



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street  
San Francisco, CA 94105-3901

JAN 25 2013

Colonel R. Mark Toy  
District Engineer, Los Angeles District  
U.S. Army Corps of Engineers  
Attn: Regulatory Branch (SPL-2004-01399-MB)  
5205 E. Comanche Street  
Tucson, Arizona 85707

Subject: Draft Rosemont Copper Project Habitat Mitigation and Monitoring Plan (HMMP)

Dear Colonel Toy:

EPA Region 9 appreciates the Corps' ongoing coordination regarding your pending permit decision for the Rosemont copper mine, located on 4,750 acres of predominantly on U.S. Forest Service (USFS) lands in Pima County, Arizona. Enclosed please find comments reflecting our detailed technical review of the project's November 2012 HMMP and related documents,<sup>1</sup> which we trust will be useful to the Corps in advancing the project through the regulatory process.

In summary, we believe implementation of the HMMP would fail to fully compensate for the project's impacts to regulated waters. The methods used to assess aquatic functions at the project site and proposed mitigation sites are scientifically flawed, and therefore fail to adequately identify and quantify those functions. This fundamental error is then compounded by the attempt to establish appropriate compensation ratios. Among the most significant issues are:

- The failure to fully assess the direct, indirect and cumulative impacts from the proposed project;
- The functional assessment methodology does not provide any meaningful assessment of the functions of ephemeral systems across the proposed project and mitigations sites and significantly underestimates the function of impacted waters; and
- The habitat creation proposed at Sonoita Creek Ranch may not be ecologically sustainable and may not result in the creation of jurisdictional waters.

EPA remains concerned that substantial loss and/or degradation of water quality and other aquatic ecosystem functions are likely if the proposed mine is constructed. Although we are pleased to provide the enclosed detailed analysis of proposed compensatory mitigation, the applicant should be reminded that mitigation begins with the avoidance and minimization of impacts, and that compliance with 40 CFR 230.10(a) (alternatives) is prerequisite to assessing compliance with 40 CFR 230.10(d) (mitigation) or the requirements of Subpart J of the 404(b)(1) Guidelines.

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<sup>1</sup>All documents November 2012 by WestLand Resources, Inc on behalf of Rosemont Copper Company: (a) *Functional Analysis of Impacted Waters of the U.S.* (RCFA); (b) *Sonoita Creek Ranch Functional Analysis and Mitigation Ratio Determination* (SCR); and (c) *State Route 83 Corridor and Davidson Parcels: Functional Analysis and Mitigation Ratio Determination* (SR83/Davidson).

Thank you for your ongoing partnership in implementing CWA programs. As additional information on this project's regulatory progress becomes available, please ask your staff to coordinate with Elizabeth Goldman at (415) 972-3398 or Dr. Robert Leidy at (415) 972-3463.

Sincerely,

A handwritten signature in black ink, appearing to read "Jason Brush". The signature is fluid and cursive, with a large initial "J" and "B".

Jason Brush  
Supervisor  
Wetlands Office

Attachment

cc: Rosemont Copper Company  
U.S. Forest Service  
U.S. Fish and Wildlife Service

## Rosemont Copper Mine 404 Comments on HMMP

### Proposed Project Impacts

In our evaluation of the proposed HMMP, it is important to identify in advance the discrepancy that exists between EPA's and Rosemont's assessment of project impacts upon which the HMMP has been developed. In addition to other significant concerns (*e.g.*, functional analysis) described in this letter, the HMMP fails to provide compensation as required by the Guidelines and 2008 Mitigation Rule for the entire scope of direct and indirect/secondary project impacts associated with the proposed project.

The proposed project site supports 101.6 acres of waters, including wetlands, in the Cienega Creek watershed providing hydrologic, chemical and biological connectivity to Cienega Creek and the Santa Cruz River. In developing the HMMP, Rosemont identified only 39.97 acres of direct impacts and 2.79 acres of indirect impacts in their mitigation analysis.

