

Rosemont Copper Mine

Objection Review

Objection # (s): 0091-PimaCounty; 0097-JIsaman; 0105-RCasavant

Resource Area(s): Minerals and Geology – General (MG-1)

Objection Issue:

- 0097-1: Springs in Gardner and Sawmill canyons are at the same elevation below the (Onyx and Cave of the Bells) cave entrance, and dye tracing experiments conducted by Lang Brod show that the pools are connected to these springs. Therefore, groundwater draw down in the area would drain these pools as well as local springs in those canyons. Additionally, if any groundwater becomes more acidic as a result of drainage from the Rosemont mine, there could be substantial dissolution at and below the current water table level, which could even lead to collapse and break down in the upper cave passages. Acidification of the groundwater would also have a severe impact on troglobitic species dependent upon this water.
- 0105-1: A topic of concern for the FEIS and draft ROD revolves around specifics associated with independent and robust monitoring and reporting of changes, etc. that may impact resources on public lands. The characterization of flow paths is crucial, but also a difficult task to do consistently or correctly in some industries. To that end surface and borehole mapping should be continued as mining proceeds, given that sufficient fracture aperture analyses, and connectivity may not have been not measured and modeled directly beforehand.
- 0091-28: The FEIS and ROD fail to disclose the Forest Supervisor's decision not to require a mineral validity exam on Rosemont's unpatented mining claims and the impacts resulting from that federal action.

Remedy Supplied by Objector (if any):

0105-1: Key hydraulic tests (e.g. flow, pressure, isotope, geochemistry, and tracer studies) could be designed and conducted before and during mining by independent monitoring experts like the U.S. Geologic Survey. Individual fractures assessments can also be tested using packers in current and future boreholes.

Law, Regulation and/or Policy: Federal Cave Resources Protection Act of 1988, FSM 2356 Cave Management, General Mining Law of 187, Multiple Use Mining Act of 1955, Mining and Minerals Policy Act of 1970, 36 CFR 228, subpart A.

Review Team Member Response:Response to objection issue 0097-1

This objection issue concerns impacts to caves from drawdown, as well as potential effects of acid mine drainage on caves.

The FEIS provides a thorough analysis of potential impacts to caves in the section titled Geology, Minerals, and Paleontology [PR 047511_3, pp. 144-145, 171-172, and 174-177]. Cave of the Bells and Onyx Cave are located approximately 7 and 8 miles away, respectively from the project site and effects to these caves from the mining operation are not expected. The FEIS notes that oxygen isotope analysis on a stalagmite from Cave of the Bells indicates that over the past 75,000 years, water entering the cave has been meteoric in nature (as with other caves in the area), and concludes that "...any possible groundwater withdrawal from the area would not affect known caves, and surface water impacts that would result from the project would be far removed from these known caves" [PR 047511_3, p. 174]. The objector does not dispute that the formations in Onyx and Cave of the Bells are attributed to meteoric water, but claims that pools in both caves are connected to the groundwater table and thus are subject to groundwater drawdown and acidification.

Acidification of the groundwater in the area around the mine site is not predicted to occur. The potential for acid-rock conditions to be present at the project site has been studied in detail for the project. The FEIS provides an analysis of groundwater quality [PR 047511_3, pp. 362-398]. Specifically, effects on groundwater quality from tailings seepage, waste rock seepage, heap leach seepage, and explosive residue are located on pages 377-386; and effects from water quality in the pit lake are located on pages 387-390. With respect to acid rock drainage, a summary of all geochemical tests conducted to assess acid rock drainage potential is on pages 374-376 and the overall potential for acid rock drainage is discussed explicitly in the "Surface Water Quality" section on pages 468-471. The modeling concludes that infiltration from precipitation over tailings, waste rock, and the heap leach facilities is expected to be negligible and none of the modeled scenarios create acidic lake conditions [PR 047511_3, pp. 377 and 389].

A major part of the mitigation package for this project is a robust suite of monitoring and mitigation measures [PR 047511_6, Appendix B] to continue to verify or not, many of the scientific assumptions used in the modelling of the geo-hydrology. A summary of monitoring specifically to assess groundwater quality during mine operations is described in the FEIS [PR 047511_3, pp. 368-369, 379] and all mitigation/monitoring measures related to groundwater quality are described on pages 395-398. A summary of monitoring specifically to assess acid rock drainage is on page 471. These measures are more fully described in Appendix B [PR 047511_6], specifically OA-GW-02 (p. B-84), OA-GW-06 (p. B-87), FS-GW-01 (p. B-16), FS-GW-02 (p. B-17), FS-GW-03 (p. B-19), FS-GW-04 (p. B-21) and OA-SW-01 (p. B-88).

