OBJECTOR:	The Arizona Game and Fish Department
PROPOSED PROJECT:	Rosemont Copper Project Final EIS and Draft ROD
RESPONSIBLE OFFICIAL:	Jim Upchurch, Forest Supervisor, Coronado National Forest
DATE:	14 February 2014

OBJECTION NO. 1. The FEIS does not contain any disclosure or analysis of the potential effects of mining activities on downgradient surface waters, aquatic wildlife or riparian resources of Davidson Canyon or Cienega Creek.

As a result, there is no factual basis for the following statements in the FEIS: Vol. 1 at xxv that "riparian areas within the *analysis area* would not be impacted by mine activities"; Vol. 2, Ch. 3, *Surface Water Quality* at 479 that "runoff water quality from the . . . waste rock facilities from all action alternatives is not expected to degrade the existing surface water quality in the *analysis area"* (emphasis added).

Basis for Objection**:** The *Surface Water Quality* section purports to discuss the potential impacts of the mine to the quality of existing surface water resources in the Rosemont *analysis area*, which includes 146,163 acres surrounding the mine that may experience direct or indirect temporal and spatial impacts from the Rosemont Mine proposed project. The *analysis area* for surface water quality impacts is depicted in Figure 64 on 445.

The *analysis area* includes the immediate sub-watersheds, including Barrel Canyon, the portion of Davidson Canyon that receives discharge from the mine area and is tributary to Lower Cienega Creek, as well as Cienega Creek downstream of its confluence with Davidson Canyon to the Pantano Dam. FEIS at 98.

The FEIS at 391 states that the Rosemont Mine project area "drains to Davidson Canyon and ultimately Cienega Creek", and in 471 acknowledges that "during operations and postclosure, the waste rock facility would be exposed to surface runoff that leaves the project area and could have the potential to impact downstream surface water quality".

The FEIS text at 471-473 on mining contaminants in waste rock runoff analyzes potential water quality effects of waste rock runoff only for Barrel Canyon. There is no comparable analysis for potential mine-related waste rock stormwater runoff impacts to the water quality or aquatic wildlife in Outstanding Arizona Waters (OAWs) Davidson Canyon or Cienega Creek.

The FEIS at 548, Table 111 (*Potential to Affect Outstanding Arizona Water in Davidson Canyon and Lower Cienega Creek*) states that "[f]ull analysis of antidegradation standards and

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compliance with surface water standards in the Outstanding Arizona Water reaches of Davidson Canyon and Cienega Creek is under the jurisdiction of ADEQ and has not yet been conducted . .'

The FEIS at 548 states that Rosemont Copper has not completed its demonstration to the State of Arizona that discharges from the proposed Rosemont Mine will not degrade existing water quality in the downstream OAWs.

Notwithstanding this fact, the Forest Service acknowledges in the FEIS its legal obligation under NEPA to describe and disclose all potential project-related resource impacts, including downstream effects on special status species from upslope sources, and to analyze alternatives that would mitigate or avoid such impacts.

AGFD has repeatedly commented that both the DEIS and PAFEIS contained inadequate information on the mine's potential impacts to downstream OAWs and their aquatic ecosystems. Cienega Creek supports more than 280 native species of mammals, birds, reptiles, amphibians, fish and insects, and provides habitat for neotropical migratory birds and threatened and endangered species. FEIS at 547. The creek is designated critical habitat for Gila chub. Gila chub in Upper Cienega Creek are classified by AGFD and USFWS as a stable-secure population, while the chub in Lower Cienega Creek are classified as an unstable-threatened population. The endangered status of the Gila chub and the historical losses of its former habitats in Arizona renders a full and fair discussion of the mine's potential adverse impacts on Lower Cienega Creek an essential element of a "hard look" under NEPA.

Suggested remedy: Conduct an analysis of constituents in Rosemont waste rock stormwater runoff and compare with current existing water quality data for OAWs Davidson Canyon and Cienega Creek. The analysis should include a discussion of the numeric and narrative standards for all State of Arizona-protected uses in both OAWs: AW&Ww (Aquatic and Wildlife Warm Water, acute and chronic); FBC (full-body contact); PBC (partial body contact); FC (fish consumption) and Agl (agricultural livestock watering)

Previous AGFD comments:

AGFD 1/18/2012 Comments to Rosemont DEIS at 17 (DEIS does not describe the adverse effects to OAWs in the event contaminated water is discharged down Barrel Canyon).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 21-22 (FEIS should describe the potential effects of mine stormwater runoff to surface water quality of downstream Outstanding Arizona Waters).

AGFD 8/15/2013 Comments to Rosemont PAFEIS, Page 28 (potentially adverse effects of mine-related discharges to surface waters should be analyzed against relevant numeric water quality standards, wildlife water quality standards and the anti-degradation Tier 3 criteria for the OAWs Davidson Canyon and Cienega Creek).

Violation of law, regulation or policy:

NEPA 43 U.S.C. § 4332(C) and 40 CFR 1502.16. EIS must include the environmental impacts of all alternatives including the proposed action, and a description of all adverse environmental effects.

NEPA 40 CFR 1502.16. The EIS discussion of environmental impacts shall include a discussion of all direct and indirect effects and their significance.

NEPA 40 CFR 1500.2; 1502.1. Statements in EISs shall be supported with evidence that the federal lead agency has made the necessary environmental analyses.

NEPA 40 CFR 1502.22. Analyses of impacts must be supported by credible scientific evidence and not based on pure conjecture.

National Best Management Practices for Water Quality Management on National Forest System Lands (USDA Forest Service, April 2012) (Forest Service should identify and evaluate the condition of streams, riparian areas and groundwater-dependent ecosystems; identify State-designated beneficial uses and water quality parameters that are critical to those uses; and the likelihood that proposed activities would contribute to current or future impairment of watersheds)

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OBJECTION NO. 2. The following statements in the FEIS are not supported by the analysis conducted by the Coronado National Forest and reported in SWCA 2013k of the potential environmental effects of mine stormwater runoff in Barrel Canyon:

The text at 472, 548 and Table 111 (*Potential to Affect Outstanding Arizona Water in Davidson Canyon and Lower Cienega Creek*) that "predicted runoff water quality from waste rock and [waste rock] soil cover meets surface water quality standards in Barrel Canyon".

The text at 663 that "[n]o exceedances of surface water quality standards that are not already exceeded in natural runoff in Barrel Canyon are expected from the proposed mine operations".

The Draft ROD at 14 which states that for all alternatives, "stormwater runoff from the waste rock facility would not exceed applicable surface water quality standards in Barrel Canyon, except for some water quality parameters that are already observed in stormwater runoff ."

Basis for Objection**:** The above-quoted FEIS statements are contradicted by the FEIS at 447, Table 97 (*Summary of Effects*), which predicts that runoff from mine waste rock meets Arizona surface water quality standards in Barrel Canyon for all constituents except dissolved silver. Both Tables 111 and Table 97 are further contradicted by Table 105 at 475 (*Predicted stormwater runoff water quality and applicable surface water standards in Barrel Canyon*) which reflects mine stormwater runoff exceeding Barrel Canyon ephemeral surface water standards for dissolved mercury as well as dissolved silver. Total lead may also be exceeded.

