CHJ Consultants
A Terracon COMPANY

May 15, 2017

EnviroMine, Inc. Job No. CB175119
3511 Camino Del Rio South, Suite 403
San Diego, California 92108
Attention: Mr. Dennis Fransway

Dear Mr. Fransway:

This letter transmits two copies of our report of slope stability investigation, prepared for the All American Asphalt Quarry (SMP 95-1), located in the City of Corona, California.

We appreciate this opportunity to provide geotechnical services for this project. If you have questions or comments concerning this report, please contact us at your convenience.

Respectfully submitted,
CHJ CONSULTANTS, a Terracon Company

Jay J. Martin, E.G.
Principal Geologist

JJM:lb

Distribution: EnviroMine (2 and electronic)

SLOPE STABILITY INVESTIGATION
AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY
SMP 95-1
CITY OF CORONA, CALIFORNIA
PREPARED FOR
ENVIROMINE INC.
JOB NO. CB175119

May 15, 2017

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3511 Camino Del Rio South, Suite 403
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Attention: Mr. Dennis Fransway

Dear Mr. Fransway:

Attached herewith is the report of slope stability investigation, prepared for the All American Asphalt Quarry (SMP 95-1), located in the City of Corona, California.

This report was based upon a scope of services generally outlined in our proposal dated January 15, 2017, and other written and verbal communications.

We appreciate this opportunity to provide geotechnical services for this project. If you have questions or comments concerning this report, please contact us at your convenience.

Respectfully submitted,
CHJ CONSULTANTS, a Terracon Company

Jay J. Martin, E.G.
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INTRODUCTION

During March and April of 2017, this firm conducted document review, geologic mapping, laboratory testing, and slope stability analysis for the All American Quarry in Corona, California. The purposes of this study were to characterize the engineering geologic conditions at the subject mine and evaluate suitable slope configurations for proposed amendments to the mining and reclamation plan.

To orient our investigation, several documents and maps were provided for our use. These include the following:

- Slope Stability Analysis Report by Morhol, Inc. (2002)
- Groundwater Evaluation Report, Fox/Roberts Consulting Engineering and Groundwater Geologists (2001)
- Response to California Regional Water Quality Control Board letter, Fox - Consulting Engineering Geologist (2001)
- Engineering Geology and Geotechnical Investigation of Slope Stability, Gary S. Rasmussen & Associates, Inc. (2002)
- Comprehensive Mining Plan (sheet nos. 1 and 2 of 2), Amendment No. 1 dated July 2001
- Comprehensive Mining Plan (sheet nos. 1-5 of 5), Amendment No. 2 dated November 2016

The approximate location of the site is shown on the attached Location Map (Enclosure A-1). A Site Plan and Geologic Map is included as Enclosure A-2.1.

The results of our investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this investigation included the following:

- Review of published and unpublished literature and maps including geologic mapping by Gray (1961), Gray and others (2002), and Morton and Miller (2006)
- Examination of aerial imagery dated 1949, 1974, 1980, 1985, 1990, 1991, 1995, 1997, 2000, 2002, 2003, 2004, 2005, 2006, 2009, 2011, 2013, 2014 and 2016
- Examination of the Comprehensive Mining Plan
- Review of studies, including groundwater condition investigations, by prior consultants
- Structural and geologic mapping of the quarry area
- Collection of representative rock samples
- Laboratory tests including Unconfined Compressive Strength and Specific Gravity
- Evaluation of site seismic conditions
- Kinematic evaluation of the proposed rock slopes
- Slope stability calculations (limit equilibrium) for the proposed slopes under static and seismic conditions
- Consideration of final bench configurations using 50-foot-high by 40-foot-wide benches
- Preparation of this report

PROJECT CONSIDERATIONS

This study was performed to evaluate the geotechnical slope stability of proposed reclaimed mine slopes as described in the Comprehensive Mining Plan (Amendment No. 2) dated November 2016. It is proposed to extend the mined and reclaimed slopes eastward from the existing east pit wall to access resource within the eastern property limits and increase the area and volume of future landfill capacity. The mine produces construction aggregate from a granodiorite sources.

The 2016 Mining Plan (Amendment No. 2) shows (Phase 1) a final mined depth to the 400-foot elevation in the western and central final pit bottom with a small portion of the eastern pit bottom between Elevations 500 and 600. Phase 2 consists of a partial backfill operation to bring the reclaimed bottom to between Elevations 500 to 538. Phase 2 backfill operations are not within the scope of this investigation; however, consideration of the fill will be included in calculation of the final reclaimed slope configurations. Phase 3 includes relocation of the processing plant to the central site area and mining to the 400-foot elevation in the area of the existing processing plant in the western portion of the site. Phase 5 includes mining to the 400-foot elevation in a small area in the northwest portion of the property. Mining is not planned in alluvial sediments beneath the plant areas.

Slope configurations for temporary (mining) and reclaimed slopes are depicted on the Mining Plan as follows:

- Maximum inclination of bench faces to be 80 degrees [0.2(h) to 1(v)].
- Finished bench faces to be inclined between 80 degrees (maximum) and 60 degrees (typical based on site conditions).
- Bench height = 25 feet and width = 15 feet where sloped.
- Bench width depicted as 30 feet where temporary vertical slopes are to be utilized below elevation of backfill.
- A 50-foot lateral setback from the brow of the uppermost slope to the property line.
- The overall cut slope angle resulting from the depicted bench geometry is approximately 45 degrees [1(h) to 1(v)].
- Fill slopes are proposed at an angle of 2(h) to 1(v) or flatter.

The tallest cut slope depicted on the 2016 Mining Plan is approximately 920 feet tall and is located along the southern mine boundary. Several slope aspects and heights are depicted including northeast-facing, northwest-facing, north-facing, west-facing, south-facing and southwest-facing slopes.

This investigation provides recommendations for slope and bench geometries that provide suitably stable slopes for final reclamation. Our slope stability evaluation considered the existing 50-foot-tall bench faces with 40-foot-wide benches as are now utilized in mining based on equipment reach capabilities.

Terminology used in this report includes the following as depicted on Enclosure D-1.0.

- Bench height – vertical distance between benches
- Bench width – lateral distance from the toe of bench face to top of next bench face
- Bench face angle – inclination of the slope between two benches
- Haul road (ramp) – road (ramp) provided for access by mining equipment to selected pit levels or pit bottom
- Interramp angle – slope angle formed by a series of uninterrupted benches
- Overall slope – slope formed by a series of interramp slopes separated by haul roads or pit top/bottom

SITE DESCRIPTION

The site includes approximately 298 acres with 233 acres in mining. The site is located east of Interstate Highway 15 in the City of Corona in Riverside County, California. Temescal Wash is located west of the site, and an open-pit mining operation is located south of the site. The eastern portion of the site consists of undeveloped hillside terrain formed in granitic bedrock. The site pit is open toward the west-northwest. The site is accessed from Magnolia Avenue and All American Way. Various access roads, haul roads and ramps provide access to the active mine pit and adjacent areas. Site relief rises from west to east and is formed in several bedrock units of the Perris Structural Block. Natural slopes generally slope at angles less than 30 degrees; however locally steep slopes are present where headward-cutting drainages reach harder bedrock. The Perris Block includes intrusive granitic, metasedimentary and metavolcanic rocks of Cretaceous age in the site area.

Native bedrock exposures are generally limited to the eastern portion of the site and consist of isolated outcrops surrounded by slopes with a mantle of colluvium and a growth of grass (photograph no. 1, Appendix E). The eastern portion of the site consists of a dissected highland with ephemeral northward drainage. Outcrop patterns visible in aerial imagery suggest two roughly east-west and north-south trending structural orientations.

The active pit lacks significant vegetation. Some recently active mine slopes include a mantle of slough concealing underlying benched slopes (photograph no. 2). Reclaimed slopes in the southern portion of the pit are locally vegetated with shrub-type plants. Low grasses and weedy shrubs comprise the primary vegetative cover across the undisturbed portions of the site. Surface water was not present in the pit bottom at the time of our site examinations.

The proposed site configurations, including Phase 1 mining and Phase 2 landfill, are depicted on Enclosure A-2.1. A Geologic Map is included as Enclosure A-2.2. Slope Stability cross sections are presented on Enclosures A-2.3a-c. Ground-based photographs of the site and selected features are included in Appendix E.

PREVIOUS INVESTIGATIONS

A series of prior reports addressing slope stability in the mine were reviewed for information pertinent to the current investigation. These include reports by Morhol, Inc. (2002), Fox/Roberts (2001), and Rasmussen (2002).

The Morhol report documents geologic mapping, use of pole plots of measured structural data, preparation of cross sections, geotechnical stability analyses of representative critical slopes, and discussion of general groundwater conditions. Morhol reported the following:

- Groundwater as seepage along fractures and clay-lined fault zones in site bedrock with variable depth and dry conditions in the pit bottom.
- Presence of faults and joints as discontinuities in site bedrock. Faults with clay gouge zones from several inches to one foot in width. Orientation of a "West fault" as N15W, 46NE and an "East fault" as N36W, 34NE.
- Diagrams of joint set orientations for each of five mine benches. Identification of four predominant joint sets that influence quarry stability. These are: N59-83E, 65-80NW; N26-66W, 50-78NE; N10-30W, 75-82SW; and N64-80E, 45-65SE.
- Published values for rock shear strength characterized as cohesion (20 ksf) and friction angle (25 degrees). Factors of safety in two cross sections of 2.48 and 2.12 (static) and 1.99 and 1.70 (seismic). Suitable calculated stability for the planned mine configuration analyzed.
- Gross stability of final mined slopes cut a 40-45 degrees to a maximum height of 700 feet.

A report was prepared by Fox/Roberts Consulting Engineering and Groundwater Geologists (2001), which describes test hole drilling and evaluation of a hydrologic model regarding the potential connectivity of the quarry pit with Temescal Wash. Fox/Roberts reported the following:

- Geologic materials that include young alluvium (recent sediments), older alluvial fan deposits, Puente Formation marine siltstone (black shale and gumbo clay in driller’s logs), and granitic basement rocks.
- Two owner-installed wells within or near the site. These are designated as "3S/6W-32H01" and a "second located well west of the first well and closer to the center of the wash." Driller's logs for the first well documented sand and gravel to 108 feet below the existing ground surface (bgs) and gumbo blue clay from 130 to 180 feet bgs. Driller's logs for the second well documented sand and gravel to 175 feet bgs and blue-gray clayey shale from 175 to 300 feet bgs.
- Seasonal fluctuations of groundwater in Temescal Wash from 5 to 15 feet bgs.

- Two test holes were drilled within the floor of the quarry. Test Hole No. 1 was located in the southeast corner of the pit at elevation 605 feet. Test Hole No. 2 was located in the northwest corner of the pit at elevation 603 feet. Both holes were drilled to 105 feet bgs. Test hole summaries are provided in the subject report.
- Elevation of the water table in the Temescal Basin adjacent to the quarry 625 to 630 feet amsl.
- Static water level in Test Hole No. 1 at 595 feet amsl. Test Hole No. 2 was dry.
- No hydraulic continuity between the granitics in the floor of the quarry and the aquifer in Temescal Wash.

A report was prepared by Gary S. Rasmussen and Associates, Inc. (2002) addresses the engineering geologic conditions and their effect on proposed reclaimed slope configurations. Rasmussen reported the following:

- The general geologic units and nomenclature of bedrock within the site.
- Aerial photograph examination that suggested deep-seated landsliding in the granitic materials. Planned mining would remove this feature if it is present. Landsliding was unconfirmed.
- Colluvium mantling slopes.
- Evidence for faults within the quarry cuts.
- Wedge failure in temporary cuts.
- Summary of groundwater and slope stability findings from the Fox/Roberts and Morhol reports, respectively.
- Recommended cut faces at 60 to 80 degrees between benches in accordance with joint orientation. A 25-foot limit to cut face height. Overall final cut slopes at 1(h) to 1(v) or flatter.
- Alluvium and fill slopes to be cut/constructed at 2(h) to 1(v) or flatter.
- A minimum setback distance of 50 feet from the top of final cut slopes and the site boundary.
- Recommendations for treatment of loose boulders on slopes, on site fills, building locations, and abandonment of unused water wells.

FIELD INVESTIGATION

A certified engineering geologist conducted geologic mapping of the site on April 18 and 20, 2017. Geologic structure was measured, including joint and fault orientations, using a Brunton compass and clinometer. Structural mapping was focused toward existing high walls and quarry exposures. Exposures are sparse in the eastern portion of the proposed mine area as that portion is covered by grass and mantled by a weathered profile that includes thick soil accumulations. The field mapping focus included geologic contacts and rock fabric in proposed slope areas and on features that might affect kinematic stability of local slope faces.

Structural data were augmented by data from a prior study by Morhol (2002). The structural data are summarized in Appendix C. A Geologic Map depicting the recent mine configuration, topography, roads, facilities, and locations of mapping areas and features is provided as Enclosure A-2.2.

SITE GEOLOGY

The site is situated in an uplifted and dissected bedrock terrain in the northern Peninsular Ranges geomorphic province. The Peninsular Ranges include plutonic and metamorphic crystalline rocks of Cretaceous and older age. The crystalline basement rocks are locally mantled by residual soils and capped by isolated alluvial/sedimentary remnants. Geologic units in the site area include intrusive rocks associated with Santiago volcanics (Kvspi), intrusive granitics (Kcg), and alluvium of the adjacent valley area. The mine produces aggregate from the intrusive rock units.

GEOLOGIC UNITS:

As mapped by Gray (1961), Gray and others (2002), and Morton and Miller (2006), the site is underlain by granitic bedrock units that include monzogranite (Kcg), undifferentiated granite (Kgu) and intrusive rocks associated with Santiago Peak volcanics (Kvspi). Estelle Mountain volcanics (Kvem) are mapped adjacent to the southeastern site boundary. The nomenclature of these units varies by author and date of mapping. The bedrock is mantled by a soil residuum derived from weathering and alteration of bedrock material on flats, accumulation of colluvium on slopes and deposition of alluvium in drainages. The units designated for this investigation are described below.

Fill (f)

Fill associated with roadways, processing pads, material stockpiles and ongoing mining operations in the pit is present throughout the mine area. All of these materials are considered undocumented and unsuitable for support of engineered improvements.

Young Alluvial Channel Deposits (Qya)

Alluvial channel deposits consisting of poorly sorted, unconsolidated sand, silt and gravel are anticipated in the Temescal Wash channel west of the site. As encountered in driller's logs, these are reported as sand and gravel to 175 feet bgs. The alluvium is underlain by Puente Formation bedrock logged as blue-gray clayey shale.

Old Alluvial Fan Deposits (Qof)

Old alluvial fan deposits are mapped along the western site boundary in contact with granitic rocks. These are expected to have soil profiles in the upper portion where undisturbed. This unit is not included within the proposed mining area.

Monzogranite (Kcg)

Medium- to coarse-grained tan granitics occur as an intrusive mass that trends roughly north-south across the western portion of the pit (photograph no. 3). As observed in mine exposures, these are locally in fault contact with unit Kvspi. Kcg weathers to a tan color, forms a friable residuum where highly weathered, and exhibits brownish staining on fracture surfaces. Fresh Kcg is hard to very hard based on examination of hand samples. Dark mineral enclaves occur locally where unit Kcg is in contact with Kvspi.

Intrusive Rocks Associated with Santiago Peak Volcanics (Kvspi)

Hard to very hard, dark gray, intrusive rocks associated with Santiago Peak Volcanics form the majority of the mine resource (photograph no. 4). This unit is primarily a fine-grained, dark gray rock composed of a suite of mafic minerals with quartz. A porphyritic phase occurs locally and is characterized by euhedral plagioclase crysts up to 6 millimeters in size in a dark gray aphanitic groundmass. The porphyritic phase often, but not always, occurs near the contact with unit Kcg.

GEOLOGIC STRUCTURE:

The intrusive rock units of the mine resource are jointed and mildly fractured, forming blocky high wall cuts with a relatively regular pattern of joints, fractures, faults (photograph no. 5). Several inactive faults are exposed in the south high wall. These typically dip eastward at moderate angles and are neutral to north-facing slope faces (photograph no. 6). Some form a contact between the granitic and intrusive units (photograph no. 7). One west-dipping fault was observed. An inactive bedrock fault is mapped by Gray and others (2002) as forming and offsetting a contact along the northeast pit margin. The contact fault is not currently exposed as mapped by Gray and others; however, a smaller fault was observed near the Location 1. We interpret the smaller fault to be a conjugate of and related to the larger mapped fault. The potential for faults to influence slope geometry is addressed in the "Kinematic Evaluation" section of this report.

Unit Kvspi forms few outcrops in the undisturbed eastern portion of the site; however, it is well exposed along a series of high walls near the southern mine boundary. Unit Kcg is exposed at the south and north ends of the mine pit. The more continuous joints in both units dip steeply to the north-northwest, northeast and west-northwest, defining three major joint sets. These joints sets are cut by orthogonal low-angle joints. A similar joint structure was recognized by prior investigators. A variety of less-continuous joints is superimposed on the major joint fabric and represents a more random jointing process and blast-induced fracturing of the high wall mass.

An inactive bedrock fault mapped by Gray and others (2002) projects along the northeast portion of the mine pit. This fault is discussed in the following section.

FAULTING AND SEISMICITY

Regional seismic sources and historic earthquakes were assessed to determine ground motion conditions for evaluation of potential seismic effects on stability of proposed finished slopes. We calculated deterministic peak ground accelerations for the regional seismic sources. These data are presented in the following sections:

REGIONAL FAULTS:

The tectonics of Southern California are dominated by the interaction of the North American and Pacific tectonic plates, which slide past each other in transform motion. Although some motion may be accommodated by rotation of crustal blocks such as the western Transverse Ranges (Dickinson, 1996), the San Andreas fault zone is the major surface expression of the tectonic boundary and accommodates most transform slip between the Pacific and North American Plates. Some slip is accommodated by other northwest-trending strike-slip faults related to the San Andreas system, such as the San Jacinto and the Elsinore faults. Local compressional or extensional strain resulting from the transform motion along this boundary is accommodated by left-lateral, normal and reverse faults such as the Cucamonga fault. Enclosure A-4 depicts faults and their relative activity within the site region. The site is not located within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone (APZ) designated by the State of California or fault hazard zones designated by the County of Riverside to include traces of suspected active faulting.

Elsinore Fault Zone

The Glen Ivy segment of the Elsinore fault zone is the nearest major active fault, about 6.3 kilometers southwest of the site. The Elsinore fault zone is typified by multiple en echelon and diverging faults. To the north, it splays into the Whittier and Chino faults. The Elsinore is primarily a strike-slip fault zone; however, transtentional features such as the graben of the Elsinore and Temecula Valleys also occur. Most Elsinore fault traces are demonstrably active (Holocene) as documented by Saul (1978), Rockwell and others (1986) and Wills (1988).

The southern segment of the northwest-trending Chino-Central Avenue fault, a northern splay of the Elsinore fault zone, is approximately 10 kilometers miles west of the site and is assigned a 6.8 magnitude by Petersen and others (2008).

The west-to-northwest-trending Whittier fault is approximately 16 kilometers west of the site. The Whittier fault exhibits almost pure right-lateral strike slip (Rockwell and others, 1986). Evidence for activity includes offset of Holocene sediments (Hannan and Lung, 1979) and historic microseismicity (Yerkes, 1985).

San Jacinto Fault Zone

The San Jacinto fault zone (SJFZ) is a system of northwest-trending, right-lateral, strike-slip faults approximately 30 kilometers northeast of the site. More large historic earthquakes have occurred on the San Jacinto fault than any other fault in Southern California (Working Group on California Earthquake Probabilities, 1988). The North Clark strand of the SJFZ is suggested to have ruptured twice in the past 300 years during events in 1800 and 1918 (Salisbury and others, 2017).

Based on the data of Matti and others (1992), a portion of the San Jacinto fault may accommodate most of the slip between the Pacific and the North American Plates. Matti and others (1992) suggest this motion is transferred to the San Andreas fault in the Cajon Pass region by "stepping over" to parallel fault strands that include the Glen Helen fault.

San Andreas Fault Zone

The San Andreas fault zone is located along the southwest margin of the San Bernardino Mountains, approximately 41 kilometers northeast of the site. The mountain front in the San Bernardino area approximately marks the active trace of the San Andreas fault, here characterized by youthful fault scarps, vegetation lineaments, springs and offset drainages.

Blind Thrust Faults

The San Joaquin Hills fault is an inferred blind thrust beneath the San Joaquin Hills in coastal Orange County, southern California. The vertical surface projection of the San Joaquin Hills blind thrust (SJHT) is approximately 32 kilometers southwest of the site. The SJHT is southwest dipping and presumably gave rise to uplift of the San Joaquin Hills. Measurement of uplifted back-bay shorelines and fossil dating suggests an uplift rate of 0.24 meter per 1,000 years and an average earthquake recurrence of 2,500 years on the SJHT (Grant and others, 1999). The SJHT has a postulated potential to produce earthquakes with magnitudes up to Mw 7.3. A latest large event may have occurred in 1769 A.D. based on radiocarbon dating of uplifted marsh sediments (Grant and others, 1999).

LOCAL FAULTS:

Several bedrock faults were reported by prior investigators in quarry excavations. As observed during our site mapping these consist of east-, northeast- and lesser southwest-dipping inactive structures related to emplacement of the intrusive bodies at depth. No active faults were identified within the site area during our review of published and unpublished literature and maps, stereoscopic aerial photographs or field mapping. Accordingly, ground fault rupture in the quarry area is not anticipated.

As shown on Enclosures A-2.2 and A-3, an unnamed west-northwest-trending bedrock fault cuts the Kcg and Kvspi units (Gray and others, 2002) and offsets their eastern contact. There are, however, no manifestations of youthful activity along this feature such as scarps or offset drainages. We have observed no indications or evidence of this feature along its southeastward projection in the site exposures. The potential for fault rupture or seismic activity along this fault or other minor shear zones mapped within the quarry is considered very low.

REGIONAL SEISMICITY:

A map of recorded earthquake epicenters is included as Enclosure A-5. The epicenters and magnitudes are plotted using Google Earth from a USGS database of California earthquake catalogs. This enclosure presents yellow circles as epicenters of earthquakes with magnitude equal to or greater than magnitude 4.0 recorded from 1918 through 2016. Red icons are included for named and larger historic earthquakes in the southern California region.

From a ground-shaking standpoint the most significant fault for the site is the Elsinore fault, about 4 miles to the southwest. The potential for ground shaking generated by the Elsinore fault and other regional faults is discussed in the following section.

GROUND-SHAKING HAZARD

The ground-shaking hazard at the site was evaluated from a deterministic standpoint for use as a guide to formulate an appropriate seismic coefficient for use in slope stability analyses.

A deterministic evaluation of seismic hazard was performed for the Elsinore fault and other regional faults using the attenuation relations of Boore and Atkinson (2008), Campbell and Bozorgnia (2008) and Chiou and Youngs (2008). These data are summarized in the following table.

Table 1: Summary of Regional Seismic Sources

Fault (segments)	Magnitude	Distance (km)	Peak Ground Acceleration (g)
Elsinore (W+GI)	7.3	6.3	0.38
San Jacinto (SBV+SJV)	7.4	30	0.16
Cucamonga	6.7	33	0.11
San Andreas (SM+NSB+SSB)	7.6	41	0.14
San Joaquin Hills	7.1	32	0.13

W=Whittier, GI=Glen Ivy, SBV=San Bernardino Valley, SJV=San Jacinto Valley, SM=South Mojave, NSB=North San Bernardino, SSB=South San Bernardino

We utilized Kh = 0.2 to model the psuedostatic condition for slope stability calculations, consistent with conservative application of methods described by Seed (1979). Seed (1979) considered the size of the sliding mass and earthquake magnitude in selection of Kh. For large slopes, Seed suggested Kh = 0.15 for sites near faults capable of generating magnitude 8.5 earthquakes. The closest fault to the site, the Elsinore fault, is assigned a characteristic magnitude of 7.3 for the Whittier and Glen Ivy segments. Based on the method of Seed (1979) and the seismic setting of the site, our selection of Kh = 0.20 is conservative and appropriate for evaluation of existing and future site slopes.

GROUNDWATER

The site is located in Sections 32 and 33 of Township 3 South, Range 6 West adjacent to the Temescal sub-basin of the Temescal Valley groundwater basin (Wildermuth, 2007). Groundwater data compiled by Western Municipal Water District (2017) indicates that groundwater occurs along the Temescal Wash channel at shallow depth. Temescal Wash is located near the western site boundary where the channel has an elevation of approximately 640 feet. Static groundwater was reported at 595 feet amsl in a test hole drilled in the "southeastern corner" of the mine pit in 2001. A second test hole No. 2 located in the "northwestern corner" of the pit was dry. A groundwater study investigation by Mr. Mark Roberts (2017), conducted concurrent with our slope stability investigation, included drilling of four test holes to depths ranging from 88 to 135 feet bgs. Information from the test holes indicates static groundwater at elevations from 496.5 feet amsl to 643 feet amsl. The locations of test holes is shown on Enclosure A-2.2. The lowest portion of the pit is currently mined to an elevation near 500 feet amsl. A maximum pit depth of 400 feet amsl is proposed with a lowest outlet elevation (pit rim) of 660 amsl. The following table summarizes groundwater data for the site.

Table 2: Summary of Groundwater Data					
Well/Boring No.	**Date**	**Depth to Water (feet bgs)**	**Water Elevation (feet amsl)**	**Measuring Point Elevation (feet)**	**Location**
T3S/R6W-32H01 All American Well No. 1	5-13-2016	73.3	590.7	664	NW portion
	10-02-2015	66.1	597.9		
	6-1-2001	30	634		
	5-20-2003	38	626		
	12-8-2014	67.4	596.6		
T3S/R6W-32G01 All American Well No. 2	5-13-2016	66.6	593.4	660	NW portion
	10-30-2001	43	617		
	5-14-2003	41	619		
	6-10-2005	31.3	628.7		
	11-20-2011	37.3	622.7		
	4-19-2014	53.5	606.5		
Mark Roberts TH-1	4-4-2017	5.5	497.5	503	Pit
Mark Roberts TH-2	4-4-2017	8.5	496.5	505	Pit
Mark Roberts TH-3	4/13/2017	39.8*	631.2	671	West portion
Mark Roberts TH-4	4/13/2017	41	643	684	West portion

*initial reading – hole collapsed prior to 24-hour reading.

Recent groundwater elevation measurements indicate that groundwater levels within the pit area are at 495 feet amsl - approximately 95 feet higher than the planned pit bottom (400 feet amsl). Mark Roberts concluded that groundwater beneath the pit is not hydraulically connected to the Temescal Wash (basin) and that no deleterious effects are anticipated with the deepened mining plan.

For purposes of slope stability modeling, we assumed a conservative pit-full condition with a static water table established at elevation 650 feet amsl; however, this condition is not anticipated.

We observed slight seepage and enhanced plant growth along bedrock faults in the southern portion of the site. An adjacent mine operator reportedly releases surface flow to a ravine adjacent to the south access road above the south high wall. The seepage occurs in an unconfined state as a result of overland flow and local infiltration. Evidence of a groundwater table was not observed in the pit, and no standing water was present. The western portion of the site, near Temescal Wash, is within an area of "low" liquefaction susceptibility according to the Riverside County Integrated Project (2013). This area of the site is outside of quarry boundary and is not anticipated to be affected by mining activities.

Based on the presence of non-liquefiable bedrock, the potential for liquefaction and other shallow groundwater-related hazards at the site is considered to be very low. The quarry bottom may be exposed to periodic ponding of surface water after locally heavy precipitation. However, such ponding is anticipated to be shallow and short-lived—lasting only as long as evaporation/infiltration occurs; therefore, this transient water is not considered in slope stability calculations. Groundwater is not anticipated to significantly affect the stability of the proposed slopes; therefore, our evaluation considered dry conditions in the slope stability calculations.

SLOPE STABILITY

The term "landslide", as used in this report, refers to deep-seated slope failures that involve mine pit-scale features that have the potential to reduce the long-term stability of finished quarry reclamation slopes. Landslides in rock are typically related to structure in the parent material. Surficial failures refer to shallow failures that affect limited bench faces and may result in localized raveling of rock material.

Surficial failures or raveling, typically involving surface soils or the disturbed rock zone mantle, are considered a slope management/maintenance issue during mining.

The susceptibility of a geologic unit to landsliding depends on various factors, primarily: 1) the presence and orientation of weak structures, such as fractures, faults or clay beds; 2) the height and steepness of the natural or cut slope; 3) the presence and quantity of groundwater and 4) the occurrence of strong seismic shaking. Primary influences on the stability of final mine slopes are anticipated to be interaction between slope geometry and geologic structure including joints and bedrock faults within the final pit margin.

Typical bench face heights in hard rock mines range from 40 to 50 feet, the expected (and existing) range for the All American Asphalt mine. The modified Ritchie Criteria (MRC), where bench width is equal to 0.2 x height + 15 feet, provides a guide for selection of bench width to mitigate rock fall (Ryan and Pryor, 2000). The minimum recommended bench widths for 40-foot-tall and 50-foot-tall slopes is 23 feet and 25 feet, respectively. A bench configuration of 50 feet (H) x 40 feet (W) was evaluated that utilizes an interramp slope with an angle of 51 degrees. Bench faces will be approximately 80 degrees based on examination of existing conditions. Consideration of backbreak results in an effective bench width of approximately 31 feet measured from the toe of the bench face to the outside of the bench. This effective bench width is considered suitable for mitigation of rockfall for the subject mine. A diagram of this bench configuration is provided as Enclosure C-7. Additional discussion of slope geometries and recommendations for design benching and an overall slope angle is provided in following sections.

<u>GEOLOGIC STRUCTURE</u>:

Geologic structural observations included measuring the orientation of bedrock structures (discontinuities) in outcrop exposures during field mapping. The orientations of discontinuities were recorded in tabular format (Appendix C - Table C-1). Structural data were listed according to location.

The majority of more-continuous bedrock discontinuities consist of steeply-dipping joints that dip more steeply than or control the bench face angle (photograph no. 8). At the bench/face scale, discontinuities are primarily block-forming, random fractures developed as a result of blast fracture. Unit contacts consist of sharp intrusive and fault contacts between the Kcg and Kvspi units. Based on these observations and the results of our investigation, deep-seated landsliding is not anticipated in the proposed slopes. Analyses of the proposed reclamation slopes are presented in the following section as kinematic analysis and slope stability calculations.

SLOPE STABILITY EVALUATION

We evaluated the kinematic and global slope stability of the proposed slopes for representative configurations and material types. Stereographic analyses were conducted on the discontinuity orientation data (Table C-1) to identify the kinematically-possible failure modes in bench faces. Typically, it is not cost effective to eliminate all potentially unstable blocks, and a certain percentage of bench face failure and/or multiple bench instabilities is acceptable. Most of the smaller unstable features are removed during mining by scaling of the bench faces. Limit equilibrium analyses (global stability) of the proposed rock slopes were performed to compute the overall factors of safety against large-scale, multi-bench failures through the rock mass. Slope heights were determined from the Mine Plan, and overall slope angle and bench geometry were modeled according to the steepest/tallest slope/face anticipated for the final mine configuration.

Rock strength properties for global stability calculations were modeled using Hoek Brown criteria and the ultimate mining depths (highest slopes) anticipated in the mine pit. Discussion and summary of these analyses are presented below. Slope stability data and calculations are presented in Appendices C and D.

KINEMATIC ANALYSIS:

Kinematic analysis involves the evaluation of geometrically feasible failure modes in bedrock based on the orientation of structural discontinuities including joints, faults and shear zones. Kinematic analysis does not consider mass or force as in a limit-equilibrium analysis. The presence of bonded contacts and rough surfaces along joints between adjacent blocks and scaling practices makes the mined slope condition more stable than is inferred by kinematic statistics. Structurally controlled kinematic failure modes include planar, wedge and topple failures. The potential for circular failure of highly fractured rock masses is addressed by the global stability analysis. The angles evaluated in the kinematic analysis are selected to represent maximum or worst-case conditions to capture the potential for daylighted features in bench faces and overall slopes. Bench face angles are determined by field conditions. Due to the inclusion of ramps or haul roads in the overall slopes, final overall slope angles determined by global limit equilibrium analysis are typically flatter than the kinematic models.

Stereonet analysis (Rocscience, 2016) for selected representative slope/bench aspects was performed utilizing the data compiled from mapping and measurement of geologic structures within the site (Appendix C – Table C-1). A maximum bench face angle of 80 degrees was used to represent the existing high wall faces along the southern pit margin and expectedfinal bench faces that are controlled by major joint orientations. A 50-degree overall slope angle (representing slopes extending from the pit rim to pit floor and including benches, ramps and intervening slopes) was evaluated for large-scale faults and shears.

The bench face angle was evaluated for a suite of representative slope azimuths (facing directions) based on the Mine Plan. The slope orientations are listed in Table 3. A plot of major structural trends identified by prior investigators was also created (Enclosure C-2.4). The major joint sets defined by our investigation (Enclosure C-2.2) are consistent with those of the prior investigators. The dominant joint sets exhibit steeply-dipping northeast, north-northwest, and northwest dip directions. Faults and shears exhibit a similar bias to the major joint sets with the addition of a moderate southwest-dipping trend for a fault observed on the 850 Bench and a shear at Location 5.

Planar sliding analysis considers dip vectors of measured data points. Planar sliding requires a releasing surface—a joint or tension crack—to allow sliding to occur. Kinematic analysis does not consider the geometry of releasing surfaces or the presence/strength of bonded contacts along the sliding plane; therefore actual conditions are typically more stable than indicated by kinematic results. The potential for planar sliding or wedge failure suggested by stereonet analysis should be considered a conservative estimate of probability subject to mitigation by mining practices such as scaling and adjustment of slope face angles to the geometry and conditions encountered during mining. Wedge analysis generates dip vectors for the intersections of all planes; therefore, wedge analysis generates a large number of vectors to evaluate. Topple analysis identifies the potential for columns to form along steeply dipping joint systems or contacts to tilt out of the excavated face along separation surfaces. The stereonet data plots are presented in Appendix C. Table 3 summarizes the results of kinematic evaluation.

