



Armando Martinez
Environmental Manager, Questa Mine

November 14, 2017

Mr. Michael Coleman and Mr. Holland Sheppard
Energy, Minerals and Natural Resources Department
Wendell Chino Building
1220 South St. Francis Drive
Santa Fe, NM 87505

RE: Request for Permit Modification, TA001RE, Revision 96-2, Questa Mine Post Mining Land Uses

Dear Mr. Coleman and Mr. Sheppard:

The approved post-mining land uses ("PMLU") for the Chevron Mining Inc. ("CMI") Questa Mine and Mill site are currently forestry and water management [(Permit TA001RE, Revision 96-2 (May 24, 2002), Sections 5.F, 6.A, and 9.D & E; Revision 05-01 (April 4, 2006), Sections 5.1.F, 6.1.A, and 9.1.D)]. The current open pit and PMLU areas are shown in Figure 1 attached to this request. The open pit is waived from the requirement to achieve a self-sustaining ecosystem (Condition 9.D). As discussed below, CMI proposes to change the PMLU at the site to wildlife habitat and industrial/commercial.

Forestry to Wildlife Habitat

CMI proposes to change the PMLU for the mine site, in those areas outside the open pit waiver area, from forestry to wildlife habitat. This PMLU change represents a shift from a commercial to ecological focus. CMI recognizes it is impracticable to operate the former mine site as a commercial forest after the cessation of mining. The PMLU change is consistent with the surrounding land use and site potential. Designating the PMLU at the mine site as wildlife habitat will align the reclamation objectives (ecological focus) for both the mine site and the tailing facilities, where the approved PMLU is wildlife habitat. Furthermore, CMI believes the vegetation conditions that will be necessary to meet the wildlife PMLU will provide adequate cover performance and stability functions.

For areas reclaimed to wildlife habitat, CMI would establish a plant community comprised of native vegetation capable of self-regeneration and compatible with facilitating natural plant succession over the long term. It is expected that over time the reclaimed areas would recruit local native plant species, including trees, from surrounding undisturbed areas. CMI believes the revegetation performance standards for the wildlife PMLU should reflect the mine site's ecological potential. Modifications to the proposed revegetation performance standards are based on the ecosystem processes observed in the natural regeneration in the

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Goat Hill subsidence area, the 2003 Spring Gulch test plots, the 2014 Spring Gulch cover trials and the surrounding undisturbed seral and mid-climax plant communities including burn scars. Observations include:

- Grazing pressure on the Spring Gulch Cover Trials by bighorn sheep (BHS) has significantly impacted vegetation cover, especially grasses. Herbivory was observed on essentially all grass species and, in many instances, the BHS have pulled the entire plant out of the ground. Comparison of the fenced portion of the platform plots to the unfenced areas show a sharp contrast in vegetation cover where the BHS are excluded.
- Several forb species have shown a strong initial response to the composted biosolids, though it is uncertain how long they will persist. Very few new forb seedlings have been observed in the cover trials despite a strong seed set.
- More than a decade after seeding, the original (2003) Spring Gulch Test Plots had limited herbaceous plant canopy cover. The main grasses present are fescues that resist uprooting by BHS, but have limited canopy coverage. Several shrub species have persisted, but appear to have increased in density.
- Natural regeneration in the primary subsidence zone at Goat Hill is progressing at a slow rate, particularly in the understory that is primarily comprised of woody plants and forbs. Total canopy cover for understory plants in 2014 was estimated at 15.2 percent and grasses only represented 1 percent absolute cover compared to 12.9 percent for shrubs and tree saplings.
- The surrounding mature forest has a very low understory component that is dominated by perennial forbs, subshrubs, and shrubs. Grasses are generally absent.
- Secondary successional plant communities in undisturbed areas surround the waste rock piles are considered an ecological reference for the anticipated trajectory and composition of Questa's reclamation. Burn scars adjacent to the waste rock piles that are undergoing secondary succession are mainly comprised of shrubs with a forb/subshrub understory.

CMI believes the near-term (10 to 15 years) target for the waste rock pile reclamation is a shrub/subshrub plant community consistent with the surrounding environment. Because of the grazing pressure, it is anticipated that grasses will not be a significant component to shrub understory.

