DOCKET	
09-AFC-9	
DATE	MAY 11 2010
RECD.	MAY 11 2010

May 11, 2010

Eric Solorio
Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: Ridgecrest Solar Power Project (RSPP), Docket No. 09-AFC-9, Addendum to Preliminary Geotechnical Investigation Report 2: Supplemental Field Reconnaissance and Soils Characterization in Upstream Watershed Areas

Dear Mr. Solorio:

As requested, attached please find the second Addendum to the Preliminary Geotechnical Investigation Report. This addendum provides a summary of the supplemental soil reconnaissance to characterize soils infiltration at the RSPP site. This supplements and/or provides clarification of the information provided in the August 26, 2009 "Preliminary Geotechnical Report". The conclusions and recommendations in our August 26, 2009 report remain valid.

This has been docketed in accordance with CEC requirements.

If you have any questions, please feel free to contact me at 510-809-4662 (office) or 949-433-4049 (cell).

Sincerely,

Billy Owens
Director, Project Development

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APPLICATION FOR CERTIFICATION For the *RIDGECREST SOLAR POWER PROJECT*

Docket No. 09-AFC-9

PROOF OF SERVICE (Revised 4/30/2010)

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DECLARATION OF SERVICE

I, Elizabeth Copley, declare that on May 11, 2010, I served and filed copies of the attached Ridgecrest Solar Power Project (Docket No. 09-AFC-9) Addendum to Preliminary Geotechnical Investigation Report 2: Supplemental Field Reconnaissance and Soils Characterization in Upstream Watershed Areas. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:

[http://www.energy.ca.gov/sitingcases/solar_millennium_ridgecrest].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(C*heck all that Apply*)

For service to all other parties:

X sent electronically to all email addresses on the Proof of Service list;

_ by personal delivery;

X by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "email preferred."

AND

For filing with the Energy Commission:

X sending an original paper copy and one electronic copy, mailed and emailed Respectively, to the address below (preferred method);

OR

__ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-9
1516 Ninth Street, MS-4
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I declare under penalty of perjury that the foregoing is true and correct.

May 7, 2010
Project No. 104961

Solar Millennium, LLC
625 Shattuck Avenue, Suite 270
Berkeley, California 94709-1611

Attention: Mr. Billy Owens

Subject: Addendum 2, Supplemental Field Reconnaissance and Soils Characterization in Upstream Watershed Areas of Solar Millennium Concentrating Solar Power Project Ridgecrest, Kern County, California

Dear Mr. Owens:

In accordance with your request, Kleinfelder performed supplemental soil reconnaissance to characterize soils present in the area south (upstream) of the Ridgecrest Solar Power Project (RSPP or Project). Our work included sending a soil scientist into the field to walk into the areas upstream of the site, visually document the soil and vegetation condition, and obtain representative soil samples for additional laboratory testing. This addendum letter presents a summary of this supplemental work. We previously performed a preliminary geotechnical investigation for the subject site and published the results of our investigation in our report dated August 27, 2009. This addendum letter supplements our August 26, 2009 "Preliminary Geotechnical Investigation Report" for the subject project. The conclusions and recommendations presented in our August 26, 2009 report remain valid.

PROJECT AND SITE DESCRIPTION

We understand that Solar Millennium intends to develop an approximately 1,440-acre area within a 3,920-acre project site. The project plans to generate approximately 250 megawatts (MW) of power with a single power plant utilizing two solar fields. Based on the information provided to date, the power block will include associated structures and equipment such as a switch yard, retention/detention basin(s), cooling tower(s), steam turbines, and numerous lightly loaded structures. Building construction will include a single-story warehouse facility (approximately 30 feet tall) and a single-story administrative building.

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The entire site is generally undeveloped and covered with desert vegetation, jeep trails, and includes natural drainage swales or channels. A power transmission line traverses northwest-southeast at the west side of the site. The entire site has an overall topographic relief of about 200 feet, with generally level areas, some mildly undulating terrain, and rock outcroppings with elevations up to 2,892 feet at the southeastern portion of the site. We understand that post-development site grades will be on the order of 1% (current grades are approximately 2%).

PURPOSE AND SCOPE

The purpose of Kleinfelder's scope of services presented below was to describe soils and vegetation present in the area south of the Project for use in developing Curve Numbers (CN). The development of CNs is necessary to complete hydrological modeling for storm water design. Curve numbers are a measure of the potential for infiltration at a site and are based on the Hydrologic Soils Group (HSG) of the soils present, the type and condition of the vegetation and the percentage of bare ground. Our scope of services included site reconnaissance, in-situ and laboratory testing, analysis, and preparation of this letter report as detailed below:

- Kleinfelder provided a team consisting of a senior soil scientist and a soil technician to evaluate the soils at nine locations requested by AECOM (see Figures 1a, 1b, and 2) to support AECOM's watershed evaluation up-gradient of the project site near Ridgecrest, California. Kleinfelder's team made qualitative and quantitative observations to evaluate soil characteristics, vegetation present, and factors that influence the hydrological properties of the soils present at the sample locations. Soils and vegetation data was collected at each of the nine locations to assess the physical characteristics necessary to support hydrological modeling of the watershed.

- In-situ density testing using sand cone was performed at each of the nine locations described above and following field reconnaissance, laboratory testing was performed on surface and near surface soil samples collected at each location. Laboratory testing included sieve analysis (including hydrometer) to aid in soil textural analysis and rough order of magnitude assessment of hydraulic conductivity for comparison to results presented in Kleinfelder's August 26, 2009 report. The results of in-situ density testing are presented in Table 1, In-Situ Density Results. Results of sieve analysis are presented on Plates B-1 through B-3, Grain Size Distribution (attached).

- Preparation of this supplemental letter report that includes the following items:
  - Vicinity map and Site plan showing the approximate sample locations;
  - Discussion of the general environment of the Mojave Desert;
  - Descriptions of the soils sampled during our site reconnaissance;
  - Discussion of soil influence on hydrological characteristics;

- o Results of in-situ and laboratory testing;
- o Summary of our findings; and
- o Limitations of this work.

GENERAL ENVIRONMENT

The Mojave Desert is an arid environment characterized by low rainfall (less than 10 inches per year), extremes of temperature and elevation. At 2,289 feet above sea level it is characterized by hot days and cool nights. The mean annual temperature is 65º F. Temperatures can approach 120º F in July and August. Such high temperatures lead to many ecological adaptations by the native plants and animals of the Mojave. The average annual rainfall is 6.9 inches. The highest rainfall amounts typically occur in February. Rainfall intensity is generally low, the 2-yr, 6-hr rainfall is 0.7 inches per hour. Occasional thunderstorms can occur with greater intensity.

The vegetation of the Mojave Desert is characterized by a number of distinct plant communities and associations. Plant species and density are highly dependent upon available moisture, aspect, elevation, and soil. The vegetation community at the RSPP is classified as Creosote Bush Shrubland. Vegetation observed throughout the area south of the RSPP included: Creosote Bush (*Larrea tridentata*), Burrobush (*Ambrosia dumosa*), Cholla (*Opuntia spp*.), Brome (*Bromus spp*.), Mormon tea, (*Ephedra trifurca*), Shadescale (*Atriplex confertifolia*), Saltbush (*Atriplex canescens*), Bursage (*Ambrosia dumosa*), Filaree (*Erodium cicutarium*) and a large number of forbs in bloom.

