisham,
Governor

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 NM.SHPO@dca.nm.gov

November 18, 2024

Mr. Clinton Chisler
Permit Lead
Mining Act Reclamation Program
Energy, Minerals and Natural Resources Department
Mining and Minerals Division
1220 South St. Francis Drive
Santa Fe, NM 87505
clinton.chisler@emnrd.nm.gov

Via Email Only

RE: HPD Log #123591— Request for Comment Emma Project, Regular (Part 4) Exploration Permit Application, Permit No. GR095ER

Dear Mr. Chisler:

Thank you for submitting the information on the Emma Project, Regular (Part 4) Exploration Permit Application, Permit No. GR095ER to the New Mexico State Historic Preservation Office (SHPO) for review and comment. The SHPO received the information on September 25, 2024, via email. The project was reviewed under §19.10.4.402.F NMAC.

Based on the information provided in the Exploration Permit Application, I reviewed our cultural resource database. The area proposed for the Emma Project was surveyed in 2022 in anticipation of a prior exploration project. There are no known cemeteries or burial grounds within the permit area. Nor are there any known cultural resources listed in or eligible for listing in the National Register of Historic Places. I have included a Discovery Clause below.

DISCOVERY CLAUSE

If archaeological artifacts (i.e. metal, china, historic ceramics, pottery sherds, flaked stone, bone, colored glass, etc.) are found during earth disturbing activities, cease work immediately, protect the discovery and contact the State Historic Preservation Office (SHPO) at (505) 827-6320.

If human remains are found, work must cease immediately in the vicinity of the remains pursuant to state law. Secure the area to protect the remains from further disturbance and contact the local law enforcement agency (sheriff's office or city police) with jurisdiction over the area. Law enforcement will contact the Office of the

Medical Investigator (OMI) and the SHPO. If the OMI determines that the remains are without medicolegal significance, the OMI will terminate jurisdiction to the SHPO. The SHPO will, with the assistance of a professional archaeologist, determine if the remains can be left in place and protected or if they need to be excavated by an archaeologist holding permit to excavate unmarked human burials.

If you have any questions or concerns, please contact me at cortney.wands@dca.nm.gov.

Sincerely,

Cortney Wands

Cortney Wands
Archaeological Reviewer

GOVERNOR
Michelle Lujan Grisham

DIRECTOR AND SECRETARY
TO THE COMMISSION
Michael B. Sloane

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

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For information call: (888) 248-6866

wildlife.dgf.nm.gov

12 November 2024

Clint Chisler, Permit Lead
Mining Act Reclamation Program
Mining and Minerals Division (MMD)
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Emma Project, Regular (Part 4) Exploration Permit Application, Freeport-McMoRan Tyrone* Inc., *Permit No. GR095ER; NMDGF No. NMERT-3856.

Dear Mr. Chisler,

The New Mexico Department of Game and Fish (Department) has reviewed the exploration project referenced above. Freeport-McMoRan Tyrone Inc. (Tyrone) is proposing to drill 34 exploratory bore holes, to a maximum depth of approximately 2,500 feet, from a total of 33 drill pad sites. Some of the proposed drilling sites are located near previously-drilled and reclaimed exploration sites. The project area is in Grant County, Township 19S, Range 15W, Sections 25, 26, 35, and 36. The proposed drilling project would disturb a total area of approximately 60 acres. Staff from the Department, MMD, New Mexico Environment Department, and Tyrone conducted a site inspection on 21 October 2024. The Department provides the following recommendations to minimize potential impacts of the proposed action to wildlife and their habitats.

The permit application states that, to prevent wildlife entrapment, plastic tarps will be placed over the drilling mud pits. The Department believes that placing plastic tarps over the mud pits may not adequately prevent wildlife from becoming entrapped and recommends that, if tarps are used, they be securely anchored over the pits. The mud pits should also be adequately fenced to prevent larger animals from walking onto the tarps and potentially becoming entrapped. To exclude mule deer (*Odocoileus hemionus*) and other large animals, the above-ground fence height should be a minimum of eight feet. The Department continues to recommend that Tyrone use a closed loop drilling system. Closed loop systems eliminate the need to build fences or install netting or similar materials to exclude wildlife from mud pits, reduce the amount of surface disturbance associated with the drill pad site, and consume significantly less water.

