



Energy, Minerals and Natural Resources Department Mining Act Public Meeting - Tyrone Mine Closeout Plan

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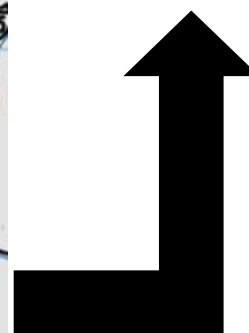
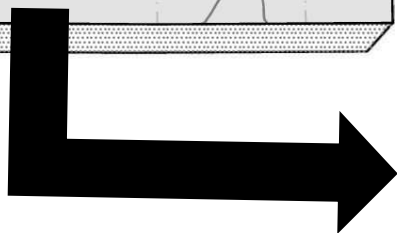
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A member of
ICMM
International Council
on Mining & Metals



- Education
 - B.Sc. Mining Engineering
 - M.Sc. Engineering Management
 - Graduate Specialty Certificates: Construction Management and Occupational Safety
- Work
 - 16 years in mining industry
 - ~5 years with Mine Engineering
 - Mine Planning: day to day operations to life of mine
 - Geomechanics
 - 11+ years with Reclamation/Environmental
 - Quality Control / Quality Assurance
 - Compliance
 - Project and Construction Management
 - Permitting
 - Closure Design
 - Financial Assurance Estimating

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| What is a Closeout Plan?

- Mines regulated by the Mining Act must have an approved Closeout Plan
- The Closeout Plan = Reclamation Plan; describes activities to stabilize/safeguard the mine site to protect human life and the environment
- Mining Act reclamation standard
 - Reclaim to a “self-sustaining ecosystem” or another approved “post-mining land use”
- Includes costs estimate used to determine financial assurance amount
- Mine operator is required to prepare the plan and submit it to the Agencies for review/approval

Revision 09-1 History

- Updated application submitted on July 15, 2013
- Updates Closeout Plan to comply with the Copper Mine Rule
- Tyrone has addressed comments from agencies and the public
- Workgroup was established in August 2018 to resolve comments on cost-estimating methodology
 - Workgroup was comprised of MMD, NMED, GRIP, FMI representatives
- Submitted cost estimate for closure on April 29, 2020

