Technical Memorandum

To: Rosemont Mining Company Project 9420119100

From: AMEC Earth & Environmental

Date: December 15, 2009

Re: Dry Stack Facility Stability Analysis

Stability Analysis

1.0 Stability Analysis

Slope stability analyses were conducted by AMEC Earth & Environmental (AMEC) in support of the proposed alternate geometry for the Dry Stack Tailings Storage Facility as supplied by Tetra Tech. The stability of the proposed tailings facility was evaluated under both static and seismic loading conditions. Six cross sections were evaluated, Sections A through F, using the proposed geometry provided by Tetra Tech, including alternate bench widths, dry stack tailings slope, and crest elevations for reclamation purposes. The locations of the six cross sections used for the stability analyses can be seen on Figure 7.

1.1 Analysis Methods

The stability analyses were conducted using SLIDE 5.0, a commercially available computer program (Rocscience, 2007) which enables the user to conduct limit equilibrium slope stability calculations by a variety of methods.

For the failure mechanisms considered in the analyses, slope stability was evaluated using limit equilibrium methods based on Spencer's method of analysis (Spencer, 1967). Spencer's method is a method of slices approach, whereby consideration of potential failure masses as rigid bodies divided into adjacent regions or "slices," separated by vertical boundary planes. The method is based on the principle of limiting equilibrium which calculates the shear strengths that would be required to maintain equilibrium along the selected failure plane, and then determines a safety factor by dividing the available shear strength by the driving shear stress. Consequently, safety factors calculated by Spencer's, or by any other limiting equilibrium method, indicate the ratio by which the available shear strength exceeds, or falls short of, that required to maintain equilibrium. Therefore, safety factors in excess of 1.0 indicate stability and those less than 1.0 indicate instability, while the greater the mathematical difference between a safety factor and 1.0, the larger the margin of safety (for safety factors in excess of 1.0), or the more extreme the likelihood of failure (for safety factors less than 1.0). The minimum required safety factors used in accordance with the Arizona Mining BADCT (Best Available Demonstrated Control Technology) Guidance Manual are 1.3 and 1.0 for steady state and seismic conditions; respectively.

1.2 Seismic Conditions

Stability analyses were conducted under both static and seismic loading conditions. Pseudostatic based analyses are commonly used to represent seismic loading conditions on earthfill structures. The pseudostatic method replaces seismically induced accelerations with a constant horizontal acceleration. In an actual seismic event, the peak acceleration would be sustained for only a fraction of a second. The accelerations produced by seismic events rapidly reverse motion and generally tend to build to a peak acceleration that quickly decays to lesser accelerations. Consequently, the duration that a mass is actually subjected to a unidirectional, peak seismic acceleration is finite, rather than infinite. The pseudostatic analyses conservatively model seismic events as constant acceleration and direction, i.e., an infinitely long pulse. Therefore, it is customary to use only a fraction of the predicted peak maximum acceleration when modeling seismic events using pseudostatic analyses.

The stability of the Dry Stack TSF under earthquake loading was evaluated based on the expected earthquake magnitude of 7.1 and a pseudostatic coefficient equal to two-thirds of the Peak Ground Acceleration (PGA), i.e., 0.24 g. This represents a conservative approach as Hynes-Griffin and Franklin (1984) and Seed (1982) suggest using one-half of the peak horizontal ground acceleration.

1.3 Strength Parameters

Tailings deposited within the Dry Stack TSF are anticipated to be deposited in an unsaturated condition, at an average moisture content of 18 percent (by dry weight) or less. Any tailings to be deposited within the TSF exceeding this maximum allowable moisture content must be placed at least 1,100 feet away from the upstream crest. Although the TSF is not expected to become fully saturated it was modeled with significant sections of tailings with no shear strength to ensure global stability under worst case conditions. It Is important to note that this scenario is unlikely to occur given the site conditions and operational parameters.

