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## Technical Memorandum

### Expanded Barrel Only Alternative

### Noise Analysis

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#### 1.0 Introduction

This Technical Memorandum was prepared by Tetra Tech and presents a Noise Analysis for the Expanded Barrel Only Alternative being considered in the US Forest Service Environmental Impact Statement (EIS) for the proposed Rosemont Copper Project (Project). This analysis assesses the potential impacts that the Expanded Barrel Only Alternative will have on noise conditions.

Tetra Tech published a comprehensive Supplemental Noise Study Report in April of 2009 that was based on the facility layouts in the Mine Plan of Operations (MPO). The Noise Study provided data on existing noise levels in the vicinity of the Project and noise levels measured at an active copper mine such as blasting and other operational activities. Modeling of the blasting vibrations was also performed. Noise effect contouring in the April 2009 study was based on the MPO facility layouts.

The following provides a comparison between the MPO and the Expanded Barrel Only Alternative facility layouts:

- The top surface of the Dry Stack Tailings Facility would be about 5,250 feet above mean sea level (amsl) for the MPO, and about 5,300 feet amsl for the Expanded Barrel Only Alternative. The Dry Stack Tailings Facility for Expanded Barrel Only Alternative would have a footprint of 987 acres compared to 870 acres under the MPO.
- The top surface of the Waste Rock Storage Area would be about 5,450 feet amsl for the MPO. The Expanded Barrel Only Alternative would have two (2) sections to the Waste Rock Storage Facility, with the larger south section having a top elevation of 5,700 feet amsl and the smaller east section having a top elevation of 5,200 feet amsl. The footprint of the Waste Rock Storage Area would be 1,460 acres under the Expanded Barrel Only Alternative, compared to 2,000 acres for the MPO.



- The Heap Leach Pad for the MPO would be constructed in two (2) phases. The leach pad for the Expanded Barrel Only Alternative would be constructed in one (1) phase with a smaller total footprint. In both cases, the closed heaps would eventually be covered with waste rock.
- Under the Expanded Barrel Only Alternative, the combined footprints of the Waste Rock Storage Area and Dry Stack Tailings Facility (about 2,450 acres) would be somewhat smaller than the combined footprints under the MPO (about 2,870 acres). Under the Expanded Barrel Only Alternative, the Dry Stack Tailings Facility would not extend as far to the northeast as it would under the MPO and the Waste Rock Storage Area would extend further to the east than it would under the MPO.
- The location and size of the Open Pit would be the same under both the MPO and the Expanded Barrel Only Alternative.
- Under the Expanded Barrel Only Alternative, the Plant Site facilities would have a slightly different configuration and footprint than under the MPO. Under the Expanded Barrel Only Alternative, the Waste Rock Storage Area and the Dry Stack Tailings Facility would shield the Plant Site from State Route 83 (SR 83) only for SR 83 segments a mile or more south of the Primary Access Road.
- The Primary Access Road would be in the same location under both the MPO and the Expanded Barrel Only Alternative.

The differences between the Expanded Barrel Only Alternative and the MPO are mostly matters of small details, not major features that would affect noise impacts. Consequently, most of the noise and vibration impact discussions, and the associated noise contour figures in the April 2009 Noise Study, are applicable to the Expanded Barrel Only Alternative. Differences in the shape of the combined Waste Rock Storage Area and Dry Stack Tailings Facility would, however, result in some changes in the potential locations for operation equipment under the Expanded Barrel Only Alternative.

The following sections of this Technical Memorandum explain which results of the April 2009 Noise Study are still applicable to the Expanded Barrel Only Alternative and which results would change under this alternative.

## **2.0 Blast Noise and Blast Vibration Impacts**

The Open Pit would be in the same location and operated in the same manner under both the MPO and the Expanded Barrel Only Alternative. Blasting events would be limited to one (1) event per day. Daily explosives usage is also expected to be the same under both scenarios.

In addition, differences in the maximum height and shape of the combined footprints of the Waste Rock Storage Area and the Dry Stack Tailings Facility would produce only minor localized shielding differences for blast noise under the MPO and the Expanded Barrel Only Alternative. Blast noise effects at the closest noise-sensitive receptor locations would not be



affected by differences in the combined footprints of the Waste Rock Storage Area and the Dry Stack Tailings Facility under the MPO and the Expanded Barrel Only Alternative.

Because blasting events would be similar under both the MPO and the Expanded Barrel Only Alternative, groundborne vibrations would be the same. Thus, the discussions and associated noise contour figures for blast noise and blast-related vibrations, as presented in the April 2009 Noise Study, would be applicable to the Expanded Barrel Only Alternative.