Finally, in the event that the mining encounters significant voids or karst features, mining is to be suspended and the Forest Service is to be notified to assess the situation (see mitigation measure

specific to cave resources in Appendix B, FS-GMP-02 [PR 047511_6, pp. B7-B8]). Caves are also addressed in the general response to comments in Appendix G [PR 047511_7, pp. G20-G21].

The FEIS adequately considered potential impacts and effects to Cave of the Bells and Onyx Cave, as well as other caves. Mitigation measures designed to protect cave resources have been incorporated into the project and adverse effects are not predicted to occur.

Response to objection issue 0105-1

This objection issue concerns the monitoring that could be implemented with respect to hydrologic and geologic systems.

The FEIS acknowledges “uncertainty associated with predicting long-term impact of any hydrologic system and the limitations identified in the groundwater models” and prescribes “monitoring components that are intended to provide a database from which periodic assessment of model predictions can be undertaken and management strategies adapted as necessary” [PR 047511_3, p. 302 and PR 047511_6, Appendix B]. Monitoring specifically intended to assess groundwater modeling predictions is summarized in the FEIS [PR 047511_3, p. 302] and described more fully in Appendix B [PR 047511_6]. These monitoring measures include: FS-GW-02 for monitoring of wells and springs beyond point-of-compliance wells (p. B-17); FS-SSR-02, for monitoring of seeps, springs and constructed/enhanced water (p. B-26); FS-BR-22, monitor impacts from pit dewatering on downstream sites in Barrel and Davidson Canyon (p. B-48); and FS-BR-27, for periodic validation and rerunning of groundwater models through life of mine (B-53).

The pertinent analysis for the groundwater models and methodology used is disclosed in the FEIS [PR 047511_3, pp. 293-315]. This section addresses the 3 models used and the uncertainties of each of these models. Mitigation/monitoring measures for groundwater quantity are also discussed specifically in Chapter 3 of the FEIS, including analysis of mitigation effectiveness [PR 047511_3, pp. 357-361].

The selected alternative incorporates an adaptive management approach to address issues and project uncertainties like the ones raised by the objector. The adaptive approach related to the performance and accuracy of the groundwater models, and a more complete picture of flow paths and fracture systems in the sub-surface is the intent of validating and rerunning the models as described above. As such, the FEIS has adequately addressed this issue.

Response to objection issue 0091-28

The objector contends that the FEIS and DROD fail to disclose the Forest Supervisor’s decision not to require a validity examination and the impacts resulting from the action.

Determining whether to conduct a validity examination is not considered a “decision” or a “federal action” in the context of NEPA. The policy of the Forest Service with regard to conducting validity exams is to require a validity determination for: 1) mineral patent

applications, 2) mineral withdrawals where mineral operations are planned, and 3) proposed uses which are not incidental to prospecting, mining, milling, etc., such as illegal occupancy under the guise of the Mining Law.

The issue of claim validity for the Rosemont project is addressed in the following locations in the FEIS [PR 047511_3]: Geology, Minerals, and Paleontology: Issues, Cause and Effect Relationships of Concern (p. 144); Relevant Laws, Regulations, Policies, and Plans (p. 147); Mineral Discovery (p. 148); and Claim Location and Mineral Discovery (pp. 148-149).

The various federal laws and regulations related to mining on federal land are discussed in the FEIS [PR 047511_2, p. 7; PR 047511_3, p. 147] and outline the minerals policy of the Forest Service and federal government. The Multiple Use Mining Act of 1955 states: “citizens may conduct mining activities on public lands, locate necessary facilities, and conduct reasonable and incidental uses to mining on public lands, including NFS lands. Additionally, the 1970 Mining and Minerals Policy Act further established the federal government’s policy: “to foster and encourage private enterprise in the development of economically sound and stable industries and in the orderly development of domestic resources to help assure satisfaction of industrial, security, and environmental needs.” The response to DEIS comments is an appropriate response to this objection [PR 047511_7, Appendix G, p. G-17].

