



COUNTY ADMINISTRATOR'S OFFICE

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C. H. HUCKELBERRY
County Administrator

June 16, 2009

The Honorable Joe Hart
Arizona State Mine Inspector
1700 West Washington, Suite 403
Phoenix, Arizona 85007

Re: Rosemont Copper Project - Mined Land Reclamation Plan, September 2008

Dear Mr. Hart:

The Board of Supervisors, at their public meeting of June 16, 2009, unanimously directed me to forward the following comments to you. Pursuant to A.R.S. § 27-929, below are comments from Pima County regarding the Rosemont Copper, Mined Land Reclamation Plan dated September 2008. Pima County is a cooperator with the Forest Service for the Rosemont Project Environmental Impact Statement (EIS). Several state agencies including the Arizona State Land Department and Arizona Department of Environmental Quality are also cooperators. Pima County has previously commented on the subject of reclamation to the Forest Service, but this is the first opportunity we have had to comment to the State Mine Inspector.

Potential approval of this reclamation plan concerns Pima County because the Forest Service and cooperating agencies have not yet completed analyzing alternatives for the mine proposal itself. The reclamation requirements will only be known after completion of the EIS and the Record of Decision and Mining Plan of Operation are issued by the Forest Service, through the process defined by the National Environmental Policy Act (NEPA). Central to development of the EIS and reclamation plan are the various technical studies that must be conducted to determine potential impacts and mitigation requirements. The reclamation plan submitted to the State Mine Inspector identifies these technical studies and acknowledges that the studies have not yet been conducted. The document also acknowledges the fact that the final reclamation plan requirements will change based upon the NEPA process and the Forest Service's Record of Decision. The state reclamation plan should only be considered for approval after completion of the NEPA process.

At this point, the Forest Service is still early in the NEPA process. The public has requested many different alternatives to be analyzed including underground mining, backfilling, off-site disposition of waste rock and tailings, and many others. These alternatives are being

investigated at the present time. Locations of roadways and other linear infrastructure across State lands are not yet fixed. The post-closure authorized uses have not yet been determined either.

Rosemont has on its own initiative changed the location and timing of project features since the 2008 reclamation proposal, and reserves the right to continue changing the Mining Plan of Operation. There are fundamental changes underway that will require alteration of the reclamation proposal since the Forest Services' Record of Decision and the EIS process will affect the reclamation plan.

This is an important issue to the citizens of Pima County because while the majority of the mine disposal areas are on Forest Service lands, many of the most visible locations are on State Trust lands, and the latter are found in disparate locations. The state and federal reclamation plans must work together. Approval of a state reclamation plan that ignores the as-yet undeveloped federal plan is not in the public interest.

All of these factors render the proposed state reclamation plan premature and inadequate; therefore dangerous to the health, safety and welfare of the citizens of Pima County.

General Concerns

The following comments summarize some of Pima County's concerns about the reclamation plan and supporting documents.

Watershed Impacts - The bottom of the pit, at approximately 3100 feet per the report, is below the base flow elevation of Cienega Creek and Davidson Canyon, both designated as Outstanding Arizona Waters. Predicted groundwater flow changes due to the pit excavation have been documented in a model previously provided by the County to the Forest Service. The model indicates that the mountain front recharge captured by the pit could be several times the diffuse recharge in the mountain block. This could have a significant impact on the downstream base flow in Cienega Creek. These changes will surely contribute to water shortages for down gradient private well use and in a watershed that supplies shallow groundwater and surface water to maintain valued riparian vegetation for the Las Cienegas National Conservation Area and the Pima County Cienega Creek Preserve. The pit would serve to intercept both surface and subsurface flows contributing to Davidson Canyon and Cienega Creek. The pit would allow ponded water to evaporate after mine closure and deprive continued flow of water to the Cienega Creek Watershed. Therefore, the only viable option for pit reclamation is to refill the pit with the parent material to make sure surface and subsurface flows are re-established post mining.

