

*United States of America v. Magnesium Corp. of America, et al.*

Case No. 2:01CV0040B

Consent Decree

Appendix No. 9

Avian Risk Mitigation Plan

## APPENDIX 9

### STATEMENT OF WORK

### RCRA AVIAN RISK MITIGATION PLAN

The following is a Statement of Work/RCRA Avian Risk Mitigation Plan (SOW/Plan) describing the obligations for US Magnesium LLC (USM) to assess and/or mitigate potential risk to avian receptors.

#### A. BACKGROUND

Samples of soil and sediment that have been collected from the current and historic waste ponds (PRIs 5, 6, and 7) as part of the Remedial Investigation (RI) at the site have revealed that many of the samples contain elevated levels of site-related contaminants, primarily dioxins and furans, hexachlorobenzene, and polychlorinated biphenyls. Preliminary Hazard Quotient (HQ) risk calculations performed as part of the data adequacy assessment for the Baseline Ecological Risk Assessment (BERA) indicate that there may be potentially unacceptable risk to birds due to chronic exposure to these contaminants, either through direct ingestion of contaminated soil or sediment or through intake of prey items that have accumulated these contaminants.

Samples collected within the current PRI-5 and PRI-6 wastewater ponds (depicted as Current Waste Pond on Map 1 of Appendix 1 to the Consent Decree) are categorized either as “upland” or “lakebed,” while all samples from PRI-7 (depicted as Old Waste Pond on Map 1 of Appendix 1 to the Consent Decree) are characterized as “lakebed.” Upland samples are from the berms around the ponds or from areas of the pond bottom that are never or rarely covered with water, while “lakebed” samples are from areas of the pond bottom that are sometimes or always covered with water. This is important because differing ecological habitats are likely to be utilized by differing types of birds. For example, “upland” area receptors may include the lark and dove, while “lakebed” receptors may include the avocet and snowy plover. However, the habitat categorization is not fixed. For example, if areas of the ponds currently categorized as lakebed were to dry out for such an extended period of time that upland vegetation and habitat developed, then that area may be re-categorized as upland.

Both “upland” and “lakebed” receptors will be evaluated in the BERA as specified in the Problem Formulation and Baseline Ecological Risk Assessment Technical Memorandum and consistent with the categorization of upland and lakebed habitats as defined in SWReGAP (USGS 2007)<sup>1</sup>. Analysis of the Remedial Investigation sample data from PRI-5 and PRI-6 reveal that contaminant levels are substantially higher in samples that are categorized as lakebed as compared to upland samples. Hence, there is special concern for receptors that may forage for prey items in the sediments along the margin or shallow waters of the ponds.

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<sup>1</sup> United States Geological Survey (USGS), *Ecoregional Gap Analysis of the Southwestern United States: The Southwest Regional Gap Analysis Project Final Report* (edited by Colorado Division of Wildlife, USEPA National Exposure Laboratory, USGS Southwest Biological Science Center, USGS Cooperative Fish and Wildlife Unit, and Utah State University, 2007).

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One of the key determinants of risk to birds from contaminants in lakebed sediments is the degree to which birds actually utilize the sediments for foraging or habitat. The assumption that birds do utilize the ponds is supported by historic surveys (Beltman and Stackhouse 2007; Cavitt 2008) that documented avian usage of areas around the ponds, and historic data based on the measurement of dioxins and furans and hexachlorobenzene in bird eggs collected from areas around the ponds. However, portions of the sediments are often covered with strongly acidic wastewater ( $\text{pH} < 1$ ). Repeated inundation of the sediments with acidic wastewater may inhibit use of the area and prevent the formation of habitat and the growth of aquatic prey items, which may tend to reduce exposure and risk from the sediments. The BERA will discuss this as one important source of uncertainty in the risk characterization.