Despite strong initial establishment on the composted biosolids treatments, it is likely that BHS grazing over the next 10-15 years may lead to plant community on the Cover Trials plots that is similar to the vegetation conditions observed on the 2003 Test Plots.

CMI proposes to maintain the 30% total canopy cover technical performance standard for herbaceous and woody species (Revision 96-02, Section 6.Q) but qualifies that the standard

might be modified based on the results of on-going field trials and proposed pilot studies.

Changes to the woody plant density (Revision 96-02, Section 6.Q) and plant diversity performance standards (Revision 96-02, Section 6.R) are also proposed. Additional changes to the permit would be required to eliminate the performance objectives regarding tree establishment referenced in Sections 6.O and 6.U and the extended monitoring period detailed in Sections 6.K and 6.O.

Industrial/Commercial

The long-term water treatment at the Mine site necessitates changing the designation of the former Mill and water treatment plant areas to an industrial/commercial PMLU. Section 9.E of the permit is consistent with this designation as it allows for the development of a permanent water management system for the site. Additionally, a non-residential land use restriction is already in place for the Mill area (EPA, 2010). Figure 2 illustrates the areas designated for the industrial/commercial PMLU.

The performance standard for the industrial/commercial area will be to provide sufficient canopy cover to control erosion compared to site-specific erosion rates in adjacent undisturbed areas. This may be achieved through both revegetation and the application of erosion resistant materials including placement of aggregate base course or other construction materials in operational areas.

Attached to this request is a draft of the proposed modifications to Permit No. TA001RE, Revision 96-2 and the two figures mentioned above.

Pursuant to §19.10.2.201 Subpart H the required permit fee of \$1000 will be submitted under separate cover.

CMI appreciates your consideration of this issue. Should you have any questions or require additional information, please contact me at (575) 586-7639.

Sincerely,

A handwritten signature in blue ink, appearing to read "Armando Martinez".

Armando Martinez
Environmental Manager

Attachments: TA001RE Permit Modification language (inline edits and clean versions)
Figures (Mine Area and Mill Site)

Cc: A. Maurer, NMED

New permit language for Sections 6 and 9, Permit TA001RE, Revision 96-2

Section 6. Closeout Plan Summary

Revegetation Monitoring

- K. The Permittee shall perform vegetation monitoring of reclaimed areas during the 12-year financial assurance period. The minimum 12-year monitoring period will determine whether the permit area has been reclaimed to a condition that allows for the re-establishment of a Self-Sustaining Ecosystem (19.10 NMAC, Part 12, 19.10.12.1204.A).
- L. The Permittee will implement a systematic, statistically based monitoring program to confirm that the "site is reclaimed to a condition that allows for re-establishment of a Self-Sustaining Ecosystem appropriate for the life zone of the surrounding areas" (19.10 NMAC, Part 5, 19.10.5.507).
- M. The Permittee will implement a Revegetation Monitoring Program that will evaluate plant establishment and growth performance, to verify that the plant community is developing into a Self-Sustaining Ecosystem. Additionally, the program will provide a mechanism for implementing corrective actions if the revegetation plan goals are not being met. The Revegetation Monitoring Program will consist of the following activities:
- Collecting annual meteorological data.
 - Documenting trends in vegetation parameters over time through annual qualitative inspections, an interim quantitative survey in year 6 of the reclamation and quantitative surveys in two of the last four years of the responsibility period to demonstrate the reclamation has met performance standards.
 - Identifying areas where vegetation development may be performing below expectation.
 - Data to be collected shall include diversity, woody plant density, and total canopy cover .
- N. If after the implementation of the approved revegetation plan, a reclaimed area does not exhibit the potential to achieve the revegetation performance standards described above, the Permittee shall prepare a report which describes the area in question, the situation as identified, probable causes, and a corrective action plan. This report shall be submitted to MMD in a timely manner. The corrective actions to be taken include, but need not be limited to, addition of soil amendments, reseeding or interseeding of herbaceous and/or shrub species, or other appropriate land husbandry practices . Revegetated areas will be qualitatively evaluated on an annual basis to determine the extent of colonization by invasive species. Detailed plans for weed control will be developed as needed.

