



**FREEPORT-McMoRAN  
COPPER & GOLD**

Copper Queen Branch/Freeport-McMoRan Corporation  
36 West Highway 92  
Bisbee, Arizona 85603

**CERTIFIED MAIL # 7011 3500 0001 0664 3096**  
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August 17, 2012

Ms. Mindi Cross  
Water Quality Compliance Section  
Arizona Department of Environmental Quality  
1110 West Washington Street  
Phoenix, Arizona 85007

**Re: Mitigation Order on Consent No. P-121-07**  
**ADEQ Letter of July 13, 2012**

Dear Ms. Cross:

Freeport-McMoRan Corporation, Copper Queen Branch (CQB) received the Arizona Department of Environmental Quality (ADEQ) letter of July 13, 2012 providing comments on a travel time analysis for the sulfate plume<sup>1</sup> and the proposed schedule for the Feasibility Study and Mitigation Plan<sup>2</sup>. The letter contained the following three comments requiring responses from CQB.

1. ADEQ requested that the travel time analysis using the regional hydraulic gradient be revised to add a calculation of plume travel time “using the hydraulic gradients caused by the AWC well field”.
2. ADEQ requested that the description of the occurrence of sulfate in well TVI 875 in the travel time memorandum be revised to account for sulfate detections in excess of 250 milligrams per liter (mg/L).
3. ADEQ requested a specific date for submittal of the Mitigation Plan for “existing wells that may be impacted by the sulfate plume in the future”.

ADEQ requested that the two documents be revised and submitted within 30 days of receipt of the letter. CQB’s response to these requests is below.

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<sup>1</sup> Clear Creek Associates. 2012. Technical Memorandum – Travel Time Analysis for Leading Edge of the Sulfate Plume, Mitigation Order on Consent No. P-121-07. January 16, 2012.

<sup>2</sup> Correspondence from Rebecca A. Sawyer, Copper Queen Branch, to Mindi Cross, ADEQ, Re: Mitigation Order on Consent No. P-121-07. January 24, 2012.

The requested revision of the travel time calculation would require estimating drawdown due to the AWC wellfield and determining where the wellfield drawdown exceeds the regional hydraulic gradient. This could be done with an analytical model for drawdown, but it requires making simplifying assumptions that would be subject to additional uncertainties. As noted in the technical memorandum, a detailed analysis of plume migration is being conducted using the existing numerical model for groundwater flow and sulfate transport. The analysis will be reported in the Feasibility Study for drinking water supply wells that might be impacted in the future which is scheduled for submittal to ADEQ in July 2013. CQB would like to discuss options for addressing this comment at our meeting on August 23, 2012.

ADEQ correctly notes that sulfate in excess of 250 mg/L had been detected in well TVI 875 several times prior to the third quarter of 2011, which was the timeframe of the last data available during preparation of the memorandum. The memorandum will be revised accordingly.

The proposed schedule for the Mitigation Plan for drinking water supplies that may be affected by the sulfate plume in the future indicates that the plan would be submitted 60 days after ADEQ approves the Feasibility Study. Because the Mitigation Plan will address how the recommended mitigation actions will be implemented, it cannot be prepared until ADEQ has commented on and approved the Feasibility Study. For this reason, CQB cannot provide a specific date for submittal of the Mitigation Plan, because it is dependent upon the timing of ADEQ's approval of the Feasibility Study.

CQB requests a day extension on revising the two documents so that we can discuss ADEQ's comments at our August 23, 2012 meeting.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rebecca A. Sawyer', with a stylized, cursive script.

Rebecca A. Sawyer  
Sr. Environmental Engineer  
Freeport-McMoRan Corporation, Copper Queen Branch

cc: Stuart Brown/Freeport-McMoRan Copper and Gold  
Mike Jaworski/Freeport-McMoRan Corporation, Copper Queen Branch  
Jim Norris/Clear Creek Associates

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**Manager, Water Quality Compliance Section**  
**Arizona Department of Environmental Quality**  
Street, Apt. No., or PO Box No. **1110 West Washington Street**  
**Phoenix, Arizona 85007-2935**  
City, State, ZIP+4

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Ms. Mindy Cross  
Manager, Water Quality Compliance Section  
Arizona Department of Environmental Quality  
1110 West Washington Street  
Phoenix, Arizona 85007-2935

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