The cross sections used for the stability analyses included the following materials: (1) alluvial soil, (2) tailings, (3) compacted tailings, (4) no strength saturated tailings, and (5) rockfill. The material properties for each were derived from laboratory testing including triaxial and direct shear tests; data from the geotechnical field investigation including standard penetration tests; and experience with similar materials. The unit weights and strength parameters used in the stability analyses are summarized below:

Material Type	Moist Unit Weight (pcf)	Effective Friction Angle (deg)	Effective Cohesion (psf)
Alluvium	125	36	0
Tailings	110	28	0
Compacted Tailings	116	32	0
No Strength Tailings	110	0	0
Rockfill	130	38	0

1.4 Slope Stability Results

Results of the Dry Stack TSF stability analyses for the six cross sections under consideration are shown on Figures 1 through 6 and are summarized below.

Cross Section	Static Factor of Safety	Pseudostatic Factor of Safety
A	3.4	1.5
B	2.3	1.1
C	2.3	1.1
D	2.9	1.3
E	2.5	1.3
F	3.2	1.5

As shown in the table above, the factors of safety for the Dry Stack TSF exceed the prescriptive values outlined by the BADCT Guidance Manual.

In conclusion, the bench widths, tailing slope, and crest elevations proposed by Tetra Tech are acceptable as designed and represent a stable configuration under both static and seismic conditions as shown in the above stability analysis. For a full discussion of material properties or the seismic hazard analysis, please refer to the AMEC report entitled "Rosemont Copper Company, Dry Stack Tailings Storage Facility Final Design Report", dated April 15, 2009.

2.0 References

Hynes, M.E., F.G. Franklin. 1984. Rationalizing the Seismic Coefficient Method. U.S. Army Corps of Engineers (USACE), Waterways Experiment Station, Miscellaneous Paper GL-84-13, Vicksburg, MS.

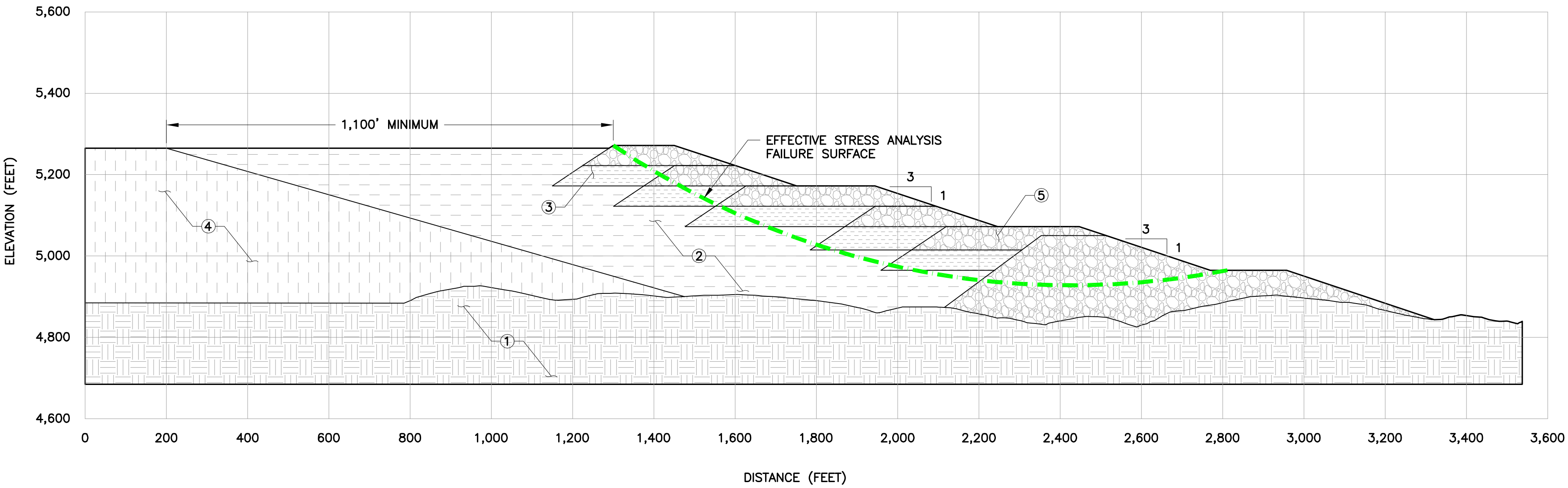
Rocscience. 2007. Slide Version 5.0 Users Manual. Toronto, Ontario, Canada.