Table 3: Summary of Kinematic Evaluation			
Percentage Critical Points (80 degree face)			
Slope Aspect	**Planar**	**Wedge**	**Topple**
065	8.05	24.64	13.42
180	2.01	23.50	8.72
195	6.71	26.83	6.71
275	7.38	26.78	6.71
320	9.40	24.99	10.07
360	6.71	24.73	4.70

The stereonet evaluation provides results as a percentage of points in a data set with a geometrically feasible orientation to undergo a particular failure mode. In general, the percentage value relates to geometric probability of a particular failure mode. Probabilities below 5 percent suggest low failure potential, 5 percent to 20 percent a low to moderate potential, and values above 20 percent a moderate or higher potential. The sensitivity of slope aspect as a percentage of the total discontinuities (intersections for wedge analysis) for the three failure modes is presented as series of graphs in Enclosures C-3.1 through C-3.3.

80-Degree Bench Faces

For 80-degree bench faces, low to moderate planar sliding potential is indicated. Northwest-facing slopes exhibit a moderate potential for planar sliding (Enclosure C-4.5) along discontinuities consisting of joints with low continuity (Enclosure C-2.2). Based on the steep dip of northwest-facing joints in the global data set and a lack of faults or major joints with daylighted northwest-facing geometries (Enclosure C-2.3), the effective potential for planar sliding is low for all slope aspects. Existing slopes with a northwest aspect exhibit suitable performance with regard to planar stability; future benched slopes with this aspect are expected to perform similarly.

Topple potential is low to moderate for all slope azimuths based on the sensitivity plot for 80-degree faces (Enclosure C-3.2). The steep joint orientations observed in existing cuts provide potential for flexural topple, the expected topple condition for rough joint surfaces, where rock condition is poor and dilation has occurred from production blasting; however, scaling during mining has eliminated topple features. The effective potential for topple is considered low for effectively managed and scaled bench faces.

The sensitivity plot of wedge potential versus slope aspect suggests a moderate to strong potential for wedge failure geometries to form in all slopes, with aspects from 210 to 250 degrees having the highest potential (Enclosure C-3.3). However, the bench faces examined during this investigation did not exhibit problematic wedge failures. The wall scaling and mining practices conducted thus far, including of unstable blocks, appear to produce bench faces with stable conditions relative to wedge geometries. It appears that the effect of joint roughness and strong contact/incomplete separation between blocks mitigates the wedge geometry. The effective potential for problematic, multi-bench-scale wedge failures is considered low. Wedge blocks are expected to be bench-scale features mitigatable during mining.

Recommendations for mitigation of bench-scale raveling due to kinematically-possible slope failures are provided in the "Recommendations" section. The benching plan presented in the Mine Plan is considered feasible with regard to the performance of the proposed rock faces provided that the recommendations presented herein are considered in mine planning and operation. Bench design should allow for adjustments due to areas of raveling on wall faces.

50-Degree Overall Slopes

We considered a 50-degree slope to evaluate the potential for faults or shears— the most continuous structures—to affect large-scale kinematic stability. The sensitivity plot for planar sliding in 50-degree slopes is shown as Enclosure 3.4. A moderate to high potential is suggested for sliding in the southwest direction. Southwest-facing reclamation slopes are not planned where mapped faults or shears have adverse orientations. In addition, existing southwest-facing slopes appear uniformly stable and lack large-scale structures with adverse southwest-dipping orientations (photograph no. 9). For future southwest-facing excavations in unexplored areas of the site, geologic mapping can identify faults or large-scale structures with the potential to cause instability. The remaining slopes aspects show low potential for large-scale kinematic planar instabilities.

GLOBAL STABILITY CALCULATIONS:

The global stability for the steepest anticipated overall mine and reclamation slopes, as depicted on the Mining Plan, was analyzed using Spencer's method under both static and seismic conditions for rotational and composite failure surfaces using the SLIDE computer program, version 6.039 (Rocscience, Inc., 2016). Selection of the slope configurations for the analysis, which include the tallest anticipated excavated slope proposed and maximum recommended overall slope angle, is based on a most-conservative approach and is applicable to all reclaimed slopes throughout the mine. The final haul road alignments/locations are not determined at this time, but inclusion of haul roads will result in flatter overall slopes angles. Therefore, we modeled the tallest slope (920 feet measured perpendicular to the slope *near* Section D with an overall slope angle of 49 degrees) as a benched slope with a haul road to demonstrate the stability of the steepest allowable overall slope angle.

We modeled several additional overall slopes using a smoothed, un-benched model with an angle of 49 degrees. The overall angle for slopes that include haul roads and safety benches may be flatter than 49 degrees. Individual structural features are addressed in the kinematic evaluation and are not considered in the global, whole-rock analysis. In addition, faults with a potential to produce whole-slope instabilities of a global type were not present. Table 4 summarizes the slope configuration evaluated for this study.

Table 4: Summary of Slope Configurations

Section	Height (feet)	Configuration
A	460	Smooth slope at overall 49° angle
B	290	Smooth slope at overall 49° slope
C	540	Smooth slope at overall 49° slope
D (modified)	920	50' (H) - vertical face x 40' (W) benches forming a slope with overall angle at 49°
F	320	Smooth slope at overall 49° slope

The seismic stability calculations were performed using a lateral pseudostatic coefficient "Kh" of 0.20, consistent with the seismic conditions of the site region. Groundwater was modeled at an elevation of 650 feet amsl to consider a conservative condition. The whole rock strength of the geologic units was determined in part by unconfined compressive strength (UCS) tests using block samples from the mine. Laboratory tests are summarized below.

Table 5: UCS Test Summary				
Sample	**Unconfined Compressive Strength (UCS)**		**Specific Gravity**	**Notes**
	PSI	**PSF**		
Kcg	27,490	3.96×10^6	2.623	Intact Core
Kvspi	24,816	3.57×10^6	2.782	Intact Core
Kvspi (porphyritic)	29,678	4.27×10^6	2.743	Intact Core

The rock strength was modeled utilizing the Generalized Hoek-Brown criteria (Hoek, 2000 and Hoek, Carranza-Torres & Corkum, 2002) and the program's built-in parameter calculator with the following input values:

Table 6.1: Granitic Unit (Kcg) Rock Strength Parameters		
Parameter	**Value**	**Description**
Unit Weight (pcf*)	163.7	Measured
Specific Gravity	2.623	Measured
Intact UCS[1] (psf**)	3.958×10^6	Measured by UCS Test
Geological Strength Index	55	Blocky with Fair Surface Conditions
Intact Rock Constant (mi***)	29	Granodiorite
Disturbance Factor	1	Production Blasting

1 Uniaxial Compressive Strength test result
* pcf = pounds per cubic foot
** psf = pounds per square foot
*** mi = unitless constant

Table 6.2: Intrusive Units (Kvspi) Rock Strength Parameters		
Parameter	**Value**	**Description**
Unit Weight (pcf*)	173.6	Measured
Specific Gravity	2.782	Measured
Intact UCS[1] (psf**)	3.573×10^6	Measured by UCS Test
Geological Strength Index	54	Blocky with Fair Surface Conditions
Intact Rock Constant (mi***)	27	Gabbro
Disturbance Factor	1	Production Blasting

[1] Uniaxial Compressive Strength test result
* pcf = pounds per cubic foot
** psf = pounds per square foot
*** mi = unitless constant

The results of the global slope stability analyses are summarized below in Table 7. Details of stability calculations including material type boundaries, strength parameters utilized and the minimum factor of safety and critical slip surface are included in Enclosures D-1.1 through D-5.2.

Table 7: Summary of Global Slope Stability			
Cross Section	**Slope Configuration**	**Static F.S.**	**Seismic F.S. (Kh=0.20)**
A	460H	3.62	2.60
B	290H	4.39	3.00
C	550H	3.10	2.26
D	920H benched at 49° overall angle	2.53	1.87
F	370H	3.71	2.81

As indicated by calculation, sufficient static factors of safety in excess of 1.5 and seismic factors of safety in excess of 1.1 were indicated for the modeled proposed rock slope configurations and satisfy Office of Mine Reclamation criteria. The global rock slope configurations appear suitably stable for reclamation of the proposed slopes according to regulatory requirements.

CONCLUSIONS

On the basis of our field investigation and slope stability analyses, it is the opinion of this firm that the proposed slope excavations and reclamation of the proposed mine slopes are feasible from geotechnical engineering and engineering geologic standpoints, provided the recommendations contained in this report are implemented during mining.

In general, it appears that the whole rock strength of aggregate resource is sufficient to accommodate the proposed overall slope angles.

Based on our analyses, overall approximate 49-degree mine cut-slopes up to approximately 920 feet in height are suitably stable by calculation against gross failure for the anticipated long-term conditions, including the effects of seismic shaking.

Surficial debris is anticipated to be removed during site development.

Subsequent to blasting of the final rock slope walls, quarry operations may include the use of a scaling chain or mechanical equipment to assist in removal of loose or precarious blocks during removal of the resource. Adherence to the slope benching plan and consideration of newly exposed adverse structural features (if present) during future quarry work can result in stable slopes after completion of reclamation.

Evidence of active faulting was not observed on the site during this investigation. An inactive fault is mapped in the northeast portion of the mine area. The potential for liquefaction and other shallow groundwater hazards within the reclamation/development areas is considered to be low.

Moderate to severe seismic shaking of the site can be expected to occur during the lifetime of the proposed mining and reclamation. This potential has been considered in our analyses and evaluation of slope stability.

Raveling processes during and after quarry operation, with time, will result in deposition of talus on benches. Talus left on the benches can facilitate revegetation and lend a more natural appearance to the reclaimed slopes. It is anticipated that rock fragments will be angular and relatively resistant to rolling. Therefore, rockfall hazard is not anticipated for properly excavated and scaled rock slopes.

Groundwater measurements in onsite wells and drilled test holes indicates static groundwater at elevations from 496.5 feet amsl to 643 feet amsl. The lowest portion of the pit is currently mined to an elevation near 500 feet amsl. A maximum pit depth of 400 feet amsl is proposed with a lowest outlet elevation (pit rim) of 660 amsl. We conservatively modeled static water at the proposed pit outflow elevation for purposes of slope calculation; however, this condition is not anticipated for the reclaimed project. The presence of groundwater in the pit is not considered problematic from a slope stability standpoint.

RECOMMENDATIONS

Final reclaimed overall slopes in competent rock materials within the pit should be designed equal to or flatter than, 49 degrees) up to the maximum height evaluated (920 feet). Inclusion of haul roads or ramps will decrease the overall slope angle. Benching with 40-foot-wide benches every 50 vertical feet, 80-degree bench faces, and 50-degree interramp slopes is suitable by calculation for mining and reclamation. Benching configurations that provide a similar interramp angle and bench width are allowable. Allowance for a final maximum 49-degree overall slope angle should be provided by addition of haul roads or locally wider benches where needed. Haul roads and ramps should be designed in accordance with accepted mining standards. The prevalent joint systems will influence the final geometry of pit walls. The occurrence of back break and kinematic influence on face angles may result in flatter interramp slope angles.

Visual inspection of rock excavations and mine slopes/benches should be performed to address the potential for unknown or newly exposed discontinuities/geologic conditions. If raveling or instability is evident due to features in the geologic structure, the bench width should be increased to provide a suitable buffer to daylighted or unstable features and a sufficient area to mitigate rockfall. Geologic mapping of final slopes should be performed during excavation of reclamation slopes. Preparation of the final benched slope faces may include scaling to ensure removal of loose or potentially unstable blocks.

Blasting practices should be adjusted to reduce damage to rock to be left in reclaimed bench faces. This may require transition from production blasts to pit-wall blasts as mining approaches the designed pit wall (Hagan and Bulow, 2000). Several techniques are available to aid in producing design pit walls that meet reclamation needs. These should be considered and tested prior to reaching final design pit walls as it is often expensive or impossible to correct adverse conditions near pit margins. A blasting consultant experienced with design pit blasting techniques may be consulted if final slope and bench conditions become unsatisfactory.

Unstable or rounded boulders/blocks should be removed or stabilized where accessible. Mine areas below loose rock, if left in place during mining, should be restricted from casual access and indicated by means of signage or fencing.

Based on anticipated reclamation conditions, use of steel netting or other structural installations to mitigate toppling or rock fall is not considered necessary if suitable design pit wall benches are produced; however, these measures can be considered if warranted by future observations or conditions.

Geotechnical evaluation and design, management of mine bench geometry based on encountered conditions, or use of mechanical support systems can enhance the safety of or mitigate hazards in mining; however, monitoring of slope conditions for failure warning signs is the most important means for protecting mine workers (Girard and McHugh, 2000) as it can prevent exposure of personnel to potentially hazardous conditions. As is typical for any surface mining operation, we recommend periodic observation of mine benches above working areas for indications of potential instability during mine operations.

Mine slopes should be protected with berms and/or levees as necessary to prevent slope erosion in the areas where natural slopes drain onto the reclaimed slopes.

LIMITATIONS

CHJ Consultants, a Terracon Company, has striven to perform our services within the limits prescribed by our client, and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the study, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application, or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject study, and the findings of this report may be invalidated fully or partially by changes outside of the control of CHJ Consultants. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions that appear different than those described herein be encountered in the field by the client, any firm performing services for the client or the client's assign, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this study are not intended or represented to be suitable for reuse on extensions or modifications of the project, or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

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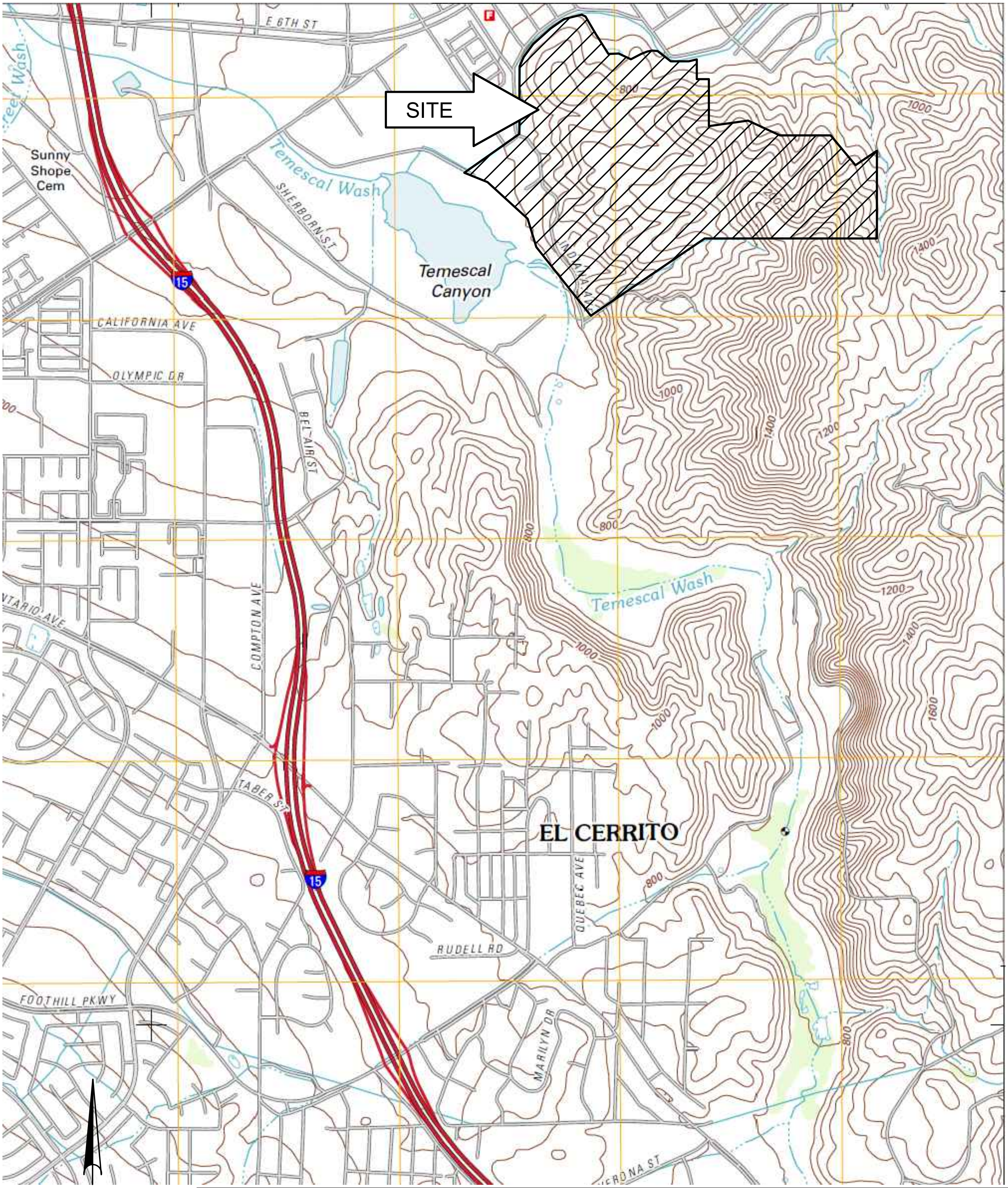
Source not determined, black and white aerial imagery dated April 30, 2004, photograph nos. 1-1 and 1-2; scale: 1" = 600 feet.

Source not determined, black and white aerial imagery dated April 30, 2004, photograph nos. 1-1 through 1-5; scale: 1" = 300 feet.

APPENDIX A

MAPS AND CROSS SECTIONS



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SCALE: 1" = 2000'

LOCATION MAP

FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-1"
DATE: APRIL 2017		JOB NUMBER CB175119

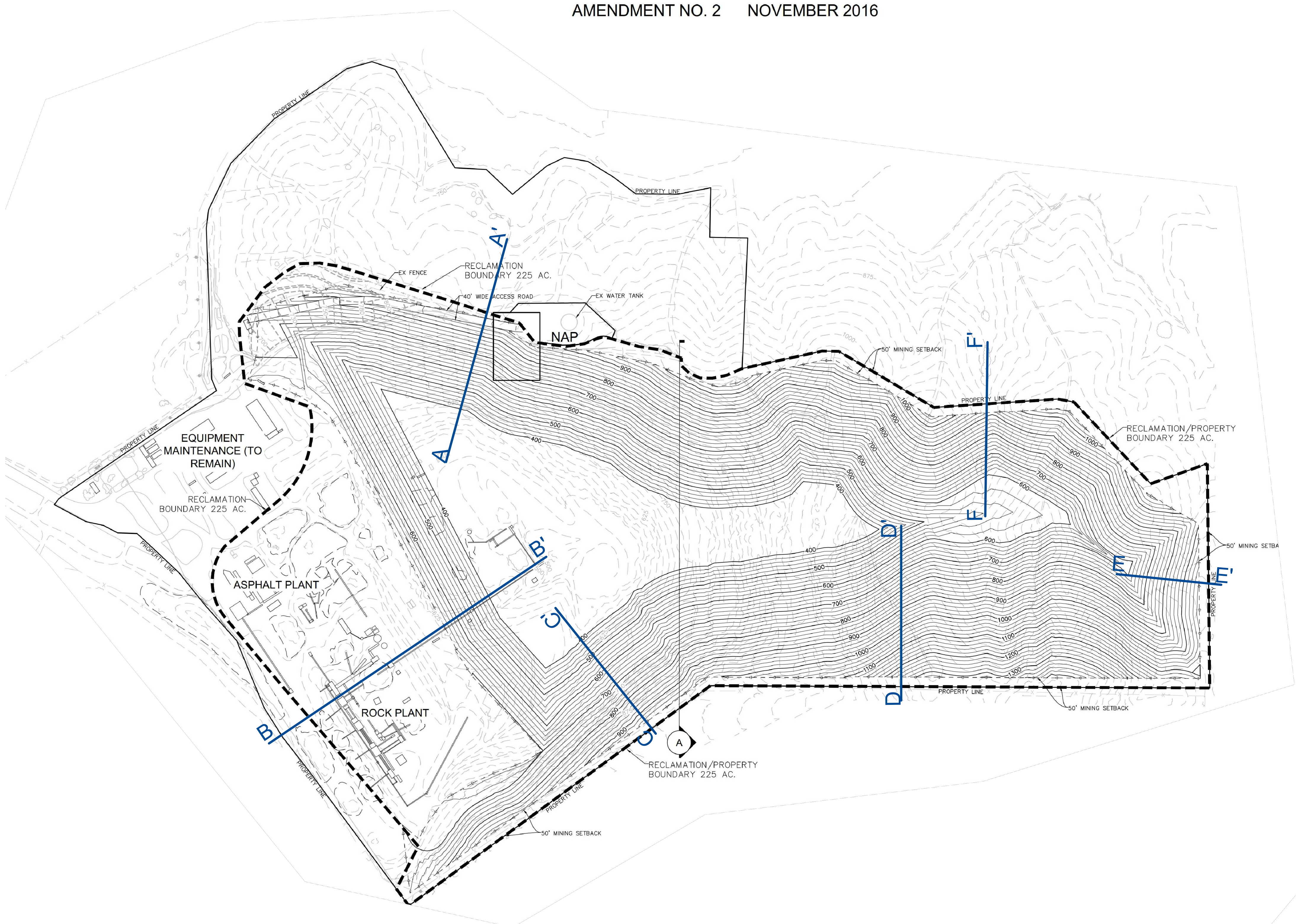
Terracon

PHASE 1

CY CUT = 50,960,000 (Down to 500')
CY CUT = 57,800,000 (Down to 400')
AREA = 171.4 Ac

ALL AMERICAN ASPHALT
S.M.P. 95-1
COMPREHENSIVE MINING PLAN

AMENDMENT NO. 2 NOVEMBER 2016

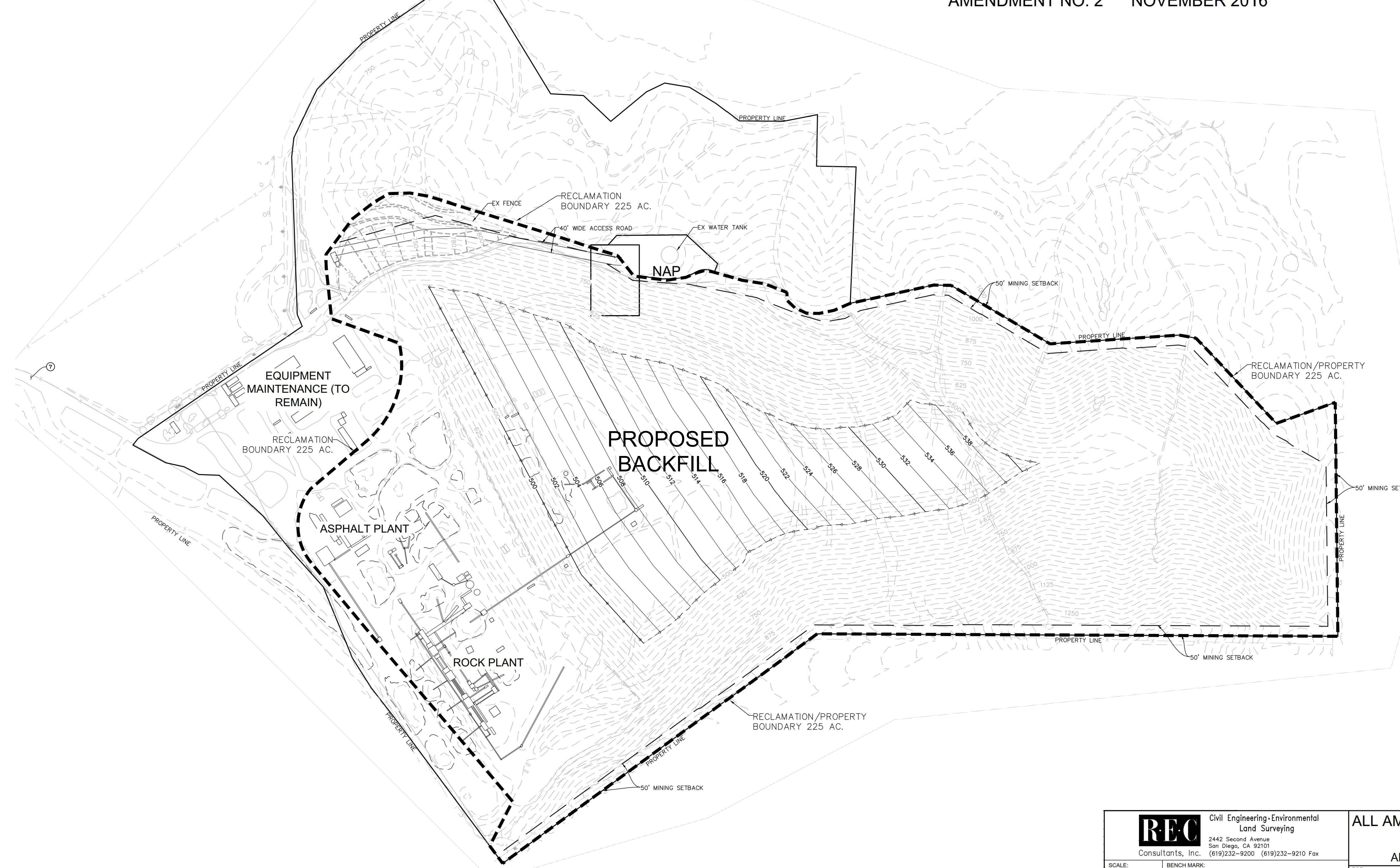


PHASE 2

CY FILL = 7,750,000 (Up to 500' from 400' Base)

ALL AMERICAN ASPHALT
S.M.P. 95-1
COMPREHENSIVE MINING PLAN

AMENDMENT NO. 2 NOVEMBER 2016



N

SCALE: 1" = 600

0 600 1200

REC Consultants, Inc. Civil Engineering • Environmental Land Surveying

ALL AMERICAN ASPHALT
CORONA PLANT
S.M.P. 95-1
AMENDMENT NO. 2

FOR: ALL AMERICAN ASPHALT

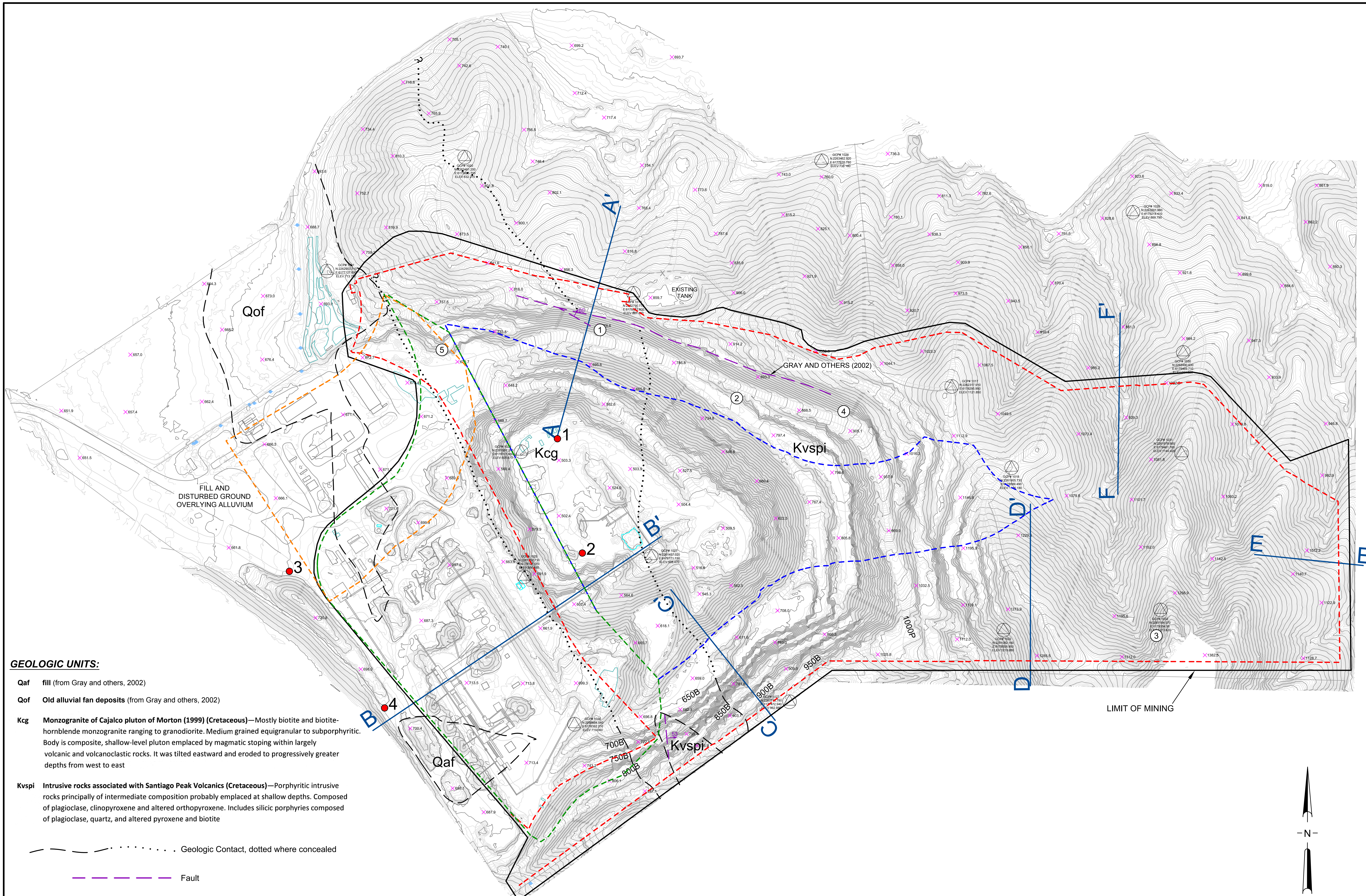
LEGEND:

F ———— F' Slope Stability Section

(also appears on A-2.2, Geologic Map)

MINING PLAN		
FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-2.1"
DATE: APRIL 2017		JOB NUMBER CB175119

Terracon



GEOLOGIC UNITS:

Qaf **fill** (from Gray and others, 2002)

Qof **Old alluvial fan deposits** (from Gray and others, 2002)

Kcg **Monzogranite of Cajalco pluton of Morton (1999) (Cretaceous)**—Mostly biotite and biotite-hornblende monzogranite ranging to granodiorite. Medium grained equigranular to subporphyritic. Body is composite, shallow-level pluton emplaced by magmatic stoping within largely volcanic and volcanoclastic rocks. It was tilted eastward and eroded to progressively greater depths from west to east

Kvspi **Intrusive rocks associated with Santiago Peak Volcanics (Cretaceous)**—Porphyritic intrusive rocks principally of intermediate composition probably emplaced at shallow depths. Composed of plagioclase, clinopyroxene and altered orthopyroxene. Includes silicic porphyries composed of plagioclase, quartz, and altered pyroxene and biotite

Geologic Contact, dotted where concealed

Fault

F F' Slope Stability Section (also appears on A-2.1 Mining Plan)

5 Reference Location for Mapping

750B Bench Designation

4 Test Hole Location (Mark Roberts, 2017)

1000P Working Pad

53 Strike and dip of fault

Phase 1 Boundary

Phase 2 Boundary

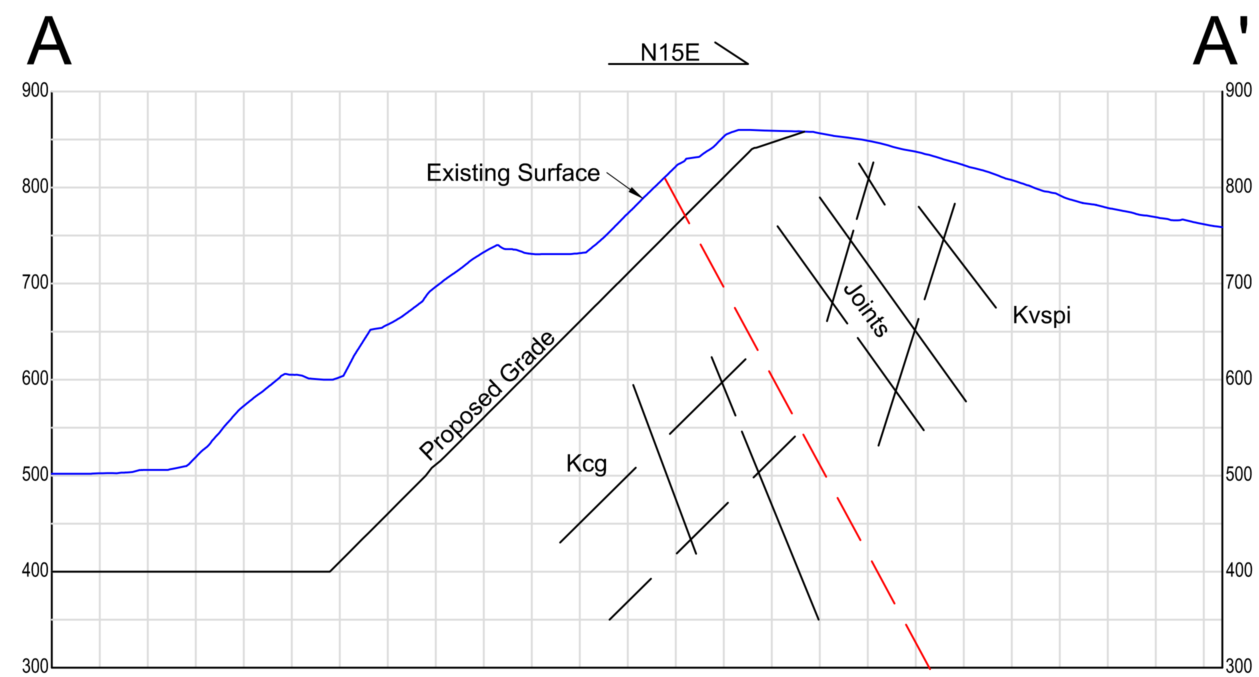
Phase 3 Boundary

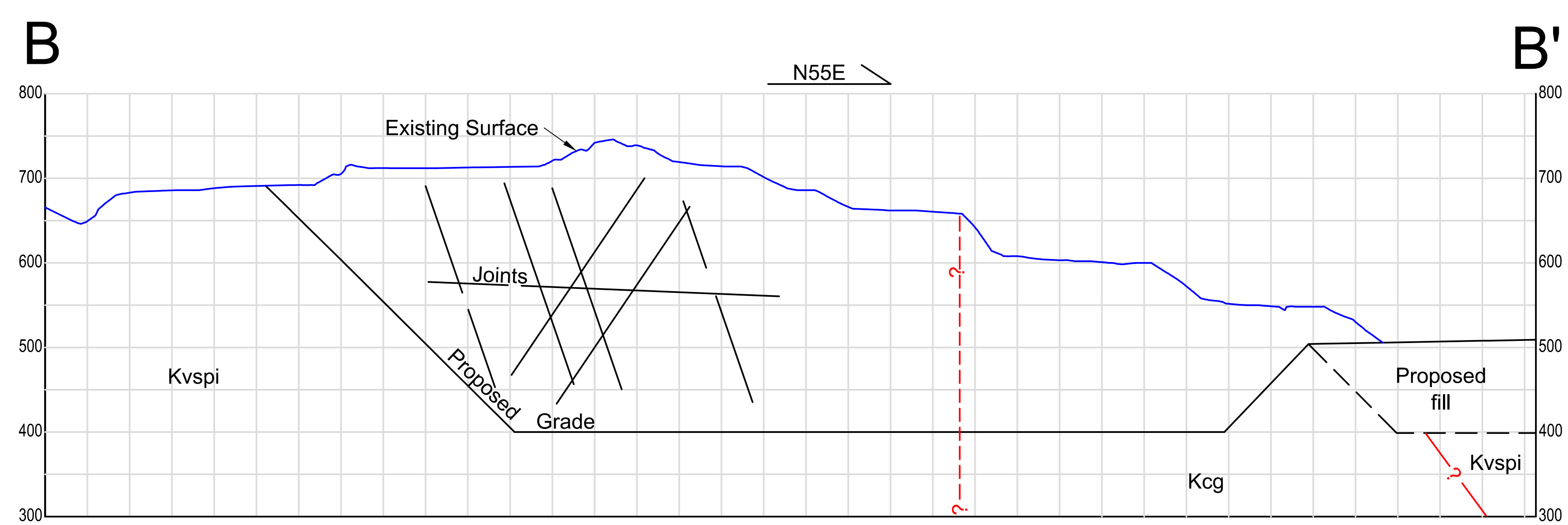
Phase 4 Boundary

GEOLOGIC MAP

FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-2.2"
DATE: MAY 2017		JOB NUMBER CB175119