Suggested remedy: Amend the draft ROD, the FEIS text at 472, 548 and 663, and Tables 97, 105 and 111 to reflect that predicted runoff water quality from waste rock and soil cover does not meet surface water quality standards in Barrel Canyon for dissolved silver and dissolved mercury. Conduct an analysis for total lead, which has a numerical surface water hardness standard. Further conduct an analysis for potential copper in waste rock runoff (see Objection No. 6 below). Analyze the potential impacts of these metals to the ephemeral and wetted OAW portions of Davidson Canyon and Lower Cienega Creek.

Previous AGFD comments:

This Objection is based in part on new information contained in 2013k, *Revised Analysis of Surface Water Quality*: Memorandum to file by Chris Garrett, SWCA Environmental Consultants (Phoenix, Arizona: SWCA Environmental Consultants, August 23) (SWCA 2013k) that was developed after the opportunity for comments. *See also*:

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 21-22 (PAFEIS does not fully describe the impacts of pollutants from the mine site on downstream watersheds).

Violation of law, regulation or policy:

NEPA 43 U.S.C. § 4332(C) and 40 CFR 1502.16. EIS must include the environmental impacts of all alternatives including the proposed action, and a description of all adverse environmental effects.

NEPA 40 CFR 1500.2; 1502.1. Statements in the EIS must be supported by environmental analyses.

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OBJECTION NO. 3. No data exists for the statement in the FEIS at 410 that "[b]oth Cienega Creek and Davidson Canyon are outside any area of direct impact from the proposed [mine] project but could be indirectly impacted by reductions in stream flow. A full analysis of impacts to these Outstanding Arizona Waters is included in the "Seeps, Springs, and Riparian Areas" resource section in this chapter".

Basis for Objection**:**

(1) Table 111 at 548 in *Seeps, Springs, and Riparian Areas* states that an analysis of the mine's potential impacts to Cienega Creek and Davidson Canyon has not yet been conducted;

(2) SWCA 2013k at 7, which attempts a "screening level analysis" of the existing Rosemont data, states that it is "impossible" to attempt to conduct a screening level analysis of potential degradation in the downstream OAW segments of Davidson Canyon and Cienega Creek by mine waste rock runoff due to a lack of stormwater samples "anywhere else in the watershed except in Barrel Canyon" and

(3) SWCA 2013k only attempts a screening level analysis of potential impacts of mine stormwater runoff for Barrel Canyon only.

SWCA, the Coronado National Forest's consultant, further notes that "existing stormwater quality appears never to have been sampled in Davidson Canyon, thus preventing SWCA from performing a good faith, screening level effort to predict the potential for waste rock runoff quality to impact the Outstanding Arizona Water (OAW) reaches of Davidson Canyon and Cienega Creek. SWCA 2013k at 2 and 9.

SWCA 2013k at 3 notes that since 2008 Rosemont has collected stormwater quality samples in Barrel Canyon and tributaries from 8 different locations on 15 different dates, and collected water quality samples from Cienega Creek and Lower Davidson Canyon in 2008.

It is not clear why stormwater data from Davidson Canyon were not collected and analyzed, or why the existing water quality data for the OAW portion of Davidson Canyon and Lower Cienega Creek were not analyzed and compared against predicted waste rock runoff water quality. No showing is made that the costs of collection and analysis of this surface water quality data are exorbitant, or that the means to obtain the data are not known.

A more strict set of surface water quality standards exists for the OAW reach downstream in Davidson Canyon. Because water is present more regularly in portions of the OAW stretch of Davidson Canyon, more species are presumed to be present and longer term exposure is assumed, with the result that lower concentrations of pollutants are allowed. These standards for perennial flows are in place to provide year-round protection for wildlife and warm water aquatic species with a lower threshold of toxicity than applies to intermittent flows. *Integrated Watershed Summary* (June 2012) at 66.

Suggested remedy: Conduct the analysis by utilizing the existing water quality data for Lower Davidson Canyon and Cienega Creek collected by Rosemont in 2008, and the 2012-2013 surface water quality data collected in Davidson Canyon and Cienega Creek by ADEQ and turned over to SWCA by ADEQ in September 2013.
Previous AGFD comments:

This Objection is based in part on new information that was developed after the opportunity for comments, contained in 2013k, *Revised Analysis of Surface Water Quality* (SWCA Environmental Consultants, August 23 2013). *See also*:

AGFD 1/18/2012 Comments to Rosemont DEIS at 17 (DEIS does not describe the adverse effects to OAWs in the event contaminated water is discharged down Barrel Canyon).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 21-22 (PAFEIS does not fully describe the impacts of pollutants from the mine site on downstream watersheds).

Violation of law, regulation or policy:

NEPA 40 CFR 1502.22. If incomplete information relevant to reasonably forseeable significant adverse effects is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the federal lead agency shall include the information in the EIS.

NEPA 40 CFR 1502.22. An analysis of adverse impacts must be based on credible scientific evidence, not conjecture.

Expert conclusions about possible effects, or the lack of effects, must be based on hard data, and the public provided with the underlying environmental data from which a federal land management agency derives its opinion. *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management,* 387 F. 3d 989, 995 (9th Cir. 2004).

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OBJECTION NO. 4. The methods used by the CNF to develop its "screening analysis" of the potential impacts of mine waste rock runoff on Barrel Canyon water quality is not the best data available, and is not generally accepted in the scientific community where more scientifically-defensible data is readily available.

Basis for Objection: All waste rock core characterizations performed in 2007-08 by Rosemont Mine were conducted to support its application for an Arizona Aquifer Protection Permit, and as a result the laboratory analytical tests were performed with laboratory detection limits set to aquifer water quality standards. The consequence is that for certain analytes, the laboratory method detection limits (MDLs) for Rosemont's APP waste rock characterization samples exceeds numeric Arizona surface water quality standards. SWCA in 2013k, *Revised Analysis of Surface Water Quality.*

In response to comments from EPA and ADEQ about the lack of information of the mine's potential effects on surface water quality, SWCA conducted an analysis of the available laboratory data for the waste rock and the Barrel Canyon stormwater samples collected by Rosemont. SWCA 2013k, *Revised Analysis of Surface Water Quality.*

To compensate for the absence of laboratory data with MDLs set below Arizona numeric surface water quality standards, SWCA resorted to a strategem of applying half the laboratory detection limit for the analytes in its Table 5 analysis, and then applied this standard only against the ephemeral water quality standards in Barrel Canyon. SWCA admits that this "screening level analysis" strategem is a "mathematical construct" with "no guarantee that the actual concentration would equal the result used in [SWCA's] calculation". SWCA 2013k at 6.

While using half the detection limit is a common practice when detection limits are not easily attainable, the detection limits for Arizona numeric surface water quality standards are attainable by a certified laboratory.

Suggested remedy: Perform waste rock characterization with laboratory method detection limits set for Arizona surface water quality standards, and then compare the data to the AW&We standards for the ephemeral portion of Davidson Canyon and to the AW&Ww standards in OAWs Davidson Canyon and Cienega Creek.

The proper sample collection and analysis methodology for compliance with Arizona surface water quality standards are found in the following references:

a. Environmental Monitoring and Support Laboratory–Cincinnati, EPA, Pub. No. EPA-600/4-79-020, Methods for Chemical Analysis of Water and Wastes (rev. March 1983), available at http://nepis.epa.gov/pubtitleord.htm.

b. American Public Health Association et al., Standard Methods for the Examination of Water and Wastewater (19th ed. 1995 & 20th ed. 1998), available from American Public Health Association, 800 I Street, NW, Washington, DC 20001.

c. 40 CFR Part 136 app. A (July 2005), available at http://www.access.gpo.gov/nara/cfr/cfr-table-search.html).