The dominant soil orders in the Mojave Desert region are Aridisols and Entisols. These soils are typified by a thermic soil temperature regime, an aridic soil moisture regime, and mixed or carbonate mineralogy. They are generally well drained to excessively drained, loamy-skeletal or sand-skeletal, and shallow to very deep. The majority of the area south of the RSPP consists of soils formed in alluvium on bedrock surfaces at the base of steeper slopes, alluvial fans, fan aprons, and flood plains. The balances of the area are soils formed in residium and colluvium formed on limestone and volcanic hills and mountains. Variations from these general characteristics are reported in the site observations below.

SOIL DESCRIPTIONS

Field reconnaissance of the area south of the RSPP was carried out April 14, 15, and 16, 2010 by Stephen Caruana, Senior Agronomist and George Schubert, Soil Technician. Observations of site conditions were recorded on standard soil pedon description forms. Soil observations were made of surface conditions, characteristics of the soil horizons revealed by 18-inch to 60-inch deep hand excavations (hand auguring). Observed conditions and characteristics are summarized in the tables below:

Table 1. General Site Characteristics

Site No.	Lat/Long	Elevation (ft. MSL)	Aspect	Slope (%)
No. 1	N35°31.812'/W117°45.749'	2,900	North	5
No. 2	N35°31.348'/W117°45.135'	2,884	East	10
No. 3	N35°30.312'/W117°44.384'	2,969	East	4
No. 4	N35°30.904'/W117°44.304'	2,900	North	2
No. 5	N35°31.739'/W117°43.792'	2,854	West	4
No. 6	N35°31.872'/W117°42.573'	3,097	West	8
No. 7	N35°32.638'/W117°41.733'	3,048	Northeast	17
No. 10	N35°31.964'/W117°40.647'	3,140	West	5
No. 11	N35°30.907'/W117°40.401'	3,182	East	16

Table 2. Soil Textural Analysis (Laboratory)

Site No.	Depth (in)	% Gravel	% Sand	% Clay	% Silt	Texture
No. 1	0-8	40.0	49.1	13.3	37.6	Loam
No. 2	0-10	6.0	35.9	29.3	34.8	Clay loam
No. 3	0-6	45.0	60.8	21.6	17.6	Sandy clay loam
No. 3_{sub}	8-20	11.0	47.1	37.9	14.9	Sandy clay
No. 4	0-6	2.0	73.2	16.8	8.0	Sandy loam
No. 5	0-6	12.0	75.3	13.6	11.1	Sandy loam
No. 6	0-6	2.0	85.6	7.4	7.0	Loamy sand
No. 7	0-6	31.0	46.8	30.6	22.6	Sandy clay loam
No. 10	0-4	8.0	64.6	16.5	19.0	Sandy loam
No. 10_{sub}	4-10	3.0	74.4	8.0	17.6	Sandy loam
No. 11	0-6	12.0	74.0	9.6	16.4	Sandy loam

Table 3. Soil and Vegetation Characteristics

Site No.	Landform	Hydrological Soil Group (preliminary)	% Bare Ground	% Shrubs
No. 1	Alluvial Fan	A	55	25 - 30
No. 2	Lower slope	C	50	20
No. 3	Toeslope	C/D	75	20 - 25
No. 4	Valley floor	B	75	15
No. 5	Valley floor	B	75	25
No. 6	Foothill (midslope)	A	60	40
No. 7	Foothill (midslope)	C	55	25 - 30
No. 10	Foothill (midslope)	B	70	20
No. 11	Floodplain	B	60	25

SOIL INFLUENCE ON HYDROLOGICAL CHARACTERISTICS

In its simplest form, hydrologic soil group is determined by the water transmitting soil layer with the lowest saturated hydraulic conductivity and depth to any layer that is more or less water impermeable (such as a fragipan or duripan) or depth to a water table (if present). The least transmissive layer can be any soil horizon that transmits water at a slower rate relative to those horizons above or below it. For example, a layer having a saturated hydraulic conductivity of 9.0 micrometers per second (1.3 inches per hour) is the least transmissive layer in a soil if the layers above and below it have a saturated hydraulic conductivity of 23 micrometers per second (3.3 inches per hour). Water impermeable soil layers (USDA definition) are among those types of layers recorded in the component restriction table of the National Soil Information System (NASIS) database. The saturated hydraulic conductivity of an impermeable or nearly impermeable layer may range from essentially 0 micrometers per second (0 inches per hour) to 0.9 micrometers per second (0.1 inches per hour). For simplicity, either case is considered impermeable for hydrologic soil group purposes.

Soil map units are grouped into four hydrologic soil groups (HSGs). The groups are designated A, B, C, or, D. The characteristics of each group are described by the Natural Resources Conservation Service (USDA, 2007):

Group A—Soils in this group have low runoff potential when thoroughly wet. Water is transmitted freely through the soil. Group A soils typically have less than 10 percent clay and more than 90 percent sand or gravel and have gravel or sand textures. Some soils having loamy sand, sandy loam, loam or silt loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group A are as follows. The saturated hydraulic conductivity of all soil layers exceeds 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters (20 inches). The depth to the water table is greater than 60 centimeters (24 inches). Soils that are deeper than 100 centimeters (40 inches) to a water impermeable layer are in group A if the saturated hydraulic conductivity of all soil layers within 100 centimeters (40 inches) of the surface exceeds 10 micrometers per second (1.42 inches per hour).

Group B—Soils in this group have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded. Group B soils typically have between 10 percent and 20 percent clay and 50 percent to 90 percent sand and have loamy sand or sandy loam textures. Some soils having loam, silt loam, silt, or sandy clay loam textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments. The limits on the diagnostic physical characteristics of group B are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters (20 inches) ranges from 10.0 micrometers per second (1.42 inches per hour) to 40.0 micrometers per second (5.67 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters (20 inches). The depth to the water table is greater than 60 centimeters (24 inches). Soils that are deeper than 100 centimeters (40 inches) to a water impermeable layer or water table are in group B if the saturated hydraulic conductivity of all soil layers within 100 centimeters (40 inches) of the surface exceeds 4.0 micrometers per second (0.57 inches per hour) but is less than 10.0 micrometers per second (1.42 inches per hour).

Group C—Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted. Group C soils typically have between 20 percent and 40 percent clay and less than 50 percent sand and have loam, silt loam, sandy clay loam, clay loam, and silty clay loam textures. Some soils having clay, silty clay, or sandy clay textures may be placed in this group if they are well aggregated, of low bulk density, or contain greater than 35 percent rock fragments.

The limits on the diagnostic physical characteristics of group C are as follows. The saturated hydraulic conductivity in the least transmissive layer between the surface and 50 centimeters (20 inches) is between 1.0 micrometer per second (0.14 inches per hour) and 10.0 micrometers per second (1.42 inches per hour). The depth to any water impermeable layer is greater than 50 centimeters (20 inches). The depth to the water table is greater than 60 centimeters (24 inches). Soils that are deeper than 100 centimeters (40 inches) to a restriction or water table are in group C if the saturated hydraulic conductivity of all soil layers within 100 centimeters (40 inches) of the surface exceeds 0.40 micrometers per second (0.06 inches per hour) but is less than 4.0 micrometers per second (0.57 inches per hour).

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Group D—Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted. Group D soils typically have greater than 40 percent clay, less than 50 percent sand, and have clayey textures. In some areas, they also have high shrink-swell potential. All soils with a depth to a water impermeable layer less than 50 centimeters (20 inches) and all soils with a water table within 60 centimeters (24 inches) of the surface are in this group, although some may have a dual classification, as described in the next section, if they can be adequately drained.