Revegetation of Disturbed Areas

- O. Implementation of the revegetation plan will achieve the vegetation performance objective ~~is~~ to reduce erosion rates by the planting and establishment of grasses, forbs,

and woody plants and establish an -ecosystem capable of providing food and cover for wildlife species. This will be implemented through simultaneous establishment of shrub and herbaceous cover. The permittee can request release of the site from a vegetation success perspective no sooner than 12 years after seeding, pending a demonstration of success.

- P. The Permittee will apply a mixture of grasses, forbs and selected woody species to establish the vegetation cover for erosion and infiltration control on covered areas. Reclamation seed mixes, including alternate or substitute species, will be approved by the MMD. Vegetation established in drainage channels may be restricted to herbaceous species only, although selected native woody species of high evapotranspiration potential may also be established. Preliminary mixtures and application rates of grasses and forbs for herbaceous cover establishment are provided in the closeout plan in Tables 3-3 through 3-5 and have been further refined with on-going and proposed studies, such as, the Spring Gulch Cover Trials and Goat Hill North Pilot project. Final species selection will be based upon thorough characterization of the in-place cover material, availability of seed, and recommendations derived from site-specific performance data.

Vegetative Management Objectives and Standards

- Q. The final -vegetation standards shall be:
A woody plant density equal to or greater than 320 stems per acre comprised of 4 species of shrubs, sub-shrubs, and/or trees. Volunteer vegetation can be included towards meeting vegetation success.
Total herbaceous and woody canopy cover technical standard = 30 percent (total canopy cover is the percentage of the ground surface area covered by the vertical projection of the canopy). The proportional numerical standard for total canopy cover shall be 70 percent of the technical standard. The canopy cover standard may be refined pending the results of on-going field trials and projected pilot studies in consultation with MMD.
- R. A diversity standard of at least 3 perennial grasses, 3 biennial or perennial forbs, 4 woody species including shrubs, sub-shrubs, conifers and/or deciduous trees. Minimum relative cover levels by life form for the diversity standard will be:

Life Form	Number of Species	Minimum Occurrence (% relative cover)
Perennial Grasses	3	1 % combined
Forbs	3	1 % combined
Shrubs, subshrubs and trees	4	5 % combined

The diversity standard may be refined pending the results of on-going field trials and projected pilot studies in consultation with the MMD.

- U. The Permittee shall take the following reclamation measures to help stabilize portions of the pit where practicable and meet applicable federal and state regulations:

- 1). Broadcast seeding on accessible slopes and the pit bottom;
- 2). Aerial seeding will be performed on other portions of the pit slope and benches;
- 3). Surface water run-on diversion ditches around the north side of the pit will be constructed as a source control of runoff from natural/undisturbed ground; and

Section 9. Conditions

Post-Mine Land Use

- D. Pursuant to §19.10.1.7. P.(5) of the Rules, the post-mine land uses for the Questa Mine site are wildlife and-industrial/commercial. All areas of the site, other than E below, that have not been waived from the requirement to achieve a Self-Sustaining Ecosystem or are subject to the variance approved on May 24, 2002, shall be developed to allow for the establishment of a self-sustaining ecosystem.
- E. Other portions of the site shall be designated as an industrial/commercial post-mining land use to accommodate a permanent water management system for the site including a water treatment plant, sludge repository and other ancillary support facilities in the mill site area (see Map 2). Additionally, areas designated as wildlife may contain wells, impoundments, and drainage and conveyance systems necessary for water management.

Revegetation

- O. The Permittee shall submit for MMD approval seed mixtures and planting rates for all areas to be revegetated as part of the Closeout Plan. The proposed seed mixtures and planting rates shall be provided to MMD, within 6 months after completion of on-going and proposed studies, such as, the Spring Gulch Cover Trials and Goat Hill North Pilot project.
- P. The Permittee shall provide a revised revegetation plan, for MMD approval, within 6 months after completion of the on-going and proposed studies, such as, the Spring Gulch Cover Trials and Goat Hill North Pilot project.
- Q. The Permittee's revised revegetation plan shall include the methods to be used to collect vegetation data on reclaimed areas once closeout of the site has been initiated. The plan shall include the statistical methods to be used to verify sampling confidence and adequacy.