Previous AGFD comments:

This Objection is based in part on new information that was developed after the opportunity for comments, contained in 2013k, *Revised Analysis of Surface Water Quality* (SWCA Environmental Consultants, August 23 2013). *See also*:

AGFD 1/18/2012 Comments to Rosemont DEIS at 17 (DEIS does not describe the adverse effects to OAWs in the event contaminated water is discharged down Barrel Canyon).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 21-22 (PAFEIS does not fully describe the impacts of pollutants from the mine site on downstream watersheds).

Violation of law, regulation or policy:

NEPA 40 CFR 1500.1; 1502.24. Federal lead agencies must utilize accurate analysis and high quality information to ensure scientific integrity.

NEPA 40 CFR 1502.15. Data collection should be commensurate with the importance of the impacts.

NEPA 40 CFR 1502.22. Data gaps must be filled where information is essential to a reasoned choice between alternatives, unless the cost of obtaining the information is exorbitant or the means to obtain it are not known.

NEPA 40 CFR 1502.22. The lead federal agency's evaluation of impacts must be based on research methods generally accepted in the scientific community. NEPA 40 CFR 1502.22. Information on foreseeable significant adverse impacts shall be included in an EIS, provided the costs of obtaining the information are not exorbitant.

NEPA 40 CFR 1502.22. Reasonably foreseeable impacts include impacts which have catastrophic consequences, even if their probability is low, provided that the analysis is supported by credible scientific evidence.

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OBJECTION NO. 5. The FEIS, SWCA 2013k screening analysis, and draft ROD contain conflicting statements of the potential effects of mine waste rock runoff on surface water quality of OAWs in Davidson Canyon and Cienega Creek.

Table 108 at 511 in the FEIS states that "some constituents may be elevated in stormwater . . . [o]therwise, no predicted changes that would affect Outstanding Arizona Waters or biological characteristics under wadeable, perennial standards".

Chapter 3 at 553 in the FEIS, "Summary of Expected Effects on Outstanding Arizona Waters" states " . . .the only potential effect on the Outstanding Arizona Waters in Lower Davidson Canyon and Lower Cienega Creek would be the result of a decrease in [stormwater] runoff . . ."

The above-quoted statements are contradicted by:

The FEIS at 549 which states that runoff from mine waste rock and soil cover is predicted to contain elevated levels of dissolved arsenic, iron, total and dissolved mercury, molybdenum, aluminum, selenium and total and dissolved sulfates and "could present antidegradation problems".

The Draft ROD at 22 which states that the analysis suggests that several constituents, including sulfate, molybdenum, arsenic, sodium, and mercury may be elevated in stormwater with all action alternatives for Lower Davidson Canyon and Cienega Creek.

<u>Basis for Objection</u>: The Draft ROD at 5 recognizes that the downstream segments of Davidson Canyon and Cienega Creek are Outstanding Arizona Waters, which are given the highest level of antidegradation protection under Arizona law, with no degradation in water quality allowed.

The Coronado National Forest acknowledges its legal responsibility under NEPA to assess and disclose potential resource impacts. FEIS at 553. The SWCA 2013k "screening analysis" was intended to assess the mine's potential to impact surface water quality "beyond Barrel Canyon". FEIS at 553.

The SWCA 2013K screening analysis identified several heavy metals in Rosemont waste rock runoff that that is predicted to degrade, or significantly degrade, water quality in the OAWs under a mine scenario. SWCA 2013k Table 6.

SWCA 2013k analyzed the "limited data available" and in its Table 6 identified arsenic, dissolved and total mercury, iron, dissolved selenium, molybdenum, sulfates and sodium in mine waste rock runoff and waste rock soil cover runoff that are predicted to degrade, or significantly degrade water quality of "downstream waters".

SWCA 2013k concludes that it is "impossible" to conduct a screening level analysis of predicted mine runoff on existing water quality in the OAWs due to a lack of stormwater data in the OAWs.

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Suggested remedy: At a minimum, compare the screening analysis of the waste rock constituents with the most restrictive state surface water standard for all protected uses in Davidson Canyon and Cienega Creek and disclose those results in Tables 97, 105, 108, and 111 and accompanying text to all Tables.

The more scientifically-defensible approach is for Rosemont to conduct waste rock analyses using proper laboratory MDL protocols to detect levels of constituents below the Arizona Surface Water Quality Standards, and compare those results with existing surface water quality samples collected by Rosemont and ADEQ in Davidson Canyon and Cienega Creek.

Previous AGFD comments:

This Objection is based on new information contained in 2013k, *Revised Analysis of Surface Water Quality* developed after the opportunity for comments. *See also*:

AGFD 1/18/2012 Comments to Rosemont DEIS at 13 (DEIS analyzes surface water quality impacts only by reference to Arizona Aquifer Water Quality Standards)

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 21-22 (PAFEIS does not fully describe the impacts of pollutants from the mine site on downstream watersheds).

Violation of law, regulation or policy:

Expert conclusions must be based on hard data, not speculation, and not run contrary to the evidence. *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management,* 387 F. 3d 989, 995 (9th Cir. 2004).

Vague statements about possible effects (*i.e.* elevated constituents in Rosemont mine waste rock runoff "could present antidegradation problems") do not constitute a" hard look" under NEPA. *Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F. 3d 989 (9th Cir. 2004) (statement in EIS that environment will be "degraded" does not constitute a hard look)

General statements about possible effects does not constitute a 'hard look' absent a justification why more definitive information could not be provided. *Neighbors of Cuddy Mountain v. U.S. Forest Service*, 137 F. 3d 1372 (9th Cir. 1998).

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OBJECTION NO. 6. The FEIS lacks a qualitative prediction of the potential of copper constituents in stormwater runoff from the waste rock facility and its impact on surface waters in Barrel Canyon, Davidson Canyon and Cienega Creek.

Basis for Objection: SWCA 2013k reviewed the waste rock characterization Rosemont conducted for its Aquifer Protection Permit, and found that copper leachate exceedances above the AW&We-acute surface water standard for Barrel Canyon in three waste rock types: arkose, bolsa and QMP limestone. SWCA 2013k at 3 and Tables 2 and 3 (Summary of Synthetic Precipitation Leaching Procedure results for waste rock samples).

Arkose waste rock contains copper oxide, FEIS at 156. Arkose is the largest component of the waste rock at the Rosemont Mine. More than one-half of the waste materials consist of weathered (oxidized) and fresh (unoxidized) arkose, FEIS at 156, 166. Oxide arkose comprises 521,476 kilotons of the waste rock, or 44.38% of the total waste rock. FEIS, Table 70 at 375.

Suggested remedy: Perform additional waste characterization for Bolsa Quartsite, Arkose and Limestone for presence of leachable copper in waste rock; determine the potential for degradation of Barrel Canyon, Davidson Canyon and Cienega Creek surface water quality standards under the applicable surface water standards (acute and chronic), and disclose the results in FEIS Tables 97, 105, 108, 111, 112 and accompanying text.

If the Arkose, Bolsa or QMP reflect the potential to leach copper, revise the Rosemont waste rock segregation plan to avoid contact of such copper oxide waste rock with stormwater as a mitigation measure.