Dust Control - The reclamation plan is incomplete and does not include any type of analysis or discussion of dust control post mining other than to state that "At closure, capping material will be placed over the tailings, eliminating the possibility of dust generation." This is inadequate and Pima County believes this discussion should be expanded to specifically include a discussion on how the entire site will be permanently stabilized to prevent wind

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blown emission of dust. Pima County Code (PCC) Title 17, Chapter 16, Article III, requires that the site not be left in a manner that allows wind blown dust to cause a violation of the visibility limiting standard in PCC 17.16.050. The entire site (any disturbed areas, haul roads, access roads, storage piles, and tailings) must be treated to permanently suppress dust by using gravel, vegetation, and/or equivalent controls. The report should discuss a detailed analysis on how the site will be stabilized post mining, how the controls will be monitored, and the frequency of maintenance activities to ensure the control's effectiveness. Any re-vegetation activities must ensure that invasive species (such as buffelgrass) are not used as dust control measures.

Revegetation - We question the viability of using reseeding and natural rainfall as an adequate method to achieve the desired 70 percent of the existing native vegetative cover. Unfortunately, details of the revegetation program, including monitoring protocols, are not available for review at this time. The native vegetation in this area includes Alligator Juniper which can grow to be 400 years old, Century Plants, Agave, and other species including Ocotillo which take decades to reach maturity. The report correctly identifies that the endangered Agaves are critical to endangered bats and yet no plans are included to plant mature or at least viable young plants. Only seeding is proposed and a caveat included that if the identified species are not available that alternatives may be used. The revegetation plan is completely unacceptable.

Reclamation revegetation activities should include propagation, planting, water harvesting for irrigation and contaminant control, fertilizing, and monitoring in addition to seeding. A seed growing farm should be established for Agave and other slow growing species at start up so that mature locally acclimatized plants are available for reclamation. Placement of this farm on-site would also provide roosting, nectar, and other habitat requirements to replace those lost during the lifetime of the project and prior to full reclamation.

In conclusion, we strongly object to approval of a state reclamation plan prior to completion of the NEPA process and development of the federal reclamation plan. Approval of a state reclamation plan that ignores the as-yet undeveloped federal plan is not in the public interest and public health and safety of the residents of Pima County. Because of the magnitude of the impact to the citizens, environment and economy of Pima County, we urge the State Mine Inspector to hold a public hearing in Pima County pursuant to A.R.S. § 27-929. More detailed comments are attached for your information.

Sincerely,



C.H. Huckelberry
County Administrator

CHH/jj

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Attachment

- c: The Honorable Chairman and Members, Pima County Board of Supervisors
 - John Bernal, Deputy County Administrator for Public Works
 - Nanette Slusser, Assistant County Administrator for Policy for Public Works
 - Ursula Kramer, Environmental Quality Director
 - Suzanne Shields, Regional Flood Control District Director
 - Priscilla Cornelio, Transportation Director
 - Carmine DeBonis, Development Services Director
 - Rafael Payan, Natural Resources, Parks and Recreation Director
 - Maeveen Behan, Office of Conservation Science and Environmental Policy Director
 - Linda Mayro, Cultural Resources Manager
 - Nicole Fyffe, Executive Assistant to the County Administrator
 - Julia Fonseca, Program Manager, Office of Conservation Science and Environmental Policy

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Mining and Reclamation Plan

1. Final Surface Configuration of Rosemont Ridge Landform

Section 3.3 of the *MLR Plan* (Existing and Proposed Final Topography) states: "As much as practicable, Rosemont Copper plans on reclaiming the site with methods that mimic natural landform terrain." However, there is no consideration of "mimicking natural landform terrain" for the upper surface of the mine waste pile, a proposed planar surface >3 miles long and ½ to 1 mile wide). The upper topography of the landform represents nothing more than a waste materials stockpile in its presently-designed form.

Within the *R&C Plan* (Figures 29-31), small "hills" proposed to be built on the east perimeter of the top slope of the Rosemont Ridge landform represent a crude attempt to provide a broken viewshed from Hwy 83. These small features on the upper surface of the landform do not mimic natural landform terrain, nor provide natural topography. The permanent legacy for future generations of Arizonans living or visiting the area will be a linear feature with bumps, which is certainly not representative of a ridge. Nor does this insufficient effort provide for meaningful landforms conducive to suitable habitat for species, which is one of the three post-mining reclamation objectives outlined in Section 3.1 (Proposed Post-Mining Use of the Land).

Should waste materials not be replaced into the mining pit, Pima County requests a professional approach to the design of the large upper surface of the Rosemont Ridge landform which incorporates undulating, natural-looking topography across the entire upper surface.