Terracon



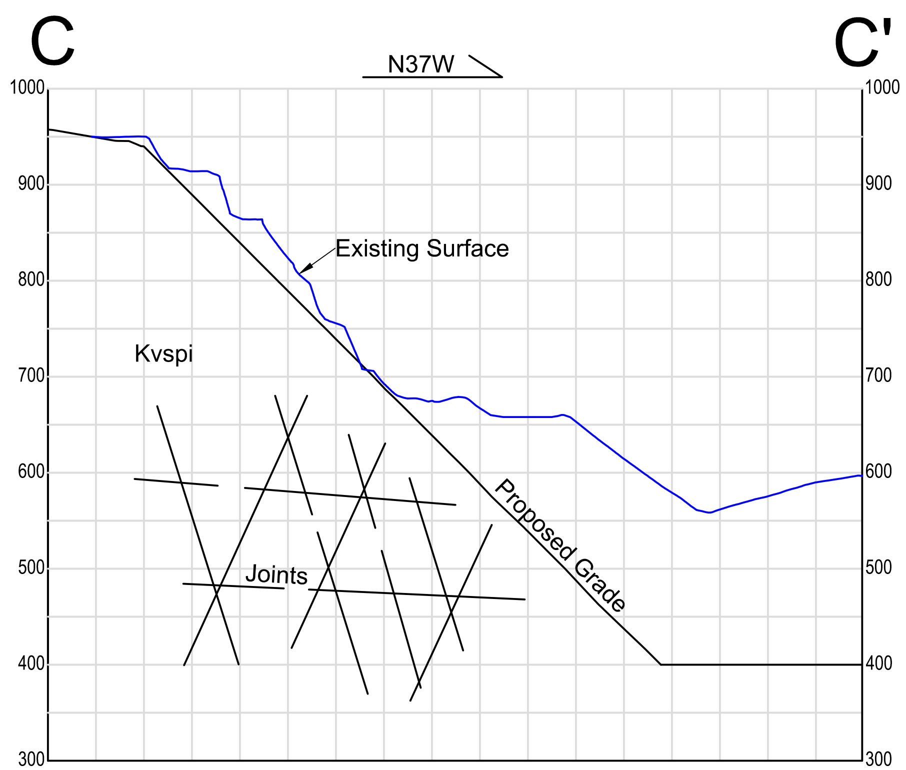


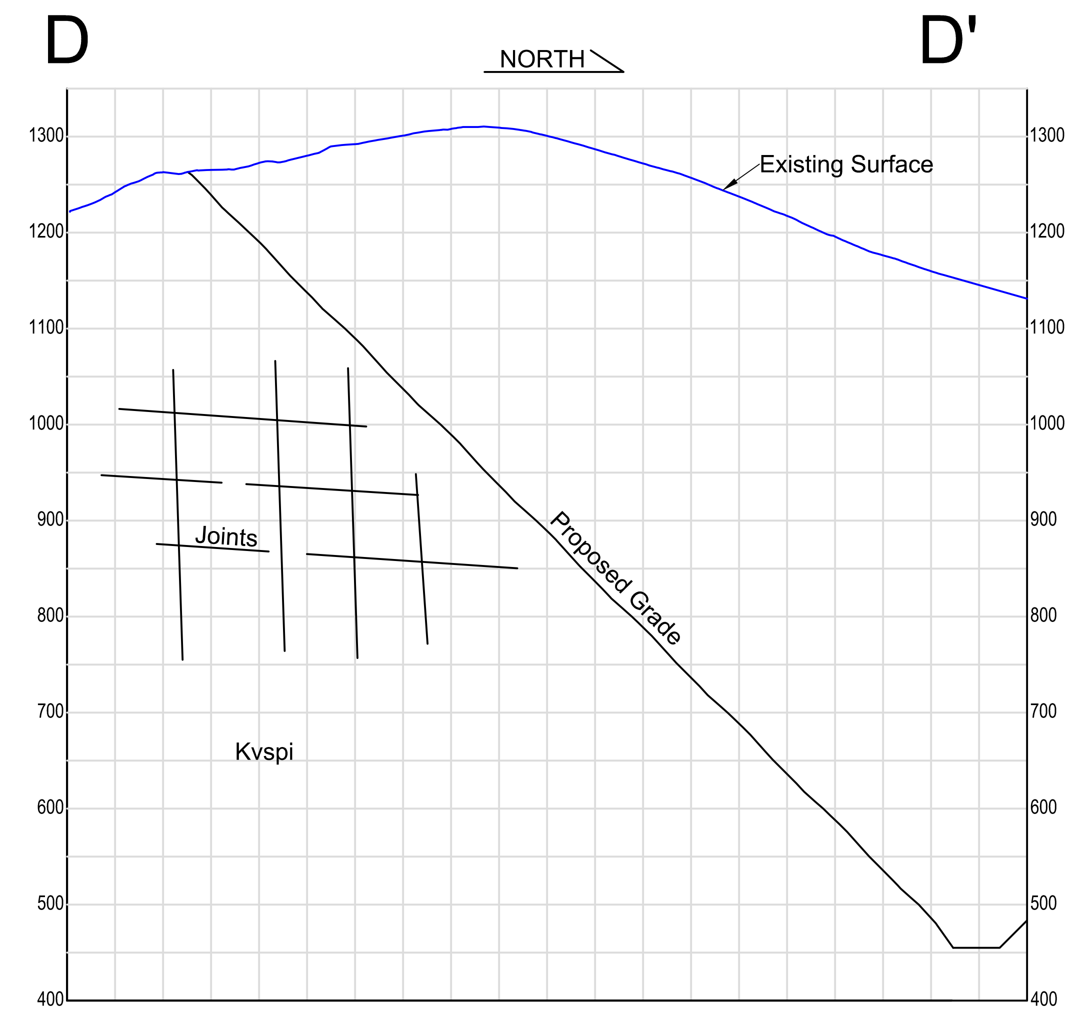
SCALE: 1" = 200'

Notes: Proposed grade depicted herein for illustration & approximates overall final benched slope angle.
Haul roads not determined at this time. Inclusion of haul roads will result in flatter overall slopes.
Proposed fill to be contained within final quarry walls. Existing fill & colluvium not shown.

CROSS SECTIONS		
FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-2.3a"
DATE: APRIL 2017		JOB NUMBER CB175119

Terracon



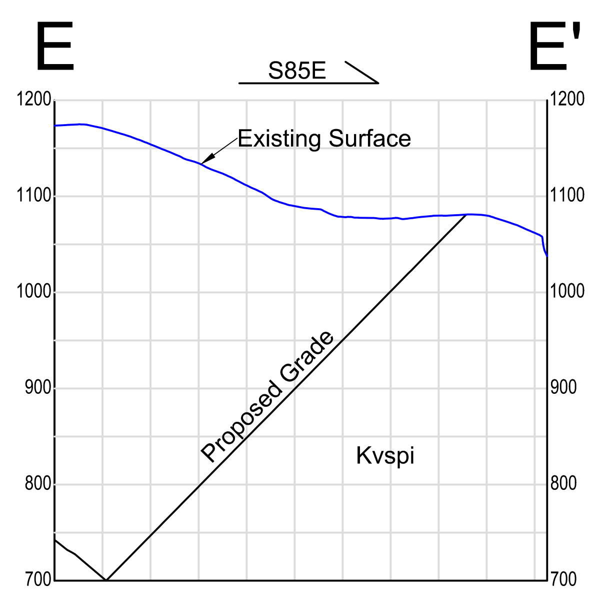


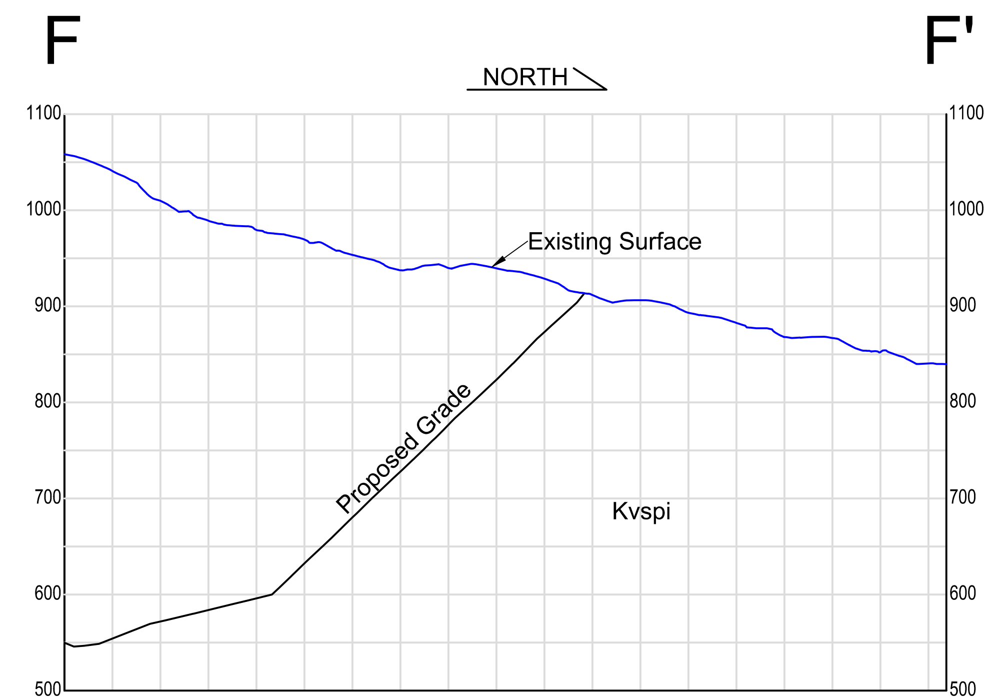
Note: Proposed grade depicted herein for illustration & approximates overall final benched slope angle.
Haul roads not determined at this time. Inclusion of haul roads will result in flatter overall slopes.
Proposed fill to be contained within final quarry walls. Existing fill & colluvium not shown.

SCALE: 1" = 200'

CROSS SECTIONS		
FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-2.3b"
DATE: APRIL 2017		JOB NUMBER CB175119

Terracon





SCALE: 1" = 200'

Note: Proposed grade depicted herein for illustration & approximates overall final benched slope angle.
Haul roads not determined at this time. Inclusion of haul roads will result in flatter overall slopes.
Proposed fill to be contained within final quarry walls. Existing fill & colluvium not shown.

CROSS SECTIONS

FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-2.3c"
DATE: APRIL 2017		JOB NUMBER CB175119

GEOLOGIC UNITS:

Qaf Deposits of fill resulting from human construction or mining activities

Qya **Young alluvial channel deposits (Holocene and late Pleistocene)**—Gray, unconsolidated alluvium. Found chiefly in Temescal Wash and its tributaries, where it consists of medium- to fine-grained sand in lower reaches and coarsens to gravel and cobbles up stream

Qof **Old alluvial fan deposits (late to middle Pleistocene)**—Moderately indurated, gravel and cobble alluvial fan deposits. Most of unit is slightly to moderately dissected and reddish-brown. Some Qof includes thin, discontinuous surface layer of Holocene alluvial fan material

Tvss **Vaqueros, Sespe, Santiago and Silverado Formations, undifferentiated (early Miocene, Oligocene, late Eocene, and Paleocene)**—Marine and nonmarine sandstone and conglomerate of Sespe, Vaqueros, and Silverado Formations. Found only on small hill between Home Gardens and El Cerrito

Kcg **Monzogranite of Cajalco pluton of Morton (1999) (Cretaceous)**—Mostly biotite and biotite-hornblende monzogranite ranging to granodiorite. Exposed north and east of El Cerrito; Medium grained equigranular to subporphyritic. Informally named for exposures in Cajalco area, Lake Mathews 7.5' quadrangle (Morton, 1999). Rocks of Cajalco pluton were included within Cajalco quartz monzonite by Dudley (1935) and within Woodson Mountain granodiorite by Larsen (1948). Body is composite, shallow-level pluton emplaced by magmatic stoping within largely volcanic and volcanoclastic rocks. It was tilted eastward and eroded to progressively greater depths from west to east

Kgu **Granite, undifferentiated (Cretaceous)**—Equigranular, leucocratic fine-to coarse-grained massive granite and biotite monzogranite. Consists of quartz, alkali feldspars and sparse biotite. Forms elongate dike-like mass northeast of El Cerrito

Kvspi **Intrusive rocks associated with Santiago Peak Volcanics (Cretaceous)**—Porphyritic intrusive rocks principally of intermediate composition probably emplaced at shallow depths. Composed of plagioclase, clinopyroxene and altered orthopyroxene. Includes silicic porphyries composed of plagioclase, quartz, and altered pyroxene and biotite

Kvem **Estelle Mountain volcanics of Herzig (1991) (Cretaceous)**—Heterogeneous mixture of rhyolite flows, shallow intrusive rocks, and volcaniclastic rocks. Distinguished from Santiago Peak Volcanics (Kvsp) by paucity of andesitic rocks. Underlies large area east of El Cerrito. Informally named by Herzig (1991) for exposures in vicinity of Estelle Mountain, Lake Mathews 7.5' quadrangle. These rocks were termed Temescal dacite-porphyry by Dudley (1935) and Temescal Wash quartz latite porphyry by Larsen (1948).

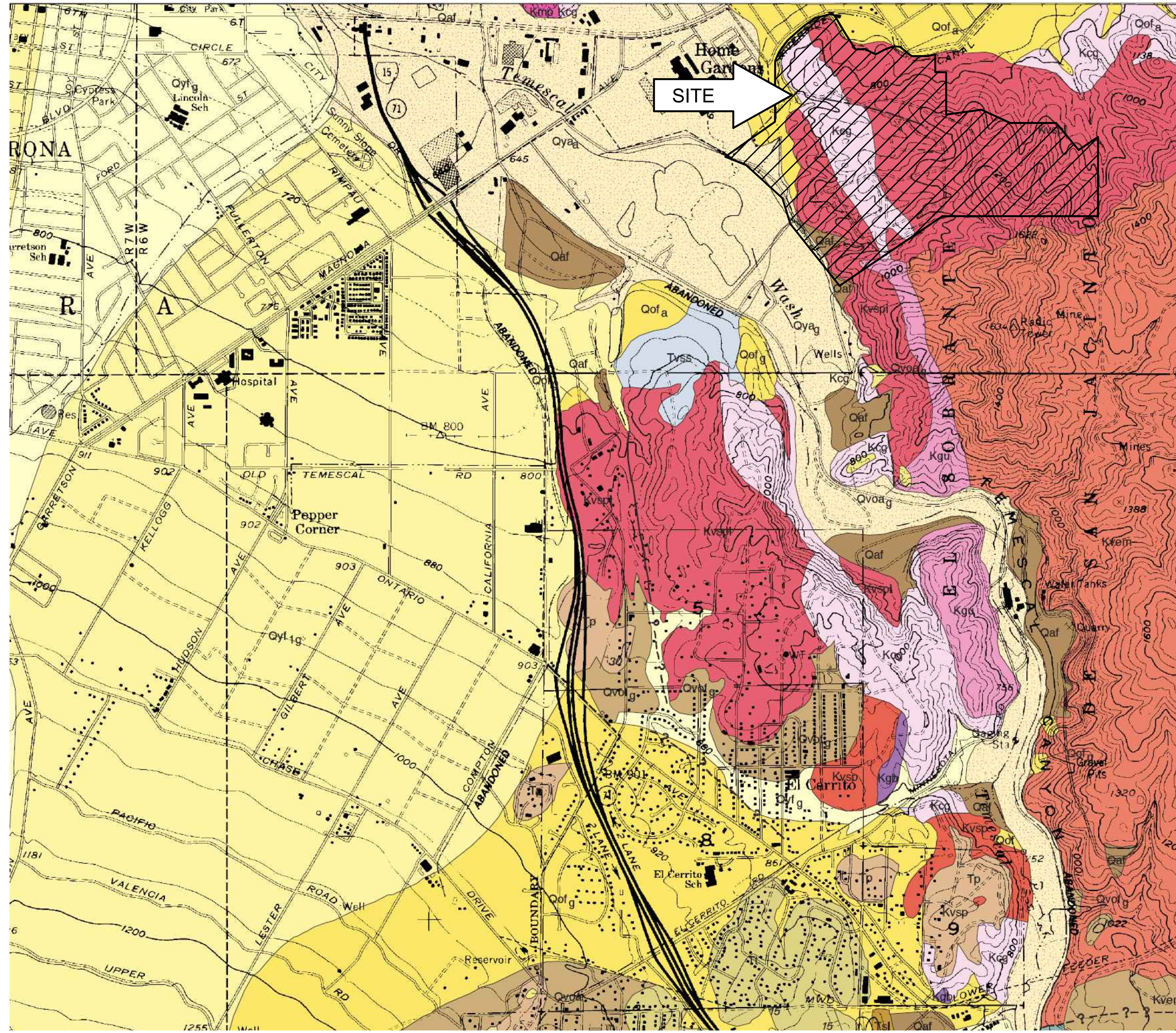
______________ Geologic Contact

__________ _ _ _ _ _Fault High angle. Strike-slip component on all faults is right-lateral; dip-slip component is unknown, but probably reflects valley-highland relations. Solid where located within ±15 m; dashed where located within ±30 m; dotted where concealed; queried where existence questionable

Reference: Gray and others (2002)

–N–

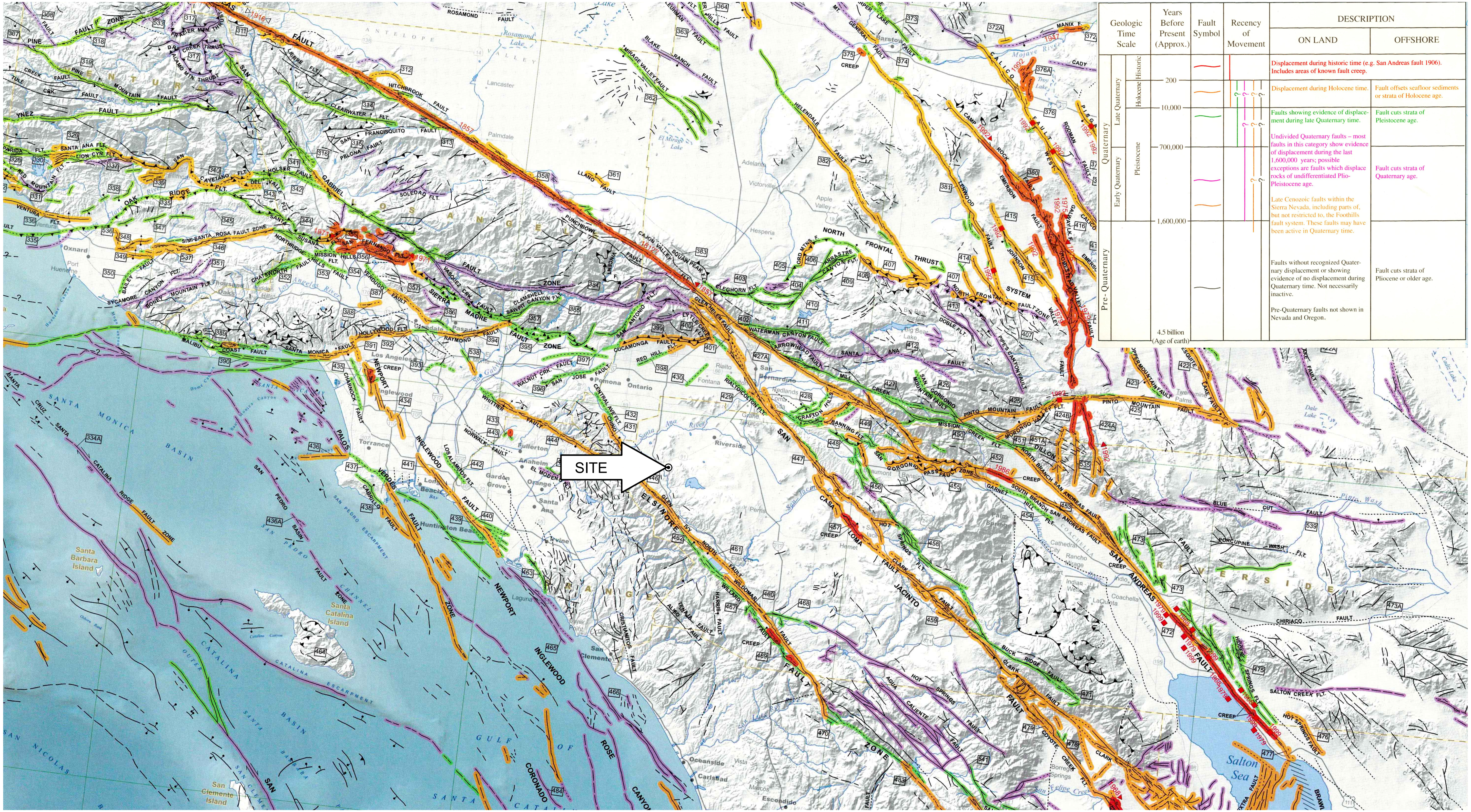
SCALE: 1" = 2000'



GEOLOGIC INDEX MAP

FOR:		ENCLOSURE
ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	"A-3"
DATE: APRIL 2017		JOB NUMBER CB175119

Terracon



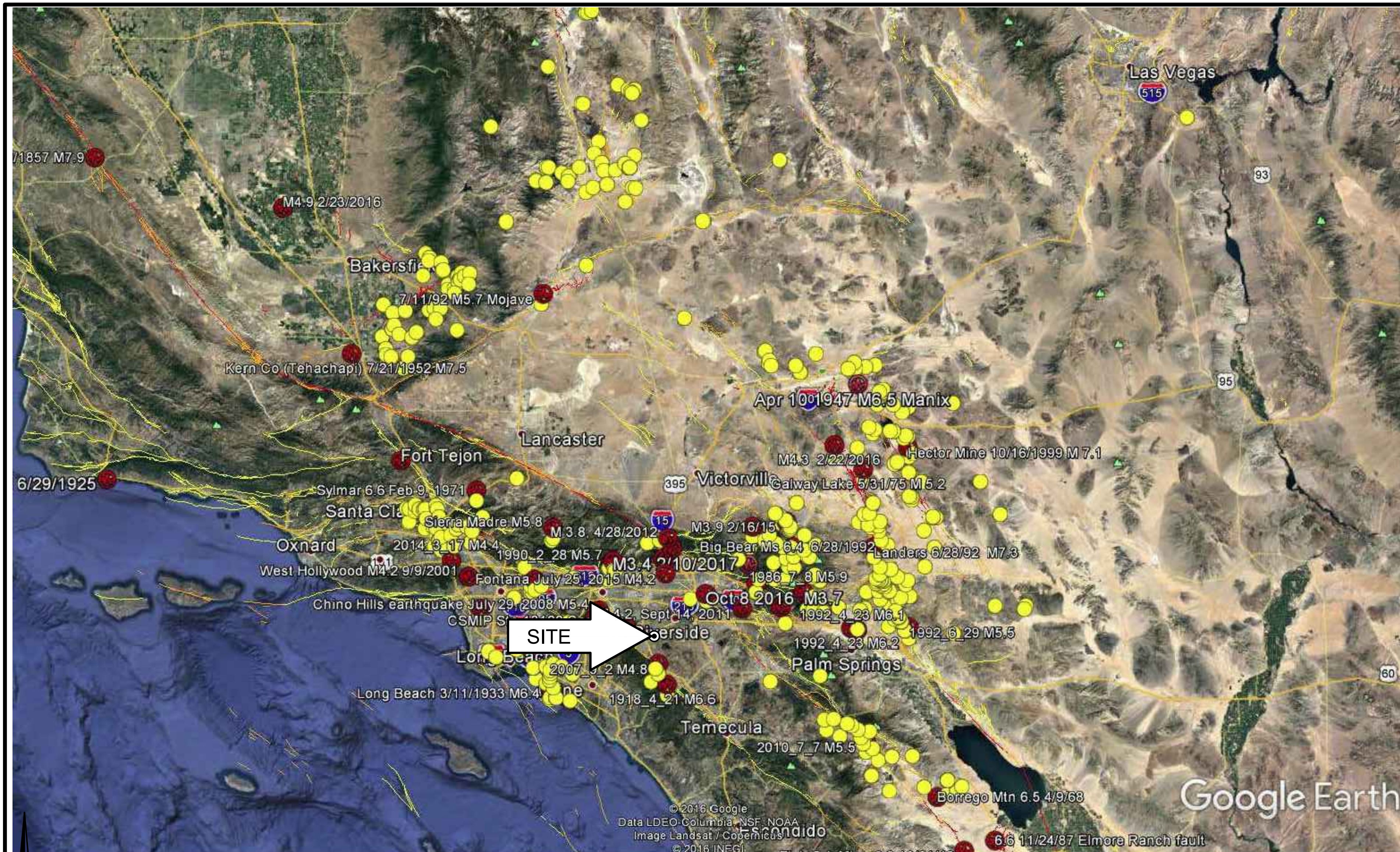
-N-

SCALE: 1" = Approx. 15 miles

REGIONAL FAULT MAP

FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-4"
DATE: APRIL 2017		JOB NUMBER CB175119

Terracon



N

SCALE: 1" = Approx. 40 miles

REGIONAL SEISMICITY MAP

FOR: ENVIROMINE INC.	SLOPE STABILITY INVESTIGATION AMENDED RECLAMATION OF ALL AMERICAN ASPHALT QUARRY SMP 95-1 CORONA, CALIFORNIA	ENCLOSURE "A-5"
DATE: APRIL 2017		JOB NUMBER CB175119

Terracon

APPENDIX B

LABORATORY TEST RESULTS

Summary of Laboratory Tests on Rock Samples			
Sample	Kvspi	Kvspi (porphyritic)	Kcg
Specific Gravity	2.782	2.743	2.623
Length (in)	4.88	4.89	5.05
Diameter (in)	2.75	2.70	2.72
Cross Section Area (in2)	5.94	5.72	5.81
Load (lbs.)	147410	169760	159720
UCS (psi)	24,816	29,678	27490

APPENDIX C

KINEMATIC EVALUATION

Table C-1: Global Discontinuity Data – All American Asphalt Corona Mine							
Discontinuity No.	**Dip**	**Dip Direction**	**Type**	**Location**	**Geologic Unit**	**Continuity**	**Roughness**
1	81	330	J	750B	Kvspi	4	4
2	78	080	J	750B	Kvspi	3	3
3	81	096	J	750B	Kvspi	3	3
4	35	110	J	750B	Kvspi	1	2
5	29	114	J	750B	Kvspi	1	2
6	61	321	J	750B	Kvspi	2	3
7	54	050	J	750B	Kvspi	5	3
8	49	220	J	750B	Kvspi	5	3
9	81	331	J	750B	Kvspi	5	3
10	86	201	J	750B	Kvspi	1	5
11	48	231	J	750B	Kvspi	3	2
12	87	148	J	750B	Kvspi	5	3
13	43	228	J	750B	Kvspi	2	2
14	65	070	J	750B	Kvspi	4	2
15	64	249	J	750B	Kvspi	1	2
16	47	110	J	750B	Kvspi	1	2
17	86	142	J	750B	Kvspi	4	3
18	35	130	J	750B	Kvspi	3	2
19	87	108	J	750B	Kvspi	3	3
20	79	351	J	750B	Kvspi	5	3
21	49	050	J	750B	Kvspi	4	2
22	37	145	J	750B	Kvspi	1	1
23	33	095	J	750B	Kvspi	5	3
24	80	340	J	700B	Kvspi	4	4
25	64	039	J	700B	Kvspi	1	3
26	46	086	J	700B	Kvspi	3	3
27	25	252	J	700B	Kvspi	3	3
28	42	310	J	700B	Kvspi	1	1
29	83	334	J	700B	Kvspi	4	4
30	45	105	J	700B	Kvspi	4	2
31	81	325	J	700B	Kvspi	4	3
32	83	242	J	650B	Kvspi	3	2
33	78	335	J	650B	Kvspi	5	3
34	59	237	J	650B	Kvspi	2	3
35	36	085	J	650B	Kvspi	4	3
36	39	131	J	650B	Kvspi	3	3
37	70	119	J	650B	Kcg	5	3
38	87	285	J	650B	Kcg	5	3
39	53	200	J	650B	Kcg	1	1
40	76	315	J	650B	Kcg	3	2
41	77	305	J	650B	Kcg	3	2
42	80	340	J	650B	Kcg	3	2
43	85	305	J	650B	Kcg	3	4
44	55	056	J	650B	Kcg	4	2

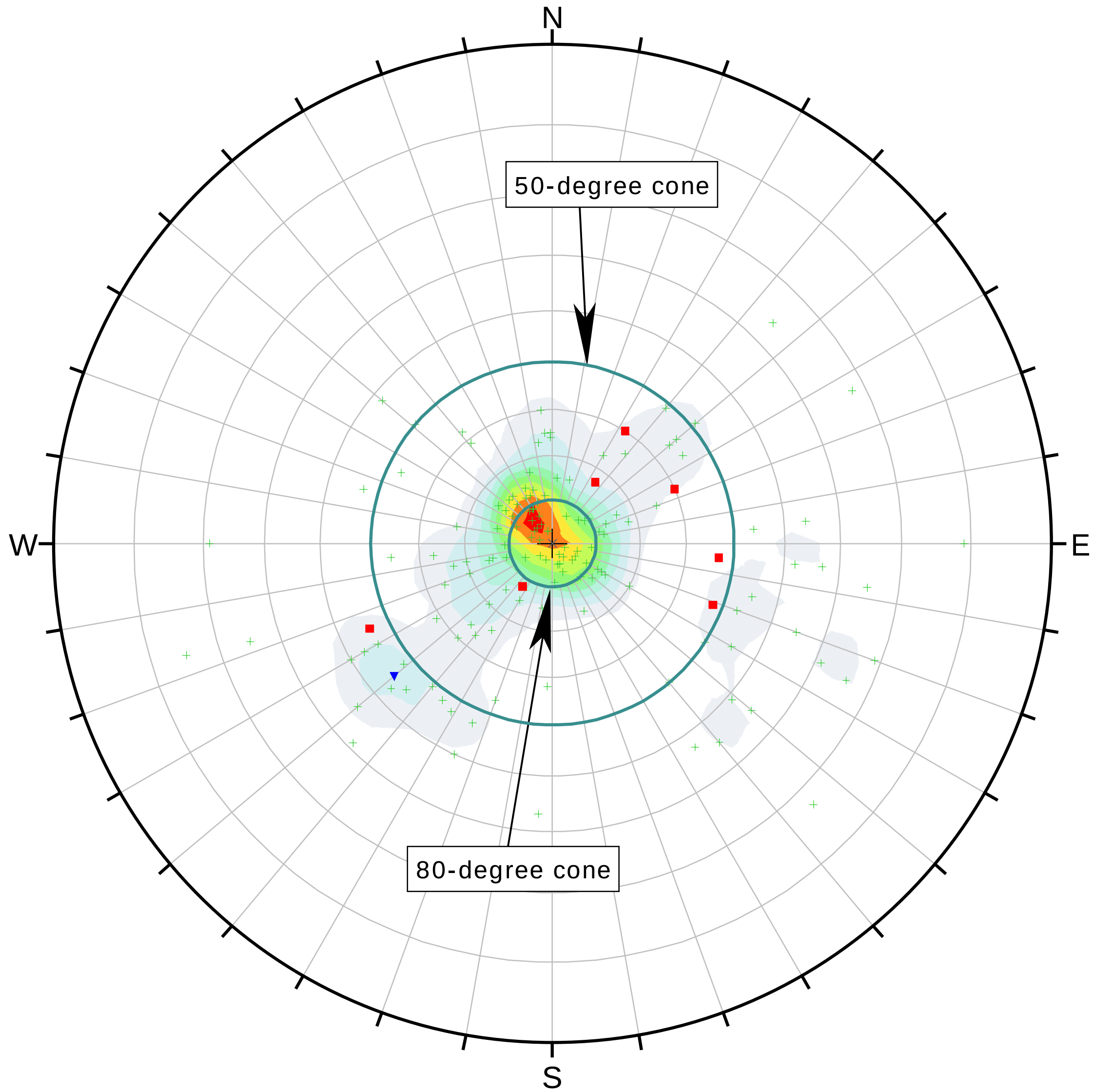
Table C-1: Global Discontinuity Data – All American Asphalt Corona Mine							
Discontinuity No.	**Dip**	**Dip Direction**	**Type**	**Location**	**Geologic Unit**	**Continuity**	**Roughness**
45	53	095	F	650B	Kcg/Kvspi	5	--
46	58	321	J	650B	Kvspi	4	4
47	73	342	J	650B	Kvspi	3	3
48	45	120	J	650B	Kvspi	3	3
49	54	265	J	650B	Kvspi	1	1
50	67	257	J	650B	Kvspi	3	3
51	60	355	J	650B	Kvspi	3	3
52	65	356	J	650B	Kvspi	3	3
53	77	285	J	650B	Kvspi	5	3
54	75	189	J	850B	Kvspi	3	4
55	79	304	J	850B	Kvspi	3	2
56	56	050	J	850B	Kvspi	4	3
57	85	285	J	850B	Kvspi	2	3
58	53	295	J	850B	Kvspi	4	3
59	50	123	J	850B	Kvspi	3	2
60	83	027	J	850B	Kvspi	1	2
61	24	115	J	850B	Kvspi	3	2
62	65	359	J	850B	Kvspi	1	2
63	35	140	J	850B	Kvspi	4	3
64	73	035	F	850B	Kvspi	5	3
65	68	280	J	850B	Kvspi	3	3
66	50	311	J	850B	Kvspi	2	3
67	81	055	J	850B	Kvspi	1	2
68	75	015	J	850B	Kvspi	3	2
69	81	295	J	850B	Kvspi	3	3
70	66	359	J	850B	Kvspi	2	2
71	52	111	F	850B	Kvspi	4	2
72	75	305	J	850B	Kvspi	4	3
73	50	140	J	850B	Kvspi	2	3
74	86	225	J	850B	Kvspi	1	2
75	43	240	J	850B	Kvspi	3	3
76	76	334	J	850B	Kvspi	3	2
77	85	330	J	850B	Kvspi	3	2
78	83	160	J	850B	Kvspi	1	2
79	31	225	J	850B	Kvspi	3	3
80	78	330	J	850B	Kvspi	4	3
81	80	056	J	850B	Kvspi	2	2
82	64	225	J	850B	Kvspi	2	2
83	15	253	J	850B	Kvspi	4	3