Previous AGFD comments:

This Objection is based on new information concerning copper leachate contained in 2013k, *Revised Analysis of Surface Water Quality* developed after the opportunity for comments. *See also*:

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 30 (PAFEIS lacks discussion of mitigating measures if seepage with metals constituents in excess of water quality standards develops).

Violation of law, regulation or policy:

Failure to consider an important aspect of an issue does not constitute a "hard look". *Anderson v. Evans*, 371 F.3d 475 (9th Cir. 2004).

OBJECTION NO. 7. The FEIS lacks a qualitative prediction of the potential of selenium, copper, lead or zinc constituents in stormwater runoff from the waste rock facility and its impact on surface waters in Barrel Canyon, Davidson Canyon and Cienega Creek.

Basis for Objection: According to Tetra Tech, Hudson, A.L.; and Williamson, M.A. (2011b), *Rosemont Facility Fate and Transport Modeling Response to Comments* (May 16, 2011), the model starting solutions for the Waste Rock Storage Area modeling show that the selenium starting solution concentrations for arkose, andesite and horquilla waste rock exceed the 0.002 mg/l (2 ug/l) Arizona numeric surface water quality standards for selenium. Arkose comprises more than 44% of the waste rock materials. None of the constituents shown in Table 6.7, including copper, lead, zinc, are measured against surface water numeric standards for OAWs Cienega Creek, Davidson Canyon and ephemeral tributaries to these waters. The *Modeling Response* notes, consistent with the finding of SWCA 2013k, that the method detection limits were too high to confirm their concentration relative to Arizona surface water quality standards.

Suggested remedy: Perform additional waste characterization to determine the potential of the waste rock to exceed Arizona surface water quality standards (acute and chronic) for selenium, copper, zinc and lead and disclose the results in FEIS Tables 68 (*Summary of Effects*); Table 71 (*Expected Water Quality from Tailings Facility*) and accompanying text.

Previous AGFD comments:

AGFD 8/15/2013 *Comments to Rosemont PAFEIS at 28* (potentially adverse effects of mine-related discharges to surface waters should be analyzed against relevant numeric surface water quality standards).

Violation of law, regulation or policy:

NEPA 40 CFR 1508.8. All adverse effects of the proposed action must be analyzed, including those indirect effects on water and ecosystems which are caused by the action and are further removed in distance.

NEPA 40 CFR 1508; 1502.16. All direct and indirect effects of the proposed action are to be analyzed, which are the incremental impacts of the proposed action when added to other past, present and future actions.

Failure to consider an important aspect of an issue does not constitute a "hard look". *Anderson v. Evans*, 371 F.3d 475 (9th Cir. 2004).

OBJECTION NO. 8. The FEIS statement at 548 that a comparison of predicted mine waste rock runoff water quality to the water quality in the downstream Outstanding Arizona Waters is "not appropriate" is not supported by NEPA.

Basis for Objection: The FEIS at 548 claims that direct comparison of predicted water quality from mine waste rock runoff to the existing water quality in Davidson Canyon and Cienega Creek is "problematic" and "not appropriate" given that the OAW portion of Davidson Canyon is more than 12 miles downstream and the contribution from the mine "would only represent a portion of the runoff reaching the Outstanding Arizona Water".

The proposed mine is located near the ridgeline of the Santa Ritas, at the top of a watershed leading to Cienega Creek. The FEIS at 410 notes that surface drainage from the mine area leaves via the Barrel Canyon drainage. Barrel Canyon connects with the Davidson Canyon drainage east of SR 83, approximately 4 miles downstream. Farther downstream in the watershed, Davidson Canyon is tributary to Cienega Creek.

No showing is made in the FEIS that stormwater runoff from the mine will not reach the OAWs; or that an analysis and full disclosure of impacts, or an analysis of alternatives to avoid impacts, is not necessary because mine runoff will constitute only "a portion" of the watershed runoff reaching the OAWs.

Suggested remedy: Conduct the analyses as suggested above.

Previous AGFD comments:

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 21-22 (FEIS should describe the potential effects of mine stormwater runoff to surface water quality of downstream Outstanding Arizona Waters).

AGFD 8/15/2013 Comments to Rosemont PAFEIS, at 28 (potentially adverse effects of mine-related discharges to surface waters should be analyzed against relevant numeric water quality standards, wildlife water quality standards and the anti-degradation Tier 3 criteria for the OAWs Davidson Canyon and Cienega Creek).

Violation of law, regulation or policy:

NEPA 40 CFR 1508.8. All adverse effects of the proposed action must be analyzed, including those indirect effects on water and ecosystems which are caused by the action and are further removed in distance.

NEPA 40 CFR 1508; 1502.16. All direct and indirect effects of the proposed action are to be analyzed, which are the incremental impacts of the proposed action when added to other past, present and future actions.

OBJECTION NO. 9. The FEIS statement at 548-9 that the lack of stormwater samples in Davidson Canyon or Cienega Creek prevents a comparison of mine waste rock runoff to existing water quality in the OAWs lacks a regulatory and scientific basis.

Basis for Objection: The FEIS states that the lack of stormwater samples in Davidson Canyon or Cienega Creek prevents a comparison of mine waste rock runoff to existing water quality in Davidson Canyon and Cienega Creek. FEIS at 548-9; SWCA 2013k at 8.

Barrel Canyon is an ephemeral stream that only flows during storm events; therefore the water quality of Barrel Canyon is by necessity characterized by storm water flow because that is the only water available to collect and analyze. The perennial portions of Davidson Canyon and Cienega Creek are not dependent on storm events; data exists that describes the chemical characteristics of these waters. Rosemont collected two water samples in Lower Cienega Creek in 2008. FEIS at 453 and Table 101. ADEQ collected additional water samples in 2012 and 2013. FEIS at 454. The Coronado National Forest should compare predicted waste rock water runoff with this baseline data.

The Arizona Surface Water Quality Standards, A.C.C.R. 18-11-108 (narrative standards), A.C.C.R. 18-11-109 (numeric standards) A.C.C.R. 18-11-112 (Outstanding Arizona Waters) are not based on storm events. The standards are independent of storm flows. The standards are adopted to preserve and protect the quality of navigable waters for all present and reasonably foreseeable uses. A.R.S. § 49-221(A). The standards "shall assure water quality" protective of public health and welfare, its value for public water supplies, and the propagation of fish and wildlife, recreational and other purposes. A.R.S. 49-222(A).

While upper Davidson Canyon is also an ephemeral stream, there is no explanation why stormwater data from this section of Davidson Canyon was never collected for analysis. SWCA 2013k at 9.

Suggested remedy: Compare predicted stormwater waste rock runoff to existing baseline water quality in the OAW sections of Davidson Canyon and Lower Cienega Creek. If stormwater data are not readily available for the ephemeral reaches of Davidson Canyon, use the existing stormwater data in Barrel Canyon as an analog.

Previous AGFD comments:

This Objection is based on new information contained in 2013k, *Revised Analysis of Surface Water Quality* developed after the opportunity for comments.

AGFD 8/15/2013 *Comments to Rosemont PAFEIS at 28* (potentially adverse effects of mine-related discharges to surface waters should be analyzed against relevant numeric surface water quality standards).

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Violation of law, regulation or policy:

NEPA 40 CFR 1502.22. If incomplete information is obtainable, it shall be included in the EIS.