Seed, H.B. 1982. The Selection of Design Earthquakes for Critical Structures. Bulletin of the Seismological Society of America. Vol. 72, No. 6, pp. S7-S12.

Spencer, E. 1967. A method of analysis of the stability of embankments assuming parallel inter-slice forces. Geotechnique. Vol. 68, No.1, pp. 190-198.

U.S. Committee on Large Dams (USCOLD). 1999. Guidelines for Selecting Seismic Parameters for Dam Projects. USCOLD Committee on Earthquakes.

U.S. Geological Survey Earthquake Hazards Program, http://earthquake.usgs.gov/eqcenter/ Website.



STABILITY RESULTS		
FAILURE MODELED	STATIC FACTOR OF SAFETY	PSEUDOSTATIC FACTOR OF SAFETY
EFFECTIVE	3.4	1.5

MATERIAL PROPERTIES				
ZONE	SOIL OR INTERFACE	UNIT WEIGHT MOIST (PCF)	EFFECTIVE STRESS ANALYSIS	
			FRICTION ANGLE (DEGREES)	COHESION (PSF)
1	ALLUVIUM	125	36	0
2	TAILINGS	110	28	0
3	COMPACTED TAILINGS	116	32	0
4	NO STRENGTH TAILINGS	110	0	0
5	ROCKFILL	130	38	0

NOTES:

1. TAILINGS REPORTING TO THE DRY STACK FACILITY EXCEEDING THE MAXIMUM ALLOWABLE MOISTURE CONTENT OF 18% MUST BE PLACED AT LEAST 1,100 FT AWAY FROM THE UPSTREAM CREST AT ANY ELEVATION.

CLIENT: ROSEMONT COPPER

PROJECT: ROSEMONT PROJECT

TITLE: STABILITY ANALYSIS CROSS SECTION A

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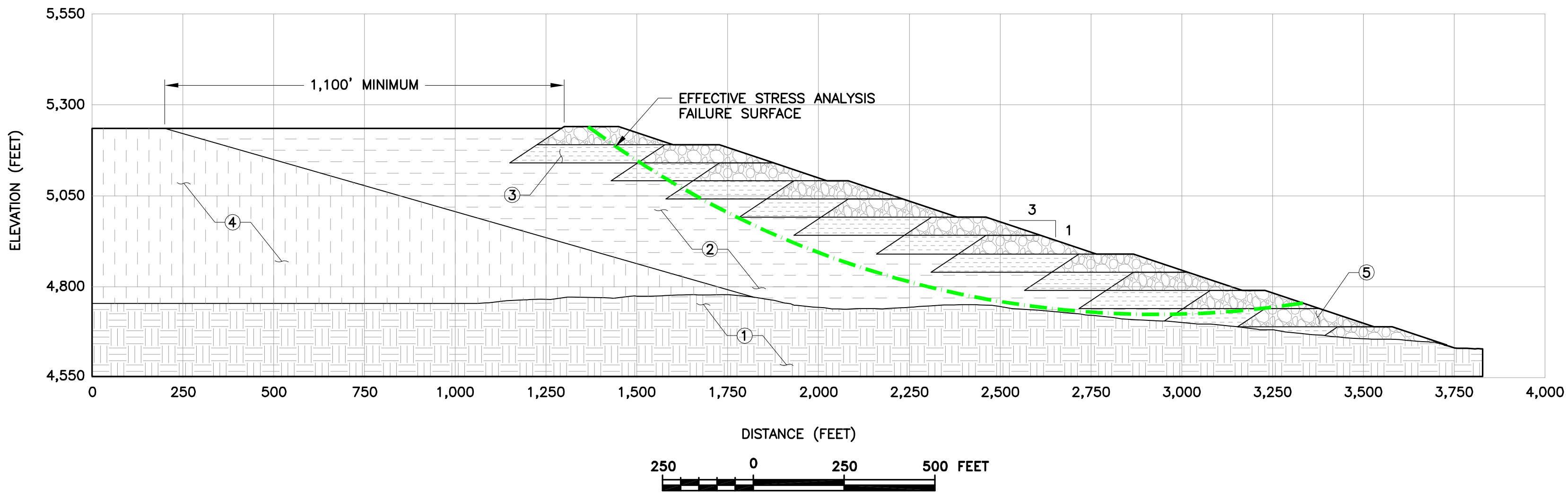
DESIGNED BY	ALD	CHECKED BY	DTW	DATE
DRAWN BY	ALD	APPROVED BY	DTW	12/8/09
FILENAME: FIGURE 1		FIGURE No.: 1		REV: A



