



Tucson Office  
3031 West Ina Road  
Tucson, AZ 85741  
Tel 520.297.7723 Fax 520.297.7724  
www.tetrattech.com

## Technical Memorandum Partial Backfill Alternative Geochemical Characterization

<b>To:</b>	<u>Kathy Arnold</u>	<b>From:</b>	<u>David Krizek</u>
<b>Company:</b>	<u>Rosemont Copper Company</u>	<b>Date:</b>	<u>January 10, 2010</u>
<b>CC:</b>	<u>Mark Williamson (Tt)</u>	<b>Doc #:</b>	<u>017/10-320871-5.3</u>

### 1.0 Introduction

This Technical Memorandum was prepared by Tetra Tech and presents a geochemical characterization of the tailings and waste rock materials for the Partial Backfill Alternative being considered in the US Forest Service Environmental Impact Statement (EIS) for the proposed Rosemont Copper Project (Project).

In 2007, Tetra Tech published a Baseline Geochemical Characterization report and a Geochemical Characterization Addendum Report for the proposed Project as part of the Mine Plan of Operations (MPO). In addition to these two (2) reports, several technical memoranda have been prepared for the Project which provides supplemental geochemical information and testing. The Partial Backfill Alternative differs from the MPO primarily in the design and location of the Waste Rock Storage Area and the Dry Stack Tailings Facility and partially backfilling the Open Pit with waste rock following the cessation of mining. This alternative does not change the location of the proposed Open Pit or the source of waste rock and tailings materials.

However, the addition of waste rock to the Open Pit following the cessation of mining may alter the geochemistry of the anticipated pit lake. This analysis is not part of this discussion, only the source and composition of the waste rock generated from the Open Pit.

Since the source of waste rock and tailings materials does not change in the Partial Backfill Alternative, the geochemical test results and conclusions published to date are still applicable to this alternative. The following sections of this Technical Memorandum provide a general summary of the overall geochemical characterization of the tailings and waste rock materials associated with the Project.

### 2.0 Waste Rock

Upon completion of the 2006-2007 geochemical testing program, a total of 180 waste rock samples were tested for acid-generating potential, metals content, and/or metal release. In 2008, an additional 46 waste rock samples underwent testing, bringing the total count to 226



samples. Less than 1% of 208 samples tested were classified as likely to generate acid. About 24% of the samples were classified as uncertain or moderately acid generating. These samples underwent additional evaluations, including leaching tests.

Based on all the geochemical testing of waste rock samples, the two (2) rock types which have the potential to be acid generating are the Bolsa Quartzite and Andesite. However, only leachates from a few Bolsa quartzite samples gave an acidic pH, and contained low acidity. This low acidity can be easily mitigated during placement of the waste rock by blending with acid-neutralizing rock types. Also, the Bolsa Quartzite and Andesite waste rock material account for a small percentage, 3% and 6% respectively, of the total waste rock volume.

### **3.0 Tailings**

To date, four (4) samples of tailings material have been generated for the Project. All of the samples were tested for acid-generating capacity, metals content, and/or metal release. Results of the acid-generating tests did not indicate the potential to generate acid but exhibited a pronounced acid neutralizing potential. Thus, with respect to the potential for acidic drainage, the tailings are acid consuming, not acid generating. Additionally, when the tailings were tested for the potential release of chemical constituents using both static (Synthetic Precipitation Leaching Procedure) and kinetic (standard humidity cells), the results showed a very limited release of any chemical parameter, including metals.

### **4.0 Conclusion**

The Partial Backfill Alternative being considered in the EIS for the proposed Rosemont Copper Project has the same geochemical characterization for the tailings and waste rock materials as the MPO design. This alternative does not change the location of the proposed Open Pit or the source of waste rock and tailings materials. Therefore, all the geochemical testing results, reports, and technical memoranda published to date are still valid and applicable to this alternative.



## REFERENCES

Tetra Tech (2007) *Baseline Geochemical Characterization*. Prepared for Augusta Resource Corporation. Report Dated June 2007.

Tetra Tech (2007) *Geochemical Characterization, Addendum 1*. Prepared for Rosemont Copper. Report Dated November 2007.

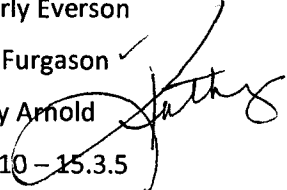
Tetra Tech, Levy, D. and Williamson, M. (2008) *Geochemistry Sample Update*. Technical Memorandum. November 10, 2008.

Tetra Tech, Williamson, M. (2009) *Tailings Geochemistry*. Technical Memorandum. March 24, 2009.

Tetra Tech, Levy, D. (2009) *Bolsa Quartzite – Acid-Base Accounting Properties and Humidity Cell Testing Results*. Technical Memorandum. October 7, 2009.

## Memorandum

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**To:** Beverly Everson  
**Cc:** Tom Furgason ✓  
**From:** Kathy Arnold   
**Doc #:** 003/10 - 15.3.5  
**Subject:** Transmittal of Technical Memoranda and Pit Lake Report  
**Date:** February 8, 2010

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Rosemont Copper is pleased to transmit the following twenty technical memoranda and one report:

1. Rosemont Hydrology Method Justification, a Tetra Tech memo dated January 7, 2010;
2. Barrel Only alternative –
  - a. Noise Analysis, a Tetra Tech memo dated January 15, 2010
  - b. Traffic Analysis, a Tetra Tech memo dated January 8, 2010
  - c. Geochemical Characterization of Facilities, a Tetra Tech memo dated January 10, 2010
  - d. Lighting, an M3 memo dated December 2009
3. Barrel and McCleary alternative –
  - a. Noise Analysis, a Tetra Tech memo dated January 9, 2010
  - b. Traffic Analysis, a Tetra Tech memo dated December 15, 2009
  - c. Geochemical Characterization of Facilities, a Tetra Tech memo dated December 16, 2009
  - d. Lighting, an M3 memo dated December 2009
4. Scholefield Tailings and McCleary Waste alternative –
  - a. Noise Analysis, a Tetra Tech memo dated January 15, 2010
  - b. Traffic Analysis, a Tetra Tech memo dated January 12, 2010
  - c. Geochemical Characterization of Facilities, a Tetra Tech memo dated January 10, 2010
  - d. Lighting, an M3 memo dated January 2010
5. Sycamore Tailings and Barrel Waste alternative –
  - a. Noise Analysis, a Tetra Tech memo dated January 15, 2010
  - b. Traffic Analysis, a Tetra Tech memo dated January 9, 2010
  - c. Geochemical Characterization of Facilities, a Tetra Tech memo dated January 10, 2010
  - d. Lighting, an M3 memo dated January 2010
6. Partial Backfill alternative –
  - a. Noise Analysis, a Tetra Tech memo dated January 23, 2010
  - b. Traffic Analysis, a Tetra Tech memo dated January 9, 2010
  - c. Geochemical Characterization of Facilities, a Tetra Tech memo dated January 10, 2010
7. Geochemical Pit Lake Predictive Model, prepared by Tetra Tech and dated February 2010

As per your request, I am transmitting three hardcopies and two disks (disks contain tech memos only) directly to the Forest Service and two copies and one disk directly to SWCA. The Pit Lake report includes a copy of the report on a CD on the inside of the back cover of each report.