National Best Management Practices for Water Quality Management on National Forest System Lands (USDA Forest Service, April 2012) (Forest Service should identify and evaluate the condition of streams, riparian areas and groundwater-dependent ecosystems; identify State-designated beneficial uses and water quality parameters that are critical to those uses; and determine the potential or likely direct and indirect impacts to chemical, physical and biological water quality from the proposed activity).

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OBJECTION NO. 10. The data presented in Table 112 (*Summary of screening analysis to identify potential problem constituents in mine runoff*) predicts postmine exceedances in stormwater runoff from mine waste rock and soil cover on downstream watersheds in terms of percentages that are not readily understandable.

Basis for Objection**:** Table 112 describes the increases in "problem constituents" of mine waste rock stormwater runoff in terms of percentages. An example is dissolved mercury, predicted in Table 112 to be 1050% higher in postmine watershed water quality compared to pre-mine watershed water quality.

A portion of mercury released into the environment is transformed by abiotic and biotic chemical reactions to organic derivatives, such as methylmercury, and is the most toxic form of mercury to which wildlife are exposed (EPA 1997). FEIS at 147. The use of percentages in describing constituent increases in mine-related stormwater runoff fails to provide the Department with a basis for evaluating the impacts to aquatic wildlife.

Suggested remedy: Convert the percentages in Table 112 of "problem constituents" in postmine waste rock runoff to milligrams per liter.

Previous AGFD comments: This Objection is based on new information from the screening analysis in in SWCA 2013k, *Revised Analysis of Surface Water Quality* developed after the opportunity for comments.

Violation of law, regulation or policy:

NEPA 40 CFR 1500.2; 1502.1. An EIS shall be concise and clear and useful to decision makers and the public.

NEPA 40 CFR 1502.8. An EIS shall be written in plain language so that decision makers and the public can readily understand them.

Relevant information should be made available to the public *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 109 S.Ct. 1835, 104 L.Ed.2d 351 (1989)

OBJECTION NO. 11. The screening level data developed by the Coronado National Forest does not support the claim in the FEIS that the mine does not have the potential to change the biological integrity along any portion of Lower Cienega Creek.

Basis for Objection: The FEIS acknowledges that Lower Cienega Creek currently meets the regulatory definition of a wadeable, perennial stream. Narrative Arizona Surface Water Quality standards specific to biological integrity (taxa richness, species composition, tolerance, and functional organization comparable to that of a stream with reference conditions in Arizona) and bottom deposits would need to be met. FEIS at 549.

The FEIS states that based on the analyses conducted, the mine is not expected to alter the biological integrity of Cienega Creek. This statement appears to be speculative, as the text then states that because of the lack of stormwater samples in Davidson Canyon or Lower Cienega Creek, the Forest Service's screening analysis "is unable to predict water quality changes in these Outstanding Arizona Water reaches." FEIS at 553.

SWCA 2013k identified arsenic, dissolved and total mercury, iron, dissolved selenium, molybdenum, sulfates and sodium in mine waste rock runoff and waste rock soil cover runoff that are predicted to degrade, or significantly degrade water quality of "downstream waters". The FEIS states these elevated constituents "could present antidegradation problems" in the OAWs. FEIS at 549.

Suggested remedy: Analyze and disclose potential impacts of stormwater waste rock runoff on taxa richness, species composition, tolerance and functional organization of Lower Cienega Creek.

Previous AGFD comments:

AGFD 1/18/2012 Comments to Rosemont DEIS at 13 (The DEIS should compare modeled mine seepage with Arizona Surface Water numeric and narrative standards, including the A.A.C. R18-11-108 narrative standard that a wadeable, perennial stream shall support and maintain a community of organisms having a taxa richness, species composition, tolerance, and functional organization comparable to that of a stream with reference conditions in Arizona).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 28 (potentially adverse effects of mine-related discharges to surface waters should be analyzed against relevant numeric water quality standards, wildlife water quality standards and the anti-degradation Tier 3 criteria for the OAWs Davidson Canyon and Cienega Creek).

Violation of law, regulation or policy:

NEPA 40 CFR 1502.22. Analysis of environmental impacts must be supported by credible scientific evidence and not conjecture.

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OBJECTION NO. 12. The statement in the FEIS at 555 that Mitigation Measure OA-SW-01 will "address uncertainty associated with impacts to Outstanding Arizona Waters" by requiring the detention and testing of stormwater quality "prior to flowing downstream" is not supported by other sections of the FEIS.

Basis for Objection: The FEIS at 478 states that stormwater from the minesite reaching the compliance point dam is not halted or retained in any way and will flow downstream. The FEIS at 471 states that "during operations and postclosure, the waste rock facility would be exposed to surface runoff that leaves the project area and could have the potential to impact downstream surface water quality'.

The mine sediment control basins and compliance point dam are not designed to control all stormwater runoff from the minesite, including waste rock and soil cover runoff. The 2-acre capacity compliance point dam, downgradient of the minesite at the lower end of the Barrel Canyon, is the final water quality testing station for contaminants of concern "prior to release in the natural channel". FEIS at 470, 478. Large stormwater flows from the mine are expected to overtop and occasionally destroy the dam. FEIS at 478.

In response to the Department's prior comments on the DEIS and PAFEIS that the small capacity of the dam means that the unregulated discharge of mine waste rock and tailings stormwater will be discharged downstream to OAWs, the FEIS at 478 replies:

> Cooperating agencies have commented on the potential for unregulated discharge of stormwater that has been in contact with ore bodies and mine processing facilities in the event that the compliance point dam is overtopped and destroyed, which could happen with some frequency. This concern is based on a misunderstanding of the purpose of the compliance point dam. The stormwater reaching the compliance point dam is not halted or permanently retained by the dam in any way and will flow downstream in any case. The dam allows for some settling of sediment, detains stormwater temporarily, and allows for a convenient location to collect stormwater samples. The dam does not, however, prevent stormwater from flowing downstream . . . [s]tormwater reaching the compliance point dam has only been in contact with waste rock, either flowing off of the perimeter buttress, the waste rock facility, or, once closed, the waste rock cap over the tailings facility.

Suggested remedy: Amend the statement at 555 that only a small portion of the mine stormwater waste rock runoff will be detained for testing. Describe what corrective measures will be taken in the event that tested stormwater is elevated in mine-related constituents.

Prior AGFD comments:

AGFD 1/18/2012 Comments to Rosemont DEIS at 17 (Stormwater will be shed of the mine site and discharges to downstream receiving waters during construction, operation, and following closure)

AGFD 1/18/2012 Comments to Rosemont DEIS at 18 (If the compliance point dam is destroyed, large volumes of potentially contaminated stormwater will proceed down the Barrel Canyon drainage to Davidson Canyon)

AGFD 1/18/2012 Comments to Rosemont DEIS at 20 (The PAFEIS text does not describe potential adverse consequences to Outstanding Arizona Waters if stormwater discharges breach or destroy the compliance point dam)

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 22 (during mine operations, a 2-year, 24-hour storm event will report from 229 to 406 acre-feet of stormwater to the 2-acre dam).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 24 (uncontained stormwater runoff which overtops the compliance point dam may contain sediments; this increased turbidity should be evaluated against Arizona narrative water quality standards, and potentially adverse effects disclosed).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 23 (The AFEIS should analyze potential mitigation measure, such as stormwater runoff containment).

<u>Violation of law, regulation or policy:</u>

42 U.S.C. 4332(C); 40 CFR §1502. The NEPA 'hard look' standard requires a description of all potentially adverse environmental effects.