The limits on the physical diagnostic characteristics of group D are as follows. For soils with a water impermeable layer at a depth between 50 centimeters and 100 centimeters (20 and 40 inches), the saturated hydraulic conductivity in the least transmissive soil layer is less than or equal to 1.0 micrometers per second (0.14 inches per hour). For soils that are deeper than 100 centimeters (40 inches) to a restriction or water table, the saturated hydraulic conductivity of all soil layers within 100 centimeters (40 inches) of the surface is less than or equal to 0.40 micrometers per second (0.06 inches per hour).

Dual hydrologic soil groups—Certain wet soils are placed in group D based solely on the presence of a water table within 60 centimeters (24 inches) of the surface even though the saturated hydraulic conductivity may be favorable for water transmission. If these soils can be adequately drained, then they are assigned to dual hydrologic soil groups (A/D, B/D, and C/D) based on their saturated hydraulic conductivity and the water table depth when drained. The first letter applies to the drained condition and the second to the undrained condition. For the purpose of hydrologic soil group, adequately drained means that the seasonal high water table is kept at least 60 centimeters (24 inches) below the surface in a soil where it would be higher in a natural state.

IN-SITU AND LABORATORY TESTING

Field density/moisture tests of near surface soils at each sample location were performed in general accordance with ASTM test procedures D-1556 (Density and Unit Weight of Soil in Place by the Sand Cone Method). The results of field density tests performed are presented in the following table.

Table 4. In-Situ Density Test Results

Site No.	USCS Soil Description	Dry Density (pcf)	Moisture Content %
No. 1	Silty Gravel	94.5	4.2
No. 2	Sandy Silt/Sandy Clay	88	8.3
No. 3	Silty Sand	92.9	4.4
No. 4	Silty Sand	95.3	3.4
No. 5	Silty Sand	91.1	3.6

Site No.	USCS Soil Description	Dry Density (pcf)	Moisture Content %
No. 6	Silty Sand	107.1	2.0
No. 7	Clayey Sand with Gravel	114.3	4.7
No. 10	Silty Sand	97.8	3.1
No. 11	Silty Sand	100.8	5.7

Sieve analysis tests were performed in general accordance with ASTM Test Method D 422 (including hydrometer analyses). The sieve analysis results are presented on the attached Plates B-1 through B-3. The soil descriptions presented in the table above are in general accordance with the Unified Soil Classification System (USCS) ASTM D2488-09 (visual-manual procedure).

PRELIMINARY ESTIMATES FOR STORMWATER INFILTRATION

The following information is presented for comparison with the results presented in Section 5.12, Preliminary Estimates for Stormwater Infiltration, of our referenced report dated August 26, 2009. Section 5.12 was provided for preliminary evaluation of the project site and the feasibility of stormwater infiltration systems. Saturated hydraulic conductivity (permeability) of a soil, when considering infiltration system design, may be approximated by correlation with the grain size distribution. Correlations do not generally account for the in-situ compaction and/or density of the infiltrating soils. The infiltration rate of a soil is a measure of vertical flow through an unsaturated or partially saturated soil and approximates the hydraulic conductivity or permeability of a soil when it becomes saturated. Consequently, when infiltration of precipitation (stormwater runoff) occurs for sufficient duration *and* where groundwater is deep (generally greater than 20 feet below the bottom of the infiltration system) and near impermeable or low permeable layers are also deep, the rate of infiltration generally approaches or is equivalent to the saturated hydraulic conductivity. Saturated hydraulic conductivity correlations based on laboratory grain size distribution testing presented herein range from 120 to greater than 12,000 minutes per inch (less than 0.005 to 0.5 in/hr). One sample grain size distribution correlates with a saturated hydraulic conductivity of 120 minutes per inch (0.5 in/hr). The majority of saturated hydraulic conductivity correlations range from 750 to greater than 12,000 minutes per inch (less than 0.005 to 0.08 in/hr).

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SUMMARY

A reconnaissance level soil survey was conducted in the area south of the RSPP on April 14-16, 2010. Observations included the characterizing of the soil profile at nine sample location (No.1,2,3,4,5,6,7,10,11) to a depth of 18 inches, observations of surface and vegetation conditions at the sample sites, laboratory textural analysis (hydrometer) on surface samples from the upper surface of the sample site (and subsurface at Site Nos. 3 and 10) were completed.

Soil textures at the site were observed to range from coarse sands to sandy clay loams, but were predominantly sandy loams. This was confirmed by the laboratory textural analysis. The soils were formed in alluvial deposits from the surrounding mountains. The vegetation at the site is dominated by creosote bush, with other low brush, cacti, annual forbs, and some introduced grasses in places. The surficial soils at the sample sites ranged from collections of a few small stones to boulders, to many fine gravels.

The nine soil sample locations are located from ½ mile to as much as 3 miles from the project site. These sample locations are all located upslope from the project area but within the watershed boundary and generally on steeper and more rolling terrain. These upslope soils exhibit greater variability and slightly different characteristics than the soils examined at the project site. The area upslope from the project site has greater topographic relief and a wider diversity of landforms. Sample Nos. 4 and 5 show the greatest similarity to the soils found at the project site. Characteristics of the soils in the upslope area are noted below.

Soil profiles were observed at the sample locations. Profiles were observed to a maximum depth of 18 inches. Soil colors ranged from brown to yellowish and reddish brown. Profiles were typically sandy loams over courser sands and were characterized by boulders, smaller stones and gravels at the surface with increasingly larger stones and cobbles at greater depth at several sites. Sites Nos. 2,3,4, and 7 were underlain by horizons with increasing clay content. These layers with increasing clay content are likely to decrease infiltration rates in these areas. The 11 (2 subsurface samples at Site Nos. 3 and 10) laboratory textural analysis measured sand content from 36% to 85%, silt content from 7% to 38%, and clay content from 8% to 38%. The average from the measured sites was 62.4% sand, 18.8% silt, and 18.6% clay; characterized as a sandy loam. The average hydrologic soil group for the area is a B; however as referenced above several sites are underlain by clayey horizons and as such would be classified as either group C or C/D. These observations are consistent with the published descriptions for the soil series that comprise the components of the three general soil map units mapped across the area south of the RSPP in the General Soil Map of California. Soils at Sites Nos. 1, 3, and 7 were observed to contain in excess of 25% gravels in the surface layer and would be described as very gravelly. Observed and measured soil characteristics and percentage ground cover are graphically displayed in Figures 4 and 5.

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Hydraulic conductivity (permeability) correlations based on laboratory grain size distribution testing ranged from 4,600 to 7,300 minutes per inch (0.008 to 0.01 in/hr).

LIMITATIONS

Soil surveys are conducted for differing planning purposes. The complexity of a soil survey is designated by Order. An Order 5 survey is the least detailed, usually conducted at a scale of 1:250,000 to 1:1,000,000. The minimum size delineation can approach 10,000 acres. The most detailed soil survey is an Order 1 survey; the scale is usually less than 1:12,000, with minimum polygon delineations of less than 1.5 acres.

The commonly published soil surveys of the USDA Natural Resources Conservation Service (NRCS) are classified as 2nd Order surveys at a scale of 1:20,000 with delineations of 1.5 to 10 acres. The published soils data available for the area of the RSPP is a 4th Order survey, derived from the United States General Soil Map (Soil Survey Staff). There are three soil map units identified in the general area south of the RSPP. A soil association is a group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

In the general area south of the RSPP there are three of these map units (see Figure 3). They are the Wasco-Rosamond-Cajon map unit through the central portion of the site, the Trigger-Sparkhule-Rock outcrop map unit along the western edge, and the Trigger-Rock outcrop-Calvista map unit along the eastern portion of the area.