Revegetation, Meteorological, and Wildlife Monitoring

- R. The Permittee shall provide the results of qualitative or quantitative revegetation monitoring to MMD in the vegetation report due on February 1st of each year in years that it is performed unless submitted for CERCLA. Revegetation monitoring shall include a description of plant diversity, woody plant density, and total canopy cover.

New permit language for Sections 6 and 9, Permit TA001RE, Revision 96-2

Section 6. Closeout Plan Summary

Revegetation Monitoring

- K. The Permittee shall perform ~~long-term~~ vegetation monitoring of reclaimed areas ~~annually, over an extended period of time. This time frame will include a 5 to 10 year monitoring and maintenance period, during which the monitoring program will assist in the evaluation of interim reclamation management objectives. This will be followed by a minimum~~ during the 12-year financial assurance monitoring period, ~~which will commence after the final maintenance procedures have been completed.~~ The minimum 12-year monitoring period ~~without maintenance~~ will determine whether ~~or not~~ the permit area has been reclaimed to a condition that allows for the re-establishment of a Self-Sustaining Ecosystem (19.10 NMAC, Part 12, 19.10.12.1204.A).
- L. The Permittee will implement a systematic, statistically based monitoring program to confirm that the "site is reclaimed to a condition that allows for re-establishment of a Self-Sustaining Ecosystem appropriate for the life zone of the surrounding areas" (19.10 NMAC, Part 5, 19.10.5.507).
- M. The Permittee will implement a Revegetation Monitoring Program that will evaluate ~~growth medium development~~, plant establishment and growth performance, to verify that the plant community is developing into a Self-Sustaining Ecosystem. Additionally, the program will provide a mechanism for implementing corrective actions s if the revegetation plan goals are not being met. The Revegetation Monitoring Program will consist of the following activities:
- Collecting annual ~~substrate~~, meteorological ~~and vegetation performance~~ data ~~on the reclaimed areas~~.
 - Documenting trends in ~~substrate and~~ vegetation parameters over time through annual qualitative inspections, an interim quantitative survey in year 6 of the reclamation and quantitative surveys in two of the last four years of the responsibility period to demonstrate the reclamation has met performance standards.
 - Identifying areas where ~~substrate and~~ vegetation development may be performing below expectation.
 - ~~Providing recommendations for monitoring revegetated areas.~~ Data to be collected shall include diversity, woody plant density, and total canopy cover ~~ground cover, and shrub and tree survival and growth~~.
- N. ~~If plant nutrient deficiencies appear or if vegetation monitoring indicates that, due to natural or other causes,~~ If after the implementation of the approved revegetation plan, a reclaimed area does not exhibit the potential to achieve the revegetation performance standards described above, the Permittee shall prepare a report which describes the area in question, the situation as identified, probable causes, and a corrective action plan. This

report shall be submitted to MMD in a timely manner. The corrective actions to be taken include, but need not be limited to, addition of soil amendments, reseeding or interseeding of herbaceous and/or shrub species, or other appropriate land husbandry practices ~~cover, and replanting of trees, shrubs, and sub-shrubs~~. Revegetated areas will be qualitatively evaluated on an annual basis to determine the extent of colonization by invasive species. Detailed plans for weed control will be developed as needed.