NEPA 1502.14(f), 1502.16(h); 1508.14. An EIS must outline steps that might be taken to mitigate adverse effects, both on and off site.

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OBJECTION NO. 13. Technical reports contradict the FEIS statement that mine-related contaminants in the dry stack tailings seepage will be contained by the capture zone of the mine pit lake.

Basis for Objection: The FEIS at 367 claims that seepage from the project tailings will be captured by the mine pit lake. According to *Dry Stack Tailings Storage Facility Final Design Report Section 6.0* (AMEC 2009), the "majority" of the entrained seepage from the dry stack tailings will not be captured by the mine pit, but will flow downgradient following groundwater pathways into the Barrel Canyon drainage for 500 years. This analysis is confirmed in *Technical Memorandum, Rosemont Area-Wide Fate and Transport and DIA Assessment* (Tetra Tech 2010) (Document #242/10-320877-5.3) which reported the results of particle tracking to determine the extent of the pit-lake capture zone and the potential for uncaptured drain-down seepage to flow downgradient. The Technical Memorandum at 5 states that the pit capture zone includes all of the project-related recharge sources except for portions of the dry stack Tailings facility. Approximately 74% of the dry stack tailings facility is outside the predicted pit capture zone, and uncaptured drain-down seepage is expected to recharge the aquifer at a rate of over 10 acre-feet a year. *Technical Memorandum* at 6. This uncaptured recharge outside the mine pit capture zone "[has] the potential to impact down-gradient groundwater quality" for 500 years. *Technical Memorandum* at 7.

The *Technical Memorandum* at 7 further summarizes the expected water quality from dry stack tailings draindown in Table 4, which reflects concentrations of magnesium, sulfates, total dissolved solids, molybdenum and selenium in the dry stack tailings draindown in excess of background groundwater levels.

The *Technical Memorandum, Rosemont Facility Fate and Transport Modeling Response to Comments* (Hudson and Williamson, May 16, 2011), Table 6.9 (Dry Stack Tailings Facility Seepage Revised) at 26 reflects the presence of sulfates at 559 mg/l; magnesium at 19.61 mg/l, and total dissolved solids at 810 mg/l.

The FEIS, Table 105 at 475, predicts that dissolved cadmium, dissolved mercury, total selenium, and dissolved silver in tailings seepage exceeds the surface water quality ephemeral standards for Barrel Canyon. Total copper may be exceeded as well, as the AW&We hardness standard for copper is 0.01096 mg/l (as calculated by SWCA) which is not reflected in Table 105. Table 105 also states that there is no surface water standard for lead, which has a hardness standard in the surface water regulations. If the constituents in Table 105 were to be compared to the AW&Ww standards for Davidson Canyon and Cienega Creek, arsenic and mercury are exceeded as well.

Figure 6-2 of the *Regional Groundwater Flow Model, Rosemont Copper Project* (Tetra Tech, 2010b) shows the groundwater flow from the dry stack tailing facility is eastward along Barrel Canyon into the Davidson Canyon drainage. The tailings seepage equals approximately 13 acre-feet a year. FEIS at 380.

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The model grid for the dry stack tailings seepage fate and transport analysis conducted by Rosemont in *Infiltration, Seepage, Fate and Transport Modeling Report, Revision 2* was limited to the configuration of the dry stack tailings facility.

Suggested remedy: Strike all references in the FEIS that the mine pit lake will capture all dry stack seepage. Revise FEIS Table 71 at 380 (Expected water quality from tailings facility) and Table 105 at 475 to list all constituents which exceed Arizona surface water quality standards. Analyze the fate and transport of the dry stack tailings draindown seepage for the next 500 years, and disclose potential exposure pathways of the seepage to downstream aquatic resources, wildlife, and private drinking water wells in the vicinity of Barrel and Davidson Canyons.

Previous AGFD comments:

AGFD 1/18/2012 Comments to Rosemont DEIS at 14 (dry stack tailings seepage is outside the capture zone of the mine pit, and will migrate down the Barrel Canyon drainage).

AGFD 8/15/13 Comments to Rosemont PAFEIS at 25 (technical reports contradict PAFEIS claim that mine site seepage will be captured by pit lake).

Violation of law, regulation or policy:

An EIS should not offer an explanation that runs counter to the evidence before the federal agency. *Lands Council v. McNair*, 537 F.3d 981 (9th Cir. 2008).

NEPA 1502.1. Statements in an EIS must be supported by environmental data and analyses.

OBJECTION NO. 14. The technical data does not support the statement in the FEIS *Groundwater Section* at 379-80 that if dry stack tailings seepage were to daylight or appear downstream, none of the concentrations reported in the tailings seepage would exceed the applicable surface water quality standards in Barrel Canyon.

Basis for Objection: This statement is contradicted by the FEIS *Seeps, Springs and Riparian Areas* text at 473, which states that in the event tailings seepage were to appear in Barrel Canyon, applicable surface water quality standards for dissolved silver, dissolved cadmium, total and dissolved lead, dissolved mercury, and total selenium would be exceeded.

Suggested remedy: Revise the discussion of tailings seepage in the Groundwater Section of the FEIS to reflect the text and Table 105 of the FEIS at 475 that daylighted seepage in Barrel Canyon is predicted to exceed the Aquatic and Wildlife-warm water ephemeral surface water standards for Barrel Canyon. Analyze temporal effects of the seepage for Davidson Canyon and Cienega Creek.

Previous AGFD comments:

AGFD 12/18/2012 Comments to Rosemont DEIS at 13 (contaminants in seepage may be toxic to wildlife and should be compared with Arizona surface water quality numeric and narrative standards).

AGFD 12/18/2012 Comments to Rosemont DEIS at 14 (fate and transport of the dry stack tailings seepage over the next 500 years should be modelled, and adverse impacts to wildlife and drinking water wells disclosed).

AGFD 8/15/13 Comments to Rosemont PAFEIS at 25 (mine seepage has the potential to affect water quality in Lower Davidson Canyon and Lower Cienega Creek).

AGFD 8/15/13 Comments to Rosemont PAFEIS at 26 (the PAFEIS does not present discussion or analysis of the potential effects of seepage from the Dry Stack Tailings Facility, which will flow downgradient for the predicted drain-down period of 500 years).

Violation of law, regulation or policy:

NEPA 1502.1. Statements in an EIS must be supported by environmental data and analyses.

OBJECTION NO. 15. The FEIS *Required Disclosures* text at 1131 that dry stack tailings seepage is not expected to exceed any numeric Arizona Aquifer Water Quality Standard, and that irreversible or irretrievable commitments are not anticipated for groundwater quality, does not address the issue of other contaminants in dry stack tailings seepage that potentially exceed surface water quality standards for the downstream watershed.

Basis for Objection: According to Tetra Tech, Hudson, A.L. and Williamson, M.A. (2011b), *Rosemont Facility Fate and Transport Modeling Response to Comments* (May 16, 2011), the method detection limits for analyses of the dry stack tailings samples were too high to confirm their concentration relative to Arizona Surface Water Quality Standards. The *Modeling Response* notes that the method detection limit for mercury is reported at less than 0.0002 mg/l, when the surface water quality standard for mercury for AW&Ww chronic is 0.00001 mg/l. Selenium exceedances in the dry stack tailings seepage at 0.006 mg/l exceeds the surface water standard for selenium for AW&Ww chronic at 0.002 mg/l.