Characterization of the sample site locations was limited to the excavation of small pits (generally to 18 inches with a sharpshooter), hand augering to bedrock or 60 inches, descriptions of prevalent vegetation and soil characteristics with a potential to influence infiltration. Adjustments to the sample location was made at Site No. 2 in order to choose a location representative of landscape conditions and topography.

The infiltration rates and/or hydraulic conductivities provided in this report reflect an order of magnitude accuracy based on the soil samples collected and tested during investigations. Significantly greater or lower actual infiltration rates and/or hydraulic conductivities for site soils will result in an increase or decrease in the actual changes in ground water conditions, ground water mounding and flow rates from those estimated above.

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CLOSING

This letter has been prepared to supplemental information presented in our August 26, 2009 report and our April 22, 2010 addendum letter. The conclusions and recommendations presented in our August 26, 2009 report remain valid. This letter is subject to the limitations presented above and in our August 26, 2009 report.

We appreciate the opportunity to provide continuing services on this project. If you have any questions or need additional information, please contact this office.

Respectfully submitted,

KLEINFELDER WEST, INC.

REGISTERED PROFESSIONAL ENGINEER
CARL ERIC PHILIPS
No. 2788
EXP. 9-30-11
GEOTECHNICAL
STATE OF CALIFORNIA

C. Eric Philips, P.E., G.E
Senior Geotechnical Engineer

Stephen Caruana
Environmental Planning & Permitting Leader

Attachments:
- References
- Plates B-1 through B-3 – Grain Size Distribution
- Figures 1a and 1b - Site Locations, Aerial Base
- Figure 2 - Site Locations, Topographic Base
- Figure 3 – California General Soils Map
- Figure 4 – Surface/Subsurface Soil Texture
- Figure 5 – Percentage Bare Ground

REFERENCES

Kleinfelder (2010), "Addendum to Preliminary Geotechnical Investigation Report, Solar Millennium Concentrating Solar Power Project, Ridgecrest, Kern County, California" Kleinfelder West, Inc. Dated April 22, 2010 Document Number 104961/LAN10L001

Kleinfelder (2009), "Preliminary Geotechnical Investigation Report, Solar Millennium Concentrating Solar Power Project, Ridgecrest, Kern County, California" Kleinfelder West, Inc. Dated August 27, 2009 Document Number 104961.Rid/FRE9R324

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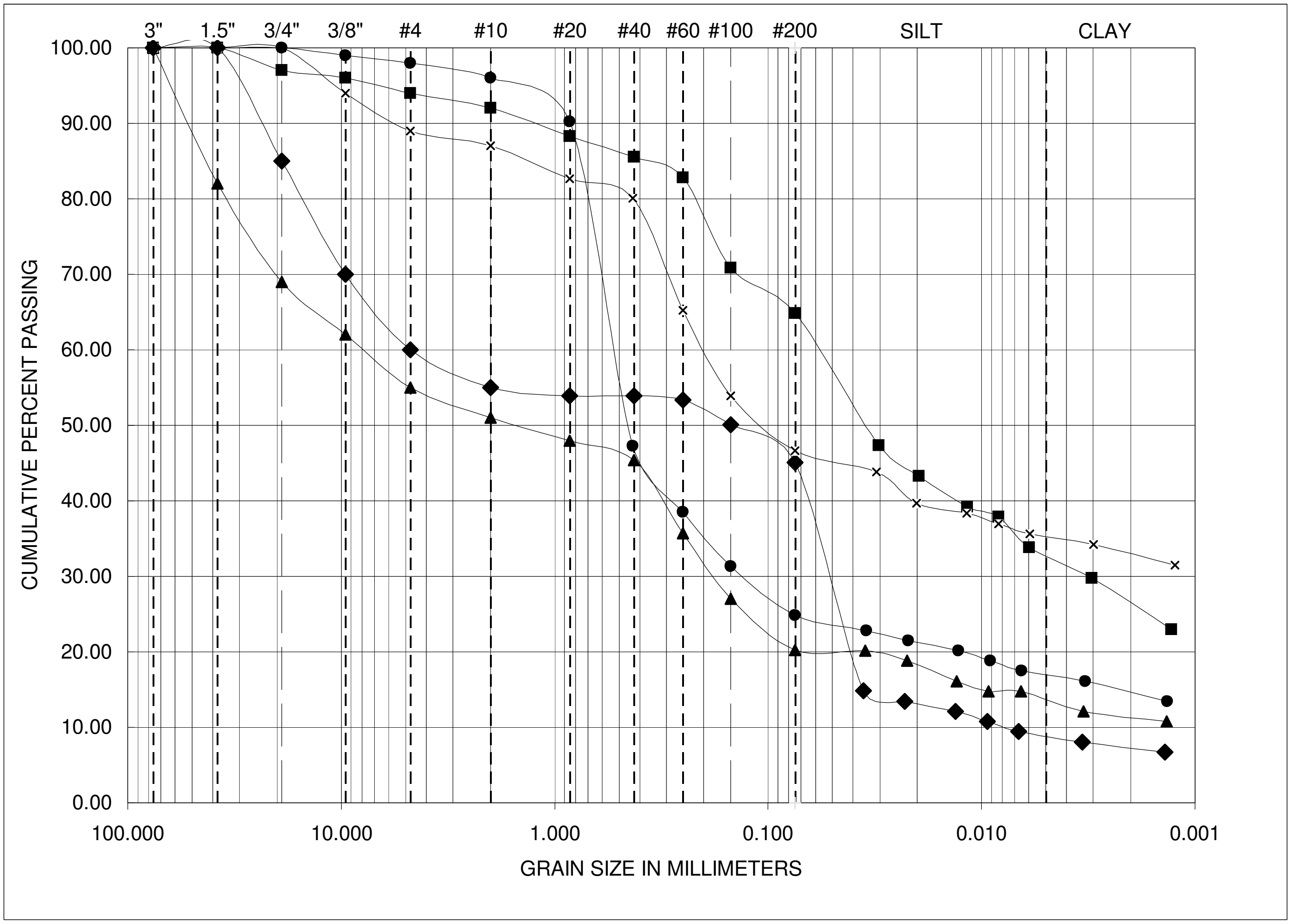
U.S. Department of Agriculture, Natural Resources Conservation Service. 2007. National Engineering Handbook, title 210-VI. Part 630, Chapter 7. Washington, DC.

KLEINFELDER 523 West 6th Street, Suite 620, Los Angeles, CA 90014 **p |** 213.622-3706 **f |** 213.612.4954

PLATES



COBBLE	GRAVEL	SAND	SILT	CLAY

SYMBOL	SAMPLE IDENTIFICATION			PERCENTAGES			ATTERBERG LIMITS			SOIL CLASSIFICATION	USCS TOTAL SAMPLE
	BORING NO.	SAMPLE NO.	DEPTH	GRAVEL	SAND	FINES	LL	PL	PI		
◆	1	1	0-8"	40	15	45.1	--	--	--	silty Gravel	GM
■	2	2	0-10"	6	29	64.9	--	--	--	sandy Silt/sandy Clay	ML/CL
▲	3	3	0-6"	45	35	20.2	--	--	--	silty Sand	SM
X	3	4	8-20"	11	42	46.6	--	--	--	clayey Sand	SC
●	4	5	0-6"	2	73	24.8	--	--		silty Sand	SM

