

**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

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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.

