SAVE THE SCENIC
SANTA RITAS
ASSOCIATION

December 11, 2017

VIA EMAIL AND U.S. MAIL

Brig. Gen. D. Peter Helmlinger
Commander, South Pacific Division
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, California 94103-1398

RE: CLEAN WATER ACT 404 PERMIT FOR THE PROPOSED ROSEMONT COPPER MINE

Dear General Helmlinger:

On behalf of Save the Scenic Santa Ritas, I am writing to request the U.S. Army Corps of Engineers (Corps) prepare and circulate for public review and comment a supplemental environmental impact statement (SEIS) prior to making a decision regarding issuance of a Section 404 permit under the Clean Water Act for the proposed Rosemont copper mine. Rosemont's new proposed mitigation plan proffered for compliance with the Clean Water Act triggers the requirements to prepare an SEIS, as well other developments noted below. Save the Scenic Ritas (SSSR) is a non-profit organization dedicated to protecting the Santa Rita and Patagonia Mountains from environmental degradation. We have been involved in the administrative processes regarding mining at the Rosemont site since 1996.

We appreciate the diligence and integrity that the Corps has shown while working on Clean Water Act issues for the proposed Rosemont mine. The District Engineer for the Los Angeles District consistently made it clear that the multiple mitigation plans proffered during her review of the Rosemont application provided "more acres of upland and riparian preservation, with some enhancement, than acres of actual restoration/enhancement" of waters of the United States (Letter from Colonel Kimberly Colloton, P.E., Commander and District Engineer, Los Angeles District to Mr. Rod Pace, President/CEO, Rosemont Copper Co., 28 February 2014) and that "the proposed compensatory mitigation would not fully compensate for the unavoidable adverse impacts that would remain after all appropriate and practicable avoidance and minimization measures have been achieved." (Letter from Colonel Colloton to Rod Pace, 13 May 2014). Further, upon elevation of the permit decision to your office, you explained that the District "further concluded that implementation of the proposed project would result in significant

degradation of waters of the United States...", " the project would contribute to the degradation of Outstanding Arizona Waters" and the "mitigation proposed to offset project impacts would be inadequate." You also summarized the District's conclusion that the proposed project would not meet the public interest criteria under the Clean Water Act, specifically noting that among serious concerns were adverse effects to resources important to tribes. (Letter from Colonel Peter Helminger, P.E., Commander, South Pacific Division to Mr. Patrick Merrin, Vice President, Hudbay, 29 December 2016).

Having been told that their earlier mitigation plans were seriously deficient, Hudbay has now submitted yet another mitigation plan to the Arizona Department of Environmental Quality and, as we understand it, to the Corps for review.

A supplement to an existing EIS is required when: 1) there is a substantial change to the proposed action that is relevant to environmental concerns, or 2) there is significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts, or 3) when preparing an SEIS would further the purposes of the National Environmental Policy Act (NEPA). 40 C.F.R. §1502.9(c). In this instance, as we discuss below, all three criteria are triggered. The SEIS should be prepared and filed as a draft SEIS, made available for public comment and then filed as an FEIS. 33 C.F.R. § 230.13(b).

1) Substantial change to the proposed action: The new 859-page Final Habitat Mitigation and Monitoring Plan (HMMP), dated September 12, 2017, is substantially different from the 6 page Mitigation Concept included in the 2011 draft EIS, the 6 page Conceptual HMMP included in the Final EIS or the 108 page revised HMMP that was submitted in September 2014 following the publication of the FEIS.

A) Draft EIS, September 2011: The 6 page Proposed Mitigation Concept for Section 404 Permit included as Appendix E is the only document regarding mitigation that has been subject to public review and comment. The first 4 ½ pages are a description of the proposed project and the 2008 rule for compensatory mitigation for losses of aquatic resources, leaving a scant page and a half discussion of the possible types of mitigation available for the Rosemont project. In that brief discussion, Rosemont explained that there were no approved mitigation banks in Arizona, noted that the only approved in-lieu fee program in the Santa Cruz River watershed was not available to it and stated that Rosemont would be evaluating on-site and in-kind and off-site and/or out-of-kind mitigation but did not identify any specific locations.

B) Final EIS, December 2013: The main feature of the Conceptual Habitat Mitigation and Monitoring Plan Summary that was included in Appendix B of the Forest Service's Final EIS had as its main feature a combination of in lieu fee and permittee-responsible mitigation measures focused on the Pantano Dam.

Purchasing Sonoita Creek Ranch and enhancing its wetland, riparian, and upland buffer habitat was identified as a fallback possibility, along with the possibility of preservation of waters in Mulberry Canyon Parcel.

C) Post-Final EIS, September 2014 Final Habitat and Mitigation Monitoring Plan contained the following components: 1) Sonoita Creek Ranch – engineering of ephemeral channels, establishment of buffer habitat and various enhancement features; 2) Fullerton Ranch – restrictive covenant and rehabilitation of ephemeral channel and existing riparian buffer habitat, fence construction, and other activities; 3) Davidson Canyon Parcels – restrictive covenant; 4) Helvetia Ranch Annex North Parcels – restrictive covenant, rehabilitation of ephemeral channels, removal, and exclusion of livestock and other activities.

D) The new September 12, 2017, Final Habitat Mitigation and Monitoring Plan contains three elements: 1) re-engineering of Sonoita Creek and associated measures; 2) removal of stock ponds, and 3) possible in lieu fee project on the lower San Pedro River.

The 751-page difference in the last HMMP that the public reviewed and the current "final" HMMP is not just a matter of technical detail designs fleshing out the concepts set forth earlier, but instead a significantly revised Sonoita Creek component plus two new components. The Sonoita Creek component is presented with a significant change in design, going from a braided scheme to a single channel, filling in large portions of the existing creek and dropping efforts to address the lower reaches of the channel process. Hudbay claims this proposal would restore the Creek although a preliminary review suggests many of these measures are enhancement measures, not restoration, an important distinction in the context of the Clean Water Act 404b(1) guidelines, 40 C.F.R. § 230.92. In any case, it is a new design accompanied by extensive technical information that needs to be reviewed and analyzed by the public.

The second component of the latest final HMMP - the removal of the stock ponds - has never, to our knowledge, been proposed in any iteration of the various mitigation plans. The public has no information as to why these particular stock ponds were selected and whether the stock ponds can perform as suggested. There is no analysis of the impacts of removing these stock ponds from their immediate environment or regarding downstream impacts.

Hudbay suggests an "in lieu fee" project on the lower San Pedro River as a third component, should the Corps think additional mitigation is necessary. While other proposed "in lieu fee" projects were at least described in earlier mitigation plans (e.g., Pantano Dam proposal discussed in the December 2013 final EIS), there is virtually no information about the "in lieu fees" project other than the location generally on the lower San Pedro River. We note the obvious fact that the ecology of that area is quite different from the areas that would be

impacted by the proposed Rosemont mine and question how this would be suitable mitigation.

The Supplemental Information Report (SIR) published by the Forest Service in May 2015, acknowledges the addition of changes in acreage for mitigation parcels between the September 2014 HMMP and the "similar" mitigation measures contained in Appendices B and G of the FEIS. It then concludes that the 2014 HMMP provided more details but followed the same concepts as presented in the FEIS appendices. However: a) the SIR never compared the 2014 HMMP to the information presented in the DEIS, and at any rate, b) the September, 2017 HMMP is substantially different than the 2014 HMMP. And as the Corps knows, an SIR cannot be substituted for an SEIS, if the latter is required. Idaho Sporting Congress Inc. v. Alexander, 222 F.3d 562 (9th Cir. 2000).

While analysis of the current proposed HMMP is still underway, work to date demonstrates that it would likely have significant adverse impacts. For example, the Sonoita Creek plan, if implemented, would destroy an additional 8.9 acres of waters of the United States while significantly decreasing the amount of Sonoita Creek purportedly restored. There are also several constraints on the feasibility of the plan and problems with the analysis in the HMMP itself identified by Pima County. (Letter from Administrator C.H. Huckleberry to Mr. William James, U.S. Army Corps of Engineers, December 4, 2017, incorporated herein by reference). Key facts related to the stock pond proposal including how much volume the tanks actually hold, are missing and thus it is unclear whether, and to what extent, there is value in this aspect of the plan. The "in lieu fee" project suggested as the third possible element of the HMMP has not yet been approved as qualifying as such a site, but in any event, is in ecoregion than the resources that would be affected by the proposed mine.

In short, the last time the public got to review and comment on proposed mitigation related to Hudbay's Clean Water Act permit, there were no specific measures identified. The public reviewed a 6-page conceptual paper in which, among other things, the applicant had ruled out an "in lieu fee" project because there were none available in the Santa Cruz watershed (a proposition we agree with) and had identified no on-site or off-site measures. Yet the Corps now faces a decision based in significant part on an 859-page mitigation plan that contains new mitigation measures, including those ruled out in the conceptual paper included in the draft EIS. The public and other federal, state, tribal and local agencies must be a given the opportunity to review and comment on this plan under the auspices of both NEPA and the Clean Water Act.

2) Significant New Information Relevant to Environmental Concerns and Bearing on the Proposed Action: There has been a considerable amount of significant new information relevant to environmental concerns since the publication of the December 2013, final EIS, including:

A. Critical habitat listed for jaguar, March 4, 2014, U.S. Fish and Wildlife Service.

B. Isotope samples collected within the Las Cienegas National Conservation Area and Empire Gulch by both Rosemont Copper and the Bureau of Land Management, not previously seen by the Forest Service until six months after publication of the final EIS.

C. The understanding that, in the words of the Forest Service's Rosemont Copper Project Supplemental Information Report, May 2015, "it became clear that an important aspect of the hydrologic system is the continued presence of water in the stream during the critical low-flow season of May and June. Even if stream flow ceases during these times, there are standing pools. The presence of these refugia pools is deemed critical to the ability of aquatic species to survive prior the onset of monsoon rains." SWCA Environmental Consultants Memorandum, 2015.

D. Dr. Mathias Kondolf and James Ashby, PG, Conceptual Design for Sonoita Creek, Technical Memorandum, July 27, 2015. While the report reviews the applicant's August 12, 2014 proposal for Sonoita Creek work, it provides valuable insights into the present ecological benefits of the Creek and adverse impacts associated with with the proposed mitigation plan as well as a critical analysis of the hydrological modeling used to estimate the water available there.

E. Eastoe, C.J. and Gu, A. (2016), Groundwater Depletion Beneath Downtown Tucson, Arizona: A 240-Year Record. Journal of Contemporary Water Research & Education, 159: 62–77. doi:10.1111/j.1936-704X.2016.03230.x
As Pima County explained in their letter of September 28, 2017, this study traces the origins of groundwater Tucson to the Cienega Creek watershed, thus verifying the link between what happens to Cienega Creek and much of the drinking water for America's 33rd largest city.

F. Dr. Jennifer C. McIntosh, University of Arizona, Upper Cienega Creek Watershed Study, 2017. This study was conducted by scientists from the University of Arizona, Desert Botanical Garden and The Nature Conservancy and funded by the Bureau of Land Management. The study used water samples from precipitation collectors, wells, springs, piezometers and wetlands collected from 2014-2017 and analyzed for major ion chemistry and isotopic makeup. The geographic scope was bounded by the Santa Rita muntains, Empire Gulch, Cinega Creek and Gardner Canyon. Among other findings, it found that there is no evidence of monsoon floodwater recharge in this area. In the words of Dr. McIntosh, "The combination of relatively old groundwater and limited modern recharge indicates that groundwater resources across the basin are vulnerable to over-extraction from unregulated groundwater use with resulting depletion of connected surface waters." Letter from Dr. Jennifer C. McIntosh, Department of Hydrology and Atmospheric Sciences, University of

Arizona to Kerwin Dewberry, Forest Supervisor, Coronado National Forest, June 1, 2017.

G. We incorporate by reference the new information noted in the Forest Service's Supplemental Information Report, Rosemont Copper Project, May, 2015 and the letter from C.H. Huckelberry, Administrator, Pima County to William James, National Mining Expert, U.S. Army Corps of Engineers and Kerwin Dewberry, Forest Supervisor, dated September 28, 2017.

3) Furthering the Purposes of NEPA by Providing Adequate Analysis: While the FEIS prepared by the Forest Service purported to cover a number of issues relevant to the Corps' Clean Water Act decision, a close look at the analysis reveals numerous flaws. Below is a discussion of some of the issues that SSSR identified in the context of the FEIS that the Corps should reevaluate. Much of this material is taken from Save the Scenic Santa Rita's objections to the FEIS, which can be accessed here: http://www.rosemonteis.us/files/objection-letters/084_save_scenic_santa_ritas_et_al.pdf

The proposed project will directly fill 39.97 acres of waters, including a largely undisturbed network of 18 linear miles of streams comprised of up to 154 individual drainages. In addition, five springs and their associated wetlands will be filled. EPA's Guidelines (40 CFR 230.11(h)) and the 2008 Mitigation Rule (40 CFR 230.93) state the need to compensate for losses of waters due to secondary impacts. The requirement that secondary impacts be fully compensated is consistent with standard practice for projects of this magnitude and essential given that the range, extent, and severity of secondary adverse impacts upon aquatic resources are as significant as the direct impacts.

As described herein, secondary impacts have yet to be analyzed upstream of the mine and downstream of the mine beyond the confluence of Davidson Canyon and Cienega Creek. Moreover, the secondary impacts that are currently assessed by the Forest Service rely upon models that, while valid, lack the sensitivity to detect adverse impacts to much of the affected arid aquatic environment. These assessments will be necessary under the CWA/404 Guidelines to make defensible decisions regarding the regulatory restrictions on discharges and the possibility of mitigation.

As discussed herein, the project site supports 101.6 acres of waters of which 39.97 acres will be directly impacted. The remaining 62 acres of waters on the project site will likely be indirectly impacted. Some of these secondary impacts are accounted for by reduced surface stormwater flows in Barrel and Davidson Canyons within the project area downstream of the mine site. However, there will also be secondary impacts to the drainage upstream of the mine. These impacts include severing surface hydrology and connectivity, decreasing quality of wildlife habitat, and fragmentation of animal movement corridors. Secondary impacts to waters that lie upstream from the mine site need to be more completely quantified and ultimately mitigated.

Estimated indirect impacts to jurisdictional waters in Barrel and Davidson canyons downstream from the proposed mine due to modeled reductions in surface water volume resulting from the Rosemont Project include 28.4 acres during mine operation. The estimate shows impacts at the confluence of Cienega Creek and Davidson Canyon but ceases its analysis at that confluence. Yet data showing an impact at this confluence is a signal that impacts are likely to extend some point beyond this confluence. Secondary impacts to waters downstream from the mine site include the reach of Cienega Creek from its confluence with Davidson Canyon downstream to Pantano Dam. Reductions in surface water flow volume have the potential to adversely affect other surface waters, including wetlands, in Cienega Creek downstream from the confluence of Davidson Canyon. These surface water impacts are likely to be significant, especially given the cumulative effects of predicted reductions in groundwater levels from the proposed mine pit.

Importantly, in the FEIS, the Forest Service failed to analyze whether the predicted dewatering of Upper Empire Gulch would violate Arizona's antidegradation water quality standards at R18-11-108.E and R-18-11-108.01.A. There is no NEPA analysis of this issue and no mitigation analyzed in the FEIS intended to prevent flow losses in Empire Gulch that would likely result in the flow transiting from perennial to intermittent or ephemeral. There are also no mitigation measures identified to avoid violation of Arizona's wadeable/perennial water quality standards for Empire Gulch and Cienega Creek. R18-11-108.E. Of course, if there are no adequate mitigation measures available, then the Corps must simply deny the permit.

Further, the FEIS fails to analyze the effects of the proposed mine on the Bureau of Land Management's federal water rights identified in the FEIS or on express and implied federal reserved water rights established with the reservation and creation of the Las Cienegas National Conservation Area. And again, along with the omission of analysis about impacts, there are no mitigation measures proposed by the Forest Service. The Forest Service claims - wrongly, we believe - that they lack authority to require such mitigation; the Corps has such authority and must analyze these effects and identify and require any feasible and appropriate mitigation measures.

Secondary effects on the aquatic environment include dramatic and persistent changes to surface hydrologic and hydraulic regimes driven by groundwater hydrology. For example, following mine closure, the pit lake will continue to permanently, capture and evaporate 35-127 acre-feet of mountain-front groundwater recharge in perpetuity. This natural groundwater would otherwise replenish sensitive downstream receiving waters. (See Comment Letter from Pima County to U.S. Forest Service on PAFEIS, dated August 14, 2013). During active mining, the pit will cause significant losses to recharge between 18,000-26,000 acre-feet, or about 900-1300 acre-feet annually.

Portions of sensitive and regionally significant downstream receiving waters, including Outstanding Arizona Waters, rely in part or whole on groundwater contributions to

baseflow. Secondary impacts from project-related groundwater drawdown will reduce streamflows, increase water temperatures, and disrupt breeding, spawning, rearing and migratory movements, or other critical life history requirements of fish and wildlife resources.

At a minimum, eleven springs are highly likely to be indirectly impacted due to groundwater drawdown. An additional fifty-nine springs may be indirectly impacted due to drawdown. An additional 13 riparian areas associated with springs would be directly or indirectly disturbed with high certainty and an additional 36 riparian areas associated with springs may be indirectly disturbed. Although not formally delineated, subsets of these riparian areas contain jurisdictional wetlands and other waters of the U.S.

Modification to the water balance along portions of Davidson Canyon, Empire Gulch, Gardner Canyon and Cienega Creek will adversely impact special aquatic sites. The 2,900-foot deep mine pit will permanently convert the hydrologic regime of the site from a water source area to a terminal sink, significantly lowering the surrounding regional aquifer. The pit will permanently reverse the natural direction of groundwater flow toward and into the mine pit, and away from the sensitive aquatic habitats in Las Cienegas NCA and Cienega Creek Natural Preserve. This will add to a baseline trend of decreasing groundwater, causing a permanent reduction, and in some cases elimination, of water in streams and wetlands along Empire Gulch, Mattie Canyon, Gardner Canyon and Cienega Creek with potential adverse impacts to over 30 seasonal and perennial wetlands, and threatened and endangered aquatic habitat dependent plants, fish, and wildlife.

All three groundwater models utilized by the Forest Service show an increasing, long-term trend of significant declines in groundwater levels due to the mine pit. Although there are limitations in groundwater model accuracy, the drawdown at Upper Empire Gulch Spring is within the accuracy of the models to predict (i.e., 5- foot drawdown contour) and therefore, impacts to streamflow and wetlands from drawdown within Empire Gulch are reasonably certain and will be significant.

No compensatory mitigation plan compliant with the regulations has been prepared to date. A complete mitigation plan that satisfies each element of the 2008 Mitigation Rule will be necessary to comply with the CWA (including Section 404). Based on Rosemont's Conceptual Habitat Mitigation and Monitoring Plan Summary, dated on or about September 25, 2013, (Summary), proposed 404 mitigation consists of 1) enhancement of waters and non-aquatic upland habitat at Cienega Creek below Pantano Dam, and, if necessary 2) conservation and establishment of waters at Sonoita Creek Ranch (SCR) and 3) conservation of a 160 acre parcel along a portion of Mulberry Canyon. These components are sequential; the SCR and Mulberry Canyon activities are presented as a contingency if an ILF project with sufficient credits is not available for Rosemont's purchase at Pantano Dam. To date, there is not any supporting documentation or assessment demonstrating the mitigation proposed to offset impacts to waters is compensatory. Also, such revised

mitigation plans should have been in the Draft EIS, and as such any such consideration in the FEIS without full public review beforehand violates NEPA. See also Nov. 7, 2013, EPA letter and the issues raised therein for further evidence that the Project, even with Rosemont's proposed mitigation, can comply with the CWA.

There are significant flaws in Rosemont's plans for offsetting the project's environmental harm. First, the proposals lack an adequate functional assessment characterizing the services performed by streams/springs and wetlands directly and indirectly impacted by the project, or of those resources at the proposed mitigation lands. Second, the compensatory mitigation proposals do not account for the interrelationship of the headwater streams and the surrounding terrestrial ecology and will not replace the high-quality resources in the Cienega Creek watershed. Enhancement of existing waters and upland habitat (Pantano Dam) in the lower watershed would not offset the mine's impacts to high-quality headwater streams. Third, despite some assurances inherent in ILF (In Lieu Fee) proposals, there is great ecological uncertainty in the Pantano Dam proposal. Based on the information to date, the proposed mitigation is grossly inadequate to compensate for mine impacts.

Several springs, seeps, streams, and riparian areas within the assessment area likely contain jurisdictional waters of the United States, including wetlands that will be indirectly impacted by the proposed project, primarily from groundwater drawdown. Although the FEIS estimates 407 acres of mapped hydroriparian habitat in the assessment area, a subset of these are jurisdictional waters of the United States that have not been delineated. For example, BLM staff estimate that over thirty perennial and seasonal wetlands of various acreages are associated with Cienega Creek within the Las Cienegas National Conservation Area (J. Simms, personal communication with Dr. Robert Leidy, EPA, June 2013), some or all of which may be waters of the U.S. See EPA August 1, 2013 Comments to USFS on Preliminary Administrative Draft FEIS, at 2.

The FEIS concludes that no seeps, springs, hydroriparian or mesoriparian habitat areas with perennial stream flow, or critical areas that would be affected by groundwater drawdown were identified within or beyond the western model boundary. But the FEIS failed to clarify whether the required detailed surveys of springs and seeps and other critical areas (similar to surveys conducted on the eastern slopes of the Santa Rita Mountains within the model boundaries) were conducted within and immediately adjacent to the western model boundary, particularly within the Santa Rita and Empire mountains.

Additional information regarding the potential adverse environmental consequence of seemingly small changes in groundwater levels must be added in the revised DEIS. The FEIS repeatedly characterizes changes in levels of < 1 foot as "small." The use of the descriptors "small" or "very small" are not meaningful absent some relative measure of ecological significance or risk. Seemingly "small" changes in groundwater levels may have profound adverse affects on surface, and shallow subsurface (i.e., groundwater and

hyporheic) flows. In part, this is because the wetted surface area of many aquatic habitats in the arid Southwest, including the Cienega Creek watershed, is characterized by shallow surface water depths (e.g., < than a few inches), especially during the drier portions of the year (April-early July), and is, therefore, extremely susceptible to drying from small changes in groundwater levels. Significant changes to stream base flow are possible because, typically, inflow to streams originates from the topmost portions of the subsidizing aquifer; small declines in the water table can significantly reduce groundwater contributions that sustain stream flow.

The FEIS acknowledges that predicted increases in temperatures and reduced precipitation resulting from climate change will continue to reduce the quantity of stormwater and groundwater available for use by riparian vegetation; result in shifts from perennial to intermittent flow along upper Cienega Creek and Empire Gulch, and increase the vulnerability of springs and riparian vegetation. The FEIS does not, however, adequately characterize potential cumulative effects from project-related groundwater drawdown and increasing demand for groundwater as a result of residential and commercial growth within the context of drought and projected climate change. Currently, only 13 percent of the length of Cienega Creek within the preserve exhibits a wetted channel during the driest portion of the year (i.e., June) on the heels of the ongoing drought. The FEIS should reflect the latest science on climate change by explicitly acknowledging the moderate-to-high levels of confidence of the latest climate change science model predictions for the American Southwest. If, as the FEIS admits, prolonged droughts similar to the ongoing Southwestern drought brought on by climate change could result in similar shifts from perennial to intermittent flow along upper Cienega Creek and Empire Gulch, then the potential additive/cumulative adverse effects from the project and other water demands on streams, wetlands, and riparian areas in the context of climate change should be clearly discussed in the revised DEIS.

The groundwater analysis area extends east of Cienega Creek, yet it appears that seeps, springs, streams, wetlands and riparian areas that may lie east of Cienega Creek were not inventoried or assessed for potential effects of groundwater drawdown. Over thirty perennial and seasonal wetlands of various acreages are associated with Cienega Creek within the Las Cienegas National Conservation Area (BLM staff estimate). According to BLM, the majority of these wetlands are adjacent to Cienega Creek between Cinco Canyon and Oak Tree Canyon and include the Cienequita, Spring Water, and Cinco Ponds wetlands. Other wetlands are found upstream of the Mattie Gulch and Cienega Creek confluence (i.e., Cold Spring wetland). Many of these wetlands and aquatic features would likely qualify as jurisdictional waters of the United States. If there are potential project effects on Cienega Creek from groundwater drawdown, it follows that there would also be potential effects from groundwater drawdown on these waters, as they are immediately adjacent and hydrologically connected to Cienega Creek. The revised DEIS should describe these aquatic features adjacent to Cienega Creek, identify their likely CWA jurisdictional status, and indicate what the potential impacts to these features may be.

The FEIS does not include a discussion of the federal Clean Water Act (CWA) or Department of Army regulations as influencing or guiding the analysis of biological resources. In particular, there is no reference to the 404(b)(1) Guidelines and restrictions on discharge, most notably 40CFR 230.10(b)(3): adverse effects on endangered species; and (c): significant degradation of waters of the United States; and 40CFR 230.11(g) and (h) determination of cumulative and indirect/secondary effects on aquatic ecosystems. There is no discussion of impacts to jurisdictional waters of the United States impacted by the project.

The FEIS does not discuss the extensive riverine and palustrine wetland systems within and adjacent to Empire Gulch, Gardner Canyon and Cienega Creek that will or may be indirectly impacted by the proposed action. Many of these wetlands are likely to be jurisdictional waters of the United States, but the reach and extent of federally regulated wetlands have not been delineated; therefore, the extent of indirect impacts to these waters has yet to be determined.

The discussion of hydroriparian vegetation types does not acknowledge that portions of this vegetation type include jurisdictional wetlands regulated under the federal CWA. The reach and extent of these federally regulated wetlands have not been delineated; therefore, the extent of indirect impacts to these waters has yet to be determined in violation of NEPA.

The indirect/secondary effects of reduced aquifer recharge and bank storage from the proposed action on downstream waters in Davidson Canyon and Cienega Creek are potentially significant, as aquifer recharge is important in maintaining surface flows and shallow subsurface water levels for aquatic organisms and riparian vegetation and wetlands. The failure to provide quantified analysis of reductions in aquifer recharge violates NEPA as noted herein. Estimates of pre- and post-project aquifer recharge have been conducted for several development scenarios in the adjoining San Pedro River watershed (for example see (1): Levick L., et al. 2006. Simulated changes in runoff and sediment in developing areas near Benson, Arizona. U.S. EPA Office of Research and Development, Las Vegas, NV, and USDA Agricultural Research Service, Tucson, AZ, EPA/600/R-06/158 and ARS/1873. (2): Goodrich D.C. et al. 2004. Comparison of methods to estimate ephemeral channel recharge, Walnut Gulch, San Pedro River Basin, Arizona. Pp. 77-99 In Recharge and Vadose Zone Processes: Alluvial Basins of the Southwestern United States, ed. By F.M. Phillips, J.F. Hogan, and B. Scanlon, Water Science and Application 9, Washington D.C.). These sources are noted in EPA's August 2013 comments to the USFS on the Preliminary Administrative Draft Final EIS.

The FEIS does not adequately support the statement that mitigation measures compensate for impacts to waters of the U.S. Implementation of the mitigation measures described in the FEIS and discussed herein would not fully compensate for the project's impacts to

waters of the United States (waters) (40 CFR 230 Subpart J). The substantial loss and degradation of water quality and other aquatic ecosystem functions are likely if the proposed mine is constructed. Of particular concern is that the geographic extent of indirect effects to waters from groundwater drawdown related to the mine dewatering is not fully known, in part because waters have not been fully delineated within the assessment area. In the absence of a full delineation of waters, it is not possible to provide adequate compensatory mitigation for indirect effects.

As stated in the 404(b)(1) Guidelines, no discharge of dredged or fill material shall be permitted if it causes or contributes to violations of an applicable state water quality standard (40 CFR 230.10(b)(1)). Reductions in stream flows, alterations in sediment transport, groundwater drawdown and increases in the concentrations of pollutants have the potential to degrade water quality (*e.g.,* warm water aquatic wildlife) and the aquatic ecosystem. The proposed project does not comply with the restriction on discharge as required by the Guidelines. Indirect effects may also result in significant degradation to outstanding natural resource waters in violation of applicable water quality standards.

Any degradation of Davidson Canyon and Cienega Creek water quality would be significant because they are designated as high-quality waters that constitute Outstanding National Resource Waters due to their exceptional recreational and ecological significance to the State of Arizona. The State of Arizona classifies Davidson Canyon and Cienega Creek as Arizona Outstanding Waters (AOWs), also referred to as Tier III waters under the federal anti-degradation policy. Arizona's anti-degradation rules provide that the "[d]egradation of an AOW ... is prohibited." ACC R18-11-107. This provision is consistent with federal anti-degradation requirements, which provide that water quality shall be maintained and protected in Tier III waters and that the water quality in Tier III waters may not be lowered to accommodate economic or social development in the area where the waters are located. 40 CFR 131.12(a).

As discussed herein, the proposed project's potential to result in reduction of in stream flows to Davidson Canyon Wash, and Cienega Creek, its alteration of sediment transport, groundwater drawdown, and contribution of metals such as selenium represents a failure to maintain and protect existing water quality in those AOWs. Approval of the 404 permit would be inconsistent with applicable antidegradation policy. The 404(b)(1) Guidelines at 40 CFR 230.10(b)(1) restrict discharges that would violate applicable State water quality standards (which include antidegradation policies) in waters. Such significant degradation of the aquatic ecosystem in Outstanding Natural Resource Waters is also not consistent with the 404(b)(1) Guidelines at 40 CFR 230.10(c), and 230.11(h).

The FEIS notes that mitigation measures, both onsite and offsite, can help offset effects in the project area. Proposed mitigation would not effectively offset all impacts, and significant impacts to habitat and some species would remain. As noted herein, the development of two ILF programs and land conservation are not adequately compensatory.

Further, while certain design features may qualify as mitigation for the NEPA analysis, this form of mitigation is related to impact avoidance and minimization, not compensation. Section 404 of the CWA requires "mitigation" to consist of all three, with compensation required for impacts that are not avoidable (e.g., through design features). The proposed mitigation is insufficient to meet the restrictions on discharge required by the Guidelines at 40 CFR 230.10(d) and 40 CFR 230.12(a)(3)(iv).

Independent of the requirements to avoid, minimize and, finally, compensate for impacts, the 404(b)(1) Guidelines prohibit discharges which will cause or contribute to significant degradation of waters of the United States. In consideration of the mitigation measures described in the FEIS, the direct and indirect/secondary impacts from discharges of dredged or fill material from the proposed project will not be adequately offset. As a result, these impacts are likely to cause or contribute to significant degradation of waters.

The FEIS concludes that any stormwater discharge would not result in an impact on the downstream Outstanding Water because ADEQ's issuance of coverage under the Multi-Sector General Permit (MSGP) would not allow it. FEIS at 473. This conclusion cannot be reached until the required Storm Water Pollution Prevention Plan (SWPPP) has been submitted and accepted by ADEQ under the MSGP requirements. The SWPPP must demonstrate that any discharge will not degrade water quality in the downstream OAW. For the purposes of NEPA, it cannot be assumed that mitigation measures applied under the SWPPP would be fully effective without foreknowledge of the nature of the mitigation and control measures that would be employed. As noted herein, the failure to review and analyze these future mitigation measures, and their effectiveness, violates NEPA. As such, a supplemental EIS must be prepared and submitted for public and agency review.

Finally, the Forest Service FEIS fails to adequately address the cultural, historic and religious impacts of the proposed mine on the Tohono O'odham Nation due to failure to properly consult with the Nation. The Corps must independently consult with the Nation to fulfill its government-to-government obligations and to adequately analyze the impacts to the Nation under NEPA. We incorporate by reference the analysis provided to you in regards to these important issues in the letter to you from Earthjustice on behalf of the Nation dated November 28, 2017 and also draw your attention to the discussion in that letter of the need for the Corps to analyze the secondary effects of the proposed mine on waters of the United States.

Requirement to Supplement the EIS

As demonstrated above, the Corps must prepare an SEIS before deciding on Hudbay's application for a 404 permit. Preparation of an SIR is not adequate for these purposes. Groups like SSSR as well as Pima County, the Tohono O'odham Nation, other federal agencies and individual citizens, whatever their views might be of the proposed mine, must

understand what the new HMMP contains and review the Corps' analysis of that in a manner that facilitates public comment and analysis of it.

We understand that not every single detail of planned mitigation measures need be developed and analyzed before an agency decision. However, as the U.S. Supreme Court has stated:

> The requirement that an EIS contain a detailed discussion of the possible mitigation measures flows both from the language of the Act, and more expressly, from CEQ's implementing regulations. Implicit in NEPA's demand that an agency prepare a detailed statement on "any adverse environmental effects which cannot be avoided should the proposed should the proposal be implemented," 42 U.S.C. § 4332(C)(ii) is an understanding that the EIS will discuss the extent to which adverse effects can be avoided. [cite omitted] More generally, an omission of a reasonably complete discussion of possible mitigation measures would undermine the 'actionforcing' function of NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects. An adverse effect that can be fully remediated by, for example, an inconsequential public expenditure is certainly not as serious as a similar effect that can only be modestly ameliorated through the commitment of vast public and private resources.

Robertson v. Methow Valley, 490 U.S. 332, 371 (1989).

Further, as the Court of Appeals for the Ninth Circuit has explained, the NEPA analysis must contain enough information that all interested parties, including, of course, the decisionmaker, can assess the likely effectiveness of the proposed mitigation measures:

> An essential component of a complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective. *Compare* Neighbors of Cuddy Mountain v. U.S. Forest Service, 137 F.3d 1372, 1381 (9th Cir.1998) (disapproving an EIS that lacked such an assessment) *with* Okanogan Highlands Alliance v. Williams, 236 F.3d 468, 477 (9th Cir.2000) (upholding an EIS where "[e]ach mitigating process was evaluated separately and given an effectiveness rating"). The Supreme Court has required a mitigation discussion precisely for the purpose of evaluating whether anticipated environmental impacts can be avoided. Methow Valley, 490 U.S. at 351–52, 109 S.Ct. 1835(citing 42 U.S.C. § 4332(C)(ii)). A mitigation discussion without at least *some* evaluation of effectiveness is useless in making that determination.

South Fork Band Council v. Dept. of Interior, 588 F.3d 718, 727 (9th Cir. 2009)(rejecting EIS for open pit mine for failure to conduct adequate review of mitigation and mitigation effectiveness in mine EIS)(emphasis in original).

In this instance, the problem is not insufficient analysis – the Corps has proffered no analysis available to the public for review and comment regarding the proposed HMMP – ever. Further, the Corps must independently review and assess the analysis presented in the FEIS regarding the impacts of the proposed mine in so far as they relate to compliance with the Clean Water Act. As noted above, we believe the analysis in the FEIS is seriously flawed and must be supplemented in the light of better data and new information. Such analysis is long overdue and must be prepared in the form of an SEIS and circulated for review and comment.

Thank you for your consideration of these comments.