2. Final Cover System, Vegetation Establishment, Stormwater Management and Erosion Control

Section 9.4 of the *TT Summary* (Concurrent Reclamation Design) includes text which describes successive reclamation based upon the placement of perimeter buttress lifts, behind which tailings will be deposited. "Once a higher level buttress becomes operational, "the lower buttress can be "contoured, capped, and reseeded as required". Figures 17 and 18 of the *R&C Plan* depict successive development of 50 ft thick waste fill lifts, final slope construction with 3:1 or 3.5:1 slopes, coverage with a 1 ft growth media, and then repeating this sequence. A number of issues are raised regarding this methodology.

- The side slopes are being developed with no apparent benching at systematic vertical intervals. The establishment of vegetation on the 12-inch growth media will likely require temporary irrigation. How will this temporary irrigation be installed, operated and maintained with no access benching?
- Section 6 of the *MLR Plan* states: "Erosion control will be addressed by vegetative stabilization of slopes (concurrent reclamation) and operational control of stormwater". Yet no perimeter-slope stormwater management system has been designed in the *MLR Plan*. With no apparent benching of the side slopes, which rise to 600ft in height in places, how will surface erosion

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of the slope be managed as stormwater runs uncontrolled 2000ft down the sides of the landform? When incision of the final cover occurs after storm runoff, how will the final cover be repaired and with what equipment and soil materials?

- Section 8 of the *MLR Plan* describes the salvage of some 4.6 million cy of soil pedons within the dry tailings, waste rock storage and operations areas. Is this expected to provide all the soils needed for the final cover system? Provide a sequencing plan for the excavation, stockpile and utilization of these soils as part of the *R&C Plan* General Facility Layout drawings.
- Section 10.2 of the *R&C Plan* states: "At closure, capping material will be placed over the tailings, eliminating the possibility of dust generation." This is untrue. Apparently, growth media will also be placed on the large upper surface of the waste pile (landform). This material will be subject to dust generation, depending upon the degree to which pervasive vegetation has been established. Is the owner-requested vegetation density - "70% of the existing native vegetation coverage" (Section 7 of the *MLR Plan*) – sufficient to eliminate the possibility of dust generation?
- Section 3.1 of the *MLR Plan* (Proposed Post-Mining Use of the Land) states "Current and proposed post-mining recreational activities include horseback riding, hunting, prospecting, all-terrain vehicle and motorcycle riding, four wheeling, hiking, and bird watching.....Much of the top and side surfaces of the Rosemont Ridge post-mining landform will be ideal for grazing once vegetation is established". Grazing and recreation vehicle use on the closed waste pile surfaces will break down the thin cover system, promote development of uncontrolled rilling and incision during storm runoff events, and could possibly expose underlying tailings materials. Grazing might substantially reduce the percent of successful vegetative cover on the landform upper and side surfaces.

3. Central/Infiltration Drain

The west entrance to the central drain will be shrouded by 3.5:1 (H:V) closure slopes of dry tailings over 300 ft high, minimally covered with 1ft of finer-grained capping material. With no benches or other stormwater management control features over these ~1000 foot long slope runs, a steady progression of finer materials will be eroded from these slopes. In addition, other mining and post-mining surface flows will bring sediment-laden stormwater into the entrance of the Central Drain. Lastly, as shown on Figure 16 of the *R&C Plan*, the development of an attenuation pond, which will fully cover the entrance to the Central Drain, is predicted to last up to one month in duration following significant storm events. Sediment settling in the attenuation pond will further tend to clog the Central Drain west entrance.

Based upon these criteria, how will the entrance of the Central Drain be prevented from clogging during mining operations and the post-mining period?

The attenuation pond is expected to reach a maximum elevation of 4895 ft, or some 20+ ft in height above the Central Drain itself. With estimated ponding above the drain for periods of +/- 2 weeks, the ponded water will infiltrate laterally through the waste rock buttress and into the north and south dry tailing stacks. Leaching of hazardous constituents in the tailings is possible, with contaminated water infiltrating to the base of the tailing stacks and into underlying soil or bedrock, or migrating into the Central Drain for transportation through the waste landform and discharged on the land surface on the east side of the waste pile.