* C1 - discontinuous (less than 3 ft.); C2 - slightly continuous (3 to 10 feet); C3 - moderately continuous (10 to 30 feet); C4 - highly continuous (30 to 100 feet); C5 - very continuous (greater than 100 feet).
Based on Department of the Interior - Bureau of Reclamation, Engineering Geology Field Manual (2nd edition 1998)

Table C-1: Global Discontinuity Data – All American Asphalt Corona Mine							
Discontinuity No.	**Dip**	**Dip Direction**	**Type**	**Location**	**Geologic Unit**	**Continuity**	**Roughness**
84	75	225	J	850B	Kvspi	5	3
85	48	215	J	850B	Kvspi	3	3
86	25	098	J	850B	Kvspi	5	3
87	60	066	F	850B	Kvspi	5	3
88	74	066	J	850B	Kvspi	4	2
89	77	340	J	850B	Kvspi	4	2
90	72	074	J	850B	Kvspi	4	2
91	46	245	F	850B	Kvspi	5	3
92	79	253	J	850B	Kvspi	1	2
93	83	318	J	850B	Kvspi	3	2
94	33	183	J	850B	Kvspi	2	1
95	36	230	J	850B	Kvspi	4	3
96	47	211	J	850B	Kvspi	1	1
97	84	120	J	950B	Kvspi	3	3
98	38	095	J	950B	Kvspi	2	3
99	87	339	J	950B	Kvspi	1	3
100	63	264	J	950B	Kvspi	3	4
101	70	258	J	950B	Kvspi	2	3
102	78	318	J	950B	Kvspi	4	3
103	45	225	J	950B	Kvspi	3	2
104	82	048	J	950B	Kvspi	4	2
105	17	135	J	950B	Kvspi	4	3
106	60	225	J	1000P	Kvspi	3	1
107	79	076	J	1000P	Kvspi	1	2
108	47	286	J	1000P	Kvspi	2	2
109	85	315	J	1000P	Kvspi	2	3
110	70	226	J	4	Kvspi	3	2
111	46	240	J	4	Kvspi	3	2
112	51	040	J	4	Kvspi	2	2
113	76	320	J	4	Kvspi	3	3
114	75	210	J	4	Kvspi	4	2
115	78	215	F	4	Kvspi	5	3
116	75	255	J	4	Kvspi	3	3
117	66	215	J	4	Kvspi	3	2
118	70	250	J	4	Kvspi	4	2
119	58	182	J	4	Kvspi	2	2
120	85	160	J	5	Kcg	4	3
121	80	140	J	5	Kcg	4	3
122	21	270	J	5	Kcg	4	2
123	26	045	J	5	Kcg	4	3
124	78	131	J	5	Kcg	3	2
125	67	030	J	5	Kcg	3	3
126	45	230	S	5	Kcg	5	3

Table C-1: Global Discontinuity Data – All American Asphalt Corona Mine							
Discontinuity No.	**Dip**	**Dip Direction**	**Type**	**Location**	**Geologic Unit**	**Continuity**	**Roughness**
127	81	120	J	5	Kcg	5	3
128	84	130	J	5	Kcg	4	3
129	63	220	J	5	Kcg	4	3
130	78	120	J	5	Kcg	2	2
131	77	070	J	5	Kcg	2	2
132	77	120	J	5	Kcg	3	3
133	73	155	J	5	Kcg	3	3
134	76	121	J	5	Kcg	3	3
135	21	110	J	5	Kcg	4	3
136	11	090	J	5	Kcg	4	3
137	81	177	J	5	Kcg	5	3
138	60	033	F	1	Kcg/Kvspi	5	3
139	75	004	J	2	Kvspi	3	3
140	40	205	J	2	Kvspi	3	4
141	79	268	J	2	Kvspi	2	2
142	22	063	J	2	Kvspi	1	2
143	40	240	J	2	Kvspi	5	3
144	85	165	J	2	Kvspi	4	3
145	84	107	J	2	Kvspi	4	3
146	47	204	J	2	Kvspi	4	3
147	67	352	J	3	Kvspi	5	3
148	87	340	J	3	Kvspi	4	3
149	76	256	J	3	Kvspi	4	2

* C1 - discontinuous (less than 3 ft.); C2 - slightly continuous (3 to 10 feet); C3 - moderately continuous (10 to 30 feet); C4 - highly continuous (30 to 100 feet); C5 - very continuous (greater than 100 feet).
Based on Department of the Interior - Bureau of Reclamation, Engineering Geology Field Manual (2nd edition 1998)



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

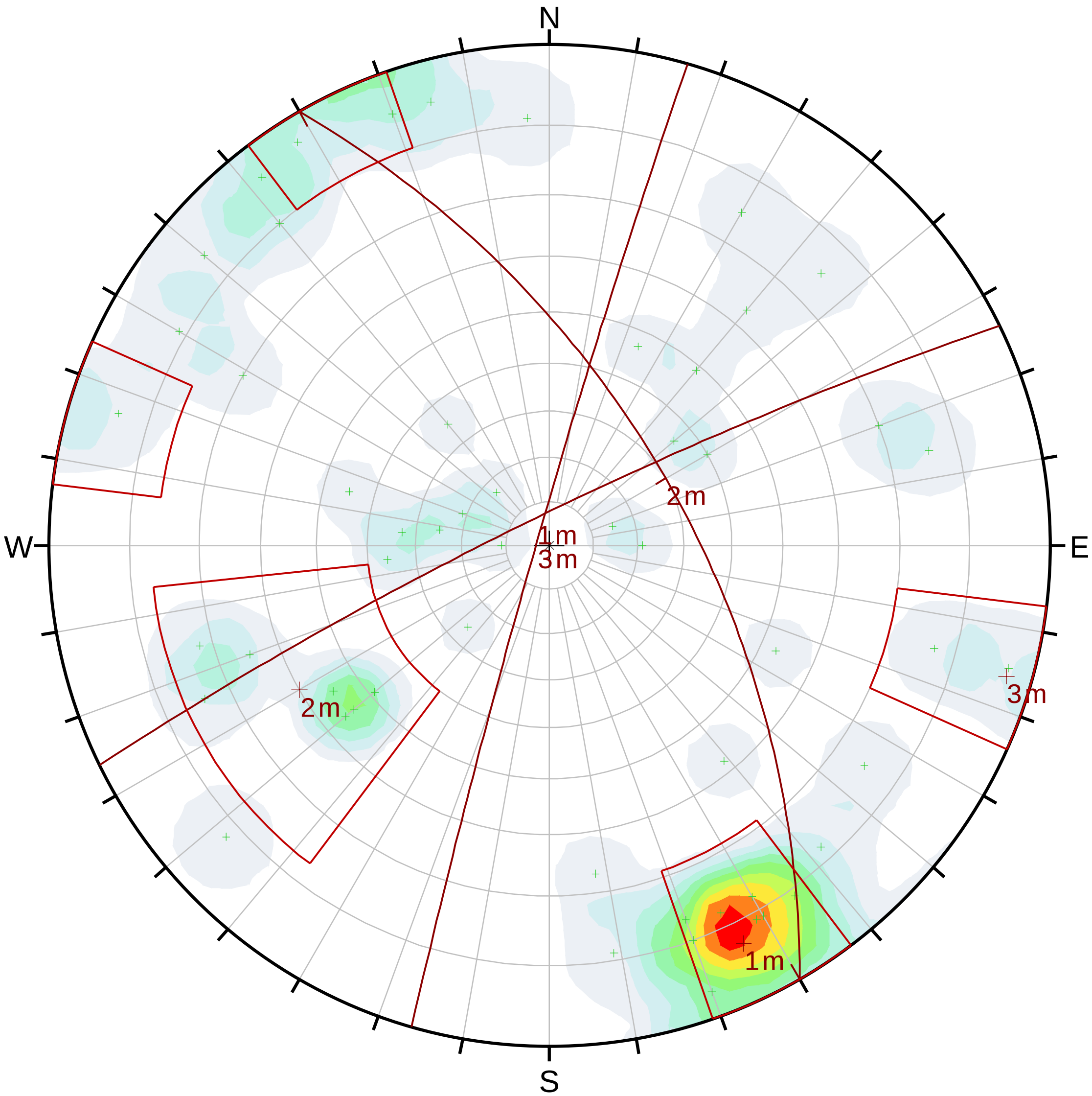
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name: All American Data w 50 and 80 cones.dips7	Enclosure C-2.1

DIPS 7.008



Symbol	TYPE	Quantity
+	J	55

Color	Density Concentrations
	0.00 - 1.30
	1.30 - 2.60
	2.60 - 3.90
	3.90 - 5.20
	5.20 - 6.50
	6.50 - 7.80
	7.80 - 9.10
	9.10 - 10.40
	10.40 - 11.70
	11.70 - 13.00
Contour Data	Pole Vectors
Maximum Density	12.43%
Contour Distribution	Fisher
Counting Circle Size	1.0%

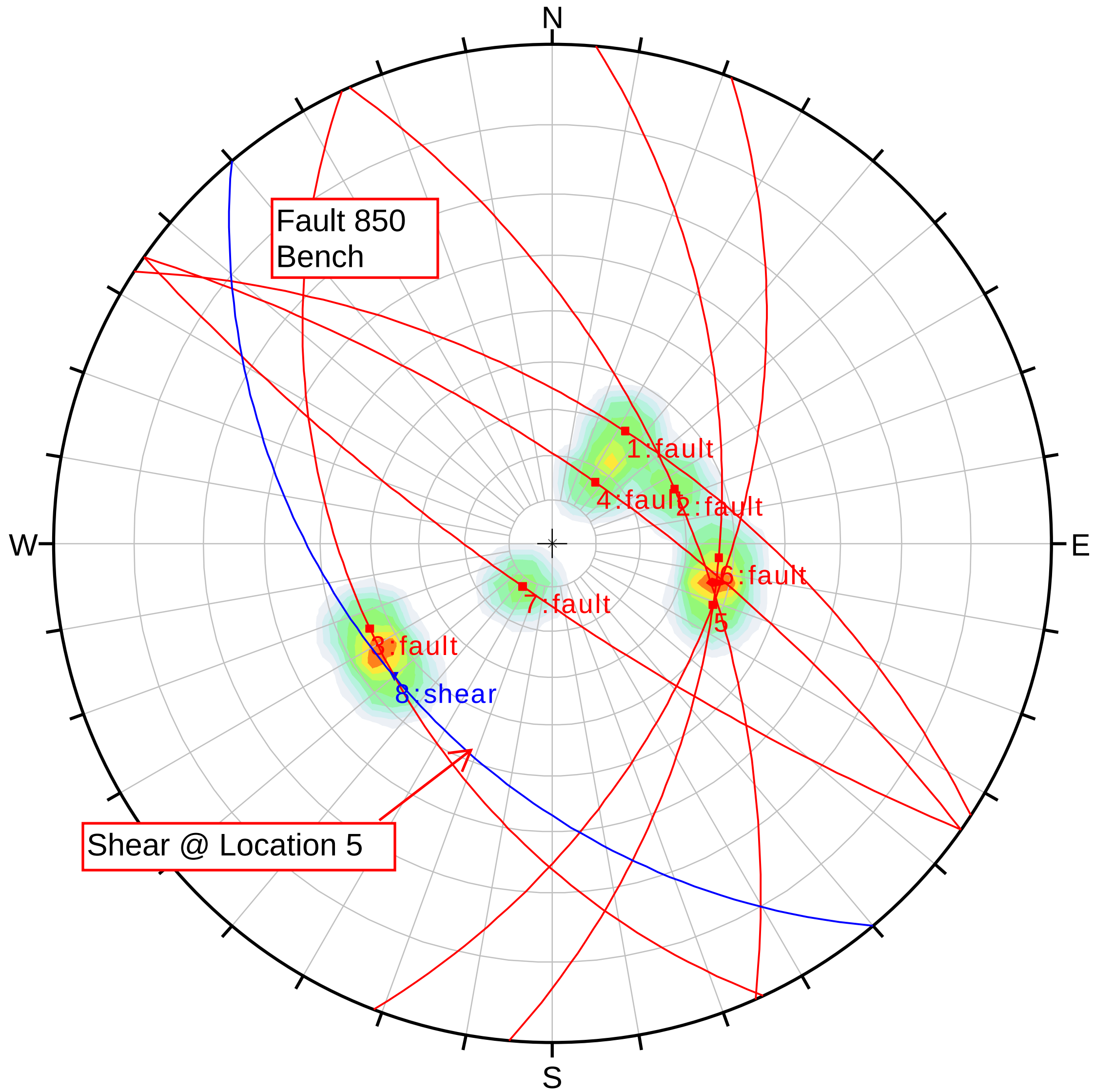
Plot Mode	Pole Vectors
Vector Count	55 (55 Entries)
Hemisphere	Lower
Projection	Equal Angle

Continuous Joints - Major Sets

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name AAA Joints Cont 4 5.dips7	Enclosure C-2.2

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
▼	S	1

Color	Density Concentrations
	0.00 - 2.30
	2.30 - 4.60
	4.60 - 6.90
	6.90 - 9.20
	9.20 - 11.50
	11.50 - 13.80
	13.80 - 16.10
	16.10 - 18.40
	18.40 - 20.70
	20.70 - 23.00

Contour Data	Dip Vectors
Maximum Density	22.16%
Contour Distribution	Fisher
Counting Circle Size	1.0%

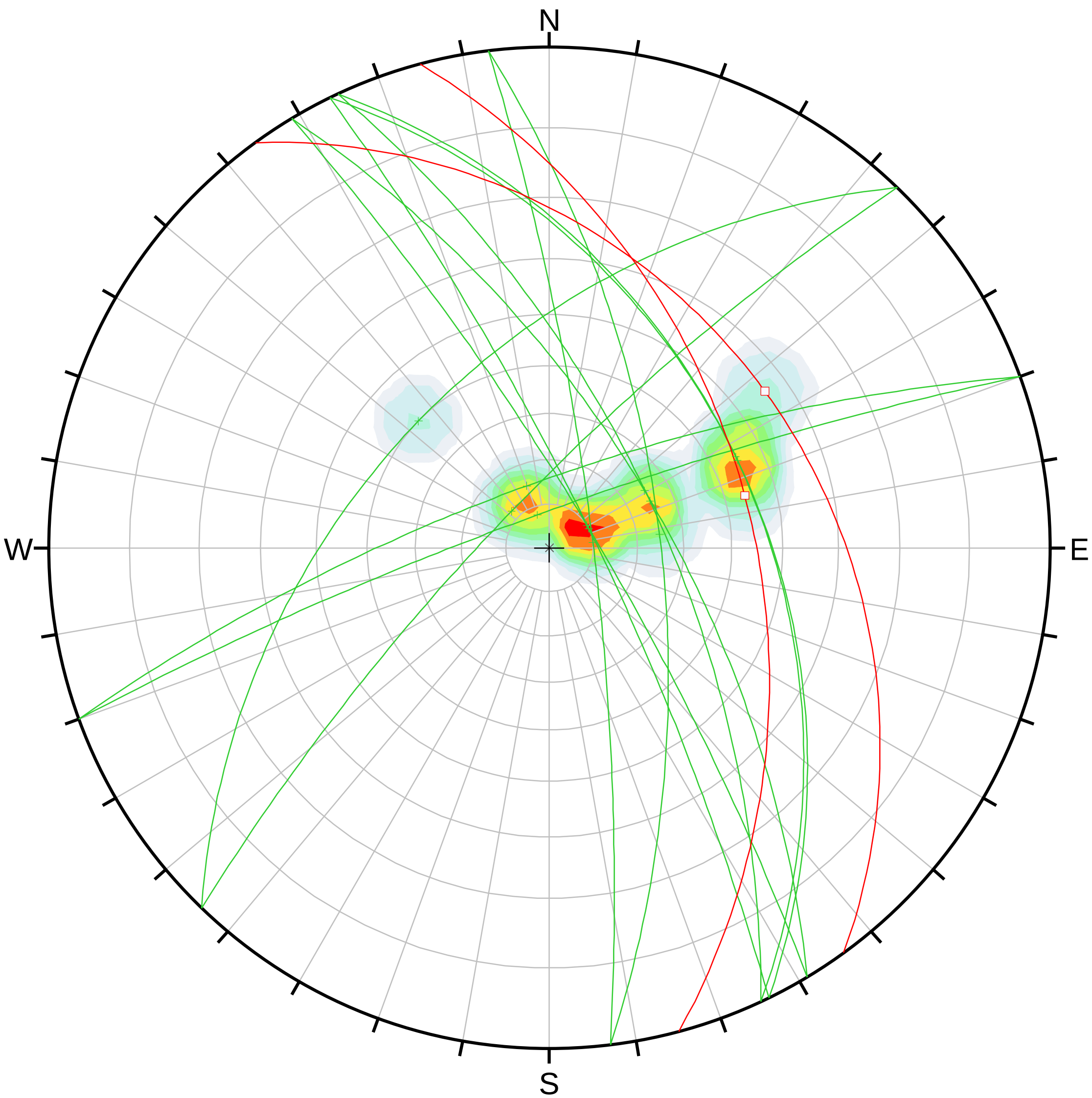
Plot Mode	Dip Vectors
Vector Count	8 (8 Entries)
Hemisphere	Lower
Projection	Equal Angle

Faults and Shears Data

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic Evaluation		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name	AAA faults and shears.dips7
		Enclosure	C-2.3

DIPS 7.008



Symbol	TYPE	Quantity
□	fault	2
+	joint	12

Color	Density Concentrations
	0.00 - 2.30
	2.30 - 4.60
	4.60 - 6.90
	6.90 - 9.20
	9.20 - 11.50
	11.50 - 13.80
	13.80 - 16.10
	16.10 - 18.40
	18.40 - 20.70
	20.70 - 23.00

Contour Data	Dip Vectors
Maximum Density	22.67%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Plot Mode	Dip Vectors
Vector Count	14 (14 Entries)
Hemisphere	Lower
Projection	Equal Angle

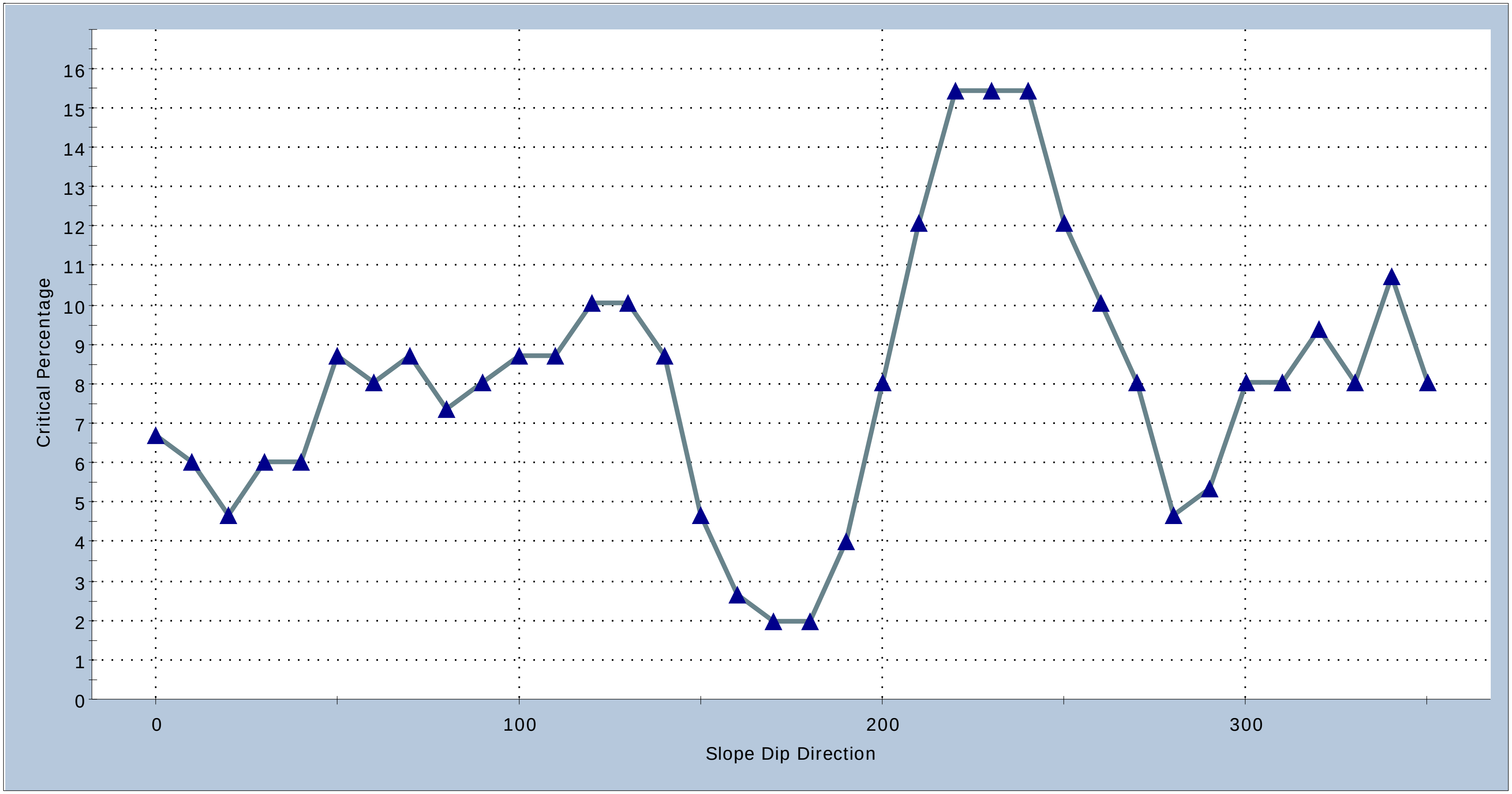
Joint Sets by Morhol (2002)
South Benches Area

CHJ Consultants
A Terracon COMPANY

Project	All American
Analysis Description	Mine Expansion
Drawn By	JMc
Company	Terracon
Date	3/13/2017, 3:14:55 PM
File Name	Priors Data.dips7
Enclosure	C-2.4

DIPS 7.008

Planar Sliding: Critical Percentage vs. Slope Dip Direction

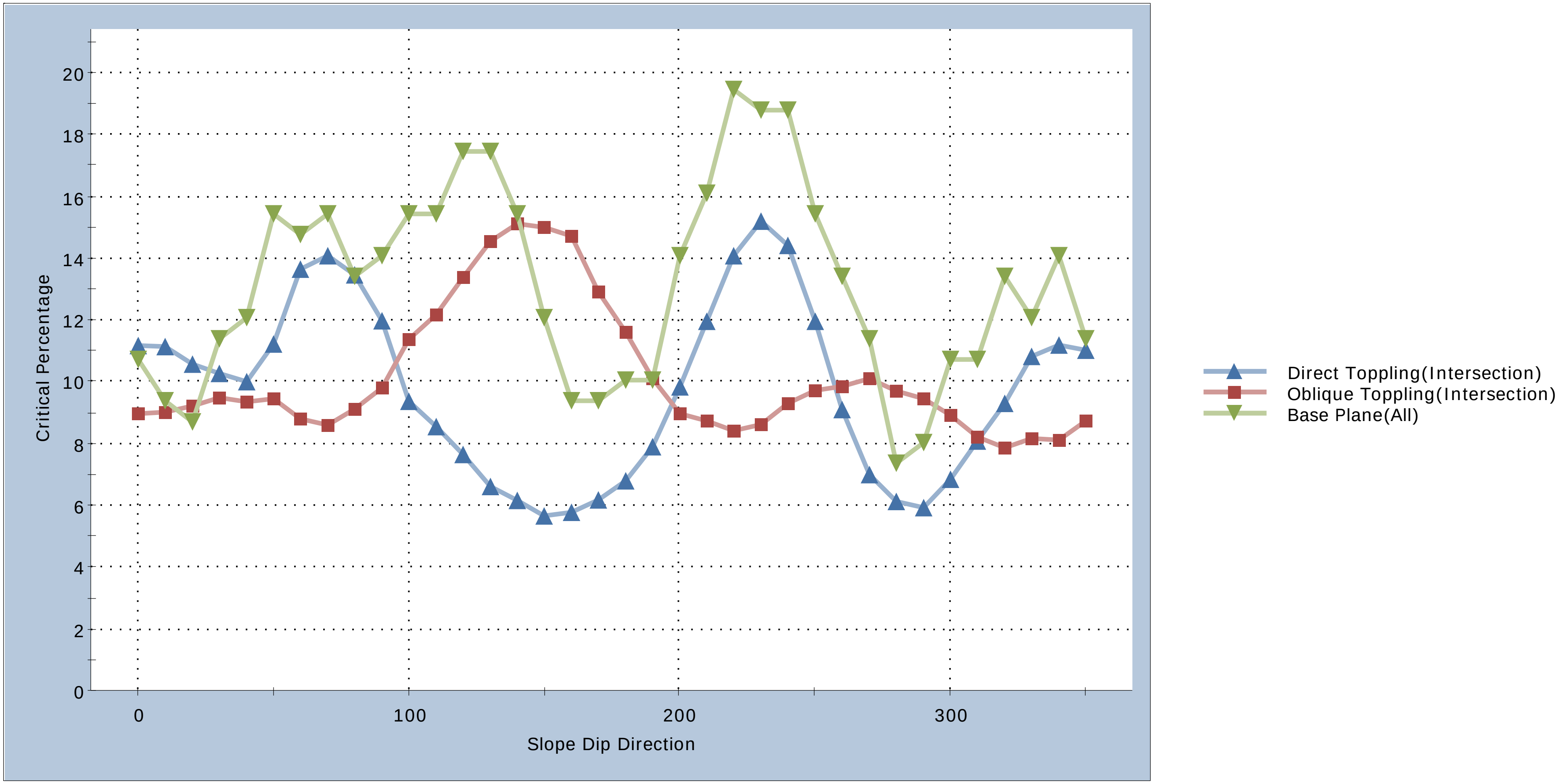


Mean Values

Slope Dip = 80 Slope Dip Direction = 0 Friction Angle = 34 Lateral Limit = 20

CHJ Consultants A Terracon COMPANY	*Project*	AAA Corona			
	Analysis Description	Kinematic			
	Drawn By	JMc	Company	CHJ-Terracon	
DIPS 7.008	*Date*	3/18/2015, 3:19:29 PM	File Name	AAA 360 global data planar.dips7	Enclosure C-3.1

Direct Toppling: Critical Percentage vs. Slope Dip Direction



Mean Values

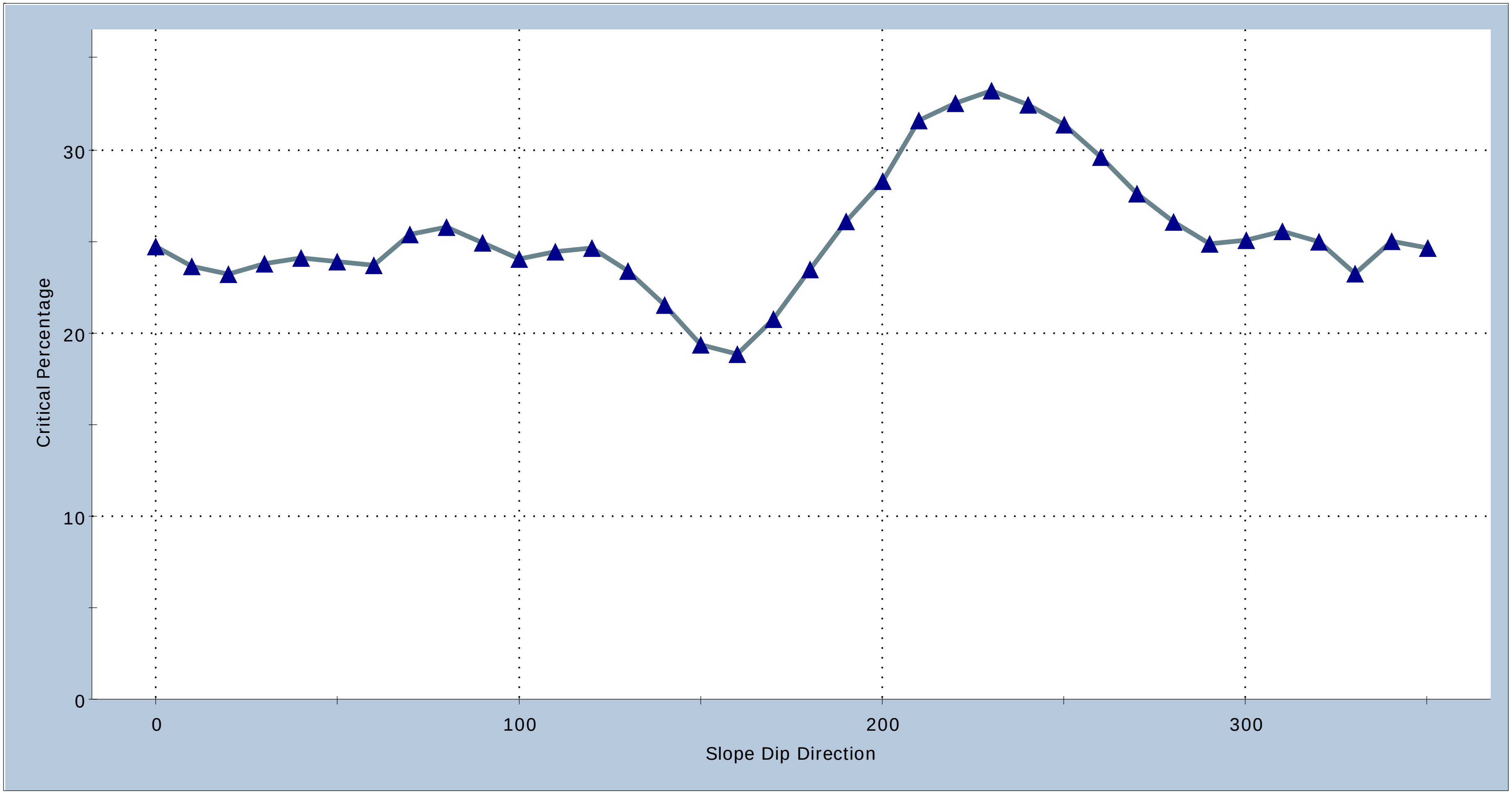
Slope Dip = 80 Slope Dip Direction = 0 Friction Angle = 34 Lateral Limit = 20

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona
Analysis Description	Kinematic
Drawn By	JMc
Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM
File Name	AAA 360 global data topple.dips7
Enclosure	C-3.2