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PROJECT NO **104961**

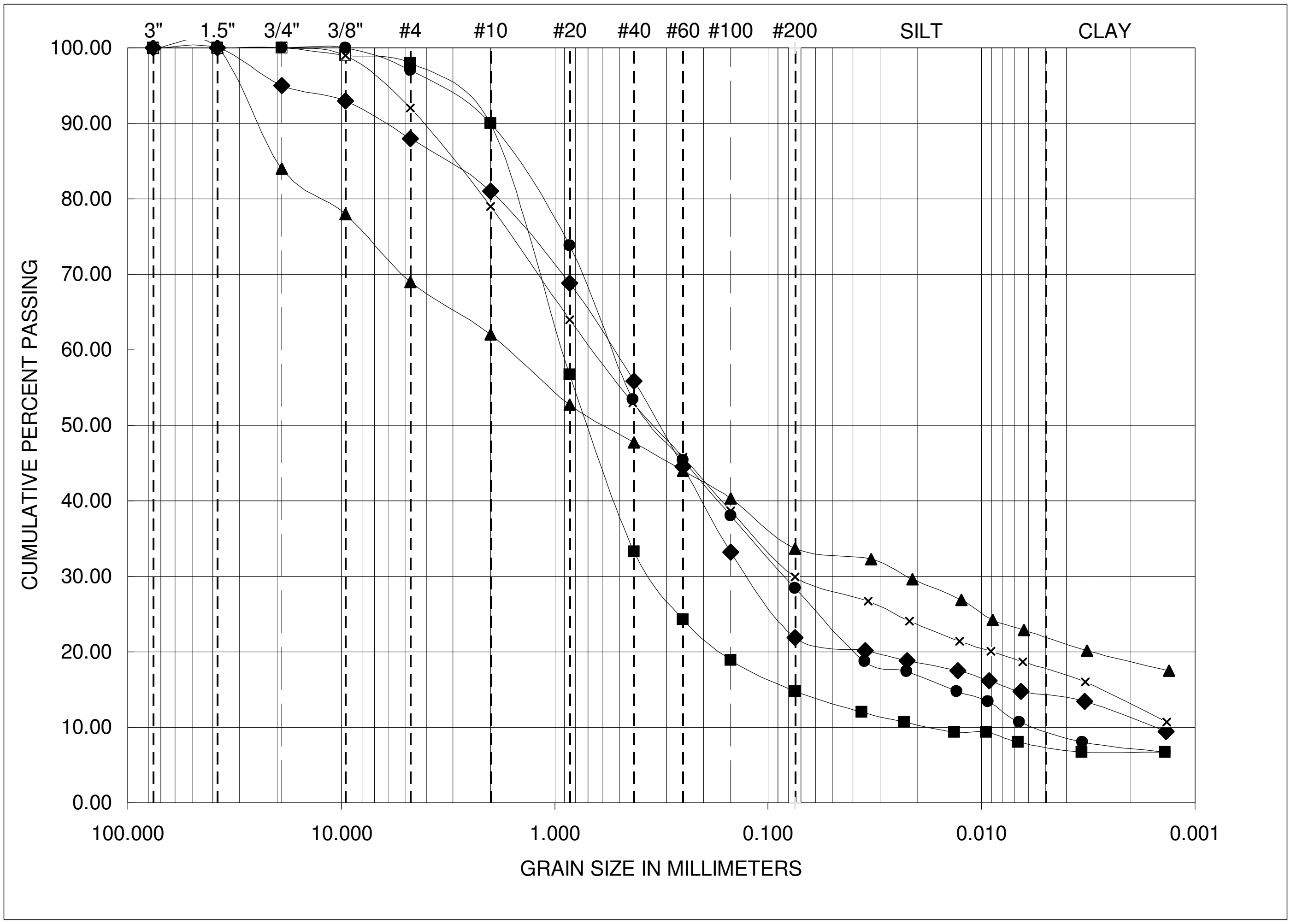
RIDGECREST - SOLAR MILLENNIUM

RIDGECREST, CALIFORNIA

GRAIN SIZE DISTRIBUTION

PLATE

B-1



COBBLE	GRAVEL	SAND	SILT	CLAY

SYMBOL	SAMPLE IDENTIFICATION			PERCENTAGES			ATTERBERG LIMITS			SOIL CLASSIFICATION	USCS TOTAL SAMPLE
	BORING NO.	SAMPLE NO.	DEPTH	GRAVEL	SAND	FINES	LL	PL	PI		
♦	5	6	0-6"	12	66	21.9	--	--	--	silty Sand	SM
■	6	7	0-6"	2	83	14.8	--	--	--	silty Sand	SM
▲	7	8	0-6"	31	35	33.7	--	--	--	clayey Sand w/gravel	SC
X	10	9	0-4"	8	62	29.9	--	--	--	silty Sand	SC
●	10	10	4-10"	3	69	28.4	--	--		silty Sand	SM