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Provide specific examples where a Central Drain/Infiltration Drain of this design and magnitude has been successfully implemented at mining sites for periods of 10-20 years, 20-40 years, and 40+ years.

4. Heap Leach Pad Design

The general site is underlain by 20 to 80 feet of alluvium which is moderately permeable (2×10^{-5} cm/s). This 5 year operation will consist of the heap leaching of an ~300ft high pile of copper ore by means of circulation of sulphuric acid etc. downward through the heap to liberate the copper, collection of the solution downgradient of the heap in a pregnant solution pond, and pumping the pregnant solution to the recovery plant at rate of ~2,500 gpm.

The Heap Leach pad is expected to be operational (leaching and drain down) through Year 10. As described in Section 6.6 of the *IT Summary*, the lining system below the heap leach pad consists of two synthetic materials, together representing less than 0.5 inch total thickness: a geosynthetic clay liner (GCL) will be placed on compacted soil, overlain by a 60 mil linear low density polyethylene (LLDPE) synthetic liner. The 1/16-inch thick LLDPE material is known for its elongation properties and accommodation of some differential settlement. The GCL material, composed of bentonite sandwiched between thin fabric layers, is known for its swelling properties when wet. On top of this base lining system, three feet of rock crushed on site to gravel-sized material (up to 3 inches) will act as a base drainage system for the pregnant solution flowing downward from the overlying heap leach pad materials.

- Can the flexible LLDPE material withstand puncturing from overlying crushed, angular rock pieces up to 3 inches in diameter? During construction? With a load of ore materials up to 300 feet high?
- Similarly, will the <1/2-inch thick GCL withstand puncturing from overlying crushed, angular rock pieces up to 3 inches in diameter which have passed through the LLDPE? During construction? With a load of ore materials up to 500 feet high? The hydrated internal shear strength of GCL is typically on the order of 500 psf, which will be greatly exceeded in this heap leach operation.
- In fact, the crushed rock drainage material at the base of the heap leach pad could elongate the LLDPE and puncture through the dry GCL. The rock pieces would therefore pierce the LLDPE below the GCL and release pregnant solution into the base soils without any resistance from the shielded GCL clay material. With sharp, angular rock pieces placed directly on the 0.5-inch thick dual material base lining system, and then loaded during construction placement and subsequently with the overlying, saturated heap this is a realistic scenario. How will this issue be remediated?

5. Facility Compliance Monitoring System

Section 9.0 of the *R&C Plan* states: "The Rosemont facilities are being designed to meet the standards of prescriptive Best Available Demonstrated Control Technology (BADCT) under the Aquifer Protection Permit (APP) process and therefore will be protective of water quality during operations and at closure."

BADCT design does not guarantee protection of water quality during operations, at closure or during the post-closure period.

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Presumably, the Heap Leach Pad design described in Item 4 above represents a BADCT design. But as the associated review comments suggest, the integrity of this base lining system in conjunction with utilizing crushed rock for the base drainage system is questionable. Should the mine insist on this design, a secondary leak detection and collection system should be installed below the primary base lining system, similarly to the process ponds, with a minimum of 1 foot of sand material (not a geonet) utilized for the secondary drainage system.

Dry stack tailings: Per Section 9.2 of the *R&C Plan* (Tailings Disposal), "During placement, the tailings are anticipated to dry out to an average moisture content of 6%. Based upon preliminary results of seepage modeling, the tailings material will be dry enough to prevent any downward flow to the alluvial material located below the facility". However, Section 6.1 of the *MLR Plan* (Operational Stormwater Controls) notes "The surface of the tailings area, which is fairly impervious, will be sloped so that precipitation falling on the top of the active area will remain on top and evaporate. Pondered water may also be pumped to the PWTS Pond (and used in the process) to limit infiltration into the tailings mass. The mine clearly anticipates pondered water on the "dry" tailings stacks, which they "may" pump off the surface. In addition, as noted in Item 3. above, the attenuation pond developing up to 20+ ft in height above the Central Drain with ponding above the drain for periods lasting +/- 2 weeks, also presents a situation where water will infiltrate laterally into the north and south dry tailing stacks. Subsequently, contaminated water could percolate to the base of the tailing stacks and into underlying soil or bedrock.