Sincerely,

Gayle Hartmann, President
Save the Scenic Santa Ritas

Attachments:

Letter from Dr. Jennifer C. McIntosh, Associate Professor, US Distinguished Scholar, Department of Hydrology and Atmospheric Sciences, University of Arizona to Kerwin Dewberry, Forest Supervisor, Coronado National Forest, June 1, 20107.

Letter from C.H. Huckelberry, Pima County Administrator to William James, National Mining Expert, U.S. Army Corps of Engineers and Kerwin Dewberry, Supervisor, Coronado National Forest, U.S. Forest Service, September 28, 2017, re "New Information: Rosemont Copper Mine, Section 404 Clean Water Act"

Letter from C.H. Huckleberry, Pima County Administrator, to William James, National Mining Expert, U.S. Army Corps of Engineers, December 4, 2017, re "Rosemont Copper Project ACOE Application No. SPL – 2008-00816-MB"

Letter from Heidi McIntosh and Stuart Gillepsie, Earthjustice, on behalf of the Tohono O'odham Nation to Colonel D. Peter Helmlinger, Divison Commander, South Pacific Division, U.S. Army Corps of Engineers, dated November 28, 2017 re "Request for Government-to-Government Consultation Regarding Clean Water Act Section 404 Permit for the Rosemont Open Pit Copper Mine

cc: William James, National Mining Expert, U.S. Army Corps of Engineers
Colonel Kirk Gibbs, District Commander, Los Angeles District, U.S. Army Corps of Engineers
Kerwin Dewberry, Supervisor, Coronado National Forest, Forest Service
Ray Suazo, Arizona State Director, Bureau of Land Management
Alexis Strauss, Acting Regional Administrator, Region 9, Environmental Protection Agency
C.H. Hucklberry, Administrator, Pima County
Edward D. Manuel, Chair, Tohono O'odham Nation

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Kerwin Dewberry
Forest Supervisor of the Coronado National Forest
300 W. Congress St.
Tucson, AZ 85701

June 1, 2017

Dear Kerwin Dewberry,

I am writing to provide new information about the hydrogeology of the Cienega Creek watershed that may be relevant for your decision about the proposed Rosemont Copper Mine. The results attached came from an on-going study that my graduate students and I have been conducting, since 2014, with other scientists from the Nature Conservancy and Desert Botanical Garden. Please let me know if you have any questions.

Sincerely,

Dr. Jennifer C. McIntosh
Associate Professor, UA Distinguished Scholar
Department of Hydrology and Atmospheric Sciences
University of Arizona
Email: mcintosh@hwr.arizona.edu
Phone: 520-626-2282

Key results from Upper Cienega Creek watershed study:

- The study in the Upper Cienega Creek Watershed was conducted by a team of scientists from the University of Arizona, the Desert Botanical Garden, and The Nature Conservancy. Study funding was provided by the BLM through a cooperative agreement with the Nature Conservancy designed to improve understanding of dynamics of shallow groundwater in the basin.

- The research area is bounded by the Santa Rita mountain front to the west, Empire Gulch in the north, Cienega Creek to the east, and Gardner Canyon in the south. Water samples from precipitation collectors, wells, springs, piezometers, and cienegas (wetlands) were collected from 2014 to 2017 and analyzed for major ion chemistry, stable water isotopes, and radioactive isotopes.

- Groundwater across the basin was mostly recharged prior to the 1950's, with a small component of modern recharge in a few locations, based on the age tracer results. The majority of groundwater samples analyzed for tritium (n= 34) contained no detectable tritium (<0.5 tritium units (TU)), indicating they were recharged prior to the 1950's, while 10 samples contained low, but measurable tritium (up to 2 TU), indicating a small portion of modern recharge mixed with older waters. Carbon-14 values ranged widely from 3.33 to 84.7 percent modern carbon (pMC). These values correspond to uncorrected radiocarbon ages of ~1,400 to 28,000. The relatively long residence time of basin groundwater is likely related to the presence of a thick clay confining unit across the basin.

- Mountain block recharge is the source of shallow groundwater near the mountain front based on age tracer results. Tritium values measured in a well and spring at the mountain front are 0.8 TU and 0.9 TU, respectively, near the detection limit. Carbon-14 of dissolved inorganic carbon in groundwater sampled from the well was 84.7 pMC. The carbon-14 and tritium results in groundwater at the mountain front imply a mixture of mostly older water with a minimal component of modern recharge. The limited recharge of ephemeral stream water beneath washes at the Santa Rita mountain front is in contrast to what has been observed in the Tucson Basin.

- Stable isotope ($\delta^{18}O$ and δD) samples were collected biannually, at the end of the rainy season, from precipitation buckets across a 5000-foot elevation gradient. Based on the range of values, season collected and short record, an altitude and seasonality affect in the isotopic composition of the precipitation could not be identified.

- Sulfur isotope ($\delta^{34}S$) values in basin groundwater are consistent with meteoric precipitation. The sulfur isotope values range from 3-10‰, which indicate an atmospheric signature. The sulfur isotope values and low sulfate concentrations indicate the groundwater did not encounter sulfur-bearing rocks along its flowpath through the basin.

- The cienegas and shallow groundwater in the Las Cienegas National Conservation Area are dependent on basin groundwater. The SO_4^{2-} to Cl^- ratios of water in the cienegas and underlying shallow groundwater in alluvial aquifers are similar to basin groundwater

throughout the year. Unlike in the San Pedro Basin, there was no evidence of monsoon floodwater recharge into the shallow alluvial aquifers during the study period.

- The combination of relatively old groundwater and limited modern recharge indicates that groundwater resources across the basin are vulnerable to over-extraction from unregulated groundwater use with resulting depletion of connected surface water resources.

COUNTY ADMINISTRATOR'S OFFICE

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C.H. HUCKELBERRY
County Administrator

September 28, 2017

William James, National Mining Expert
U.S. Army Corps of Engineers
3701 Bell Road
Nashville, Tennessee 37214-2660

Kerwin Dewberry, Forest Supervisor
U.S. Forest Service
300 W. Congress Street
Tucson, Arizona 85701

Re: **New information: Rosemont Copper Mine, Section 404 Clean Water Act**

Dear Messrs. James and Dewberry:

We appreciate the additional time and effort your agencies are taking with regard to the decisions before you. With this letter, Pima County and the Regional Flood Control District (collectively, Pima County) provide new additional information regarding the characteristics and values of the aquatic resources under your stewardship and share our concerns regarding contamination of water supplies that could be caused by the proposed Rosemont Copper Mine. Our June 6, 2017 letter to the South Pacific Division of the US Army Corps of Engineers (Corps) focused on the water supply impacts; this letter primarily concerns impacts to water quality.

A decision to issue a Clean Water Act (CWA) Section 404 permit for a modern mine carries with it the weight of geologic time. A modern mine is a landscape-level feature that opens mineralized areas to oxidation, erosion and other transformations for millennia. The Corps and US Forest Service (USFS) each have a public trust responsibility to consider, not only the potential short-term impacts of the mine, but also whether the mine design will ensure pollutants will be sequestered safely in the long-term, including long after closure.

Below we offer additional comments related to the decision of whether to issue a CWA Section 404 permit for this project and approve the Mining Plan of Operation. Our comments include responses and corrections to some of Hudbay's more questionable assertions, as well as new information representing the best and most accurate available information that should be considered as you make your decisions.

The following is a summary of key issues related to water quality that need to be considered:

1. Groundwater from the Cienega watershed appears in drinking water wells in central Tucson. Pollution resulting from the mine could impact the health of Tucson's residents.

2. Hudbay has renewed longstanding efforts to undermine water quality protections for Davidson Canyon. The State, during the designation of Davidson Canyon as an Outstanding Arizona Water (OAW), already considered those factors being rehashed by Hudbay in its opposition to the protective designation.

3. Hudbay incorrectly references stormwater data when arguing Davidson Canyon is not meeting criteria for OAWs. OAW designations rely on baseflow, not stormwater. Hudbay inappropriately references stormwater samples taken miles from the OAW reach.

4. There has been repeated reference to Barrel Canyon as ephemeral, when, in fact, lower Barrel Canyon contains an intermittent flow reach. The water quality standards for intermittent streams should be used when evaluating the effects of the mine on existing uses.

5. Observed surface water quality in Barrel Canyon and some of its tributaries exceed standards for existing uses during storm events, if not for baseflows as well. The Corps and USFS each have an obligation to protect existing uses under the CWA, whether or not those uses have been designated. Existing uses include livestock and warm-water aquatic wildlife in areas of intermittent streamflow.

6. Sediment sampling has identified the causes of copper anomalies that appeared to be emanating from the Rosemont deposit and McCleary Canyon. The effort distinguishes these anomalies from background and downstream sites.

7. Past mining activities may be contributing to the observed exceedances. These features include a former smelter site and other areas of historic mining activity defined by cultural resource surveys and Hudbay data, as well as drilling and road construction. The Corps and USFS should evaluate whether pollutants may be emanating from existing mine-related features prior to issuing permits or authorizations that could further affect water quality and existing uses.

New Information Shows Connection between Cienega Creek and Tucson Water Supply

A new publication (Eastoe and Gu 2016; (Attachment 1A) documents that the groundwater under Tucson originated from the Cienega Creek watershed. Water derived from Cienega Creek can be identified in the groundwater by the chemical signature of Permian marine sulfates that are not present in the Tucson Basin. Figure 1 below shows the spatial extent of the aquifer affected by recharge from this watershed. It extends from the Vail area to The University of Arizona campus and further down-gradient into downtown Tucson. Thus, the risks of waterborne pollutants

conveyed from the mine are not solely ecological; pollutants from mine seepage or downstream recharge would flow by gravity toward potable water supplies for Vail and Tucson.

In a *U.S. Copper Porphyry Mines Report, July 2012* (Attachment 1B), a study of 14 active copper mines in the U.S., found that all mines had at least one failure. The majority had multiple failures including, pipeline and tailing spills, and failure to contain mine seepage. The specific mines reviewed in the report accounted for 90 percent of US copper production; 9 of the 14 mines are located in Arizona. The report concludes that mine water quality impacts from mines, are common and often result from unanticipated circumstances causing release of contaminated water. Mines in close proximity to surface and groundwater are at highest risk for water quality impact. Indeed, the Arizona Department of Environmental Quality (ADEQ) 2016 Clean Water Act Assessment shows that copper affects over 200 miles of Arizona streams, second only to selenium as a pollutant stressor in streams (Condon and Jones 2017).

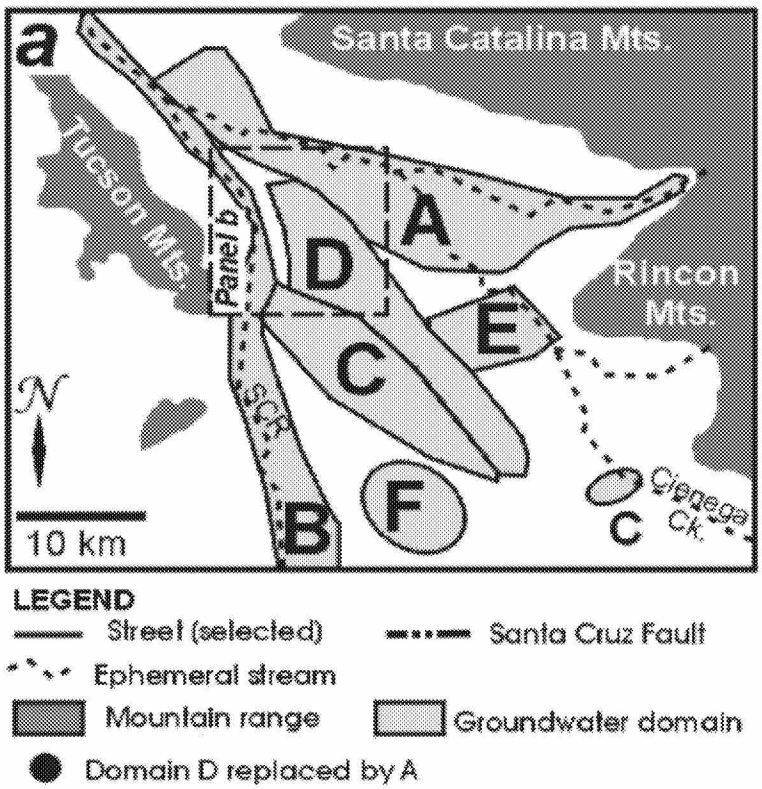

Figure 1. Reproduction from Figure 5 of Eastoe and Gu (2016) showing the contribution of water from Cienega Creek (noted by "C" on the map) to groundwater under Tucson and Vail.

Hudbay's Opposition to Outstanding Arizona Waters Designation has been Previously Evaluated by the State

The potential for the Rosemont mine to degrade water quality and diminish the amount of water available to OAWs has presented a serious concern to the Corps, as evidenced by the Colonel Helmlinger's December 2016 letter to Hudbay. We appreciate the Corps' concerns for the potential of the mine to degrade this aquatic resource, as well as downstream water supplies along Cienega Creek.

Since our last letter to you, we have become aware that Hudbay has renewed efforts to remove the state's OAW protection for Davidson Canyon. Records obtained from ADEQ indicate that in October 2016, Hudbay's Kathy Arnold asked the agency to discuss the triennial review of state water quality standards, which had been completed the previous month. In January 2017, Hudbay discussed a renewed triennial review with the Governor's representative and transmitted copies of three letters, including one from Hudbay to ADEQ requesting a process for removing or revising the OAW designations statewide (see emails and letters in Attachment 2). The January 2017 Hudbay letter requests that *"the Department undertake a review of both the rulemaking and listing process...that resulted in the listing of each of the Arizona Surface Waters classified as Outstanding Arizona Waters over the years."* In July 2017, ADEQ announced the initiation of a new triennial review, which we believe is in direct response to Hudbay's interest in reversing the longstanding designation of Davidson Canyon as an OAW.

The OAW designation helps protect the public's water supply, among other things, and has long been opposed by the mining industry. In their April 2017 presentation (Slide 13), Hudbay asserted the Davidson OAW does not meet the criteria for listing as an OAW because it includes ephemeral reaches. The previous owners of the mine attempted this argument before, and Hudbay is presenting it once again to argue for removal of the designation. This assertion clearly results from Hudbay's concerns about the stringent anti-degradation standards that OAW designation carries for both Davidson Canyon and Cienega Creek.

The Davidson Canyon OAW designation was approved by ADEQ in December 2008 after more than five years of informal and extensive stakeholder meetings. Additionally, the Davidson Canyon OAW was subject to the formal rule-making process with the Governor's Regulatory Review Commission. Attachment 3 documents some of the mining industry's issues and objections raised in 2008 during the deliberation process, including the same ephemeral streams issue Hudbay again raised in their April 2017 presentation. ADEQ granted the OAW designation in 2008 after considering this issue and the extensive input of the mining industry representatives, as well as other stakeholders.

Attachment 3 also contains excerpts from the Notice of Final Rulemaking dated December 2008 in which ADEQ established Tier 3 anti-degradation standards and other water quality protections that apply to OAWs. Explaining the purpose of these standards, the Notice states, *"Tier 3 maintains and protects existing water quality in Outstanding Arizona Waters (OAWs)."* (*Notices of Final Rulemaking* at 4713; emphasis added.) The Notice explicitly addresses the connection between OAWs and the federal anti-degradation rule (40 CFR 141.12) and specifically discusses

how it relates to Davidson Canyon. The discussion of Davidson Canyon emphasizes the canyon's recreational and ecological significance, and the role the area plays in the Sonoran Desert Conservation Plan are primary reasons for the protective designation (*Notices of Final Rulemaking* at 4715.)

Hudbay Conflated Upstream Data with the Outstanding Waters in Davidson Canyon

During the April 2017 meeting with the Corps attended by your staff, Hudbay suggested Davidson Canyon is not meeting criteria for OAW designation due to water quality considerations. Note that, in making this allegation, Hudbay conflated stormwater quality exceedances measured in in two locations in Davidson and Barrel Canyons with the OAW reach downstream.

The August 2016 water quality sampling by ADEQ did not show any exceedances in the Davidson Canyon reach located on County property, where the OAW reach of Davidson begins (see the first table in (Attachment 4). Pima County staff member Julia Fonseca clarified this point with ADEQ representative Jason Sutter at the April 2017 Corps meeting. There is an exceedance for lead, highlighted in red, for a site upstream of the Barrel Canyon confluence with Davidson. This is far upstream of the OAW reach.

The OAW designation requires, and is based on, samples of intermittent or perennial base flow, not samples of sediment-laden stormwater runoff. Base flows sustain aquatic habitat and other wildlife in the OAW during the times when washes would otherwise be dry.

Stormwater inputs provide much-needed recharge to the shallow aquifer of the OAWs and can certainly affect the biological, chemical and physical integrity of the stream. However, their effects are less easily understood because they are short-lived in comparison to the intermittent base flows. Further, the quality of the infiltrated floodwaters may change with time as they pass through sediments and the root zone of riparian and aquatic systems along the stream.

Pima County Regional Flood Control District has been conducting periodic sampling of the Davidson Canyon OAW reach on our property since its designation. Base flows are of good quality and meet applicable standards. Higher quality Davidson Canyon flows comingle with the Cienega Creek flows resulting in higher quality surface water just below their confluence.

Because stormwater sampling is not required for OAW designation, such samples were not (and should not be) used to define the water quality baseline for the Davidson Canyon OAW. Because of the lack of stormwater data to provide an adequate baseline to assess impacts from upstream mining, Pima County has entered into an agreement with ADEQ to collect additional samples of runoff in the OAW reach of Davidson. ADEQ has recently installed additional automated samplers in and upstream of the OAW (see map next page for locations).

The stormwater quality samples Hudbay referred to at the April 2017 Corps meeting are derived from their DC3 sampling site, which lies over seven channel-miles upstream of the OAW (Figure 2). Pima County has prepared the figure below to show the locations and names given to various water quality monitoring locations by the operators.

DC3, Barrel Canyon and tributaries upstream of the OAW show many repeated sampling events with metal concentrations exceeding state standards, including dissolved copper and total lead in stormwater runoff (Attachment 4, Pages 5 through 14). Copper is of particular concern because this metal constituent is shown to be in solution and therefore more available for biochemical reactions.

Upstream mining should not be permitted to release more pollutants and degrade the OAW. We appreciate that Hudbay has established the DC3 monitoring site upstream of the OAW to monitor pollutants in stormwater from the watershed upstream. However, DC3 data is not relevant to OAW designation. DC3 data should not be used to denigrate the public values of the downstream OAW that were the original motivations for anti-degradation standards in the first place. Instead, the data make clear that increased disturbance from mining in those areas upstream of the OAW is likely to contribute to degradation of water quality in Barrel and Davidson Canyon.

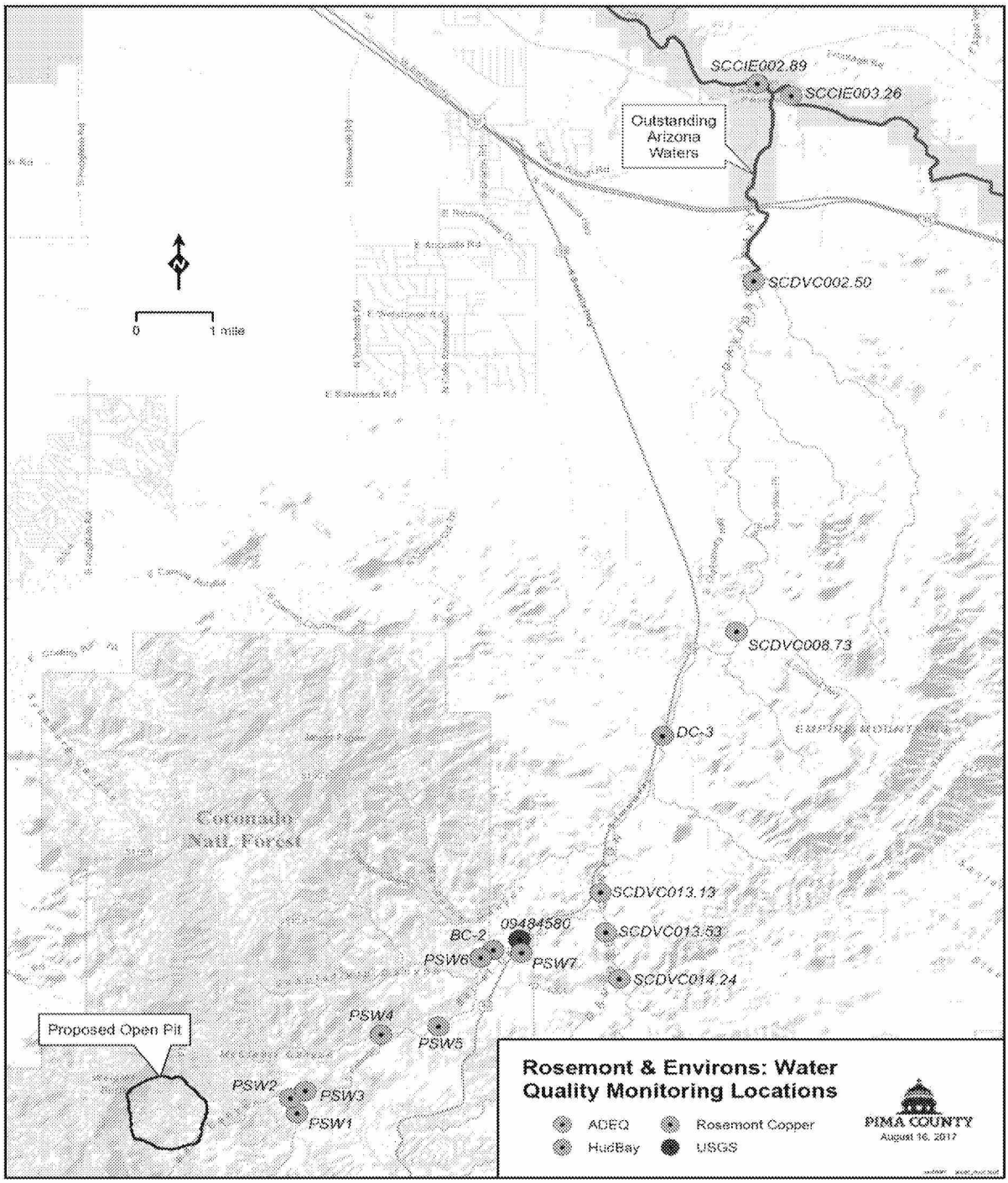

Figure 2. Location of water quality monitoring locations in relation to Outstanding Arizona Waters (Davidson Canyon and Cienega Creek).

Barrel Canyon has Intermittent Flow

At the April 2017 meeting the Corps convened, Hudbay referred to Barrel Canyon as ephemeral when, in fact, Barrel Canyon has an intermittent flow reach. The distinctions between the two are important because of their relationship to water quality protections and the potential for aquifer contamination.

U.S. Geological Survey (USGS) offers the following definitions for streamflow in relation to time (Langbein's Manual of Hydrology, after Meinzer, 1923, p. 5658, with state definitions in parentheses):

> ***Perennial.*** *One which flows continuously. (A.A.C. R18-11-101 (30) states "Perennial water" means a surface water that flows continuously throughout the year.)*
>
> ***Intermittent or seasonal.*** *One which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas. (A.A.C. R18-11-101 (25) states "Intermittent water" means a stream or reach that flows continuously only at certain times of the year, as when it receives water from a spring or from another surface source, such as melting snow.)*
>
> ***Ephemeral.*** *One that flows only in direct response to precipitation, and whose channel is at all times above the water table. (A.A.C. R18-11-101 (18) states "Ephemeral water" means a surface water that has a channel that is at all times above the water table and flows only in direct response to precipitation.)*

It is inaccurate to refer to all of Barrel Canyon as ephemeral, as is done in the Rosemont Final Environmental Impact Statement, the CWA Section 404 permit application, and the evaluations of water quality. In 2000, as part of the Sonoran Desert Conservation Plan, the Pima Association of Governments (PAG) mapped an intermittent flow reach for Barrel Canyon based on the definitions above (Attachment 5). "Barrel Spring" is noted on USGS maps, which overlaps with the intermittent flow reach as mapped by PAG.

In recent years, the USGS has more thoroughly identified the frequency, magnitude and duration of flows at USGS Gage #09484580, located at a culvert under Highway 83, upstream of "Barrel Spring" (Figure 3). The gage is located at a point within the PAG-mapped intermittent flow reach. USGS staff periodically visit the stream gage to perform maintenance and rate the accuracy of flow measurements. During visits, USGS documents actual stream flow conditions using direct measurement of flow and visual observations.

The USGS record of flow conditions is shown in Attachment 5, which documents the presence of many small flows. Their observations are important because they provide photographs and more accurate measurements than the gage. Small flows can sometimes bypass the sensors without being recorded as they move through this large, double-box culvert; and without maintenance, gage sensors can yield erroneous readings.

The table in Attachment 5 shows the days since last rain when USGS documented flows using field observation. The record shows recent events where base flows persisted as long as 14 days after rainfall (January 25, 2016). This monsoon, there were two periods with base flows for a number of consecutive days in July and August, which are shown in the graph below. Red Xs indicate the date of field observations at the gage by USGS personnel. Storm flows are shown by the sharp rises with a "tail," and the base flows by the relatively stable low flows in between the peaks.

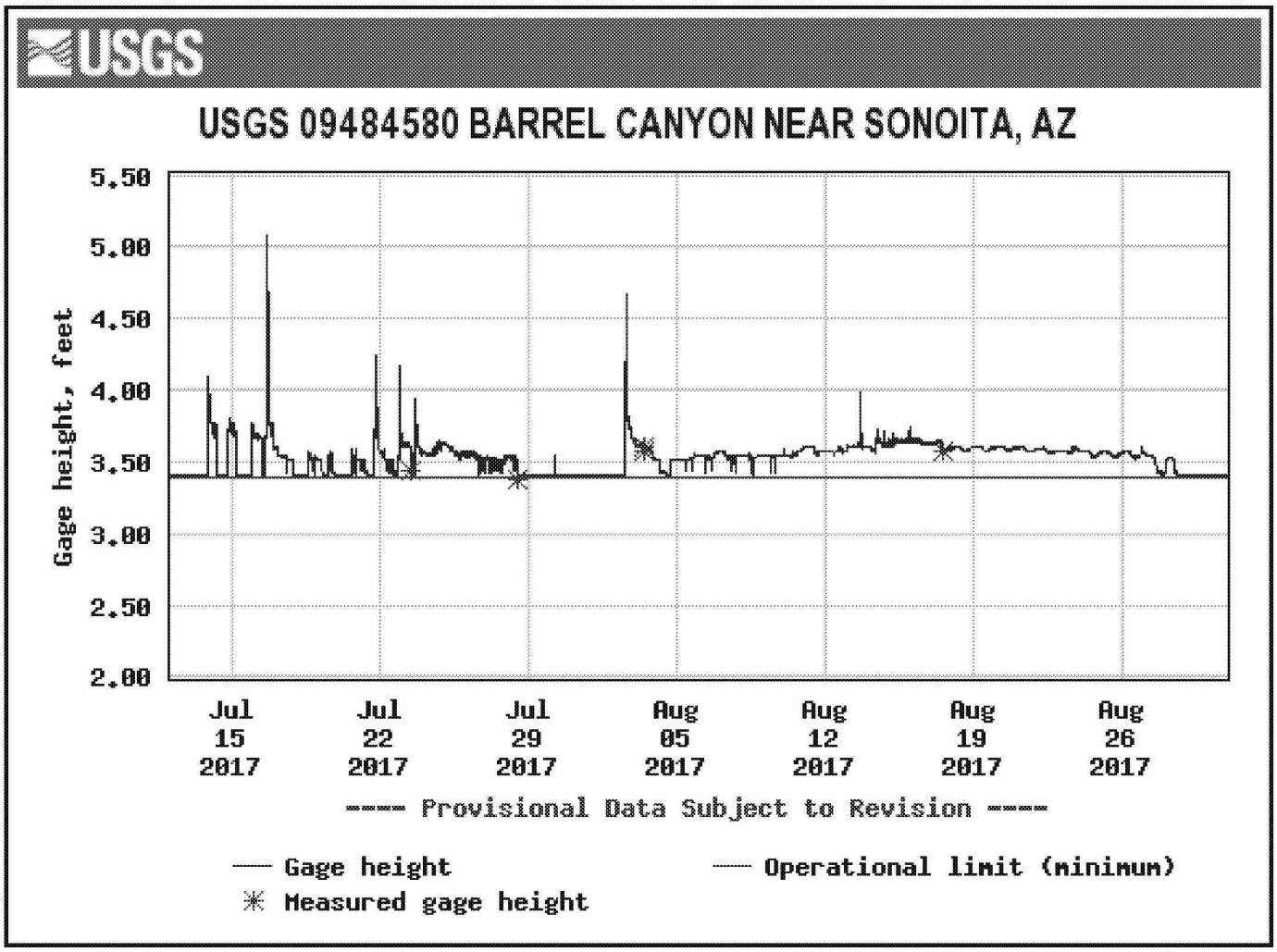

Figure 3. Peak and base flows in July and August 2017 at USGS Gage 09484580. Base flows persisted long after the last measured rain at the gage (August 3, August 15).

Figure 4. Algae in water around the pressure transducer at the Barrel gage. Algae is not found in ephemeral systems, but rather is typical of intermittent and perennial streams. Also note that the base flow is clear and very small in comparison to storm flows. The most recent rainfall (0.01 inch) at this site fell on January 16, 2016. The actual photo date is 2016/01/25, based on the field data sheet, camera metadata and confirmation with USGS (Attachment 5). USGS photograph.

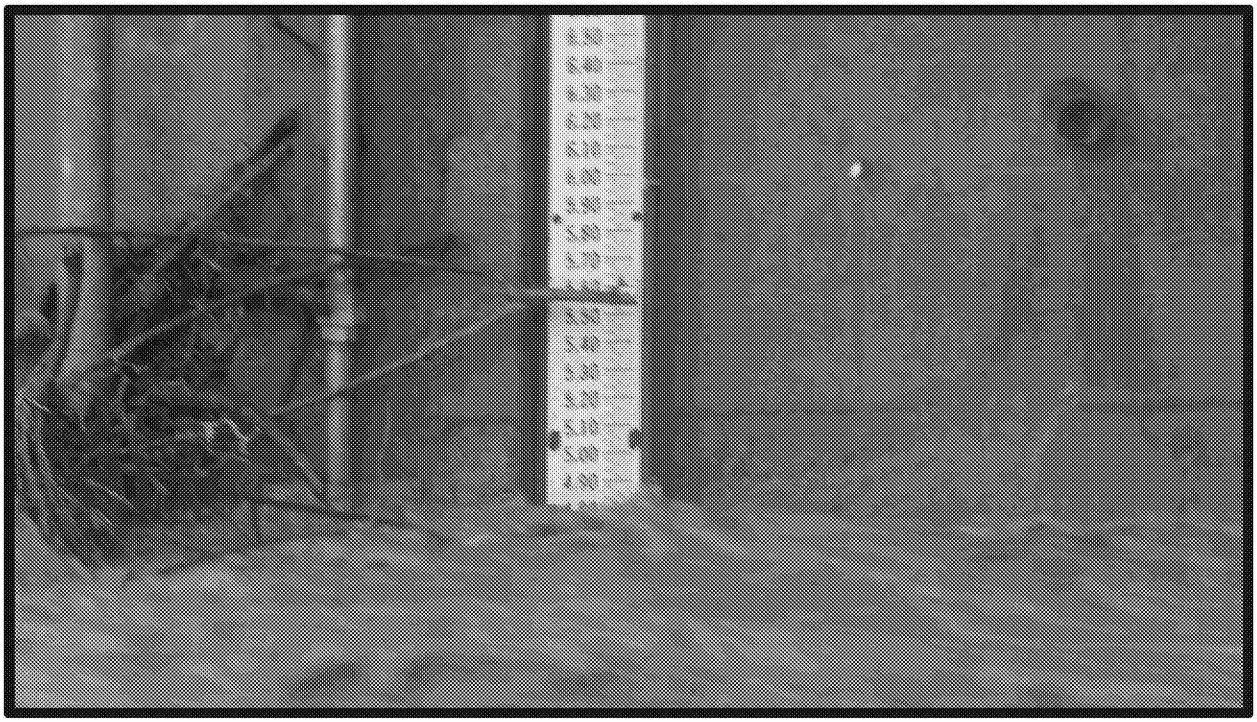

Figure 5. Flood flow taken by U. S. Geological Survey at the same location from September 11, 2013, 2:48 p.m. Note the higher elevation of the flow on the staff gage and the turbidity of the stormwater.

The water table is close to the surface in the intermittent reach, based on repeated water level measurements that have been provided to the USFS by Hudbay (2015e, see excerpts in Attachment 5. Downstream of the gage, an unnamed well (D-18-16-14dac) shows measurements that fluctuated flow less than 1 to more than 10 feet below land surface over the period 2008 to 2014. Upstream of the gage, a monitoring well installed by Hudbay (located at D18-16-15dcc) fluctuated from 2 to 3 feet below land surface during 2013 and 2014.

The Clean Water Act Requires Protection of Water Uses

The Rosemont area has been under continuous livestock use since the passage of the CWA. This is documented in the 1977 Draft Environmental Impact Statement, as well as the 2013 Final Environmental Impact Statement (FEIS). Intermittent flow conditions in Barrel Canyon are an asset to the livestock operation and motivated previous owners of the Rosemont Ranch to acquire surface water rights to the spring. Applicable water rights are shown in Attachment 6. A photograph documenting flow conditions of the streambed and a statement that Barrel Spring has been used for stock watering since 1886 is included in the Statement of Claimant filed by Robert Cote in 1989.

An intermittent stream is a type of surface water under A.A.C. R18-11-101(41)(c) defined in the rule as "a stream or reach that flows continuously only at certain times of the year, as when it

receives water from **a spring or from another surface source,** such as melting snow." (A.A.C. R18-11-101(25).)

Figure 6. This photograph, taken from the culvert and looking upstream of the gage on August 16, 2017, shows intermittent stream flow and numerous hoof prints in moist sand from livestock use.

Figure 7. This photo (same date as Figure 6), shows flow continuing downstream across bedrock exposures. A gate under the culvert can be opened to allow livestock to move safely under Highway 83.

Under the State of Arizona's tributary rule, designated uses of the reach do not currently include livestock use and do not acknowledge the existing livestock uses of the Rosemont Ranch. However, the FEIS does acknowledge Hudbay's intention to continue ranching, based on their representation to continue that use; and indeed, Tetra Tech's 2013 data summary acknowledges exceedances of livestock water quality standards for total copper and lead based on 2008 sampling. The Corps and the USFS each have an obligation to protect existing uses of the stream under the CWA, whether or not those uses have been designated, and this would include livestock use and warm-water aquatic life for an intermittent stream.