STABILITY RESULTS		
FAILURE MODELED	STATIC FACTOR OF SAFETY	PSEUDOSTATIC FACTOR OF SAFETY
EFFECTIVE	2.3	1.1

MATERIAL PROPERTIES				
ZONE	SOIL OR INTERFACE	UNIT WEIGHT MOIST (PCF)	EFFECTIVE STRESS ANALYSIS	
			FRICTION ANGLE (DEGREES)	COHESION (PSF)
①	ALLUVIUM	125	36	0
②	TAILINGS	110	28	0
③	COMPACTED TAILINGS	116	32	0
④	NO STRENGTH TAILINGS	110	0	0
⑤	ROCKFILL	130	38	0

NOTES:

1. TAILINGS REPORTING TO THE DRY STACK FACILITY EXCEEDING THE MAXIMUM ALLOWABLE MOISTURE CONTENT OF 18% MUST BE PLACED AT LEAST 1,100 FT AWAY FROM THE UPSTREAM CREST AT ANY ELEVATION.

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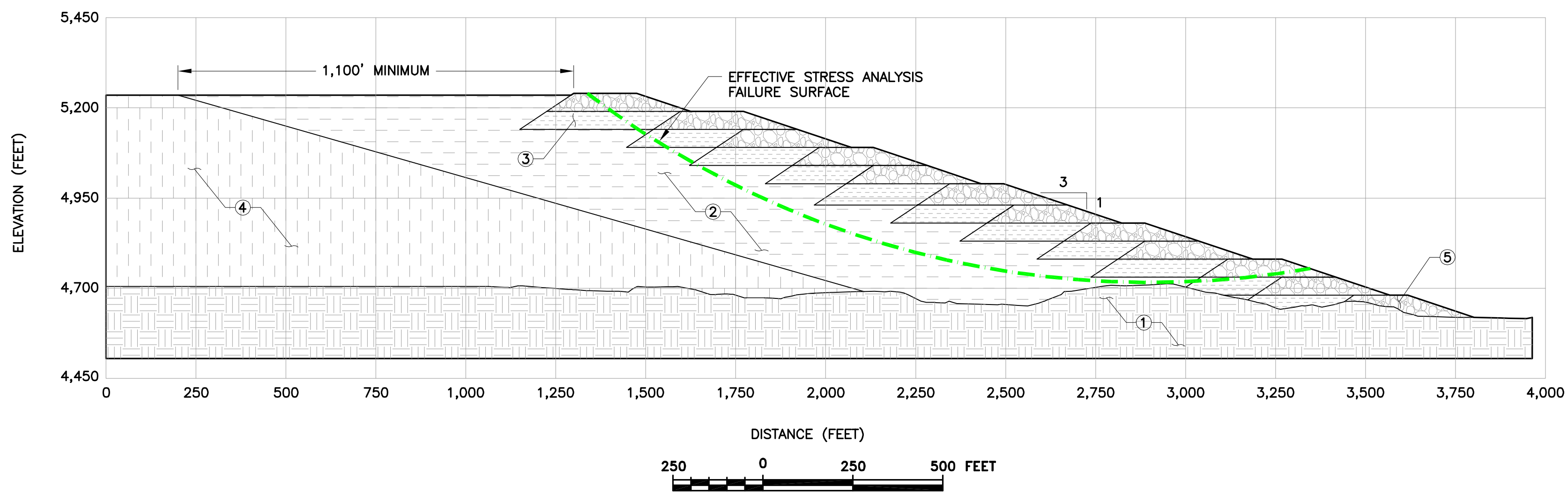