EPA maintains the impacts from the proposed project include direct fill, secondary impacts resulting in functional degradation, and habitat conversion of aquatic and terrestrial resources over a large geographic area. The project will result in the loss or conversion of approximately 7,000 acres including semi-desert grassland, Madrean evergreen woodland, and Sonoran desert scrub communities, and their associated aquatic and riparian habitats, that form a vast, largely unfragmented, natural landscape.

The proposed project will authorize the direct fill of 39.97 acres of waters, including a largely undisturbed network of 18 linear miles of stream comprised of up to 154 individual drainages. There will also be direct impacts to aquatic habitats associated with several springs. Secondary effects on the aquatic environment include dramatic and persistent changes to hydrologic and hydraulic regimes within the project and adjoining watershed, adversely affecting the function of sensitive and regionally significant downstream receiving waters, including wetlands. The U.S. Forest Service estimates 1,364 acres of riparian habitat, likely to include a significant amount of jurisdictional riparian wetlands, impacted by the proposed project.<sup>2</sup> The project will adversely affect three types of Special Aquatic Sites (wetlands, sanctuaries and refuges, and riffle and pool complexes, see 40 CFR 230.40-45) as well as Tier 3 "unique waters"; portions of Davidson Canyon Wash and Cienega Creek are designated by the State of Arizona as "Outstanding Arizona Waters" (section 303 of the CWA and 40 CFR 131.12). In addition, EPA identified these waters as "Aquatic Resources of National Importance" pursuant to the 404q MOA.

The proposed project is likely to have significant impacts to downstream reaches of Davidson Canyon, Empire Gulch and Cienega Creek, including:<sup>3</sup>

- Modification to the water balance along portions of Davidson Canyon, Cienega Creek and Empire Gulch Creek adversely impacting special aquatic sites;
- Secondary impacts from project-related groundwater drawdown disrupting breeding, spawning, rearing and migratory movements, or other critically life history requirements of fish and wildlife resources;
- Groundwater drawdown resulting in stress and mortality to riparian habitat, including wetlands;

<sup>2</sup> DEIS for the Rosemont Copper Project (December 11, 2011), Chapter 3, Table 98.

<sup>3</sup> Letters from EPA to Corps dated January 5, 2012 and February 13, 2012

- Modification of sediment yield resulting in adverse impact to downstream water quality. Permanent surface water quality impacts to 2.5 miles of Barrel Canyon Wash and 14 miles of Davidson Canyon Wash through increased channel scour and aggradation. Other changes include bank erosion and loss of riparian habitat;
- Adverse effects on aquatic organisms due to elevated suspended sediments;
- Loss of 18 miles of stream channel resulting in significant reduction of groundwater recharge functions within Davidson.

## **Rosemont's Habitat Mitigation and Monitoring Plan**

On October 11, 2011, Rosemont Copper submitted a CWA 404 permit to the Corps requesting a permit to discharge dredged or fill material into waters to construct the proposed Rosemont Copper Mine. On November 8, 2012, EPA received a copy of the Rosemont Copper Mine HMMP. Rosemont Copper proposes the HMMP as compensatory mitigation in compliance with the CWA 404 permit and the 2008 Mitigation Rule.

The 2008 Mitigation Rule states the fundamental objective of compensatory mitigation is to offset environmental losses resulting from unavoidable impacts to waters. Compensatory mitigation may be performed using the methods of restoration, enhancement, establishment, and in certain circumstances, preservation.

### **Preservation**

As described in the HMMP, Rosemont proposes to record a conservation easement on 1774 acres of land containing 35.34 acres of aquatic resources and approximately 39.45 acres of riparian vegetation within the Santa Cruz River watershed on the following parcels:

***State Route 83 Corridor Parcels*** - The State Route 83 parcels consist of 4 parcels totaling 545 acres. The size of each parcel is not described in the referenced documents. These parcels contain surface water features that occur within or drain into Davidson Canyon (SR83/Davidson p. 2). Waters located within these conservation parcels total 13.76 acres and range from 0.94 acre to 7.28 acres per parcel. There are no water rights associated with the SR 83 parcels.

***Davidson Parcels*** - The Davidson parcels consist of 2 parcels totaling 29 acres. These parcels consist of two adjoining parcels of land encompassing both sides of Davidson Canyon. Waters located within these conservation parcels total 1.75 acres (SR83/Davidson p. 3). There are no water rights associated with the Davidson parcels.