Furthermore, ADEQ must ensure the water quality standards adopted for upstream water bodies also provide for the attainment and maintenance of the water quality standards for downstream waters, as stated in R18-11-104F: *"In designating uses of a surface water and in establishing water quality criteria to protect the designated uses, the Director shall take into consideration the applicable water quality standards for downstream surface waters and shall ensure that the water quality standards that are established for an upstream surface water also provide for the attainment and maintenance of the water quality standards of downstream surface waters."*

Barrel Canyon Flows Exceed State Standards for Partial Body Contact and Livestock Use

To our knowledge, neither the USFS nor the Corps have evaluated the water quality data relative to their duties to protect existing uses including livestock and warm-water aquatic wildlife in Barrel Canyon. Hudbay (2015e) presented water quality data to the Forest highlighting where a total metal concentration was higher than a water quality standard established for the watershed. Seventeen water samples were collected at PSW7 between July 2012 and September 2014 (Attachment 4, Pages 9 through 14). The table did not differentiate between intermittent baseflows and storm event flows. The latter would have higher total metal concentrations due to the higher sediment load. Lead concentrations were higher than the partial body contact standard for 82 percent of the samples. Copper concentrations were higher than the agricultural livestock watering standard for 41 percent of the samples. Selenium concentrations were higher than the aquatic and wildlife (ephemeral) standard twice and one arsenic concentration was higher than the agricultural livestock watering standard.

The implication of these data is that current conditions, which include numerous mining features and land disturbance for roads, drilling and water catchment, result in elevated lead and copper concentrations. Additional land disturbance will increase the exposure of rock and soil to rainfall and stormwater runoff with the likely effect of increasing total metal concentrations. This likelihood is counter to the provisions of the CWA.

Multi-sector General Permits Do Not Change the Risks

Hudbay says that Multi-sector General Permits (MSGPs) for this project means the risk of lowering water quality is "extremely low," per Slide 19 of their "conservative water quality analysis." The fact that stormwater is regulated under an MSGP does not mean the risk is "extremely low." Rather, the permit is based on activities likely to cause a surface water quality problem that needs to be managed and tracked so ADEQ can verify Hudbay's practices will minimize impacts. A number of studies have documented that unanticipated pollution from mines occurs despite this type of state and federal regulation (e.g. Kuipers and Maest 2006 and Earthworks 2012).

The Carlota mine, located on USFS land in Arizona, serves as an example of a modern mine with unanticipated releases of pollutants despite an MSGP. In 2010, ADEQ found that *"the facility's structural BMPs (i.e. terraced slopes and surface pipes to prevent slope saturation) ...were ineffective to prevent discharges...The facility also failed to design and implement a combination of erosion and sediment control BMPs to keep sediment in place and to capture sediment to the extent practicable before it leaves the site."* Despite the MSGP, the facility sent pollutants downstream (Attachment 7).

Both Hudbay and the FEIS acknowledge that the most recent water quality results for the Rosemont area already exceed standards for certain metals. In addition, renewed ground disturbance and mining will cause the release of more pollutants, which will be carried in runoff and the 22,170 tons of additional sediment per year that has been estimated by the FEIS to come from the mine site. These pollutants will be carried downstream to Cienega Creek and ultimately to Tucson's water supply. We believe the failure to appropriately characterize the Rosemont

hydrologic environment (underestimating rainfall and runoff, ignoring the presence of the intermittent flow reach and shallow depths to the aquifer at Highway 83, contributes to the risk of lowering water quality.

Aquifer Protection Permit is Not Protective

Hudbay and ADEQ have described the Aquifer Protection Permit (APP) as providing protection for aquifer conditions. While we agree with the intent to protect aquifer conditions, the current permit authorizes discharges of pollutants to the aquifer from regulated facilities. The tailings facility, even though it is dry stack, is estimated in the permit application to discharge 8.4 gallons per minute (more than 4 million gallons per year) to the aquifer. The current APP also authorizes a heap leach operation, a fact that is at odds with the USFS Record of Decision (ROD).

For this mine, Hudbay's unrealistic assumptions about seepage and groundwater movement mean there are no plans for mitigating the effects of mine seepage other than monitoring because of the conclusion that what reaches the aquifer will not pollute the water beyond aquifer water quality standards. Furthermore, numerous activities not covered by the APP may also result in impacts to water quality standards. For example, the APP does not prevent any impacts to surface water quality resulting from groundwater that may eventually discharge at springs into surface streams such as the intermittent flow reach along lower Barrel Canyon. It also does not regulate the discharge likely to result from the mine pit lake that will form after closure because it is excluded from the permit.

It also does not regulate discharges from the existing slag pile or smelter site that lies adjacent to Wasp Canyon, a designated Water of the US located on Rosemont's private property, just upstream of its confluence with Barrel Canyon.

Finally, the APP does not restrict discharges that might occur from regulated facilities during storm events in excess of the 10-year, 24-hour event; and it does not have provision for regulating concentrations of sulfate, total dissolved solids or copper in the aquifer.

Pima County sought to require Hudbay to bond for post-closure costs to ensure funds are available in the event of a mine bankruptcy. Pima County also urged the state to seek a performance bond for reclaiming the dry stack tailings facility. Instead, ADEQ exercised its discretion to accept a surety bond based on a "closure strategy" rather than a detailed closure plan. Final closure plans and costs will be determined by the state only when Rosemont notifies ADEQ of its intent to close the mine, at which time there is no guarantee of fund availability. This is another risk factor that leaves existing uses and downstream populations vulnerable to impairment.

Barrel, Wasp and McCleary are Sources of Copper

A paper from the Journal of Geochemical Exploration (Hawkes 1976) documents the sources of copper anomalies in sediments tributary to Cienega Creek (Figure 8 below, from Attachment 8). The anomalous values are identified as having sources in Barrel Canyon and "old copper prospects" in McCleary Canyon. These areas have been affected by many previous mine-related activities.

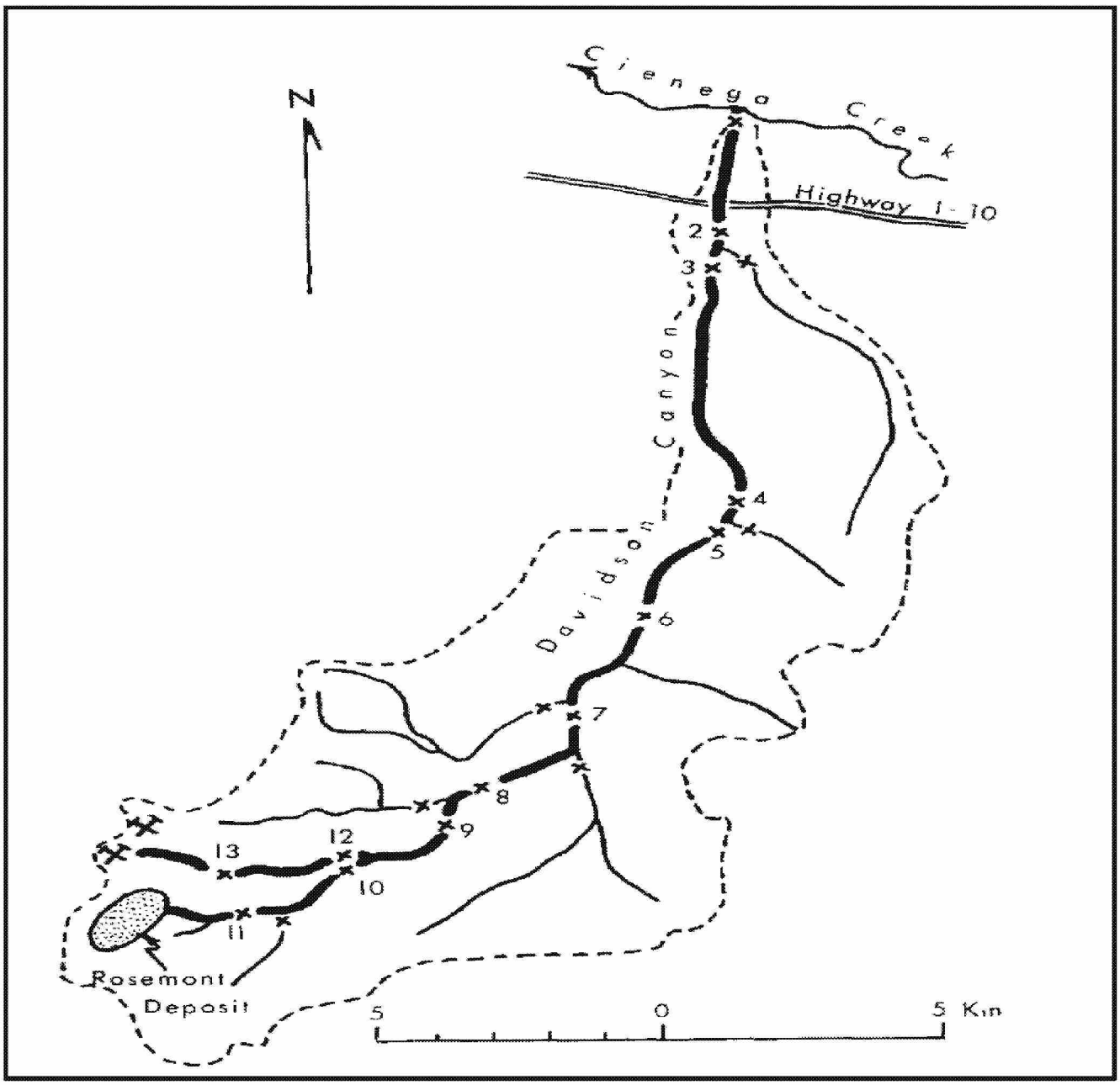

Figure 8. Sediment sampling locations in the Davidson watershed, from Hawkes (1976)

A smelter operated along Wasp Canyon just upstream of its confluence with Barrel Canyon from 1879 to 1905, and was subsequently removed. (Tetra Tech 2009 in Appendix 8, and Figure 9 below) The smelter site is exempt from APP regulations per §A.R.S. 49-250(B)(11). The APP applicant proposes to cover the slag pile and remains of the smelter site with new, "dry" tailings. We are unaware of any further site investigation that has been required by state or federal authorities.

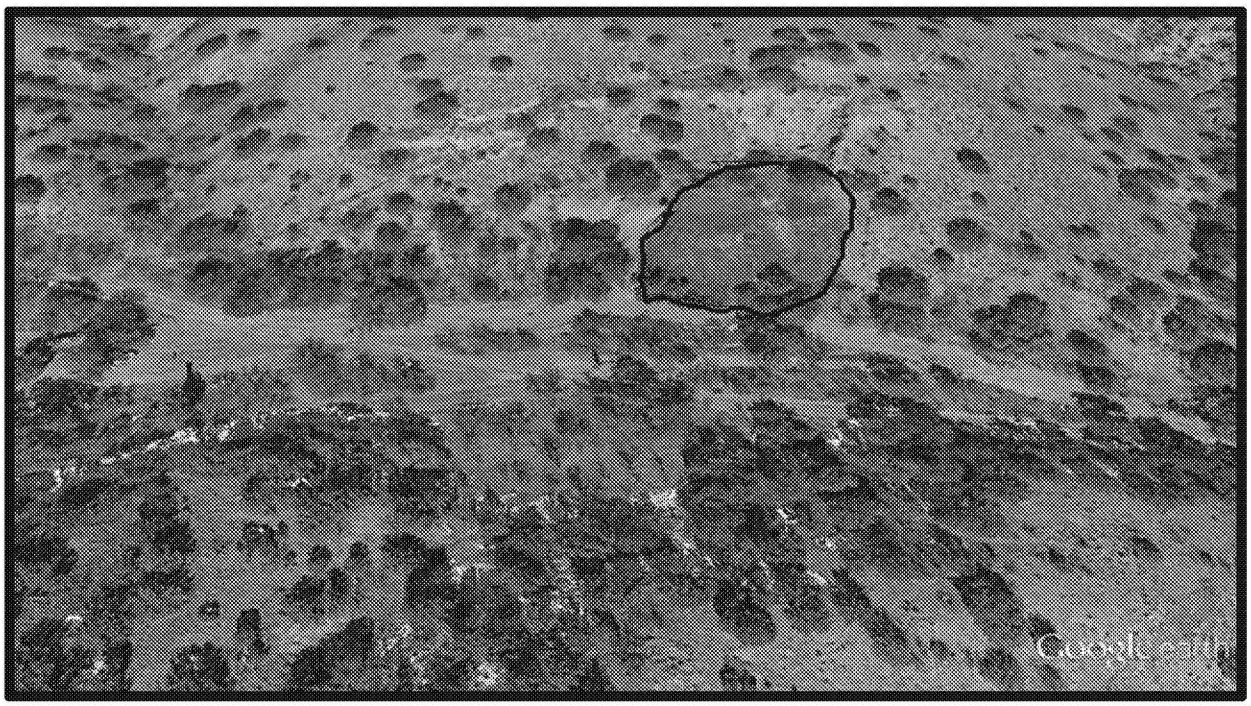

Figure 9. A photograph of the slag and former smelter site from Google Earth (outlined in black). Needs and opportunities for remediation of this site, which may be contributing to degraded water quality, have not been investigated.

Appendix 9 provides an inventory of other mining features in the Rosemont Project area such as shafts, adits, drill holes and mechanically disturbed sites, which might have enhanced the delivery of pollutants to Waters of the US to the stormwater monitoring sites that Hudbay has reported. Numerous shafts and adits that have been documented by WestLand Resources, Inc. bat researchers are mapped in Appendix 9, along with areas of previous disturbance from Rosemont's geological hazards mapping.

Figure 10 below compiles all of the drill holes and areas of historic mining activity from recent cultural resource documentation for the first time. Drilling of boreholes and road construction to provide access can generate finely comminuted sediments, which may be contributing pollutants to runoff. Historic mining district activities shown along Wasp and McCleary may have included ore processing or assaying activities, as well as blasting or otherwise liberating mineralized bedrock.

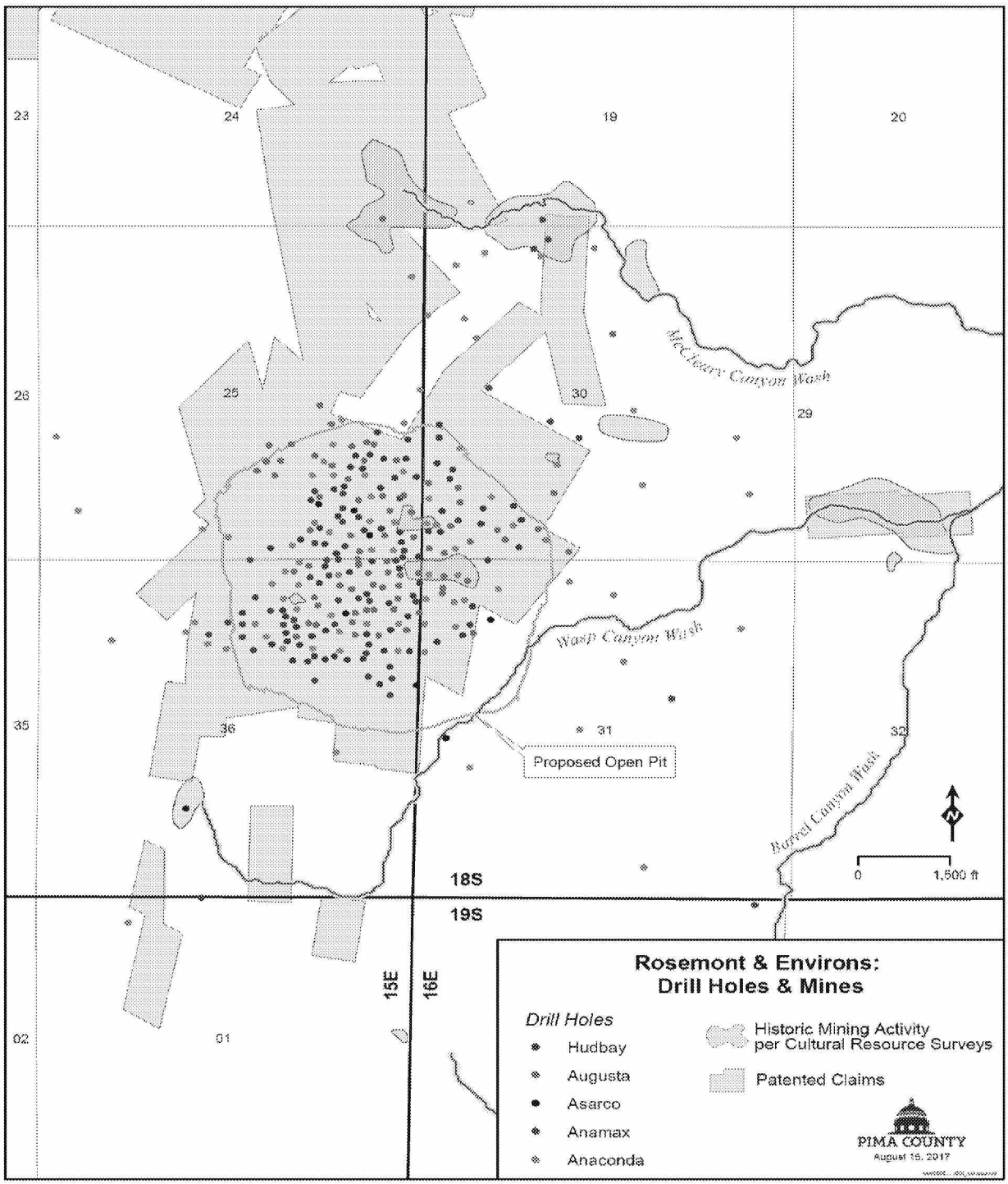

Figure 10. Map of all known drill holes and areas of historic mining activity from recent cultural resource documentation.

Finally, because prior to 1993, many holders of unpatented mineral claims performed a minimum of $100 in assessment work each year in order to justify their claims, we provide in Attachment 9 a map of Rosemont's unpatented claims, which can be seen to cover nearly the entire watershed of Barrel Canyon.

Prior to issuing permits to renew mining, the Corps and USFS should be investigating the possibility that past mine-related activities have contributed to pollution in groundwater or surface water emanating from Barrel Canyon and now detectable in stormwater. You are no doubt aware of the court decisions regarding Comprehensive Environmental Response, Compensation, and Liability Act cleanup costs. It seems prudent to clarify the situation now, rather than after dredge and fill activities begin.

Hudbay, as the owner of the patented lands, should be held accountable for investigating and remediating the slag pile, smelter site, ore leaching site and other mining features prior to renewed mining. When Hudbay acquired the property, it knew or should have known of the former smelter location and other sites that may be degrading surface water quality. It is disingenuous for Hudbay to now complain it is being held to unfair standards, rather than take responsibility for the property conditions they purchased.

In conclusion, Pima County and the Regional Flood Control District appreciate the Corps' thorough analysis of Rosemont's impacts to the Waters of the U.S. The attachments to this letter are intended to provide perspective on the significance of your decision and evaluate new information that has come to our attention since our last communication. We hope you will take the new information presented here into consideration as you make your determination to issue or deny a CWA Section 404 permit for the Rosemont mine as currently proposed.

As before, my staff are available to provide additional data and answers to any questions you may have regarding these and other matters.

Sincerely,

C.H. Huckelberry
County Administrator

Enclosures

c: Deanna Cummings, US Army Corps of Engineers
Elizabeth Goldmann, US Environmental Protection Agency
Jason Brush, US Environmental Protection Agency

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C.H. HUCKELBERRY
County Administrator

December 4, 2017

Mr. William James, National Mining Expert
U.S. Army Corps of Engineers
3701 Bell Road
Nashville, Tennessee 37214-2660

Re: **Rosemont Copper Project ACOE Application No. SPL – 2008-00816-MB**

Dear Mr. James:

This letter provides comments concerning Hudbay's final Habitat Mitigation and Monitoring Plan (HMMP; rev. 9/12/17) that was recently submitted in support of the proposed Addendum to the 401 Certification issued for the Rosemont Copper mine. To compensate for the loss of wetlands caused by mining activities, the HMMP proposes two mitigation projects, including substantial dredge and fill effort in Sonoita Creek and the removal of select stock tanks on the Rosemont project site.

In a separate letter to the Arizona Department of Environmental Quality (dated November 17, 2017; a copy of which is attached), we objected to the Certification on a variety of grounds. Because of the different responsibilities associated with your agencies regarding the Clean Water Act, this letter presents our concerns with the HMMP, rather than the Certification Addendum.

This letter is divided into three comment segments about: 1) The overall mitigation proposal, 2) Rosemont stock tank proposal, and 3) the Sonoita Creek project.

1) General Comments

The Section 401 Certification Conditions Based on the Surface Water Mitigation Plan (SWMP) are Unenforceable

The Arizona Department of Environmental Quality (ADEQ) based conditions in the existing Certification on Rosemont's SWMP, a document that was submitted to ADEQ long after the close of the public comment period and approximately one month prior to ADEQ's decision to issue the Certification for the mine. There was no public review or comment.

Nevertheless, ADEQ included conditions in the Certificate based on the SWMP. Because the SWMP-inspired Certification conditions resulted from a violation of Arizona law, they are unenforceable and cannot be relied upon by the Corps for its decision.

The SWMP-based Certification conditions require Rosemont to develop a surface water model to quantify potential changes from baseline conditions throughout development of the project. Rosemont is to determine mitigation measures to maintain and protect downstream water quality and flow. If the plan is unenforceable, then there is no way for the Corps to ensure that aquatic resources will remain unaffected or adequately compensated.

Rosemont, in its HMMP, tries to bootstrap the SWMP into legitimacy by asserting it "supports the determination by ADEQ that the project will have no adverse effect on the currently designated downstream Outstanding Arizona Waters (OAW) in Davidson Canyon and Cienega Creek" (HMMP, p. 60). In that same paragraph, Rosemont seems to suggest that the proposed stock tank mitigation is already approved because it was mentioned in the SWMP.

Relying on the SWMP to justify the stock tank mitigation in the HMMP cannot cure ADEQ's failure to include the plan in the original record offered for public comment. Further complicating the Corps' reliance on this document is the fact that there are subsequent versions of the SWMP, which are not being released for public review.

The Corps Must Issue a New Public Notice because the Current 404 Application does not Properly Describe the Mitigation Activities Proposed

While Rosemont's 404 permit application includes brief mention of the requirement to provide a HMMP prior to 404 issuance, the application includes no information about specific mitigation activities, and fails to include mention of Sonoita Creek as an impacted area. (U.S. Army Corps of Engineers, Public Notice – Application for Permit, Application no. SPL-2008-00816-MB, December 6, 2011, at 12.)

Rosemont acknowledges the lack of relevant information in the 404 permit application, admitting that the FEIS and ROD only "included a generalized description of Sonoita Creek Ranch restoration activities." (Letter to Trevor Baggiore, ADEQ, "Rosemont Copper Project, Clean Water Act Section 401 Water Quality Certification," from Katherine Arnold, Hudbay; September 14, 2017.)

In fact, descriptions of the mitigation activities planned for the Sonoita Creek Ranch mitigation site in the existing record at most include only the "conceptual design" of these activities. Moreover, Rosemont itself makes clear that this new, proposed activity is a significant departure from that conceptual design: "While the conceptual design attempted to bolster the existing system with newly constructed channels, the final design represents a complete restoration of Sonoita Creek and its floodplain." (*Id.*, emphasis added.)

In the request to modify its Certification, the mitigation activity at issue involves discharge of dredge and fill materials into WUS, and is exactly the kind of activity that must receive a 404 permit to proceed. (See 33 CFR §323.3(a).) In addition, because it is reasonably related to the Rosemont Project, it must be included in the same permit application as the Rosemont Project. (33 CFR §325.1(d)(2).)

However, this activity is not yet included in the Rosemont Project 404 permit application despite the fact that it significantly alters the application's description of the Project. There will a large amount of dredged and fill material involved in this activity, which is obviously the key point for the issuance of a 404 permit and Certification. In fact, Rosemont admits this project and the associated discharge of dredge and fill into WUS is significant enough to require mitigation of its own: "While 8.9 acres will be filled, waters of the U.S. will be created in the restored floodplain, for an overall net gain in waters of the US, sufficient to mitigate this activity and the [Rosemont Mine] Project." (Letter to U.S. Army Corps of Engineers, "Rosemont Copper Project, Clean Water Act Section 404 Permit," from Katherine Arnold, Hudbay; September 22, 2017.)

Public notice and comment is required for 404 permit applications so the public can weigh in on whether the activity involving discharge of dredge and fill into Sonoita Creek is in the public interest. The law requires that "the notice must...include sufficient information to give a clear understanding of the nature and magnitude of the activity to generate meaningful comment." (33 CFR §325.3(a).) While the Corps did issue a public notice for the original 404 application, that notice obviously did not include enough information to provide the public with "a clear understanding of the nature and magnitude of the activity," considering the notice was issued six years before Rosemont revealed this proposal to significantly increase the direct impacts to WUS in a location far removed from the mine site.

Rosemont proposes that the Sonoita Creek project will benefit the conditions along the Creek. However, without more information about what Rosemont intends, and a chance for the public to thoroughly review and comment on that information, a decision by the Corps to accept the mitigation plan solely based on Rosemont's representations would seem arbitrary and capricious.

Even if the Corps agrees that the Sonoita Creek impacts to WUS would eventually improve the conditions, denying the public a direct conduct to provide input to the Corps would seems a breach of the Corps' public trust responsibilities. This project is located in a different watershed, and affects a different set of community members. Community members who held no interest in the previous public notices may be interested to comment on the Sonoita Creek project.

For instance, the Nature Conservancy manages land downstream, but they have not been provided an invitation to respond to the Corps. As far as we can tell, their staff had no idea that the Rosemont proposal mentioned their work out of context.

Mitigation Sites in the Watersheds of Impact are Still Available

The Rosemont Mine is in the Cienega groundwater basin, but the overwhelming majority of the proposed mitigation for the Rosemont Mine will be directed to Sonoita Creek, a tributary that flows to the southwest to the upper Santa Cruz River. The proposed mitigation does not—and cannot—offset the mine's significant degradation of the Davidson Canyon Outstanding Waters and degradation of the intermittent flows of Barrel Canyon, which flow north. Because of the geographic and hydrological disconnection between the area of impact and the Sonoita Creek mitigation site, the Sonoita Creek restoration effort will not provide any mitigation for impacts caused by the mine. While both sites are within the greater Santa Cruz River watershed, they are hydrologically separated by over 125 miles.

Hudbay's description of the evolution of the mitigation packages omits the fact that Hudbay and its predecessor have rejected many opportunities to mitigate the impacts within the Cienega Creek watershed. There are many private and state land parcels in the Cienega Creek watershed and outside the Davidson Canyon watershed that still could be acquired for permittee-based mitigation. We provided a parcel-level list to the Forest Service and other resource agencies as early as December 23, 2009. We provided a map to the U. S. Army Corps on December 30, 2013, showing the state and private lands available in the watershed.

In 2014, we provided to Rosemont information about the Apache Springs real estate offering located on Gardner Canyon. Rosemont declined to purchase the property after investigating the cost. Gardner Canyon, like Barrel Canyon, is an important tributary emanating from the Santa Rita Mountains to upper Cienega Creek. Like Barrel Canyon, it is a significant source of groundwater underflow and surface water to upper Cienega Creek. The acquisition offered an opportunity to improve aquatic resources by reducing irrigation and other water uses, and restoring the intermittent streamflows within the watershed of impact.

Another strategy for keeping mitigation in the watershed would be to preserve or re-habilitate the headwaters streams located at the Broadtop Butte, Copper World and Peach-Elgin patents. These headwater streams are close in proximity and very similar in nature to the headwater streams affected at Rosemont. The company rejected the proposal in order to maintain these areas for future exploitation.

Seasonal Discharges Can Augment Flows

The mine will reduce stormwater runoff to Davidson Canyon through diversions, impoundments and other alterations of the watershed. Seasonal discharge of groundwater derived from the Santa Cruz basin and/or pit dewatering can partially address immediate

effects of diverting and capturing stormwater runoff in the watersheds tributary to Davidson Canyon. This strategy would be more certain to mitigate reduction of on-site flows than removal of stock tanks.

If one is to believe Tetra Tech's modeling, the pit water is predicted to be of good quality and the dewatering wells should be of better quality. If it is not, then good quality groundwater from the Upper Santa Cruz Basin is also being pumped over the crest of the Santa Rita Mountains for the mine, and could be made available for discharge at times when there is abundant process water from the pit dewatering and hillslope runoff catchments. This mitigation would be fundamental in providing the "wet" water so critical to the downstream riparian areas and to restoring reduced flows. Mixing of these two waters is also feasible for discharge down canyon of the mine.

To evaluate these alternative sources of water seriously, there would have to be some analysis of the expected rates of competing water demand on a monthly, weekly, and daily basis. Given that the Mine Plan of Operations has now been submitted, there should be sufficient information on which to base expected rates of use. An analysis of the frequency and duration of times when excess supply could be sent to streamflow is needed.

The total dewatering of the Rosemont basin area over the 20-year mining period will exceed 15,000 acre-feet, and much of that is expected in the early years. Advance mitigation of the impacts of diversions and impoundments may be possible with Santa Cruz basin groundwater when dewatering and surface-water diversions produce sufficient supply for construction and operation. Conversely, when seasonal supply from surface water diversions produces water in excess of the mine's demand, dewatering wells could be discharged to streams.

After closure, as the pit refills with water, pit water could be pumped downgradient to help avoid evaporative losses to the pit lake, if the water would meet state standards. An adaptive management scheme can be developed to pump the pit water downstream over time to help replenish areas that would become dewatered as a result of the pit. Downgradient wells could also benefit from this mitigation measure.

An AZPDES permit would needed to meet federal and Arizona water quality standards for either type of groundwater discharge to onsite streams. Except for dissolved oxygen, there should be, at minimum, no water quality issues with using the Santa Cruz basin groundwater.

Central Arizona Project (CAP) Water Could be Used to Augment Flows

Hudbay has a joint operating agreement to use CAP water from Community Water Company's allocation. The partners are presently constructing the pipeline from the CAP turnout along the Old Nogales Highway. The possibility of constructing an interconnection between the "Project Renews" pipeline and the water supply pipeline across State Trust

lands to bring CAP water to the mine operations in order to reduce on-site diversions of groundwater and surface water should be explored.

2) Comments: Stock Tank Mitigation Plan

This portion of the HMMP proposal relies on removing berms associated with four stock tanks located on the Rosemont property. We welcome mitigation opportunities that would be located in the Rosemont headwaters, but this particular mitigation will do nothing to address the long-term volumetric reductions of flow due to the mine, and raises new concerns about water quality impacts.

Impacts of the Mine on Volumetric Reductions Have Been Underestimated

In previous correspondence to you, we questioned the evaluation that the mine's impact to flows at Davidson Canyon is only a 4.3% reduction (SWCA Environmental Consultants. 2012d. *Method for Estimating Flow in Davidson Canyon.* Memorandum to file from DeAnne Rietz, SWCA Environmental Consultants. Phoenix, AZ). Using Hudbay's own model (Zeller, M. E., 2011. Predicted Regulatory [100-Yr] Hydrology and Average-Annual Runoff Downstream of the Rosemont Copper Project, Tucson, Arizona: Tetra Tech, July 11), staff determined the impact is a 26% reduction in flows.

While Hudbay has observed lower volumes of flow out of Barrel Canyon at the USGS gage on Highway 83 than their model predicted, it does not follow that contribution is only 4.3% of this observed flow. It is worth noting that their period record for this gage (2009-present) is one of the driest periods in recorded history.

Reducing Impacts Runoff Should Come Before Mitigation

Volumetric reductions will occur directly from dredging and discharge of fill into various WUS, and indirectly from dewatering activities. Of the direct impacts, Pima County recognized the need to retain contact water to detain pollutants, but there is no requirement to impound runoff against the waste pile. Construction of bypasses to route this impounded water downstream could minimize the impacts of the dredge and fill activities.

The Stock Tank Mitigation Strategy Has Not Been Shown to be Effective

Even if the volumetric impacts of the Rosemont mine had not been underestimated, the removal of four stock tanks will not significantly re-dress the diminution of runoff caused by various dredge and fill, impoundment and diversion activities. There are various reasons why:

1. Two of the four stock tanks in the Rosemont mitigation strategy are usually dry. Staff reviewed available aerial images (9-17 imagery dates) to determine how frequently the stock tanks held water. Rosemont Crest Tank was dry 53% of the time, and never more than 1/3 full. Barrel Canyon East Dam Tank was dry 56% of the time. McCleary Stock Tank was

dry 31% of the time, and never full. Gunsight Tank was dry only 17% of the time, but when it was wet, it only partially filled.

2. Staff reviewed the TetraTech memorandum dated July 14, 2017 on which the mitigation strategy was based. TetraTech did not verify the actual field capacity of any of the stock tanks, and observed sediment in all of the tanks. How much volume the tanks could actually supply has not been evaluated. In addition, runoff from Barrel Canyon East Dam's watershed will be compromised by the mine footprint, which reduces the watershed area contributing runoff.

3. The estimated additional yield by removing stock ponds (section 2.2.3) is inaccurate because:

a. The assumption that the ponds fully capture all water upstream is flawed for the following reasons:
    i. Ponds are typically designed with spillways which are overtopped, so the assertion that all water upstream of stock ponds is captured by them is false.
    ii. Ponds are notoriously leaky, so water seeps under the embankment and may flow out downstream as subsurface return flow.
b. The 2012 Tetra Tech regression equation was used to estimate these yields, but the equation was developed with datasets from watersheds with a larger area, and therefore cannot be extrapolated to watersheds contributing to stock ponds.

4. In order to conclude there is value in the stock-tank removal, it would be necessary to evaluate the future conditions without the removal of the stock tank berms and compare the with- and without-project futures. This analysis has not been performed. Future conditions would include new diversions intended to route runoff into upper McCleary and away from the plant site, a major road crossings, and removal of vegetation. These alterations may have unintended consequences such as additional sediment. Indeed, the Final Environmental Impact Statement (FEIS) does predict additional sediment as a consequence of the overall mine impact. Even if the stock tanks effectively rob the stream of runoff today, when taking into account the alterations of the upper McCleary hydrology and sediment transport, would the magnitude of their effect on watershed hydrology still matter under the future conditions that would be imposed by the applicant?

5. The effect of the sediment control/MSGP outfalls on the mitigation strategy has not been evaluated. According to the FEIS, the sediment control structures are around six feet high, with berms of 100 to 200 feet and a capacity of around 2 acre-feet. The structures are "designed to reduce total suspended solid loads in any stormwater discharges from the site" according to the MSGP-2010 Stormwater Pollution Prevention Plan (dated January 2015). While large flows will overtop the sediment control structures, the small but more frequent

runoff events will either evaporate, infiltrate or leak through the dam, and fine sediment and debris will accumulate behind them until the berms are removed by larger events and fail. There is a sediment control structure downstream of the tanks in the McCleary watershed that will serve to impound (for a time) smaller flows even if the stock tanks are removed. Likewise there is a sediment control/MSGP outfall structure proposed upstream of Barrel Canyon East Dam.

6. Transmission losses and channel storage in stream reaches downstream of some stock tanks have not been evaluated. Transmission losses and channel storage are likely to be sufficient in some areas that the incremental release of tiny amount of stock tank water may have no material effect on surface flows downstream. Any incremental benefit may be lost to evapotranspiration rather than replace runoff lost from filling WUS. While transpiration and transmission loss would be beneficial from an on-site biological standpoint, it diminishes the potential offset that could be realized outside the project boundaries, which is the point of the mitigation.