DIPS 7.008

Wedge Sliding: Critical Percentage vs. Slope Dip Direction

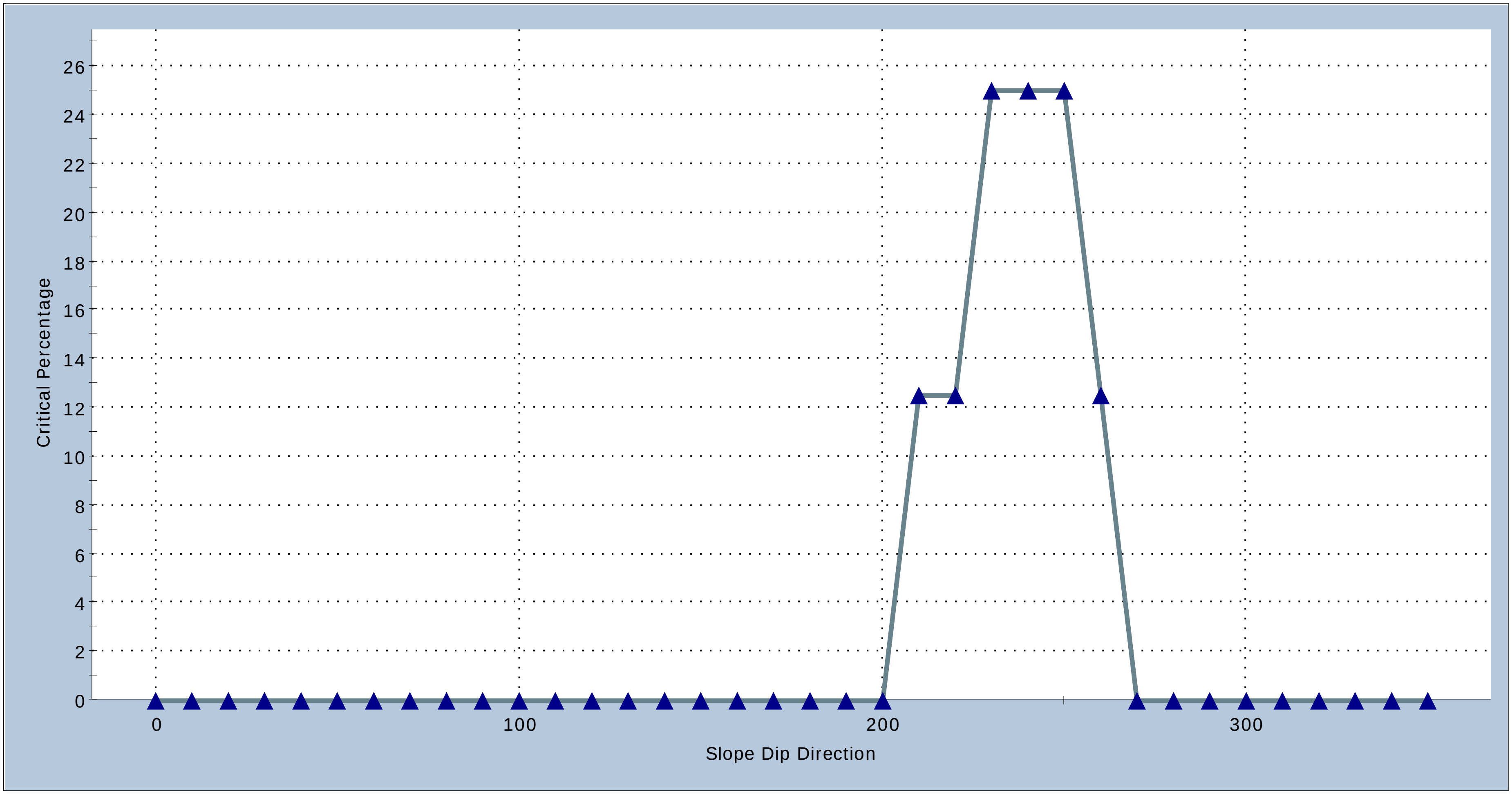


Mean Values

Slope Dip = 80 Slope Dip Direction = 0 Friction Angle = 34 Lateral Limit = 20

CHJ Consultants A Terracon COMPANY	Project: AAA Corona		
	Analysis Description: Kinematic		
	Drawn By: JMc	Company: CHJ-Terracon	
DIPS 7.008	Date: 3/18/2015, 3:19:29 PM	File Name: AAA 360 global data wedge.dips7	Enclosure: C-3.3

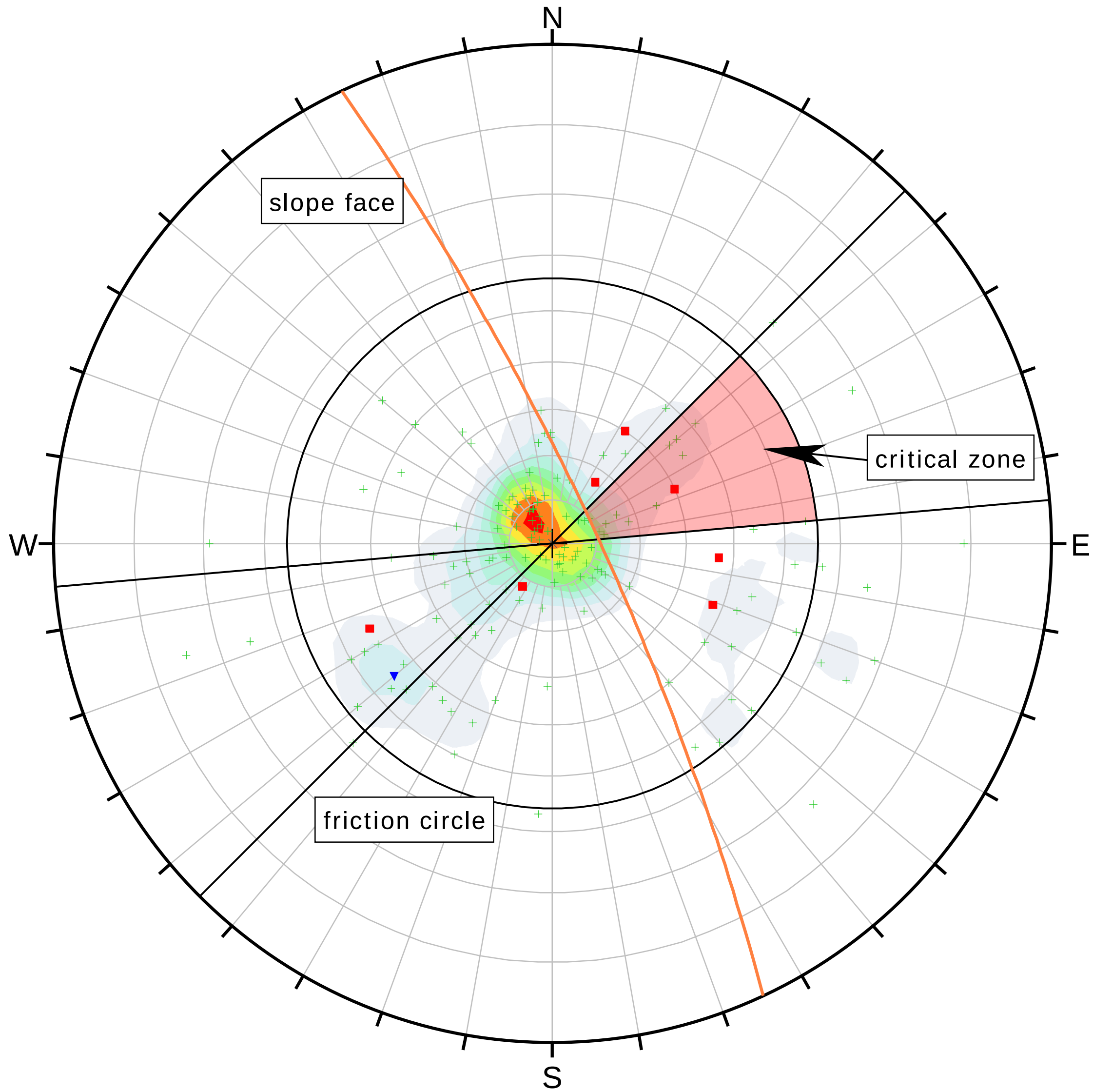
Planar Sliding: Critical Percentage vs. Slope Dip Direction



Mean Values

Slope Dip = 50   Slope Dip Direction = 359   Friction Angle = 34   Lateral Limit = 20

CHJ Consultants A Terracon COMPANY	*Project* AAA Corona			
	Analysis Description Kinematic Evaluation			
	Drawn By JMc	Company CHJ-Terracon		
DIPS 7.008	*Date* 3/18/2015, 3:19:29 PM	File Name AAA faults and shears sensplot 75bench face dips7	Enclosure	C-3.4



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00
Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Planar Sliding		
Slope Dip	80		
Slope Dip Direction	65		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Planar Sliding (All)	12	149	8.05%

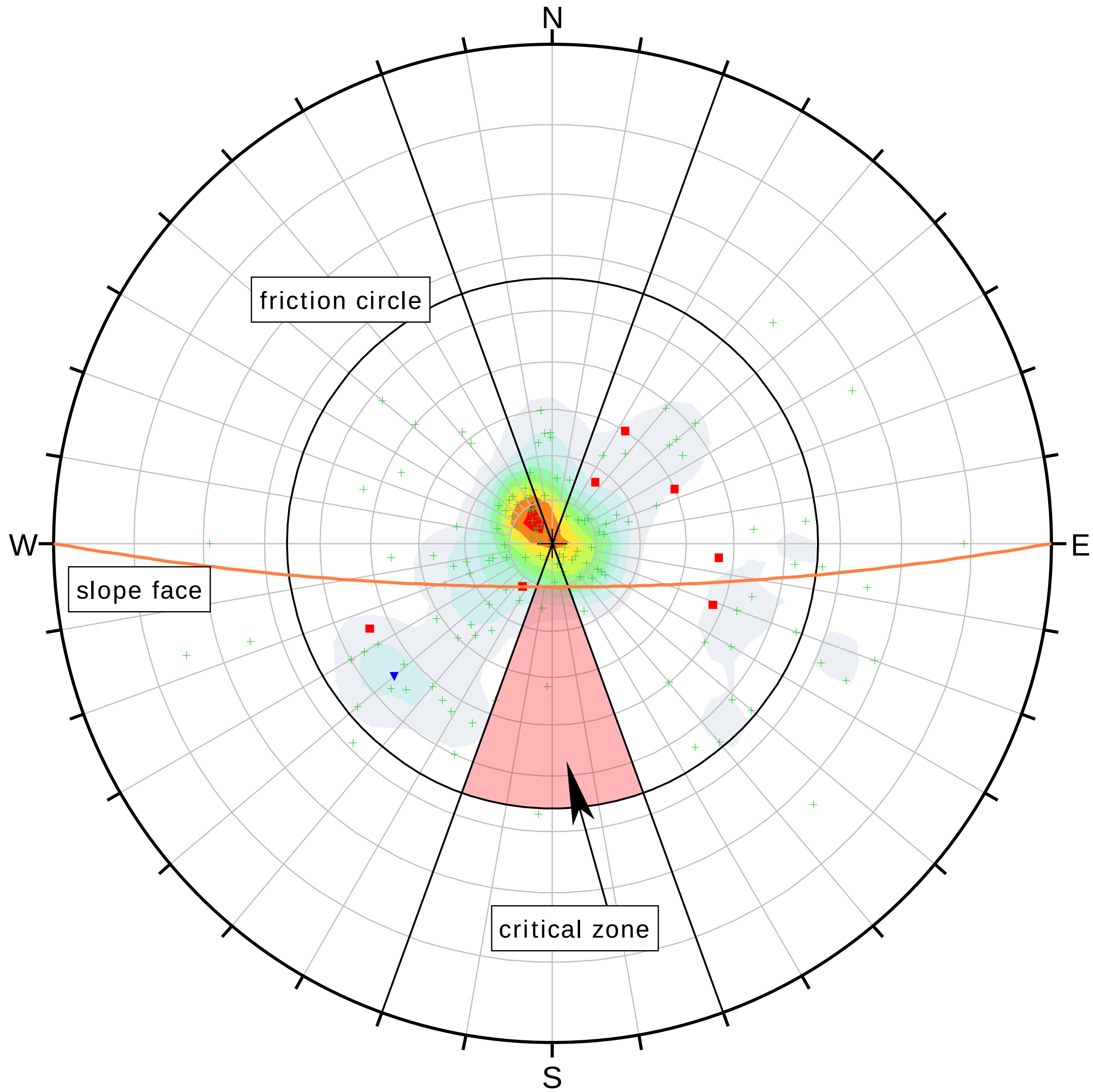
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name: All American Data planar 80 065.dips7	Enclosure: C-4.1



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Planar Sliding
Slope Dip	80
Slope Dip Direction	180
Friction Angle	34°
Lateral Limits	20°

	Critical	Total	%
Planar Sliding (All)	3	149	2.01%

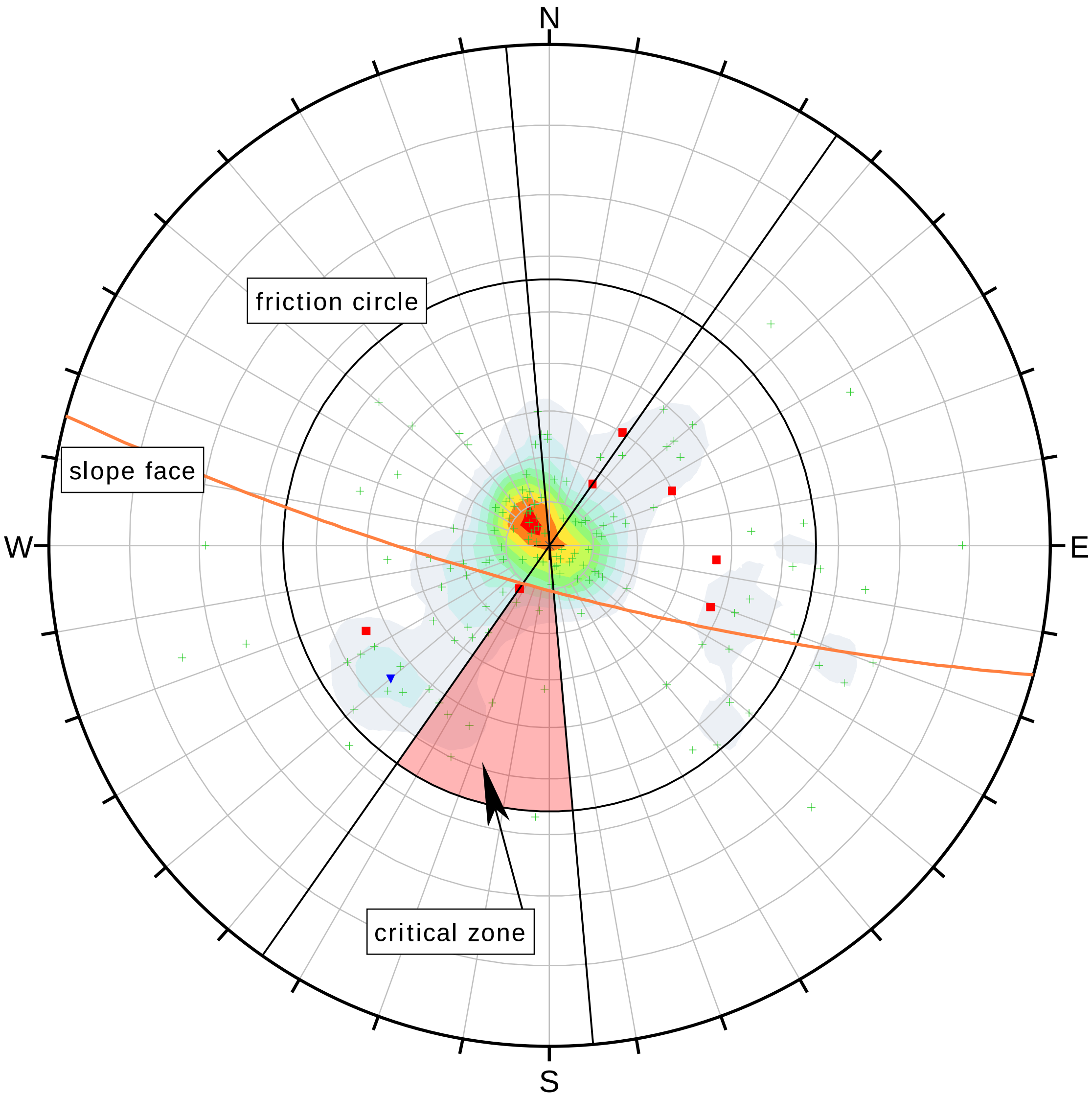
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project AAA Corona			
Analysis Description Kinematic			
Drawn By JMc		Company CHJ-Terracon	
Date 3/18/2015, 3:19:29 PM		File Name All American Data planar 80 180 dips7	Enclosure C-4.2

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00
Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Planar Sliding		
Slope Dip	80		
Slope Dip Direction	195		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Planar Sliding (All)	10	149	6.71%

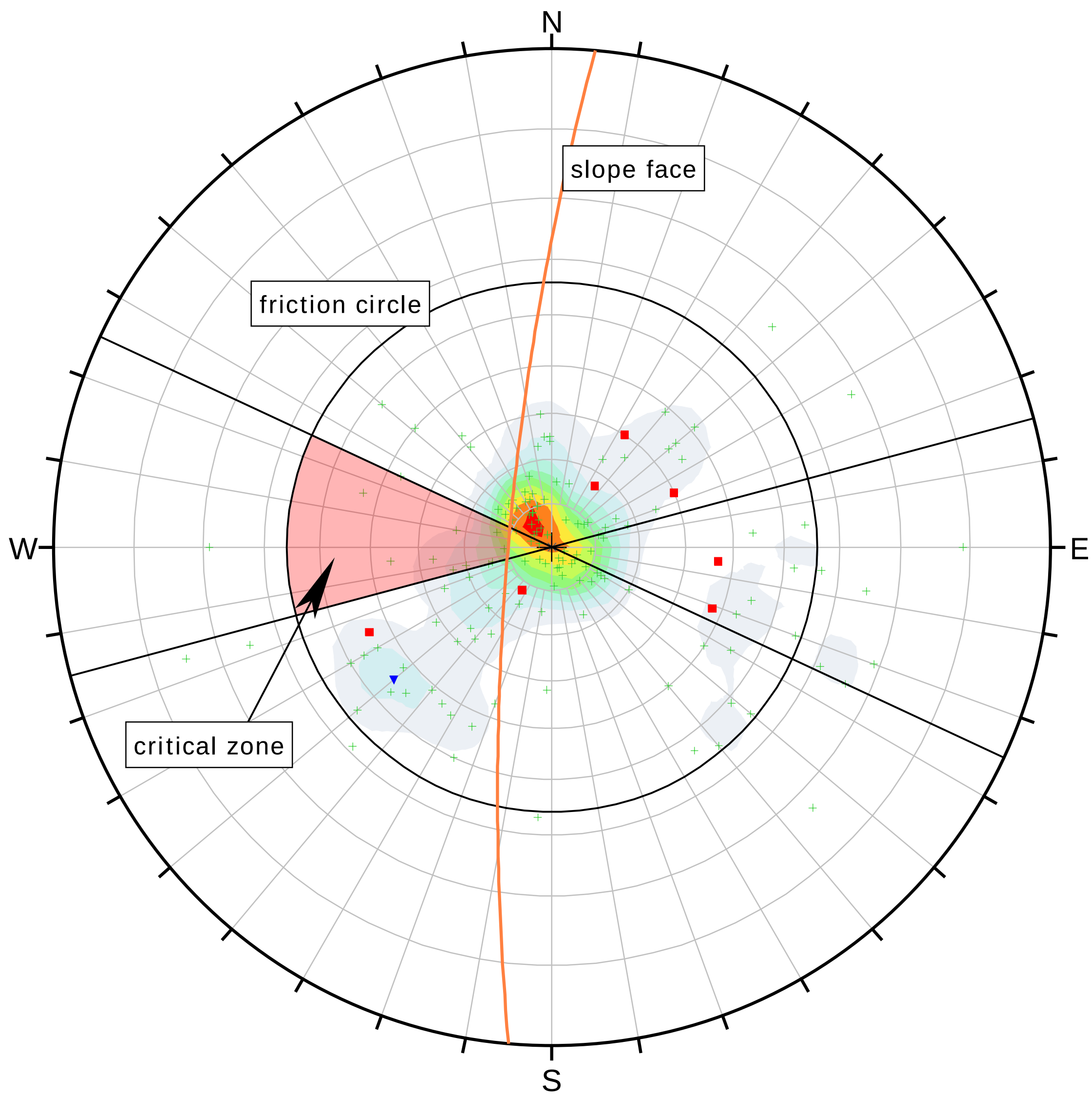
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data planar 80 195 dips7	Enclosure C-4.3



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Planar Sliding
Slope Dip	80
Slope Dip Direction	275
Friction Angle	34°
Lateral Limits	20°

	Critical	Total	%
Planar Sliding (All)	11	149	7.38%

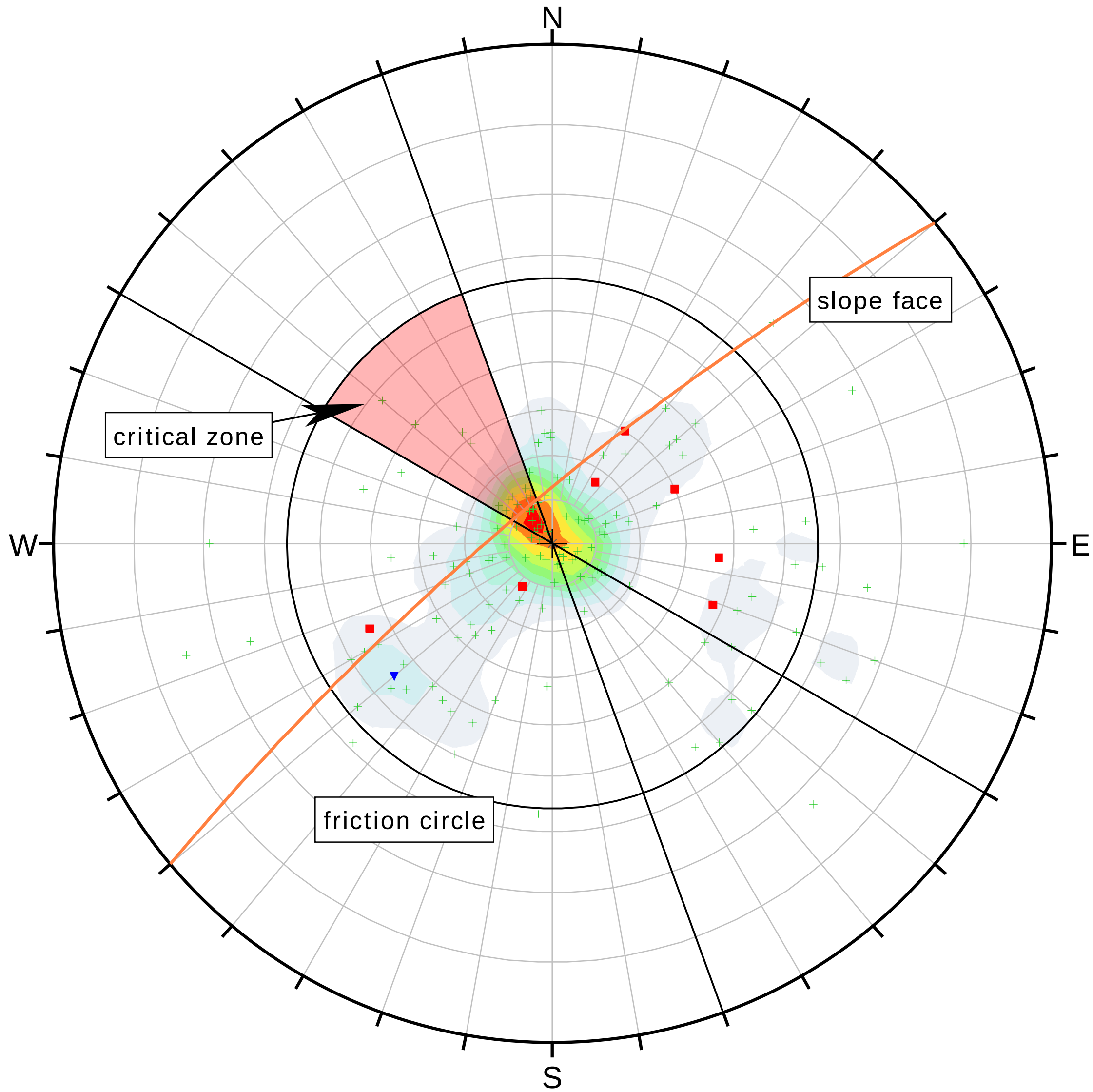
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name: All American Data planar 80 275 dips7	Enclosure: C-4.4

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Planar Sliding
Slope Dip	80
Slope Dip Direction	320
Friction Angle	34°
Lateral Limits	20°

	Critical	Total	%
Planar Sliding (All)	14	149	9.40%

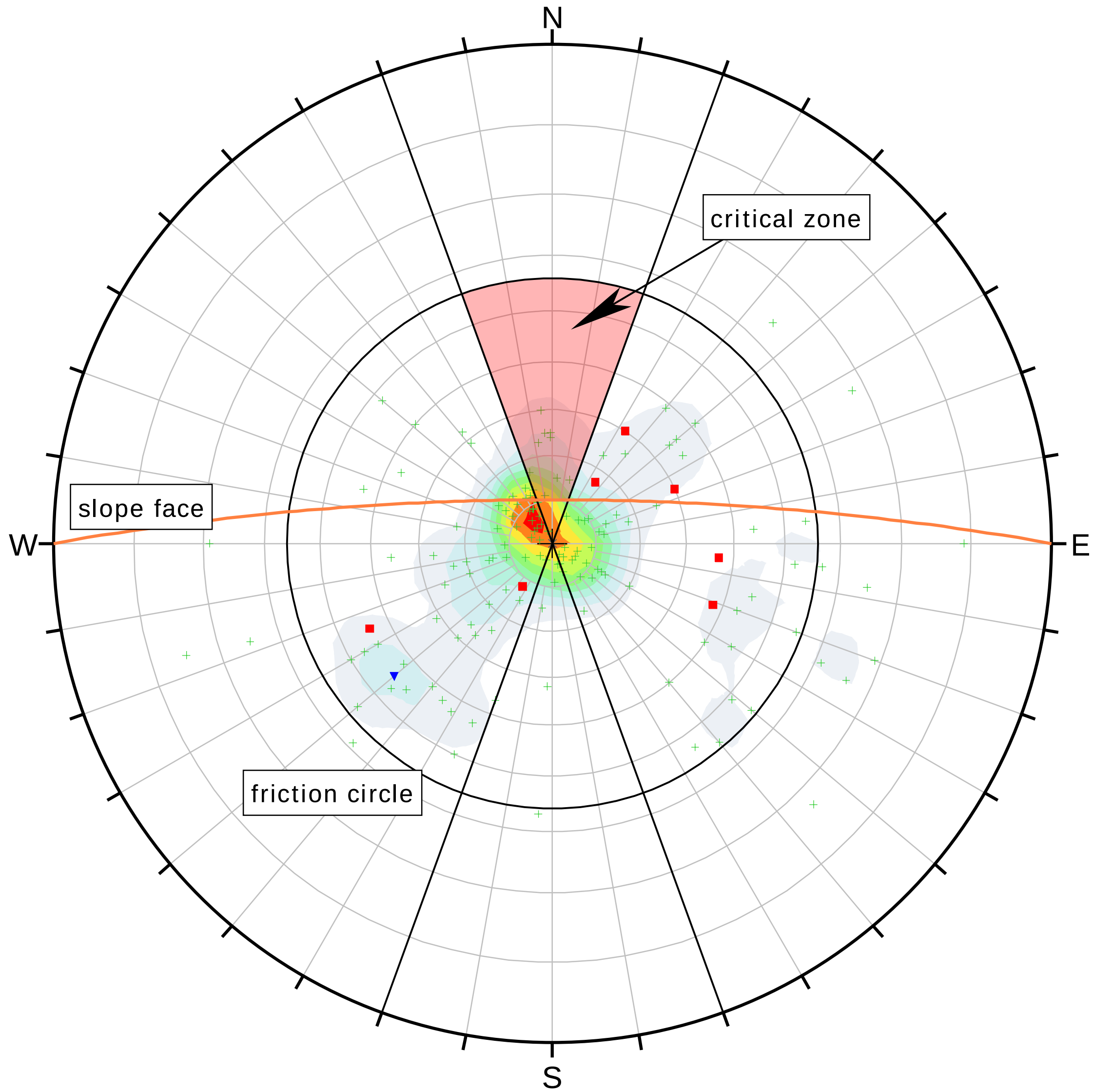
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project AAA Corona			
Analysis Description: Kinematic			
Drawn By: JMc		Company: CHJ-Terracon	
Date: 3/18/2015, 3:19:29 PM		File Name: All American Data planar 80 320 dips7	Enclosure: C-4.5

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

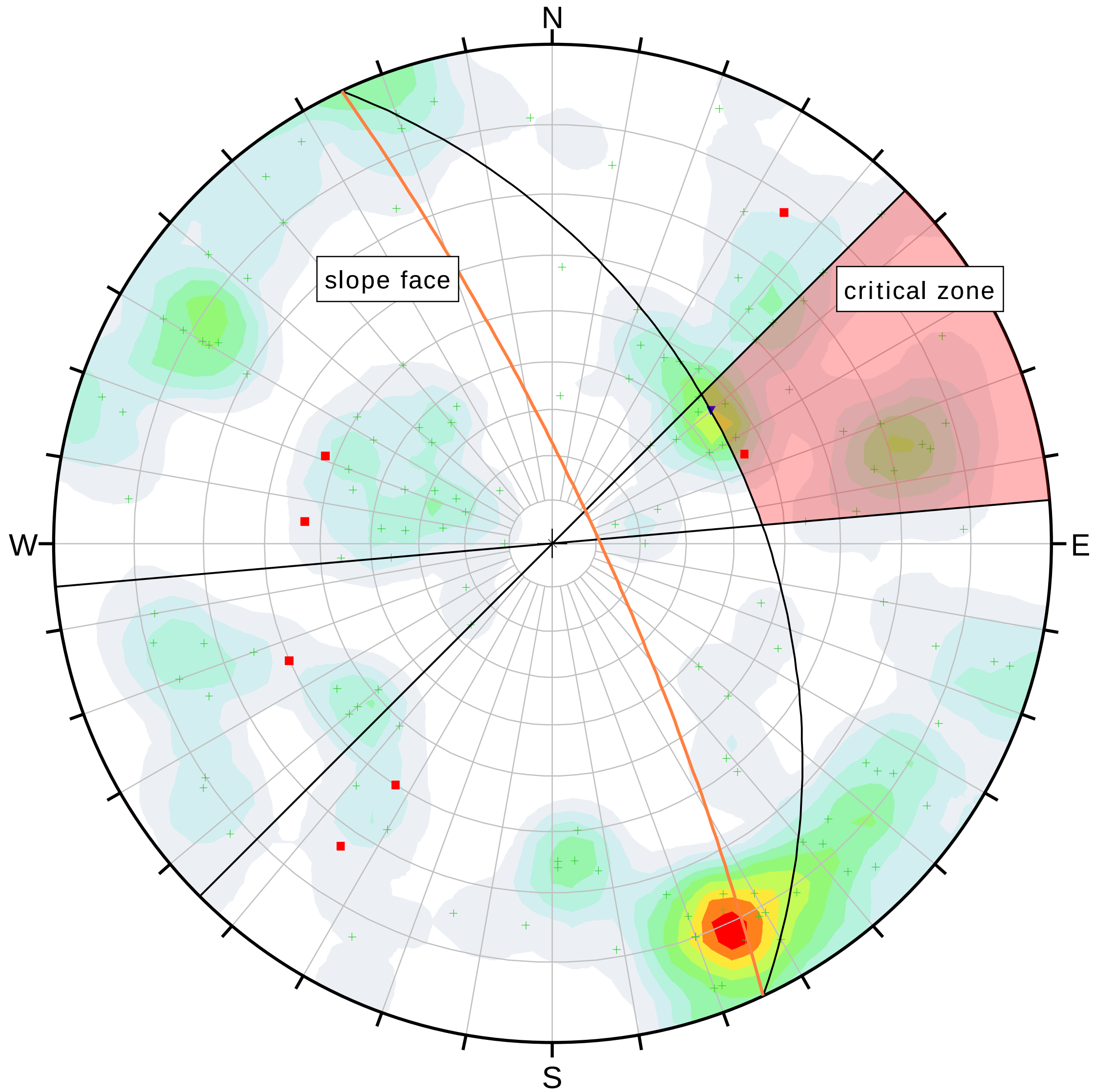
Kinematic Analysis	Planar Sliding
Slope Dip	80
Slope Dip Direction	0
Friction Angle	34°
Lateral Limits	20°

	Critical	Total	%
Planar Sliding (All)	10	149	6.71%

Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants A Terracon COMPANY	*Project* AAA Corona			
	Analysis Description Kinematic			
	Drawn By JMc		Company CHJ-Terracon	
DIPS 7.008	*Date* 3/18/2015, 3:19:29 PM		File Name All American Data planar 80 360.dips7	Enclosure C-4.6



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 0.70
	0.70 - 1.40
	1.40 - 2.10
	2.10 - 2.80
	2.80 - 3.50
	3.50 - 4.20
	4.20 - 4.90
	4.90 - 5.60
	5.60 - 6.30
	6.30 - 7.00

Contour Data	Pole Vectors
Maximum Density	6.77%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Flexural Toppling		
Slope Dip	80		
Slope Dip Direction	65		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Flexural Toppling (All)	20	149	13.42%