***Sonoita Creek Ranch Parcel*** - The Sonoita Creek Ranch parcel is 1200 acres consisting of ranching, open space and agriculture. Perennial Monkey Spring is located 0.8 mile north of the ranch and provides surface water to the ranch. There are 19.83 acres of aquatic resources on the Sonoita Creek Ranch consisting of: 1) 13.03 acres of ephemeral drainages; 2) 0.16 acre of perennial drainage; 3) 5.92 acres of wetlands; and 4) 0.72 acre of 5 seasonal ponds. A total of 52.01 acres of riparian vegetation was identified on the parcel (SCR p. 6).

## Creation

*Sonoita Creek Ranch Parcel* - The HMMP is proposing 115.5 acres of habitat consisting of a drainage feature, wetland fringe and riparian buffer (p. 9 SCR). Based on the maps provided in the HMMP, Rosemont is proposing a 3,000' riverine corridor with a 5' channel (1' to 2' bottom width) and 20' riparian habitat on each side (HMMP p. 17). This would result in approximately 0.34 acre of wetted channel and 2.75 acre of adjacent riparian habitat. The remainder of the 112 acres proposed as mitigation on this parcel would be sown with native seed mix. The native seed mix is comprised of approximately 91% upland species (HMMP p. 22-23). The 112-acres would remain as uplands.

Rosemont would share certified water rights on Monkey Springs with an upstream property owner and flow would be based on a water delivery schedule agreed to with the other property owner (HMMP p. 8). The flow of water would be controlled through existing infrastructure. This water would be used to create a perennial compacted drainage feature and adjacent riparian. Waters within the proposed 3,000' riverine channel will eventually infiltrate due to the nature of the soils on the agricultural field. Therefore, this channel may not be considered a jurisdictional water as it would not have a surface water connection with Sonoita Creek.

## **MRA - Functional Analysis of Jurisdictional Impacts**

According to the 2008 Mitigation Rule, compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. If a functional or conditional assessment, or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio must be used. The Corps must require a ratio greater than one-to-one where necessary to account for the method of compensatory mitigation (*e.g.*, preservation), the likelihood of success, differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project, temporal losses of aquatic resource functions, the difficulty of restoring or establishing the desired aquatic resource type and functions, and/or the distance between the affected aquatic resources and the compensation site (CFR 230.93(f)).

To assess the functional condition of aquatic resources on the proposed project site as well as the proposed mitigation lands, WestLands modified a Rapid Stream-Riparian Assessment<sup>4</sup> (RSRA) for their own use and called it the Modified RSA approach or "MRA." The original methodology involves a quantitative evaluation of between two to seven indicator variables in five different ecological categories: water quality, fluvial geomorphology, aquatic and fish habitat, vegetation composition and structure, and terrestrial wildlife habitat. Each variable is rated on a scale that ranges from "1," representing highly impacted and non-functional conditions, to "5," representing a healthy and completely functional system. Whenever possible, scores are scaled against what would be observed in control or reference sites that have similar ecological geophysical characteristics, but which have not been heavily impacted by human activities.

Although the RSRA was designed to assess the functional condition of perennial systems, WestLands modified the RSRA in order to apply it to ephemeral systems. In addition, they propose the MRA can also be used to compare functions between ephemeral, intermittent and perennial stream reaches on the

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<sup>4</sup> Steven, L.E., Stacey, P.B., Jones, A.K., Duff, D., Gourley, C., and J.C. Catlin. 2005. A protocol for rapid assessment of southwestern stream-riparian ecosystems. Proceedings of the Seventh Biennial Conference of Research on the Colorado Plateau titled *The Colorado Plateau II, Biophysical, Socioeconomic, and Cultural Research*. Charles van Riper III and David J. Mattsen Ed.s. pp. 397-420. Tucson, AZ: University of Arizona Press.

same scale. They used the MRA scores as an absolute assessment based upon the values and indicators in the RSRA Guidebook rather than as scores for comparison of stream reaches with similar biotic and abiotic characteristics (RCFA, p.4). The MRA averaged the indicators for each ecological category, and then calculated an overall score by averaging the five ecological categories. As a result, all ephemeral streams using the MRA scored "0" for water quality, fluvial geomorphology and fish/aquatic habitat. The overall MRA score of the Rosemont Project area was 1.17, indicating the aquatic resources are non-functioning or highly impacted (RCFA p. 11).