### **3.0 Construction Noise Impacts**

Although the Plant Site would still be in the same general area under the Expanded Barrel Only Alternative, the Plant Site facilities would have a slightly different configuration and footprint than that of the MPO. However, there would be little if any difference in the construction activity noise levels between the MPO and the Expanded Barrel Only Alternative. As noted in the April 2009 Noise Study, construction noise levels would attenuate to background noise levels over a relatively short distance and would not create any noise impacts at the nearest existing residences. Therefore, the discussions and associated noise contour figure for construction noise impacts presented in the April 2009 Noise Study would be applicable to the Expanded Barrel Only Alternative.

### **4.0 Equipment Operation Noise Impacts**

As discussed in the April 2009 Noise Study, operational noise levels from the Plant Site area would be similar to the maximum construction noise levels. Operational noise levels are expected to attenuate to background noise levels over a distance of about two (2) miles and would therefore not create any noise impacts at the nearest existing residences or along SR 83.

As indicated in Section 1.0, the combined footprints of the Waste Rock Storage Area and Dry Stack Tailings Facility under the Expanded Barrel Only Alternative (about 2,450 acres) would be somewhat smaller than the combined footprints under the MPO (about 2,870 acres). Maximum elevations of these facilities would be somewhat higher under the Expanded Barrel Only Alternative than under the MPO. Under the Expanded Barrel Only Alternative, the Dry Stack Tailings Facility would not extend as far to the northeast as it would under the MPO and the Waste Rock Storage Area would extend further to the east than it would under the MPO.

Figure 1 presents operational equipment noise contours for the Expanded Barrel Only Alternative. Actual noise generation by equipment working on the Waste Rock Storage Area and the Dry Stack Tailings Facility would be the same as for the MPO, but potential equipment locations would be somewhat different due to differences in the shapes of facility footprints.

Haul trucks and other equipment working at the south end of the Waste Rock Storage Area would be in a location very similar to that under the MPO. Consequently, the equipment operation noise contours shown in the April 2009 Noise Study for the south end of the Waste Rock Storage Area would still be applicable to the Expanded Barrel Only Alternative for equipment operations in the southernmost portion of the Waste Rock Storage Area. The eastern extension of the Waste Rock Storage Area under the Expanded Barrel Only Alternative would result in haul truck and other equipment operations being about 0.3 miles closer to homes along



Singing Valley Road than would be the case under the MPO. Figure 1 shows the noise contours for equipment operating at the southeastern corner of the Waste Rock Storage Area. Intermittent equipment operations at the southeastern corner of the Waste Rock Storage Area would increase noise levels at the closest residences along Singing Valley Road by about 2 dBA compared to MPO operations at the south end of the Waste Rock Storage Area (from about 39 dBA to about 41 dBA). Most people cannot distinguish a change in noise level that is less than about 1.5 to 2 dBA. In addition, as noted in the April 2009 Noise Study, existing minimum noise levels in the Project area are estimated to be about 30 to 40 dBA, and average noise levels were generally 37 to 45 dBA. Because intermittent equipment operation noise levels would be comparable to existing background noise levels, the change to the Waste Rock Storage Area footprint for the Expanded Barrel Only Alternative would not result in a significant noise impact at the nearest noise-sensitive locations.

Equipment working at the north end of the Dry Stack Tailings Facility would be further from homes located along Highway 83 northeast of the Project site than would be the case under the MPO. Figure 1 shows noise contours for equipment operating at the north end of the Dry Stack Tailings Facility. Noise from such equipment operations would not result in any significant noise impacts at the nearest noise-sensitive locations.

## **5.0 Traffic Noise Impacts**

The Expanded Barrel Only Alternative would not alter the basic employment level or operating material requirements for the Project as described in the MPO. In addition, this alternative would not alter the routing of the proposed Primary Access Road. Consequently, the MPO and the Expanded Barrel Only Alternative would be expected to have the same traffic generation, and thus the same resulting traffic noise impacts. Therefore, the discussions and noise contour figures, as presented in the April 2009 Noise Study, would be applicable to this alternative.

## **6.0 Conclusion**

A review of operational and facility changes was performed between the MPO and the Expanded Barrel Only Alternative being considered in the EIS process. Because the facilities, operations, and anticipated traffic patterns are generally the same for both scenarios, most of the discussions, noise contour figures, and analysis results presented in the April 2009 Noise Study are applicable to the Expanded Barrel Only Alternative. Revised noise contours (Figure 1) were prepared to illustrate maximum equipment operation noise conditions under the Expanded Barrel Only Alternative. Compared to the MPO, maximum equipment operation noise levels under the Expanded Barrel Only Alternative would increase by about 2 dBA at the closest noise sensitive receptor location. Intermittent equipment operation noise levels under this alternative would be comparable to existing background noise levels, and would not cause significant noise impacts at the nearest noise-sensitive receptors.