Groundwater flow directions at site is to the east in the western half of the mine layout area, and more to the northeast in the eastern half of the mine facility (Tom Myers report, April 2008). Per Figure 34 of the *R&C Plan*, the mine proposes four cross-gradient / down gradient point of compliance wells spaced over one mile apart each. Groundwater flow directly down gradient of the site leaving the mine area is apparently proposed to be monitored by a combination shallow / deep well system (RP-1, RP-2). This single well site, located outside the Pollutant Management Area, is insufficient for primary groundwater flow from the site into Davidson Canyon. At the very least, another Point of Compliance Well should be constructed in the central or west-southwest portion of Section 21.

6. Post-Closure Responsibilities and Cost Estimate

Has a Post-Closure Plan been prepared for the Rosemont Mine? What are the specific responsibilities of the owner with respect to maintenance and repair of the upper and perimeter slopes of the Rosemont Ridge landform, the facility stormwater management system including the Central Drain, the groundwater compliance monitoring system, etc.?

The post-closure land use is promoting a variety of recreational activities including all-terrain vehicle use, motorcycle riding, and four wheeling as well as grazing. Such activities will negate the revegetation efforts causing erosion. Who will be responsible for the monitoring and maintenance of the large landform due to the effects of these activities?

Table 13-4 of the *R&C Plan*, entitled *Reclamation Cost Summary per Activity Area*, provides an estimate of \$346, 800 under the category *Long-term Operation, Maintenance, and Monitoring Cost*. Should this cover a 30-year post-closure care period, this would equate to \$11,560 per year. Provide a breakdown of the annual activities and costs associated with this item. How much of this amount is for field groundwater monitoring activities, laboratory analyses and compliance reporting? Accordingly, how much of this amount is left for maintenance and repair of landform slopes, the

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facility stormwater management system, and the groundwater compliance monitoring system? How much will be used to monitor and maintain successful vegetative growth?

Almost no reclamation monies are allocated for reclamation after year 19. This is based on the assumption that the reclamation is completed in year 19, but this is highly unlikely. Provision should be made for funding remedial activities. In case the project timeframe is elongated (statistically speaking, this is a likelihood), there should also be provisions for bonding beyond stipulated timeframe.

Updated annual closure cost estimates should be provided for the site during the operational years of the facility.

7. Other Questions and Concerns

In addition, there are many unanswered questions about the project which would need to be addressed prior to completing a reclamation plan, such as:

- A. Will the mining produce aggregate for ADOT and other development, rock products indicated in SE Tucson using waste rock? This would affect the reclamation plan.
- B. How would bankruptcy affect performance bonding and reclamation prospects? What is the role of the State Mining Inspector in this process?
- C. To what extent will reclamation and bonding address water resource impacts?
- D. What information is there about arsenic, tungsten, U, Th, Pb etc. concentration and mobility before and after milling and how will this affect the reclamation effort?
- E. Will corporate guarantees be used for financial assurance? We understand that Arizona permits these for financial assurances. This can leave taxpayers with unmet reclamation needs if the company goes broke.
- F. Will ranch lands around Rosemont be used as financial assurance and if so, how would that affect future use of land?
- G. Are there standards for cover material coarseness and clay content?
- H. Will all cover material be derived on site or will some material be derived from off site?
- I. Identify any external sources of final cover needed to reclaim tailings/waste rock, or state that none are needed.
- J. For how long will Rosemont care for the post-closure landscape and who will be monitoring the reclaimed landscape after Rosemont?
- K. How is reclamation of the on-site landfill addressed?
- L. What happens to reclamation scheduled due to work stoppages due to labor disputes or adverse market conditions?
- M. What happens as the polymers in the tailings break down?
- N. What are the success criteria for land surface stability that if not met, will trigger remedial reclamation?
- O. What is the source water for the reclamation?
- P. Is Rosemont considering the use of biosolids?
- Q. What are the effects of processes that will occur after the mine closure, and how will the reclamation plan address those?