7. There are a number of stock tanks outside the mine footprint which are not part of the mitigation strategy. Why they have not been selected is not obvious. The rationale for selecting these four stock tanks has not been described by the applicant.

8. Table 139 of the FEIS indicates that McCleary tank will be lost under the Barrel Alternative. Table 136 indicates that "East Dam Header Tank" in T18S R16E Section 29ac would be directly impacted by the Barrel and original Proposed alternatives. If the stock tanks are destroyed anyway, then there is no mitigation value for the removal of the berms associated with the tanks.

Water Quality Risks of the New Mitigation Strategy Need to be Evaluated

The new volumetric mitigation strategy is insufficient to address the impacts, but even if it were deemed sufficient and appropriate by the Corps, it raises new water quality risks.

Rosemont is proposing to eliminate four dirt tanks within the project footprint to allow stormflow to be conveyed downstream. In two of the watersheds (McCleary Stock Tank and Gunsight Tank) there has been historical mining activities (see map below; red areas are historic mining sites as determined from cultural resource surveys and yellow dots are historical drill holes). The impact of disturbing soils associated with these features and conveying unknown—and unanalyzed—contaminants downstream has not been analyzed as part of the Biological Opinion or FEIS.

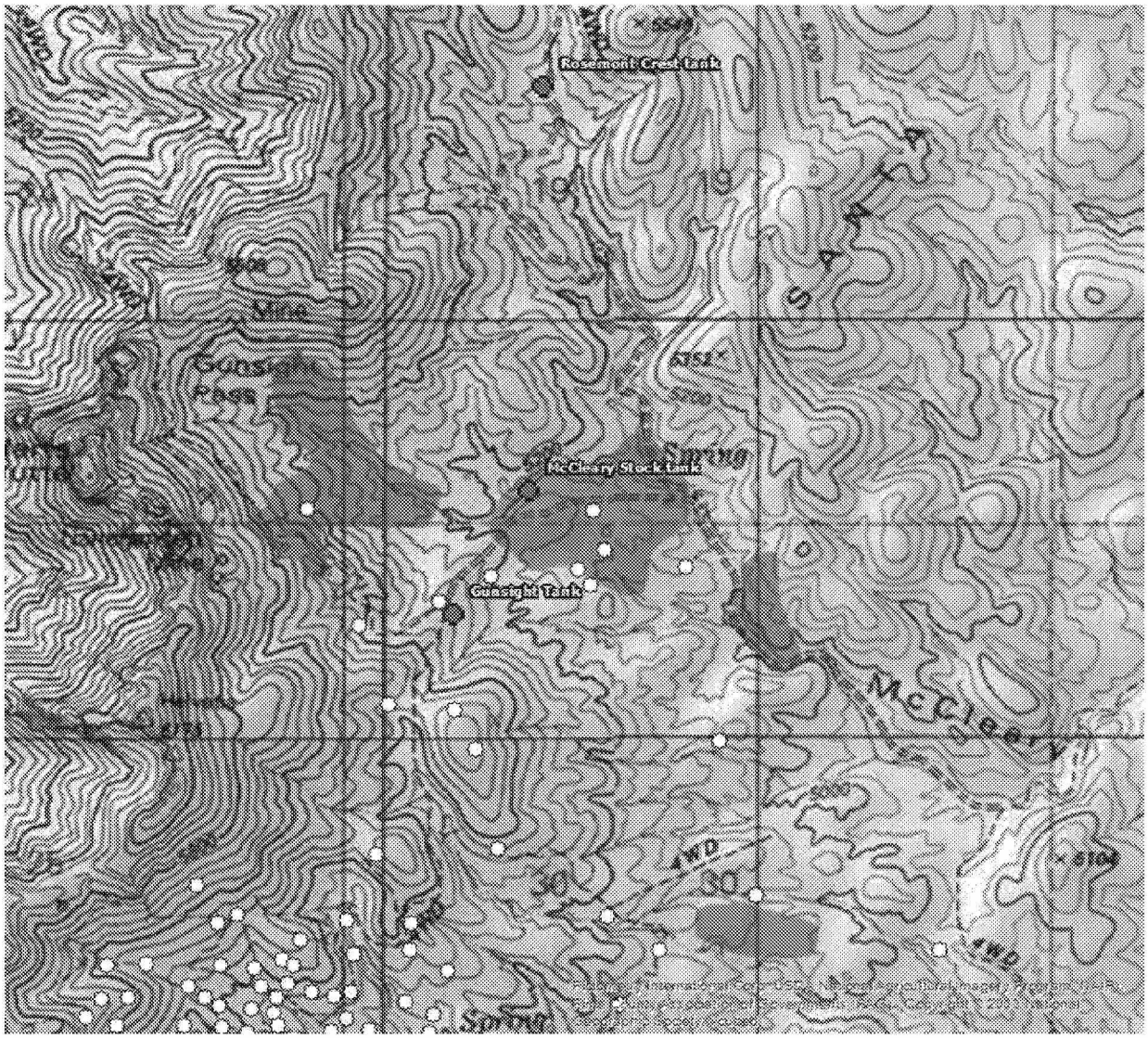

Figure 1. In red, areas of former mine-related activities based on cultural resource surveys. Drill holes in yellow. Location of stock tank removals shown in green and are approximate.

When the original certification was issued, there was little understanding of the actual water quality of stormwater and baseflows emanating from the Rosemont project area. Since then, Rosemont has provided additional data showing that Barrel Canyon and its tributaries have many repeated sampling events with metal concentrations exceeding state standards, including dissolved copper and total lead in stormwater runoff (Attachment 4, pages 5-14).

Copper is of particular concern because this metal constituent is shown to be in solution and therefore more available for biochemical reactions.

Upstream land surface disturbances may cause or contribute to surface water quality exceedances. Hawkes (1976; The downstream dilution of stream sediment anomalies. Journal of Geochemical Exploration 6: 345-358) documents the sources of copper anomalies in sediments tributary to Cienega Creek. The anomalous values are identified as having sources in Barrel Canyon, and "old copper prospects" in McCleary Canyon. These areas have been affected by many previous mine-related activities. As shown in the above figure, two of the proposed stock tanks for modification is in an area where cultural resource surveys indicate historic mine-related activities.

The Corps must investigate the possibility that past mine-related activities have contributed to pollutants now detectable in stormwater, prior to issuing a permit for dredge-and-fill activities in McCleary Canyon that could further endanger downstream water quality.

McCleary has Intermittent Flow

McCleary Canyon has periodic intermittent flow from a shallow water table and what are described by WestLand Resources (2013; *2012 Ranid Survey of the Rosemont Holdings and Vicinity, Sonoita Creek Ranch, and Fullerton Ranch.* Project No. 1049.36 0350A 0350A. Prepared for Rosemont Copper Company) as "perennial pools" at the base of a dam.

The Section 404(b)(1) Alternatives Analysis recognized that McCleary Canyon has intermittent flow on page 4, where they cite "occasional spring flow within short reaches of McCleary Canyon and other drainages" and "the highest quality (read "higher vegetation density") riparian habitat was found in a relatively short, moister reach in upper McCleary Canyon..."

Intermittent flow in McCleary includes two discharging springs and streamflow upstream and downstream of a diversion dam near latitude 32.3344 degrees north and 110.972 degrees west (Figure 2). Errol Montgomery and Associates measured flow at the McCleary dam during every month for two consecutive years, establishing the perennial nature of the discharges below the dam. In 2010, a pipe was installed at the dam to feed cattle troughs. (See Rosemont-67 East Side Information Summary of Groundwater Level Measurements for Wells, Piezometers and Drill Holes and Monitoring Date for Seeps and Springs.) Water quality samples were obtained by Montgomery and Associates during May and June, as well as other months of the year, again demonstrating the presence of perennial or near-perennial water in this stream.

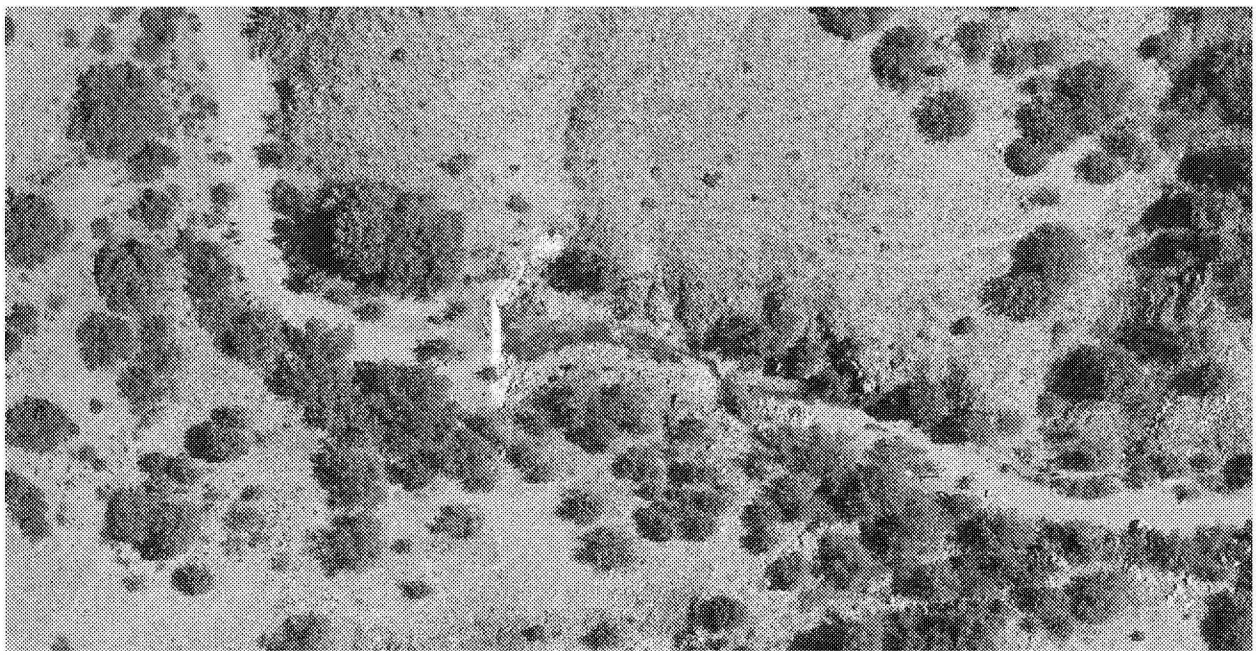

Figure 2. This aerial photograph, dated April 2016, shows intermittent stream flow downstream of McCleary diversion dam. Additional spring and in-stream flow uses occur upstream.

Accordingly, aquatic warm-water uses occur in the stream. These include macroinvertebrates such as water boatmen and backswimmers documented by WestLand Resources (2013a) on June 7, 2013.

The Clean Water Act Requires Protection of Existing Water Uses in McCleary Canyon

The Rosemont area has been under continuous livestock use since the passage of the Clean Water Act. This is documented in the 1977 Draft Environmental Impact Statement, and the intention to continue livestock use is described in the 2013 FEIS. Intermittent flow conditions in McCleary Canyon is an asset to the livestock operation and motivated previous owners of the Rosemont Ranch to acquire surface water rights to the spring-fed intermittent streams that exist on the Rosemont properties. For example, water right 33-93278 is a permit to use in-stream flow for livestock in McCleary Canyon. According to the applicant

3. Point of diversion and 4. Places of use:

Water will not be diverted out of the natural channel. The use will occur streamside along the natural course of McCleary Canyon beginning at a point within the Southwest quarter (SW¼) of the Southwest quarter (SW¼) and ending at a point within the Southeast quarter (SE¼) of the Southwest quarter (SW¼), both within Section 19, Township 18 South, Range 16 East, Gila and Salt River Base and Meridian, Pima County, Arizona.

Under the State of Arizona's tributary rule, designated uses of the intermittent reaches do not currently acknowledge the livestock use and aquatic and wildlife (warm water). Despite that fact, under the Clean Water Act, the Corps and ADEQ each have an obligation to protect existing uses of the stream, whether or not those uses have been designated, and this would include livestock use and warm-water aquatic life for an intermittent stream segment such as exists along McCleary Canyon and Barrel Canyon.

To our knowledge, the FEIS did not evaluate the water quality impacts of releasing sediment from the proposed stock tank mitigation to downstream waters, nor has any data been provided to the Forest Service to evaluate. This information would be needed relative to the Corp's duty to protect existing uses including livestock and warm-water aquatic wildlife in McCleary and Barrel Canyon and points downstream. Hudbay (2015) presented stormwater quality data to the Forest Service highlighting where a dissolved or total metal concentration was higher than a water quality standard established for the watershed, even without consideration of the more stringent standards that should have included the livestock and aquatic warm-water uses of the stream. No analysis exists relative to the livestock and aquatic warm-water uses, which are generally more stringent.

Hudbay (2015) data show that under current conditions, which include numerous mining features and land disturbance upstream, base flows of springs are of good quality. Elevated levels of dissolved copper, and total lead and copper have been consistently observed in stormwater at monitoring site PSW-4. Upstream spring flow met the livestock standards (Tetra Tech memorandum dated May 5, 2009). Would release of stored sediment increase ambient metal concentrations? Further study is warranted before the state can draw a conclusion that existing uses will not be impaired by the dredge-and-fill activities upstream, which include the stock tank removals. The stock tanks in the upper McCleary watershed are located below old mining claims which were historically worked (Figure 1).

3) Specific Comments about the Sonoita Creek Mitigation

Overall, we continue to object to mitigation that occurs in a watershed outside of the watershed that will be directly impacted by the proposed mine. More specific comments are as follows:

- **The Sonoita Creek Project Will Have Significant Effects to the Environment That Have Not Been Analyzed Under the National Environmental Policy Act.**

These proposed mitigation activities are a keystone element of the overall Rosemont Project itself, which is especially true considering the importance of the mitigation plan for the issuance of the 404 permit, which has been held up over this precise issue of appropriate and adequate mitigation to offset the impacts of the Project. Considering the significance of the Sonoita Creek activity, it is clearly subject to the provisions and requirements of the National Environmental Policy Act (NEPA).

NEPA requires that an assessment of impacts be completed for any federal action that may significantly affect the human environment. (42 USC 4332(C).) There is no question that these mitigation activities will have significant direct, indirect and cumulative impacts on the environment; in fact, the applicant admits as much with this request to modify its 401 certification, acknowledging the activities require 401 certification and, by extension, a 404 permit. However, the impacts of the activities proposed for the Sonoita Creek Ranch mitigation site have never been considered under NEPA.

Hudbay admits that there was no meaningful consideration of this activity in the Rosemont Project FEIS or ROD. These NEPA documents only "included a generalized description of Sonoita Creek Ranch restoration activities." (Letter to Trevor Baggiore, ADEQ, "Rosemont Copper Project, Clean Water Act Section 401 Water Quality Certification," from Katherine Arnold, Hudbay; September 14, 2017.) Hudbay also admits that this proposed activity is a significant departure from the initial conceptual design of these activities: "While the conceptual design attempted to bolster the existing system with newly constructed channels, the final design represents a complete restoration of Sonoita Creek and its floodplain." (*Id.*)

The mitigation activities proposed for the Sonoita Creek Ranch mitigation site must go through the required NEPA analysis in order to assess the direct and indirect impacts of the activity, as well as its likely cumulative impacts. Importantly, the cumulative impacts must be considered within the context of the full Rosemont Copper Project as well as all past, present, and reasonably foreseeable future actions within the project area, which must now be expanded to include Sonoita Creek. (40 CFR 1508.7.)

- **Sonoita Creek Project May Not Be Feasible Without Utility Approval**

The feasibility of the Sonoita Creek mitigation project depends—at least in part—on an agreement to relocate a Kinder-Morgan gas pipeline. There is no agreement that relocation

will proceed. Details regarding costs and performance standards have yet to be determined among Kinder Morgan, Rosemont and the U. S. Army Corps of Engineers. Given that there is no information provided about other utility easements which may burden the Sonoita Creek project area, the Corps has been given no assurance that other utility constraints may also compromise the feasibility of this project. Similarly, situated ILF projects are required to produce this kind of information.

- **No Stewardship Partner to Ensure Site Protection**

Rosemont has not identified a stewardship partner to hold and enforce a conservation easement, and therefore site protection is not assured. The Arizona Game and Fish Commission have not agreed to hold the easement, despite Rosemont's previous efforts to come to an agreement with the Arizona Game and Fish Department. The Nature Conservancy has not agreed to hold the easement. The Corps and U. S. Fish and Wildlife will not hold the easement. Without a conservation partner, feasibility of this mitigation strategy is in question.

- **Hudbay Recognizes the Restoration Project on 'Sonoita Creek occupies a place on the landscape more similar to Cienega Creek than Barrel Canyon (HMMP, 7.1.2.1 p.41).'**

As such it does not mitigate the same ecosystem function as the impacted WOTUS in Barrel Canyon and Wasp Canyon. The series of functions identified in HMMP 7.1.1.1, (such as surface water storage) are criteria better suited to Sonoita Creek and the San Pedro than the impacted WUS at Barrel Canyon and Wasp Canyon. In essence, by setting up the function criteria to match the mitigation site rather than the impacted site, Hudbay is avoiding the question of how to mitigate impacted ecosystem functions at the mine site.

- **The Walnut Gulch Watershed is Not an Appropriate Reference for Sonoita Creek Channel Design**

Rosemont relies on work done at the Walnut Gulch (Cochise County) as a reference site for the Sonoita Creek work. The Walnut Gulch watershed is very different from Sonoita Creek. Sonoita Creek is a valley-floor drainage, whereas Walnut Gulch is not. Walnut Gulch is a non-phreatic stream network isolated from groundwater (Goodrich, D. C., D. G. Williams, C.L. Unkrich, J. F. Hogan, R.L. Scott, K. R. Hultine, D. R. Pool, A. L. Coes, and S. Miller [2004]. Comparison of methods to estimate ephemeral channel recharge, Walnut Gulch, San Pedro River Basin, Arizona, in *Groundwater Recharge in a Desert Environment:* The Southwestern United States, *Water Science and Appl. Ser.*, vol. 9, edited by J. F. Hogan, F.M. Phillips, and B. R. Scanlon, pp 77-99, AGU, Washington, D. C.).

Sonoita Creek has a shallow water table and likely has significant riparian transpiration from groundwater. Walnut Gulch is not connected to higher elevation mountain blocks, whereas Sonoita Creek is highly connected to adjacent mountains.

The focus on Walnut Gulch as a model for a reference reach makes little reference to observed historical information, such as the 1936 Soil Conservation Service aerial photographs, which may shed light on pre-development channel alignments of Sonoita Creek or nearby watersheds.

- **Neither the Sonoita Creek Mitigation Nor the San Pedro In Lieu Fee Site Address Headwaters Impacts**

Most of the impacts of the Rosemont mine are to headwaters streams, but most of the mine impacts are to first-, second- and third-order streams, when analyzed according to the Strahler stream ordering system applied to the National Hydrographic Dataset. Even allowing for the fact that it is outside the watershed, the Sonoita Creek mitigation occurs along fourth- and fifth-order streams. The San Pedro site is a seventh-order stream under the Strahler system. It has a much larger watershed than the impacted site, has perennial flow, and shallower slope.

- **Reconsultation may be required for the Sonoita Creek Ranch Project**

Language from the Biological Opinion regarding the Sonoita Creek Ranch reads as follows:

> *"In the event that the property is approved for potential waters of the U.S. mitigation, it is not anticipated that the wildlife conservation benefits described below will be affected. If modification of any conservation measure is ultimately determined to be required, Rosemont will propose a modification for review and comment by the Corps and USFS to modify the conservation measures in a manner that would not change the evaluation for each species and which would result in the same benefits for each species but would not conflict with Section 404 mitigation requirements."*

"No yellow-billed cuckoo surveys have been conducted on Sonoita Creek Ranch but some xeroriparian habitat appears to be suitable and cuckoos are regularly documented during the breeding season immediately south in similar habitat on Sonoita Creek and in the adjacent Patagonia Mountain drainages". However, "For the purpose of section 7 consultation, the action area also includes lands proposed for acquisition (or already acquired) and areas in which conservation measures will be implemented. The action area includes 4,827 acres in which land acquisition-based conservation measures will be implemented, including: Sonoita Creek Ranch".

Despite this caveat, impacts to Yellow-billed cuckoos was not considered in the biological opinion. The Sonoita Creek project would impact 322 acres of land and cause temporal loss of habitat for many years, even if it were entirely successful.

In conclusion, there remain significant and substantive reasons why the 404 permit should not be issued for the Rosemont Copper Mine. Over the years, Pima County and the Regional

Flood Control District have provided useful and pertinent information to improve the outcomes for the various federal and state procedures that are required for mining, and to reduce the impacts to surrounding communities should the mine be approved. Pima County has been around since 1864, prior to the Mining Act, and we remain committed to working with you and others to improve the outcomes.

Sincerely,

C.H. Huckelberry
County Administrator

CHH/mp

Attachment

c: Kerwin Dewberry, Forest Supervisor, U. S. Forest Service
Elizabeth Goldmann, U. S. Environmental Protection Agency
Deanna Cummings, U. S. Army Corps of Engineers
Steve Spangle, U. S. Fish and Wildlife Service

COUNTY ADMINISTRATOR'S OFFICE
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C.H. HUCKELBERRY
County Administrator

November 17, 2017

Ms. Rosi Sherrill
Surface Water Section Project Manager
Arizona Department of Environmental Quality
1110 W. Washington Street, MC5415A-1
Phoenix, AZ 85007

Re: **2017 Addendum to Water Quality Permit, Rosemont Copper Project ACOE Application No. SPL – 2008-00816-MB**

Dear Ms. Sherrill:

This letter responds to the call for public comment regarding the proposed Addendum to the State's 401 Certification (Certification) to the U. S. Army Corps of Engineers (Corps) Section 404 for the Rosemont Copper Mine. The State proposes to amend the Certification to include mitigation for the mine's impacts to Waters of the U.S. The mitigation proposed includes the Sonoita Creek mitigation project, the San Pedro In Lieu Fee (ILF) program, and the removal of certain stock tanks on the Rosemont Project site. We object to this Certification on a variety of grounds, some of which we have previously stated, and others which are new.

This letter is divided into three segments: (A) general comments about the mitigation proposal, (B) specific comments on the Rosemont stock tank proposal, and (C) comments on Sonoita Creek and San Pedro ILF mitigation sites.

A. General Comments

Reliance on this Amendment on the SWMP Does Not Legitimize the SWMP and Results in Unenforceable Conditions

The Certification conditions based on the Surface Water Mitigation Plan (SWMP) are unenforceable because they were not properly adopted. Any reliance on them for justifying other mitigation schemes is flawed.

The Arizona Department of Environmental Quality (ADEQ) based a portion of its existing Certification for the mine on the SWMP, which was not subject to public review and comment. This document was submitted to ADEQ by Rosemont Copper Company in December 2014, long after the close of the public comment period, and approximately a month prior to ADEQ's decision to issue the Certification for the Rosemont mine. Despite the failure to comply with Arizona law concerning public review and comment, ADEQ included conditions in the Certificate based on the SWMP. Because the SWMP-inspired Certification conditions resulted from a violation of Arizona law, they are unenforceable.
The SWMP-based Certification requires Rosemont to develop a surface water model to quantify potential changes from baseline conditions through development of the project. Rosemont is to determine mitigation measures to maintain and protect downstream water quality and flow. If the plan is unenforceable, then there is no way to ensure that aquatic resources will remain unaffected.

Rosemont, in its final (9/12/17) Habitat Mitigation and Monitoring Plan (HMMP), tries to bootstrap the SWMP into legitimacy by asserting it "supports the determination by ADEQ that the project will have no adverse effect on the currently designated downstream Outstanding Arizona Waters (OAW) in Davidson Canyon and Cienega Creek" (HMMP, p. 60). In that same paragraph, Rosemont seems to suggest that mitigation and the improperly adopted Certificate conditions are already approved because the elimination of the stock tanks was mentioned in the SWMP.

Relying on the SWMP to justify the stock tank mitigation in the HMMP cannot cure ADEQ's failure to include the plan in the original record offered for public comment. Further, it distracts the public because ADEQ is in possession of subsequent versions of the SWMP which are not being released for public review.

The stock tank mitigation in the proposed Addendum is built on a house of cards. It is not approvable.

<u>The Addendum is premature</u>

Rosemont is asking ADEQ to modify its current Certification for the Rosemont Copper Project to include mitigation activities at the Sonoita Creek Ranch mitigation site. These mitigation activities include additional discharge of dredged and fill material and the associated direct impact to an additional 8.9 acres of Waters of the U.S. (WUS). These specific activities—and the associated impacts on WUS—undoubtedly requires a Clean Water Act Section 404 permit before they can proceed, and thus requires Certification from ADEQ.

Rosemont may certainly apply for the Certification at any time. However, Rosemont has yet to modify the Rosemont Copper Project 404 permit application to the Corps to include this activity, despite the fact that this modification will increase the acreage impacted by discharge of dredge and fill material associated with the Rosemont Copper Project by approximately 20 percent.

Any certification prior to the Corps acceptance of a modified 404 permit application and the habitat mitigation value of the proposed activities is premature. Because the Rosemont and the Corps have not completed their work, ADEQ does not have all of the information required to make this determination regarding the impacts of these proposed mitigation activities.

ADEQ lacks relevant information required for a Certification determination

ADEQ requires issuance of a Certification when a 404 permit (or other federal authorization of discharge to WUS) is required, thus the Certification is directly tied to the project's 404 permit. ADEQ's review of a Certification application is "solely to determine whether the effect of the [project's] discharge will comply with water quality standards for navigable waters." (A.R.S. 49-202(C); *see also* 40 CFR §121.2(a)(3).) State law requires that the ADEQ base its Certification decision on either "information found in the 404 application or other information furnished by the applicant sufficient to permit the certifying agency to make the statement described in paragraph (a)(3) of this section." (40 CFR §121.2(a)(2).) Despite these requirements, there is nothing in the existing record that provides the necessary information on which ADEQ must base its decision. While the 404 permit application includes brief mention of the requirement to provide a Habitat Mitigation and Monitoring Plan prior to issuance of the 404 permit, it includes no information regarding these specific mitigation activities, and fails to even include mention of Sonoita Creek as an affected area. (U.S. Army Corps of Engineers, Public Notice – Application for Permit, Application no. SPL-2008-00816-MB, December 6, 2011, at 12.)

Rosemont acknowledges the lack of relevant information in the 404 permit application, pointing out that while "the record examined by ADEQ included the [Final Environmental Impact Statement] and the Draft [Record of Decision], which included a discussion of the mitigation planned for our project," it goes on to admit that the FEIS and ROD only "included a generalized description of Sonoita Creek Ranch restoration activities." (Letter to Trevor Baggiore, ADEQ, "Rosemont Copper Project, Clean Water Act Section 401 Water Quality Certification," from Katherine Arnold, Hudbay; September 14, 2017.)

In fact, descriptions of the mitigation activities planned for the Sonoita Creek Ranch mitigation site in the existing record at most include only the "conceptual design" of these activities, and Rosemont makes clear that this proposed activity is a significant departure from that conceptual design: "While the conceptual design attempted to bolster the existing system with newly constructed channels, the final design represents a complete restoration of Sonoita Creek and its floodplain." (*Id.*, emphasis added.)

This activity must be included in 404 application and must go through public notice and comment

In the request to modify its Certification, the mitigation activity at issue involves discharge of dredge and fill materials into WUS and is exactly the kind of activity that must receive a

404 permit to proceed. (See 33 CFR §323.3(a).) In addition, because it is reasonably related to the Rosemont Project, it must be included in the same permit application as the Rosemont Project. (33 CFR §325.1(d)(2).)

However, this activity is not yet included in the Rosemont Project 404 permit application, despite the fact that it significantly alters the description of the Project included in in the existing application, particularly the amount of discharge of dredged and fill material that will be involved, which is obviously the key point for the issuance of a 404 permit and Certification. In fact, Rosemont admits this project and the associated discharge of dredge and fill into WUS is significant enough to require mitigation of its own: "While 8.9 acres will be filled, waters of the U.S. will be created in the restored floodplain, for an overall net gain in waters of the US, sufficient to mitigate this activity and the Project." (Letter to U.S. Army Corps of Engineers, "Rosemont Copper Project, Clean Water Act Section 404 Permit," from Katherine Arnold, Hudbay; September 22, 2017.)

Again, nothing prevents Rosemont from submitting its application to amend the Certification. However, considering the significance of this amendment as it relates to 404 permitting, it is premature to amend the Certification to include this activity until the Rosemont Copper project's 404 application has been modified, and the modified application is reviewed under all relevant Clean Water Act provisions, including the public notice and comment requirements of 404 permitting.

Public notice and comment is required for 404 permit applications so that the public can weigh in on whether the activity involving discharge of dredge and fill is in the public interest. The law requires that "the notice must...include sufficient information to give a clear understanding of the nature and magnitude of the activity to generate meaningful comment." (33 CFR §325.3(a).) While the Corps did issue a public notice for the original 404 application, it obviously did not include enough information to provide the public with "a clear understanding of the nature and magnitude of the activity," considering the notice was issued six years before Rosemont revealed this proposal to significantly increase the direct impacts to WUS.

B. Specific Comments on the Rosemont Stock Tanks Mitigation

This portion of the new mitigation proposal relies on removing berms associated with four stock tanks located on the Rosemont property. We welcome mitigation opportunities that would be located in the Rosemont headwaters, but this particular mitigation will do nothing to address the long-term volumetric reductions of flow due to the mine, and raise new concerns about water quality impacts.

Impacts of the mine on volumetric reductions have been underestimated

Below, we provide a summary of our previous correspondence to ADEQ dated March 21, 2014, April 4, 2014, July 16, 2014, and correspondence to U. S. EPA dated December 17, 2015.

- **The actual reduction of runoff is likely to be 30 to 40% during early years of mining, not 17%.**

- Because ADEQ relied on lower post-closure reductions as a basis, any certification reliant on this not maintain the aquatic and riparian resources at pre-project levels.

- Barrel Canyon provides a disproportionately higher amount of surface water to the Davidson Canyon watershed than was modeled by Rosemont's consultants.
- Stormwater and sediment transport analysis was based on erroneous review of FEIS.

- ADEQ accepted an erroneous analysis of hydrological impacts that underestimates impacts.

- Not addressed were issue related to:
    - Additional dissolved solids from the mining operation
    - Effects on downstream recharge rates from increased fines
    - Climate change
    - Increased temperature and lower dissolved oxygen.

- ADEQ's assumption that "lower Davidson canyon is not hydraulically connected to the regional aquifer that would be impacted by pit dewatering" is flawed based on isotopic data.

- ADEQ improperly relied on Tetra Tech's erroneous conclusions regarding lack of regional aquifer connection; we presented topographic, groundwater, and streamflow data to the contrary.

- ADEQ improperly relied on FEIS conclusions regarding seepage and seepage monitoring.

Staff continue question the evaluation that the mine site to flows at Davidson Canyon is only 4.3% (section 2.1.4.2). Using Hudbay's own model (Zeller, M. E. 2011. Predicted Regulatory (100-Yr) Hydrology and Average-Annual Runoff Downstream of the Rosemont Copper Project. Tucson, Arizona: Tetra Tech. July 11), staff determined the impact is 26%. While Hudbay has observed the lower volumes of flow out of Barrel Canyon at the USGS Gage on Highway 83, than their model predicted, it does not follow that contribution to Davidson Canyon is only 4.3% of this observed flow.

Reducing the impacts of changes to runoff comes before mitigation

Volumetric reductions occur directly from dredging and discharge of fill into various WUS, and indirectly from dewatering activities. Of the direct impacts, Pima County recognized the need to retain contact water to detain pollutants, but there is no requirement to impound runoff against the waste pile. Bypasses to route this impounded water downstream could minimize the impacts of the dredge and fill activities.

The stock tank mitigation strategy is not shown to be effective

Even if the volumetric impacts of the Rosemont mine had not been underestimated, the removal of four stock tanks will not significantly re-dress the diminution of runoff caused by various dredge and fill, impoundment and diversion activities. There are various reasons why:

1. Two of the four stock tanks in the Rosemont mitigation strategy are usually dry. Staff reviewed available aerial images (n = 9-17 imagery dates) to determine how frequently the stock tanks held any water. Rosemont Crest Tank was dry 53% of the time, and never more than 1/3 full. Barrel Canyon East Dam Tank was dry 56% of the time. This tank was created between 1996 and 2003. McCleary stock Tank was dry 31% of the time, and never full. Gunsight Tank was dry only 17% of the time, but when it was wet, it only partially filled.

2. Staff reviewed the TetraTech memorandum dated July 14, 2017 on which the mitigation strategy was based. TetraTech did not verify the actual field capacity of any of the stock tanks, and observed sediment in all of the tanks. How much volume the tanks could actually supply has not been evaluated. In addition, runoff from Barrel Canyon East Dam's watershed will be compromised by the mine footprint, which reduces the watershed area contributing runoff.

3. The estimated additional yield by removing stock ponds (section 2.2.3) is inaccurate because:

   a. The assumption that the ponds fully capture all water upstream is flawed for the following reasons:
      i. Ponds are typically designed with spillways which are overtopped, so the assertion that all water upstream of stock ponds is captured by them is false.
      ii. Ponds are notoriously leaky, so water seeps under the embankment and may flow out downstream as subsurface return flow.
   b. The 2012 Tetra Tech regression equation used to estimate these yields, was developed with datasets from watersheds with a larger area, and therefore cannot be extrapolated to watersheds contributing to stock ponds.

4. In order to conclude there is value in the stock-tank removal, it would be necessary to evaluate the future conditions without the removal of the stock tank berms and compare the with- and without-project futures. This analysis has not been performed. Future conditions

would include new diversions intended to route runoff into upper McCleary and away from the plant site, a major road crossings, and removal of vegetation. These alterations may have unintended consequences such as additional sediment. Indeed, the Final Environmental Impact Statement (FEIS) does predict additional sediment as a consequence of the overall mine impact. Even if the stock tanks effectively rob the stream of runoff today, when taking into account the alterations of the upper McCleary hydrology and sediment transport, would the magnitude of their effect on watershed hydrology still matter under the future conditions that would be imposed by the applicant?

5. The effect of the sediment control/MSGP outfalls on the mitigation strategy has not been evaluated. According to the FEIS, the sediment control structures are around six feet high, with berms of 100 to 200 feet and a capacity of around 2 acre-feet. The structures are "designed to reduce total suspended solid loads in any stormwater discharges from the site" according to the MSGP-2010 Stormwater Pollution Prevention Plan (dated January 2015). While large flows will overtop the sediment control structures, the small but more frequent runoff events will either evaporate, infiltrate or leak through the dam, and fine sediment and debris will accumulate behind them until the berms are removed by larger events and fail. There is a sediment control structure downstream of the tanks in the McCleary watershed that will serve to impound (for a time) smaller flows even if the stock tanks are removed. Likewise there is a sediment control/MSGP outfall structure proposed upstream of Barrel Canyon East Dam.