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PROJECT NO 104961

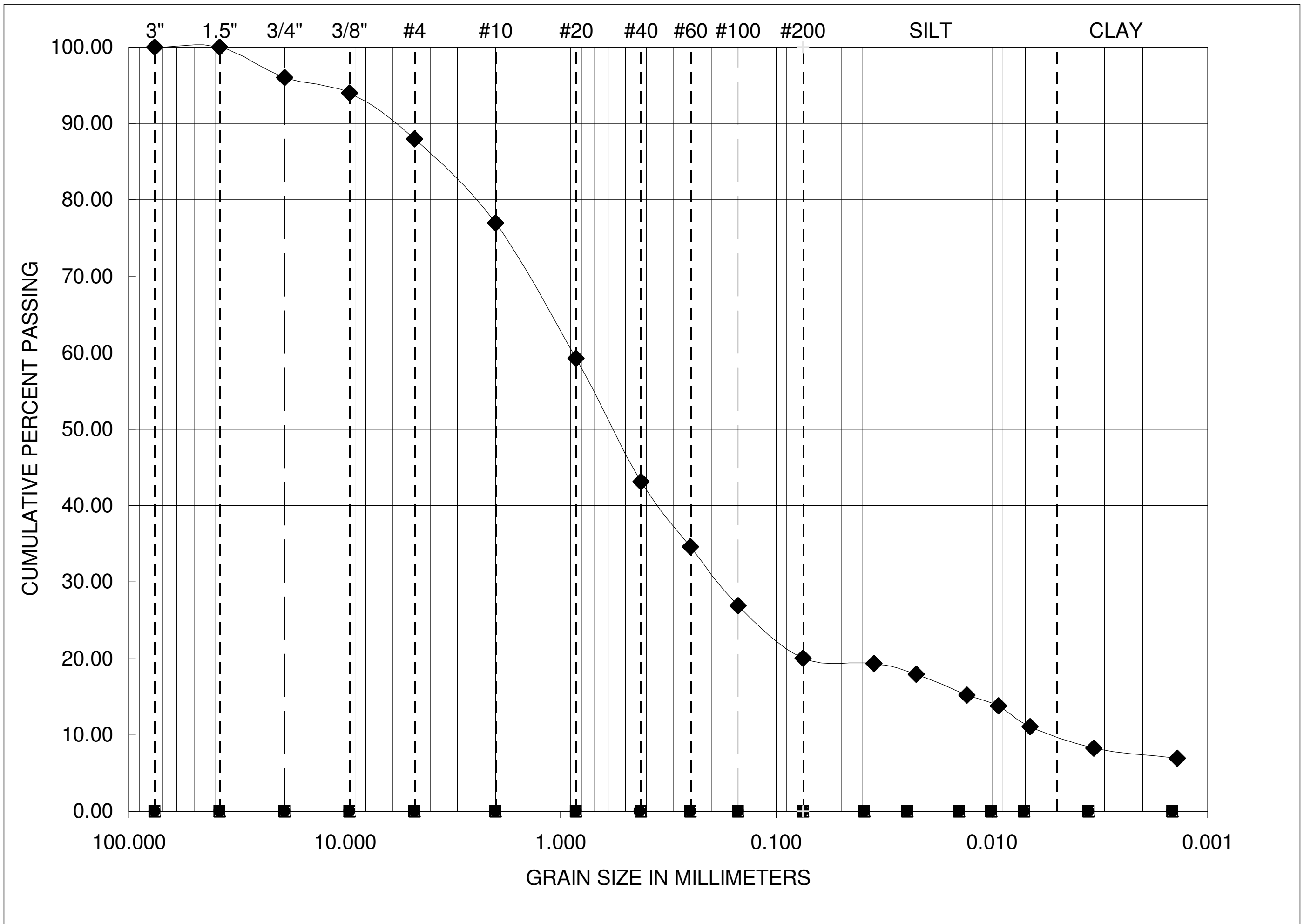
RIDGECREST - SOLAR MILLENNIUM

RIDGECREST, CALIFORNIA

GRAIN SIZE DISTRIBUTION

PLATE

B-2



COBBLE	GRAVEL	SAND	SILT	CLAY

SYMBOL	SAMPLE IDENTIFICATION			PERCENTAGES			ATTERBERG LIMITS			SOIL CLASSIFICATION	USCS TOTAL SAMPLE
	BORING NO.	SAMPLE NO.	DEPTH	GRAVEL	SAND	FINES	LL	PL	PI		
♦	11	11	0-6"	12	68	20.0	--	--	--	silty Sand	SM

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PROJECT NO 104961

RIDGECREST - SOLAR MILLENNIUM

RIDGECREST, CALIFORNIA

GRAIN SIZE DISTRIBUTION

PLATE

B-3

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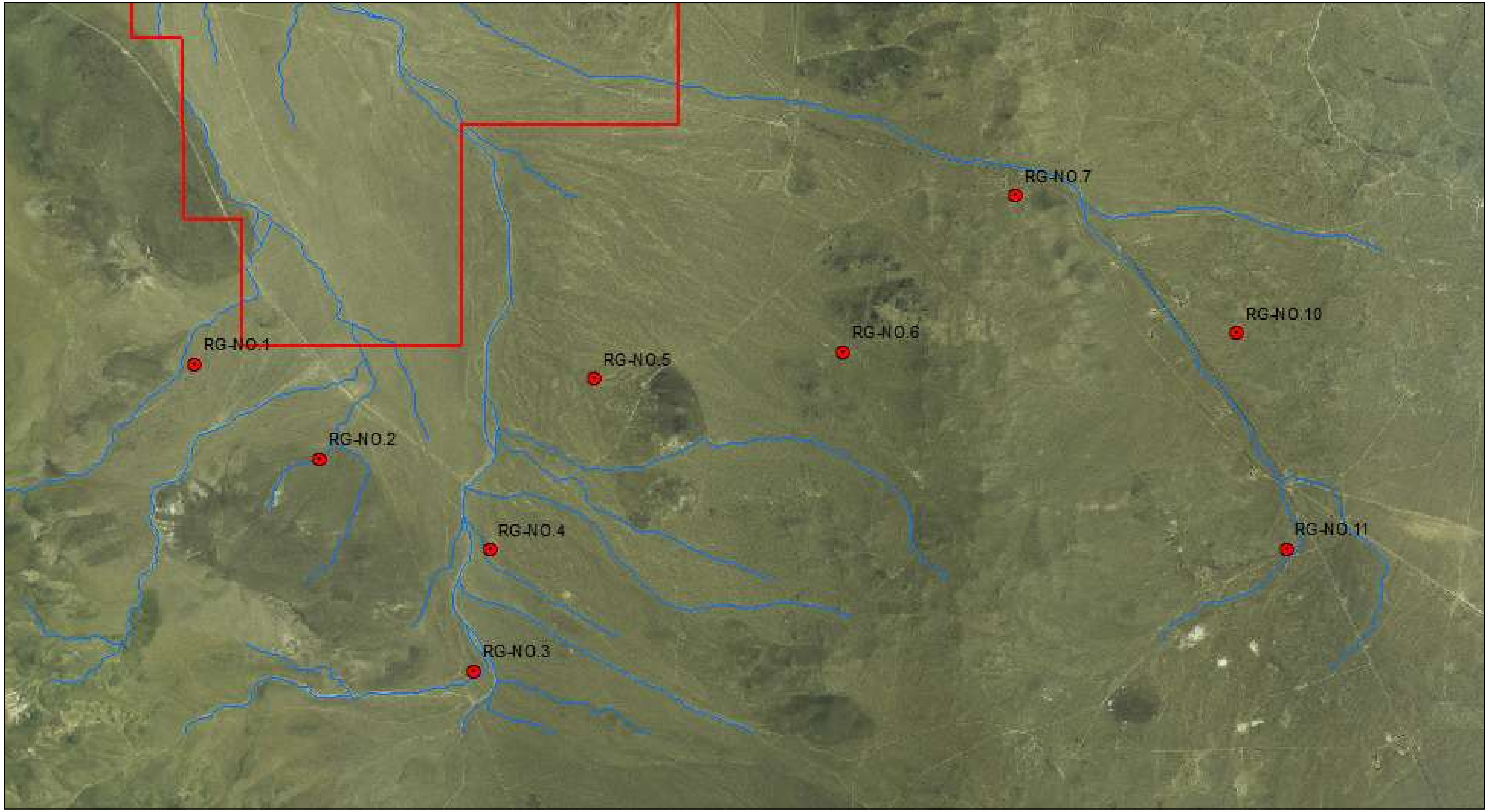
FIGURES

KLEINFELDER Bright People. Right Solutions.	PROJECT NO. 104961	Site Locations Aerial Base	FIGURE
	DRAWN: SCC		1a
	DRAWN BY: SCC		
	CHECKED BY:	Ridgecrest Supplemental Soil Assessment Ridgecrest, CA	
	FILE NAME:		