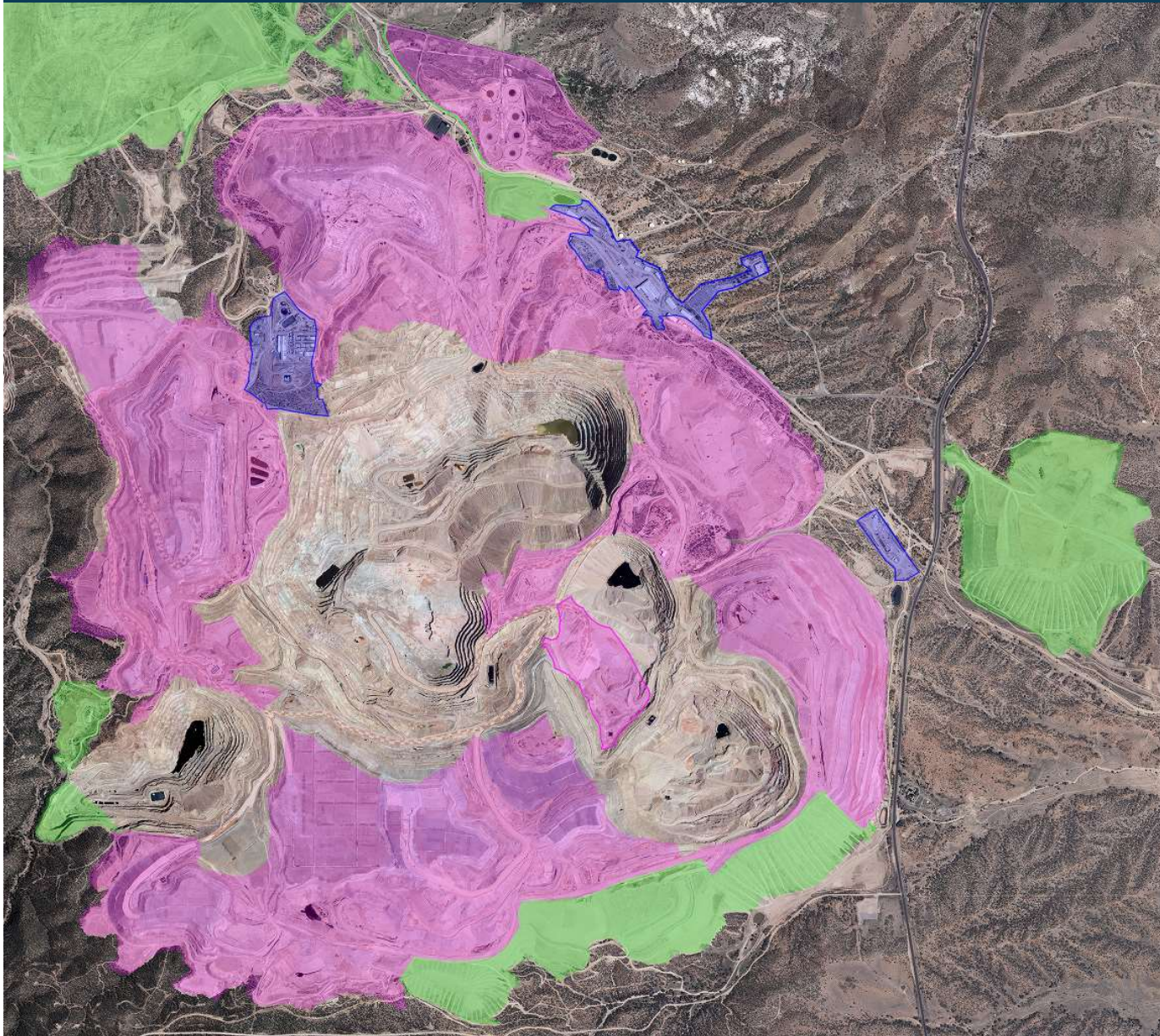
2020 Reclamation Plan - Earthwork




- Earthwork reclamation plan involves:
 - Regrading and stormwater controls
 - Approved cover material placement
 - Revegetation with native plants
 - Long-term monitoring and maintenance
 - Vegetation and erosion
- Stormwater controls
 - Minimum design: peak flow from 100 year return interval storm event
 - 100 year storm = 1% chance storm will occur in any given year
 - Infrequent event
 - Example: ~3.9 inches of rain over 24 hours
 - Standard engineering practice and required by regulation
 - Very high standard and exceeds New Mexico design requirements for closure of landfills and highway design
 - Precipitation event is regularly updated by NOAA based on all current data including climate change

- Mining Act allows for a waiver “from the requirement of achieving a post-mining land use or self-sustaining ecosystem” of open-pit areas of an existing mine
- Requires showing that achieving the “self-sustaining ecosystem” requirement is not technically feasible, would be extraordinarily costly, or would be environmentally unsound
- Originally MMD granted a waiver for Tyrone’s open-pit mine in 2004
- This permit revision would renew the waiver

Earthwork Reclamation Areas

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-  Reclaimed Area
-  Area to be Reclaimed
-  Industrial Use

Closeout Plan – Water Treatment

- During mine operation, impacted water is retained within the mine and recycled into operations
- After closeout Tyrone will continue to collect and retain all water within the mine that does not meet standards
- Mine water not meeting standards will be treated prior to release or reuse with a combination of technologies including:
 - Membrane filtration (similar to reverse osmosis)
 - Lime neutralization process
 - Evaporation
- Water Treatment
 - 100 years Tyrone: ~\$326M proposed

2020 Reclamation Plan – Other Elements

- Site Safety Management
- Monitoring well abandonment / installation
- Building demolition
- Fencing

Financial Assurance Cost Estimate

- Cost estimate based on
 - Approved CCP scope of work
 - Workgroup negotiations
- Cost estimate calculated as
 - Approximately \$431,072,000 nominal total
 - Approximately \$176,326,000 present value
 - Amount that has to be invested to for the state to have \$431M to cover the reclamation earthwork and water treatment costs
- Financial Assurance
 - Financial Assurance instrument(s) in accordance with applicable regulations will be proposed once the cost estimate is approved

- Current Instruments at Tyrone (as allowed by New Mexico law)
 - Surety Bond
 - Trust Fund
 - Letter of Credit
 - Collateral
 - 3rd Party Guarantee
- 3rd Party Guarantee
 - Allowed by other municipal and federal programs
 - New Mexico has NEVER had a default of a 3rd Party Guarantee by a mining company
 - Guarantor must demonstrate financial soundness
 - Reoccurring demonstration
 - Investment grade rating
 - Adequate assets/net worth
 - Net worth = assets - liabilities