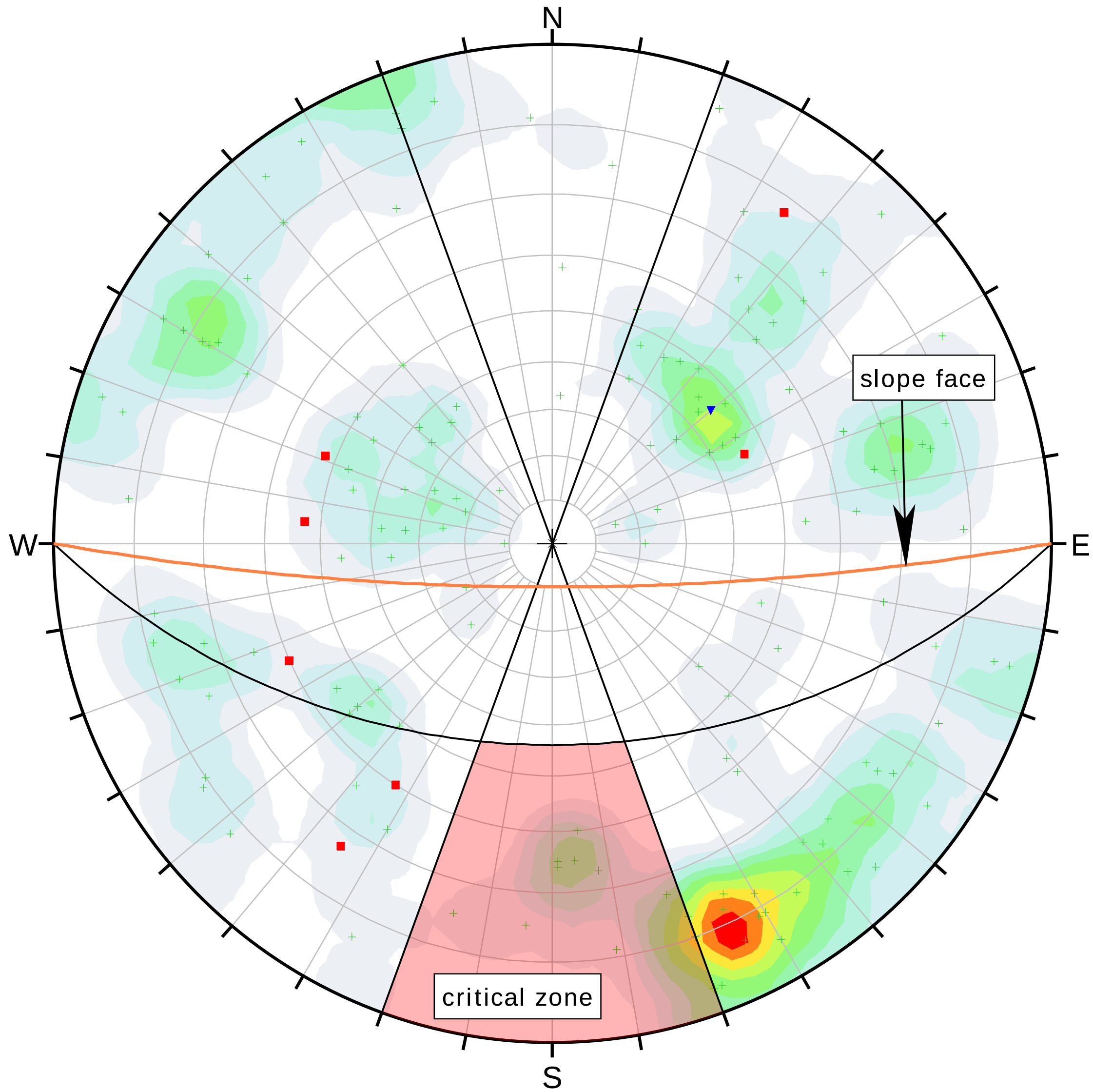
Plot Mode	Pole Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data topple 80 065.dips7	Enclosure C-5.1

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 0.70
	0.70 - 1.40
	1.40 - 2.10
	2.10 - 2.80
	2.80 - 3.50
	3.50 - 4.20
	4.20 - 4.90
	4.90 - 5.60
	5.60 - 6.30
	6.30 - 7.00
Contour Data	Pole Vectors
Maximum Density	6.77%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Flexural Toppling		
Slope Dip	80		
Slope Dip Direction	180		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Flexural Toppling (All)	13	149	8.72%

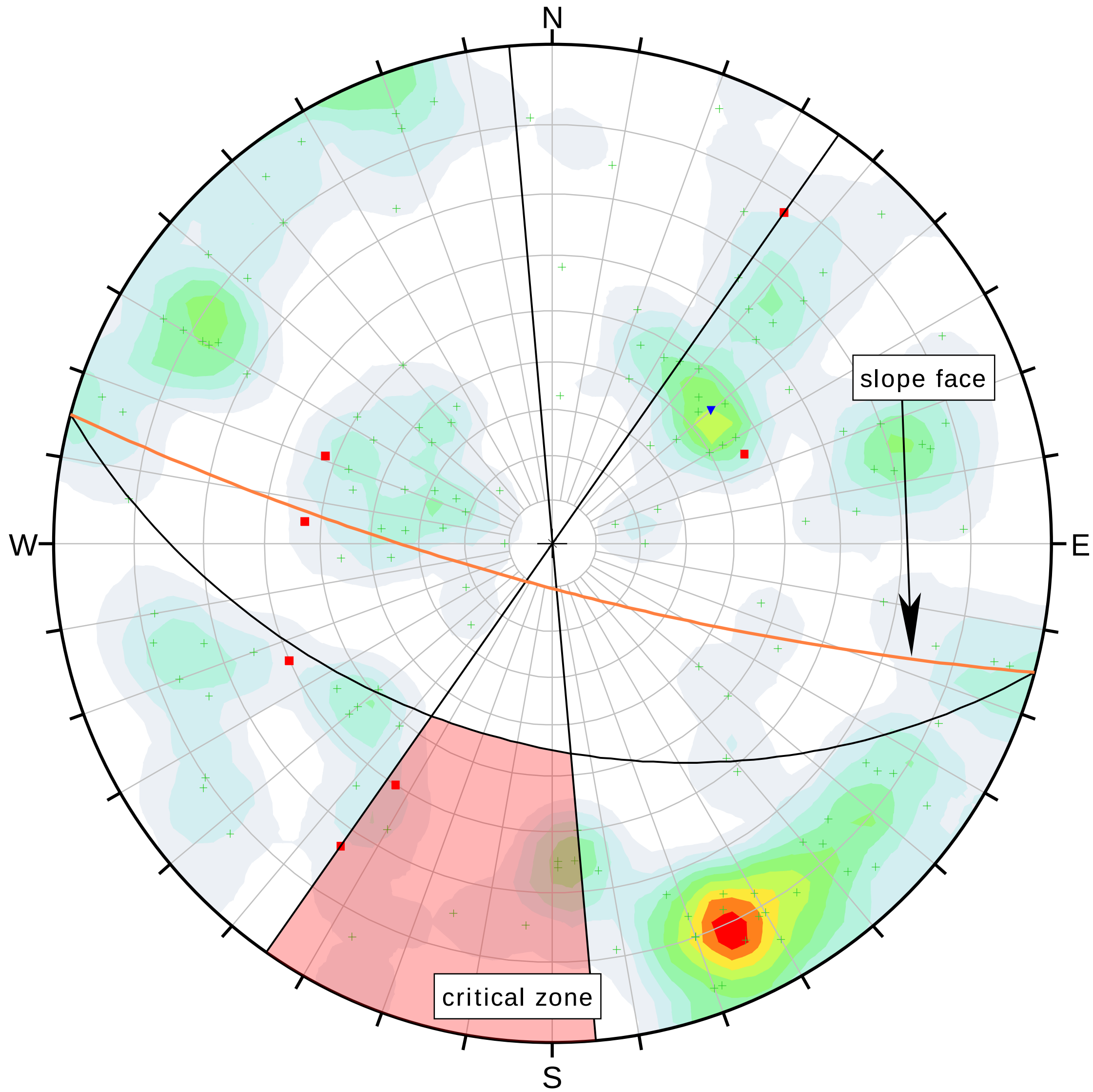
Plot Mode	Pole Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data topple 80 180.dips7	Enclosure C-5.2



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 0.70
	0.70 - 1.40
	1.40 - 2.10
	2.10 - 2.80
	2.80 - 3.50
	3.50 - 4.20
	4.20 - 4.90
	4.90 - 5.60
	5.60 - 6.30
	6.30 - 7.00
Contour Data	Pole Vectors
Maximum Density	6.77%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Flexural Toppling		
Slope Dip	80		
Slope Dip Direction	195		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Flexural Toppling (All)	10	149	6.71%

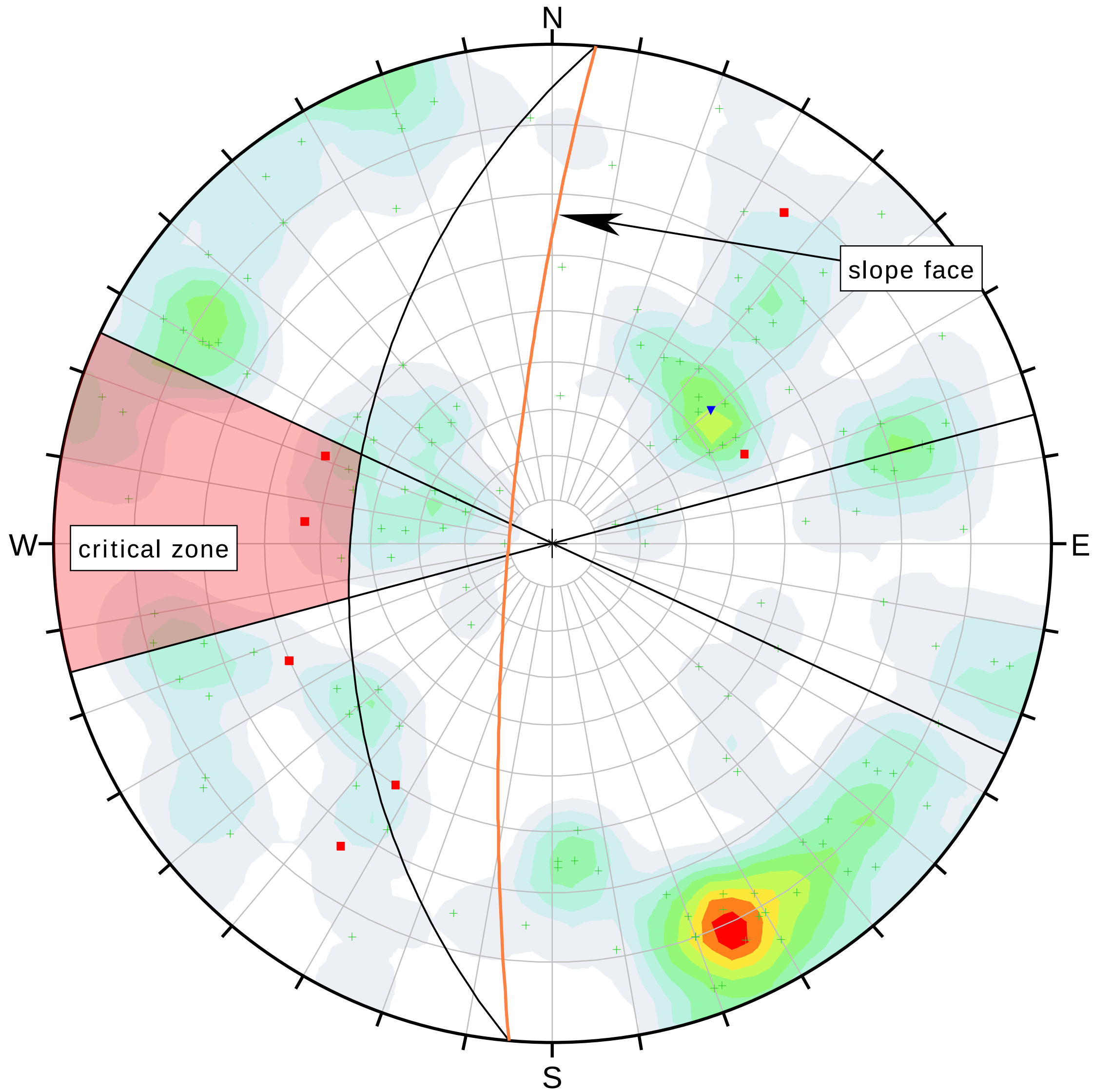
Plot Mode	Pole Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data topple 80 195 dips7	Enclosure C-5.3



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 0.70
	0.70 - 1.40
	1.40 - 2.10
	2.10 - 2.80
	2.80 - 3.50
	3.50 - 4.20
	4.20 - 4.90
	4.90 - 5.60
	5.60 - 6.30
	6.30 - 7.00

Contour Data	Pole Vectors
Maximum Density	6.77%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Flexural Toppling		
Slope Dip	80		
Slope Dip Direction	275		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Flexural Toppling (All)	10	149	6.71%

Plot Mode	Pole Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project AAA Corona

Analysis Description: Kinematic

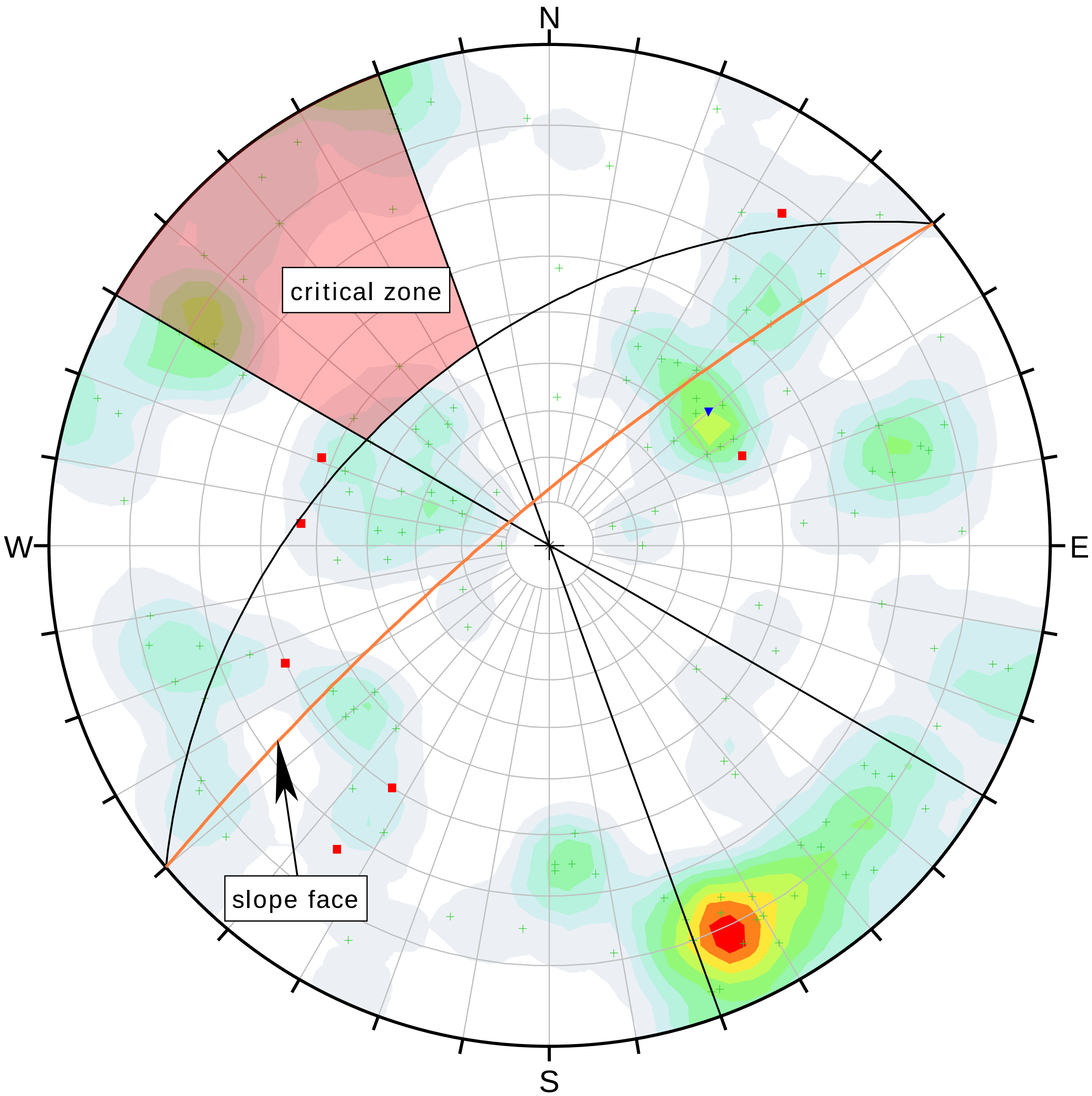
Drawn By: JMc

Company: CHJ-Terracon

Date 3/18/2015, 3:19:29 PM

File Name: All American Data topple 80 275 dips7

Enclosure: C-5.4



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 0.70
	0.70 - 1.40
	1.40 - 2.10
	2.10 - 2.80
	2.80 - 3.50
	3.50 - 4.20
	4.20 - 4.90
	4.90 - 5.60
	5.60 - 6.30
	6.30 - 7.00
Contour Data	Pole Vectors
Maximum Density	6.77%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Flexural Toppling		
Slope Dip	80		
Slope Dip Direction	320		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Flexural Toppling (All)	15	149	10.07%

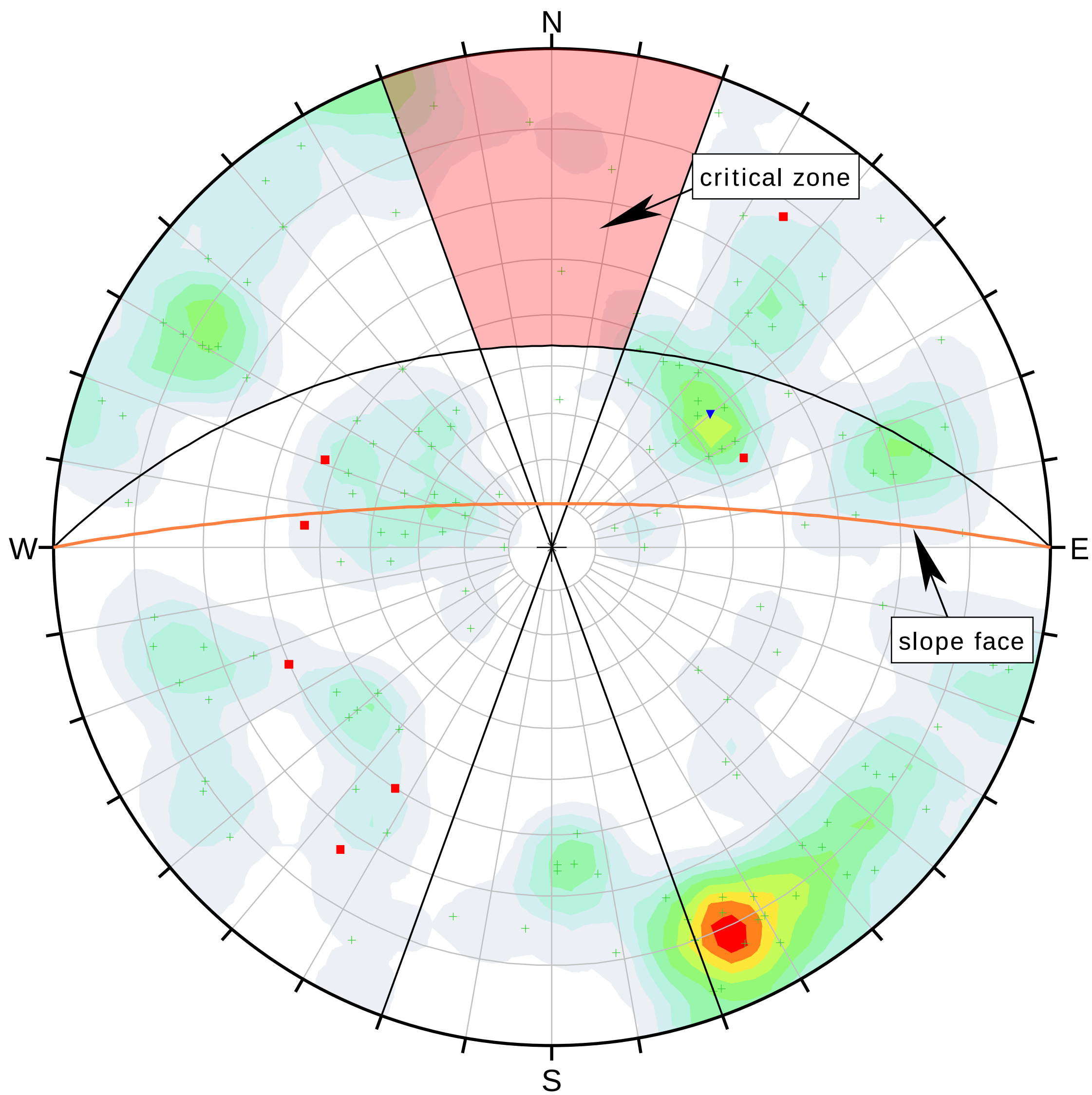
Plot Mode	Pole Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona
Analysis Description	Kinematic
Drawn By	JMc
Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM
File Name	All American Data topple 80 320 dips7
Enclosure	C-5.5

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Color	Density Concentrations
	0.00 - 0.70
	0.70 - 1.40
	1.40 - 2.10
	2.10 - 2.80
	2.80 - 3.50
	3.50 - 4.20
	4.20 - 4.90
	4.90 - 5.60
	5.60 - 6.30
	6.30 - 7.00

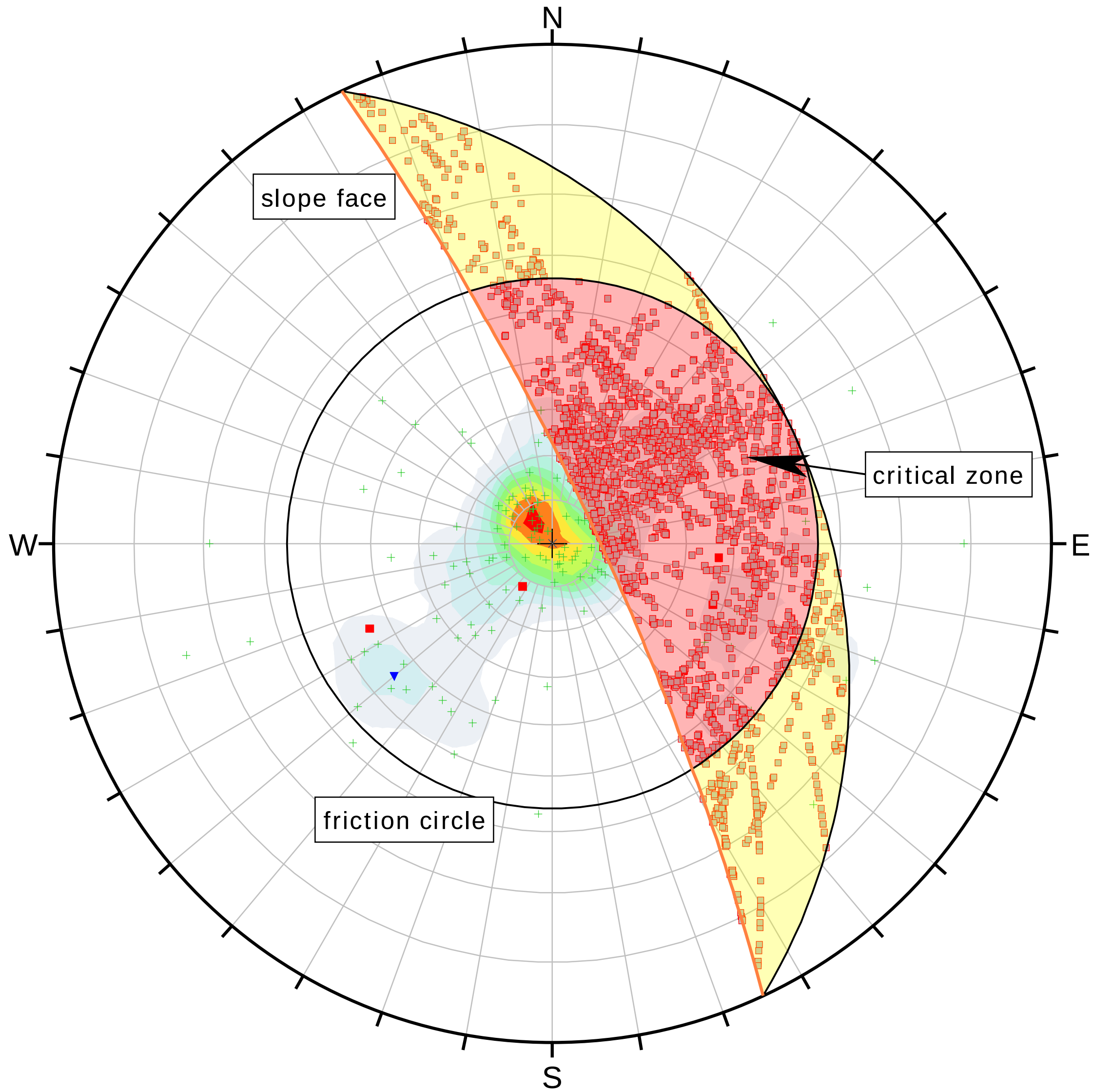
Contour Data	Pole Vectors
Maximum Density	6.77%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Flexural Toppling		
Slope Dip	80		
Slope Dip Direction	0		
Friction Angle	34°		
Lateral Limits	20°		
	Critical	Total	%
Flexural Toppling (All)	7	149	4.70%

Plot Mode	Pole Vectors
Vector Count	149 (149 Entries)
Hemisphere	Lower
Projection	Equal Angle

Global Data Set

CHJ Consultants A Terracon COMPANY	*Project* AAA Corona		
	Analysis Description Kinematic		
	Drawn By JMc	Company CHJ-Terracon	
DIPS 7.008	*Date* 3/18/2015, 3:19:29 PM	File Name All American Data topple 80 360 dips7	Enclosure C-5.6



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1
Symbol	**Feature**	
■	Critical Intersection	

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Wedge Sliding		
Slope Dip	80		
Slope Dip Direction	65		
Friction Angle	34°		
	Critical	Total	%
Wedge Sliding	2717	11025	24.64%

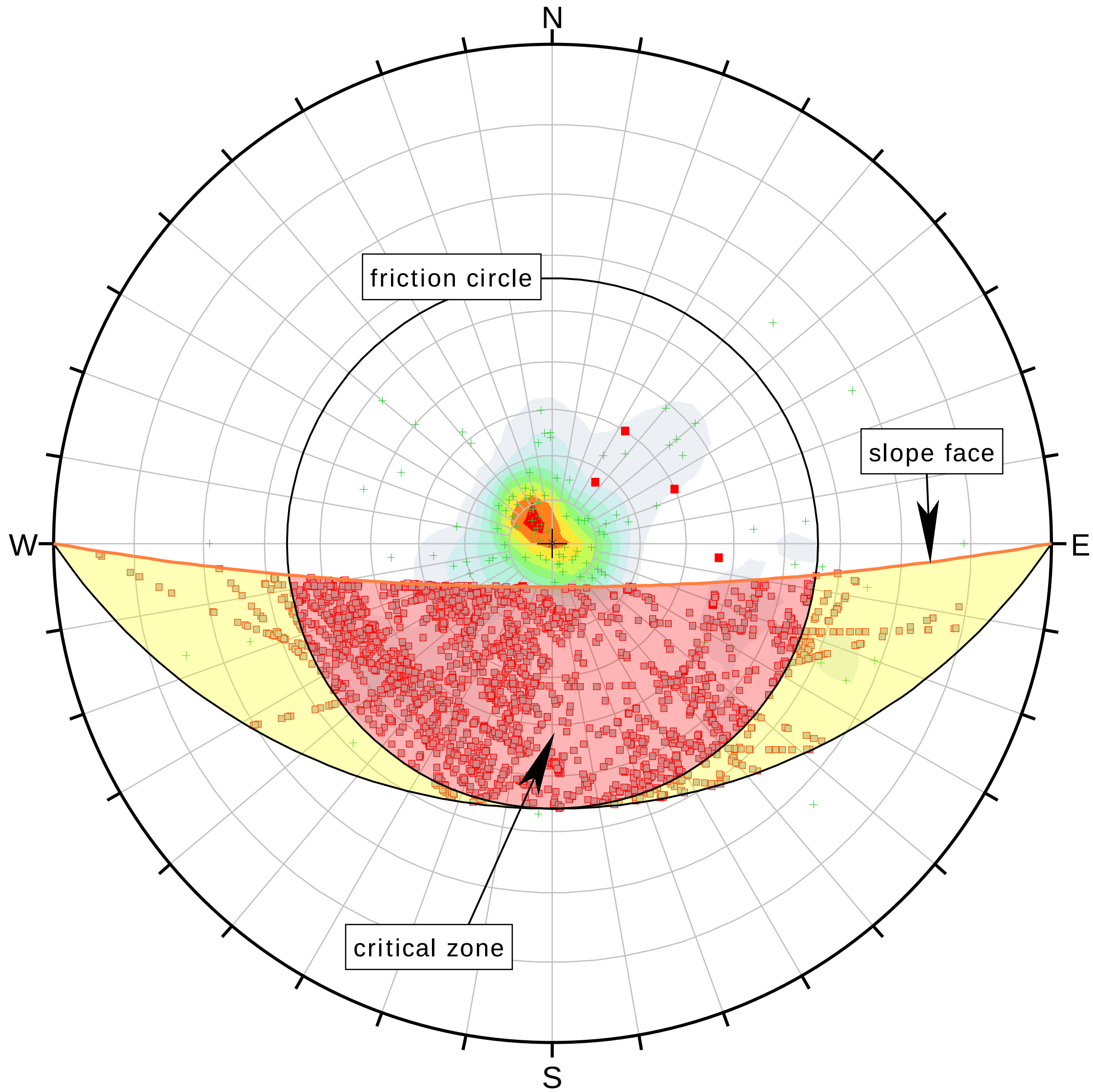
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Intersection Mode	Grid Data Planes
Intersections Count	11025
Hemisphere	Lower
	gle

Global Data Set

CHJ Consultants A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data wedge 80 065 dips7	Enclosure C-6.1

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1
Symbol	Feature	
■	Critical Intersection	

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00
Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Wedge Sliding		
Slope Dip	80		
Slope Dip Direction	180		
Friction Angle	34°		
	Critical	Total	%
Wedge Sliding	2591	11025	23.50%

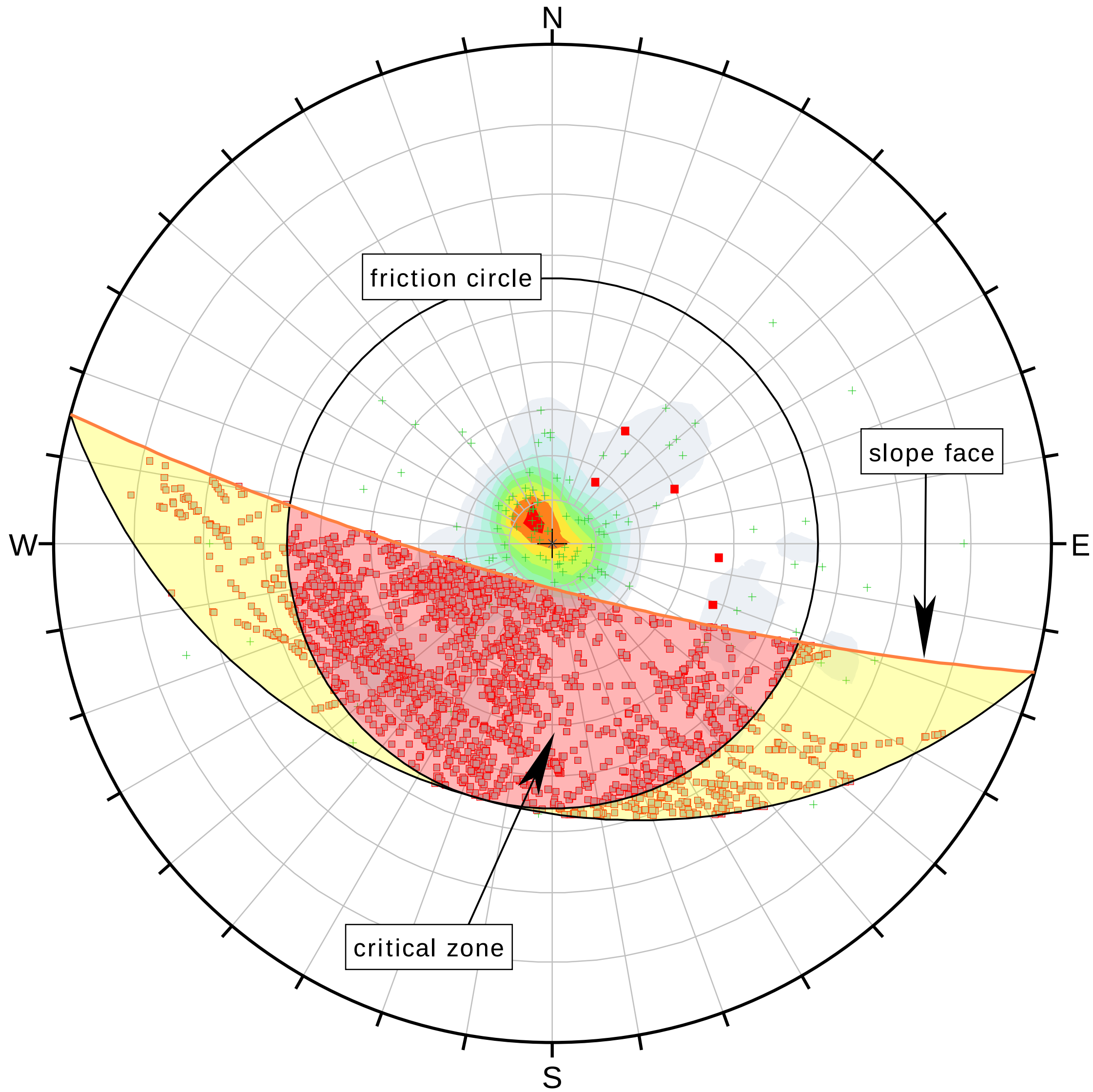
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Intersection Mode	Grid Data Planes
Intersections Count	11025
Hemisphere	Lower
	gle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data wedge 80 180.dips7	Enclosure C-6.2

DIPS 7.008



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1
Symbol	**Feature**	
■	Critical Intersection	

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Wedge Sliding
Slope Dip	80
Slope Dip Direction	195
Friction Angle	34°