In the future, under the terms of the Consent Decree, it is anticipated that all or the majority of the area of the current and old wastewater ponds will be encompassed within a Retrofitted Waste Pond (RWP), depicted on Map 2 of Appendix 1 to the Consent Decree. Because the sediments of the RWP are expected to remain contaminated with site-related chemicals, the potential for risk to birds, both upland and lakebed, will likely remain, although construction of the RWP may change (either decrease or increase) the occurrence and magnitude of the risks in some areas, especially if the areal extent of inundated sediments either increases or decreases. The BERA will evaluate multiple hypothetical acute and chronic avian exposure scenarios that may be associated with operation of the RWP.

The BERA results will use HQs and the estimates on likelihood of exposure to contaminated sediment, soil, or prey to determine if site-related chemicals potentially pose a significant risk to birds. This SOW/Plan describes USM's obligation to refine and/or delineate the extent of areas within the RWP that are driving the avian risk estimates to be developed in the BERA, and/or to implement mitigation measures to protect birds from adverse impacts if, pursuant to Section C of this SOW/Plan, the U.S. Environmental Protection Agency (EPA) determines there may be site conditions that pose a significant risk to birds.

**B. PLAN OBJECTIVE**

The objective of this SOW/Plan is to describe USM's obligations if, pursuant to Section C, the EPA determines that site-related chemicals pose a significant risk to birds. USM may choose to: (1) collect information needed to further delineate and refine avian risk posed by the RWP; and/or (2) implement measures to mitigate that risk. These options are encompassed in the following two-step process that may be implemented individually or sequentially:

- Step 1. Perform additional studies, with study designs subject to EPA approval, to refine the avian risk estimates in the BERA for areas within the RWP.

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- Step 2. Identify mitigation actions that could be taken to reduce the level of avian exposure and risk and implement one or more of those measures to help minimize avian exposure and risk.

Each of these steps is further described below within the SOW detail.

**C. CRITERIA FOR SIGNIFICANT AVIAN RISK DETERMINATION**

EPA will make an initial determination as to whether site-related chemicals in and about the RWP pose a significant risk to birds based on the results of the BERA. The EPA will consider the following when making this determination:

- Temporal and spatial patterns of acidic water levels and the area and location of sediments that are anticipated to be either exposed (such that upland receptors might be exposed) or covered only by a shallow depth of water (such that probing birds might attempt to forage).
- Quality of the habitat in and around exposed pond sediments.
- Point-by-point risk estimates for the acute and longer-term avian exposure scenarios presented in the BERA, considering both no-observed-adverse-effect level (NOAEL) and lowest-observed-adverse-effect level (LOAEL) HQs.
- The estimated area of pond sediment with elevated acute and/or longer-term risk relative to the foraging area of the receptor of concern.
- Chemical concentrations in exposed pond sediments that contribute to the exposure point concentrations used in the BERA to estimate acute and/or longer-term risk.

EPA will consult with USM to evaluate this information when determining if there is or reasonably may be unacceptable risk to birds due to exposure to site-related chemicals in upland and/or lakebed areas of the ponds. Within 45 days of receipt of a determination in writing from EPA that an unacceptable exposure or significant risk may exist, USM will provide to EPA a notice of intent informing EPA whether USM has elected to proceed under Step 1 or Step 2 in the following Section D (Statement of Work).

**D. STATEMENT OF WORK**

This document provides a generalized high-level SOW to guide the development and implementation of work plans, subject to EPA approval, to set forth refinement(s) to the risk assessment and/or describe mitigation actions (if needed). The work plans shall include implementation schedules consistent with the timelines outlined in Steps 1 and 2 below, as appropriate, and subject to EPA approval. EPA will consult with UDEQ prior to approval of work plans under this SOW/Plan.