6. Transmission losses and channel storage in stream reaches downstream of some stock tanks have not been evaluated. Transmission losses and channel storage are likely to be sufficient in some areas that the incremental release of tiny amount of stock tank water may have no material effect on surface flows downstream. Any incremental benefit may be lost to evapotranspiration rather than replace runoff lost from filling WUS. While transpiration and transmission loss would be beneficial from an on-site biological standpoint, it diminishes the potential offset that could be realized outside the project boundaries, which is the point of the mitigation.

7. There are a number of stock tanks outside the mine footprint which are not part of the mitigation strategy. Why they have not been selected is not obvious. The rationale for selecting these four stock tanks has not been described by the applicant.

8. Table 139 of the FEIS indicates that McCleary tank will be lost under the Barrel Alternative. Table 136 indicates that "East Dam Header Tank" in T18S R16E Section 29ac would be directly impacted by the Barrel and original proposed alternatives. If the stock tanks are destroyed anyway, then there is no mitigation value for the removal of the berms associated with the tanks.

Water quality risks of the new mitigation strategy need to be evaluated

The new volumetric mitigation strategy is insufficient to address the impacts, but even if it were deemed sufficient and appropriate by the Corps, it raises new water quality risks.

Rosemont is proposing to eliminate four dirt tanks within the project footprint to allow stormflow to be conveyed downstream. In two of the watersheds (McCleary Stock Tank and Gunsight Tank) there has been historical mining activities (see map below; red areas are historic mining sites as determined from cultural resource surveys and yellow dots are historical drill holes). The impact of disturbing soils associated with these features and conveying unknown—and unanalyzed—contaminants downstream has not been analyzed as part of the Biological Opinion or FEIS.

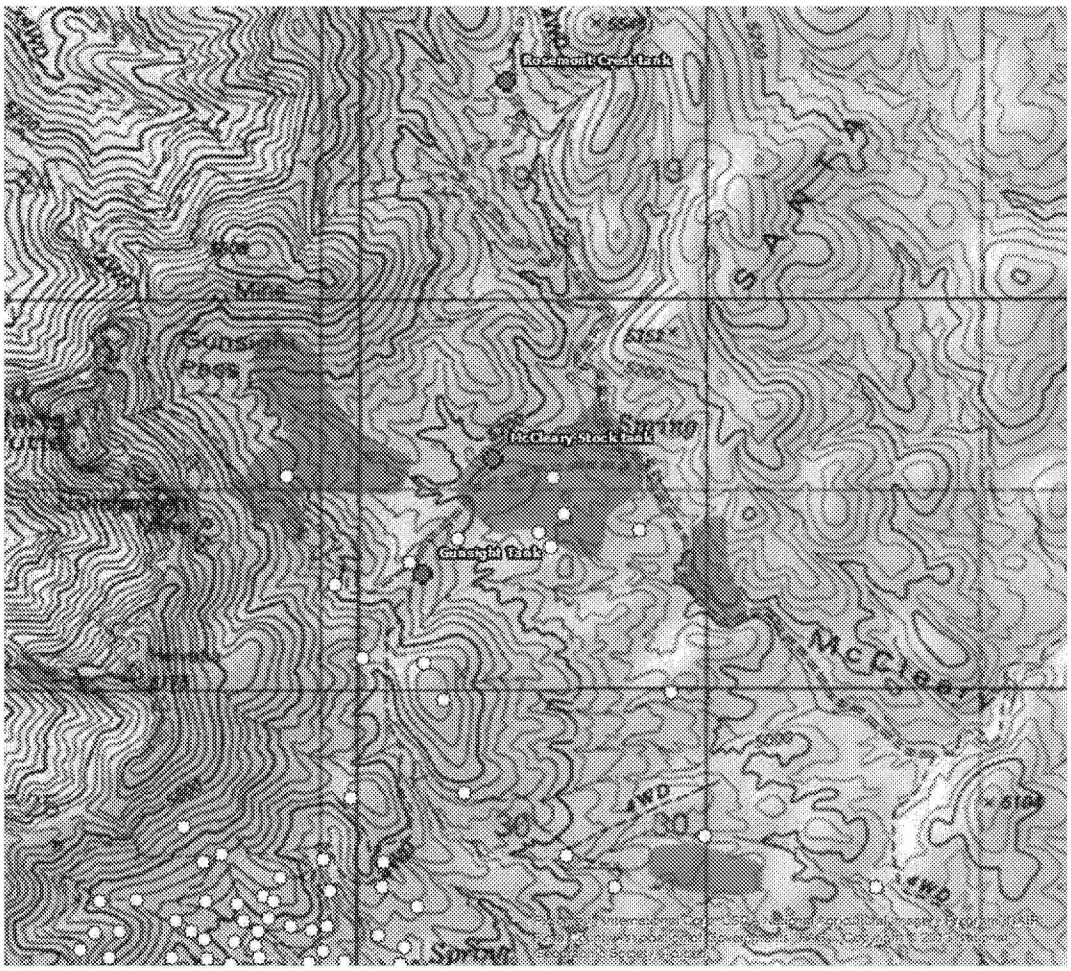

Figure 1. In red, areas of former mine-related activities based on cultural resource surveys. Drill holes in yellow. Location of stock tank removals shown in green and are approximate.

When the original certification was issued, there was little understanding of the actual water quality of stormwater and baseflows emanating from the Rosemont project area. Since then, Rosemont has provided additional data showing that Barrel Canyon and its tributaries have many repeated sampling events with metal concentrations exceeding state standards, including dissolved copper and total lead in stormwater runoff (Attachment 4, pages 5-14). Copper is of particular concern because this metal constituent is shown to be in solution and therefore more available for biochemical reactions.

Upstream land surface disturbances may cause or contribute to surface water quality exceedances. A paper from the Journal of Geochemical Exploration (Hawkes 1976) documents the sources of copper anomalies in sediments tributary to Cienega Creek. The anomalous values are identified as having sources in Barrel Canyon, and "old copper prospects" in McCleary Canyon. These areas have been affected by many previous mine-related activities. As shown in the above figure, two of the proposed stock tanks for modification is in an area where cultural resource surveys indicate historic mine-related activities.

ADEQ must investigate the possibility that past mine-related activities have contributed to pollution in groundwater or surface water emanating from McCleary Canyon and are now detectable in stormwater, prior to issuing a certification to renew mining.

McCleary and Barrel Canyons have Intermittent Flow

McCleary Canyon has periodic intermittent flow from a shallow water table and what are described by WestLand Resources (2013; *2012* Ranid Survey of the Rosemont Holdings and Vicinity, Sonoita Creek Ranch, and Fullerton Ranch. Project No. 1049.36 0350A 0350A. Prepared for Rosemont Copper Company) as "perennial pools" at the base of a dam. The distinctions between ephemeral and intermittent or perennial waters are important to the stock tank decision because stream flow types affect the state's water quality protections. U. S. Geological Survey offers the following definitions for streamflow in relation to time (Langbein's Manual of Hydrology, after Meinzer, 1923, p. 5658, with state definitions in parentheses):

> ***Perennial.*** *One which flows continuously. (A.A.C. R18-11-101 (30) states "Perennial water" means a surface water that flows continuously throughout the year.)*
>
> ***Intermittent or seasonal****. One which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas. (A.A.C. R18-11-101 (25) states "Intermittent water" means a stream or reach that flows continuously only at certain times of the year, as when it receives water* ***from a spring*** *or from another surface source, such as melting snow.)*

> ***Ephemeral.*** *One that flows only in direct response to precipitation, and whose channel is at all times above the water table. (A.A.C. R18-11-101 (18) states "Ephemeral water" means a surface water that has a channel that is at all times above the water table and flows only in direct response to precipitation.)*

The Section 404(b)(1) Alternatives Analysis recognized that McCleary Canyon has intermittent flow on page 4, where they cite "occasional spring flow within short reaches of McCleary Canyon and other drainages" and "the highest quality (read "higher vegetation density") riparian habitat was found in a relatively short, moister reach in upper McCleary Canyon..."

Intermittent flow in McCleary includes two discharging springs and streamflow upstream and downstream of a diversion dam near latitude 32.3344 degrees north and 110.972 degrees west (Figure 2). Errol Montgomery and Associates measured flow at the McCleary dam during every month for two consecutive years, establishing the perennial nature of the discharges below the dam. In 2010, a pipe was installed at the dam to feed cattle troughs. (See Rosemont-67 East Side Information Summary of Groundwater Level Measurements for Wells, Piezometers and Drill Holes and Monitoring Date for Seeps and Springs.) Water quality samples were obtained by Montgomery and Associates during May and June, as well as other months of the year, again demonstrating the presence of perennial or near-perennial water in this stream.

Figure 2. This aerial photograph, dated April 2016, shows intermittent stream flow downstream of McCleary diversion dam. Additional spring and in-stream flow uses occur upstream.

Accordingly, aquatic warm-water uses occur in the stream. These include macroinvertebrates such as water boatmen and backswimmers documented by WestLand Resources (2013a) on June 7, 2013.

Barrel Canyon also has intermittent reaches downstream of the mine. Despite recent drought, the U. S. Geological Survey (USGS) data collection at USGS gage #09484580, located at a culvert under Highway 83, upstream of "Barrel Spring" shows evidence of intermittent flows (Figure 3). The gage is located at a point within the previously documented PAG-mapped intermittent flow reach. USGS staff periodically visit the stream gage to perform maintenance, and rate the accuracy of flow measurements. During their visits, they document actual stream flow conditions using direct measurement of flow and visual observations.
The gage record for the 2017 monsoon season shows two periods with base flows for a number of consecutive days in July and August, shown in the graph below. Red asterisks indicate the date of field observations at the gage by USGS personnel. Storm flows are shown by the sharp rises with a "tail", and the base flows by the relatively stable low flows in between the peaks.

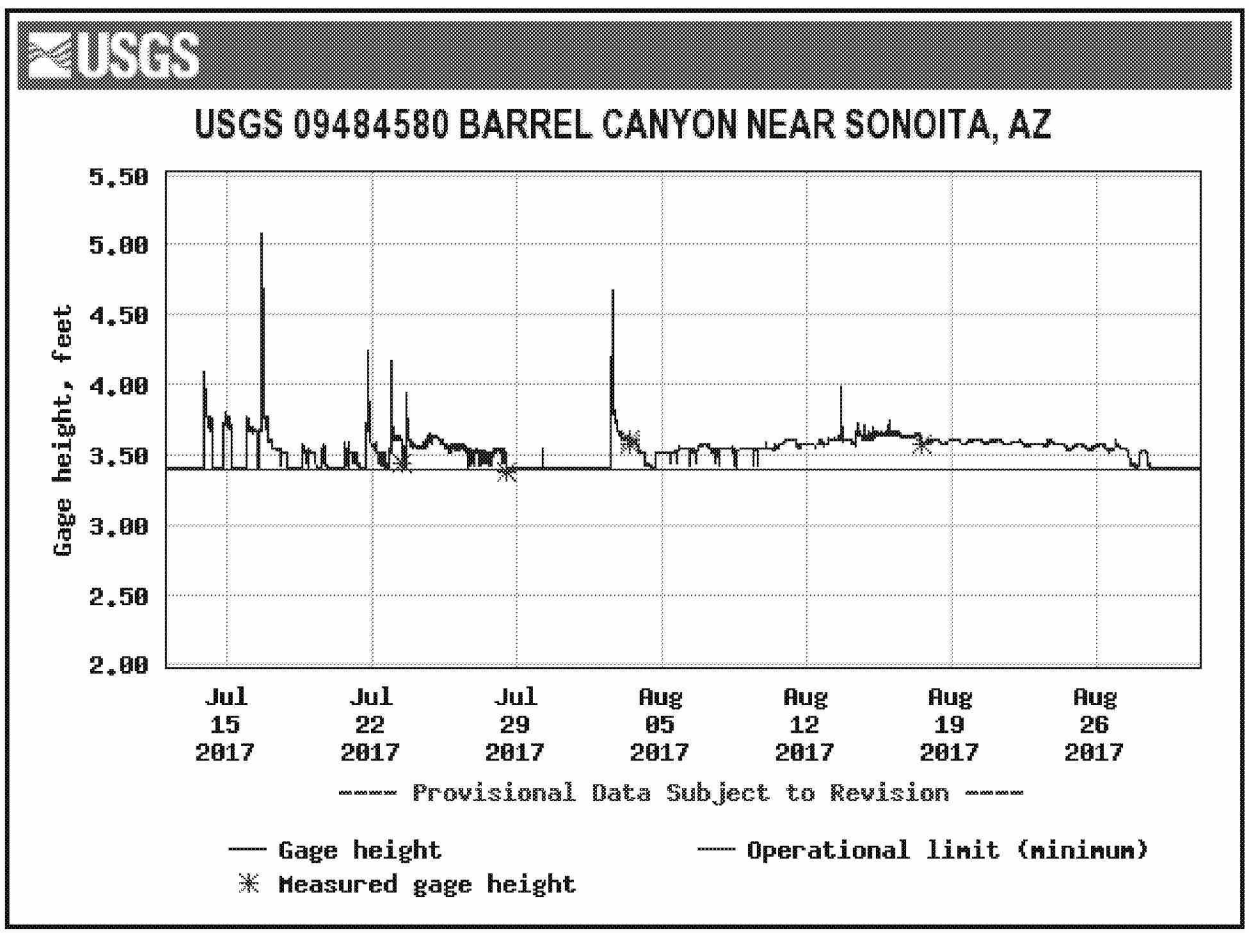

Figure 3. Peak and base flows in July and August 2017 at USGS gage 09484580. Base flows persisted long after the last measured rain at the gage (August 3, August 15).

Figure 4. Algae in water around the pressure transducer at the Barrel gage. Algae is not found in ephemeral systems, but rather is typical of intermittent and perennial streams. Also note that the base flow is clear and very small in comparison to storm flows. The most recent rainfall (0.01 inch) at this site fell on January 16, 2016. The actual photo date is 2016/01/25, based on the field data sheet, camera metadata and confirmation with USGS. USGS photograph.

A shallow water table appears to help sustain flows in this intermittent reach. Figure 5 shows bedrock exposures which help to bring groundwater to the surface. Repeated groundwater level measurements have been provided to the Forest Service by Hudbay (2015; Memorandum from Kathy Arnold to Karen Herther, "Water Quality/Water Level data for U. S. Forest Service") both upstream and downstream of the gage. Downstream of the gage, an unnamed well (D-18-16-14dac) shows measurements that fluctuated flow less than one to more than ten feet below land surface over the period 2008 to 2014. Upstream of the gage, groundwater levels in a monitoring well installed by Rosemont (located at D18-16-15dcc) fluctuated from two to three feet below land surface during 2013 and 2014. There is also a recorded spring downstream of the gage, called Barrel Spring.

Figure 5. This photograph (August 16, 2017), shows dry-weather flows continuing downstream across bedrock exposures in the bottom of Barrel Canyon, downstream of the stream gage. The gate under the culvert is opened to allow livestock to move safely under Highway 83.

The Clean Water Act Requires Protection of Existing Water Uses

The Rosemont area has been under continuous livestock use since the passage of the Clean Water Act. This is documented in the 1977 Draft Environmental Impact Statement, and the intention to continue livestock use is described in the 2013 FEIS. Intermittent flow conditions in McCleary and Barrel Canyons are an asset to the livestock operation and motivated previous owners of the Rosemont Ranch to acquire surface water rights to the spring-fed intermittent streams that exist on the Rosemont properties. For example, water right 33-93278 is a permit to use in-stream flow for livestock in McCleary Canyon, which is located..... According to the applicant

3. Point of diversion and 4. Places of use:

Water will not be diverted out of the natural channel. The use will occur streamside along the natural course of McCleary Canyon beginning at a point within the Southwest quarter (SW¼) of the Southwest quarter (SW¼) and ending at a point within the Southeast quarter (SE¼) of the Southwest quarter (SW¼), both within Section 19, Township 18 South, Range 16 East, Gila and Salt River Base and Meridian, Pima County, Arizona.

Under the State of Arizona's tributary rule, designated uses of the intermittent reaches do not currently acknowledge the livestock use and aquatic and wildlife (warm water). Despite that fact, under the Clean Water Act, the Corps and ADEQ each have an obligation to protect existing uses of the stream, whether or not those uses have been designated, and this would include livestock use and warm-water aquatic life for an intermittent stream segment such as exists along McCleary Canyon and Barrel Canyon.

Furthermore, ADEQ must ensure that the water quality standards that are adopted for upstream water bodies also provide for the attainment and maintenance of the water quality standards for downstream waters, as stated in R18-11-104F: *"In designating uses of a surface water and in establishing water quality criteria to protect the designated uses, the Director shall take into consideration the applicable water quality standards for downstream surface waters and shall ensure that the water quality standards that are established for an upstream surface water also provide for the attainment and maintenance of the water quality standards of downstream surface waters."*

To our knowledge, ADEQ has not evaluated the water quality impacts of releasing sediment from the proposed stock tank mitigation to downstream waters, nor has any data been provided to them to evaluate. This information would be needed relative to the state's duty to protect existing uses including livestock and warm-water aquatic wildlife in McCleary and Barrel Canyon and points downstream. Hudbay (2015) presented water quality data to the Forest Service highlighting where a dissolved or total metal concentration was higher than a water quality standard established for the watershed, even without consideration of the more stringent standards that should have included the livestock and aquatic warm-water uses of the stream. No analysis exists relative to the livestock and aquatic warm-water uses, which are generally more stringent.

Hudbay (2015) data show that under current conditions, which include numerous mining features and land disturbance upstream, base flows of springs are of good quality. Elevated levels of dissolved copper, and total lead and copper have been consistently observed in stormwater at monitoring site PSW-4. Upstream spring flow met the livestock standards (Tetra Tech memorandum dated May 5, 2009). Would release of stored sediment increase ambient metal concentrations? Further study is warranted before the state can draw a conclusion that existing uses will not be impaired by the dredge-and-fill activities upstream, which include the stock tank removals. The stock tanks in the upper McCleary watershed are located below old mining claims which were historically worked (Figure 1).

Furthermore, in evaluating the surface water mitigation plan, the Certification and the mining MSGP, ADEQ has not evaluated McCleary or Barrel Canyon using standards appropriate to intermittent flow. Instead, ADEQ relied on Rosemont's assertion that standards for ephemeral streams would be protective of the intermittent flow.

Multi-Sector General Permits and Aquifer Protection Permits Do Not Reduce the Risks

In their April 2017 presentation to the Corps regarding the Certification considerations, ADEQ said they considered the requirements of the Multi-Sector General Permits (MSGPs) and Aquifer Protection Permits issued by ADEQ when issuing the Certification.

The fact that stormwater is regulated under an MSGP does not lower the risk that this Certification presents. The MSGP permit is required because there are activities likely to cause a surface water quality problem that needs to be managed and tracked so ADEQ can verify Rosemont's practices will minimize impacts.

The Carlota mine, located on Forest Service land in Arizona, serves as an example of a modern mine with unanticipated releases of pollutants despite an MSGP. In 2010, ADEQ found that *"the facility's structural BMPs (i.e. terraced slopes and surface pipes to prevent slope saturation) ...were ineffective to prevent discharges....The facility also failed to design and implement a combination of erosion and sediment control BMPs to keep sediment in place and to capture sediment to the extent practicable before it leaves the site."* Despite the MSGP, the facility sent pollutants downstream (Attachment 7).

Similarly, should there be spills at the Rosemont Plant, they will be conveyed into the intermittent flow reach of McCleary Canyon unless the capacity of the Sediment Control structure no. 3 is sufficient to hold the material under remediation can occur. Rosemont does not propose to monitor stormwater at the McCleary Canyon Sediment Control structure as stated in their letter of May 22, 2015 to ADEQ.

We also note that the APP does not restrict discharges that might occur from regulated facilities during storm events in excess of the 10-year, 24-hour event, and it does not have provision for regulating concentrations of sulfate, total dissolved solids or copper in the aquifer.

Pima County sought to require Rosemont to bond for post-closure costs to ensure that funds are available in the event of a mine bankruptcy. Pima County also urged the state to seek a performance bond for reclaiming the dry stack tailings facility. Instead, ADEQ exercised its discretion to accept a surety bond based on a "closure strategy" instead of a detailed closure plan. Final closure plans and costs will be determined by the state only when Rosemont notifies ADEQ of its intent to close the mine, at which time there is no guarantee of fund availability. This is another risk factor which leaves existing uses vulnerable to impairment.

C. Comments about the Sonoita Creek and San Pedro ILF Mitigation

Overall, we continue to object to mitigation that occurs in a watershed outside of the watershed that will be directly impacted by the proposed mine. More specific comments are as follows:

Sonoita Creek project may be infeasible without utility approval

The feasibility of the Sonoita Creek mitigation project depends at least in part on an agreement to relocate a Kinder-Morgan gas pipeline. There is no agreement that relocation will proceed. Details regarding costs and performance standards have yet to be determined among Kinder Morgan, Rosemont and the U. S. Army Corps of Engineers. Given that there is no information provided about other utility easements which may burden the Sonoita Creek project area, ADEQ has no assurance that other utility constraints may also compromise the feasibility of this project.

No conservation partner to ensure site protection

Rosemont has not identified a conservation partner to hold and enforce a conservation easement. This project may be infeasible without a conservation partner to ensure site protection. The Arizona Game and Fish Commission have not agreed to hold the easement, despite Rosemont's previous efforts to come to an agreement with the Arizona Game and Fish Department. The Nature Conservancy has not agreed to hold the easement. The Corps and U. S. Fish and Wildlife will not hold the easement. Without a conservation partner, feasibility of this mitigation strategy is in question.

Hudbay recognizes that the restoration project on 'Sonoita Creek occupies a place on the landscape more similar to Cienega Creek than Barrel Canyon (7.1.2.1 p.41).'

As such it does not mitigate the same ecosystem function as the impacted WUS in Barrel Canyon and Wasp Canyon. The series of functions identified in 7.1.1.1, (such as surface water storage) are criteria better suited to Sonoita Creek and the San Pedro than the impacted WOTUS at Barrel Canyon and Wasp Canyon. In essence, by setting up the function criteria to match the mitigation site rather than the impacted site, Hudbay is avoiding the question of how to mitigate impacted ecosystem functions at the mine site.

The Walnut Gulch watershed is an inappropriate reference for Sonoita Creek channel design

The Walnut Gulch watershed is very different from Sonoita Creek. Sonoita Creek is a valley-floor drainage, whereas Walnut Gulch is not. Walnut Gulch is a non-phreatic stream network isolated from groundwater (Goodrich, D. C., D. G. Williams, C.L. Unkrich, J. F. Hogan, R.L. Scott, K. R. Hultine, D. R. Pool, A. L. Coes, and S. Miller [2004]. Comparison of methods to estimate ephemeral channel recharge, Walnut Gulch, San Pedro River Basin, Arizona, in *Groundwater Recharge in a Desert Environment:* The Southwestern United States, *Water*

Science and Appl. Ser., vol. 9, edited by J. F. Hogan, F.M. Phillips, and B. R. Scanlon, pp 77-99, AGU, Washington, D. C.). Sonoita Creek has a shallow water table and likely has significant riparian transpiration from groundwater. Walnut Gulch is not connected to higher elevation mountain blocks, whereas Sonoita Creek is highly connected to adjacent mountains. The focus on Walnut Gulch as a model for a reference reach makes little reference to observed historical information, such as the 1936 air photos, which may shed light on pre-development channel alignments of Sonoita Creek or nearby watersheds.

The San Pedro In Lieu Fee site is a dramatically different site than the impacted mine site. It has a much larger watershed than the impacted site has perennial flow, shallower slope.

Sincerely,

C.H. Huckelberry
County Administrator

CHH/

c: Carmine DeBonis, Deputy County Administrator for Public Works
Suzanne Shields, Director, Pima County Regional Flood Control District
Linda Mayro, Director, Office of Sustainability and Conservation
Julia Fonseca, Environmental Planning Manager, Office of Sustainability and Conservation

EARTHJUSTICE

By FED EX

November 28, 2017

Colonel D. Peter Helmlinger, Division Commander
South Pacific Division
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, CA 94103-1398

Re: Request for Government-to-Government Consultation Regarding Clean Water Act Section 404 Permit for the Rosemont Open Pit Copper Mine

Dear Colonel Helmlinger:

We write on behalf of the Tohono O'odham Nation (Nation) to request government-to-government consultation with the South Pacific Division regarding the Clean Water Act Section 404 Permit for the Rosemont Open Pit Copper Mine. The Nation has a deep cultural and spiritual connection to the lands that would be destroyed by the proposed Rosemont Mine. As Art Wilson, a Tohono O'odham Legislative Council member, movingly explained in the documentary film *Ours is the Land*:

> Our ancestors roamed in those areas and their bones are buried there and to us we consider those sacred places where our people have fallen and they left this world and went into the spirit world and we are taught not to bother them, to leave them alone.[1]

The Rosemont Mine would devastate this cultural landscape, causing "severe, irreversible, and irretrievable" impacts to the cultural identity of the Nation.[2]

The Los Angeles District issued a final decision in July of 2016 recommending denial of the 404 Permit. "The key CWA 404(b)(1) factors identified by the District that support a permit denial are determinations that the proposed Rosemont Mine will cause or contribute to violations of state water quality standards and significant degradation of waters of the United States,

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[1] *Ours is the Land* is available at https://vimeo.com/223976575. This short film was produced by the Nation and depicts in powerful detail the spiritual, cultural and physical connection of the Tohono O'odham people of Arizona to *Ce:wi Duag* or the Santa Rita Mountains, which is imperiled by the proposed creation of the mile-wide, half mile deep Rosemont open pit copper mine.

[2] Final Environmental Impact Statement for the Rosemont Copper Project 1036 (Dec. 2013) [hereinafter FEIS].

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including shortfalls in the proposed compensatory mitigation."[3] The District also concluded that the Habitat Mitigation and Monitoring Plan proposed by Hudbay would not offset the adverse impacts of the mine on aquatic ecosystems. Finally, the district concluded that implementation of the proposed project would be contrary to the public interest. "Among the key public interest concerns are adverse affects to cultural resources and traditional cultural properties important to tribes."[4] The South Pacific Division is currently reviewing the Los Angeles District's decision and recommendation.

In our prior letter sent on November 8, 2017, we summarized the Corps' obligation to engage in consultation with the Nation before a decision is made by the South Pacific Division regarding the 404 Permit for the Rosemont Mine. We also summarized the Nation's significant concerns with the proposed Rosemont Mine. We expand on each of these points in this letter.

The Corps must engage in government-to-government consultation with the Nation to address new undertakings and elements of the Rosemont Mine that have yet to be considered by the Corps. During the preparation of the FEIS, the Forest Service led the consultation process with tribal nations, but consistently refused to acknowledge the full scope of its authority to regulate the proposed mine, and even deny the permit on unpatented claims, to protect the Nation's cultural and religious interests. This self-imposed limitation resulted in a truncated consultation under the National Historic Preservation Act (NHPA). Moreover, the Forest Service terminated the consultation in 2013, leaving a gap in the consultation process during the Corps' Section 404 review. The Corps must consult with the Nation regarding its ongoing review of the permit, including all of the reasons articulated in the Los Angeles District's decision recommending denial of the permit.

The Corps may not issue a permit without a full analysis of the impacts of the Rosemont Mine on waters of the United States. To date, the Corps has refused to analyze or disclose to the public the effects of mine-driven groundwater drawdown on hydrologically-connected waters of the United States. These impacts fall within the Corps' regulatory jurisdiction and must be analyzed to comply with the Clean Water Act and reach an informed decision under the National Environmental Policy Act (NEPA). The Corps must therefore prepare a supplemental Environmental Impact Statement (EIS) analyzing the impacts of mine-driven groundwater drawdown. Pursuant to its NEPA regulations, the Corps must provide the public with a draft supplemental EIS and a meaningful opportunity to submit public comments.

The Corps cannot issue a decision approving the Rosemont Mine until it has complied with these procedural obligations. Indeed, there is no need to rush ahead without the requisite analysis as Hudbay has consistently set aside the Rosemont Mine for future development when

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[3] Letter from Colonel Helmlinger, U.S. Army Corps of Engineers, to Patrick Merrin, Hudbay 1 (Dec. 28, 2016) (summarizing Los Angeles District's decision), attached as Ex. 1 [hereinafter Helmlinger Letter].
[4] *Id.* at 2.

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"market conditions [] improve."[5] The Corps must therefore take a hard look at the full impacts of the Rosemont mine on jurisdictional waters of the United States before it makes any decision.

In addition to these procedural flaws, the Corps must deny the 404 Permit for four substantive reasons. First, the 404 Permit must be denied because the Rosemont Mine will cause significant degradation to waters of the United States. The Los Angeles District determined that the project would contribute to degradation of Outstanding Arizona Waters and, among other things, adversely affect sediment delivery, hydrological functions, surface water quality, and use by wildlife and humans. The mine will also significantly adversely affect the life stages of aquatic life as well as the diversity, productivity, and stability of the aquatic ecosystem.

Second, the Rosemont Mine fails to include all appropriate and practicable measures to minimize potential harm to aquatic ecosystems. Hudbay Minerals Inc. (Hudbay) has submitted multiple Habitat Mitigation and Monitoring Plans (HMMPs), all of which are insufficient to compensate for aquatic resource functions that will be lost as a result of the Rosemont Mine. The most recent HMMP, submitted in September of 2017, is wholly inadequate and will cause even greater harm to the environment than Hudbay's prior HMMP, which the Los Angeles District found insufficient.

Third, Hudbay has not clearly demonstrated that Rosemont Mine is the least environmentally damaging practicable alternative. The Corps may not, therefore, issue the permit.

Fourth, issuing a 404 Permit would be contrary to the public interest, as recognized by the Los Angeles District. One of the key factors militating against issuance of a permit is the significant, permanent, and adverse impacts of the Rosemont Mine on tribal cultural properties and sacred sites. The mine will also cause substantial impacts to wetlands; violate state water quality standards; adversely affect fish and wildlife; irreversibly impact aesthetic, scenic, and recreational values; burden the federal government's property rights; and fail to mitigate permanent impacts to the aquatic ecosystem, fish and wildlife, and tribal cultural properties. All of these factors require denial of the 404 Permit as contrary to the public interest.

BACKGROUND

Hudbay proposes to develop an open pit copper mine in a high-functioning, undisturbed landscape just below the ridgeline of the Santa Rita Mountains. Mine operations would disturb approximately 5,431 acres of habitat.[6] Hudbay would excavate approximately 1.2 billion tons of material from the earth through a combination of blasting, drilling, and excavation. These activities would create a mile-wide by half-mile deep mine pit.[7] Hudbay would dispose of waste

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[5] *See* http://www.rosemontminetruth.com/hudbays-debt-low-copper-prices-puts-rosemont-on-back-burner/ (last visited Nov. 27, 2017).

[6] Record of Decision Rosemont Copper Project and Amendment of the Coronado Land and Resource Management Plan 17 (June 2017) [hereinafter ROD].

[7] Final Biological and Conference Opinion for the Rosemont Copper Mine 19 [hereinafter 2013 BiOp].

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materials on National Forest System Lands in waste rock storage areas and dry stack tailings piles that occupy upper Barrel, Trail, and Wasp Canyons.

The mine would impact high-functioning, unique, and outstanding aquatic resources within the region. Construction of the mine pit and waste piles would destroy approximately 40 acres of waters of the United States, including a largely undisturbed network of streams comprised of up to 154 drainages.[8] These facilities would reduce surface runoff into Barrel Canyon, indirectly impacting an additional 28.4 acres of waters of the United States located downstream from the mine.[9]

Construction of the mine will also result in a pit lake that acts like a hydraulic sink, drawing groundwater into the pit lake into perpetuity.[10] These groundwater resources would then be permanently lost through evaporation.[11] As a result of this process, the mine pit will dewater the regional aquifer, effecting hundreds of acres of hydrologically connected riparian habitat and wetlands in Empire Gulch, Davidson Canyon, Cienega Creek, and around associated seeps and springs. Many of these riparian areas likely qualify as waters of the United States.[12]

In addition to impacts to waters of the United States, the mine would likely violate water quality standards in downstream Outstanding Arizona Waters (OAWs). The State of Arizona designated portions of Davidson Canyon and Cienega Creek as OAWs due to their perennial nature and exceptional ecological and recreational significance.[13] The Rosemont Mine will curtail water inputs (e.g., stormwater runoff and baseflows) to Davidson Canyon, thereby reducing the assimilative capacity and geomorphology of downstream OAWs.[14] Mine-driven dewatering of the regional aquifer will exacerbate these impacts to OAWs. Dewatering will also cause Empire Gulch to transition from a hydroriparian to xeroriparian corridor,[15] violating Arizona's perennial/wadeable standard.

The EPA repeatedly objected to the project on the grounds that the mine would significantly degrade waters of the United States and violate state water quality standards.[16]

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[8] FEIS at 463.
[9] *Id.*
[10] *Id.* at 339.
[11] *Id.* at 353.
[12] Letter from Jane Diamond, Environmental Protection Agency to Colonel Colloton, U.S. Army (Nov. 7, 2013), attached as Ex. 2 [hereinafter EPA Mitigation Letter].
[13] FEIS at 453; *see also id.* at 411 Fig. 62 (Outstanding Arizona Waters and stock tanks).
[14] Letter from Jared Blumenfeld, EPA Region IX, to Colonel Colloton, U.S. Army Corps of Engineers (Apr. 14, 2015), enclosing EPA Region 9 comments on the Draft Section 401 Water Quality Certification for the Rosemont Copper Project dated February 21, 2014 (Draft 401 Certification), and the Basis for State 401 Certification Decision Rosemont Copper Project ACOE Application No. SPL-2008-00816-MB, 3, attached as Ex. 3 [hereinafter EPA 401 Letter]
[15] FEIS at 528.
[16] *See* EPA 401 Letter, Ex. 3.

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Furthermore, EPA repeatedly objected to the mitigation measures proposed by Hudbay, finding they were inadequate to compensate for the adverse effects of the mine.[17]

The Nation objected to the severe, adverse, and permanent impacts of the Rosemont Mine on Traditional Cultural Properties. The Nation documented its spiritual connection to the lands underlying the mine site, including *Ce;wi Duag*.[18] The Tribe repeatedly voiced its concerns that the magnitude of impacts caused by the mine could not be mitigated. Throughout the consultation process, however, the Forest Service took the unfounded position that it lacked the authority to deny mining activities on unpatented lands surrounding the open pit. The Forest Service terminated the consultation process in October of 2013 by signing a Memorandum of Understanding and subsequently signed a Record of Decision on June 6, 2017 approving the Barrel Alternative.