Recommended Remedy by Review Team Member (if any): The remedy suggested by the objector is not warranted. No remedy is required.

Review Team Member: Michael Linden, Regional Liaison for Minerals and Geology

Rosemont Copper Mine

Objection Review

Objection # (s): 0084-SSSR, 0062-DanMeyer

Resource Area(s): Minerals and Geology – Legal (MG-3)

Objection Issue:

- 0084-74: The project violates the Organic Act, 36 CFR Part 228, and the Surface Resources Act of 1955. Any argument that the agency is precluded from meeting its statutory and regulatory obligations because they allegedly make a mine operation "too expensive" is not supported by federal law and applicable court decisions and thus can be rejected.
- 0084-75: The unacceptable environmental impacts that are predicted to occur if any of the action alternatives are approved (even with the limited mitigation measures proposed), violate the Organic Act and Part 228 regulations.
- 0062-3: Forest Service regulations regarding mining which uses the surface of the National Forests shall be conducted so as to minimize adverse impacts to those resources (Organic Act). He questions how the project meets this requirement.
- 0084-76: In the FEIS, the USFS acknowledges the catastrophic impacts that this project may have on Empire Gulch, Cienega Creek, and the LCNCA, but the fails to meaningfully consider that this will undermine the LCNCA establishing legislation or acknowledge that because of this, this project will violate the law if allowed to proceed.

Remedy Supplied by Objector (if any):

0084-74, 75, 76: The USFS cannot approve any of the action alternatives, and the FEIS and Draft ROD must be remanded back to the Coronado.

Law, Regulation and/or Policy: Organic Administration Act of 1897; 36 CFR 228 subpart A; Multiple Use Mining Act of 1955 (also called Surface Resources Act of 1955); Mining and Minerals Policy Act of 1970; Las Cienegas National Conservation Area, Section 5 of Public Law 106-538

Review Team Member Response:

Response to objection issues 0084-74, 75 and 0062 -3

The agency is meeting its statutory and regulatory responsibilities under the Organic Administration Act, the federal regulations at 36 CFR 228 subpart A, and the Multiple Use Mining Act of 1955. These Acts and accompanying regulations recognize the importance of

reducing adverse impacts from mining operations on the National Forests but also strive to establish an appropriate and reasonable balance between the public's interests and resources on National Forest land and the rights granted under the Mining Law. The discussion of applicable laws and regulations for the Rosemont Copper Project in the FEIS [PR 047511_2, pp. 6-12] is an accurate discussion of the agency's roles and responsibilities for this project. During the NEPA process, the agency has strived to follow the locatable mineral regulations (36 CFR 228) which provide the direction for the management of surface resources with locatable mineral operations.

Many mitigation measures are displayed in Appendix B of the FEIS [PR 046511_6], some which go beyond the legal authority of the Forest Service to enforce (because they are under the jurisdiction of other agencies), but which have been agreed to by the proponent. These mitigation measures are a good example of how the project has been "shaped" by the agency, the public scoping process, and cooperating agency comments on many levels, to reduce adverse impacts. The FEIS [PR 047511_6, Appendix B] includes many mitigation measures which are practical and feasible for the scale of this operation and which greatly reduce adverse impacts. The Forest Service is not authorized by these Acts and regulations to go further and impose such unreasonable mitigation measures or operational limitations that would render the project infeasible from an economic standpoint.

Response to objection issue 0084-76

The issue of potential effects to the Las Cienegas National Conservation Resource Management Area (LCNCRMA) and the legal implications of potentially affecting the waters of the area are addressed on in the FEIS [PR 047511_5, pp. 1143-1145]. In that section, it is acknowledged that although the goals of the BLM's management plan for the LCNCRMA may be difficult to implement due to the potential affects from the Rosemont project over time, it would not violate the implementing legislation for the area. Section 5 of the Act describes that there are no "buffer zones" to the LCNCRMA, and activities conducted outside the area are not impacted by the Act.

A thorough discussion of groundwater quantity and modeling analyses is found in the FEIS [PR 047511_3, pp. 288-362]. The topic of seeps and springs which are within the project analysis area is discussed at pp. 485-570 of the FEIS. Issues directly relating to Empire Gulch and its springs at LCNCRMA, along with other springs, seeps and drainages that could be affected beyond the project site itself are also discussed in the FEIS [PR 047511, pp. 528-539].