Revegetation of Disturbed Areas

- O. ~~The Permittee's revegetation plan has three main components: 1.) the conceptual design, 2.) the planting methods and techniques, and 3.) establishment period maintenance requirements. The conceptual design provides an overview and general picture of the final configuration of the revegetation plan. The planting methods and techniques component describes the process of implementing~~ Implementation ~~of the revegetation plan and has two major performance objectives: 1.) short term vegetation performance, and 2.) mid to long term vegetation performance. The short term~~ will achieve the ~~vegetation performance objective is to reduce erosion rates by the planting and establishment of fast growing grasses, and forbs legumes, and potentially, and~~ woody plants. The mid to long term vegetation performance objective is to achieve the eventual ~~and~~ establishment of an forest ecosystem capable of providing food and cover for wildlife species. This will be implemented ~~either~~ through simultaneous establishment of woody vegetation with shrub and herbaceous cover, or as a separate second phase. This will require a 5 to 10 year post planting management and monitoring phase and a minimum 12 year post final amendment phase. Standards will potentially be met within a 15 to 22 year period after initial planting. The permittee can request release of the site from a vegetation success perspective no sooner than 12 years after seeding, pending a demonstration of success.
- P. The Permittee will apply a mixture of grasses, forbs and selected woody species to establish the vegetation cover for erosion and infiltration control on ~~cut and fill slopes covered areas.~~ Reclamation seed mixes, including alternate or substitute species, will be approved by the MMD. Vegetation established in drainage channels may be restricted to herbaceous species only, although selected native woody species of high evapotranspiration potential may also be established. Preliminary mixtures and application rates of grasses and forbs for herbaceous cover establishment are provided in the closeout plan in Tables ~~43-3~~ through ~~43-5~~ and have been further refined with ongoing and proposed studies, such as, the Spring Gulch Cover Trials and Goat Hill North Pilot project. Final species selection will be based upon thorough characterization of the in-place cover material, availability of seed ~~and containerized stock,~~ and recommendations derived from site-specific performance data.

Vegetative Management Objectives and Standards

- Q. The final ~~12 year post amendment~~ vegetation standards shall be:
A woody plant density equal to or greater than 320 stems per acre comprised ing 2

~~species of conifer at a density of 220 stems per acre, and a mixture of 4 species of deciduous trees, shrubs, and sub-shrubs, and/or trees. Volunteer vegetation can be included towards meeting vegetation success. of a combined density of 100 stems per acre.~~

Total herbaceous and woody canopy cover technical standard = 30 percent (total canopy cover ~~= herbaceous species foliar cover plus woody species crown cover~~ is the percentage of the ground surface area covered by the vertical projection of the canopy). The proportional numerical standard for total canopy cover shall be 70 percent of the technical standard. The canopy cover standard may be refined pending the results of on-going field trials and projected pilot studies in consultation with MMD.

- R. A diversity standard of at least ~~1 warm season grass, 4 cool season~~ 3 native perennial grasses, ~~2-3 native biennial or perennial~~ forbs, ~~2 species of conifer, 4 woody~~ species including shrubs, sub-shrubs, conifers and/or ~~of deciduous trees. shrubs and/or sub-shrubs. There shall be at least 1 leguminous species, which may be a forb or shrub/tree.~~ Minimum relative cover levels by life form for the diversity standard will be:

<u>Life Form</u>	<u>Number of Species</u>	<u>Minimum Occurrence (% relative cover)</u>
<u>Perennial Grasses</u>	<u>3</u>	<u>1 % combined</u>
<u>Forbs</u>	<u>3</u>	<u>1 % combined</u>
<u>Shrubs, subshrubs and trees</u>	<u>4</u>	<u>5 % combined</u>

The diversity standard may be refined pending the results of on-going field trials and projected pilot studies in consultation with the MMD.

- U. The Permittee shall take the following reclamation measures to help stabilize portions of the pit where practicable and meet applicable federal and state regulations:
- 1). ~~Trees and shrubs will be manually planted~~ Broadcast seeding on accessible slopes and the pit bottom;
 - 2). Aerial seeding will be performed on other portions of the pit slope and benches;
 - 3). Surface water run-on diversion ditches around the north side of the pit will be constructed as a source control of runoff from natural/undisturbed ground; and

Section 9. Conditions

Post-Mine Land Use

- D. Pursuant to §19.10.1.7. P.(5) of the Rules, the post-mine land uses for the Questa Mine site are ~~forestry-wildlife~~ and ~~water management~~ industrial/commercial. All areas of the site, other than E below, that have not been waived from the requirement to achieve a Self-Sustaining Ecosystem or are subject to the variance approved on May 24, 2002, shall be developed to allow for the establishment of a self-sustaining ~~forest~~ ecosystem.