On July 25, 2016, the Los Angeles District issued a final decision recommending denial of the 404 Permit. The District found that the Rosemont Mine would significantly degrade waters of the United States and that Hudbay had failed to adequately mitigate the adverse impacts of the mine on aquatic ecosystems. Furthermore, the district concluded that implementation of the proposed project would be contrary to the public interest. The South Pacific Division is currently reviewing the District's decision recommending denial of the permit.[19]

As part of its review, the South Pacific Division invited Hudbay to respond to the Los Angeles District's denial of the permit.[20] Hudbay submitted a new HMMP in September of 2017.[21] The HMMP proposes to mitigate the direct impacts of the mine on waters of the United States by filling an additional 8.9 acres of waters of the United States along Sonoita Creek. The proposal makes no effort to mitigate the indirect impacts of the Rosemont Mine on waters of the United States. Due to the proposed destruction of Sonoita Creek, Hudbay submitted an addendum to the Arizona Department of Environmental Quality (ADEQ) for its Clean Water Act Section 401 Water Quality Certification. It has yet to request an addendum to its 404 Permit application.

ANALYSIS

I. The Corps Must Consult with the Nation to Comply with the NHPA.

The Corps should engage in government-to-government consultation with the Nation so that it can reach an informed decision about the severe and irreversible impacts of the Rosemont

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[17] EPA Mitigation Letter, Ex. 2 at 2; *Id.* at Attachment 2 (EPA Letter to Corps Los Angeles District dated January 25, 2013).
[18] Tohono O'odham Nation, Objection to Rosemont Copper Project Final Environmental Impact Statement and Proposed Record of Decision (Feb. 14, 2014), attached as Ex. 4 (hereinafter Nation's Objection].
[19] Helmlinger Letter, Ex. 1.
[20] *Id.*
[21] Final Habitat Mitigation and Monitoring Plan (September 12, 2017) [hereinafter 2017 HMMP].

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Mine on sacred properties and sites. The Corps must engage in government-to-government consultation with the Nation to address new undertakings and unconsidered elements of the Rosemont Mine. And the Corps may not defer to the Forest Service's prior consultation with the Nation, which was fundamentally flawed and unilaterally terminated by the Forest Service with the October 22, 2013 Memorandum of Agreement.

Section 106 of the NHPA imposes an obligation on federal agencies to consult with tribal nations *before* a decision is made on a federal undertaking. *See Muckleshoot Indian Tribe v. U.S. Forest Serv.*, 177 F.3d 800, 805 (9th Cir. 1999) ("Section 106 of NHPA is a 'stop, look, and listen' provision that requires each federal agency to consider the effects of its programs."). The purpose of consultation with Indian tribes under the NHPA is "to ensure that all types of historic properties and all public interests in such properties are given due consideration." *Te-Moak Tribe v. U.S. Dep't of Interior*, 608 F.3d 592, 609 (9th Cir. 2010). Courts routinely set aside agency decisions that fail to comply with the NHPA and its implementing regulations. *See Pit River Tribe v. U.S. Forest Serv.*, 469 F.3d 768, 787 (9th Cir. 2006) (reversing summary judgment in favor of Government, and ordering summary judgment in favor of tribe, in part because it was "undisputed that no consultation or consideration of historical sites occurred").

The Corps should consult with the Nation so that it can reach an informed decision about the impacts of the Rosemont Mine on the public interest, as required by the Clean Water Act. A "[f]ull evaluation of the general public interest requires" the Corps to give "due consideration" to archaeological resources, "including Indian religious or cultural sites." 33 C.F.R. § 320.4(e). This analysis is essential in this case due to the profound and permanent effects of the Rosemont Mine on the Nation, as discussed in greater detail below. Consultation with the Nation ensures that the South Pacific Division is fully informed about the breadth and depth of impacts to the Nation's cultural identity, which warrant denial of the 404 Permit. *See Muckleshoot Indian Tribe*, 177 F.3d at 805 (a federal agency must make a "reasonable and good faith effort" to identify historic properties, assess the effects of the undertaking on any eligible historic properties found, determine whether the effect will be adverse, and avoid or mitigate any adverse effects). Indeed, the Corp's Tribal Consultation Policy recognizes the need for "leader to leader" meetings, which is especially appropriate here given the substantial, and indeed eternal, impacts of the Rosemont Mine on cultural and traditional properties. [22]

The Corps must consult with the Nation regarding new undertakings that have been proposed since the Forest Service terminated consultation in 2013. In particular, Hudbay submitted a HMMP to the Corps in September of 2017 that purports to mitigate the impacts of the Rosemont Mine on waters of the United States, and does so by destroying additional waters of the United States. This is a dubious proposition, and one that is entirely inadequate, as discussed below. It also constitutes a new "undertaking" within the meaning of the NHPA as Hudbay is now requesting a 404 Permit to fill an additional 8.9 acres of waters of the United States. *See* 36 C.F.R. 800.16(y) ("Undertaking means a project, activity, or program . . . requiring a Federal Permit, license, or approval.").

The Corps must also consult with the Nation regarding unconsidered elements of the Rosemont Mine. "[I]f a project has previously satisfied the § 106 process, then nothing would be

[22] *See* U.S. Army Corps of Engineers Tribal Consultation Policy § 5(c)(3)(2012).

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gained by further review if there are no new, unconsidered elements presented by the project." *McMillan Park Comm. v. Nat'l Capital Planning Comm'n*, 968 F.2d 1283, 1288 (D.C. Cir. 1992). Conversely, consultation is required where there are new, unconsidered elements presented by the project. Here, there are at least three elements of the Rosemont Mine that were not considered in the prior consultation process.

First, during the prior consultation, the Forest Service refused to consider the no action alternative (denying the mining plan of operations), taking the unfounded position that it lacked the authority to deny mining activities on unpatented lands surrounding the open pit. This self-imposed limitation resulted in a truncated review under NEPA and skewed the consultation under the NHPA. There is no dispute the Corps has the authority to deny the permit, and the Los Angeles District recommended denial of the permit based on multiple violations of the Clean Water Act and the Corps' public interest requirements. The Nation is entitled to a reasonable and good-faith consultation with the Corps on the need to deny the permit for all of the reasons set forth in the Los Angeles District's decision.

Second, the Nation is entitled to consultation with the Corps regarding alternatives to the Rosemont Mine that were not considered in the prior consultation. *See* 36 C.F.R. § 800.1(c)(the purpose of consultation is to ensure "that a broad range of alternatives may be considered during the planning process for the undertaking."). As explained in greater detail below, the Corps rejected a number of off-site alternatives to the Rosemont Mine based on an analysis of Augusta Resources' acquisition of the mine in 2007 and its limited capitalization ($37 million dollars). Hudbay subsequently acquired the mine in July of 2014 and has a market capitalization of $1.5 billion. The Corps must consult with the Nation regarding practicable alternatives to the Rosemont Mine, including investment options elsewhere, that reduce impacts to cultural resources.

Third, the Corps must consult with the Nation regarding fundamental changes in the Fish and Wildlife Service's (FWS) Biological Opinion. In multiple prior drafts of the Biological Opinion, the FWS took the position that the Rosemont Mine would adversely modify critical habitat for the jaguar, a species sacred to the Nation. The FWS reversed course on these findings in its October 30, 2013 Biological Opinion based on an impermissible interpretation of the Endangered Species Act.[23] The FWS thus refused to require any reasonably prudent alternatives to offset the adverse modification of critical habitat on the conservation of the species. Consultation is required to address these unconsidered elements of the project, which would minimize impacts to the Corp's cultural and religious beliefs.

The Corps may not escape its obligation to consult with the Nation with respect to the 404 Permit by claiming that the Forest Service is the lead federal agency on this project. The Forest Service is not an appropriate lead for consultation because it is laboring under the false impression that it must approve the mine plan of opertations. In addition, the Forest Service concluded the consultation process in October of 2013 by signing a Memorandum of Understanding, despite the Nation's objections. Finally, the Forest Service has already issued a record of decision approving the mine, and thus is not in a position to consult with the Nation *before* a decision is made.

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[23] 2013 BiOp at 146.

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On a final note, the South Pacific Division has been in close communication with Hudbay regarding the Los Angeles District's decision recommending denial of the permit. The Division selectively requested Hudbay's opinion on the Los Angeles District's decision and offered to provide the company with advance notice of any forthcoming permit decision.[24] This continuing conversation concerns the Nation as it raises the specter of a biased decision by the Division based on one-sided information, despite the Corps' obligation to consult with the Nation about the significant, adverse, and permanent impacts of the proposed mine on the Nation's cultural, historical, and religious beliefs.

For these reasons, the Nation respectfully requests full, comprehensive consultation with Colonel Helmlinger before any decision is made. This process is necessary to comply with the requirements of the NHPA and the Corps' Tribal Consultation Policy.

II. The Corps Must Analyze the Secondary Effects of the Project on Waters of the United States to Comply with the Clean Water Act and NEPA.

The proposed Rosemont Mine will result in a mile-wide by half-mile deep open pit that would act like a huge groundwater sink. The best available groundwater models demonstrate that this hydraulic sink will dewater the regional aquifer, indirectly impacting hydrologically connected surface waters of the United States. The Corps must undertake a full analysis of these impacts in a supplemental EIS to comply with its obligations under the Clean Water Act and NEPA.

A. The Corps Must Evaluate Impacts to Hydrologically Connected Groundwater to Comply with the Clean Water Act.

The Corps has jurisdiction under the Clean Water Act to regulate impacts to groundwater that are hydrologically connected to surface waters of the United States. The best available data establishes a connection between the regional aquifer underlying the Rosemont Mine and surface flows along Empire Gulch, Davidson Canyon, Cienega Creek, and multiple seeps, springs, and wetlands in the area. At least a subset of these riparian areas likely qualifies as waters of the United States. Accordingly, the Corps must fully analyze the indirect effects of the Rosemont Mine on these jurisdictional waters of the United States.

i. The Corps Must Regulate Impacts to Hydrologically Connected Groundwater.

Congress enacted the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." 33 U.S.C. § 1251(a); *see also* 40 C.F.R. § 230.1. Section 404 of the act prohibits the discharge of dredged or fill material into waters of the United States without a permit from Corps. *See* 33 U.S.C. § 1344(a). The 404(b)(1) Guidelines prohibit the Corps from issuing a permit if it "will cause or contribute to significant degradation of the waters of the United States." 40 C.F.R. § 230.10(c).

Multiple courts have held that the Clean Water Act extends federal jurisdiction to impacts on groundwaters that are hydrologically connected to surface waters of the United States. *See,*

[24] Helmlinger Letter, Ex. 1 at 1.

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e.g., *Hawai'i Wildlife Fund v. Cty. of Maui*, 24 F. Supp. 3d 980, 995 (D. Haw. 2014) (inferring "that Congress sought to include sufficiently 'confined and discrete' groundwater conduits as 'point sources' under the Act"); *Nw. Envtl. Def. Ctr. v. Grabhorn, Inc.*, No. CV–08–548–ST, 2009 WL 3672895, at *11 (D. Or. Oct. 30, 2009) (concluding, in light of the EPA's regulatory pronouncements, that "the CWA covers discharges to navigable surface waters via hydrologically connected groundwater"); *Idaho Rural Council v. Bosma*, 143 F.Supp.2d 1169, 1180 (D. Idaho 2001) (finding that "the CWA extends federal jurisdiction over groundwater that is hydrologically connected to surface waters that are themselves waters of the United States"); *Wash. Wilderness Coal. v. Hecla Mining Co.*, 870 F. Supp. 983, 990 (E.D. Wash. 1994) (reasoning that "since the goal of the CWA is to protect the quality of surface waters, any pollutant which enters such waters, whether directly or through groundwater, is subject to regulation by NPDES permit"); *Yadkin Riverkeeper, Inc. v. Duke Energy Carolinas, LLC*, 141 F. Supp. 3d 428, 444 (M.D.N.C. 2015) ("affirming CWA jurisdiction over the discharge of pollutants to navigable surface waters via hydrologically connected groundwater, which serves as a conduit between the point source and the navigable waters."); *Hernandez v. Esso Standard Oil Co. (P.R.)*, 599 F.Supp.2d 175, 181 (D.P.R. 2009) (holding that "the CWA extends federal jurisdiction over groundwater that is hydrologically connected to surface waters that are themselves waters of the United States"); *Williams Pipe Line Co. v. Bayer Corp.*, 964 F. Supp. 1300, 1319 (S.D. Iowa 1997) (observing that "[t]he majority of courts have held that groundwaters that are hydrologically connected to surface waters are regulated waters of the United States, and that unpermitted discharges into such groundwaters are prohibited under section 1311"); *Sierra Club v. Colorado Refining Co.*, 838 F.Supp. 1428 (D. Colo. 1993) ("discharge of any pollutant into 'navigable waters' includes such discharge which reaches 'navigable waters' through groundwater"). These cases stand for the proposition that the Corps can and must regulate the discharge of fill material that degrades surface waters of the United States via hydrologically connected groundwater.

Before issuing a 404 permit, the Corps must determine whether groundwaters are hydrologically connected to surface waters and if so, whether impacts to those groundwaters from the discharge of fill material comply with the Clean Water Act. For example, in *Town of Norfolk v. United States Army Corps of Engineers*, 968 F.2d 1438 (1st Cir. 1992), the court held that "[a]lthough other courts have questioned whether the term 'waters of the United States' should include groundwaters connected to surface waters—we agree with the Corps that since such a determination ultimately involves an ecological judgment about the relationship between surface waters and groundwaters, it should be left in the first instance to the discretion of the EPA and the Corps." *Id.* at 1451 (citations omitted).

The 404(b)(1) Guidelines confirm the Corps' duty to consider the indirect effects of a project on hydrologically connected groundwater. Section 230.11 requires the Corps to analyze "the potential short-term or long-term effects of a proposed discharge of dredged or fill material," including secondary (indirect) effects. *Id.* § 230.11. Secondary effects are defined as "effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material." *Id.* § 230.11(h)(1). Dewatering of a groundwater aquifer that impacts hydrologically connected surface waters of the United States meets the definition of secondary or indirect effects. *See, e.g.*, *Riverside Irr. Dist. v. Andrews*, 758 F.2d 508, 512 (10th Cir. 1985) ("[T]he depletion of water is an indirect effect of

ED_002020B_00040140-00080

the discharge, in that it results from the increased consumptive use of water facilitated by the discharge.").

Impacts to groundwater are not categorically excluded from regulation under Section 404 of the Clean Water Act. Some courts have declined to exercise jurisdiction over hydrologically connected groundwater claims "under the theory that the groundwater is not *itself* 'water of the United States.'" *Hawai'i Wildlife Fund*, 24 F.Supp.3d at 996 (pondering that the split in authority "may largely flow from a lack of clarity by courts as to whether they are determining that groundwater itself may or may not be regulated under the Clean Water Act or are determining that groundwater may or may not be regulated when it serves as a conduit to water that is indeed regulated"); *see, e.g., Cape Fear River Watch v. Duke Energy Progress, Inc.*, 25 F.Supp.3d 798, 810 (E.D.N.C. 2014); *Umatilla*, 962 F. Supp. at 1320. But the relevant issue is not whether groundwater itself qualifies as a water of the United States; rather, the issue is whether impacts to groundwater adversely affect hydrologically connected surface waters of the United States and thus must be regulated under the Clean Water Act.

Other courts have reasoned that Congress decided not to attempt the general regulation of discharges to groundwater when it enacted the Clean Water Act. *See Village of Oconomowoc Lake v. Dayton Hudson Corp.*, 24 F.3d 962, 965–66 (7th Cir. 1994). But "the decision not to comprehensively regulate groundwater as part of the [Clean Water Act] does not require the conclusion that Congress intended to exempt groundwater from all regulation, particularly when the introduction of pollutants into the groundwater adversely affects adjoining river surface water." *Hernandez*, 599 F. Supp. 2d at 181. Indeed, excluding impacts to hydrologically connected groundwater leads to absurd results, as persuasively explained by one court:

> [I]t would hardly make sense for the CWA to encompass a polluter who discharges pollutants via a pipe running from the factory directly to the riverbank, but not a polluter who dumps the same pollutants into a man-made settling basin some distance short of the river and then allows the pollutants to seep into the river via the groundwater.

N. Cal. River Watch v. Mercer Fraser Co., No. C–04–4620 SC, 2005 WL 2122052, at *2 (N.D. Cal. Sept. 1, 2005). The same logic applies to the discharge of fill material that impacts surface waters of the United States, whether those impacts occur directly or indirectly via hydrologically connected groundwater. Indeed, given that the goal of the Clean Water Act is to protect the quality of the nation's waters, the Corps must analyze impacts to groundwater where those impacts indirectly result in an adverse effect to surface waters of the United States.

ii. <u>The Best Available Data Establishes a Hydrologic Connection Between the Regional Aquifer and Surface Waters of the United States.</u>

There is no clear test for determining whether groundwaters are hydrologically connected to surface waters of the United States. Rather, this is an "ecological judgment" that must be made based on the available evidence in the record. *Town of Norfolk*, 968 F.2d at 1451. Here, multiple lines of evidence establish a hydrological connection between the regional aquifer and Empire Gulch, Davidson Canyon, Cienega Creek, and seeps, springs and wetlands in the area.

ED_002020B_00040140-00081

At the most fundamental level, the persistence of these streams, seeps, springs, and wetlands "suggests there is some hydraulic connection to a larger regional source of water."[25] For example, the presence of the surface flows along upper Empire Gulch, in an area where most drainages at similar elevations are ephemeral without spring flow, "suggests there is indeed a unique connection to the regional aquifer at this location," as recognized by Hudbay's own contractor.[26] Likewise, experts have recognized that the shallow alluvial aquifer supporting surface flows along Cienega Creek "likely is recharged by multiple sources of water, including a hydraulic connection with the regional aquifer and periodic recharge by storm flows."[27] Long-term observations confirm a hydrological connection between the regional aquifer and multiple springs and seeps in the area. The Forest Service monitored 23 springs over several years and different seasons, concluding that "10 of these were found to be perennial springs likely tied to the regional aquifer."[28]

Isotopic testing of water samples further establishes the presence of a hydrological connection between surface flows and the regional aquifer for these streams, seeps, and springs. "[I]sotopic signatures suggest – like many of the water sources in the area – that a mix of both regional and local water sources supports Upper Empire Gulch Springs."[29] The same holds true for Davidson Canyon, where recent natural tracer studies demonstrate that baseflows contain a mixture of winter and summer recharge, as well as a mixture of old and young water.[30] These results further establish a connection between baseflows along Davidson Canyon and the regional aquifer. Finally, isotopic tests for seeps and springs in the area also "suggest a variety of water sources from both the regional aquifer and more localized sources," further confirming a hydrological connection.[31] In fact, "Questa Spring exhibited a signature that suggests a strong regional source of water."[32]

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[25] Supplemental Information Report Rosemont Copper Project 68 (Rev. June 2015) [hereinafter June SIR].
[26] *Id.* at 71
[27] Amended Final Reinitiated Biological and Conference Opinion for the Rosemont Copper Mine, Pima County, Arizona (April 28, 2016) at 272 [hereinafter Am. BiOp]. In addition to the impacts of groundwater drawdown from the open pit, Cienega Creek is also impacted by the reduction in contributing surface flows from upstream tributaries like Empire Gulch. *Id.* These flow losses would then propagate downstream through the alluvial system, further establishing the indirect effects of groundwater drawdown on surface waters of the United States.
[28] FEIS at 492.
[29] June SIR at 71; *see also* Letter from Dr. Jennifer McIntosh to Kerwin Dewberry (June 1, 2017), attached as Ex. 5.
[30] Letter from Huckleberry, C.H. to Colonel Helmlinger, Attachment 5 at 1-2 (June 6, 2017).
[31] FEIS at 493. *See also* Tetra Tech, 2010, Davidson Canyon hydrogeologic conceptual model and assessment of spring impacts, Rosemont Copper Project; unpublished report prepared for Rosemont Copper Company, July 2010 (documenting wells and springs in the upper reaches of Davidson Canyon with isotopic values indicating that winter recharge from precipitation is a significant source of water; this suggests that the regional aquifer is a significant component of the surface flows); Letter from Pima County Administrator's Office to Robert Scalamera, Project Manager, Arizona Department of Environmental Quality (ADEQ) (April 4, 2014).
[32] FEIS at 493.

ED_002020B_00040140-00082

Powell *et al.* (2014) quantified the relationship between surface flows along Davidson Canyon and groundwater levels.[33] They modeled the depth of water in wells, baseflow and total length of streamflows at two sites along Cienega Creek and Davidson Canyon. The results of this statistical analysis "provide very convincing evidence" of hydrological connectivity between Davidson Canyon, Cienega Creek, and the regional aquifer.[34]

By contrast, there is no data clearly ruling out a hydrological connection between the regional aquifer and upper Empire Gulch, Cienega Creek, Davidson Canyon, or numerous seeps, springs, and wetlands in the area.[35] The FEIS reasoned that Davidson Canyon may not be connected to the regional aquifer based on various assumptions made by Tetra Tech in 2010.[36] But Powell *et al.* (2014) demonstrated the clear errors in this analysis.[37] Furthermore, the FEIS did not consider new isotopic tracer samples establishing connectivity between Davidson Canyon and the regional aquifer.[38]

iii. The Rosemont Mine Will Dewater the Regional Aquifer, Impacting Hydrologically Connected Surface Waters of the United States.

The Forest Service developed and refined three groundwater models to assess the impacts of the open pit on surface and subsurface flows downstream from the mine. These "groundwater models remain the best available science for predicting theoretical impacts to a complex hydrological system."[39]

All of the models demonstrate that the open pit will deplete surface flows along Empire Gulch, negatively impacting associated wetlands and riparian habitat.[40] The best-fit modeling scenarios predict a shift from perennial to intermittent in Empire Gulch between 50 to 300 years

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[33] Powell, B., *et al.* Impacts of the Rosemont Mine on Hydrology and Threatened and Endangered Species of the Cienega Creek Natural Preserve (July 14, 2014).
[34] *Id.* at 11. Additionally, the work of Montgomery and Associates (2010) supports a connection to the regional aquifer in lower Davidson Canyon. *See* Montgomery and Associates Inc. 2010. Revised report: Groundwater flow modeling conducted for simulation of proposed Rosemont pit dewatering and post-closure, Vol. 1: Text and tables. Prepared for Rosemont Copper. Tucson, Arizona. The model produced results for both discharge and streamflow length that approximately matches past observations of flows and the extent of the Davidson perennial reach. If the regional aquifer was disconnected from the perennial reach, or so far below it that it does not impact surface flows, then one would expect that to be reflected in the model simulation showing a dry reach. It does not, confirming the connectivity between the regional aquifer and lower Davidson Canyon.
[35] Tetra Tech, 2010, Davidson Canyon hydrogeologic conceptual model and assessment of spring impacts, Rosemont Copper Project; unpublished report prepared for Rosemont Copper Company, July 2010.
[36] FEIS at 536.
[37] Powell *et al.* (2014).
[38] *See* Letter from Huckleberry, C.H. to Colonel Helmlinger, Attachment 5 at 1-2 (June 6, 2017); *see also* McIntosh Letter, Ex. 5.
[39] June SIR at 60.
[40] FEIS at 528.

after mine closure. The worst-case scenarios have this shift occurring as early as 20 years after mine closure. Ultimately, Empire Gulch will transition from a perennial to ephemeral spring, losing all or most of its pools and riparian vegetation.[41] Thus, while "[a]n important question for [Empire Gulch] is how early predicted effects could occur,"[42] the level of drawdown is "within the ability of the models to accurately predict."[43]

The groundwater models also predict impacts to surface flows along Cienega Creek caused by mine-driven groundwater drawdown, especially when considered in combination with the lack of contributing flow from upper Empire Gulch and the exacerbating impacts of climate change. Currently, dry conditions only occur 3 days per year along Cienega Creek, and low-flow conditions only occur 4 days per year.[44] Near term impacts from the mine (within 50-years), however, could result in 141 low-flow days per year, nearly half the time. Long-term impacts are even more severe, potentially leading to a dry stream 351 days per year.[45] When these indirect effects are superimposed on top of climate change and reduced flows from upper Empire Gulch, the mine drawdown changes flow status from perennial to intermittent for at least two reaches of Cienega Creek, totaling 1.1 miles of perennial stream that supports at least 20 pools.[46] As discussed in greater detail below, these drawdowns will significantly impair the aquatic ecosystem.

Groundwater impacts to Davidson Canyon also would be noticeable, significant, and adverse. In the near term, the highest estimates predict that groundwater drawdown could likely cause widespread absence of surface flows for large portions of the year.[47] For example, Dr. Myers estimated the potential reduction in discharge as a result of drawdown in the regional aquifer to be 6.4 percent.[48] The best fit models over the longer term corroborate these impacts, concluding that there would be noticeable reductions in stream sections.[49]

There is a high probability that groundwater drawdown will severely impair 10 springs within the analysis area (in addition to seven springs directly impacted by the footprint of the mine).[50] An additional 59 springs could be impacted by reductions in groundwater flows as they lie within the area expected to see groundwater drawdown of at least five feet.[51] Riparian habitats adjacent to these springs would be adversely impacted with similar degrees of certainty.[52]

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[41] June SIR at 140. *See also id.* at 61 (Table 6. Summary of stream flow analysis in FEIS).
[42] *Id.* at 131.
[43] FEIS at 528.
[44] FEIS at 531.
[45] *Id.* at 532.
[46] June SIR at 139.
[47] FEIS at 537.
[48] *Id.* at 355.
[49] *Id.* at 537.
[50] *Id.* at 562.
[51] *Id.*
[52] *Id.*

The Corps must consider the impacts of the open pit on the regional aquifer because they adversely affect surface waters of the United States. *See Mingo Logan Coal Co. Inc. v. U.S. Envtl. Prot. Agency*, 70 F. Supp. 3d 151, 178–79 (D.D.C. 2014) (An agency's analysis of secondary effects "should not be limited in geographic scope as long as it can connect the identified adverse effects to the upstream discharge.").

Multiple federal agencies have relied on the existing groundwater models to assess the indirect effects of the mine on aquatic ecosystems. EPA concluded that "the drawdown at Upper Empire Gulch Spring is within the accuracy of the models to predict, and therefore we believe impacts to stream flows and wetlands from drawdown within Empire Gulch are reasonably certain and will be significant."[53] EPA also believed there was a "high potential" for many other additional waters of the United States, including Cienega Creek, to be adversely impacted by mine pit drawdown.[54]

Likewise, FWS relied on the 95th percentile model results in its analysis of endangered species and critical habitat, lending further support to the credibility of the models. "Our analyses of the effects of the proposed action will therefore rely primarily on the 95th percentile analyses from the May 2015 [Biological Assessment], which reflect a reasonable certainty that the effects will occur."[55] FWS believed this approach was appropriate "because of the irreversibility of the proposed action's possible effects at the higher end of the 95th percentile analyses." *Id.* at 31.

The Corps may not forego an analysis of the indirect effects to waters of the United States on the grounds that it has not delineated all of the downstream waters of the United States. The EPA estimated "the presence of tens to hundreds of acres of jurisdictional waters/wetlands in the assessment area likely to be impacted by groundwater drawdown."[56] The Corps has completed jurisdictional determinations for the mine and Barrel Canyon; it has the tools to complete similar determinations for the assessment area, as urged by the EPA. These preliminary determinations will enable the Corps to assess the full scope of indirect impacts to waters of the United States, as required by the Clean Water Act.

In sum, the available models accurately predict the impacts of mine-driven groundwater drawdown on surface flows, and all forecast that the impacts of groundwater drawdown will increase over time. The Corps must assess these impacts to both determine whether the Rosemont Mine will significantly degrade waters of the United States and whether these adverse effects can be adequately mitigated. If the Corps does not undertake this analysis, it must deny the permit for lack of sufficient information regarding a crucial aspect of the permitting decision – indirect effects to waters of the United States. *See* 40 C.F.R. § 230.12(a)(iv).

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[53] EPA Mitigation Letter, Ex. 2 Attachment 1 at 5.
[54] *Id.*
[55] Am. BiOp at 30.
[56] Letter from Jane Diamond, Environmental Protection Agency to Colonel Colloton, U.S. Army (Nov. 7, 2013), Attachment at 4 n.6.

ED_002020B_00040140-00085

B. The Corps Must Analyze Indirect Effects to Waters of the United States to Reach an Informed Decision Under NEPA.

The Corps must prepare a supplement EIS analyzing the full impacts of the mine on jurisdictional waters of the United States. These impacts are reasonably foreseeable, significant, and essential to an informed decision under NEPA

NEPA requires agencies to evaluate not just the direct effects of an agency action but also those indirect effects that "are later in time or farther removed in distance, but are still reasonably foreseeable." 40 C.F.R. § 1508.8(b). Indirect effects are "reasonably foreseeable" where there is "a reasonably close causal relationship" between the agency action and the indirect effect. *Dept. of Tans. v. Public Citizen*, 541 U.S. 752, 767 (2004).

Here, the impacts of the open pit on surface waters of the United States are reasonably foreseeable. There is no dispute the open pit will dewater the regional aquifer.[57] The best available data, summarized above, establishes a "reasonably close causal relationship" between impacts to the regional aquifer and subsequent impacts to surface waters of the United States. *Public Citizen*, 541 U.S. at 767. While these indirect impacts to surface waters will take place "later in time" and at a "farther removed distance," they are within the calibration of the models and thus must be analyzed by the Corps. *See City of Davis v. Coleman*, 521 F.2d 661, 676 (9th Cir. 1975) ("we must reject any attempt by agencies to shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as 'crystal ball inquiry.'").

The indirect effects of the open pit are significant, further warranting a thorough analysis under NEPA. *See* 40 C.F.R. § 1502.2(b) ("[i]mpacts shall be discussed in proportion to their significance."). The Los Angeles District recommended denial of the permit due to the significant adverse effects of the Rosemont Mine on surface waters of the United States. Those direct impacts are compounded by the indirect effects to surface waters caused by dewatering of the regional aquifer. As the EPA emphasized, groundwater drawdown will indirectly impact up to 70 springs, an additional 39 riparian areas, and up to 1,071 acres of riparian vegetation along Empire Gulch.[58] Subsets of these riparian areas contain jurisdictional wetlands and other waters of the United States. Unless and until the Corps analyzes these impacts, it may not conclude the Rosemont Mine does not significantly degrade waters of the United States. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1987) (agencies must assure that "the adverse environmental effects of the proposed action are adequately identified and evaluated").

In addition, the Corps must undertake an analysis of indirect effects to waters of the United States so that it can evaluate whether these impacts can be mitigated, as required by NEPA. *See South Fork Band Council of W. Soshone of Nev. v. Dept. of Interior*, 588 F.3d 718,727 (9th Cir. 2009) ("An essential component of a reasonably complete mitigation discussion is an assessment of whether the proposed mitigation measures can be effective.").

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[57] During active mining, the pit will cause significant losses to recharge of groundwater between 18,000-26,000 acre-feet, or about 900-1300 acre-feet annually. Following mine closure, the pit lake will continue to divert, capture and evaporate 35-127 acre-feet of mountain-front groundwater recharge. *Id.* at 3.

[58] *Id.* at 4.

ED_002020B_00040140-00086

The mitigation measures proposed by Hudbay fail to discuss indirect effects to waters of the United States, and thus necessarily fail to satisfy NEPA's requirements. *See Ctr. for Biological Diversity v. United States Bureau of Land Mgmt.*, 2017 WL 3667700, at *14 (D. Nev. Aug. 23, 2017) (finding analysis of mitigation measures inadequate because agency failed to consider how it "would replace or restore wetlands impacted by the project (or even whether compensating for thousands of acres of destroyed wetlands is possible in the first place).").

Finally, an analysis of indirect effects to waters of the United States is central to the Corps' public interest review. As discussed below, 33 C.F.R. § 320.4(a) requires the Corps to consider "the probable impacts" of the proposed Rosemont Copper mine on "[a]ll factors which may be relevant to the proposal." Indirect effects to jurisdictional waters of the United States fall within this inquiry, and thus must be analyzed to reach an informed decision under NEPA.

The Corps may not rely on the Forest Service's prior preparation of an EIS to satisfy the Corps' obligations under NEPA. In the FEIS, the Forest Service analyzed direct impacts to waters of the United States and a subset of indirect effects caused by reduced surface runoff from the mine. But the Forest Service refused to analyze impactscaused by dewatering of the regional aquifer on waters of the United States, essentially claiming the Corps would conduct its own independent analysis of this issue.[59] The Forest Service also refused to propose, let alone consider, mitigation measures to offset indirect effects to waters of the United States along Empire Gulch, Cienega Creek, and any other areas beyond National Forest System Lands.[60] These glaring holes in the analysis must be addressed by the Corps in a supplemental EIS before any decision is made. *See Robertson*, 490 U.S. at 349 (The EIS requirement "ensures that important effects will not be overlooked or underestimated only to be discovered after resources have been committed or the die otherwise cast."); *see also Baltimore Gas & Elec. Co. v. Nat. Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983) (requiring "that the agency take a 'hard look' at the environmental consequences *before taking a major action*.") (emphasis added).

The Corps must engage the public in the preparation of a supplemental EIS that thoroughly analyzes the impacts of mine-driven groundwater drawdown. *See* 33 C.F.R. § 230.13(b) ("A supplement to a final EIS should be prepared and filed first as a draft supplement and then as a final supplement"). This public process "permits the public and other government agencies to react to the effects of a proposed action at a meaningful time" and "ensures that the agency will not act on incomplete information, only to regret its decision after it is too late to correct." *Marsh v. Oregon Nat. Res. Council*, 490 U.S. 360, 371 (1989).

In sum, to comply with NEPA and the 404(b)(1) Guidelines, the Corps must prepare a supplemental EIS that analyzes impacts to jurisdictional waters of the United States. The Corps must provide the public with a draft version of this supplemental EIS and a meaningful opportunity to provide comments.

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[59] FEIS at 496.

[60] *Id.* at 546. According to the FEIS: "[T]he Forest Service does not have authority to require mitigations for surface resources beyond the boundaries of the Forest Service, such as those requested by the objectors."[60] The Corps faces no such jurisdictional constraint and must analyze mitigation measures to offset the indirect effects of the mine on jurisdictional waters of the United States.

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III. The Corps Must Deny the Permit Because The Rosemont Mine Will Cause Significant Degradation to Waters of the United States.

The 404(b)(1) Guidelines prohibit the discharge of fill material which result in significant degradation to waters of the United States. 40 C.F.R. § 230.10(c). A discharge is deemed to contribute to significant degradation if it results, either individually or collectively, in significant adverse effects on the life stages of aquatic life and other wildlife dependent on aquatic ecosystems or the diversity, productivity, and stability of the aquatic ecosystem. 40 C.F.R. § 230.10(c)(2)-(3).

Here, the Rosemont Mine will discharge fill material into waters of the United States through the construction of a mine pit and associated waste rock piles and tailings storage facilities.[61] These facilities will permanently destroy or degrade aquatic habitat that is crucial to the survival of multiple aquatic-dependent endangered species. They will also precipitate an ecological regime shift, severely impacting hundreds of acres of unique and high-functioning riparian habitats. These significant adverse effects require denial of the permit.

A. The Rosemont Mine Will Cause Significant Adverse Effects to Aquatic Life and Wildlife Dependent on Aquatic Ecosystems.