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1. The reclamation plan should be designed in such a way that water quality standards and concerns identified, by Arizona Department of Environment Quality, Pima County and other regulators, can be addressed within the reclamation plan. No such provisions are included in this plan to address requirements for permits, such as the Aquifer Protection Permit, or future changes and modifications that may be required as more is known about the Mining Plan of Operation. The reclamation plan as presented is not fully integrated with water quality measures, slope stability and dam safety measures and other aspects of the mine. Many of these non-reclamation measures are responsibilities of the state agencies involved in the project. All state agencies should work together on this project.
2. Hydrogeologic and hydrochemistry studies have not yet been conducted to evaluate potential impacts on groundwater quality with regard to the open pit as well as the mining operations.
3. Section 6.1 Operational Stormwater Controls on page 9 states that sediment control will be put in place to reduce suspended solid loads to the "minimum practical level for the 10 year, 24 hour storm event." While my initial reaction was that this should be to the 100 year event or greater given its location at the top of a major watershed and the lifetime of the impacts, however the plan also includes an attenuation pond downstream which is designed to detain the 100 year 24 hour event with a drain time of 30 days. Quality testing should be conducted here for performance standards established by EPA and PCDEQ permits not simply to the minimum extent practical at the 10 year facilities.
4. The storm water section reflects the intention from the summary that facilities will be "capped, graded, and reseeded". As described above, reseeded is inadequate and reclamation should include use of topsoil anchoring and mature plants in addition to seeding. Furthermore rather than capping the FCD supports reuse of storm water facilities as riparian habitat or restoring original landform topography.
5. The proposed facility is immediately upstream of designated Outstanding Arizona Water(s) and no degradation of the water quality is allowed.

Air Quality

1. The document titled "*Mined Land Reclamation Plan, Rosemont Copper Project*" dated September 2008 does not specifically address how the site will be permanently stabilized to prevent wind blown emission of dust (particulate matter) post mining. The document does include in Appendix A, a document titled "*Mined Land Reclamation Plan, Rosemont Copper Project*" dated July 2007. In the report in Appendix A, dust control is discussed. Since text of the 2008 report does not address dust control, Pima County Department of Environmental Quality (PDEQ) cannot determine if the discussion in Appendix A is still valid. Dust control post mining must specifically be addressed in the 2008 text.
2. PDEQ has not received an application for the proposed mining operation to date. PDEQ has had discussions with representatives from Rosemont Copper Mining Co. and the proposed facility may require a Prevention of Significant Deterioration (PSD) Permit under the Clean Air Act. Since a permit application has not been filed with PDEQ, the discussion of operational and engineering dust control measures found in section 10.2 of the report in Appendix A cannot be reviewed. If the source is required to obtain a PSD permit, considerably more dust controls will

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be required, as well as air quality modeling and monitoring, to ensure the adequacy of those controls.

3. Section 10.2 of the report in Appendix A is incomplete and does not include any type of analysis or discussion of dust control post mining other than to state: "At closure, capping material will be placed over the tailings, eliminating the possibility of dust generation."

Pima County believes this section should be expanded to specifically include a discussion on how the entire site will be permanently stabilized to prevent wind blown emission of dust. Pima County Code (PCC) Title 17, Chapter 16, Article III, requires that the site not be left in a manner that allows wind blown dust to cause a violation of the visibility limiting standard in PCC 17.16.050. The entire site (any disturb area, haul roads, access roads, any storage piles, and tailings) must be treated to permanently suppress dust by using gravel, vegetation, and/or equivalent controls. The report should discuss a detailed analysis on how the site will be stabilized post mining, how the controls will be monitored, and the frequency of maintenance activities to ensure the control's effectiveness. Any re-vegetation activities must ensure that invasive species (such as buffelgrass) are not used as dust control measures.

4. Currently, the Rosemont Copper Co. is conducting Particulate Matter (PM) ambient air monitoring on their site. Will this monitoring continue post mining? Will Rosemont Copper Co. maintain the same ambient PM levels post mining as are currently being found pre-mining?

Revegetation

While we commend the Augusta Resource Corporation for retaining the University of Arizona to investigate an appropriate location-specific response to the challenge of vegetative reclamation of an open pit mine, we question the viability of using reseeding and natural rainfall as an adequate method to achieve the desired 70% of the existing native vegetative cover. Unfortunately, details of the revegetation program, including monitoring protocols, are not available for review at this time.

The native vegetation in this area includes Alligator Juniper which can grow to be 400 years old, Century Plants, Agave, and other species including Ocotillo which take decades to reach maturity. Existing plants should be harvested and set aside for planting. Furthermore a farm of plants should be started upon project inception so that they are mature when needed. These could be done with the top soil to be stockpiled.