The MRA used by WestLands does not provide any meaningful assessment of the functions of ephemeral systems across the proposed project and mitigation sites. The MRA is not scientifically sound. Therefore, the MRA does not satisfy the requirements of a suitable assessment method to assess the loss of aquatic function (33 CFR 332.3 (f)(1)). Since 1993, the federal government has expressed the need for improvement of rapid assessment techniques to allow for better consideration of the functions of waters/wetlands in the context of the CWA Section 404 process. Fundamental to the development of a functional assessment is the recognition that waters/wetlands perform certain functions better than others, not because they are impacted in some way, but because waters are inherently different. Therefore, it is critical to accurately describe functions for each class of waters/wetlands that occur within a study area. It is not appropriate to strictly compare functions across classes of waters/wetlands. For example, comparison of the functions of 1<sup>st</sup> through 3<sup>rd</sup> order ephemeral riverine waters with those of perennial waters/wetlands for the purpose of computing MRA scores is not meaningful. Even though some functions overlap significantly between classes, which they often do, the functions are likely to be performed through the combination of slightly difference processes and at different levels or intensities.

Essential to the development of a functional assessment, is the use of reference systems. Reference sites are the observed and measured characteristics of a range of similar sites within a regional or study area. Development of a reference framework allows the use of a relative rather than an absolute scale, which provides for better resolution of expected functions and a regional standard for comparison. For example, within the context of a regional reference framework the 1<sup>st</sup> through 3<sup>rd</sup> order ephemeral streams on the Rosemont Project impact site likely would be scored as high functioning (*i.e.*, an overall functional rating of 4 or 5 within the RSRA framework).

The MRA also assigns a score of zero to RSRA categories that rely on the presence of water for proper functioning. The MRA assumes that "any variable within the five major RSRA categories that rely on the presence of surface water that cannot be assessed due to the lack of an appropriate water regime at the time of sampling will result in the overall major category receiving a score of zero, representing a lack of functionality" (p. 4). This fails to acknowledge that by definition ephemeral and intermittent streams are functioning aquatic ecosystems that periodically contain flowing water. Any scientifically valid functional assessment of ephemeral and intermittent streams must account for the seasonal nature of flows and either: 1) assess and score functions when water is present, or 2) assay the probable functions in the absence of flows. The MRA assumption that the ephemeral and intermittent streams have no function because there is no water present at the time of the assessment demonstrates a clear lack of understanding of how these aquatic ecosystems function. Ephemeral and intermittent streams on the Rosemont Project impact site perform important functions that were not properly assessed by the MRA. In this regard, there are several hydrogeomorphic (HGM) functional assessments available for modification and use in arid western systems similar to environmental conditions found at the Rosemont project site. The RSRA or other functional assessment methodologies could have been easily modified

to fully assess the functions of ephemeral and intermittent streams or other methodologies for the Rosemont Project.

The MRA does not assess the full range of functions that are performed by riverine waters at the Rosemont Project site. Several important functions not assessed by the MRA performed by ephemeral and intermittent riverine waters in the Arid West and that would be expected to occur in the Rosemont Project area include the following:

### Hydrologic Functions

- *Surface and Subsurface Water Flow, Storage and Exchange* - The retention and/or circulation of surface and ground water within the floodprone area.
- *Sediment Mobilization, Transport, and Deposition/Storage* – The mobilization, transport, and deposition of sediment influences the channel pattern, dimension, and profile, channel bed materials, and vegetation of riverine waters/wetlands at the assessment site and in downstream waters.
- *Energy Dissipation* – Energy dissipation results in the allocation of potential energy to other forms of kinetic energy as water moves into, through, and out of a water/wetland.
- *Landscape Hydrologic Connections* – The hydrologic connectivity of contributing areas to riverine waters/wetlands and then, in turn, to other down-gradient waters/wetlands.