The Rosemont Mine will impact multiple aquatic obligate species, including threatened and endangered species, causing "impairment or destruction of habitat to which these species are limited." 40 C.F.R. § 230.30(b)(2). The ecosystem cannot afford these losses. The Corps must therefore deny the permit due to the "[s]ignificantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent on aquatic ecosystems." 40 C.F.R. § 230.10(c)(2).

The Rosemont Mine will adversely affect the endangered Chiricahua leopard frog, including meta-sites crucial to the species. Physical construction and operation of the mine will destroy sites that support the species, including the Lower Stock Tank site.[62] Mine-driven groundwater drawdown will "will permanently remove the longest standing and most prolific site occupied by the Chiricahua leopard frog in Las Cienegas NCA and likely within [Recovery Unit 2] for the frog" – the Empire Spring source population.[63] This population serves an "important disease-buffering role" by providing frogs infected with the skin fungus *Batrachochytrium dendrobatidis* to persist.[64] Loss of Empire Gulch will have dire consequences

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[61] Constructing the mine pit is equivalent to "the building of any structure, infrastructure, or impoundment requiring rock, sand, dirt, or other material for its construction" in waters of the United States, and thus constitutes a discharge of fill material under the Corps' regulations. 33 C.F.R. § 323.2(f). Likewise, the "[p]lacement" of tailings and waste material into jurisdictional waters adjacent to the mine pit constitutes a discharge of fill material. *Id.*

[62] 2013 BiOp at 214-15.

[63] Am. BiOp at 143-44, 150

[64] *Id.* at 188. *Batrachochytrium dendrobatidis* considered the greatest threat to the survival and recovery of the Chiricahua leopard frog. 2013 BiOp at 200-201.

ED_002020B_00040140-00088

for the conservation of the species, which depends on the existence of "at least one isolated and robust population in each [Recovery Unit]," an outcome that will no lover be attainable for Recovery Unit 2.[65]

In addition to the Chiricahua leopard frog, the Rosemont Mine will affect three aquatic obligate species protected by the Endangered Species Act. First, the mine will adversely affect a "high priority" population of Gila chub in Cienega Creek.[66] The Gila chub depends on surface flows year-round, especially during the crucial dry season in May and June. Cienega Creek Reach 7, however, would transition from perennial to intermittent in dry months, eliminating this reach of critical habitat.[67] These adverse impacts presents a "problematic picture" for the chub,[68] a species already "likely to become extinct throughout all or a significant portion of its range."[69]

Second, the mine will adversely affect the only extant population of Gila topminnow on public lands – the last (albeit small) remaining population along Cienega Creek.[70] The impacts of groundwater drawdown are more severe for this species than the Gila chub due to the topminnow's dependence on deeper pools, especially those along upper Cienega Creek.[71] By dewatering these pools, the Rosemont Mine will adversely affect the species.[72] FWS avoided a jeopardy conclusion by relying on the conservation measures at Sonoita Creek, which it deemed "essential to partially offset expected effects to Gila topminnow and its habitat."[73] The topminnow has yet, however, to be successfully reestablished at Sonoita Creek Ranch, calling into question FWS's reliance on this essential conservation measure and potentially triggering a jeopardy finding that would foreclose issuance of the permit. *See* 40 C.F.R. § 230.10(b)(3).

Third, the mine will adversely affect desert pupfish that rely on habitat in upper Cienega Creek for their survival. Groundwater drawdown will negatively impact many components of the upper watershed and will reduce the volume of surface water at Cieneguita Wetlands by sixty-seven percent, significantly reducing the habitat for the desert pupfish and adversely affecting the species.[74]

The loss of all of these species will have a significant impact on the northern Mexican garter snake, which preys upon ranid frogs (Chiricahua and lowland leopard frogs) and fish (Gila chub, desert pupfish, Gila topminnow, and longfin dace).[75] The complete loss of the Chirichaua leopard population at Empire Gulch will "place significant nutritional strain on northern Mexican gartesnakes and weaken the functionality of the habitat for recovery as a whole for northern

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[65] Am. BiOp at 140.
[66] Am. BiOp at 75. Of the five extant populations of Gila chub within the Santa Cruz watershed, only the Cienega creek population is considered stable-secure. *Id.i at 176.*
[67] *Id.* at 86.
[68] *Id.* at 86.
[69] *Id.* at 72.
[70] *Id.* at 110.
[71] *Id.* at 112.
[72] *Id.* at 115.
[73] *Id.* at 117.
[74] *Id.* at 134.
[75] *Id.* at 181.

ED_002020B_00040140-00089

Mexican gartesnakes, in perpetuity."[76] Furthermore, there will be a loss of lentic habitats around seeps, springs, and stock tanks impacted by groundwater drawdown.[77]

The mine will also significantly impact the Huachuca water umbel, an aquatic plant that is restricted to cienegas, streams, and springs with permanently wet soils.[78] The Cienega creek subwatershed is crucial to the sustainability of the umbel as it supports roughly 12 percent of the species' remaining plant material, is centrally located, and boasts significant genetic variability.[79] Groundwater drawdown will substantially decrease surface pool area along the occupied reaches of Cienega Creek and Cieneguita Wetlands, adversely impacting a 423-acre area central to the species' survival.[80]

Climate change will exacerbates the significant impacts of the Rosemont Mine on all of these endangered or threatened species. Climate change models predict that over time, the southwest is likely to become hotter and drier, punctuated with more extreme droughts and intense flooding.[81] These models predict increased water temperatures, decreased streamflow, and changes in the hydrologic cycle, all of which threaten at-risk aquatic species, such as the Chirichaua leopard frog, Gila chub, Gila topminnow, and desert pupfish discussed above.[82]

In sum, the Rosemont Mine will cause significant adverse effects to aquatic life dependent on ecosystems, foreclosing issuance of the 404 Permit.

B. The Rosemont Mine Will Cause Significant Adverse Effects to the Diversity, Productivity, and Stability of the Aquatic Ecosystem.

The Rosemont Mine will severely degrade hundreds of acres of high functioning riparian habitat, including designated critical habitat for multiple aquatic species. This permanent loss of fish and wildlife habitat rises to the level of an ecological regime shift. The Corps must deny the permit due to the "[s]ignificantly adverse effects of the discharge of pollutants on aquatic ecosystem diversity, productivity, and stability." 40 C.F.R. § 230.10(c)(3).

The proposed mine will directly impact high-functioning upland aquatic habitat within the footprint of the mine, including five known springs or seeps. The mine will sever what was once a continuous hydrological unit, reducing mountain-front recharge by approximately 35 to 127 acre-feet per year[83] and curtailing stormwater runoff by 242-acre feet per year.[84] This adverse effect will alter downstream aquatic ecosystem by changing channel geomorphology and

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[76] *Id.* at 182-83.
[77] *Id.* at 183.
[78] *Id.* at 198.
[79] *Id.* at 203.
[80] *Id.* at 204-210.
[81] 2013 BiOp at 258-62.
[82] *Id.* at 261-62; *Id.* at 222 (discussing anticipated take of Chiricahua leopard frog); *Id.* at 290 (highlighting impacts of climate change on Gila topminnow).
[83] FEIS at 354.
[84] FEIS at 463.

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reducing flows in downstream OAWs.[85] The FEIS estimates the destruction of 68.4 acres of waters of the United States.

Mine-driven groundwater drawdown will also affect "the structure and function" of aquatic ecosystems throughout the analysis area. 40 C.F.R. § 230.11(e). Currently, the analysis area contains a number of sensitive aquatic environments, including Las Cienegas National Conservation Area, OAWs, and multiple seeps, springs, and wetlands. The best available groundwater models predict drawdown in surface flows at these critical sites, impacting the riparian vegetation.

For example, 403 acres of upper Empire Gulch would transition from a hydroriparian corridor with a large cottonwood gallery that supports aquatic and wildlife species to a xeroriparian corridor with tamarisk and mesquite.[86] In the long term, wetland complexes within the hydroriparian zone would likely experience drying and mortality.[87] This transition would impact multiple species that depend on hydroriparian habitat, including native fish and aquatic species (e.g., the Chiricahua leopard frog,[88] northern Mexican garter snake,[89] and Gila chub,[90] to name just a few).

The quantitative models don't capture the full extent of the "loss of environmental value" caused by the mine. 40 C.F.R. § 230.11(e). Changes in pool volume constrict pool size, adversely affecting the life cycles of species such as the Huachuca water umbel and Gila topominnow, as discussed above. Even small surface water drawdowns can have dire consequences for ecosystems during the driest months of the year.

The "persistence and permanence" of these impacts underscores their significance. 40 C.F.R. § 230.10(c)(1). All of the expert agencies agree that mine-driven groundwater will lead to greater and greater impacts over time. These impacts cannot be reversed; they constitute an "ecological regime shift" to a drier, more inhospitable environment.[91] Moreover, these impacts are exacerbated by climate change, which is highly likely to negatively impact aquatic ecosystem and the species that depend on these environments for survival.[92] These significant adverse impacts to aquatic ecosystems require denial of the permit

IV. The Rosemont Mine Does Not Include All Appropriate and Practicable Measures to Minimize Potential Harm to the Aquatic Ecosystem.

The Los Angeles District found that Hudbay's previous HMMP failed to compensate for aquatic resource functions that would be lost as a result of the Rosemont Mine. The 2017 HMMP is even more inadequate. It fails to adequately compensate for the direct effects of the

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[85] FEIS at 404 (Table 76).
[86] FEIS at 542.
[87] *Id.* at 542.
[88] June SIR at 159-60
[89] *Id.* at 168
[90] FEIS at 690.
[91] EPA Mitigation Letter, Ex. 2 Enclosure at 2.
[92] 2013 BiOp at 261-62.

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Rosemont Mine and wholly disregards the indirect effects of the Rosemont Mine on aquatic resource functions. The Corps must deny the 404 Permit due to the extensive, unmitigated impacts on waters of the United States. *See* 40 C.F.R. § 230.93(a).

A. The 2017 HMMP Fails to Mitigate the Significant Resource Losses Caused by the Rosemont Mine.

The purpose of the Corps' compensatory mitigation program is to "offset unavoidable impacts to waters of the United States authorized through the issuance of permits by the U.S. Army Corps of Engineers pursuant to section 404 of the Clean Water Act." 40 C.F.R. § 230.91(a)(1). The district engineer "must determine the compensatory mitigation to be required in a DA permit, based on what is practicable and capable of compensating for aquatic resource functions that will be lost as a result of the permitted activity." *Id.* § 230.93(a).

As detailed above, construction of the Rosemont Mine, reduced surface water-runoff, and mine-driven groundwater drawdown will cause "significant resource losses which are specifically identifiable, reasonably likely to occur, and of importance to the human or aquatic environment." 33 C.F.R. § 320.4(r)(2). These adverse effects to aquatic resource functions, whether direct or indirect, must be mitigated. *Id.*; 40 C.F.R. § 230.93(a). In fact, "[t]he requirement that secondary impacts be fully compensated is consistent with standard practice for projects of this magnitude and essential given that the range, extent, and severity of secondary adverse impacts upon aquatic resources are as significant as the direct impacts."[93]

Yet, the most recent HMMP makes absolutely no effort to mitigate the indirect impacts of the Rosemont Mine. The failure to even consider these effects to waters of the United States renders the HMMP inadequate on its face. *See Envtl. Def. v. U.S. Army Corps of Engineers*, 515 F. Supp. 2d 69, 81 (D.D.C. 2007) ("The agency cannot reliably conclude that the selected project has minimized adverse impacts on aquatic ecosystems to the extent practicable when its habitat mitigation calculations are infected with an underestimate of the floodplain habitat impacted.").

The approach taken by Hudbay in the 2017 HMMP reflects a sharp, unexplained departure from the prior HMMP. In 2014, Hudbay recognized that "all Project impacts must be mitigated, there is no special class of mitigation for varying impacts."[94] Hudbay thus submitted a HMMP to compensate for impacts to 69.9 acres (40.4 direct, 28.4 indirect, and 1.1 temporary) of jurisdictional waters of the United States.[95] Hudbay thus recognized that it was "required to mitigate for 28.4 acres of downstream impacts," even if it grossly underestimated the true extent of those secondary impacts.[96] Hudbay offers no explanation for entirely omitting any mitigation measures for indirect effects in its most recent HMMP.

For these reasons, the Corps should reject the HMMP as entirely inadequate on its face.

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[93] EPA Mitigation Letter, Ex. 2 Enclosure at 2.
[94] September 2014 HMMP at 8.
[95] September 2014 HMMP at 1.
[96] Habitat Mitigation and Monitoring Plan (April 1, 2014), Response to Comments Addendum at 21-22.

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B. The 2017 HMMP Fails to Mitigate the Direct Impacts of the Mine on Waters of the United States.

The Los Angeles District rejected the prior HMMP submitted by Hudbay on the grounds that "the permanent loss of 40.4 acres of waters [of the United States] would not be mitigated by the proposed re-establishment at Sonoita Creek Ranch, along with the proposed mitigation on Davidson Canyon parcels and on proposed mitigation parcels, located outside of the impacted watershed."[97] Hudbay now claims to have adopted a simpler design in the 2017 HMMP to mitigate these impacts. But this pared down HMMP fails to generate adequate mitigation credits and causes even more damage than the prior HMMP. In fact, the 2017 HMMP simply repackages many of the deficiencies identified by the Los Angeles District, EPA, and Pima County. The HMMP fails to comply with the 404(b)(1) guidelines or the Compensatory Mitigation Rule,[98] and must be rejected.

The 2017 HMMP leads from the proposition that destroying Sonoita Creek is the simplest way to maximize mitigation credits. This proposition is doubly flawed. First, it rests on the misconception that Sonoita Creek is in dire straits and non-functioning for much of its length. But that is not the case. Sonoita Creek has achieved a state of equilibrium since it was channelized in the 1940s. Significant portions of Sonoita Creek are "especially active and complex," including the lower 6,000 feet of the Sonoita Spring Ranch property (Lots 1 through 8) and Lot 7 of the Rail X Ranch property.[99] Altering flows in upstream portions of Sonoita Creek – such as those targeted by Hudbay – could significantly impair these high-functioning downstream reaches, causing even more harm to high-functioning waters of the United States.[100]

Second, destroying additional waters of the United States in no way mitigates the significant adverse effects of the Rosemont Mine. Every prior HMMP strained to maximize mitigation credits by constructing (not destroying) additional stream reaches and creating as much sinuosity as possible. But even that approach was deemed insufficient to mitigate the oversized impacts of the Rosemont Mine. Specifically, the Los Angeles District found that the construction of 17,091 linear feet of channels under the prior HMMP was insufficient to offset the 40.4 acres of direct effects to waters of the United States. It defies sense to suggest that the current HMMP, which proposes the destruction of an additional 8.9 acres of waters of the United States while significantly paring down the amount of linear feet purportedly restored (only 13,841 linear feet), even remotely offsets the direct impacts of the Rosemont Mine on waters of the United States, let alone the indirect effects of the mine, which are even more significant.

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[97] Letter from Colonel Helmlinger, U.S. Army Corps of Engineers, to Patrick Merrin, Hudbay 2 (Dec. 28, 2016).

[98] *See* Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19594 (Apr. 10, 2018) [hereinafter Compensatory Mitigation Rule].

[99] Leidy, Robert and Kondolf, Matthias. Technical Memorandum: Conceptual Design for Sonoita Creek, AZ, Technical Review Support (Order Number EP-G149-00241) 9 (July 27, 2015), attached as Ex. 6 [hereinafter EPA Technical Memo].

[100] This, of course, would mean that the filling of Sonoita Creek indirectly impacts downstream jurisdictional waters of the United States (in addition to the 8.9 acres directly impacted). The Corps must analyze these downstream impacts and ensure they are properly accounted for and mitigated by Hudbay.

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The HMMP violates numerous requirements of the 404(b)(1) Guidelines and the Compensatory Mitigation Rule. As an initial matter, the HMMP fails to accurately assess the necessary compensatory mitigation for the Rosemont Mine. Per the Compensatory Mitigation Rule, "[f]unctional assessments will be used to determine compensatory mitigation amounts in cases where such methods are available, appropriate, and practicable for use."[101] Where these tools are not available, the Corps must use "condition assessment methods or other appropriate metrics for determining the amount of compensatory mitigation that is to be required for DA permits."[102] Here, the HMMP acknowledges the lack of an available functional assessment for the area, but then proceeds to provide a condition assessment that undervalues the impacts of the mine and overvalues the compensatory mitigation measures.[103]

There are a number of inaccuracies in the conditional assessment undertaken by Hudbay that impermissibly skew the analysis. It is not "scientifically valid" to directly compare functional gain and loss between the different stream classes on the Rosemont mine site (1st and 2nd order riverine waters) and the Sonoita Creek Ranch site (4th and 5th order riverine waters).[104] Hudbay fails to acknowledge this principle and, as a result, "the headwater streams at the mine impact site are functionally undervalued when compared to the broad low-level floodplain site at [Sonoita Creek Ranch]."[105] For example, the HMMP argues that the Sonoita Creek Ranch floodplain is much broader and underlain by more alluvium than the mine impact site, and therefore the proposed mitigation measures will provide increased functional gain as compared to the impacted mine site. But this is an inappropriate comparison. The mine site drainages are "part of an interconnected stream network totaling over 100 acres of waters that function together *as a water source area* which maintains functions critical to the health of the broader Cienega Creek watershed."[106] The mitigation at Sonoita Creek Ranch will do nothing to compensate for these lost values.

Indeed, the mitigation measures at Sonoita Creek Ranch are located within a different watershed, undercutting their effectiveness. This is problematic because "the required compensatory mitigation should be located within the same watershed as the impact site, and should be located where it is most likely to successfully replace lost functions and services." 40 C.F.R. § 230.93(b)(1).[107] The proposed mitigations at Sonoita Creek do not offset the mine's direct impacts to Davidson Canyon or Cienega Creek, as Sonoita Creek is located in a different watershed. Nor do the proposed mitigation measures address indirect impacts to Empire Gulch,

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[101] Compensatory Mitigation Rule, 73 Fed. Reg. at 19634 (

[102] *Id.*; 40 C.F.R. § 230.93(f)(1).

[103] 2017 HMMP at 36-43.

[104] EPA Comments on Rosemont Copper Project – response to Corps staff comments of April 16, 2014 on Habitat Mitigation and Monitoring Plan 16 (April 28, 2014), attached as Ex. 7 [hereinafter EPA HMMP Comments].

[105] *Id.*

[106] *Id.* at 16-17.

[107] The Compensatory Mitigation Rule emphasizes the importance of a "watershed approach" to mitigation, which "involves consideration of watershed needs, and how the location and types of compensatory mitigation projects address those needs." 73 Fed. Reg. at 19690.

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Davidson Canyon, or Cienega Creek as "groundwater at Sonoita Creek Ranch moves towards Patagonia, not the Cienega Creek watershed."[108]

In addition to being misplaced, the HMMP is not "likely to be successful and sustainable" due to the dynamic hydrology of Sonoita Creek. 40 C.F.R. § 230.93(b)(4). The reestablishment of Sonoita Creek is premised on the assumption that the new channel will replicate the historical characteristics of Sonoita Creek. But the HMMP fails to verify the very historical conditions it is attempting to replicate.[109] The HMMP cannot make up for this deficit by relying on the Walnut Gulch Experimental Watershed as a "reference site."[110] That project is an inappropriate reference point for multiple reasons, including the fact that it is not located within the same 8-digit Hydrologic Unit Code (it's located near Tombstone, AZ) and differs significantly from the characteristics of Sonoita Creek.[111] The HMMP's reliance on Walnut Gulch thus underscores the untested and unverified approach proposed by Hudbay that call into question its proposed mitigation.

Furthermore, the HMMP fails to take into account the fact that new channels, such as the one Hudbay proposes to construct for Sonoita Creek, are prone to failure.[112] Any alleged "benefits" of Hudbay's proposal are speculative. *See* 40 C.F.R. § 230.93(a)(1) ("the district engineer must assess the likelihood for ecological success and sustainability"). There are also serious concerns about the feasibility of relocating Sonoita Creek along this stretch given the Kinder Morgan Pipeline, which runs alongside the current location of the creek and burdens the Sonoita Creek project area.[113]

Moreover, the proposed relocation of the Sonoita Creek may not be "ecologically suitable for providing the desired aquatic resource functions." 40 C.F.R. § 230.93(d)(1). According to Hudbay, the success of the proposed mitigation depends on an adequate supply of water to "drive ecological function."[114] But the Sonoita Creek valley bottom is characterized by soils with high infiltration rates, low runoff potential, and a high rate of water transmission.[115] The EPA and Corps have consistently and repeatedly raised significant concerns about the availability of

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[108] EPA HMMP Comments, Ex. 7 at 17.
[109] *Id.* at 22.
[110] Final Design of the Sonoita Creek Mitigation Project 5-6 (Sept. 8, 2017).
[111] EPA HMMP Comments, Ex. 7 at 16-17.
[112] *See, e.g.,* G. Nagle, "Evaluating 'Natural Channel Design' Stream Projects," Hydrological Processes 21 (July 17, 2007) (describing 70% failure rate in 40 projects evaluated in North Carolina); G.M. Kondolf, "River Restoration and Meanders," Ecology & Society (Vol. 11, Issue 2) (2006) (describing project failure in Cuneo and Uvas Creeks, California); S.M. Smith & K.L. Prestergaard, "Hydraulic Performance of a Morphology-Based Stream Channel Design," Water Resources Research 41 (Nov. 10, 2005) (describing project failure in Deep Run, Maryland).
[113] EPA HMP Comments, Ex. 7 at 16. Indeed, the Corps previously rejected relocation of Sonoita Creek along this stretch due to these very concerns. It is unclear why Hudbay now believes this approach is feasible as it has not offered any plan or proposal to successfully relocate the pipeline.
[114] Letter from Katherine Arnold, Hudbay to William James, U.S. Army Corps of Engineers 4 (Sept. 22, 2017).
[115] EPA Technical Memo, Ex. 6 at 6.

ED_002020B_00040140-00095

adequate water supplies to maintain the new channel.[116] While Hudbay now claims that is has an adequate water supply at Monkey Springs to maintain flows in the new creek, it does not provide its monitoring data for this water supply. Instead, it cautions that its data may be overstated due to the potential capture of water flows from another source.[117] Hudbay has not therefore demonstrated that there will be adequate water supply to "provid[e] the desired aquatic resource functions." 40 C.F.R. § 230.93(d)(1).

Even assuming the 2017 HMMP might be ecologically successful and sustainable, something that has yet to be demonstrated, it wholly fails to generate the mitigation credits needed by Hudbay to offset the significant impacts of the Rosemont Mine on waters of the United States. As noted above, the 2014 HMMP attempted to construct 17,091 linear feet to offset impacts, an approach that was deemed inadequate by the Los Angeles District. There is no clear explanation for how the current paired-down approach will mitigate an even greater acreage of impacts to waters of the United States. And, there is absolutely no explanation for how Hudbay proposes to mitigate indirect impacts to waters of the United States.

There are multiple instances where Hudbay claims credit, where no credit is due. For example, Hudbay claims 57.4 acres for its proposed restoration of 13,841 linear feet of Sonoita Creek. But this result is not ecologically justified. At most, a 50-foot riparian buffer is ecologically justified along both sides of the constructed channels.[118] Applying this buffer to 13,841 linear feet of reestablished channel equates to 37.77 total acres of reestablished riparian buffers. HudBay also overinflates (or miscalculates) the size of its mitigation for the rehabilitation of 2,511 linear feet of Sonoita Creek. Applying 50-foot buffers to this rehabilitation equates to 5.76 acres, at most. This acreage is far less than the 12.1 acres claimed by Hudbay, further undervaluing the mitigation potential of the HMMP.[119]

Hudbay also claims compensation for the pond mitigation, but credit for those measures would constitute impermissible double-counting. As the preamble to the 2008 Rule states, "Resources that are restored, established, enhanced, or preserved to satisfy the requirements of other federal programs may not also be used for compensatory mitigation for DA permits . . . ."[120] The FWS Biological Opinion stresses the importance of the mitigation ponds as conservation measures to avoid jeopardy to multiple species, such as the Chiricahua leopard frog, Gila Chub, Gila topminnow, and Huachuca water umbel. Hudbay may not claim these same mitigation activities to offset the adverse effects of the Rosemont Mine on waters of the United States.

Ultimately, the 2017 HMMP is a dubious proposal that does not stand up to the 404(b)(1) Guidelines, the Compensatory Mitigation Rule, or the EPA and Corps' prior concerns with the proposal that remain largely applicable. The inadequacies in the 2017 HMMP are particularly apparent given that it makes no attempt to mitigate the indirect effects of the project on waters of

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[116] *Id.*
[117] 2017 HMMP at 25.
[118] EPA HMMP Comments, Ex. 7 at 2. Hudbay claims to have applied a 50-foot buffer to Sonoita Creek, HMMP at 42, but its calculations nonetheless appear overinflated.
[119] 2017 HMMP at ES-5.
[120] 73 Fed. Reg. at 19608.

ED_002020B_00040140-00096

the United States, which are just as substantial (if not more substantial) than the direct impacts of the Rosemont Mine. The Corps should therefore reject the proposal as insufficient and deny the 404 permit, consistent with the Los Angeles District's final recommendation.

V. Hudbay Must Clearly Demonstrate that the Rosemont Mine is the Least Environmentally Damaging Practicable Alternative.

The Corps may not issue a Section 404 Permit for the Rosemont Mine if there is a less environmentally damaging practicable alternative. 40 C.F.R. § 230.10(a). Where, as here, the proposed project is not water dependent, the guidelines place the burden on the applicant to "clearly demonstrate[ ]" that there are no practicable, less damaging sites. 40 C.F.R. § 230.10(a)(3). Hudbay has not made this required showing since it acquired the Rosemont Mine in July of 2014. It may not rely on the Corps' prior analysis of alternatives, which was suspect from the start, does not apply to Hudbay's acquisition of the mine in 2014, and fails to consider changed circumstances over the past ten years.

The Corps undertook an analysis of alternative sites to the Rosemont Mine based on a snapshot of the copper industry in 2005 when Augusta bought the Rosemont Property. At that moment in time, "the price of copper had increased 29.5 percent over the previous year due to increased domestic and international demand, and was continuing to rise."[121] Due to the booming market, the Corps ruled out ten alternate mine sites, concluding those mines were not available for sale in 2005 due to market conditions.[122] The Corps ruled out 11 more sites (which were available) on the grounds they were not practicable. For example, the Corps ruled out the Resolution Copper Mine in Superior, Arizona, finding it "readily apparent that Augusta Resource Corporation, with such limited financial capitalization, could not have participated in the Resolution Copper Project."[123]

This analysis was suspect from the start and does not satisfy the Corps obligation to independently evaluate practicable alternatives to the proposed project. *See Sierra Club v. Van Antwerp*, 709 F. Supp. 2d 1254, 1263 (S.D. Fla. 2009), *aff'd*, 362 F. App'x 100 (11th Cir. 2010) (finding that Corps failed to exercise independent judgment when evaluating a mining company's claims about the practicability of alternate sites). During the month of March 2005, Augusta Resources' market capitalization ranged between $37 and $61 million dollars; its revenues were essentially nil; and, it had no track record of actually operating a mine.[124] It was thus apparent that Augusta Resources was not going to operate *any* mine; it was going to sell the Rosemont Mine to a much bigger investor. The Corps should not therefore have eliminated any alternative sites based on Augusta's limited capitalization. Otherwise, holding companies with limited capital could proceed through the permitting process, render toothless the requirement to analyze alternative sites, and then sell the permitted mine to a much larger entity.

The Corps must analyze alternatives to the Rosemont Mine site based on Hudbay's acquisition of the property in 2014. Just as the Corps directed Augusta Resources "to evaluate

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[121] FEIS Appx. A at 11.
[122] *Id.*
[123] *Id.* at 18.
[124] *Id.*

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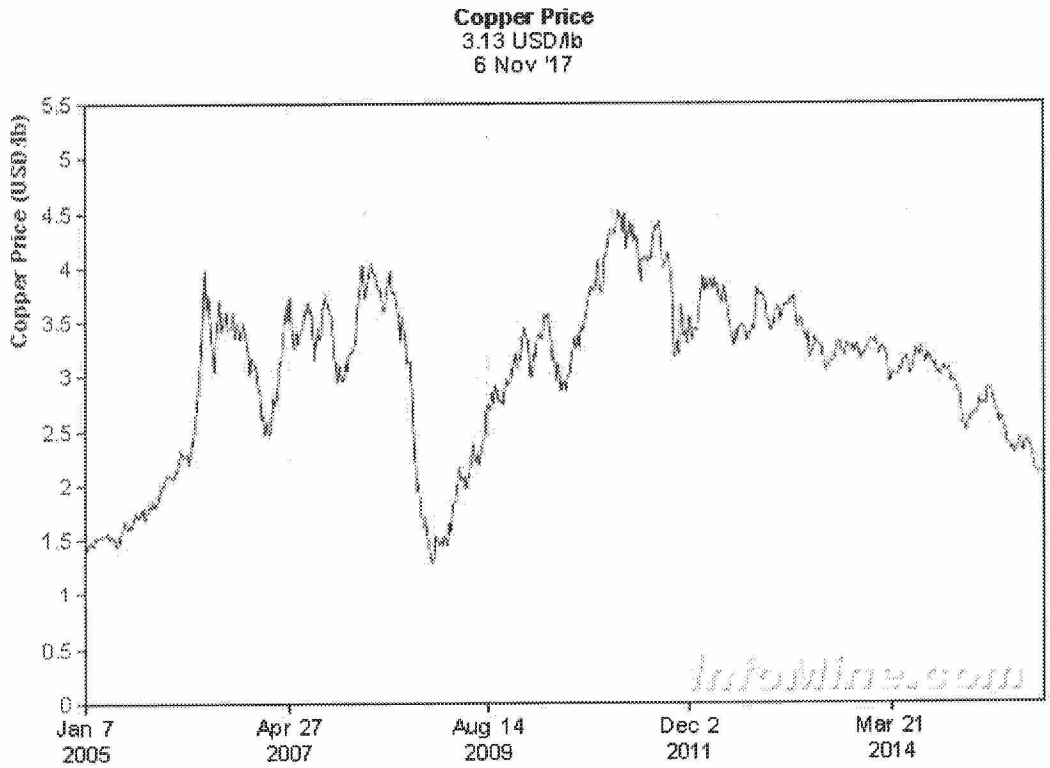
availability [of alternate mine sites] as of the date of acquisition of the Rosemont Project, in 2005,"[125] the Corps must direct Hudbay to evaluate availability as of the date of acquisition of the Rosemont Project in 2014. This analysis is especially important due to the vastly changed circumstances between 2005 and 2014. As depicted below, whereas copper prices were rapidly rising in 2007, they were in a steady state of decline in 2014:



This makes it much more likely that there were other available mines in 2014 that might be less environmentally damaging. Moreover, HudBay had a market capitalization of $1.5 billion in 2014, making it 24 and 41 times better financed that Augusta Resources, and thus much more capable of purchasing alternate mines.[126] HudBay has not "clearly demonstrate[ ]" that there are no practicable, less damaging sites to the Rosemont Mine. 40 C.F.R. § 230.10(a)(3).

Furthermore, the Corps must evaluate any changed circumstances since 2007 that would alter the availability of offsite or onsite alternatives to the Rosemont Mine. As made clear by the 404(b)(1) Guidelines, the analysis of practicable alternatives turns on "*available*" alternatives in light of "*existing* technology" and conditions. 40 C.F.R. § 230.10(a)(2) (emphasis added). The Corps must therefore analyze how current circumstances impact the practicability of alternatives. For example, there may be other copper mines available for purchase, either in 2014 or more recently. Alternatively, there may be new technologies that require consideration of alternative sites or a smaller project footprint.

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[125] *Id.* at 9.

[126] https://www.macroaxis.com/invest/ratioPatterns/HBM/Market-Capitalization

As parts of its alternatives analysis, the Corps must consider options for backfilling the pit. The 404(b)(1) analysis rejected backfilling based on the rationale that the mine pit (a hydraulic sink) provided a "passive containment system" contemplated by ADEQ and its removal would not alter the loss of waters of the United States.[127] Neither point holds true. There is no need to maintain a hydraulic sink, according to the Forest Service.[128] Furthermore, backfilling the pit will prevent the permanent drawdown of groundwater, thereby minimizing the indirect impacts to waters of the United States discussed in detail above. This environmental benefit weighs heavily in favor of backfilling and cannot be ignored by the Corps. *See All. to Save the Mattaponi v. U.S. Army Corps of Engr's*, 606 F. Supp. 2d 121, 130 (D.D.C. 2009) ("The Corps must adequately explain why there is no less damaging practicable alternative. If it cannot so explain based on the record before it, it must reconsider its determination based on an adequate analysis of the alternatives.").

Because Hudbay has not clearly demonstrated that the Rosemont Mine is the least environmentally damaging practicable alternative, the Corps must deny the 404 Permit.

VI. The Division Must Deny the Permit Because It is Contrary to the Public Interest.

The Corps' public-interest requirement prohibits issuance of the 404 Permit if the "district engineer determines that it would be contrary to the public interest." 33 C.F.R. § 320.4(a).[129] This far-reaching inquiry requires the Corps to consider "the probable impacts" of the proposed Rosemont Copper mine on "[a]ll factors which may be relevant to the proposal," including historic, cultural, scenic and recreational values; effects on wetlands; water quality; floodplain management; water supply and conservation; fish and wildlife; considerations of property ownership; and, mitigation. *Id.* Here, the Los Angeles District has already concluded "that implementation of the proposed project would be contrary to the public interest." The Division should affirm the District's decision recommending denial of the permit.

A. The Rosemont Mine Will Significantly, Permanently, and Adversely Impact Traditional Cultural Properties and Sacred Sites.

A "[f]ull evaluation of the general public interest requires" the Corps to give "due consideration" to archaeological resources, "including Indian religious or cultural sites." 33 C.F.R. § 320.4(e). Any action on permit applications should "avoid significant adverse effects on the values or purposes for which those classifications, controls, or policies were established." *Id.* Here, the Los Angeles District highlighted the adverse impacts of the Rosemont Mine on tribes, finding that "[a]mong the key public interest concerns are adverse effects to cultural resources and traditional cultural properties important to tribes."[130] Due to these "significant adverse effects," 33 C.F.R. § 320.4(e), the Los Angeles District decided to recommend denial of

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[127] FEIS Appx. A at 29.
[128] FEIS at 105.
[129] The Corps has a substantive obligation to deny any permit contrary to the public interest, which exists in addition to its procedural obligation to analyze impacts to the public interest under NEPA. *See* 33 C.F.R. § 320.4(a).
[130] Helmlinger Letter, Ex. 1 at 2.

ED_002020B_00040140-00099

the 404 Permit application. The Nation fully concurs with this determination given the profound impacts of the Rosemont Mine on the Nation's cultural identity.