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PROJECT NO.	104961	Site Locations Aerial Base	FIGURE
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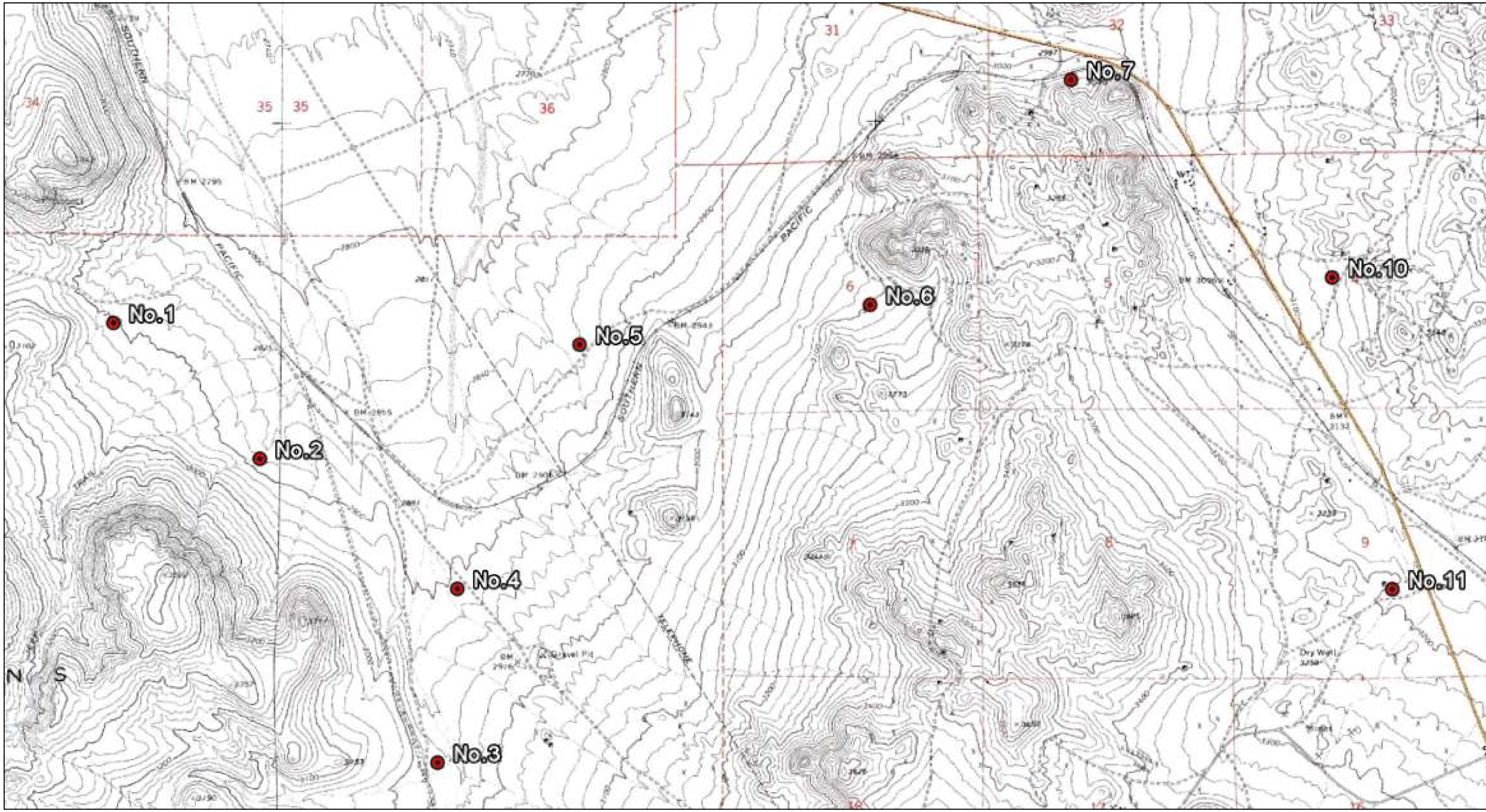
DRAWN BY:	SCC		
CHECKED BY:		Ridgecrest Supplemental Soil Assessment Ridgecrest, CA	
FILE NAME:			



PROJECT NO.	104961
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FILE NAME:	

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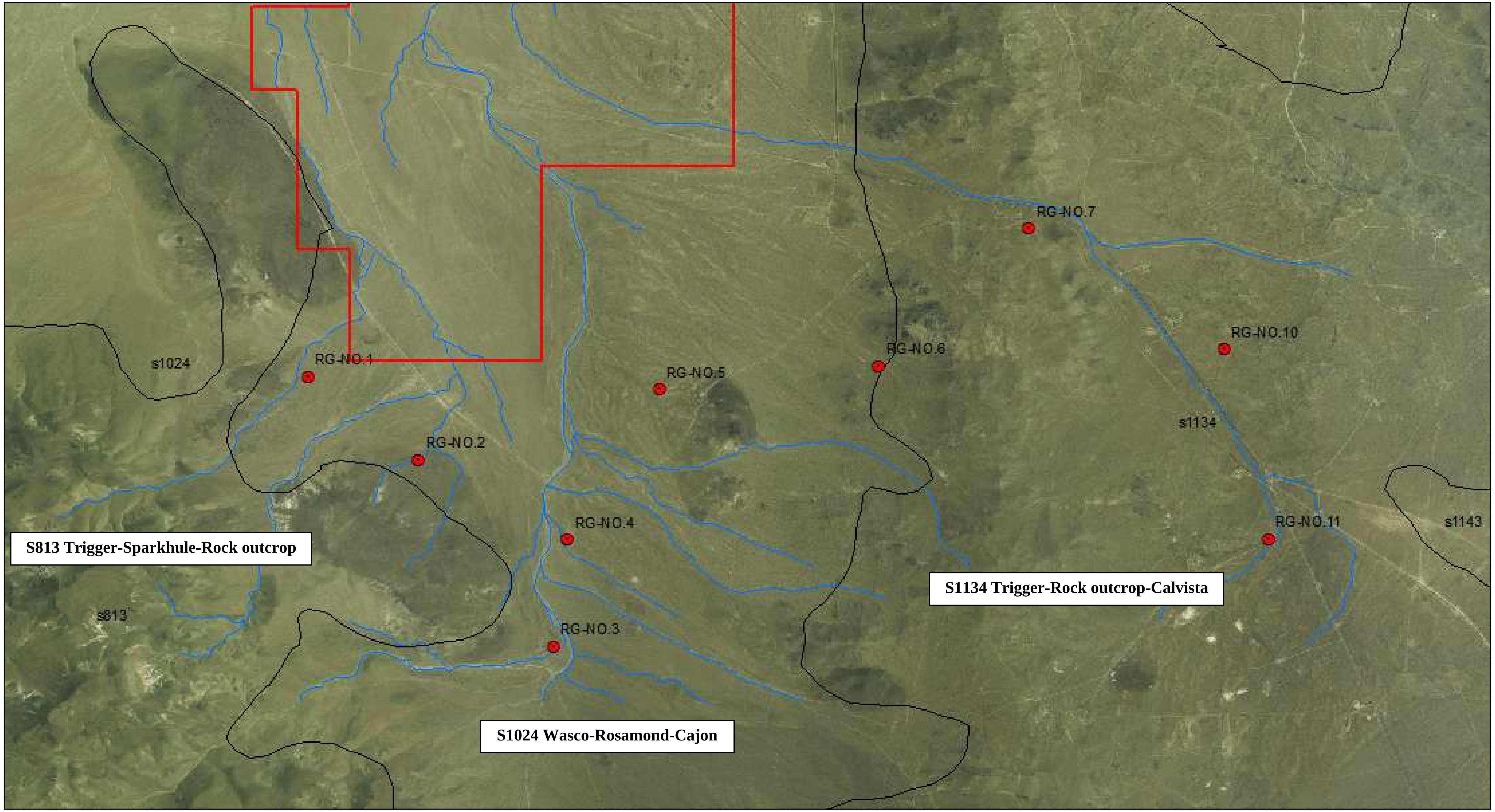
Site Locations
Topographic Base