### Biogeochemical Functions

- *Element and Compound Cycling* – Element and compound cycling includes the abiotic and biotic processes that convert compounds (e.g., nutrients and metals) from one form to another.
- *Organic Carbon Export* – The export of dissolved and particulate organic carbon through leaching, flushing, displacement, and erosion from waters/wetlands.
- *Detention, Retention, and Removal of Imported Elements, Compounds and Particulates* – The delay, transformation and removal of imported nutrients, contaminants, particulates, and other compounds into, through, and out of the riverine system.

### Habitat/Faunal Support Functions

- *Maintenance of Spatial Structure of the Habitat* – The capacity of waters/wetlands to support animal populations and guilds by providing heterogeneous habitats.
- *Maintenance of Habitat Interpersions and Connectivity* – The capacity of a water/wetland to permit aquatic, semi-aquatic and terrestrial organisms to enter and leave a riverine system via permanent, intermittent, or ephemeral channels, floodprone areas, or unconfined hyporheic gravel aquifers, or other large contiguous habitat patches.
- *Distribution and abundance of Invertebrates and Vertebrates* – The capacity of the water/wetland to maintain the density and spatial distribution of characteristic aquatic, semi-aquatic and terrestrial invertebrates and vertebrates.

Several of the MRA sampling method indicators are not adequate to assess a particular function. For example, water quality is a societal value and not strictly a function. Hydrologic functions (e.g., element and compound cycling, removal of compounds) are better measures of the ability of a water/wetland to affect “water quality.” The MRA uses a single indicator (e.g., channel shading, solar exposure) for water quality. Also, as noted above, it is not reasonable to assign a zero score to the functioning of a

water/wetland just because there is no water present at the time the assessment was conducted. Clearly, the waters that were assessed on the Rosemont Project impact site function in some capacity to improve the quality of downstream receiving water. The MRA is not designed to capture the performance of this function.

Other MRA sampling method indicators are inappropriate for the types to waters being assessed. For example, the logic for using variables 8 (riffle-pool distribution), 9 (underbank cover), and 10 (cobble embeddedness), to assess the functioning of fish/aquatic habitat in 1<sup>st</sup> and 2<sup>nd</sup> ephemeral streams is unclear. These variables are better suited for assessing fish and invertebrate habitat in perennial streams, not streams where one would not expect to find fish. If these variables are to be used, the logic for their use needs to be clearly justified and the scoring definitions need to be scaled within the context of a reference framework. In addition, there are 10 plant-related indicators for assessing riparian and vegetation and terrestrial wildlife habitat that are similar (*sensu* autocorrelated), which would tend to bias the combined scores.

The overall MRA water quality, hydrogeomorphology, and fish/aquatic habitat scores for the Rosemont Project area are zero (*e.g.*, Table 5), even though the scores for individual variables for these functions may not have scored zero. For example, if for the water quality function a site receives a score of “2” for channel shading from solar exposure in the absence of surface water, then why would it not receive the same score when surface water is present? Again, the assignment of a “zero” score in the absence of water at the time of the assessment unjustifiably lowers the overall MRA scores.

### Calculating Mitigation Ratios

To assist in calculating a compensatory mitigation ratio, the functions and values of the mitigation sites were evaluated relative to the functions and values of the impact site prior to the occurrence of impacts. The functional scores of the impact and mitigation site informed the final mitigation ratio (RCFA p.13).

Using the MRA, WestLands calculated the overall functional score of the aquatic habitat: 1) Rosemont site scored 1.17; 2) Sonoita Creek Ranch scored 1.25; 3) and the SR 83 Corridor and Davidson Parcels scored 1.25. In order to determine compensatory mitigation ratios for the proposed Rosemont Copper Project, WestLands used the Mitigation Ratio Setting Checklist Attachment 12501.2 SPD. Using a qualitative impact mitigation comparison and ratio adjustment, WestLands concluded their proposed mitigation would provide 592% of the required mitigation credits. In other words, the compensatory mitigation package proposed by Rosemont Copper will provide nearly six times the required mitigation for unavoidable impacts to waters (HMMP p. 9).

