

**ROSEMONT MINE OUTDOOR LIGHTING &  
PIMA COUNTY OUTDOOR LIGHTING CODE  
TECHNICAL MEMO**

**TAILINGS CONVEYOR OPTION 'BARREL ONLY'**

**ROSEMONT PROJECT  
M3-PN08036**

**Prepared for**

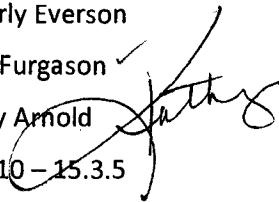
**ROSEMONT COPPER COMPANY**

**December 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.

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## ATTACHMENTS

- 000-EL-310 - Site General, Electrical, Lighting Compliance Plan, Barrel Canyon Only**
- 000-EL-311 - USFS Alternatives, Electrical, Tailings in, Barrel Canyon Only**
- 000-EL-317 - Site General, Electrical, Area & Road Lighting, Designation, Barrel Only**
- 000-EL-318 - Site General, Electrical, Pima Co. Outdoor Ltg. Code, Compliance Plan, Barrel Only**



## 1 Background

A Technical Memo was issued in June 2009 and updated in December 2009 describing the impact of the proposed Outdoor Lighting at the Rosemont Mine. The information and results in that Technical Memo are the beginning point for this Technical Memo.

The 2006 Pima County Outdoor Lighting Code is the Code in effect regulating the amount of light permitted outdoors within the City of Tucson and Pima County. The Code describes several Lighting Areas that are centered on the various astronomical telescope facilities located within Pima County. The Rosemont Mine is within an area of Pima County that is the most restrictive Lighting Area of the Code, namely, Area 'E1a.' The maximum amount of light within the Area 'E1a' is 18,000 lumens per acre for Low Pressure Sodium (LPS) type outdoor lighting and 3,000 lumens per acre for High Pressure Sodium (HPS) type outdoor lighting with an additional restriction of 3,000 lumens per lamp maximum for HPS.

The mine is exempt from complying with the Pima County Outdoor Lighting Code, however, Rosemont Copper plans to operate within the intent of the Pima County Outdoor Lighting Code as long as mine safety and operations are not compromised. To these ends, the mine outdoor lighting design was given special attention, and the results are discussed below.

## 2 Tailings Conveyor New Configuration

The 'Barrel Only' option refers to an option to route the mine tailings conveyor so that the tailings stack is limited to the Barrel Canyon location. In this configuration, the tailings conveyor lighting will not change from the tailings conveyor lighting used in the December 2009 report. Total lumens of Low Pressure Sodium lighting on the Rosemont Mine site will be approximately 7,736,300 for an approximate 1,753 lumens per acre (9.7% of the 18,000 lumens per acre allowed).

The High Pressure Sodium lighting on the Site is not anticipated to change with the 'Barrel Only' Option.

### 2.1 Results

Total acreage of the Rosemont Mine Site: 4,415 acres

#### High Pressure Sodium Lamp Lumens

Maximum Lumens per Acre:	3,000
Total HPS lumens allowed @ 3,000 lumens/acre:	13,245,000
Current Total Lumens proposed:	6,590,250
Current Total Percent of Maximum Allowed:	49.8%
Current Proposed Average Lumens per Acre:	1,493



**Low Pressure Sodium Lamp Lumens**

Maximum Lumens per Acre:	18,000
Total LPS lumens allowed @ 18,000 lumens/acre:	79,470,000
Current Total Lumens proposed:	7,736,300
Current Total Percent of Maximum Allowed:	9.7%
Current Proposed Average Lumens per Acre:	1,753

**Xenon Lamp Lumens**

Maximum Lumens per Acre:	No limit established
Total Xenon lumens allowed:	No limit established
Current Total Lumens proposed:	78,000
Current Total Percent of Maximum Allowed:	No limit established
Current Proposed Average Lumens per Acre:	18

Drawings 000-EL-310, 000-EL-311, 000-EL-317, and 000-EL-318, attached, are provided as a guide to the Mine Areas discussed.