STABILITY RESULTS

FAILURE MODELED	STATIC FACTOR OF SAFETY	PSEUDOSTATIC FACTOR OF SAFETY
EFFECTIVE	2.3	1.1

MATERIAL PROPERTIES

ZONE	SOIL OR INTERFACE	UNIT WEIGHT MOIST (PCF)	EFFECTIVE STRESS ANALYSIS	
			FRICTION ANGLE (DEGREES)	COHESION (PSF)
①	ALLUVIUM	125	36	0
②	TAILINGS	110	28	0
③	COMPACTED TAILINGS	116	32	0
④	NO STRENGTH TAILINGS	110	0	0
⑤	ROCKFILL	130	38	0

NOTES:

1. TAILINGS REPORTING TO THE DRY STACK FACILITY EXCEEDING THE MAXIMUM ALLOWABLE MOISTURE CONTENT OF 18% MUST BE PLACED AT LEAST 1,100 FT AWAY FROM THE UPSTREAM CREST AT ANY ELEVATION.

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TITLE
STABILITY ANALYSIS CROSS SECTION C

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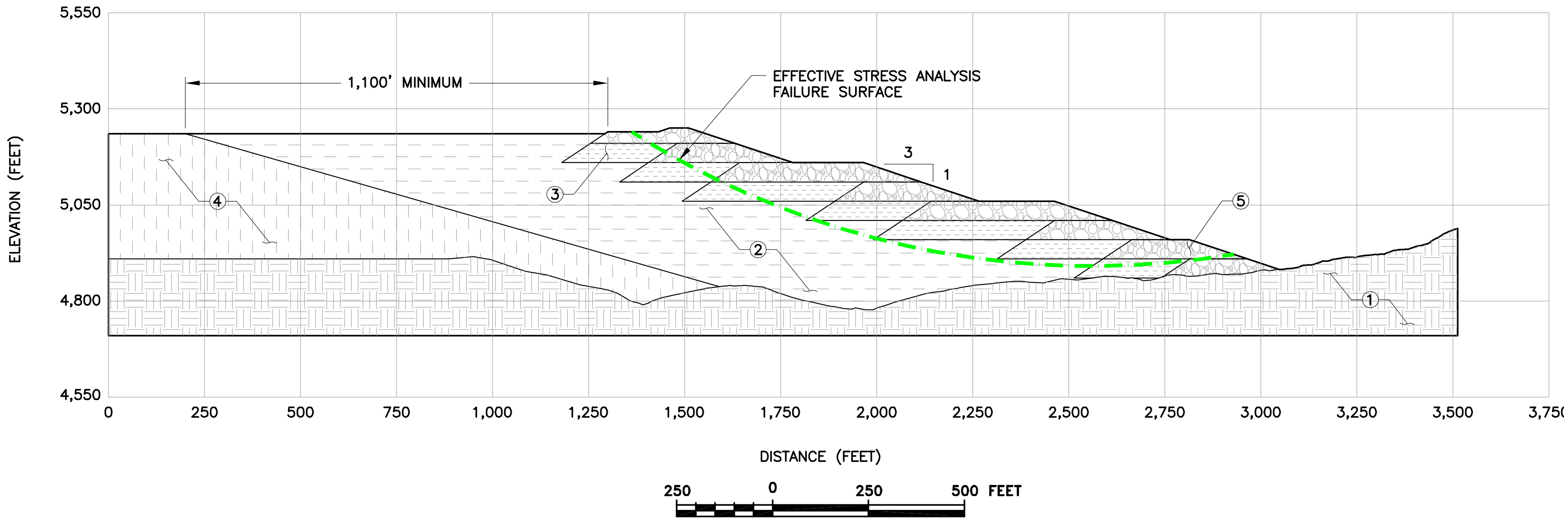
FILENAME: FIGURE 3		FIGURE No.: 3		REV: A



STABILITY RESULTS		
FAILURE MODELED	STATIC FACTOR OF SAFETY	PSEUDOSTATIC FACTOR OF SAFETY
EFFECTIVE	2.9	1.3

MATERIAL PROPERTIES				
ZONE	SOIL OR INTERFACE	UNIT WEIGHT MOIST (PCF)	EFFECTIVE STRESS ANALYSIS	
			FRICTION ANGLE (DEGREES)	COHESION (PSF)
1	ALLUVIUM	125	36	0
2	TAILINGS	110	28	0
3	COMPACTED TAILINGS	116	32	0
4	NO STRENGTH TAILINGS	110	0	0
5	ROCKFILL	130	38	0

NOTES:

1. TAILINGS REPORTING TO THE DRY STACK FACILITY EXCEEDING THE MAXIMUM ALLOWABLE MOISTURE CONTENT OF 18% MUST BE PLACED AT LEAST 1,100 FT AWAY FROM THE UPSTREAM CREST AT ANY ELEVATION.