The Coronado National Forest-commissioned peer-review Technical Memorandum by SRK Consulting (*Technical Review of Infiltration, Seepage, Fate and Transport Modeling Report-Revision 1, Part 2, Geochemical Fate and Transport Modeling*) recommended that an analysis of waste rock runoff and mine seepage be made against relevant surface water quality standards. This was not done for the dry stack seepage.

Suggested remedy: Perform additional waste characterization to determine the potential of the dry stack tailings seepage to exceed Arizona surface water quality standards (acute and chronic), and disclose the results in FEIS Tables 68 (*Summary of Effects*); Table 71 (*Expected Water Quality from Tailings Facility*); and Table 105 (*Predicted stormwater runoff water quality and applicable surface water standards in Barrel Canyon*) and accompanying text.

Previous AGFD comments:

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 28 (potentially adverse effects of mine-related discharges to surface waters should be analyzed against relevant numeric surface water quality standards).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 14 (the laboratory method detection limits for heavy metals in the dry stack tailing seepage should be re-reviewed).

Violation of law, regulation or policy:

NEPA 40 CFR 1508.8. All adverse effects of the proposed action must be analyzed, including those indirect effects on water and ecosystems which are caused by the action and are further removed in distance.

Failure to consider an important aspect of an issue does not constitute a "hard look." *Anderson v. Evans*, 371 F.3d 475 (9th Cir. 2004).

OBJECTION NO. 16. The FEIS does not discuss or analyze the potential impacts of sulfates and total dissolved solids in dry stack tailings seepage on groundwater or downstream surface water quality.

Basis for Objection: *The Technical Memorandum, Rosemont Area-Wide Fate and Transport and DIA Assessment (Tetra Tech 2010)* in Table 4 reflects that the projected concentrations of sulfates leaching from the dry stack tailings facility are up to 559 mg/l, which exceeds the Safe Drinking Water Act secondary standard of 250 mg/l. Total dissolved solids concentrations are estimated to be 810 mg/l, higher than the 400 mg/l background concentrations. The *Technical Memorandum* notes that dry stack seepage has the potential "to impact downgradient water quality".

In *Technical Memorandum, Rosemont Facility Fate and Transport Modeling Response to Comments* (Tetra Tech 2011), Table 6.9, *Dry Stack Tailings Facility Seepage (revised)* reflects 559 mg/l sulfates in seepage. SRK Consulting notes at 27 of the *Technical Memorandum* that the dry stack seepage is expected to be elevated in sulfate with an acidic pH of 5.87.

The *Regional Groundwater Flow Model, Rosemont Copper Project* (Tetra Tech 2010b) shows the groundwater flow from the dry stack tailings facility to be eastward along Barrel Canyon into the Davidson Canyon drainage.

The findings of these technical reports have not been carried into the FEIS text. Sulfates and total dissolved solids in groundwater have the potential to affect downgradient drinking water wells. Sulfates in downgradient surface waters should be evaluated against the narrative water quality standards for Davidson Canyon.

Suggested remedy: The FEIS should fully disclose the impacts of the sulfate plume from the dry stack tailings facility to downstream receptors, including wells and surface waters.

Previous AGFD comments:

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 27 (The PAFEIS does not discuss the findings of Rosemont technical reports of sulfate or total dissolved solids in the dry stack tailings seepage, or the impacts of sulfates on water quality, which may be local or regional).

Violation of law, regulation or policy:

NEPA 42 U.S.C. 4332(C); 40 CFR §1502.1. An EIS must contain a description of all potential adverse environmental effects.

OBJECTION NO. 17. The FEIS does not discuss or disclose the potential adverse effects of mine contaminants in stormwater and seepage upon riparian-dependent species and aquatic and riparian habitat in downstream watersheds.

Basis for Objection: The FEIS Biological Resources section discusses potential direct and indirect impacts of the proposed Rosemont Mine project on special status species, both on and offsite, within the *analysis area*, defined spatially as the 146,163 acres of the mine project area, plus a larger surrounding area that may experience direct or indirect temporal and spatial impacts from the proposed project. Temporally, the analysis area includes all potential onsite and offsite impacts resulting from the proposed project from all the activities associated with premining (18 to 24 months), active mining (20 to 25 years), final reclamation and closure (3 years), and postclosure (indefinite). FEIS at 573-574; *Biologists' Report on the Affected Environment and Identification of Species for Disclosure of Effects, Rosemont Copper Mine Project, Pima County, Arizona* (SWCA Environmental Consultants 2013c) (SWCA 2013c) at 1.

The *analysis area* includes all areas for which mining activity may affect groundwater and surface water, including the drainages that receive surface water discharge from the mine site, Barrel Canyon, Davidson Canyon Wash and Cienega Creek to Pantano Dam; Cienega Creek as well as and springs and seeps.

The Forest Service is required to consider downstream effects on special status species from upslope sources, regardless of landownership or management agency. FEIS at 576. Special status species analyzed for the Rosemont Mine Project include ESA threatened, endangered, proposed threatened, proposed endangered, candidate, or petitioned for listing species; Forest Service and BLM sensitive species, CNF management indicator species, migratory birds and AGFD as Species of Greatest Conservation Need (SGCN); and Species of Economic and Recreational Importance (SERI).

The FEIS analyzes the impacts of dust and air pollutants, noise, vibration, artificial night lighting, water drawdown from the regional aquifer in the Davidson Canyon/Cienega Creek basis perpetuated by the mine pit lake, reduced surface water flows from mine diversion and impoundment structures, fragmentation of habitat blocks and animal movement corridors, increased traffic volumes and related connected actions. The FEIS does not analyze the potential impacts of mine-related contaminants in stormwater or seepage on sensitive species or their aquatic habitats in the *analysis area*.

The basis for this lack of analysis is explained in SWCA 2013c at 145, and in the FEIS at 663 as follows:

> No exceedances in surface water quality standards that are not already exceeded in natural runoff in Barrel Canyon are expected from the proposed mine operations.

This statement, which also appears in the Draft ROD at 14, is inconsistent with the Draft ROD at 22 which states that with respect to Lower Davidson Canyon and Lower Cienega Creek, the Coronado National Forest's analysis suggests that several constituents, including sulfate,

molybdenum, arsenic, sodium, and mercury, may be elevated in stormwater with all action alternatives.

The FEIS at 475, Table 105 predicts that mine-related stormwater runoff from waste rock and soil cover exceeds the AW&We surface water standards for Barrel Canyon for total lead, dissolved mercury, and dissolved silver.

SWCA 2013k did attempt to conduct an analysis of the "limited data available" to predict mine-related impacts to the OAWs Davidson Canyon and Cienega Creek, and in Table 6 of SWCA 2013k identified arsenic, dissolved and total mercury, iron, dissolved selenium, molybdenum, sulfates and sodium in mine waste rock runoff and waste rock soil cover runoff that are predicted to degrade, or significantly degrade water quality of "downstream waters," SWCA 2013k at 2 which "could present antidegradation problems" in the OAWs. FEIS at 549.

As a result of this lack of analysis, the FEIS does not disclose the following potential effects of mine-related contaminants on the following riparian-dependent sensitive species or their habitat:

Gila chub. ESA listed endangered; an AGFD SGCN, critical habitat occurs in Cienega Creek within the mine analysis area, including Lower Cienega Creek, confirmed presence in creek. Primary constituent elements (physical or biological features essential to the conservation of the species) identified by the USFWS for the Gila chub is good water quality with reduced levels of contaminants, including excessive levels of sediments. FEIS at 632.