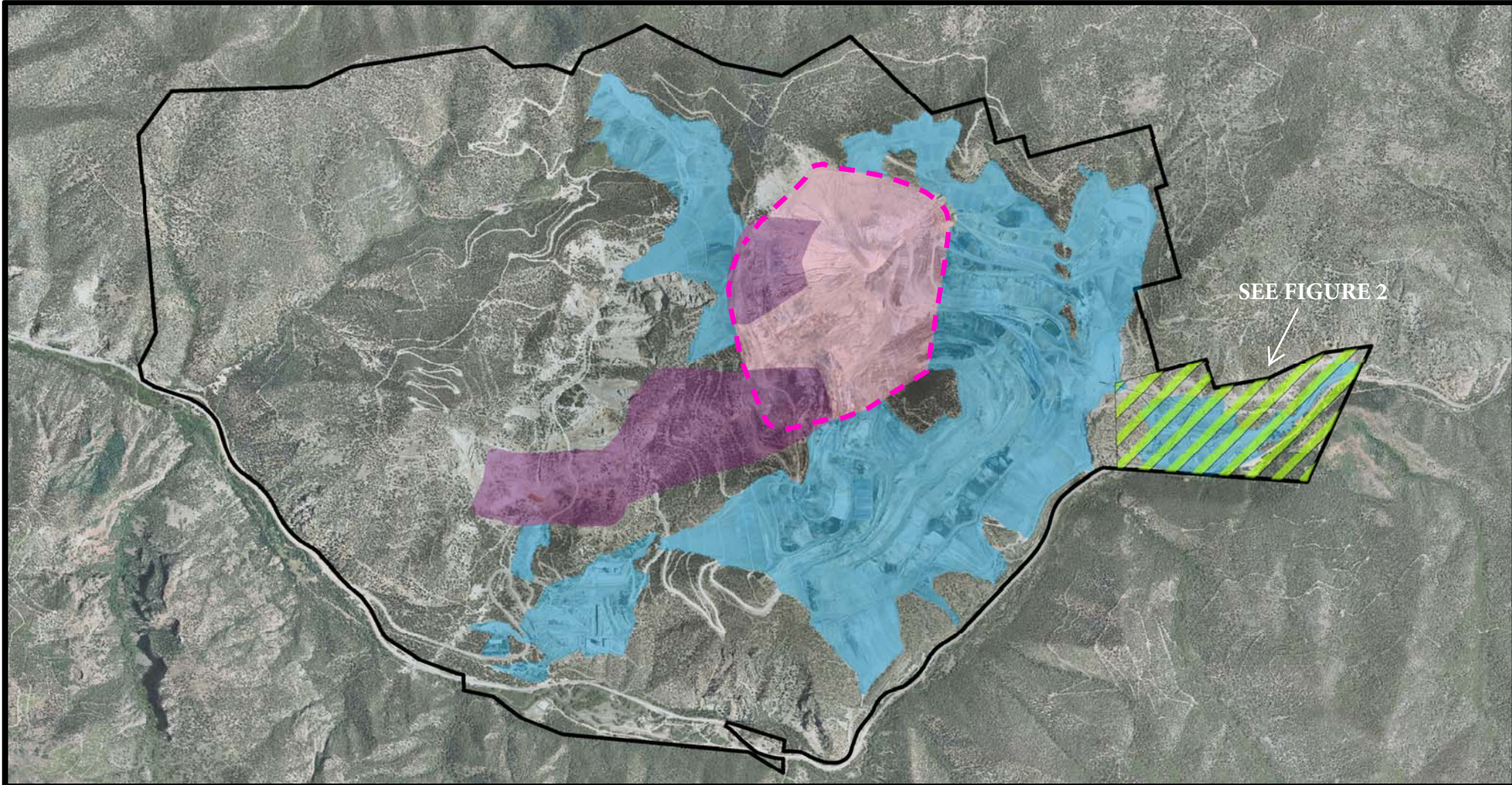
- E. Other portions of the site shall be designated as an industrial/commercial post-mining land use ~~be developed~~ to accommodate a permanent water management system for the site including a water treatment plant, sludge repository and other ancillary support facilities in the mill site area (see Map 2). ~~Additionally, areas designated as forestry wildlife~~ may contain wells, impoundments, and drainage and conveyance systems necessary for water management ~~treatment. The Permittee shall submitted a detailed map identifying those portions of the site to be established to the designated PMLUs of forestry ecosystem and water management. The map shall be updated in the revised Closeout Plan due April 30, 2004.~~