## REFERENCES

Tetra Tech (2009) *Supplemental Noise Study, Rosemont Copper Project*. Prepared for Rosemont Copper Company. Report Dated April, 2009

WestLand (2007) *Rosemont Project Mine Plan of Operations*. Prepared for Rosemont Copper Company. Report Dated June, 2007

**FIGURE**

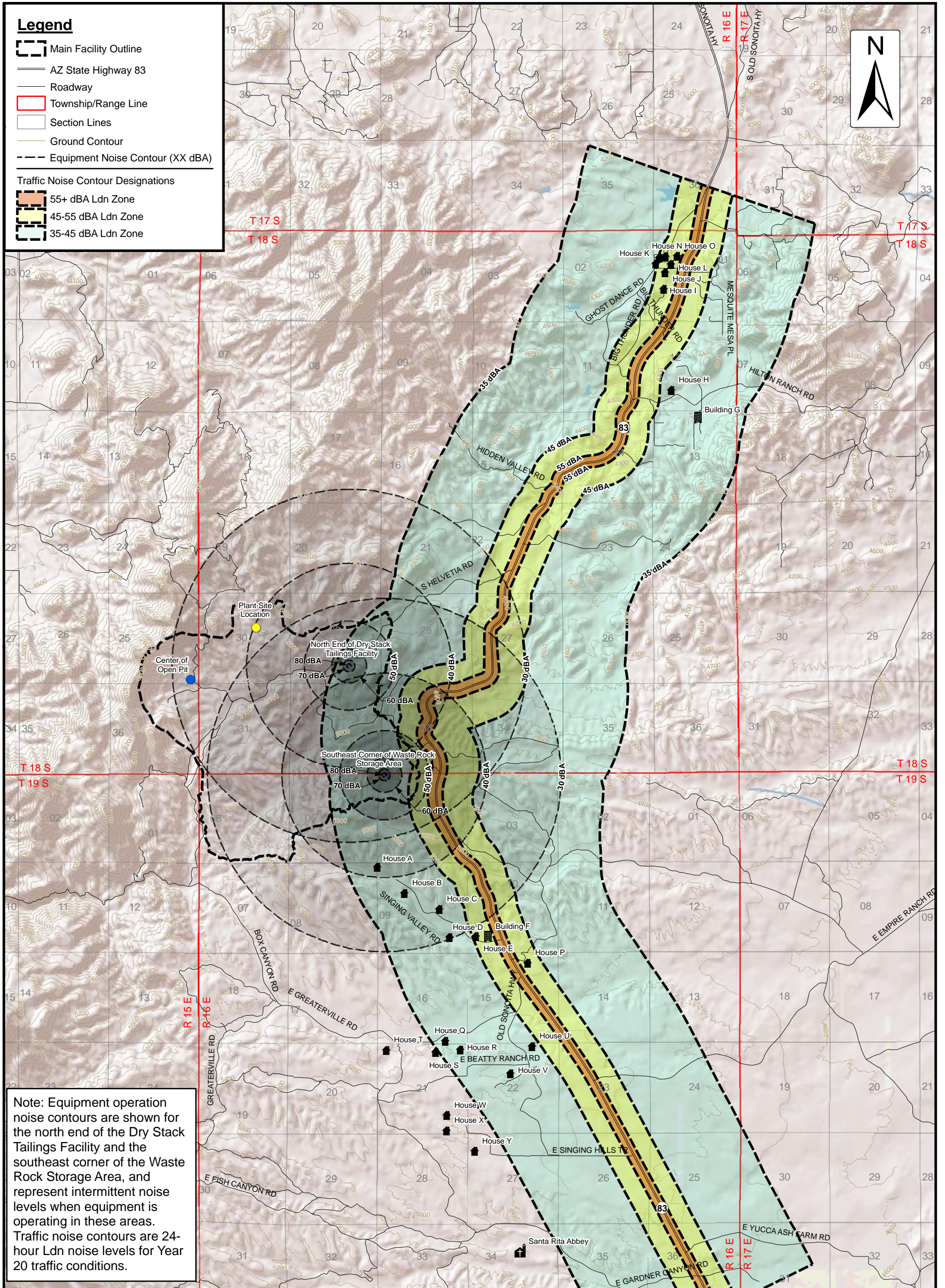


FIGURE 1  
EXPANDED BARREL ONLY ALTERNATIVE  
ROSEMONT COPPER PROJECT NOISE ANALYSIS