The report correctly identifies that the endangered Agaves are critical to endangered bats and yet no plans are included to plant mature or at least viable young plants. Only seeding is proposed and a caveat included that if the identified species are not available that alternatives may be used. Reclamation revegetation activities should include propagation, planting, water harvesting for irrigation and contaminant control, fertilizing, and monitoring in addition to seeding. A seed growing farm should be established for Agave and other slow growing species at start up so that mature locally acclimatized plants are available for reclamation. Placement of this farm on-site would also provide roosting, nectar, and other habitat requirements to replace those lost during the lifetime of the project and prior to full reclamation.

Based on the slopes indicated as 3:1 and a ridge and valley reclamation approach, anchoring and supplemental irrigation during drier periods of the supposedly topsoiled reclaimed material is absolutely

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needed. Anchoring with hay or straw will reduce erosion and build moisture for the next step of hydro-seeding and planting of small shrubs, native cacti and trees for additional anchoring.

One essential component, control of invasive species, was not been included or discussed within the reclamation plan. Mining-related activities are expected to render the 3,625 acres of private and state land covered by this MLRP, at some point during the life of the project, subject to invasion by exotic, invasive plant species.

Disturbed areas provide an optimal substrate for invasive non-native vegetation, specifically fountain grass (*Pennisetum setaceum*) and buffel grass (*Pennisetum ciliare*). These species are of high concern regionally – once established, they alter the composition and function of desert ecosystems. These grasses can prevent the establishment of native plants and crowd out existing vegetation, spread into adjacent natural areas, and increase the incidence of wildfire in a natural system not adapted to regular fire. An invasive plant control program should be part of mining operations in addition as well as being incorporated into later reclamation activities. The ability to contain/prevent the establishment of invasive plants will affect the probability of attaining the success criteria of revegetating to 70% of the existing native vegetative cover.

Given the above observations, we offer the following recommendations:

- Approval of a MLRP for Rosemont Mine will require the submittal and separate approval of a more detailed description of the Vegetative Reclamation Program upon the completion of the University of Arizona's School of Renewable Natural Resources research. The State Mining Inspector's separate approval of the detailed Vegetative Reclamation Program is to consider review/comments from those entities providing comment on the September 2008 MLRP.
- The MLRP shall be revised to include an invasive species control and eradication program to be implemented with the initiation of mining-related activities and carried forward into reclamation activities. The control and eradication program shall include, but not be limited to the following components:
 - Specific invasive species subject to control and eradication are listed in Appendix A.
 - The control and eradication program shall be carried out by persons qualified to identify the presence/absence of invasive species and to administer control and eradication treatments, as necessary.
 - Control and eradication treatments will be specific to invasive species found to occur within the project area.
 - Surveys to assess presence/absence of invasive species will be conducted annually, at a minimum.
 - Invasive species control and eradication program will be implemented until such time as the Revegetation Program achieves the stated goal of establishing 70% of the existing native vegetative cover.

Cultural Resources

Our concerns center on the identification and resolution of direct, indirect, and cumulative impacts on prehistoric and historic properties, or Heritage Resources, especially those determined or recommended eligible for the National Register of Historic Places (NRHP), resulting from the proposed mine development and operation, as well as the mine closure and implementation of the MLRP. An additional concern relates to the nature of the MLRP; whether or not it applies only to private lands within the Rosemont Mine, and if so, what standards, procedures, and defining documents for mine closure and reclamation will apply for public lands.

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In addition to identifying numerous historic mining and ranching sites, previous archaeological inventory projects within the current Rosemont Copper Project Area have identified and recorded many prehistoric sites. The protection and preservation of these resources are of particular concern. For example, Pima County has set important preservation goals for the historic Helvetia Townsite, which is recorded as site AZ EE:1:80(ASM), and is located in the western portion of the mining project area (Township 18 South, Range 15 East, Section 23; parcel #s. 305-58-0200 & 305-58-0210). As you may know, this is an important historic mining Townsite and a Priority Cultural Resource (as determined in the Sonoran Desert Conservation Plan). This preservation project is 2004 bond project, CIP No. HP-04-405; Bond No. CR4.05, but has become unavailable for County acquisition because it was acquired by the Augusta Resource Corporation in the acquisition of lands for the Rosemont Mine project.

