

February 11, 2014

To: Cal Joyner, Reviewing Officer
USFS Southwestern Region
333 Broadway SE
Albuquerque, NM 87102

Re: Formal Objection to the Final Environmental Impact Statement for the Rosemont Copper Project: A Proposed Mining Operation, Coronado National Forest

1. Objector name and address and telephone number:

Objector Name: C McCormick (full name: Carroll Gene McCormick)
Objector Address: 7473 N. Paseo Ronceval, Tucson, AZ 85704
Objector Telephone Number: 520 – 297 - 9498

2. Name of the proposed project, name and title of the responsible official, and name of the national forest and/or ranger district:

Project Name: Rosemont Copper Project: A Proposed Mining Operation
Responsible Official: Jim Upchurch, Forest Supervisor
National Forest, Ranger District: Coronado National Forest, Nogales Ranger District

3. Statement of objection

3.1. Issue of the project to which this objection specifically applies.

This objection pertains to the issue of Dark Skies, specifically the impact of increased sky brightness on the economics of the astronomy industry.

3.2. Explanation of this objection concerning the adequacy and quality of the Final Environmental Impact Statement (EIS).

One of the objector's comments on the Draft EIS pertained to the subject of Dark Skies. In that comment, under "*Extension to Operational Impacts*", page 2 of the comment, the objector recommended that the analysis be extended to include economic impacts on observatory operations. This comment has not been completely addressed in the Final EIS.

In response to comments on the Draft EIS, the Forest Service commissioned an economic research and consulting firm, BBC Research and Consulting, to review and address these concerns. The Final EIS, Volume 3, Chapter 3, under Socioeconomics and Environmental Justice, page 1053, references a report “*BBC Research and Consulting. 2013. Additional Socioeconomic Evaluations: Rosemont Copper Project EIS. Prepared for Coronado National Forest. Denver, CO: BBC Research and Consulting. May 14*”. The BBC report covers four economic categories: Nature-based Tourism, Amenity-based Migration, Property Values and Taxation, and Astronomy Industry.

Both the Final EIS and the BBC report discuss the nature of the socioeconomic impacts of the Rosemont Mining Project on the astronomy industry, which was not done in the Draft EIS. The BBC report Figure V-1, Section V, Page 3, shows the current economic importance of the Fred Lawrence Whipple Observatory (FLWO) in Arizona. Under Socioeconomics and Environmental Justice, the Final EIS presents similar (but not identical) values in Table 226 on page 1089.

Neither the Final EIS nor the BBC report, however, provide quantitative data on the economic impact of the Rosemont Copper Project on the astronomy industry.

The BBC report points out on Section V, Page 5 that in the competitive environment faced by FLWO, “*The greater concern, however, is the perception associated with the development of a copper mine in close proximity to the observatory*”. The “Summary and Conclusions” of the BBC report states on Section VI, Page 3 that because the perceived impact of the mine is likely to be as important as any actual impact, that the impact cannot be reliably projected. It could be argued that perception would also be important to Nature-based Tourism and Amenity-based Migration. The BBC report, however, in Figure VI-1, Section VI, Page 4, does show quantitative estimates of the economic impact of the Rosemont mine on the other economic categories, but for the astronomy industry simply states “*Cannot be Projected*”.

Even if the adverse impact of the Rosemont Copper Project on the FLWO were only 5 to 10% of current values, it would be comparable to the impacts of the other three economic categories shown in BBC report Figure VI-1. If FLWO were totally shut down then the impact would be greater than the total of the impacts of the other three categories, and in particular, the loss of employment would be similar in magnitude to the number of jobs estimated to be gained from the Rosemont Copper Project.

Therefore despite the importance of the economy of FLWO, the Final EIS displays a large void by its lack of data quantifying the impacts of the Rosemont Copper Project on the astronomy industry. This lack, of course, makes it difficult to decide on the significance of those impacts. As it now stands the Final EIS even allows for the assumption that the impact of the mine would be a total shutdown of FLWO. Also, the

lack of quantitative impact evaluation could in itself have a further negative impact on the perception of prospective funders or researchers who might read the Final EIS or otherwise become aware of its findings.

3.3. Suggested remedies that would resolve the objection.

An attempt can and should be made to quantitatively evaluate the socioeconomic impact of the Rosemont Copper Project on FLWO. Since perception is considered highly important it should be given priority, and one approach to its assessment is described below. Also described are some ways to evaluate the more direct cost of observatory modifications or cost of lost research opportunities.

A. Perception.

Although perception itself may be difficult to quantify, an assessment could be based on more easily interpreted measures that provide a bridge between the quantitative factor of sky brightness and the subjective factor of perception. An easily interpreted measure closely related to perception would be a ranking of competing observatories based on sky brightness. An even more meaningful measure would be ranking based on the capability to detect faint objects, which depends not only on sky brightness but also on equipment characteristics. Ranking could also serve to move the perceptions (and decisions) of funders and researchers toward a more factual basis. The change in rank caused by operation of the mine would then give a non-economic, but quantitative, indication of the impact. This might be brought even closer to an economic impact analysis by conducting a “market research” survey of customers (i.e. astronomers) to determine how their choice of an observatory would depend on rank.

B. Cost of Modifying Observatory Equipment and Operations.

The BBC report, Section V, Page 4 and Section VI, Page 3 states that new and more sensitive instruments and longer exposures can be required to compensate for increased sky brightness. Both of these incur additional expenses that can be estimated.

C. Direct Cost of Lost Research Opportunities.

As previously suggested in the objector’s comment on the Draft EIS, lost revenue might be projected from changes that increased sky brightness would’ve caused in historical research. Historical and future observations and research projects that could not be performed due to increased sky brightness could be translated into lost revenue.

D. Coarse Estimates

If there is insufficient time to execute the above suggested remedies, then Figure VI-1, Section VI, Page 4 of the BBC report for the Astronomy industry should at least show coarse estimates of the economic and employment impacts. The resulting data of Figure VI-1 of the BBC report should also be shown in the body of the Final EIS. For the Greater Tucson Area the Low value would be a few percent of the totals for FLWO of Figure V-1, Section V, Page 3 of the BBC report. The High value would be 100

percent of the totals for FLWO of Figure V-1, Section V, Page 3 of the BBC report, corresponding to complete shutdown of FLWO.

3.4. Connection between prior specific written comments and the content of the objection.

Following is an excerpt from page 2 of the objector's comment on the Draft EIS, submitted on January 08, 2012, under the name C McCormick, pertaining to the subject of Dark Skies:

“Extension to Operational Impacts

The DEIS focusses on direct environmental impact, namely sky brightness, which is predictable through modeling, but in itself is not easily interpreted in societal terms. To make the analysis of Dark Skies more meaningful, it should be extended to include impacts on more familiar or more easily interpreted factors that can be derived from sky brightness. Although some indirect or consequential impacts might be considered beyond the scope of the DEIS, impacts of that type are currently discussed in the DEIS under “Socioeconomics and Environmental Justice”, in Vol. 2, Ch. 3, pages 669 – 753. Examples of impacted factors in astronomy could be the number of hours of viewing, number of objects observed, subscription rates, revenues, or other measures that could be associated with the effectiveness of observatory operations. Impacts might be determined from changes that increased sky brightness would've caused in historical research results. Particularly interesting would be discoveries made in the past that would not have been possible under conditions of increased sky brightness.”

4. Scanned Signature

A handwritten signature in cursive script, appearing to read "C McCormick". The signature is written in black ink on a white background.