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Step 1

This step in the risk mitigation process provides USM the option to collect additional data that may be used to reduce uncertainty and improve the accuracy of risk estimates developed in the BERA and/or to better delineate the distribution of contaminants within areas that may pose a significant risk to birds. Subject to EPA approval, avian risk estimates developed for the BERA for areas within the RWP may be refined under this SOW/Plan by implementing one or more of the following:

- Perform a detailed water level study following RWP construction to record the temporal and spatial patterns of strongly acidic wastewater in the RWP in order to identify when and where probing and/or upland birds may be exposed to contaminated sediments;
- Refine the HQ calculations by collecting area-specific avian exposure and/or use data;
- Evaluate the spatial distribution of contaminants driving exposure point concentrations used in the BERA, and refine exposure estimates to account for bias introduced when the aerial extent of elevated contaminants is localized;
- Collect additional sediment/soil data to better define the exposure concentrations in the area;
- Collect eggs from birds nesting near the ponds to measure site-related contaminants in the eggs;
- Evaluate chick hatching and survival success for birds nesting around the ponds; and
- Other, yet-to-be-determined, studies or evaluations that could address uncertainties inherent in the conservative approaches used in the BERA.

If USM elects to implement Step 1, USM will, within 45 days of EPA's determination in Section C identifying potentially unacceptable avian risk from exposure to pond sediment, arrange for a meeting with representatives from the EPA, USFWS, and UDEQ, to discuss studies that may be helpful and to develop the details of study designs that are most likely to yield data necessary to refine the risk estimates. If USM elects to implement one or more of these studies, USM will, within 120 days of the meeting, submit to EPA for approval a Quality Assurance Project Plan (QAPP), which will serve as the work plan for implementation of Step 1 and will include an implementation schedule that specifies the work that will be included in Step 1. This QAPP will include all necessary methodology and supporting rationale for the work, and will be submitted to the EPA for review and approval prior to conducting any of the work.

Step 2

If the EPA determines pursuant to Section C and/or the findings of work completed as part of Step 1 (if conducted) that there are significant risks to upland and/or probing birds in the RWP,

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then USM will, in consultation with agency representatives (i.e. EPA, USFWS, and UDEQ), evaluate one or more of the following strategies to reduce avian exposures and risks from site-related contaminants:

- Hazing to reduce or eliminate avian use;
- Physical removal of habitat that supports chronic avian exposures;
- Modification of pond operations to ensure frequent acidic wastewater inundation to prevent the establishment of lakebed or terrestrial habitat that supports chronic avian exposures;
- Capping or removal of contaminated soil and sediment; and
- Other, yet-to-be-determined, actions that may be deemed worthy of consideration.

USM will submit to EPA for approval, within 90 days of receipt of the EPA determination of significant risk pursuant to Section C or following the completion of any studies and refinement of the risk (i.e., HQ) calculations performed under Step 1 (whichever is later)), a work plan, or if appropriate a revised work plan, based on the evaluated strategy to reduce unacceptable avian risk. Once EPA approval is received, USM will begin implementing the plan within 90 days. The plan will include a methodology(ies) for evaluating the efficacy of the strategies to reduce avian exposures and risks. If the EPA determines in writing that the strategy(s) implemented is not effective, then USM will submit a revised plan designed to achieve a level of protectiveness consistent with the calculated risk within 60 days for EPA approval, and will begin implementing the revised plan within 90 days of receipt of EPA approval.

**E. FUTURE REVIEWS**

If there are significant changes in the condition of the RWP in the future, especially any changes that could increase exposure of birds to contaminated sediments, then the EPA reserves the right to require follow-up actions consistent with this Appendix as may be needed to protect avian receptors.

**F. REPORTING**

Activities related to work conducted under this Appendix will be reported in accordance with Paragraph 63.a of the Consent Decree.

**REFERENCES**

Beltman, D. and M. Stackhouse, *Environmental Endangerment at the U.S. Magnesium Facility*, Rowley, Utah, Expert Report (Stratus Consulting, Inc., Boulder CO and Washington, DC, 2007).

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Cavitt, J.F., *U.S. Magnesium Avian Studies*, Final Report. (Weber State University, Avian Ecology Laboratory, Ogden, UT, 2008).