We note that Part 3.0 of Appendix A: Rosemont Copper Project Reclamation and Closure Plan (page 4) states:

As part of the National Environmental Policy Act (NEPA) analysis CNF [Coronado National Forest] will take the lead on consultation with tribal entities and the State Historic Preservation Office. Work will include the inventory, recovery, and preservation of historic and prehistoric sites.

Our review of the MLRP indicates that other than the previously quoted section, the document contains virtually no information pertaining to Heritage Resources, either regarding cultural resources identified to be at risk of damage or destruction, or strategies intended to ameliorate or mitigate impacts on the threatened resources.

We are encouraged that CNF will meet the requirements of the National Environmental Policy Act (NEPA) regarding Heritage Resources within the Rosemont Mine Project Area, under Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations (36 CFR Part 800), and other federal regulatory requirements (e.g., the Native American Graves Protection and Repatriation Act of 1990 [NAGPRA]). However, we are unaware of the status of the cultural resources work, including the consultation process with concerned Indian Tribes, a critical obligation under Section 106. In addition, at this time results of the CNF cultural resources inventory are not available for review. Moreover, the subsequent steps necessary to comply with NEPA requirements under Section 106, including development and implementation of a comprehensive Historic Properties Treatment Plan (HPTP), must be completed before the development of the Rosemont Mine can begin.

To our knowledge, much of the necessary cultural resources work has not been done at this time, so we point to the importance of linking the CNF cultural resources work to the MLRP as critical to avoiding a potential disconnect between the cultural resources results and the reclamation goals of the MLRP. This would undoubtedly hinder, or impede, the compliance process. We assert that ensuring a direct connection between the CNF cultural resources component and the MLRP will facilitate accomplishing its short-term and long-term reclamation goals and meeting its statutory obligations, minimally (as we understand it), under Parts B.7, B.9, B.9.a, B.9.b, B.9.c, B.10, and B.11 (as cited on page 1 of the MLRP). The MLRP should be supplemented with the inventory data, NRHP eligibility recommendations, and HPTP produced by the CNF and attached as appendices to allow future implementation of preservation and/or mitigation strategies throughout the life of the mine, its closure, and the reclamation schedule.

We have the following recommendations:

Pima County's Comments
June 9, 2009

1. We ask for clarifications about the question of the Rosemont Mine closure and reclamation standards, procedures, and defining documents regarding both public and private lands within the Rosemont Mine project area.
2. We strongly recommend comprehensive and consistently applied mitigation strategies to ensure compliance with Section 106 and its implementing regulations (36 CFR Part 800) and other applicable federal standards (e.g., NAGPRA).
3. We urge the Augusta Resource Corporation to take into account direct, indirect, and cumulative impacts on important prehistoric and historic resources, such as the Helvetia Townsite, and develop specific strategies to address the preservation and protection of these resources. Strategies should be part of a comprehensive Preservation Plan dealing with prehistoric and historic resources within the Rosemont Mine Project Area.
4. We reiterate the requirement of completion of appropriate consultation with concerned and interested Indian Tribes: Tribes, MOU participants (including Pima County), and other project stakeholders.
5. We request that Augusta Resource Corporation prepare a task list and approximate schedule for development and implementation of all cultural resources compliance actions to be taken by CNF for distribution to Cooperating Agencies and other project stakeholders, which will include
 - Class I and Class III survey
 - Identification and eligibility evaluations of identified resources
 - Treatment recommendations: avoidance, mitigation (including mitigation documentation of historic resources and archaeological data recovery conducted to Secretary of the Interior's Standards and Guidelines)
 - Historic Properties Treatment Plan (HPTP)
 - HPTP implementation schedule that is keyed to the MLRP Reclamation Plan implementation schedule
 - Management and Monitoring Plan (MMP)
 - Preservation Plan (PP)
 - Inadvertent Discovery Plan (IDP)
6. Finally, we recommend full and continued participation by Pima County as a Cooperating Agency in the Rosemont Mine MOU throughout the NEPA process and implementation of the Rosemont Mine Project during the life of the mine, and including its closure and implementation of all reclamation plans applying to public and private lands within the Rosemont Mine Project Area.