During drilling operations, it is also important to prevent wildlife from entering and becoming trapped in stockpiled drill pipes. Capping piping is the most effective way to prevent wildlife entry. At a minimum, the Department recommends that each section of pipe be visually inspected prior to use to verify that wild animals are not inside.

To minimize the likelihood of adverse impacts to migratory bird nests, eggs, or nestlings during implementation of proposed road and drill pad construction activities, the Department recommends that ground disturbance and vegetation removal activities be conducted outside of the primary breeding season. This season runs from 15 April - 1 September for upland songbirds; 1 March - 1 September for most raptors; and 1 January - 15 July for golden eagle (*Aquila chysaetos canadensis*) and great horned owl (*Bubo virginianus*). If ground disturbing and clearing activities must be conducted during the breeding season, the area should be surveyed for active nest sites (with birds or eggs present in the nesting territory) and avoid disturbing active nests until young have fledged. For active nests, establish adequate buffer zones to minimize disturbance to nesting birds. Buffer distances should be a minimum of 100 feet from songbird and raven nests; 0.25 miles from most raptor nests; and 0.5 miles for American goshawk (*Accipiter atricapillus*), golden eagle, peregrine falcon (*Falco peregrinus*), and prairie falcon (*Falco mexicanus*) nests. Active nest sites in trees or shrubs that must be removed should be mitigated by qualified biologists or wildlife rehabilitators. Department biologists are available to consult on nest site mitigation and can facilitate contact with qualified personnel.

The Department recommends that, to the maximum extent feasible, large mature trees are left undisturbed by road and drill pad construction activities. Tree species that should be left undisturbed include alligator juniper (*Juniperus deppeana*), piñon pine (*Pinus edulis*), and all species of oak (*Quercus* spp.).

The Department concurs with the proposed seed mix. The Department also recommends that only certified weed-free seed be used to avoid inadvertently introducing non-native species to the reclamation site. Any alternate plant species, used to substitute for primary plant species that are unavailable at the time of reclamation, should also be native. When possible, the Department recommends using seeds that are sourced from the same region and habitat type as the reclamation site and suggests including seeds from a region that represents potential future climatic conditions at the site.

Thank you for the opportunity to review and comment on the proposed exploration project. If you have any questions, please contact Ron Kellermueller, Mining and Energy Habitat Specialist, at (505) 270-6612 or ronald.kellermueller@dgf.nm.gov.

Sincerely,

Virginia Seamster, Ph.D.
Assistant Chief for Technical Guidance, Ecological and Environmental Planning Section

cc: USFWS NMES Field Office

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
Hydrology Bureau

MMD REVIEW MEMORANDUM

DATE: November 15, 2024

TO: Clint Chisler, Permit Lead, Mining Act Reclamation Program
Lloyd Valentine, District III Manager, Deming, New Mexico

THROUGH: Katie Zemlick, Ph.D., Hydrology Bureau Chief KZ

FROM: Christopher E. Angel, PG, Senior Hydrologist, Hydrology Bureau CEA

SUBJECT: Emma Project Regular (Part 4) Exploration Permit Application, GR095ER, Grant County

KEYWORD: Emma Project, District No. III, Grants, Mimbres Underground Water Basin (M), Silver City, Granite

ID: MMD_2024_010_GR095ER

INTRODUCTION

The New Mexico Office of the State Engineer (OSE) Hydrology Bureau received the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) Mining and Minerals Division's (MMD's) September 25, 2024, request for comments on the subject Emma Project. The MMD permit number is GR095ER. The application materials were downloaded from https://www.emnrd.nm.gov/mmd/gr095er-emma-project-regular-exploration-project-part-4/

The Emma Project Part 4 Application is requesting MMD permit to drill thirty-four (34) mineral exploratory boreholes from thirty-three pads (33). Each borehole is to be drilled to a maximum total depth up to 2,500 feet. Based on surface hole location, these boreholes are to be drilled in the Mimbres Underground Water Basin (M) of Grant County, New Mexico. More specifically, the surface hole locations are in Sections 25, 35, and 36, Township 19 South, Range 15 West (M). It cannot be determined where the bottom hole locations are located as no azimuth, inclination, and measured depth have been provided in the application. In addition, the true vertical depth has not been supplied. The WR-07 applications are not on the current WR-07 form which requires directional information to be submitted with the application. The current WR-07 form is dated 10/02/2024.