Reclaimed to Wildlife Habitat

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■ Award Winning Reclamation

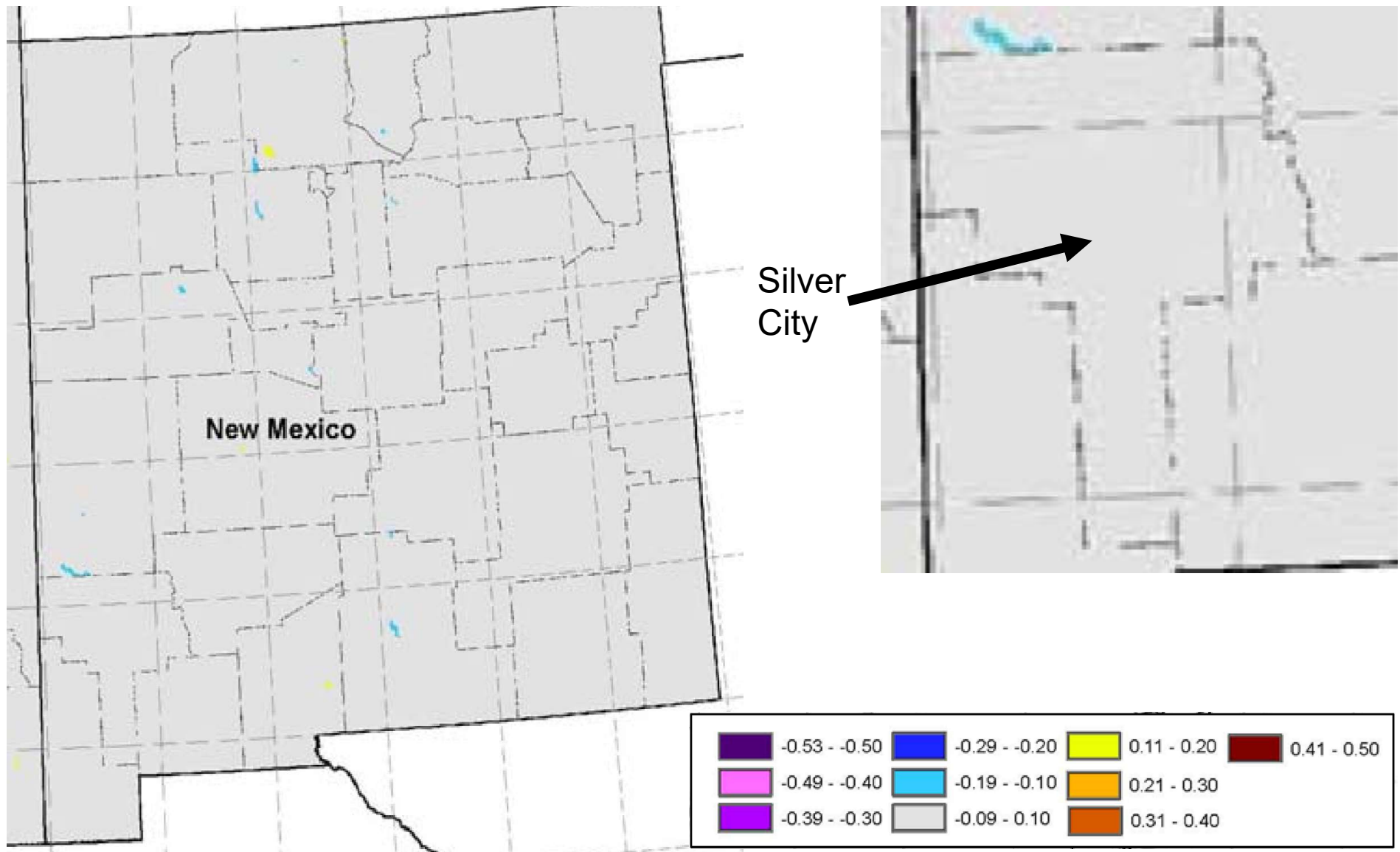
- State Agencies
- Wildlife Habitat Council



- Financial Assurance
 - 3rd Party Guarantee and Collateral
 - 100 years of maintenance and water treatment
 - Reduction of O&M
 - Disposition of treated water (beneficial use)
- Impacts to local residents during operations
- Stormwater design – 100 year return interval storm event

NOAA Assessment on Impacts of Climate Change for 100 year Storm Event

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