	Critical	Total	%
Wedge Sliding	2958	11025	26.83%

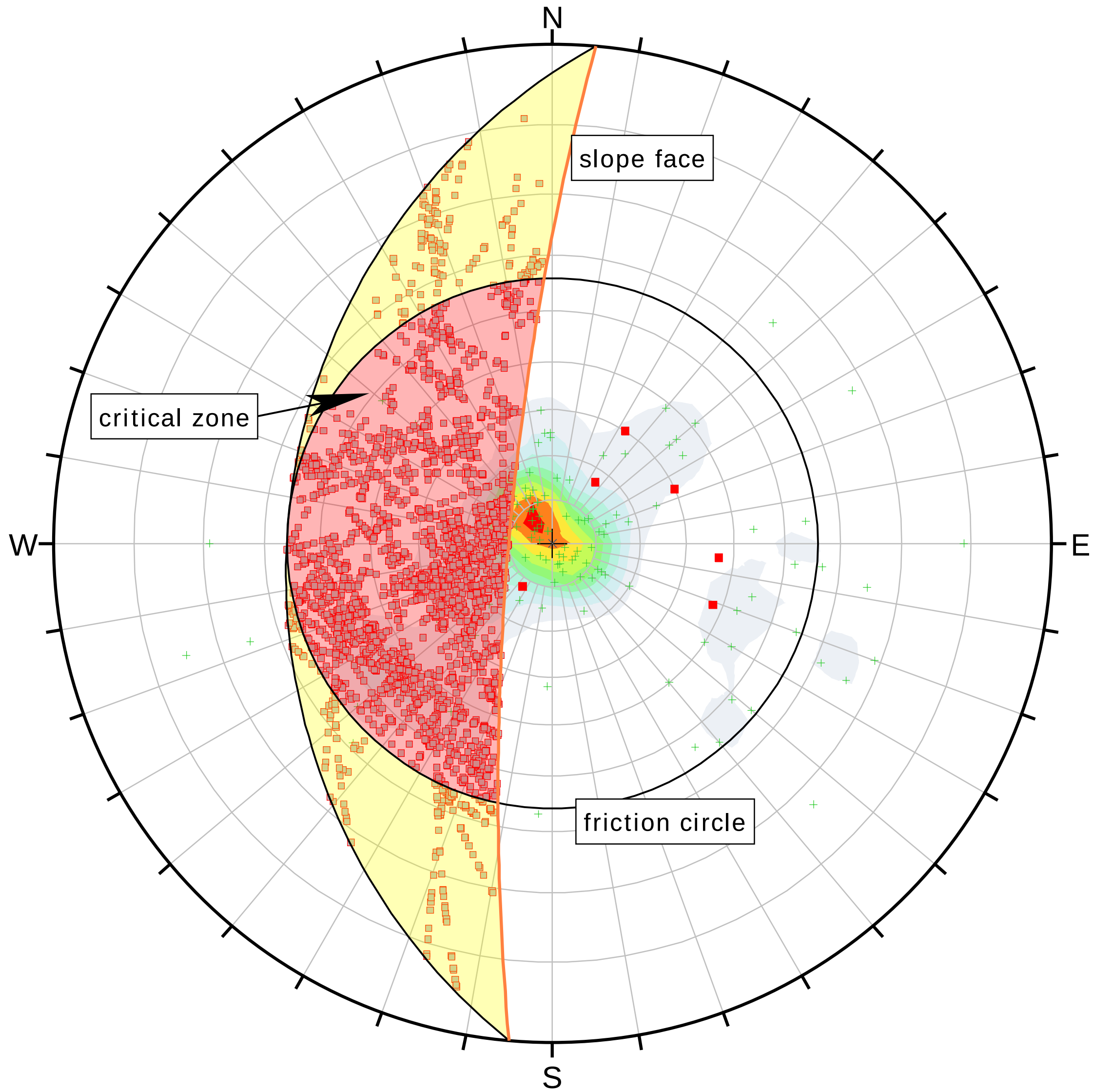
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Intersection Mode	Grid Data Planes
Intersections Count	11025
Hemisphere	Lower
	...gle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data wedge 80 195 dips7	Enclosure C-6.3



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1
Symbol	**Feature**	
■	Critical Intersection	

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Wedge Sliding
Slope Dip	80
Slope Dip Direction	275
Friction Angle	34°

	Critical	Total	%
Wedge Sliding	2953	11025	26.78%

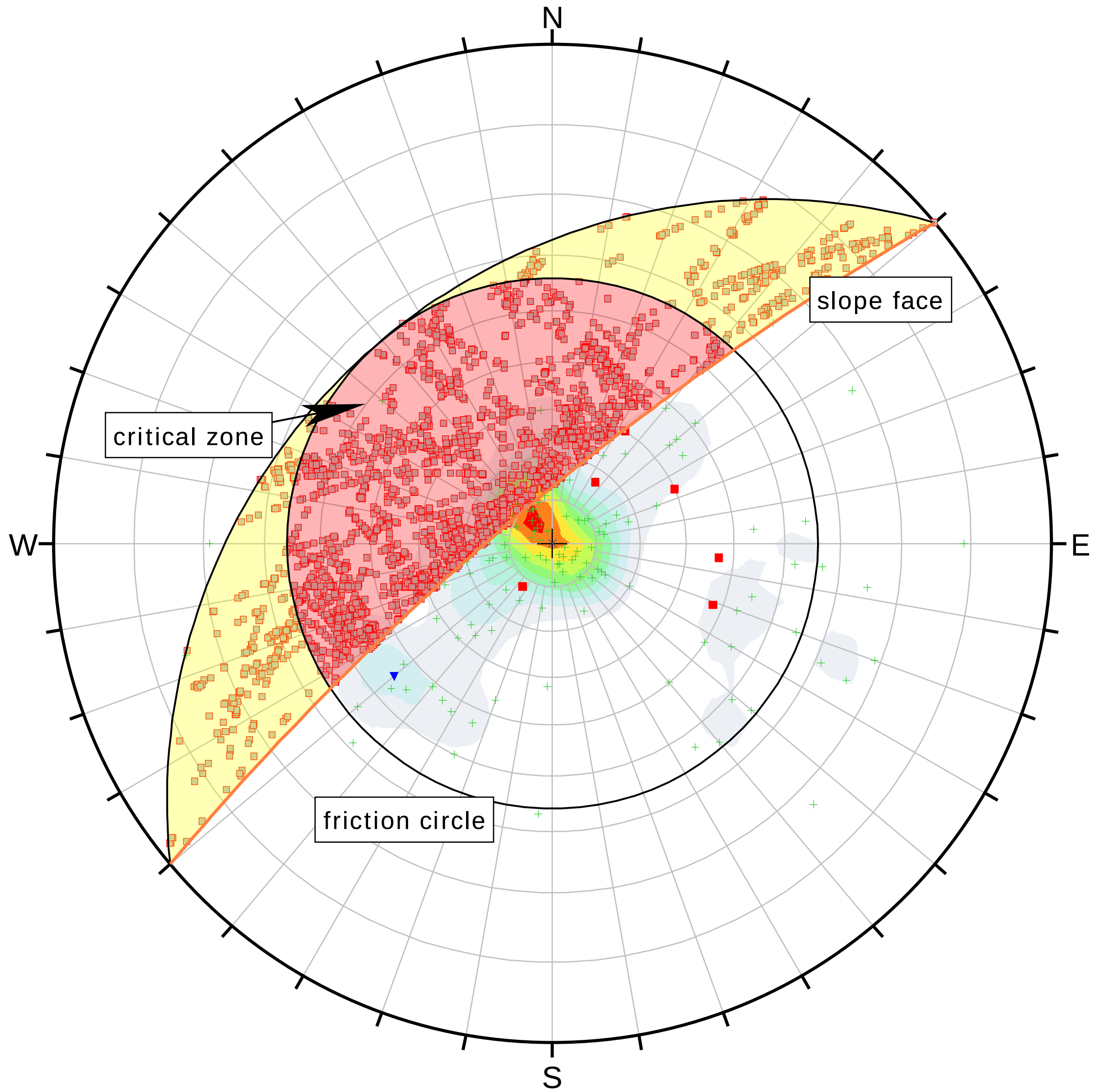
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Intersection Mode	Grid Data Planes
Intersections Count	11025
Hemisphere	Lower
	gle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name	All American Data wedge 80 275.dips7
		Enclosure	C-6.4



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1

Symbol	Feature
▫	Critical Intersection

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00

Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Wedge Sliding
Slope Dip	80
Slope Dip Direction	320
Friction Angle	34°

	Critical	Total	%
Wedge Sliding	2755	11025	24.99%

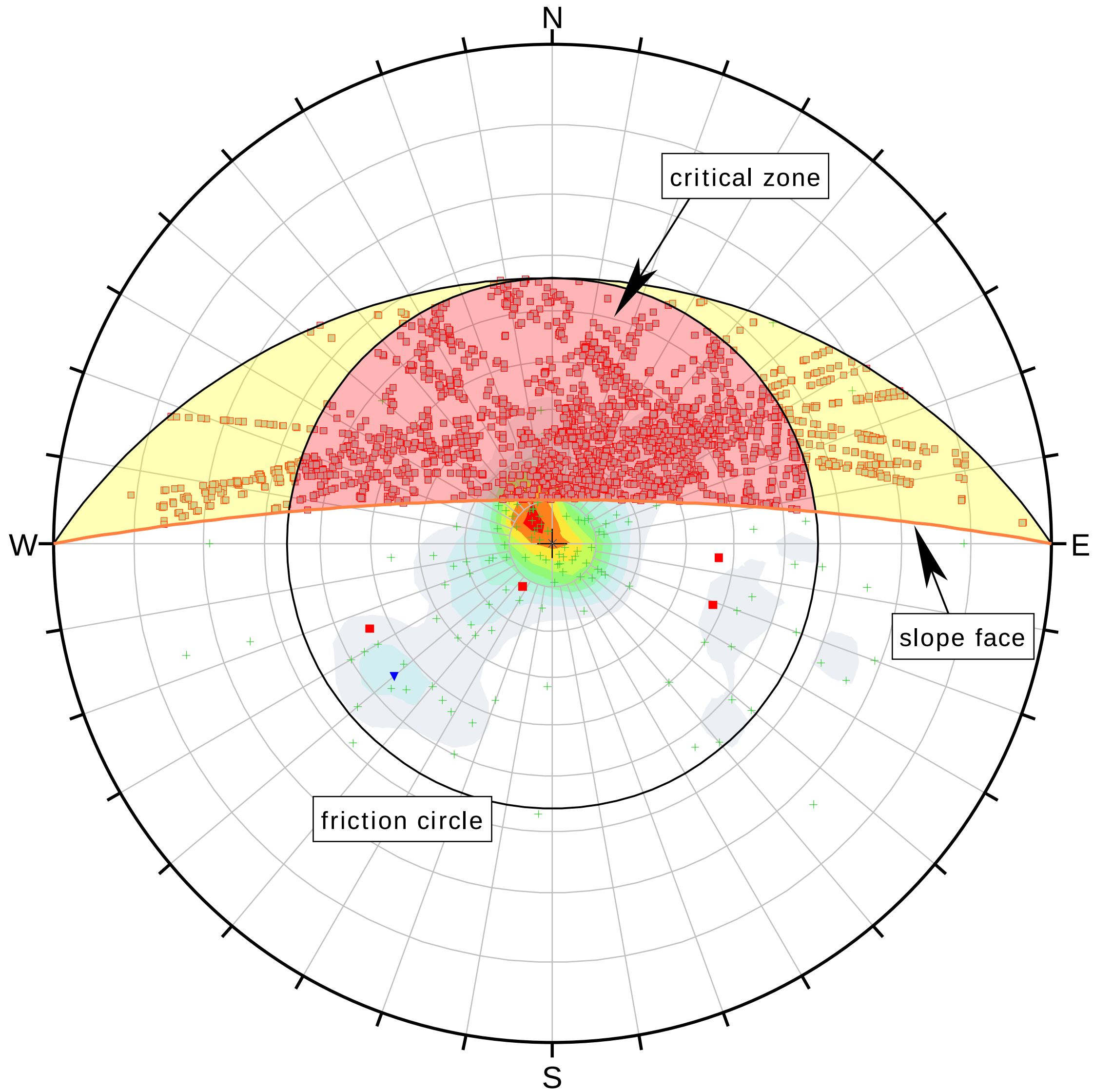
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Intersection Mode	Grid Data Planes
Intersections Count	11025
Hemisphere	Lower
	gle

Global Data Set

CHJ Consultants
A Terracon COMPANY

DIPS 7.008

Project	AAA Corona
Analysis Description	Kinematic
Drawn By	JMc
Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM
File Name	All American Data wedge 80 320 dips7
Enclosure	C-6.5



Symbol	TYPE	Quantity
■	F	7
+	J	141
▼	S	1
Symbol	Feature	
▫	Critical Intersection	

Color	Density Concentrations
	0.00 - 1.80
	1.80 - 3.60
	3.60 - 5.40
	5.40 - 7.20
	7.20 - 9.00
	9.00 - 10.80
	10.80 - 12.60
	12.60 - 14.40
	14.40 - 16.20
	16.20 - 18.00
Contour Data	Dip Vectors
Maximum Density	17.19%
Contour Distribution	Fisher
Counting Circle Size	1.0%

Kinematic Analysis	Wedge Sliding		
Slope Dip	80		
Slope Dip Direction	0		
Friction Angle	34°		
	Critical	Total	%
Wedge Sliding	2727	11025	24.73%

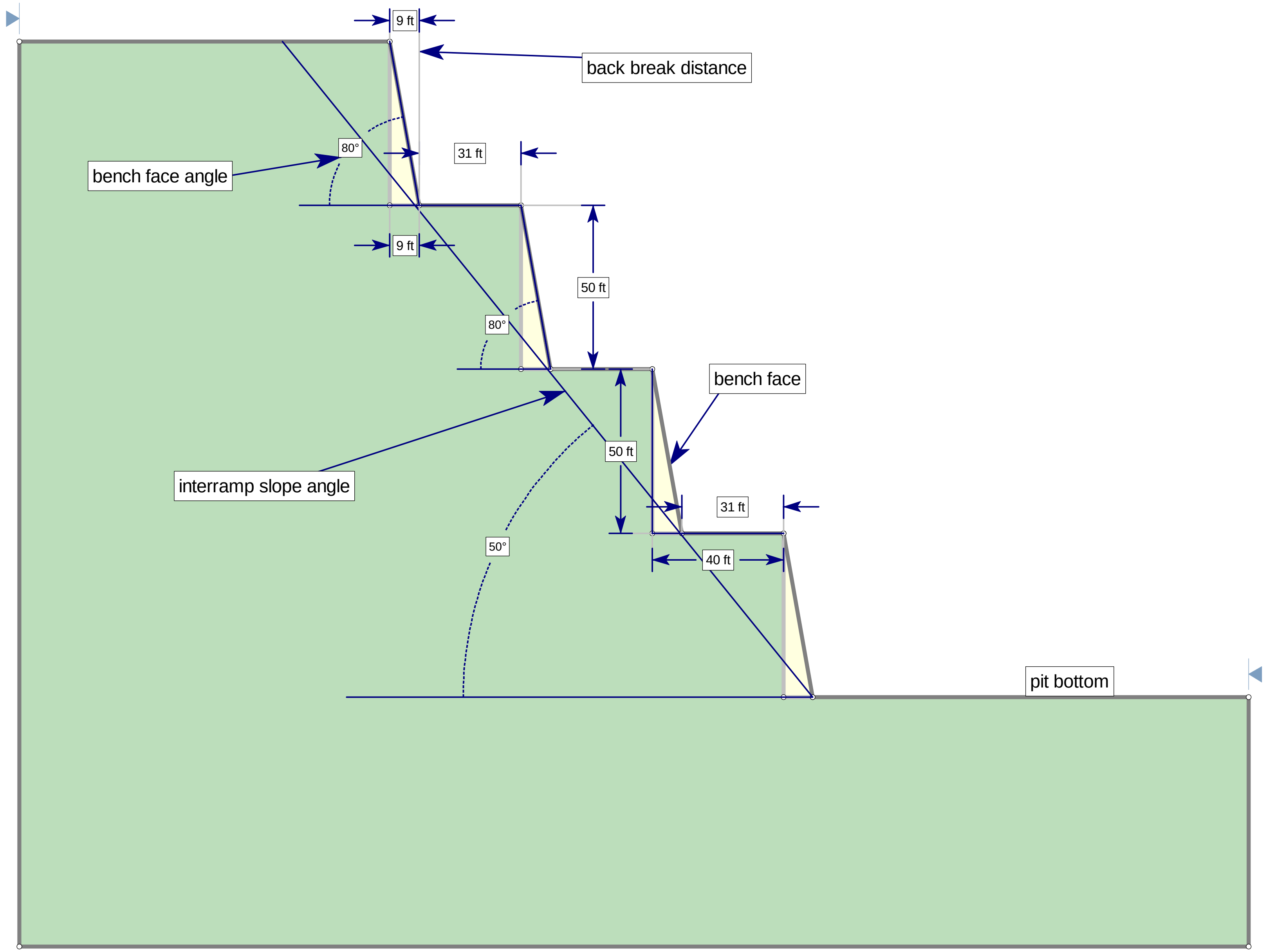
Plot Mode	Dip Vectors
Vector Count	149 (149 Entries)
Intersection Mode	Grid Data Planes
Intersections Count	11025
Hemisphere	Lower
	gle

Global Data Set

CHJ Consultants
A Terracon COMPANY

Project	AAA Corona		
Analysis Description	Kinematic		
Drawn By	JMc	Company	CHJ-Terracon
Date	3/18/2015, 3:19:29 PM	File Name All American Data wedge 80 360 dips7	Enclosure C-6.6

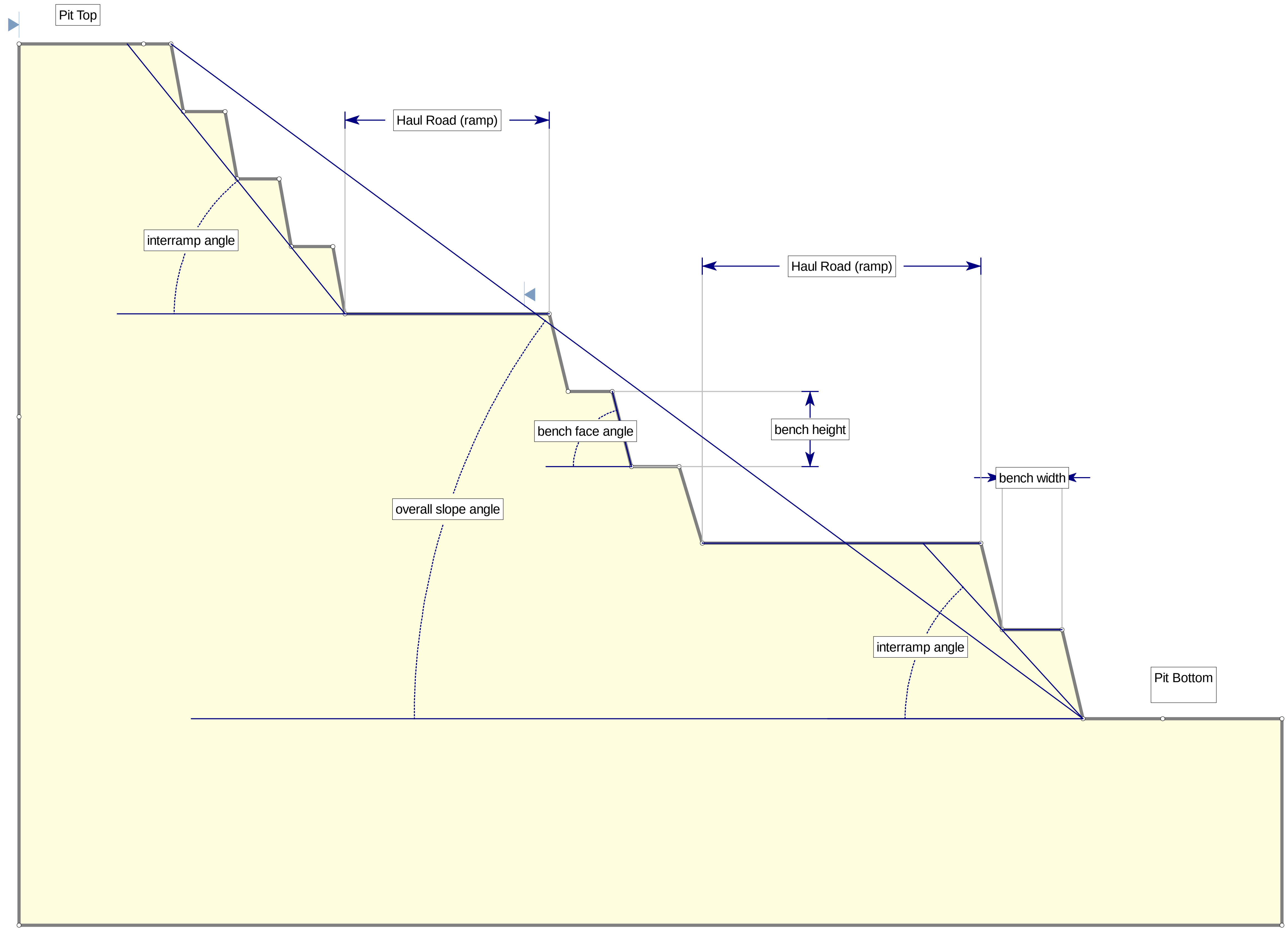
DIPS 7.008



CHJ Consultants A Terracon COMPANY	Project: AAA Mine			
	Analysis Description: Benching Model			
	Drawn By: JMc	Scale: 1:550	Company: CHJ - Terracon	
	Date: April 2017		File Name: benching model.slim	Enclosure: C - 7

APPENDIX D

GLOBAL STABILITY CALCULATIONS



CHJ Consultants
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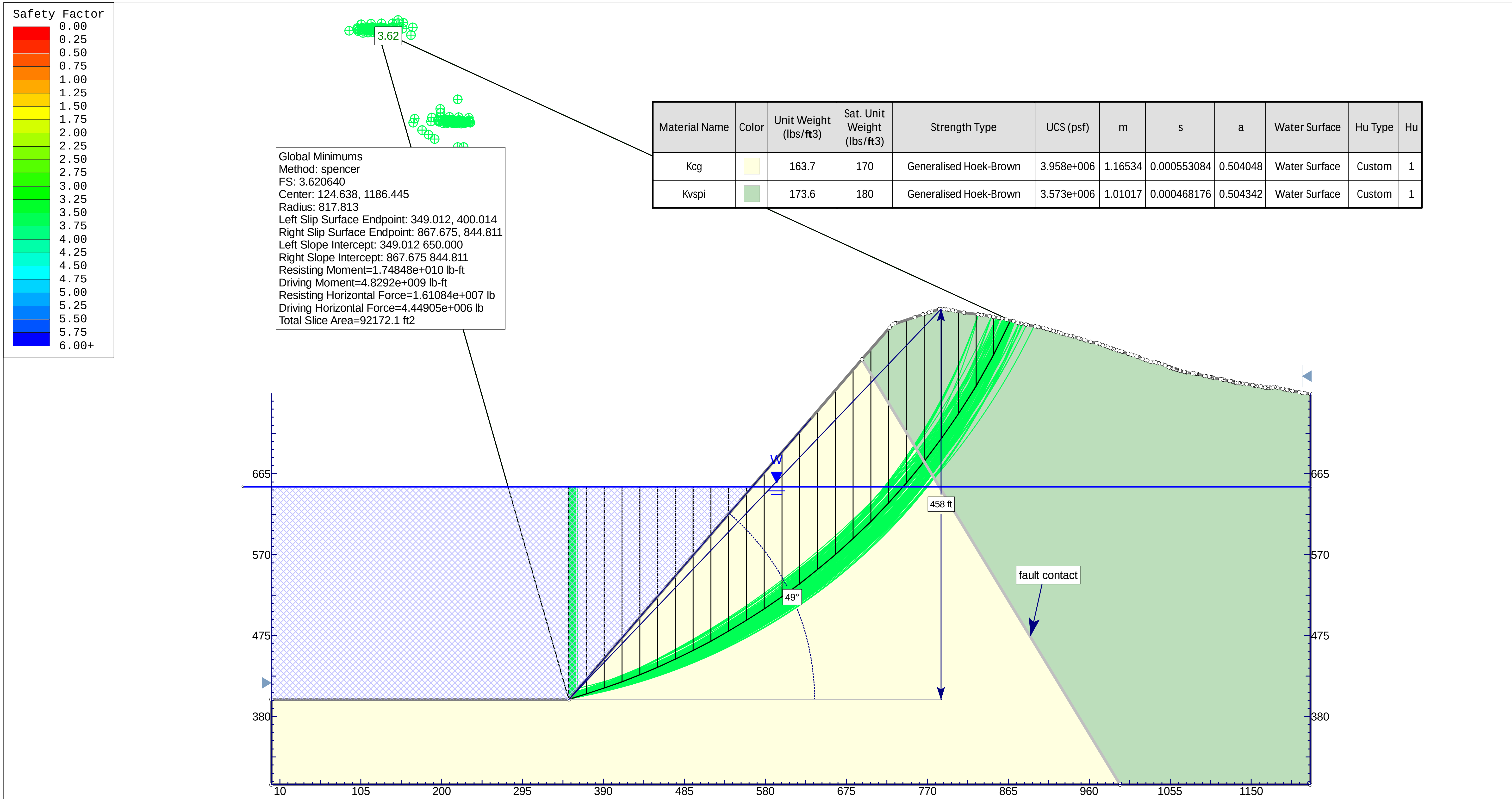
Project	AAA Mine		
Analysis Description	Illustration of Terminology		
Drawn By: JMc	Scale: 1:950	Company: CHJ - Terracon	
Date: April 2017		File Name: C-1.0 terminology model.slim	Enclosure: D - 1.0

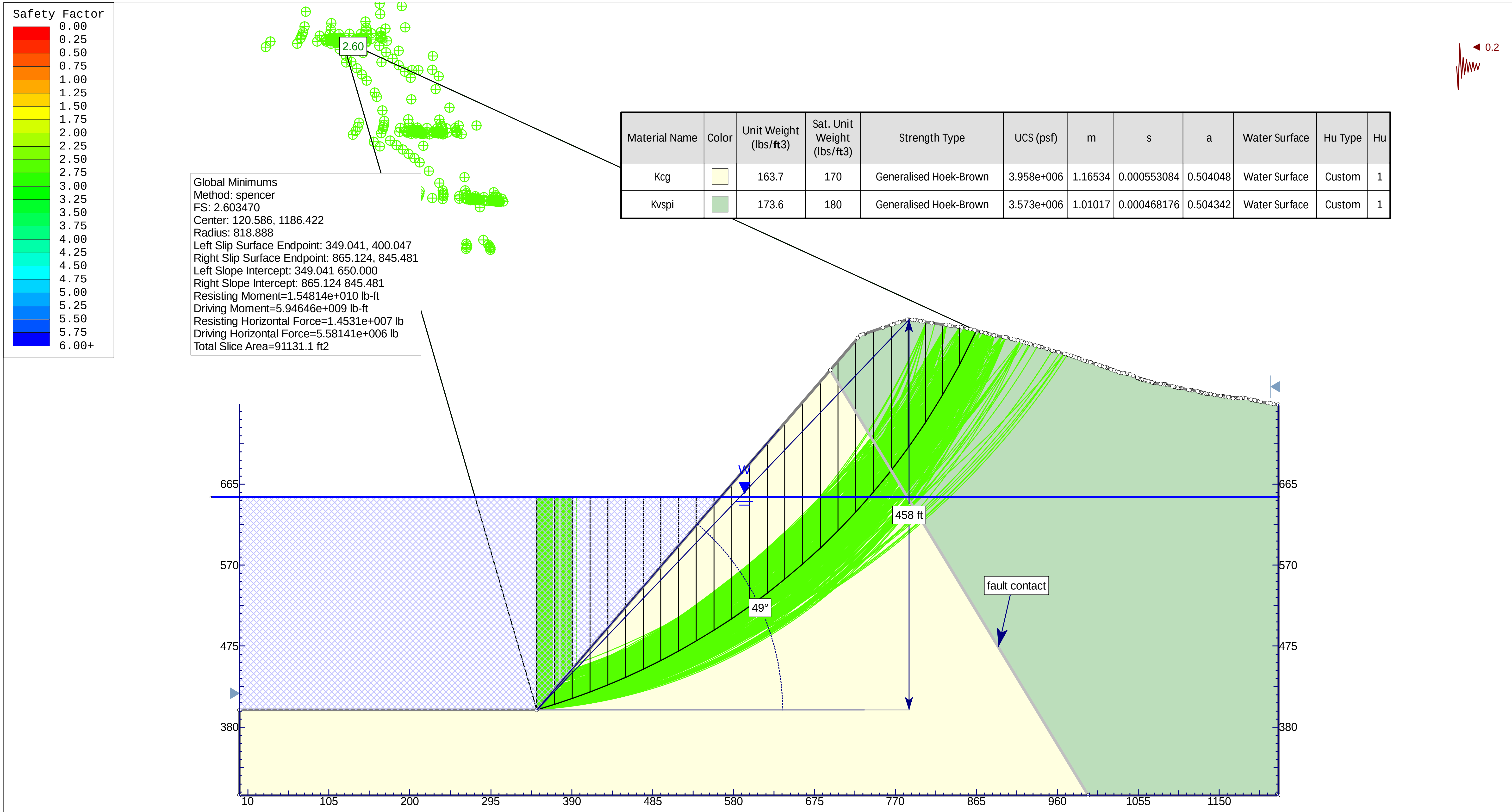


Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kcg		163.7	170	Generalised Hoek-Brown	3.958e+006	1.16534	0.000553084	0.504048	Water Surface	Custom	1
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

Global Minimums
Method: spencer
FS: 3.620640
Center: 124.638, 1186.445
Radius: 817.813
Left Slip Surface Endpoint: 349.012, 400.014
Right Slip Surface Endpoint: 867.675, 844.811
Left Slope Intercept: 349.012 650.000
Right Slope Intercept: 867.675 844.811
Resisting Moment=1.74848e+010 lb-ft
Driving Moment=4.8292e+009 lb-ft
Resisting Horizontal Force=1.61084e+007 lb
Driving Horizontal Force=4.44905e+006 lb
Total Slice Area=92172.1 ft2

CHJ Consultants
A Terracon COMPANY
SLIDEINTERPRET 6.038

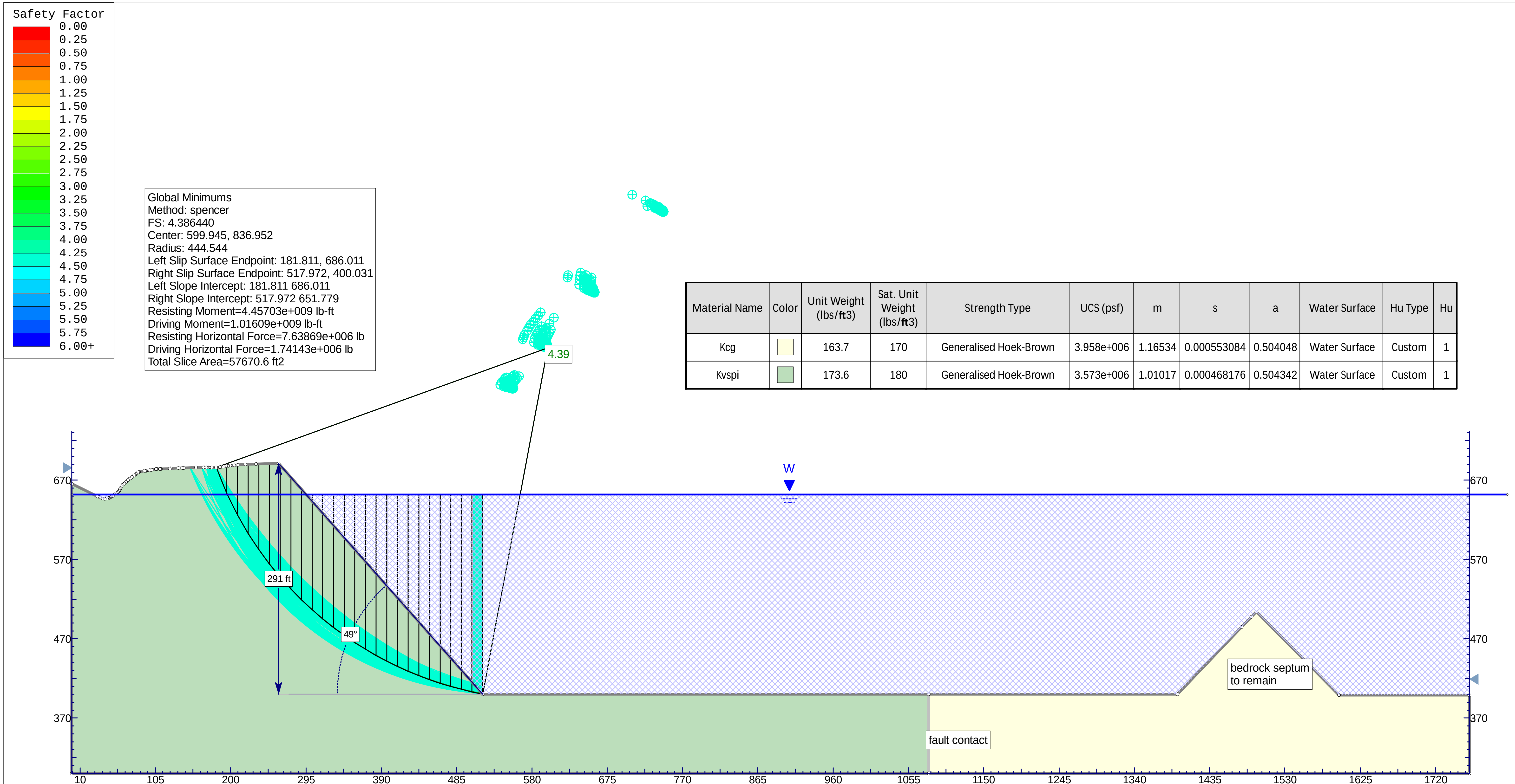
Project	AAA Mine
Analysis Description	Section A
Drawn By	JMc
Scale	1:1300
Company	CHJ - Terracon
Date	4/27/2017, 1:58:32 PM
File Name	Section A.slim
Enclosure	D-1.1