The Nation has a deep cultural and spiritual connection to the lands that would be destroyed by the proposed Rosemont Copper Mine. The mine is located within *Ce;wi Duag*, a historical and spiritual center of the Nation that was designated as a Traditional Cultural Property.[131] The Rosemont Mine would devastate this cultural landscape, as documented in chilling detail in the FEIS. Construction of the mine would directly disturb six prehistoric sites with known human remains, 24 prehistoric sites with the potential to have human remains, and three historic sites with the potential to have human remains.[132] The mine could also disturb "unmarked and unrecognized graves outside known sites and cemetery areas."[133]

Mine operations will burden this landscape with growing, rising, and laterally expanding waste rock piles and tailings facilities. These monolithic, flat-topped benches would unnaturally contrast or entirely obscure the Santa Rita Mountains ridgeline, irreparably altering the scenic quality of *Ce;wi Duag*.[134]

At the same time, the open pit will extend half-a-mile down into the earth, creating a groundwater sink that negatively impacts 16 springs that are power-laden loci and provide sacred ceremonial functions.[135] Groundwater models predict that many of the springs in the analysis area will run dry with a high level of certainty. The Corps may not ignore these impacts on the technical grounds that these springs are not designated traditional cultural places. They are central feature of *Ce;wi Duag* and must be considered by the Corps in its public interest review.

Additionally, the mine will disturb traditional gathering practices that take place within *Ce;wi Duag*, including the collection of essential basket weaving materials. As explained by Rhonda Wilson, one of the Nation's basket weavers, basket weaving is "part of who we are as O'odham people; it's a way of life . . . it's something that is sacred for us, for me, and that is something I have taught our children."[136] The mine would destroy or degrade sites within the Santa Ritas that have been used for the collection of materials essential to this livelihood.

Furthermore, the Rosemont Mine will adversely modify critical habitat for the jaguar, an animal of special importance to the Nation that relies on the Santa Rita Mountains. The jaguar is a powerful symbol to the Nation, and many other tribes. The mine will severely restrict connectivity between multiple critical habitat units and Mexico, effecting the conservation of the species as discussed in greater detail below.

The loss of these cultural resources and religious places is devastating on its own, but when added to past losses, results in the destruction of cultural identity itself. For example, the prior ANAMAX copper mine, which was located in approximately the same areas as the current

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[131] FEIS at 1033-34.
[132] *Id.* at 1040 (Table 203).
[133] *Id.* at 1039.
[134] *Id.* at 798-800.
[135] FEIS at 1040.
[136] https://vimeo.com/223976575.

ED_002020B_00040140-00100

proposed project, uncovered 193 Native Americans were uncovered in twelve burial sites. Not only was the Nation impacted by this cultural desecration, it was left with the burden of repatriating its own tribal ancestors, a process that continues to this day. The proposed Rosemont Mine will reopen these wounds, causing further damage to the Tribe's cultural identity.

The FEIS does not mince words: "These impacts are severe, irreversible, and irretrievable."[137] The physical and spiritual landscape of *Ce;wi Duag* may not be reconstructed if the Corps allows its destruction. Such destruction would have negative consequences for the health and vitality of the Nation's culture, as powerfully articulated by tribal elder Joseph Joaquin:

> To them [Rosemont Copper], maybe what are our concerns is just a little thing. But to us, it's a big thing. Because again, the land has always been us, and we have always been a part of this land. We are a part of this land. And that goes way back in our creation story of how we got here and how these lands are supposed to be taken care of; how this stewardship was awarded to the people living in these lands, to manage these lands the way they see fit.
>
> This is our ancestral land. We need to be involved, and we need to be part of some of these decision making things and we need to be at the table.

The Rosemont Mine will irrevocably alter the cultural landscape of *Ce;wi Duag*. The mine will destroy sacred seeps and springs traditional cultural properties, including sites with documented human remains. These severe, irreversible, and irretrievable impacts militate against the issuance of a 404 Permit.

B. The Rosemont Mine Will Destroy Wetlands.

The Rosemont Mine will directly and indirectly impact multiple wetlands that are crucial to ecosystem function and diversity. This destruction is directly contrary to the public interest. *See* 33 C.F.R. § 320.4(b)(1) ("Most wetlands constitute a productive and valuable public resource, the unnecessary alteration or destruction of which should be discouraged as contrary to the public interest.").

The Forest Service summarized the acreage of riparian habitat in the analysis area, including hydroriparian habitat along Cienega Creek, Empire Gulch, and the multiple seeps and springs in the area.[138] The BLM also conducted wetlands inventories within Las Cienegas National Conservation Area and identified more than 30 perennial or seasonal wetlands, many of

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[137] FEIS at 1036.
[138] FEIS at 514 (Table 109); *id.* at 520 (Table 110).

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which occur around the confluence with Empire Gulch.[139] Many of these areas likely qualify as jurisdictional waters of the United States.[140]

The Rosemont Mine will directly impact five springs located within the mine footprint and their associated wetlands.[141] In addition, the Rosemont Mine will indirectly impact potential wetlands throughout the analysis areas. The models predict that Empire Gulch, and especially upper Empire Gulch, will transition from a perennial to ephemeral stream due to groundwater drawdown, causing likely mortality to 407 acres of hyrdoriparian habitat and any associated wetlands.[142] Similarly, groundwater drawdown will impact riparian habitat around 69 seeps or springs in the area (in addition to the five springs directly impacted by the footprint of the mine), including any associated wetlands.[143]

These wetlands "serve significant natural biological functions" that are important to the public interest, including providing habitat for multiple listed and endangered species. The FWS documented at least five aquatic-obligate endangered species that depend on wetlands and perennial stream flows in the analysis area for their survival, including the Chiricahua leopard frog, Gila chub, Gila topminnow, desert pupfish, and fort Huachuca water umbel. Wetlands also provide essential habitat for the northern Mexican garter snake, which preys on ranids (frogs) and fish within these wetlands, as well as the western yellow-billed cuckoo and southwestern willow flycatcher, both of which depend on riparian habitat along perennial streams. The Rosemont Mine will severely impact the function of wetlands throughout the assessment area, adversely affecting multiple endangered species, as discussed above in Section III.A and III.B, as well as below in Section VI.D.

Based on this evidence, the EPA concluded that the mine would "cause permanent regional drawdown of groundwater that currently sustains hundreds of acres of springs, seeps, streams, and wetlands, and their aquatic and wetland dependent fish, wildlife, and plant species."[144] Furthermore, the Forest Service concluded that the Rosemont Mine would impact Las Cienegas NCA, causing a number of unmitigated impacts that conflicted with the Bureau of Land Managements' plan for the Conservation Area.[145] The magnitude and extent of these impacts – an ecological regime shift – weigh heavily against issuance of a 404 Permit.

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[139] *Id.* at 496.

[140] The Forest Service declined to determine whether these wetlands were jurisdictional, thereby omitting any analysis of indirect effects on waters of the United States. *Id.* at 496. The EPA, in its comments on the Administrative EIS, opined that "[m]any of these wetlands and aquatic features would likely qualify as jurisdictional waters of the United States" based on observations. EPA Comments on Admin. EIS at 10 (Aug. 1, 2013).

[141] *See* WestLand Resources Inc. 2010. Onsite Riparian Habitat Assessment, Rosemont Project. Project No. 1049.14. Prepared for Rosemont Copper Company. Tucson, Arizona: WestLand Resources, Inc. April.

[142] FEIS at 541.

[143] *Id.* at 562.

[144] EPA Mitigation Letter, Ex. 2 at 1.

[145] ROD at 77.

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C. The Rosemont Mine Will Violate State Water Quality Standards.

Typically, a state's certification of compliance under Section 401 is "conclusive with respect to water quality considerations," unless the EPA advises otherwise. 33 C.F.R. § 320.4(d); *Bering Strait Citizens for Responsible Res. Develop. v. U.S. Army Corps of Eng'rs*, 524 F.3d 938, 949–50 (9th Cir. 2008). Here, the EPA strenuously objected to Arizona's Certification of Compliance under Section 401 and advised the Corps of "other water quality aspects" to be taken into consideration under the Corps' regulations.[146] The Corps must therefore make its own independent determination regarding the impacts of the Rosemont Mine on state water quality standards. *See* 33 C.F.R. § 320.4(d). Indeed, the Los Angeles District informed ADEQ that "any granted state Section 401 certification [is] 'not conclusive' regarding water quality considerations, and necessitates the DE to make 'independent judgments regarding compliance with 40 CFR 230.10(b)(1) and the consideration of water quality issues in the public interest reviews."[147]

The Los Angeles District made an independent judgment and concluded that the Rosemont Mine would cause or contribute to state water quality violations.[148] This determination finds support in the record for at least three reasons. First, surface runoff from the Rosemont Mine will degrade Outstanding Arizona Waters (OAWs). Second, groundwater drawdown will dewater Empire Gulch and Cienega Creek, violating Arizona's perennial/wadeable standards. Finally, the HMMP will destroy any designated uses along Sonoita Creek. These water quality violations are directly contrary to the Corp's public interest requirement, 33 C.F.R. § 320.4(d), and independently require denial of the permit under the 404(b)(1) Guidelines. *See* 40 C.F.R. § 230.10(b)(1) (requiring denial of a 404 permit where the discharge of fill material "causes or contributes . . . to violations of applicable State water quality standards.").

i. Surface Runoff from the Rosemont Mine Will Degrade Outstanding Arizona Waters.

Arizona has designated various reaches of Davidson Canyon and Cienega Creek as OAWs due to their perennial nature and exceptional ecological and recreational significance. These OAW designations require, and are based on, intermittent or perennial baseflows, which sustain aquatic habitat and other wildlife in the OAWs during the times when washes would

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[146] Letter from Jared Blumenfeld, EPA Region IX, to Colonel Colloton, U.S. Army Corps of Engineers 1 (April 14, 2015).

[147] Letter from Castanon, David J., U.S. Army Corps of Engineers, to Mr. Robert Scalamera, ADEQ (April 7, 2014). The Corps must independently evaluate state water quality standards for two additional reasons. First, the Arizona Department of Environmental Quality (ADEQ) deferred to the Corps to include measures in its 404 Permit to protect water quality standards. The only way to read the 401 Certification is a delegation from ADEQ to the Corps to protect surface water quality. Second, ADEQ has yet to certify the Habitat Mitigation and Monitoring Plan, which proposes to destroy 8.9 acres of Sonoita Creek Ranch, eliminating any designated uses along this stretch in clear violation of state water quality standards.

[148] Helmlinger Letter, Ex. 1 at 1-2.

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otherwise be dry.[149] *Any* degradation of these OAWs is prohibited under state law. *See* R18-11-107.01 (Under the "Antidegradation" provisions of Arizona water quality standards, discharges are prohibited unless they "will not degrade existing water quality in the downstream OAW.").

The Rosemont Mine will likely violate these antidegradation standards by curtailing water inputs (e.g., stormwater runoff and baseflows) to Davidson Canyon. As documented by Pima County, the mine will reduce surface runoff between 30 and 40 percent during early mining operations.[150] The mine will permanently reduce stormflow in Barrel Canyon by approximately 242-acre feet per year, which equates to a 17.2% change in postclosure runoff volumes.[151] Estimated reductions in surface flow in lower Davidson Canyon (approximately 12 miles downstream) exceed 4.3 percent.[152] This reduction would result in the loss of assimilative capacity in downstream OAWs (i.e., the ability of those waters to receive waste waters or toxic substances without deleterious effects and without damage to aquatic life or humans who consume the water). It would also alter sediment yields and thus change downstream geomorphology (and water quality). These impacts are exacerbated by groundwater drawdown at the Davidson Canyon/lower Cienega Creek Confluence, which is expected to be as much as 0.35 feet within 150-years of mine closure.[153]

EPA raised all of these concerns (and more) in its criticism of the basis for ADEQ's 401 Certification. The EPA, like the Corps, determined that the reduction in runoff would impact assimilative capacity of downstream OAWs.[154] The EPA explicitly rejected Rosemont's estimate that only 2.2 acres of Davidson Canyon would be impacted, concluding that the entire wetted channel would be adversely affected.[155] Furthermore, EPA raised concerns with alterations in sediment yield and the downstream impacts to water quality,[156] all of which violate the antidegradation standard.

ADEQ has not proposed any specific and verifiable measures to prevent degradation of OAWs before it occurs, as is required by the antidegradation standards. ADEQ proposed a monitoring program for discharge into Cienega Creek, but that mitigation relies on lagging indicators that won't detect harm until it is too late.[157] ADEQ's approach could therefore result in unacceptable long-term impacts to OAWs.

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[149] Letter from Huckelberry, C.H. to James, William, U.S. Army Corps of Engineers at 5 (Sept. 18, 2017).
[150] Letter from Huckelberry, C.H. to Ms. Rosi Sherrill, 2017 Addendum to Water Quality Permit, Rosemont Copper Project ACOE Application No. SPL-2008-00816-MB (Nov. 17, 2017) at 5 (attached as Ex. 8) [hereinagter Pima County Letter].
[151] FEIS at 435 (Table 94).
[152] *Id.* at 404 (Table 76); Letter from Huckleberry, C.H. to Colonel Helmlinger, U.S. Army Corps of Engineers, Attachment 1 at 1-2 (June 6, 2017).
[153] Am. BiOp at 247.
[154] EPA 401 Letter, Ex. 3, Enclosure at 3.
[155] *Id.* at 4.
[156] *Id.* at 2-3.
[157] *Id.* at 5.

The most recent HMMP fails to mitigate impacts to OAWs due to decreased stormwater runoff in Barrel Canyon. The HMMP acknowledges that the mine will curtail an estimated 242 acre-feet-per year for surface water flowing to Davidson Canyon, a calculation based on the difference between pre-mining and post-mining flow rates (1,404 acre feet versus 1,162 acre feet at USGS Gage 09484580). The HMMP then attempts to zero-out this loss by taking credit for 240 acres of surface water runoff caught by stock tanks and catchments within the project area.[158] But there are no paper gains to be had here. These tanks and catchments also exist under post-mining conditions, and thus do not alter the calculations regarding the amount of runoff impounded by the mine.[159] Balancing the books, so to speak, demonstrates there are no gains to be had here, contrary to Hudbay's calculus.

In addition, the proposed mitigation measures in the HMMP cannot be verified and appear wholly speculative. The HMMP sets forth a "Stock Tank Removal Plan" and claims surface water credit for the removal of four tanks located within the immediate vicinity of the mine. But there is no evidence these tanks actually retain the quantity of waters assumed by the HMMP. To the contrary, the evidence demonstrates that at least two of these tanks are dry for the majority of the year, and none of them likely capture all upstream water.[160] Moreover, Hudbay never evaluated the future condition of the stock tanks to determine if they would continue to function once mining operations commence. It seems highly unlikely that the removal of Barrel Canyon/East Dam Tank can provide any verifiable surface water credit given that any upgradient surface flows will be captured by the open pit mine and associated rock storage facilities. The HMMP appears to acknowledge as much.[161] If the remaining stock tanks are directly or indirectly impaired by the mine, then there is no mitigation value (or discounted mitigation value) for the removal of the berms associated with the tanks. Hudbay has thus failed to demonstrate that its proposed mitigation measures will provide any verifiable benefits to surface water flows. The fact thus remains that the proposed mine will reduce surface water runoff, altering the water quality of Davidson Canyon and Cienega Creek in violation of Arizona's Tier 3 antidegradation standard.

ii. <u>The Rosemont Mine Will Violate Arizona's Perennial and Wadeable Standard for Upper Empire Gulch and Cienega Creek.</u>

The Rosemont Mine will dewater the regional aquifer, adversely impacting surface and subsurface flows along Empire Gulch, Cienega Creek, and Davidson Canyon. These indirect impacts would violate Arizona's narrative standard for perennial/wadeable streams. ADEQ refused to analyze these effects, underscoring the incomplete and flawed basis for its 401 Certification.

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[158] 2017 HMMP 6-7.

[159] To the extent the mine itself destroys any stock tanks or catchments, the surface flows contributing to those features would simply be captured by the mine itself, and thus would not contribute anything to downstream flows. Such a result would only increase the drawdown of surface runoff caused by the mine.

[160] Pima County Letter, Ex. 8 at 6-7.

[161] 2017 HMMP at 9.

Arizona regulations designate specific uses for a "wadeable, perennial stream with either an aquatic and wildlife (cold water) or an aquatic and wildlife (warm water) designated use." R-18-11-108.01.A. According to the standard, "[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." R18-11-108.E (emphasis added). Upper Empire Gulch, portions of Davidson Canyon, and two sections of Cienega creek are wadeable, perennial streams with designated uses for aquatic and wildlife, full body contact, and fish consumption.[162]

As discussed above, groundwater drawdown would cause Empire Gulch to transition from a perennial to ephemeral stream, potentially losing all or most of its pools and riparian vegetation.[163] This stream segment would switch from a hydroriparian corridor with a large cottonwood gallery that supports aquatic and wildlife species to a xeroriparian corridor with tamarisk and mesquite.[164] Wetland complexes within the hydroriparian zone would likely experience drying and mortality.[165] This transition would impact multiple species that depend on hydroriparian habitat, including native fish and multiple listed species (e.g., the Chiricahua leopard frog,[166] northern Mexican garter snake,[167] and Gila chub,[168] to name just a few). For example, the loss of flows "would permanently remove the longest standing and most prolific site occupied by the Chiricahua leopard frog in the Las Cienegas NCA metapopulation and likely within RU2 for the frog."[169] Such a drastic change to upper Empire Gulch would violate Arizona's wadeable/perennial water quality standard as this stream segment would no longer support a community of organisms "comparable to that of a stream with reference conditions in Arizona." R-18-11-108.E.

For Cienega Creek, the FEIS concludes that changes in flow condition would "increase water temperatures, increase nutrient loads, and decrease the assimilative capacity of the stream," thereby having an effect on the functional organization of the stream as compared to reference conditions in Arizona."[170] Furthermore, the mine will reduce surface flows along Davidson Canyon and drawdown the underlying aquifer, which will likely cause widespread absence of surface flows for large portions of the year.[171] These effects along Davidson Canyon and Cienega Creek violate the wadeable, perennial standard. R-18-11-108.E.

ADEQ failed to analyze the groundwater drawdown on surface waters, claiming that it was limited to an analysis of the "direct results of the fill activities."[172] This self-imposed restriction violates the Clean Water Act as it ignores the impacts of groundwater drawdown on

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[162] FEIS at 522.
[163] June SIR at 140. *See also id.* at 61 (Table 6. Summary of stream flow analysis in FEIS).
[164] FEIS at 542.
[165] *Id.* at 542.
[166] June SIR at 159-60
[167] *Id.* at 168
[168] FEIS at 690.
[169] Am. BiOp at 150.
[170] FEIS at 554-555.
[171] FEIS at 537.
[172] Basis for 401 Certification Decision, Rosemont Copper Project 2.

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hydrologically connected surface waters. As discussed above, these indirect impacts fall squarely within the regulatory jurisdiction of the Clean Water Act. Moreover, "it is important for the §401 certification authority to consider all potential water quality impacts of the project, both direct and indirect, over the life of the project."[173] ADEQ's failure to consider the full adverse effects on water quality from the Rosemont Project renders its 401 Certification invalid or, at the very least, inconclusive. The Corps must therefore consider the impacts of the project on water quality, as urged by the EPA.

iii. The Habitat Mitigation and Monitoring Plan Will Destroy Designated Uses Along Sonoita Creek.

Sonoita Creek, from its headwaters downstream to the Town of Patagonia's wastewater treatment plant, is an ephemeral creek with designated aquatic, wildlife, and human health uses. *See* Title 18 AAC, Chap. 11, Appendix B. Along this reach, Sonoita Creek is currently designated for the following existing uses: aquatic use by animals, plants, or other organisms (excluding fish) for habitation, growth, or propagation; and for human recreational use involving partial-body contact. *See id.* Sonoita Creek is thus a Tier 1 water, meaning that its existing uses must be maintained and protected. 18 AAC R18-11-107(B); *id.* at 107.1(A)(1)(c).

Despite the legal requirement to protect Sonoita Creek's existing uses, Hudbay proposes to completely fill 8.9 acres of waters of the United States along Sonoita Creek, obliterating *any* existing uses along those 8.9 acres. Hudbay's proposed mitigation—by definition—would degrade existing water quality in Sonoita Creek because it would eliminate *all of the water in the 8.9 acres of Sonoita Creek that Hudbay proposes to fill.* Moreover, because the 8.9-acre reach is proposed to be completely filled, it is impossible that the proposed mitigation work will maintain Sonoita Creek's designated uses, as required by Arizona law. In other words, animals, plants, and other organisms will not be able to use Sonoita Creek (at least in this 8.9-acre reach) for any habitation or propagation, and people will not be able to use it for recreation. At a minimum, this would violate the narrative water quality standard laid out in R18-11-108, which prohibits pollutants in surface waters "in amounts or combination that settle to form bottom deposits that inhibit or prohibit the habitation, growth, or propagation of aquatic life."

There will likely be downstream impacts to surface water quality caused by the proposed mitigation measures. Yet, neither Hudbay nor ADEQ has analyzed the downstream impacts of filling 8.9 acres of Sonoita Creek at the Sonoita Creek and Rail X Ranches. This data gap must be filled by the Corps as part of its independent evaluation to ensure there are no "violations of any applicable State water quality standard" requiring denial of the 404 Permit. *See* 40 C.F.R. § 230.10(b)(1).

Ultimately, the Rosemont Mine will cause or contribute to multiple violations of state water quality standards. These violations are highly relevant to the Corps' public interest review, 33 C.F.R. § 320.4(a), and independently require denial of the permit, 40 C.F.R. § 230.10(b)(1).

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[173] *See* Clean Water Act Section 401 Water Quality Certification: A Water Quality Protection Tool For States and Tribes (2010) ("EPA 401 Handbook"), at 17, available at http://water.epa.gov/lawsregs/guidance/cwa/upload/cwa-401-handbook-2010-interim.pdf.

D. The Rosemont Mine Will Adversely Affect Fish and Wildlife.

The Corps' public interest guidance emphasizes the importance of "the conservation of wildlife resources by prevention of their direct and indirect loss and damage due to the activity proposed in a permit application." 33 C.F.R. § 320.4. The Rosemont Mine will directly and indirectly affect multiple species that depend in part or entirely on aquatic environments for their survival. The mine will also result in adverse modification of jaguar critical habitat, significantly impairing the recovery of the species.

The Rosemont Mine will result in the loss of multiple endangered species that depend on aquatic environments for their survival. The FWS anticipates the take of Gila Chub,[174] Gila topminnow,[175] desert pupfish,[176] Chiricahua leopard frog,[177] and northern Mexican garter snake.[178] Furthermore, the Rosemont Mine will adversely affect the Huachuca water umbel. While the FWS identified essential conservation measures to prevent jeopardy, such as introduction of these species as Sonoita Creek Ranch, many of these species have never been successfully reestablished at Sonoita Creek Ranch, calling into question FWS's reliance on these conservation measures.

The Rosemont Mine will also result in the loss of multiple species protected by the ESA that depend on riparian habitat, such as the threatened western yellow-billed cuckoo and southwestern willow flycatcher. Cuckoos depend on large expanses of riparian woodland (hydroriparian) habitat,[179] and also rely on mesquite and oak woodlands some distance from riparian woodland galleries.[180] Cuckoos likely use the high-functioning upland habitat in Barrel, McCleary, and Wasp Canyons as breeding habitat,[181] and also rely heavily on riparian habitat in Empire Gulch, Davidson Canyon, and Cienega Creek.[182] Construction of the mine, reduced stormwater runoff, and groundwater drawdown will adversely affect 1,289.2 acres of cuckoo habitat, a staggering sum that would lead to the loss of cuckoo across the landscape.[183]

Rather than providing a numerical estimate of cuckoos that would be taken by the Rosemont Mine, the FWS used habitat as a surrogate. Specifically, the FWS anticipated direct impacts to 6 miles and 345.6 acres of occupied xeroriparian vegetation in Barrel, McCleary, and Wasp Canyons; indirect effect to 0.6 miles and 38.3 acres of xeroriparian habitat in Davidson Canyon; indirect effects to 0.7 miles and 44.6 acres of xeroriparian habitat in Cienega Creek; and

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[174] Am. BiOp at 101-102.
[175] *Id.* at 118.
[176] *Id.* at 137.
[177] *Id.* at 160-61.
[178] *Id.* at 193.
[179] *Id.* at 227.
[180] *Id.* at 225.
[181] *Id.* at 240.
[182] *Id.* at 247-48.
[183] *Id.* at 250-51.

ED_002020B_00040140-00108

indirect effects to 3.3 miles and 860.5 acres of hydroriparian habitat in Empire Gulch and lower Cienega Creek.[184]

The FWS claimed these severe impacts to the western yellow-billed cuckoo would not jeopardize the species, however, because conservation measures at Sonoita Creek, Davidson Canyon, and the Hydroriparian Conservation Fund minimize the effects of the action.[185] But Hudbay has since taken a drastic turn in its most recent HMMP, opting to completely destroy 8.9 acres of waters of the United States along Sonoita Creek, wiping out the very habitat FWS cited as available to mitigate impacts to Cuckoos. As FWS cautioned, "[i]f the miles and acreage anticipated to be enhanced at Sonoita Creek Ranch and/or under the Hydroriparian Conservation Fund are not met, the adverse effects to xero- and hydroriparian vegetation will be greater than analyzed in this [BiOp], thus necessitating consideration of reinitiation by the USFS and Corps."[186] The Corps must therefore either deny the permit or reinitiate consultation with FWS. *See* 50 C.F.R. § 402.16(c) (requiring reinitiation "If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion").

In addition to impacting the western yellow-billed cuckoo, the mine will adversely affect 303.8 acres of hydroriparian critical habitat for the southwestern willow flycatcher.[187] This will result in the extirpation of sites in Empire Gulch and increase the likelihood of extirpation in Cienega Creek.[188]

The mine will also result in the adverse modification of critical habitat for the jaguar, a significant loss that weighs heavily against issuance of the permit. In multiple draft biological opinions, the FWS staff concluded that the Rosemont Mine would severely restrict connectivity between multiple critical habitat units and Mexico, significantly affecting the recovery of the species. The FWS ultimately reversed this finding on the grounds that the evidence did not establish a "very probable" or "high probability" of adverse modification to critical habitat.[189] But that reversal was based on a flawed reading of Section 7 of the ESA, which requires Federal agencies to ensure that their activities are "not likely to . . . result in the destruction or adverse modification of critical habitat." 16 U.S.C. § 1536(a)(2). The FWS's "high probability" standard turns this protection on its head and fails to "give the benefit of the doubt to the species." *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988). A "high probability" standard is also contrary to the institutionalized caution required by the ESA. *See TVA v. Hill*, 437 U.S. 153, 194 (1978) ("Congress has spoken in the plainest of words, making it abundantly clear that the balance has been struck in favor of affording endangered species the highest of priorities, thereby adopting a policy which it described as 'institutionalized caution'"). The Corps is under no obligation to defer to the FWS's flawed interpretation of the ESA, and instead must factor the adverse modification of jaguar critical habitat into its public interest review,

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[184] *Id.* at 259.
[185] *Id.* at 249.
[186] *Id.*
[187] *Id.* at 277
[188] *Id.* at 281
[189] Spangle, Steve. Draft Analysis of the Draft Biological Opinion Regarding Effects of the Rosemong Mine on the Jaguar and its Critical Habitat (June 24, 2013).

ED_002020B_00040140-00109

especially as any "likelihood of the destruction or adverse modification" of critical habitat requires denial of the 404 Permit. 40 C.F.R. § 230.10(b)(3).

The impacts of the mine on threatened and endangered fish and wildlife counsel strongly against granting a 404 Permit.

E. The Rosemont Mine Will Impact Aesthetic, Scenic, and Recreational Values.

Southeastern Arizona is characterized by a series of mountain ranges, separated by deserts, that rise above the arid landscape and are known as "sky islands."[190] The Santa Rita Mountains are one such series of sky islands due to their peaks that reach an elevation of 9,453 feet.[191] The Rosemont Mine would be located just below the ridgeline of the Santa Rita Mountains in an area of aesthetic and scenic value. The following picture by Gooch Goodwin captures the beauty of this stunning landscape.

This vista of rolling hills, canyons, and ridgelines would be permanently and irrevocably destroyed by the Rosemont Mine, which would produce an open pit (6,500 feet in diameter and over 2,000 feet deep), towering waste rock piles and tailings storage facility in the foreground of the above picture. This vista would be transformed into an industrial mining operation with the associated transportation networks, infrastructure corridors, and staging facilities.[192] These impacts dwarf any prior development in the area, which currently has "high scenic integrity."[193]

The footprint of the Rosemont Mine would also impact recreational values. The mine would directly remove up to 6,990 acres of land from public entry, transforming "the existing, undeveloped, semiprimitive recreation setting on lands surrounding the project area to a developed, industrialized setting."[194] The mine would also force relocation of 13 miles of the Arizona Trail that are characterized by unobstructed views of the Santa Rita Mountains to a location on the other side of Sate Highway 83.[195] The Arizona Game and Fish Department summarized these impacts as follows: "the project will render the northern portion of the Santa

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[190] FEIS at 786.
[191] *Id.* at 787.
[192] FEIS at 798-80 (summarizing "wide-ranging impacts to scenic quality that would be evident from a variety of viewpoints.").
[193] FEIS at 790.
[194] FEIS at 862.
[195] FEIS at 793-794.

ED_002020B_00040140-00110

Rita Mountains virtually worthless as wildlife habitat and as a functioning ecosystem, and thus also worthless for wildlife recreation."[196]

These impacts to scenic and recreational values raised concerns for a wide-sector of the public. Tribal communities expressed serious reservations about the impacts of the mine on the Santa Rita Mountains.[197] So too, the communities of Tucson, Green Valley, Sonoita, Sauarita, Vail, and Corona de Tucson,[198] as well as rural residents in Corona de Tucson, Sonoita, Fellows Ranch, Empire Ranch, Hilton Ranch, and Sycamore Estates expressed concerns about visual impacts, as detailed above.[199] And recreationists along the Arizona Trail, Las Cienegas National Conservation Area, and Saguro National Park expressed concerns.[200] These broadly shared public concerns counsel against issuance of a 404 Permit.

F. Considerations of Property Ownership Weigh Heavily Against the Mine.

The Rosemont Mine will adversely impact federal public lands and federal water rights, both of which weigh heavily against issuing a permit. *See* 33 C.F.R. § 320.4(a).

The vast majority of the Rosemont Mine (3,656 acres) will occupy federal lands managed by the Coronado National Forest. Hudbay will bury these lands under approximately 1.2 billion tons of waste rock and tailings, if the mine goes forward. Hudbay does not, however, have an absolute right to conduct mining-related activities on these federally-owned lands. While it currently maintains unpatented mining claims on these public lands, it has not proved up their validity. Where there is no valid claim, "there are no rights under the Mining Law that must be respected, [and the government] has wide discretion in deciding whether to approve or disapprove of a miner's proposed plan of operations." *Mineral Policy Ctr. v. Norton*, 292 F. Supp. 2d 30, 48 (D.D.C. 2003). Safeguarding these public lands from destruction weighs heavily against permitting the Rosemont Mine.

Mine-driven groundwater drawdown will also adversely affect federal water rights. The Bureau of Land Management (BLM) owns federal reserved water rights throughout Las Cienegas National Conservation Area, as well as water rights associated with three springs on the west side of the Santa Rita Mountains (Helevita, Zackendorf, and Chavez Springs), four springs associated with Cienega Creek, and 13 springs associated with Empire Gulch.[201] "Helevita is believed to derive water from the regional aquifer and therefore there is a high likelihood of [the Rosemont Mine] impacting the BLM water right."[202] Moreover, "[w]ater rights along Empire Gulch would likely be impacted by the changes described" in the

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[196] Letter from Joan E. Scott, Arizona Game and Fish Department, to Beverley Everson, Coronado National Forest at 1 (July 8, 2008).
[197] FEIS at 1036 ("the mining project would introduce visual, atmospheric, and audible elements that would diminish the integrity of even the physically undisturbed parts of the *Ce;wi Duag*" or long mountains).
[198] FEIS at 791.
[199] *Id.*
[200] *Id.*
[201] FEIS at 422.
[202] FEIS at 562.

ED_002020B_00040140-00111

groundwater models.[203] The BLM "does not relinquish existing BLM surface water and groundwater rights" and requested an opportunity to provide a dissenting opinion to the project.[204] These impacts to public lands and water rights weigh against the 404 Permit.

G. Hudbay Has Failed to Mitigate the Impacts of the Rosemont Mine.

The Los Angeles District "concluded that mitigation proposed to offset the project would be inadequate."[205] The district determined that "the 40.4 acres of waters [of the United States] would not be mitigated by the proposed re-establishment at Sonoita Creek Ranch, along with the proposed mitigation on Davidson Canyon parcels and on proposed mitigation parcels, located outside of the impacted watershed."[206] This determination is even more apt given that Hudbay now proposes to destroy an additional 8.9 acres of waters of the United States and refuses to offset the indirect effects to waters of the United States caused by groundwater drawdown. Hudbay has thus failed to adequately mitigate the impacts of the project, as discussed in greater detail below. The lack of adequate mitigation weighs heavily against granting a 404 Permit under the Corp's public interest analysis.

In conclusion, there are multiple procedural and substantive grounds requiring denial of the 404 Permit for the Rosemont Mine. We look forward to discussing these issues with you as part of a formal government-to-government consultation.

Sincerely,

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[203] *Id.* at 529.
[204] Letter from David Baker, Tucson Field Office Manager, BLM, to Jim Upchurch, Forest Supervisor, Coronado National Forest, Aug. 15, 2013.
[205] Letter from Colonel Helmlinger, U.S. Army Corps of Engineers, to Patrick Merrin, Hudbay 2 (Dec. 28, 2016).
[206] *Id.*

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List of Exhibits

1. Letter from Colonel Helmlinger, U.S. Army Corps of Engineers, to Patrick Merrin, Hudbay (Dec. 28, 2016)

2. Letter from Jane Diamond, EPA, to Colonel Colloton, U.S. Army (Nov. 7, 2013)

3. Letter from Jared Blumenfeld, EPA Region IX, to Colonel Colloton, U.S. Army Corps of Engineers (Apr. 14, 2015), enclosing EPA Region 9 comments on the Draft Section 401 Water Quality Certification for the Rosemont Copper Project dated February 21, 2014 (Draft 401 Certification), and the Basis for State 401 Certification Decision Rosemont Copper Project ACOE Application No. SPL-2008-00816-MB

4. Tohono O'odham Nation, Objection to Rosemont Copper Project Final Environmental Impact Statement and Proposed Record of Decision (Feb. 14, 2014)

5. Letter from Dr. Jennifer McIntosh to Kerwin Dewberry (June 1, 2017)

6. Leidy, Robert and Kondolf, Matthias. Technical Memorandum: Conceptual Design for Sonoita Creek, AZ, Technical Review Support (Order Number EP-G149-00241) 9 (July 27, 2015)

7. EPA Comments on Rosemont Copper Project – response to Corps staff comments of April 16, 2014 on Habitat Mitigation and Monitoring Plan 16 (April 28, 2014)

8. Letter from Huckelberry, C.H. to Ms. Rosi Sherrill, 2017 Addendum to Water Quality Permit, Rosemont Copper Project ACOE Application No. SPL-2008-00816-MB (Nov. 17, 2017)

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