Following our review of the HMMP and mitigation ratio calculations, we have identified several significant concerns:

- The MRA used in calculating the mitigation ratios is based on a flawed functional assessment methodology (see above) and, in all likelihood, significantly underestimates the function of the impacted waters.
- The Step Adjustment in the Mitigation Setting that relied, in part, on the MRI is therefore incorrect and skewed.
- The MRA functional analysis of Sonoita Creek Ranch scored nearly all (approaching 100%) of the drainage features, while the MRA for the impacted waters scored only 10% of the drainages, which would likely bias the overall scores.



- The proposed creation of 115.5 acres of habitat consisting of a drainage feature, wetland fringe, and riparian buffer proposed at Sonoita Creek Ranch (SCR, p. 9) may not result in the creation of jurisdictional waters of the U.S. Only 3.5 acres of the proposed 115.5 acres of habitat may qualify as a three-parameter jurisdictional wetland (SCR, p. 21).
- The proposed design would not be self-sustaining as it would largely rely on the release of regulated releases of irrigation water (see HMMP, pg. 19). Because of variable soil conditions that characterize the creation site, it is unclear whether the amount of water proposed for release is sufficient to maintain the proposed wetted channel and adjacent riparian wetlands.
- The aquatic habitat proposed at Sonoita Creek Ranch consists of 112 acres of uplands (91% of the proposed native seed mix consists of upland plants) and is not aquatic habitat.
- The preservation of wetlands at Sonoita Creek Ranch, formed from controlled water releases of irrigation water upstream may be isolated aquatic features that are not jurisdictional waters of the U.S. If so, they are unacceptable as mitigation.
- It is unclear why Rosemont did not propose a continuous corridor from the ponds through the agricultural field, hydrologically connecting to Sonoita Creek. Based on the information presented, we believe the proposed creation at Sonoita Creek Ranch is unlikely to be ecologically successful and sustainable, as required in the 2008 Mitigation Rule.
- It appears as though the mitigation proposal includes 101.3 acres of upland buffer as compensation for unavoidable impacts to waters (HMMP Table 7, p. 12). Any proposed upland buffer mitigation should be first applied toward the direct and indirect impacts to upland buffers on the project site. We do not believe Rosemont has conducted this analysis.
- The scoring of several mitigation ratio adjustments on the Mitigation Ratio Setting Checklist for the SCR and SR83/Davidson Canyon Parcels are unsupportable.
- The HMMP states that plants used for the Sonoita Creek Ranch habitat creation will “be obtained from the nearest local grower to take advantage of the local genotype to maximize success.” (HMMP p. 21). All plant materials used for site restoration should come from within the Sonoita Creek Ranch or from within the Sonoita Creek watershed.
- Monitoring of all created habitat should be for a minimum 10-year period, not 5-years as implied in the HMMP.
- The success criteria presented in the HMMP do not adequately address invasive species control (p. 24).
- The SR 83 and Davidson Canyon mitigation parcels all lie downstream from the impacted drainages and yet the functional assessment used to determine compensatory mitigation does not factor in indirect effects from the proposed Rosemont copper mine to the proposed mitigation sites, thereby inflating the value of the site.
- Rosemont may convey the Sonoita Ranch property to another entity at any time (HMMP p. 25). Conveyance of the property should be pursuant to approval by the Corps.

On page 13 of the HMMP, Rosemont discusses conservation easements and notes, *“The implementation of mitigation activities described in this HMMP shall not limit or restrict Rosemont or its successors in interest from requesting and if approved securing additional compensatory mitigation credits from the mitigation sites for future 404 permits provided they are able to demonstrate functional capacity above currently proposed conditions of the function and values of the mitigation sites.”*

The compensatory mitigation package proposed in the above referenced documents is grossly inadequate, fails to accurately assess the functional condition at the project site and mitigation sites, and

fails to provide compensation for proposed project impacts. Therefore, any future request by Rosemont for securing additional compensation is moot and contrary to mitigation guidelines.