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kcg		163.7	170	Generalised Hoek-Brown	3.958e+006	1.16534	0.000553084	0.504048	Water Surface	Custom	1
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

CHJ Consultants
A Terracon COMPANY
SLIDEINTERPRET 6.038

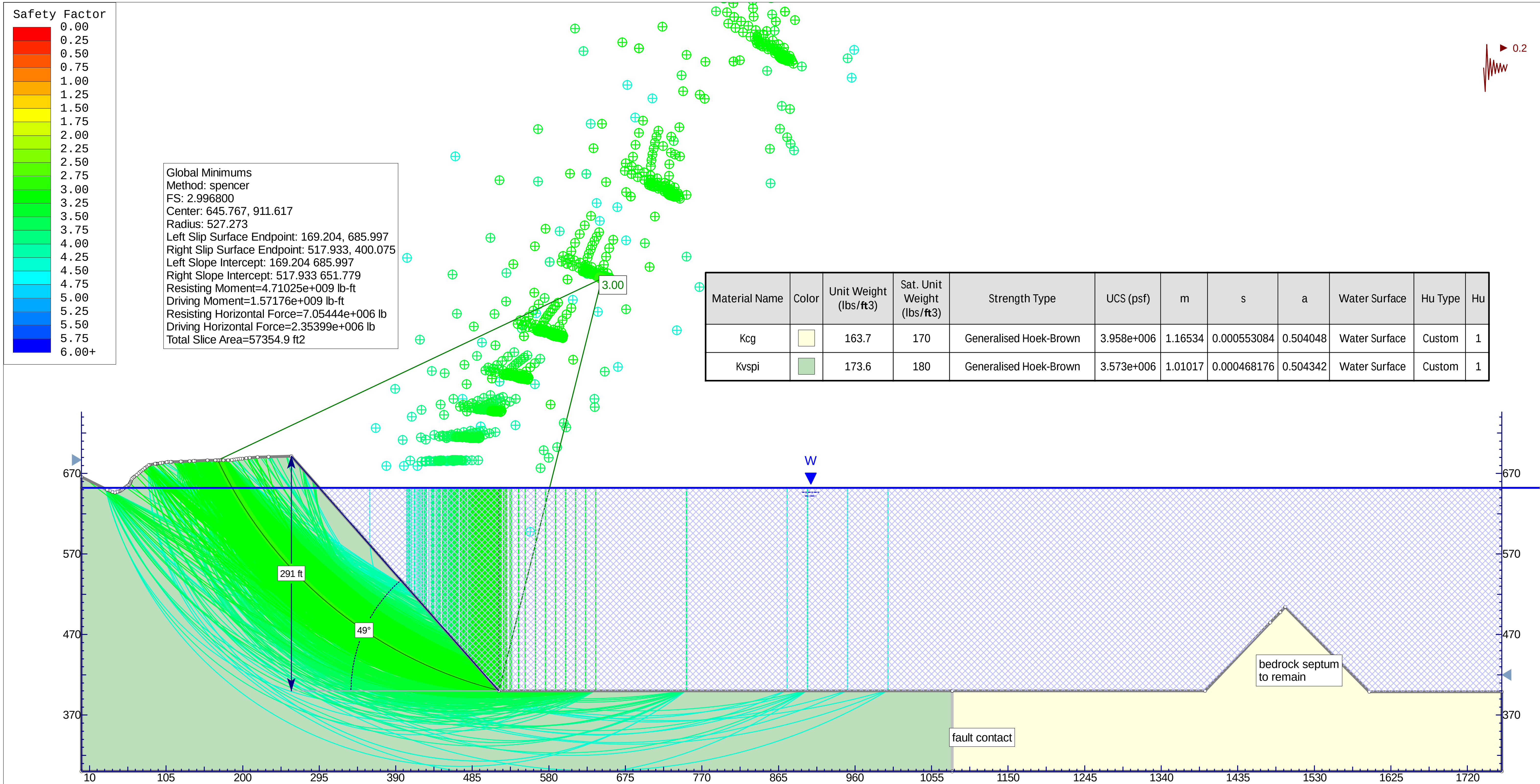
Project	AAA Mine		
Analysis Description	Section A		
Drawn By: JMc	Scale: 1:1300	Company: CHJ - Terracon	
Date: 4/27/2017, 1:58:32 PM		File Name: Section A seis.slim	Enclosure: D-1.2



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kcg		163.7	170	Generalised Hoek-Brown	3.958e+006	1.16534	0.000553084	0.504048	Water Surface	Custom	1
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

CHJ Consultants
A Terracon COMPANY
SLIDEINTERPRET 6.038

Project	AAA Mine
Analysis Description	Section B
Drawn By	JMc
Scale	1:1400
Company	CHJ - Terracon
Date	4/27/2017, 1:58:32 PM
File Name	Section B.slim
Enclosure	D-2.1



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kcg		163.7	170	Generalised Hoek-Brown	3.958e+006	1.16534	0.000553084	0.504048	Water Surface	Custom	1
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

CHJ Consultants
A Terracon COMPANY

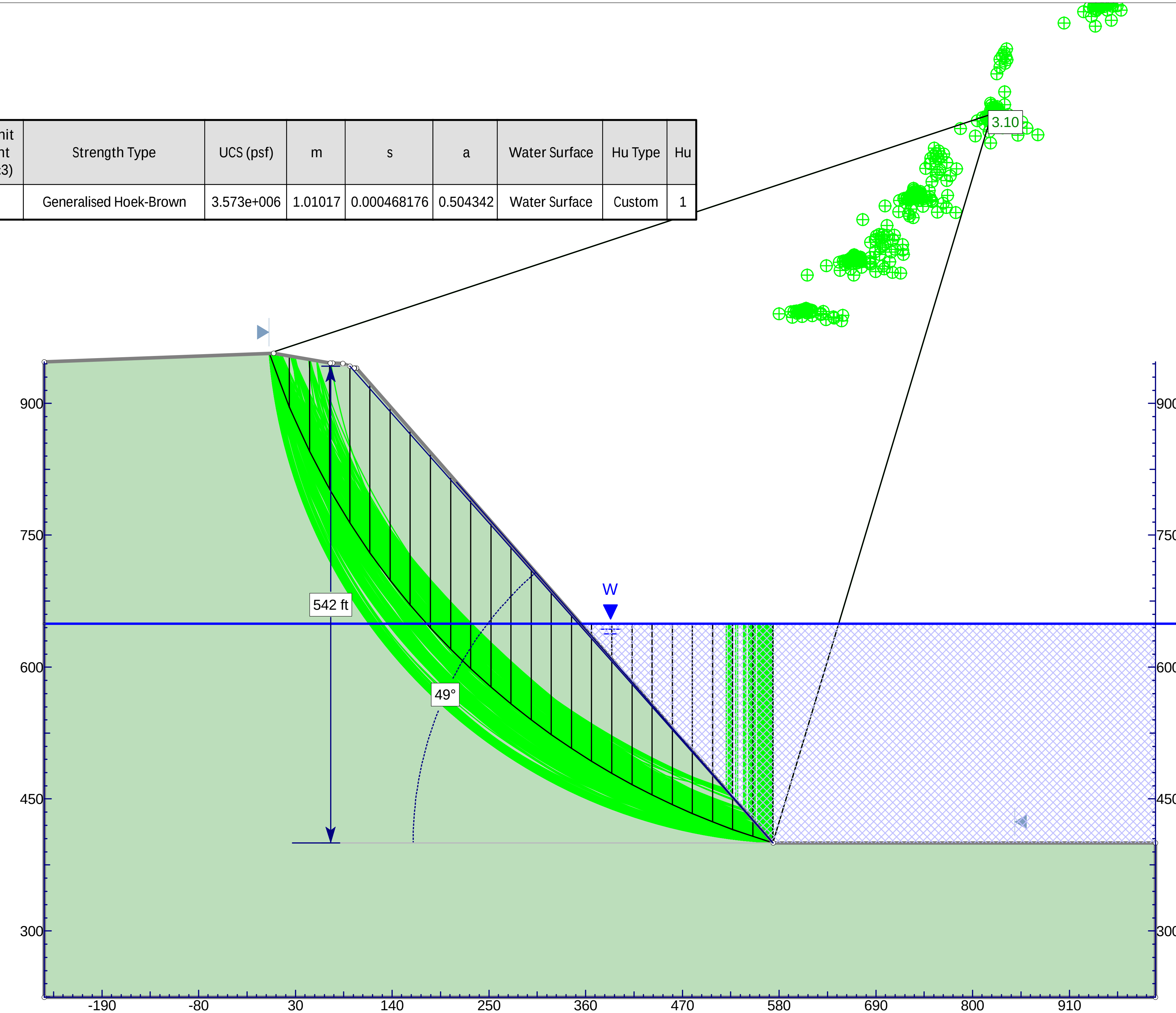
SLIDEINTERPRET 6.038

Project: AAA Mine			
Analysis Description: Section B			
Drawn By: JMc	Scale: 1:1400	Company: CHJ - Terracon	
Date: 4/27/2017, 1:58:32 PM		File Name: Section B seis.slim	Enclosure: D-2.2

Safety Factor
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
2.00
2.25
2.50
2.75
3.00
3.25
3.50
3.75
4.00
4.25
4.50
4.75
5.00
5.25
5.50
5.75
6.00+

Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

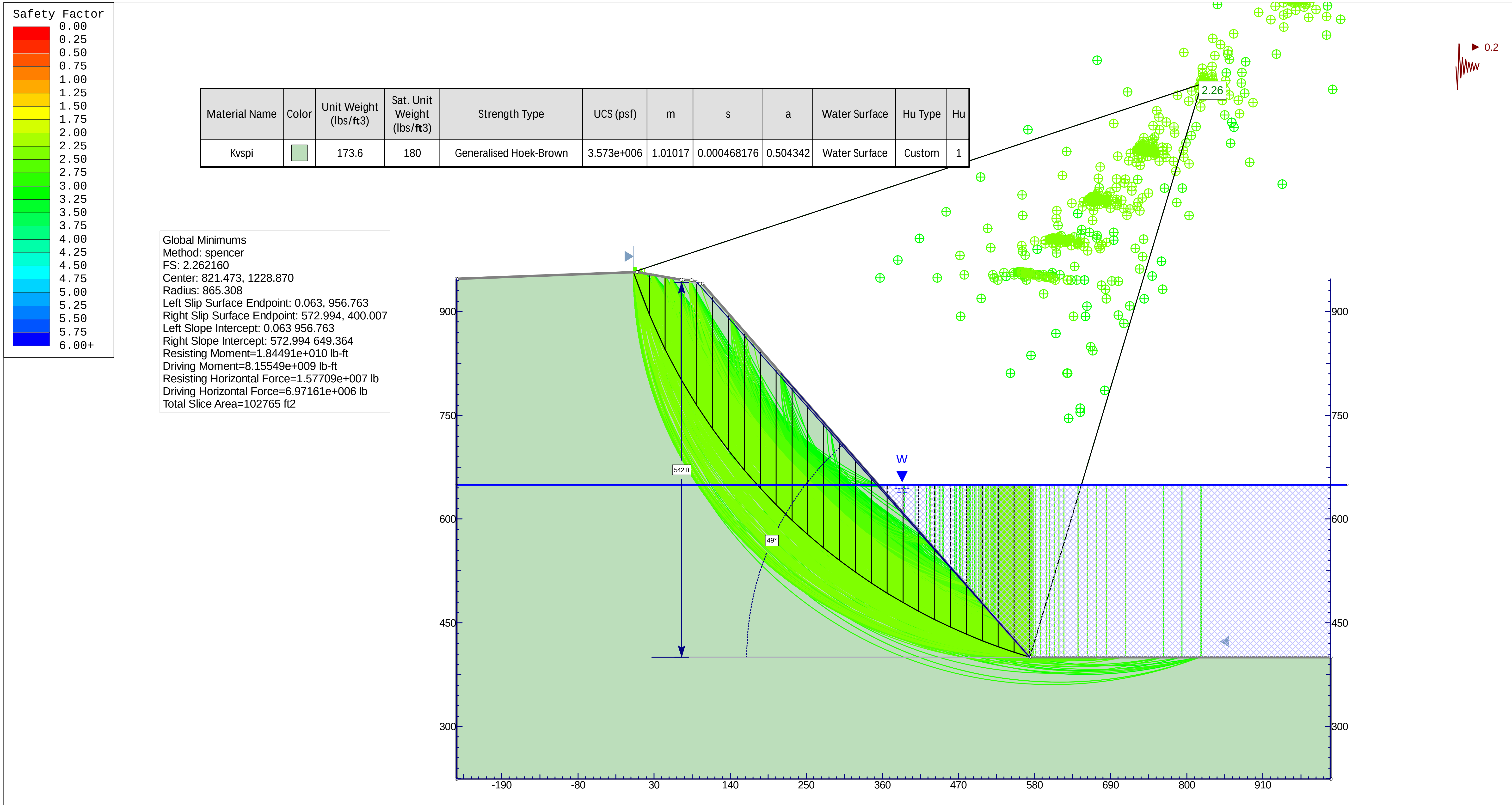
Global Minimums
Method: spencer
FS: 3.097680
Center: 821.409, 1228.828
Radius: 865.203
Left Slip Surface Endpoint: 0.095, 956.764
Right Slip Surface Endpoint: 572.938, 400.071
Left Slope Intercept: 0.095 956.764
Right Slope Intercept: 572.938 649.364
Resisting Moment=2.07554e+010 lb-ft
Driving Moment=6.70029e+009 lb-ft
Resisting Horizontal Force=1.72762e+007 lb
Driving Horizontal Force=5.57715e+006 lb
Total Slice Area=102725 ft2



CHJ Consultants
A Terracon COMPANY

Project	AAA Mine				
Analysis Description	Section C				
Drawn By	JMc	Scale	1:1600	Company	CHJ - Terracon
Date	4/27/2017, 1:58:32 PM	File Name	Section C.slim	Enclosure	D-3.1

SLIDEINTERPRET 6.038

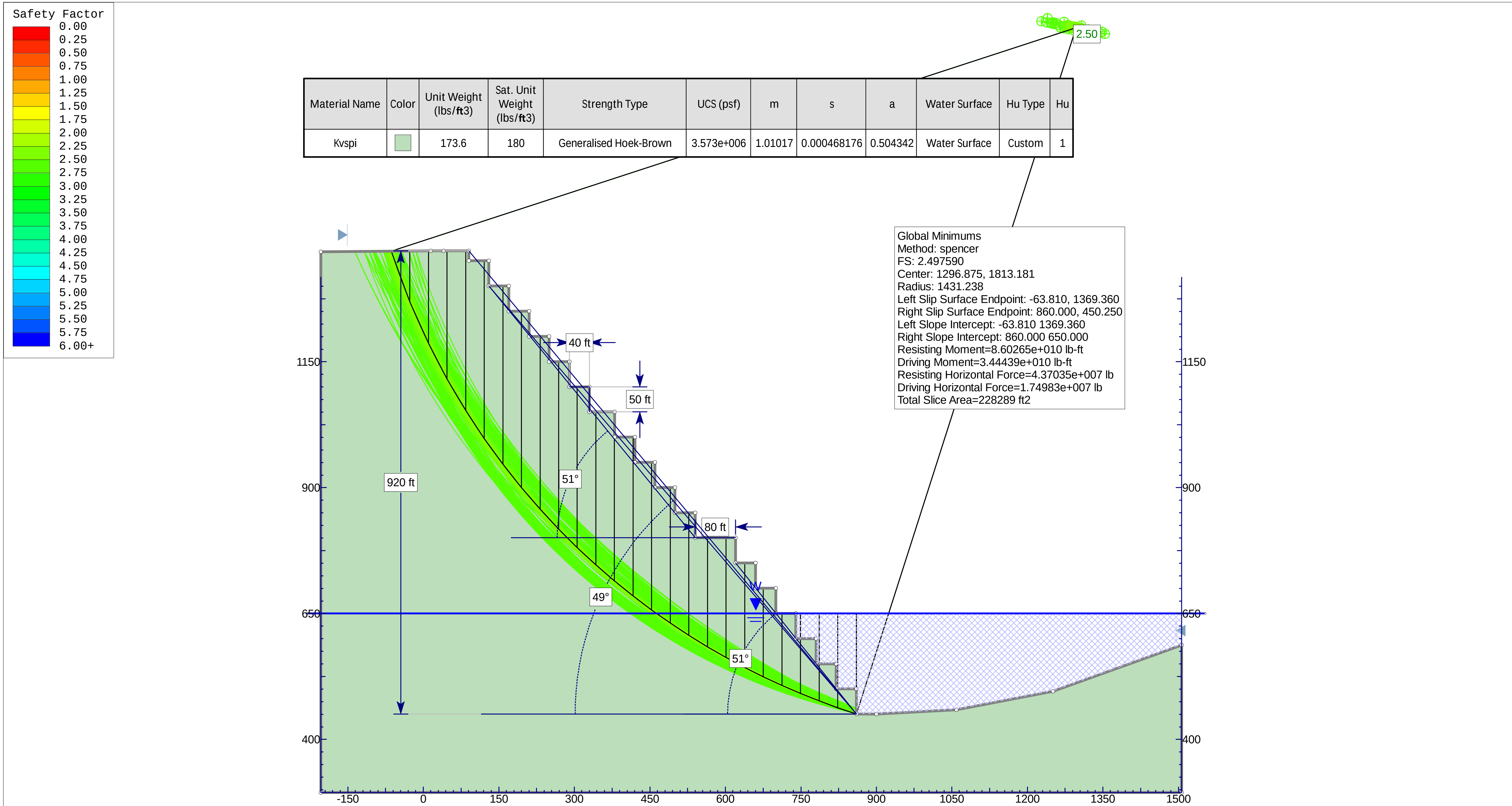


Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

Global Minimums
Method: spencer
FS: 2.262160
Center: 821.473, 1228.870
Radius: 865.308
Left Slip Surface Endpoint: 0.063, 956.763
Right Slip Surface Endpoint: 572.994, 400.007
Left Slope Intercept: 0.063 956.763
Right Slope Intercept: 572.994 649.364
Resisting Moment=1.84491e+010 lb-ft
Driving Moment=8.15549e+009 lb-ft
Resisting Horizontal Force=1.57709e+007 lb
Driving Horizontal Force=6.97161e+006 lb
Total Slice Area=102765 ft2

CHJ Consultants
A Terracon COMPANY
SLIDEINTERPRET 6.038

Project	AAA Mine		
Analysis Description	Section C		
Drawn By JMc	Scale 1:1600	Company CHJ - Terracon	
Date 4/27/2017, 1:58:32 PM		File Name Section C seis.slim	Enclosure D-3.2



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

Global Minimums
Method: spencer
FS: 2.497590
Center: 1296.875, 1813.181
Radius: 1431.238
Left Slip Surface Endpoint: -63.810, 1369.360
Right Slip Surface Endpoint: 860.000, 450.250
Left Slope Intercept: -63.810 1369.360
Right Slope Intercept: 860.000 650.000
Resisting Moment=8.60265e+010 lb-ft
Driving Moment=3.44439e+010 lb-ft
Resisting Horizontal Force=4.37035e+007 lb
Driving Horizontal Force=1.74983e+007 lb
Total Slice Area=228289 ft2

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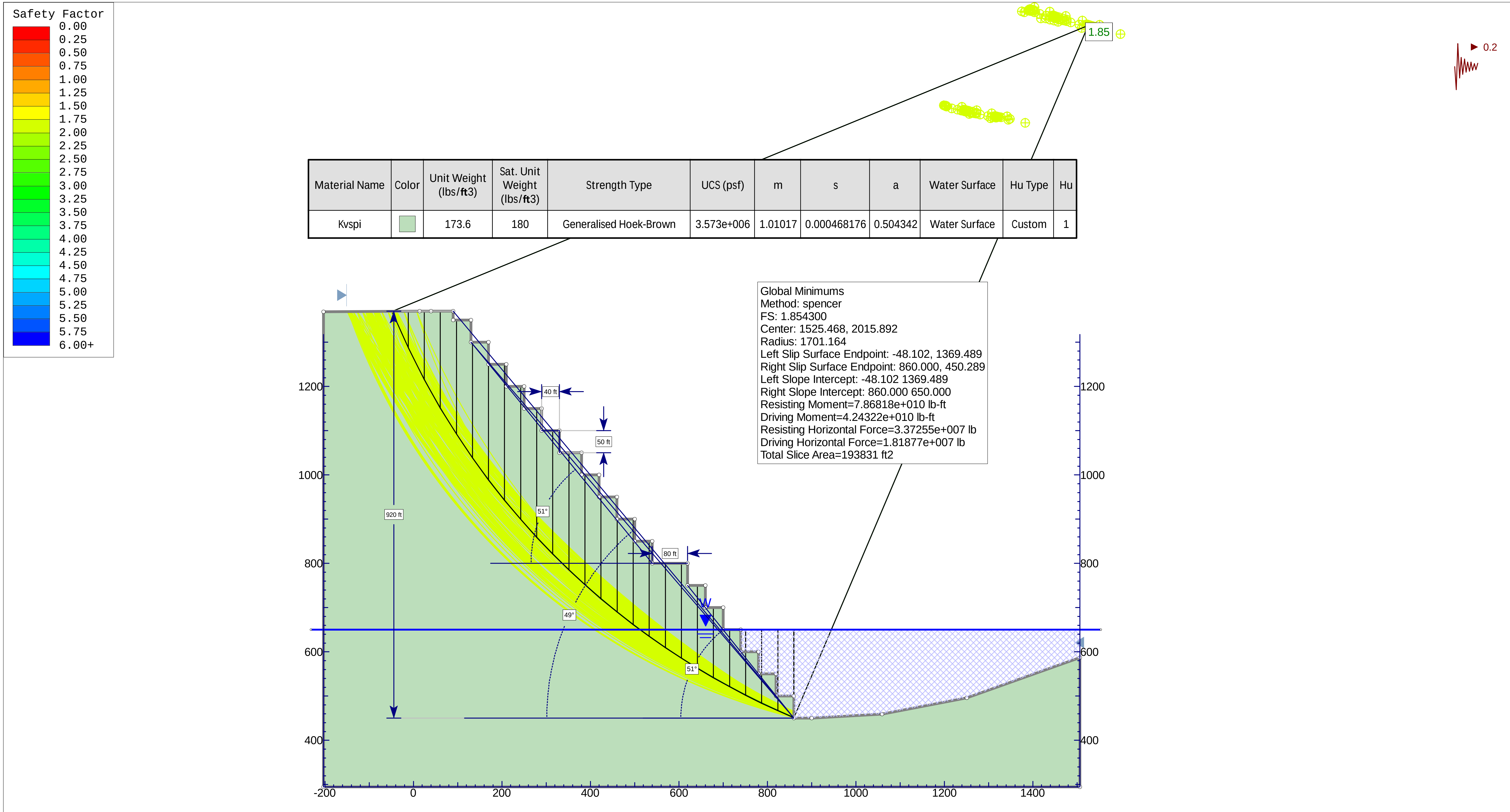
A Terracon COMPANY

SLIDEINTERPRET 6.038

Project: AAA Mine			
Analysis Description: Section D			
Drawn By: JMc	Scale: 1:2200	Company: CHJ - Terracon	
Date: April 2017		File Name: rev to 920H sect D model benched 50 40 ratio w haul road stat.slim	Enclosure: D-4.1

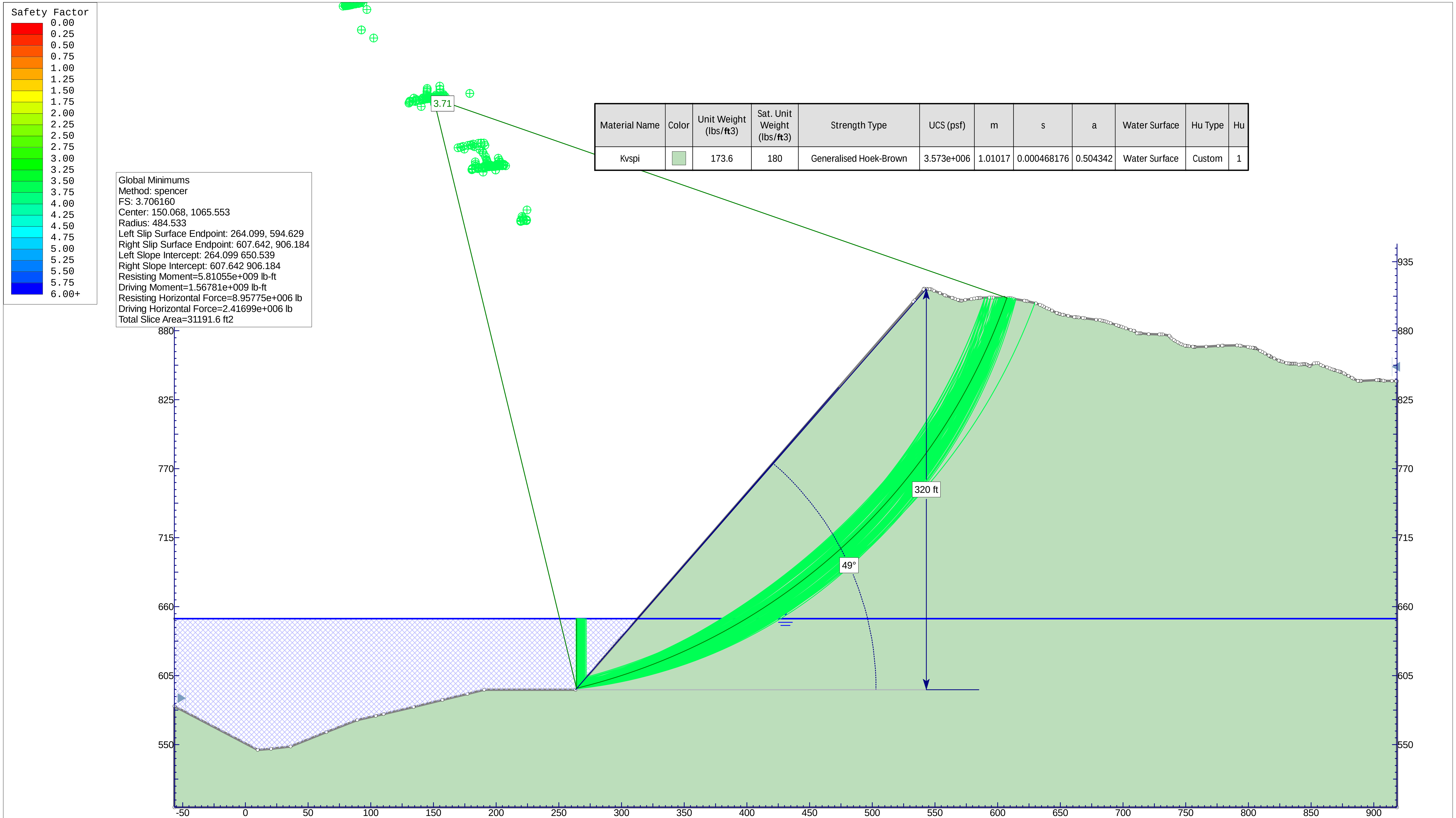


Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

CHJ Consultants
A Terracon COMPANY

Project	AAA Mine		
Analysis Description	Section D		
Drawn By: JMc	Scale: 1:2500	Company: CHJ - Terracon	
Date: April 2017	File Name: rev to 920H sect D model benched 50 40 ratio w haul road seis.slim	Enclosure: D-4.2	

SLIDEINTERPRET 6.038



Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1

CHJ Consultants
A Terracon COMPANY
SLIDEINTERPRET 6.038

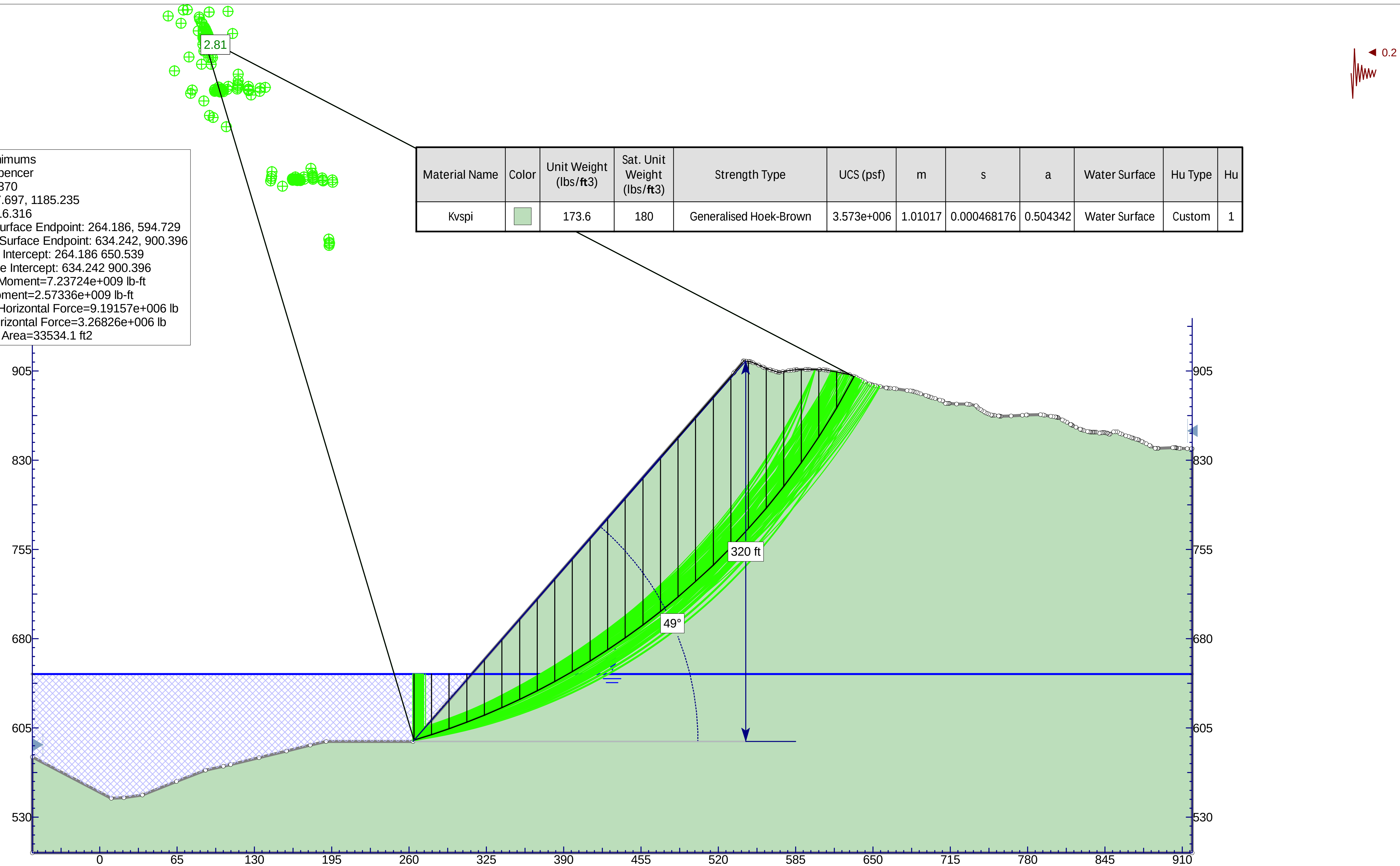
Project	AAA Mine		
Analysis Description	Section F		
Drawn By	JMc	Scale	1:750
Company	CHJ - Terracon		
Date	4/27/2017, 1:58:32 PM	File Name	Section F.slim
Enclosure	D-5.1		

Safety Factor

Color	Safety Factor
	0.00
	0.25
	0.50
	0.75
	1.00
	1.25
	1.50
	1.75
	2.00
	2.25
	2.50
	2.75
	3.00
	3.25
	3.50
	3.75
	4.00
	4.25
	4.50
	4.75
	5.00
	5.25
	5.50
	5.75
	6.00+

Global Minimums
Method: spencer
FS: 2.812370
Center: 87.697, 1185.235
Radius: 616.316
Left Slip Surface Endpoint: 264.186, 594.729
Right Slip Surface Endpoint: 634.242, 900.396
Left Slope Intercept: 264.186 650.539
Right Slope Intercept: 634.242 900.396
Resisting Moment=7.23724e+009 lb-ft
Driving Moment=2.57336e+009 lb-ft
Resisting Horizontal Force=9.19157e+006 lb
Driving Horizontal Force=3.26826e+006 lb
Total Slice Area=33534.1 ft2

Material Name	Color	Unit Weight (lbs/ft3)	Sat. Unit Weight (lbs/ft3)	Strength Type	UCS (psf)	m	s	a	Water Surface	Hu Type	Hu
Kvspi		173.6	180	Generalised Hoek-Brown	3.573e+006	1.01017	0.000468176	0.504342	Water Surface	Custom	1



CHJ Consultants
A Terracon COMPANY

Project	AAA Mine		
Analysis Description	Section F		
Drawn By: JMc	Scale: 1:1000	Company: CHJ - Terracon	
Date: 4/27/2017, 1:58:32 PM		File Name: Section F seis.slim	Enclosure: D-5.2

SLIDEINTERPRET 6.038

APPENDIX E

SITE PHOTOGRAPHS

Photo 1: Native bedrock outcrop. View east.

Photo 2: Mine slopes with slough over benches.

Photo 3: Granitics (Kcg) exposed in cut at north end of mine pit.

Photo 4: Intrusives associated with Santiago Volcanics (Kvspi).

Photo 5: Typical joint controlled, blocky bench faces – south high wall.

Photo 6: East-dipping fault with gouge and zones of seepage – south high wall.

Photo 7: Steeply-dipping fault contact between porphyritic phase of Kvspi (left) and Kcg (right).

Photo 8: Steeply-dipping, joint-controlled bench faces – south high wall.

Photo 9: Southwest-facing slope along northeast pit margin. View toward Location 1.