CLIENT	ROSEMONT COPPER
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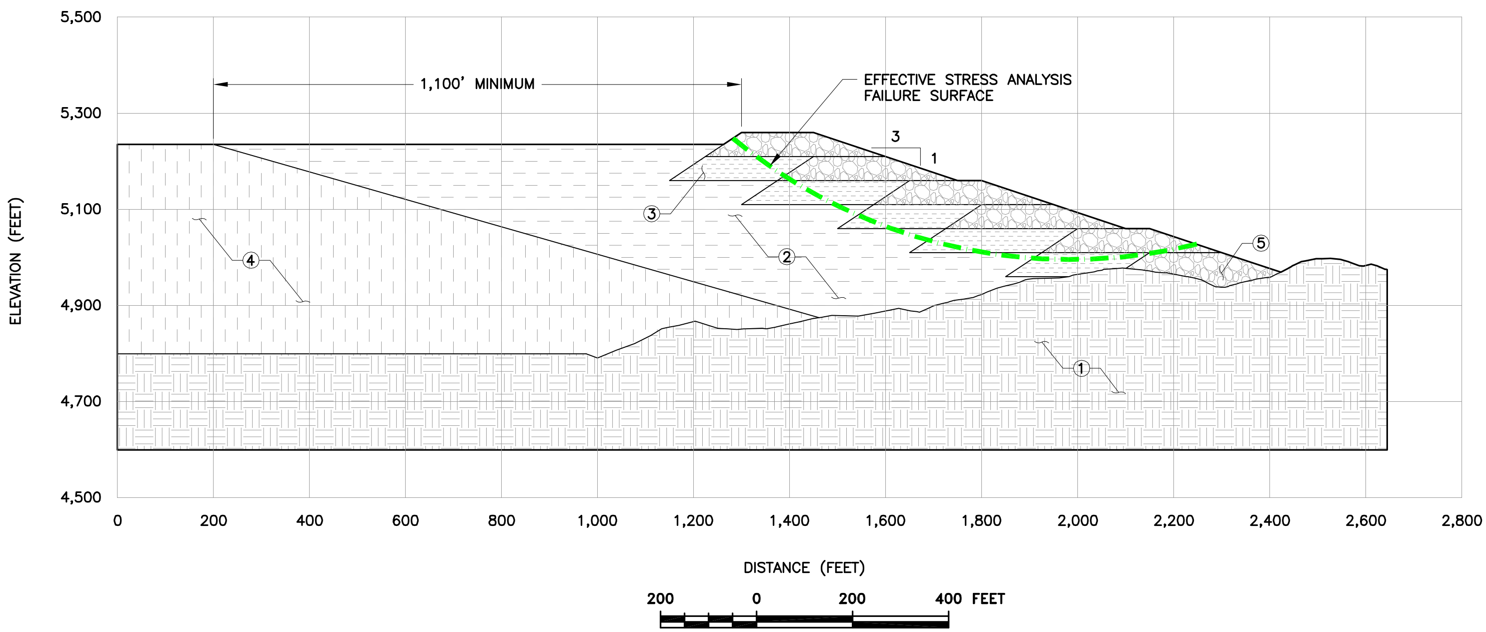
FILENAME: FIGURE 4		FIGURE No.: 4		REV: A



STABILITY RESULTS		
FAILURE MODELED	STATIC FACTOR OF SAFETY	PSEUDOSTATIC FACTOR OF SAFETY
EFFECTIVE	2.5	1.3

MATERIAL PROPERTIES				
ZONE	SOIL OR INTERFACE	UNIT WEIGHT MOIST (PCF)	EFFECTIVE STRESS ANALYSIS FRICTION ANGLE (DEGREES)	EFFECTIVE STRESS ANALYSIS COHESION (PSF)
①	ALLUVIUM	125	36	0
②	TAILINGS	110	28	0
③	COMPACTED TAILINGS	116	32	0
④	NO STRENGTH TAILINGS	110	0	0
⑤	ROCKFILL	130	38	0

NOTES:

1. TAILINGS REPORTING TO THE DRY STACK FACILITY EXCEEDING THE MAXIMUM ALLOWABLE MOISTURE CONTENT OF 18% MUST BE PLACED AT LEAST 1,100 FT AWAY FROM THE UPSTREAM CREST AT ANY ELEVATION.