**3 Conclusions**

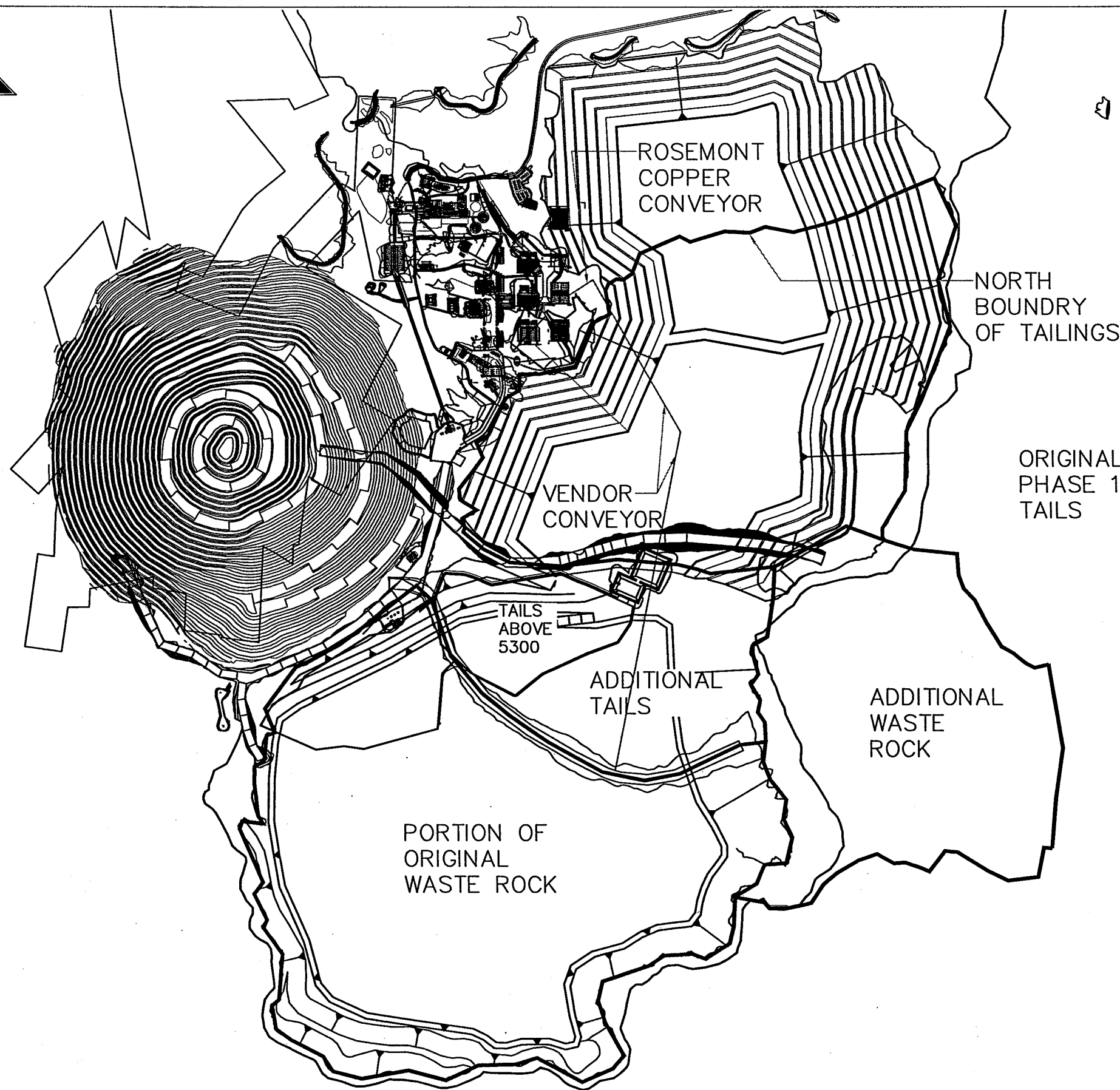
The number of lights on the conveyor that will stack tailings in the Barrel Canyon location will not change from the quantity of lights that was used for the December 2009 report. There will be no change in the lighting results with the 'Barrel Only' location.

LPS type outdoor lighting is a very attractive light (lamp) source to use in pursuit of compliance with the Pima County Outdoor Lighting Code. M3 recommends very careful use of LPS type outdoor lighting at the mine site for the following reasons.

A concern in using LPS lighting is that of a potential safety hazard, which could occur if personnel are injured, are bleeding, and the first responders cannot see by the color of the liquid that it is blood. LPS light masks all colors, and especially reds. All colors appear gray under LPS lighting. To address that issue, the more hazardous locations that require frequent visits by mine personnel have been provided with the better color-rendering lighting of the HPS lamp.

The total lumens as presented in this Report are based on preliminary design information available at the time the report was written. Final actual total lumens may vary slightly from these values as the design of the mine is completed. Nevertheless, Rosemont Copper has a commitment to make every effort to remain compliant with the Pima County Outdoor Lighting Code as final design decisions are made. Further, Rosemont Copper is working with heavy equipment manufacturers and lighting manufacturers to identify light sources and shielding methods to further limit any light pollution.





*Frank*  
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 FRANKLIN F. ELBERT, JR.  
 ARIZONA, U.S.A.  
 Expires 12/29/2010

DO NOT SCALE 11x17 DRAWINGS

APPROVED  
 FOR DESIGN DEVELOPMENT



REFERENCES		REFERENCES		REVISIONS				REVISIONS				SCALE: N.T.S.	DATE		
DWG. NO.	TITLE	DWG. NO.	TITLE	NO.	DESCRIPTION	BY	APP'D	DATE	CLIENT NO.	DESCRIPTION	BY	APP'D	DATE	CLIENT	
000-EL-201	AREA & ROAD LIGHTING DESIGNATIONS														DESIGNED BY FE DEC 09
000-EL-310	LIGHTING COMPLIANCE PLAN, BARREL CANYON														DRAWN BY FE DEC 09
															CHECKED BY FE DEC 09
															PROJECT MGR HUSS DEC 09
															CLIENT APPR.

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ROSEMONT PROJECT	
USFS ALTERNATIVES ELECTRICAL TAILINGS IN BARREL CANYON ONLY	JOB NO. M3 PH-08036 DWG NO. 000-EL-311 REV NO. 0 DATE 29 DEC 09