This review is to evaluate the area for possible hydrogeologic concerns and the materials used in drilling and plugging the boreholes.

COMMENTS

The OSE Hydrology Bureau has completed a review of the Emma Project Regular (part 4) Exploration Permit Application (GR095ER) and provides the following comments:

Drilling Comments

Boreholes

The MMD application indicates that thirty-four (34) exploratory boreholes are to be drilled from thirty-three (33) drill pads. Two or more boreholes being drilled from the same surface hole location indicates that the boreholes will be drilled as angled/directional boreholes. The letter submitting the MMD application indicates that EM-16 and EM-18 are going to be drilled from the same pad. Angled/directional boreholes have bottom hole locations that are different than the surface hole location. Therefore, when drilling angled/directional boreholes the measured total depth will be greater than the true vertical depth. The planned azimuth and inclination is necessary (but not provided) to adequately evaluate these boreholes. As drilled azimuths and inclinations should also be included on the official OSE Well Record and Log submitted to the OSE.

The MMD Part 4 application indicates that the boreholes are going to be 5.5-inches and drilled with fluid. The maximum depth of each borehole is going to be 2,500 feet. The attached unapproved OSE *"WR-07 Application for Permit to Drill a Well with No Water Right" version 07/12/22* (WR-07-22) indicates each borehole will be drilled to total depth of 900 feet. As the depth requested on the OSE permitted depth being significantly shallower than the requested MMD depth, a new permit will need to be submitted (Valentine, 2024).

"WR-07 Application for Permit to Drill a Well with No Water Right" version 07/10/2024 (WR-07-24) indicates that the boreholes will be drilled to a total depth of 2,500 feet. The check box for angled/directional boreholes is not and none of these boreholes should be drilled in a manner that intentionally deviates the borehole.

The current WR-07 requires the applicant to select a check box for angled/directional wells. When this check box is selected, additional information is required for each borehole that is going to be drilled at an angle or directionally. The as drilled angle or directional information is to be submitted with the official OSE Well Record and Log (official well record).

Each borehole is to be plugged and not converted for use as water wells.

Drilling Fluid Comments

This application indicates that the boreholes are to be drilled by fluid drilling methods. Some of the additives identified in the application. No Material Safety Data Sheets (MSDS) for the drilling fluids were provided with this application. Based on Baroid Product Data Sheets obtained by the OSE, all these products are NSF 60 certified (Baroid, 2012a, 2012b, 2012c, 2014).

According to the RC Drilling section, EZ Mud Gold and Quick Gel are to be used in the drilling of these boreholes. EZ Mud Gold is a clay stabilizer that is broken down with bleach (Baroid, 2012a). Quick-Gel is a viscosifier that can build a mud cake that has low permeability (Baroid,

2012b). When these materials are used, they need to be identified on the official well record. Should the EZ Mud Gold and Quick Gel not be properly broken down and removed from the borehole it is not possible to conclusively say that the borehole is "Dry". Should the borehole be developed, then the development procedure should also be documented on the official well record.

According to the Core Drilling section, EZ Mud Plus, Quick Trol Gold and Quick Gel are to be used in the drilling of these boreholes. EZ Mud Plus is a polymer emulsion that is broken down with bleach (Baroid, 2014). Quick-Gel is a viscosifier that can build a mud cake that has low permeability (Baroid, 2012b). Quick Trol Gold is a polymer that is used for filtration control (Baroid, 2012c). When drilling fluids are used, they need to be identified on the official well record. Should the EZ Mud Plus, Quick Trol Gold and Quick Gel not be properly broken down and removed from the borehole it is not possible to conclusively say that the borehole is "Dry". Should the borehole be developed, then the development procedure should also be documented on the official well record.

Borehole Abandonment

According to the MMD application and the approved OSE application all dry and wet boreholes are to be plugged from the bottom up. There is a difference in plugging materials between the MMD application and the OSE application. The cements identified are a Portland Type II and Portland Type I/II, respectively.