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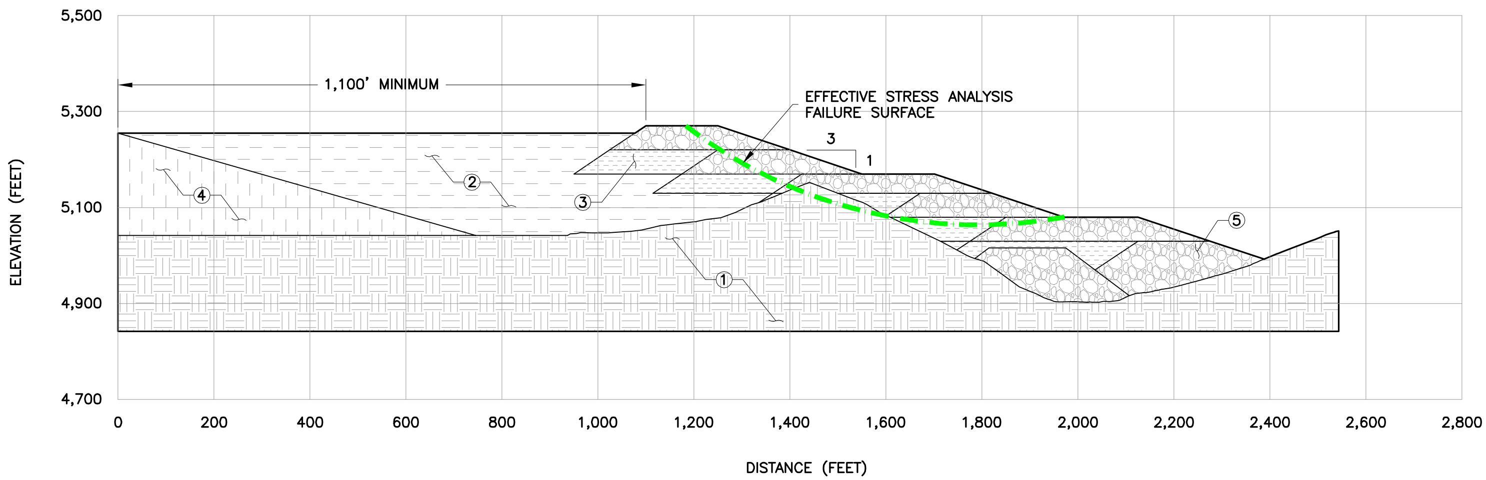
FILENAME	FIGURE 5	FIGURE No. 5	REV A	



STABILITY RESULTS

FAILURE MODELED	STATIC FACTOR OF SAFETY	PSEUDOSTATIC FACTOR OF SAFETY
EFFECTIVE	3.2	1.5

MATERIAL PROPERTIES

ZONE	SOIL OR INTERFACE	UNIT WEIGHT MOIST (PCF)	EFFECTIVE STRESS ANALYSIS	
			FRICTION ANGLE (DEGREES)	COHESION (PSF)
①	ALLUVIUM	125	36	0
②	TAILINGS	110	28	0
③	COMPACTED TAILINGS	116	32	0
④	NO STRENGTH TAILINGS	110	0	0
⑤	ROCKFILL	130	38	0

NOTES:

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PROJECT	ROSEMONT PROJECT
TITLE	STABILITY ANALYSIS CROSS SECTION F

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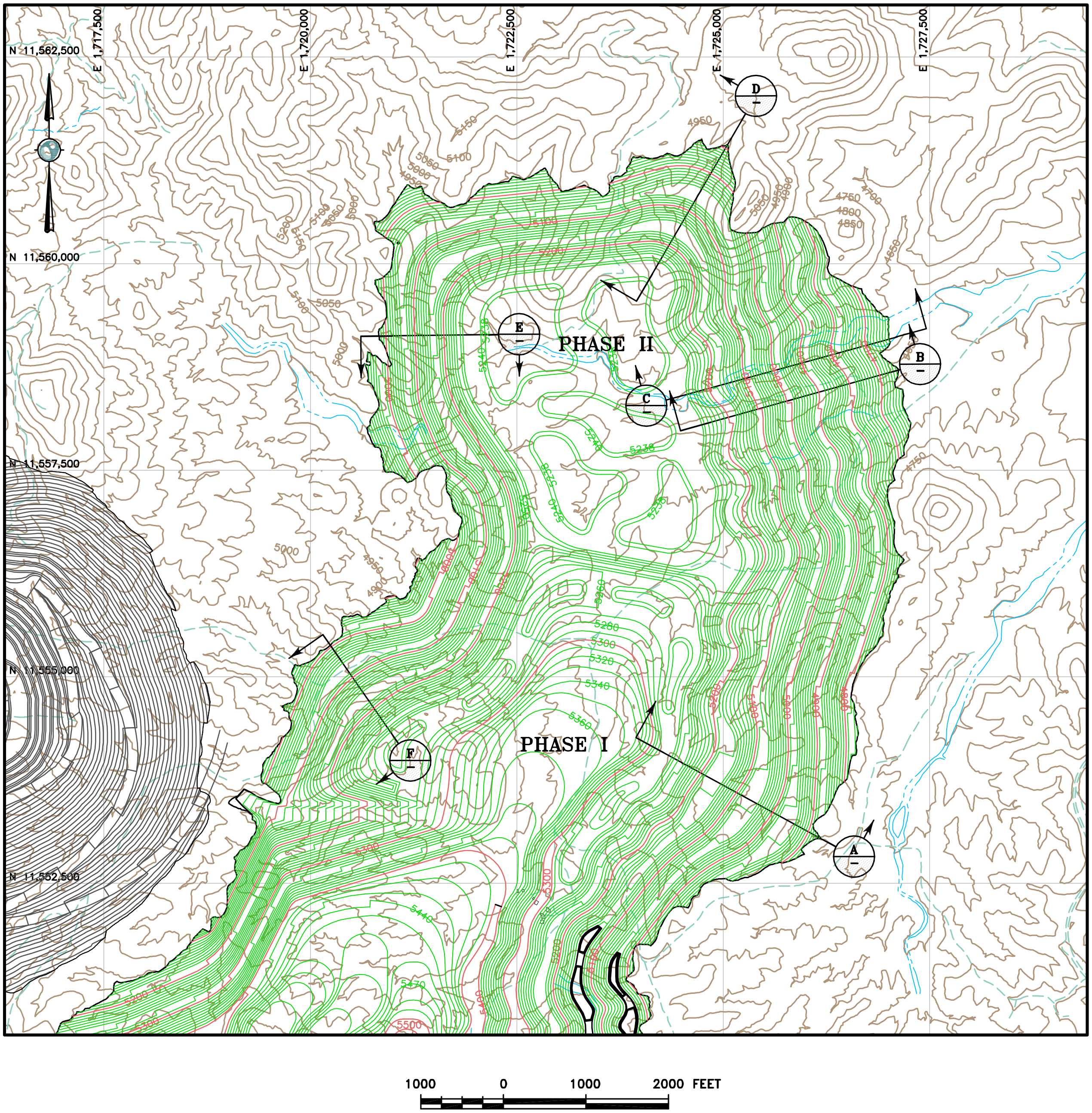
FILENAME	FIGURE 6	FIGURE No.	6	REV A



LEGEND:

- 5000 EXISTING GROUND SURFACE CONTOUR AND EL, FEET
- 5000 PROPOSED GROUND SURFACE CONTOUR AND EL, FEET
- PROPOSED PIT SURFACE CONTOUR AND EL, FEET
- EXISTING DRAINAGES
- EXISTING ROAD

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TITLE: STABILITY ANALYSIS SECTION LOCATIONS					
amec EARTH AND ENVIRONMENTAL Englewood, Colorado Phone: 303-433-0262 Elko, Nevada Phone: 775-778-3200	DESIGNED BY	JWH	CHECKED BY	DTW	DATE
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