Revegetation

- O. The Permittee shall submit for MMD approval seed mixtures and planting rates for all areas to be revegetated as part of the Closeout Plan. The proposed seed mixtures and planting rates shall be provided to MMD, within 6 months after completion of ~~the revegetation studies addressed in Section 9.SS of this permit revision approval~~ on-going and proposed studies, such as, the Spring Gulch Cover Trials and Goat Hill North Pilot project.
- P. The Permittee shall provide a revised revegetation plan, for MMD approval, within 6 months after completion of the on-going and proposed studies, such as, the Spring Gulch Cover Trials and Goat Hill North Pilot project. ~~revegetation studies addressed in Section 9.SS, and borrow materials studies addressed in Section 9.BBB. of this permit revision approval, that describes if borrow material will be amended with fertilizer and/or organic material, as determined by the revegetation studies, to assist in the establishment of self-sustaining plant communities of the types described by the Permittee in the Closeout Plan.~~
- Q. The Permittee's revised revegetation plan shall ~~submit for MMD approval a plan, within 12 months of permit approval, that~~ includes the methods to be used to collect vegetation data on reclaimed areas once closeout of the site has been initiated. The plan shall include the statistical methods to be used to verify sampling confidence and adequacy.

Revegetation, Meteorological, and Wildlife Monitoring

- R. The Permittee shall provide the results of ~~annual~~ qualitative or quantitative revegetation monitoring to MMD in the vegetation report due on February 1st of each year in years that it is performed unless submitted for CERCLA. Revegetation monitoring shall include ~~measurements~~ a description of plant diversity, woody plant density, and total canopy cover. ~~ground cover, and shrub and tree survival and shrub and tree growth.~~

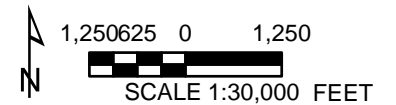


LEGEND

- Open-Pit Waiver
- Industrial/Commercial PMLU
- Disturbed Areas
- Subsidence Zones
- Pit Slopes
- MMD Permit Boundary

REFERENCES & NOTES

1. Projection: NAD 1983 StatePlane New Mexico Central FIPS 3002 Feet
2. Source Aerial: CMI Questa Mine taken 2012.
3. Shape file Source: URS 2013
4. Figure for illustration purposes only; Not for construction.