Monitoring specifically intended to assess groundwater modeling predictions is summarized in the FEIS [PR 047511_3, p. 302]. All mitigation/monitoring related to groundwater quantity is discussed on pp. 357-358, and analyzed for effectiveness on pp. 359-361. Monitoring specifically intended to assess potential impacts to stream flow is summarized on pp. 545-546. Monitoring specifically intended to assess potential impacts to seeps and springs in on p. 564. All mitigation/monitoring related to seeps, springs, and riparian areas is discussed on pp. 566-568, and analyzed for effectiveness on pp. 568-569.

The FEIS has adequately addressed this issue.

Recommended Remedy by Review Team Member (if any): The remedy suggested by the objector is not warranted. No remedy is required.

Review Team Member: Michael Linden, Regional Liaison for Minerals and Geology

Rosemont Copper Mine

Objection Review

Objection # (s): 0084-SSSR

Resource Area(s): Minerals and Geology – Effects (MG-5)

Objection Issue:

- 0084-6: The FEIS provides inadequate analysis of impacts to Colossal Cave Mountain Park and Kartchner Caverns State Park.

Remedy Supplied by Objector (if any):

0084-6: Conduct a detailed analysis of the impacts of the mine to Colossal Cave Mountain Park, with a focus on: 1) impacts due to blasting, 2) visual resources, and 3) air quality at the park.

Law, Regulation and/or Policy: Organic Administration Act of 1897, Federal Cave Resources Protection Act of 1988, FSM 2882 and FSM 2356.

Review Team Member Response:

In response to public and cooperating agency comments on the project, the Coronado NF undertook a further review of cave resources that might be affected. This review included the potential for undiscovered cave resources to occur on the site, for cave or karst features to affect hydrologic conditions, and for existing caves to be impacted by the project, including Kartchner Caverns, Colossal Cave, Onyx Cave, and Cave of the Bells [PR 047511_7, Appendix G, p. G-21]. Also see FEIS [PR 047511_3, p. 298] for a discussion related to a July 24, 2012 meeting on caves between Arizona State Parks, Pima County, Arizona Geological Survey, EPA, the Coronado NF, and regional cave specialists. The main thrust of the cave resource reviews with cave and karst scientists and interested cooperating agencies was the possible hydrological connectivity between the mine site and known cave resources. Issues such as blasting effects, visual quality, and air quality were not specifically identified as concerns to existing caves at these reviews.

Specific locations in the FEIS [PR 047511_3] where cave resources were addressed include the following: Chapter 3, Geology, Minerals and Paleontology on p. 144 (Issues), p. 145 (Analysis Methodology, Assumptions, Uncertain and Unknown Information), p. 147 (Summary of Effects), pp. 151-153 (Cave Resource Laws); pp. 171-172 (Existing Conditions, Cave Resources and Karst Landforms), pp. 174-175 (Environmental Consequences, Impacts Common to All Action Alternatives), p. 176 (Cumulative Effects and Climate Change); and p. 177 (Mitigation Effectiveness).

Blasting studies related to potential effects to historic structures were carried out by Tetra Tech for seismic vibrations and noise [PR 047511_4, p. 1038]. The studies concluded that for distances of 5 or more miles away from the blast site, no impacts are expected to man-made structures (such as buildings at Empire Ranch) because vibrations fall off rapidly at that distance. For the much greater distances from the mine site to Colossal Cave Mountain Park and Karchner Caverns, there would be no expected detrimental effects to cave resources from blasting at the mine.

Visual resources and air quality impacts were evaluated for the project [PR 047511_3] starting at p. 217 and also Mitigation measures at pp. 283-287. Particular attention is given to existing Class I areas such as Saguaro National Park East. The air quality studies do not specifically discuss visual resource issues at Karchner Caverns or Colossal Cave but the entire region surrounding the Rosemont mine site is addressed by these local and regional air quality studies.

Cave resources, including Colossal Cave and Kartchner Caverns, were adequately addressed in the FEIS.

Recommended Remedy by Review Team Member (if any): The remedy suggested by the objector is not warranted. No remedy is required.

Review Team Member: Michael Linden, Regional Liaison for Minerals and Geology