Ridgecrest Supplemental Soil Assessment
Ridgecrest, CA

FIGURE
2



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PROJECT NO.	104961
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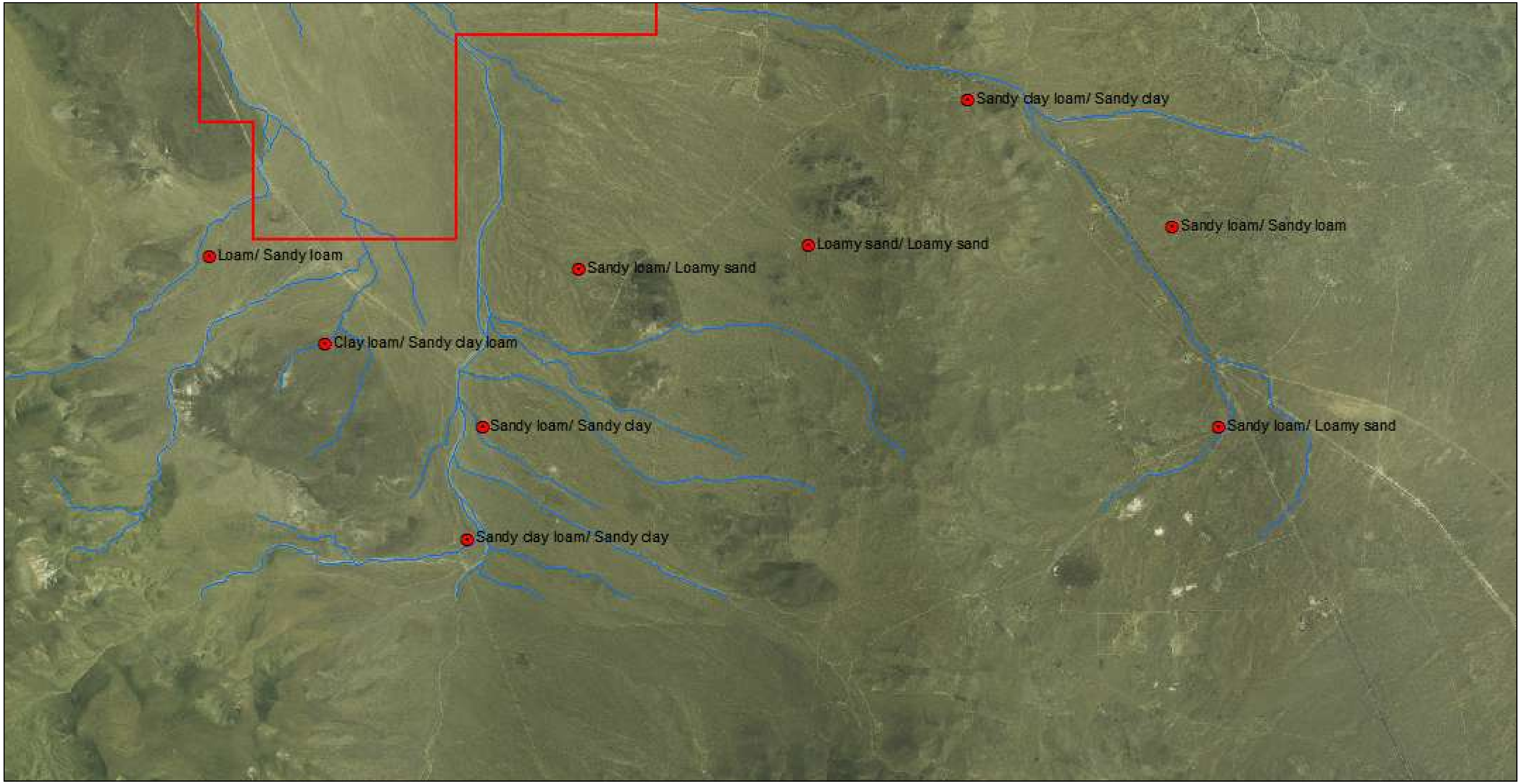
CHECKED BY:	
FILE NAME:	

California General Soils Map

Ridgecrest Supplemental Soil Assessment
Ridgecrest, CA

FIGURE
3



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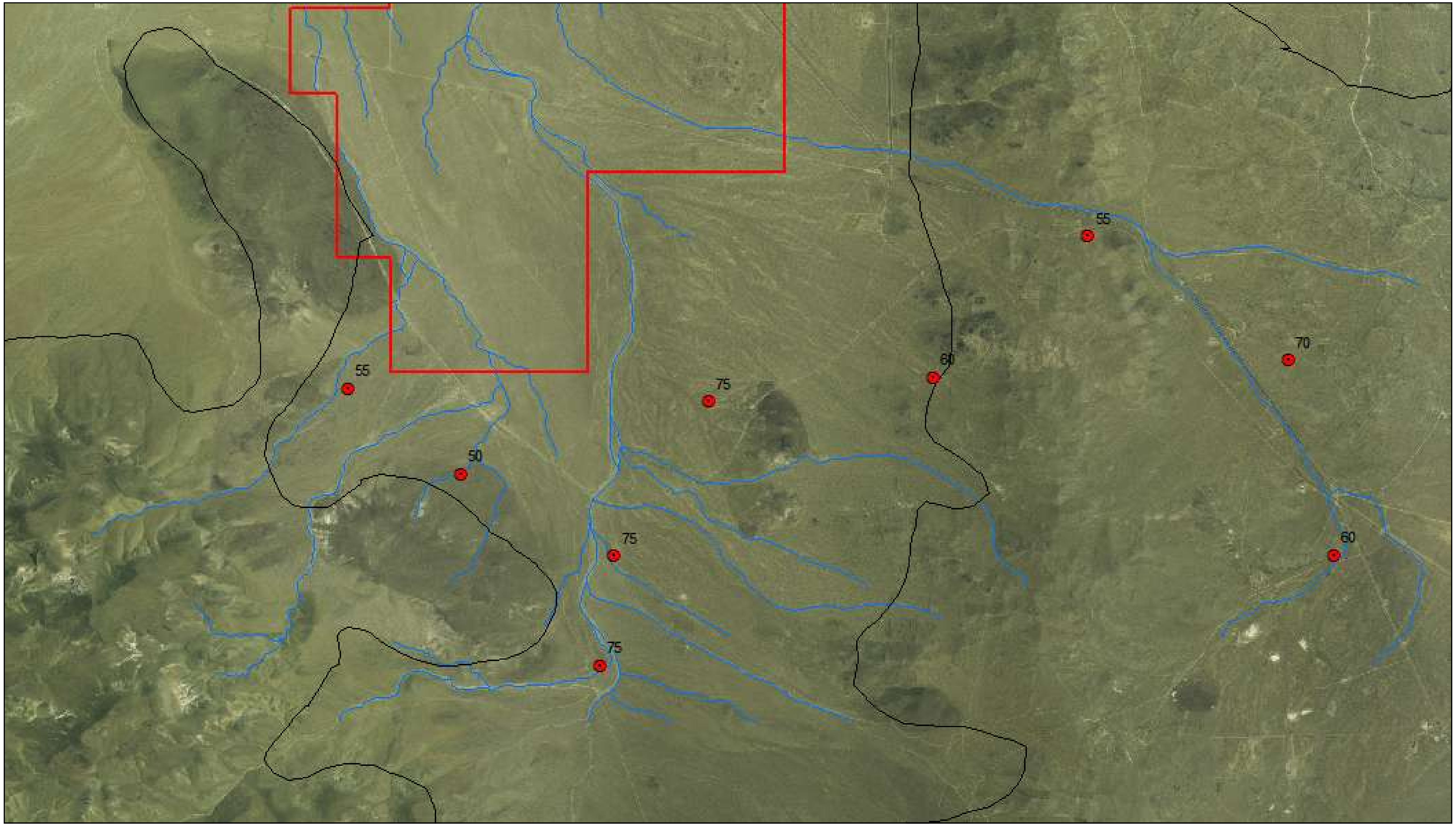
PROJECT NO.	104961	Surface/Subsurface Soil Texture	FIGURE
DRAWN:	SCC		4
DRAWN BY:	SCC		
CHECKED BY:		Ridgecrest Supplemental Soil Assessment Ridgecrest, CA	
FILE NAME:			



KLEINFELDER Bright People. Right Solutions.	PROJECT NO. 104961	Percentage Bare Ground	FIGURE
	DRAWN: SCC		5
	DRAWN BY: SCC		
	CHECKED BY:	Ridgecrest Supplemental Soil Assessment Ridgecrest, CA	
	FILE NAME:		