Gila topminnow. ESA listed endangered; an AGFD SGCN; documented in Cienega Creek, which is the largest historic topminnow population known within the species' range. Topminnows within Cienega Creek have experienced statistically significant declines since 1989. In 2012, AGFD documented and captured for translocation 116 individuals of this species in Lower Cienega Creek at the confluence with Davidson Canyon. FEIS at 634.

Longfin dace. Forest Service and BLM sensitive species and an AGFD SGCN. The greatest threats to this fish include activities that alter the flow or quality of water (Arizona Game and Fish Department 2006a). Documented in Cienega Creek (Arizona Game and Fish Department 2012d). In 2012, the AGFD documented 111 individuals of this species in Lower Cienega Creek near the confluence with Davidson Canyon. FEIS at 632.

Lowland leopard frog. Forest Service sensitive species and an AGFD SGCN. Confirmed along Lower Davidson Canyon near its confluence with Cienega Creek, along upper Davidson Canyon, and in lower and middle Cienega Creek. FEIS at 619.

Northern Mexican gartersnake. Candidate for ESA listing, a Forest Service and BLM sensitive species, and an AGFD SGCN. Cienega Creek and seeps, springs within Cienega Creek natural preserve considered to be currently occupied by the species. The primary constituent elements identified by USFWS for this species include stream flows capable of processing sediment loads and aquatic habitat with characteristics that support a native amphibian prey base, salinities less than 5 parts per thousand, pH greater than or equal to 5.6, and pollutants absent or minimally

present at levels that do not affect survival of any age class of the northern Mexican gartersnake or the maintenance of prey populations. FEIS at 620.

Giant Spotted Whiptail. Forest Service and BLM sensitive species and an AGFD SGCN. Documented in Wasp Canyon, Cienega Creek, Davidson Canyon, and Empire Gulch (Arizona Game and Fish Department 2012d).

Southwestern Willow Flycatcher. Endangered and an AGFD SGCN. 11.1-mile segment of Cienega Creek designated as critical habitat. Primary constituent elements include a variety of insect prey populations found within or adjacent to riparian flood plains or moist environments.

Western Yellow-billed cuckoo. Candidate species and an AGFD SGCN. Documented in Barrel Canyon, Davidson Canyon, Empire Gulch and Cienega Creek.

Chiricahua Leopard Frog. Threatened and an AGFD SCGN. Davidson Canyon is a migratory corridor for CLF.

Suggested remedy: Analyze the predicted constituents in mine-related stormwater runoff and seepage and the potential impacts on downslope/downstream riparian-dependent special status species. Discuss alternatives to mitigate or avoid the impacts.

Previous AGFD comments:

AGFD 1/18/2012 Comments to Rosemont DEIS at 13 (The DEIS should compare modeled mine seepage with Arizona Surface Water numeric and narrative standards, including the A.A.C. R18-11-108 narrative standard that a wadeable, perennial stream shall support and maintain a community of organisms having a taxa richness, species composition, tolerance, and functional organization comparable to that of a stream with reference conditions in Arizona).

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 30 (PAFEIS lacks a discussion of possible mitigating measures if acidic seepage or seepage with metals constituents in excess of water quality standards develops).

Violation of law, regulation or policy:

The Forest Service Organic Administration Act of 1897, 16 U.S.C. §551 and 36 CFR 228.8 requires the Forest Service to take all feasible steps to minimize adverse environmental impacts and require a mining operator take "all practicable" measures to "maintain and protect" fisheries and habitat. 36 CFR 228.8.

Executive Order 13443, "Facilitation of Hunting Heritage and Wildlife Conservation." Requires Federal agencies to work cooperatively with the states, and address the impact of their activities on state-managed wildlife.

NEPA 42 U.S.C. 4332(C); 40 CFR §1502.1. An EIS must contain a description of all potential adverse environmental effects.

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NEPA 40 CFR 1502.16. An EIS must discuss natural resource requirements and the conservation potential of various alternatives and mitigation measures.

National Best Management Practices for Water Quality Management on National Forest System Lands (USDA Forest Service, April 2012) (Forest Service should identify threatened, endangered, or sensitive species in or near water, wetlands and riparian areas in the project area and their habitat needs related to water quality; and determine the potential or likely direct and indirect impacts to chemical, physical and biological water quality from the proposed activity).

The NEPA process is intended to help public officials made decisions based on an understanding of environmental consequences, and take actions that protect, restore and enhance the environment. *Lands Council v. McNair*, 537 F. 3d 981, 1000 (9th Cir. 2008).

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OBJECTION NO. 18. The FEIS does not adequately describe all reasonable and relevant mitigation measures for the take of wildlife (including migratory birds) due to mine pit lake toxicity.

Basis for Objection: Pit lake toxicity is described at 664, 665 and 683, and multiple other areas as having potential take on bats, birds, and other wildlife, but no alternatives or effective mitigation is offered for migratory birds or other wildlife exposed to the pit lake. Mitigation FS-GW-04 at 22 (Appendix B) states: "Periodic updating of the pit lake geochemistry model to incorporate the most recent and pertinent geochemical results obtained through waste rock characterization efforts. The purpose of this measure is to ensure that the most accurate prediction of mine pit lake water quality is available at closure. At the time of closure, the results of the model would be assessed and used to develop management plans for protection of wildlife if possible harm exists from exposure to pit lake water quality".

Suggested remedy: The Forest should amend the FEIS to include a plan which identifies all reasonable mitigation measures for the potential take of all wildlife species as a result of pit lake toxicity during the life of the mine and post-closure. Such measures might include measures to prevent contact with wildlife, offsite habitat enhancements to increase populations of animal species expected to be taken, and habitat equivalency analyses to determine the extent of the injury to the resource and costs to recoup the injury. An example of offsite mitigation to recoup the injury to migratory birds could include creation of new wetlands as breeding habitat for migratory birds.

It should be noted that if pit lake biochemistry proves toxic to wildlife, perpetual monitoring and mitigation will be necessary. The temporal bounds of analysis of the mine pit extends to 1,000 years after mine closure. FEIS at 339. The FEIS refers to "management plans" for a situation that may exist in perpetuity. It is unclear who will prepare the plans or fund their implementation over time.

Previous AGFD comments:

This Objection is based in part on new information, contained in Mitigation Measure FS-GW-04 for the mine pit lake. *See also:*

AGFD 8/15/2013 Comments to Rosemont PAFEIS at 6-7 (PAFEIS does not describe any mitigation measure for the mine pit lake).

Violation of law, regulation or policy:

40 CFR 1502.14(f). An EIS must include appropriate mitigation measures not already included in the proposed action or alternatives.

40 CFR 1502.16(h). An EIS must include means to mitigate adverse environmental impacts.

40 CFR 1502.2(c). An EIS must state whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not.

16 U.S.C. 703. Taking, killing, or possessing migratory birds.

ARS §17-236. Taking any bird unlawful except horticultural/agricultural practices or as authorized by the Arizona Game and Fish Commission.

ARS §17-102. Wildlife as state property.

ARS §17-309. Take wildlife by unlawful method.

ARS §17-309. Take wildlife with deleterious substance.

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