According to the MMD application the Portland cement is to be mixed in accordance with a plugging variance issued to Tyrone on December 14, 2010. This variance request uses a neat Type I/II cement mixed with 5.0 gallons of water per 94-pound sack (gal/sk). This mixture uses 0.2 gallons of water less than the minimum amount stated in OSE (2020). This design is acceptable. The variance request to plug wells without a plugging permit will need to be determined by OSE District III.

Hydrology Comments

Surface Water

Thirty-four (34) exploratory boreholes are to be drilled from thirty-three (33) drill pads between Oak Grove Creek and Cherry Creek. It is unlikely that the ephemeral streams will be affected by the drilling of these exploratory boreholes if they are appropriately plugged and abandoned. However, all drilling fluids and cuttings must be contained on-site and cannot be discharged into Oak Grove Creek or Cherry Creek (NMAC, 2017)19.27.4.29.P(2)).

Groundwater

Golder (2021) contoured groundwater elevations in feet above sea level (fasl). These elevations were used to estimate the depth to groundwater. Groundwater elevations around this application are between approximately 6,000 and 5,800 fasl.

The Emma Project exploratory borehole true vertical total depths cannot be determined as no azimuths and/or inclinations were provided in the application. However, if fractures or porous intervals are encountered in any of the boreholes below 6,000 fasl, there is a potential to encounter

groundwater. There is a possibility that groundwater may not be observed during the drilling process. This occurs when drilling fluids (including air) enter a fracture pushing water back into the formation. The drilling mud and/or cuttings may prevent the inflow of water making the borehole appear dry. If the borehole is adequately developed by removing the drilling fluids and cuttings from the fractures and/or porous intervals, then the borehole cannot be fully described as "Dry". As these boreholes are to be plugged before the drill rig leaves the site, it is unlikely that the boreholes will be adequately developed to determine if the borehole is officially "Dry". In the case of this application, wet and dry borehole plugging materials are the same and can be used on wet and/or dry boreholes.

Inclination and azimuth of angled/directional boreholes or wells is extremely important to determine the true vertical depth of groundwater (encountered and static), and lithologic information. This application will need to be resubmitted on the most recent WR-07 (Valentine, 2024) and will need to include at a minimum the azimuth, inclination, measured depth and true vertical depth.

Miscellaneous Comments

The Tyrone mine is to supply water for the drilling of these exploratory boreholes. It is recommended that the District III Office of the State Engineer be contacted to determine if the specific source of water to be used in the drilling of the Emma Project exploratory boreholes is appropriately permitted.

CONCLUSIONS

In conclusion,

1) A new WR-07 will need to be submitted to the District III Office of the State Engineer on the most recent WR-07 Application form. This form requires directional wells to be identified and directional information to be provided to the OSE prior to drilling.
2) As directional information was not provided, an evaluation of the potential for the boreholes to encounter groundwater is incomplete.
3) As built, directional drilling information will need to be attached the official well record to be considered complete.
4) No material safety data sheets were provided for the drilling additives.
5) Marking the wells as "Dry" on the official well record is acceptable if no water is seen during the drilling process. However, it should be noted on the official Well Record that the borehole was not developed to remove drilling fluids and drill cuttings.
6) If the borehole is developed, the development methods need to be identified on the official well record along with any fluids used to breakdown and remove the fluids and cuttings.
7) Utilizing a tremie pipe and either a Type I/II or Type II cement is acceptable. The OSE District III Office of the State Engineer will need to be notified if any additives are used in the plugging materials.
8) The District III OSE should be contacted to confirm that the Tyrone mine has adequate water rights to supply water for the drilling of these boreholes.

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APPENDICES

Appendix A

GENERAL CONCERNS RELATED TO NMOSE REGULATION OF EXPLORATORY BOREHOLE DRILLING

Encountering Groundwater and Associated Plugging of Those Borings

Well drilling activities (including mineral exploration borehole drilling ("mine drill holes") that penetrate a water-bearing stratum) and well plugging, are regulated in part under 19.27.4 NMAC. Most recently promulgated in 6/30/2017, these regulations require any person engaged in the business of well drilling within New Mexico to obtain a Well Driller License issued by the NMOSE (New Mexico Office of the State Engineer). Therefore, a New Mexico licensed Well Driller shall perform the drilling and plugging of exploratory boreholes that encounter groundwater.