PROJECT/REPORT
CHEVRON MINING INC. QUESTA MINE
PERMIT TA001RE Rev 96-02 MODIFICATION
POST MINING LAND USES

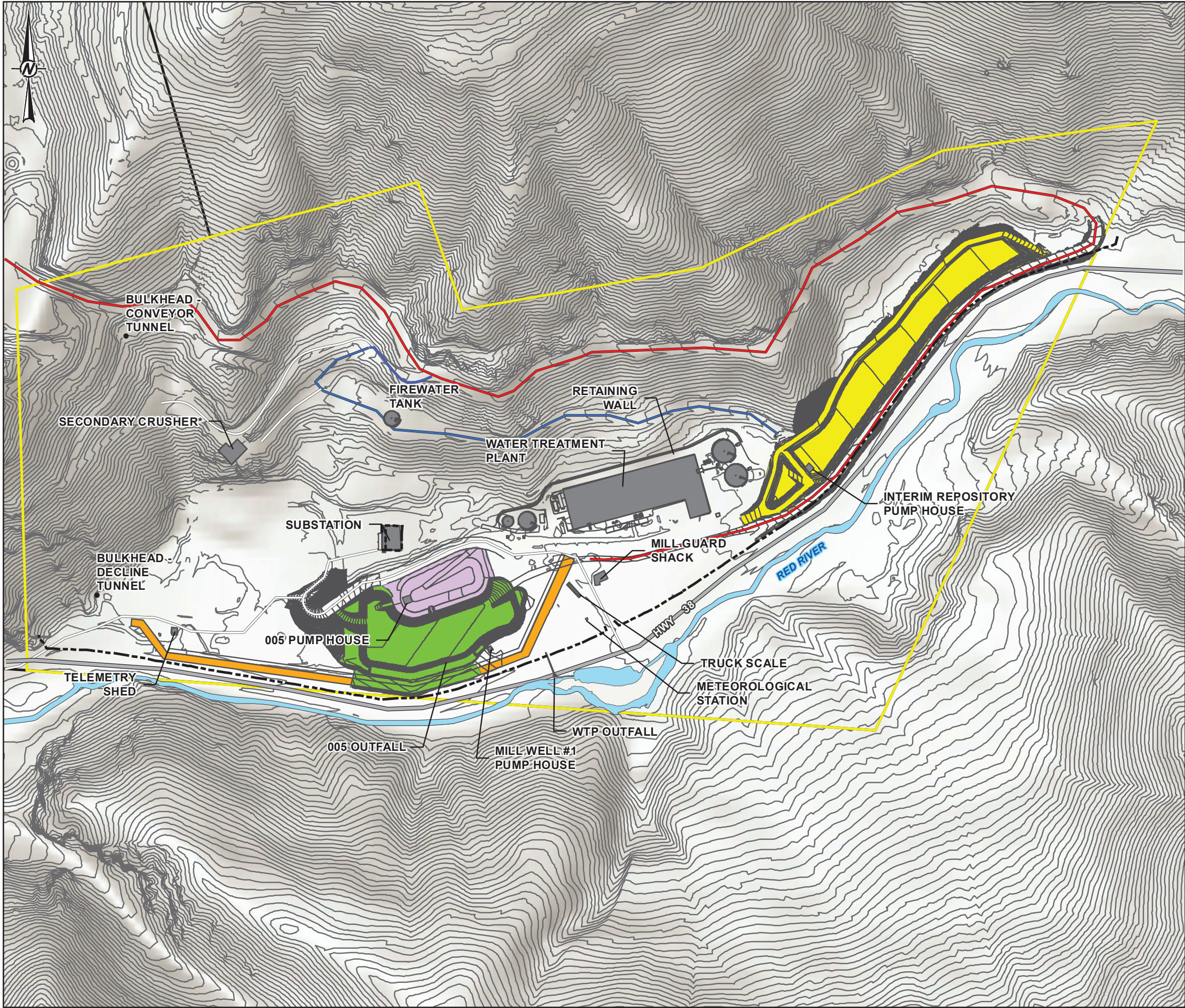
TITLE
Post Mining Land Uses

CONSULTANT



PROJECT No. 152-0532

FIGURE 1



LEGEND

INDUSTRIAL/COMMERCIAL PMLU

MMD PERMIT BOUNDARY

PRIMARY HAUL ROAD

SECONDARY HAUL ROAD

ACCESS ROAD

CHAINLINK FENCE

BUILDINGS

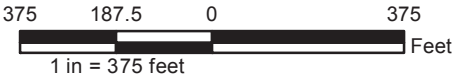
005 UPSET CELL

ENHANCED 005 CATCHMENT

INTERIM SLUDGE REPOSITORY

UTILITY CORRIDOR

FOR ILLUSTRATION ONLY
NOT FOR CONSTRUCTION



NOTES

FACILITY LOCATIONS BASED ON ENGINEERING DESIGNS FOR QUESTA'S DECOMMISSIONING, DEMOLITION AND WATER REGULATORY PROJECTS. FINAL LAYOUT OF THE MILL AREA MAY CHANGE WITH THE ISSUANCE OF AS-BUILT DOCUMENTS UPON COMPLETION OF THE PROJECTS.

*PORTION OF FOUNDATION TO REMAIN

REFERENCE

COORDINATE SYSTEM: NAD 1983 STATEPLANE NEW MEXICO CENTRAL FIPS 3002 FEET
FACILITY LOCATIONS OBTAINED FROM ACAD-20-29.DWG, 102-C-6900.DWG, 105-C-6900 MILL DEMO STATUS.DWGS, AND 105-C-5207-5210.DWG.

CLIENT
CHEVRON MINING INC
QUEST MINE

PROJECT
PERMIT TA00IRE REV 96-02
POST MINING LAND USE MODIFICATION

TITLE
MILL SITE
INDUSTRIAL/COMMERCIAL PMLU

CONSULTANT	YYYY-MM-DD	10/31/2017
	PREPARED	DZF
	DESIGN	DZF
	REVIEW	DR
	APPROVED	DR