Exploration drilling where any form of groundwater is encountered will be subject to pertinent sections of 19.27.4 NMAC, including but not limited to Sections 19.27.4.30.C NMAC for plugging and abandonment of non-artesian wells/borings; 19.27.4.31 NMAC for artesian wells/borings; and 19.27.4.36 NMAC for mine drill holes that encounter water. A complete version of the NMOSE 19.27.4 NMAC regulations can be found on the NMOSE website at: https://www.ose.state.nm.us/Statewide/wdRules.php.

MMD will likely place additional conditions on the drilling and plugging of all mineral exploration borings via the MMD project permit.

All onsite drilling and plugging activities where groundwater is encountered shall be conducted under the supervision of the New Mexico licensed Well Driller or a NMOSE-registered Drill Rig Supervisor under the direction of the licensed Well Driller.

Additional NMOSE filings will be required where it is requested that an exploratory borehole be converted to a water well. The well design and construction shall be subject to the provisions of NMOSE regulations 19.27.4 NMAC. Appropriation of water from such a conversion may require a water right. The MMD may disallow the conversions of exploratory borings to water wells if not permitted specifically in the MMD permit.

Use/Extraction of Temporary Casing

When drilling through overburden or caving, poorly consolidated, or karst geologic units, use of temporary casing may be desired. Any temporary casing should be installed with the full intention of its removal before borehole plugging, therefore temporary casing should be inserted into a borehole of sufficiently large diameter to allow easy extraction upon termination of drilling. NMAC 19.27.4 regulations dictate methodology for the installation of permanent well casing, including the installation of required annular seal, should that option be more prudent.

If temporary casing lacking a rule-compliant annular seal or casing grade becomes stuck in-place down hole, the potential for permanent commingling of aquifers or down hole surface water drainage may occur via an unsealed annulus. In these cases, staged casing cutting and extraction,

or remedial casing perforation and squeeze-cementing will be required to the satisfaction of the State Engineer as part of final well decommissioning. Steps should be taken during drilling to prevent deleterious fall-in or drainage of cuttings/sediments into the annulus outside the temporary casing to best allow for full retrieval and proper borehole plugging.

When setting of temporary casing occurs or is expected, appropriate detail of the proposed casing extraction and borehole clean-out process prior to plugging will be required in the NMOSE Well Plugging Plan of Operations form. If exploratory drilling through stratified or artesian aquifer systems, filing a NMOSE Artesian Well Plan of Operations may be required to preemptively assess and address NMOSE concerns regarding best borehole decommissioning practices.

Exploratory Borehole Plugging

Terms of borehole plugging will be established jointly by the evaluation of the NMOSE Well Plugging Plan of Operations and the review of the relevant MMD application for water-bearing boreholes. Approved high-solids bentonite abandonment-grade sealants and/or approved cement slurries will be required for plugging as deemed hydrogeologically appropriate by the agencies. NMOSE-authorized cement slurries will be required for the decommissioning of flowing artesian boreholes. If the exploratory borings do not encounter groundwater, MMD plugging regulations (19.10.3 NMAC) prevail over those of 19.27.4 NMAC.

NMOSE well plugging regulations require tremie placement of the column of well sealant, which shall extend from the bottom of the borehole to ground surface. By regulation, pumping decommissioning sealants into the top of the borehole is not allowed. The NMOSE defers to the discretion of the MMD for the choice of sealant versus natural fill in the uppermost portion of a borehole plug to facilitate site restoration.

Required plugging of water-bearing exploratory borings shall occur within the timeframe specified by either the NMOSE or MMD to minimize cave-in and the potential for incomplete plugging due to blockages in the borehole.

Drill Rig Fuels, Oils and Fluids

Drill rigs contain and consume fuels, oil, and hydraulic fluids, and are subject to leaks. Drill rigs often remain in-place longer than other pieces of exploration equipment onsite, are frequently running, and are positioned immediately above and adjacent to the open borehole. As a standard practice to prevent contamination and reduce site cleanup activities, it may be beneficial to use bermed, impermeable ground sheeting under the drill rig. Consideration of bermed containment volume sufficient to accommodate a high-intensity precipitation event is also a good practice.