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INTRODUCTION

This report presents the results of a controlled source audio magnetotellurics / magnetotellurics (CSAMT/MT) geophysical survey conducted over Lithium Energy Products Inc.'s Jackpot Lake mining claims near Las Vegas, Nevada. The purposes of the survey are to delineate basinal features, map geologic stratigraphy and structure relative to the occurrence of lithium-bearing brine, identify conductors that are thought to be representative of lithium-bearing brine, and provide information for the selection and design of additional geophysical surveys or the identification of drilling locations.

METHODOLOGY

Refer to Appendix A for a description on the methodology of CSAMT/MT surveying.

DATA ACQUISITION AND PROCESSING

Data were acquired for this project with a *StrataGem EH4* CSAMT / MT system manufactured by Geometrics Inc. of San Jose, California. A graphical representation of the field setup of the CSAMT / MT instrumentation used in this project is shown in Figure 1. In essence, electric dipoles (Ex and Ey) and magnetometers (Hx and Hy) were laid out in perpendicular directions and both natural and transmitted frequencies were recorded from distant and non-polarized sources. Because of anticipated extremely low resistivities in the survey area it was necessary to acquire data in two frequency modes (termed "low" and "high") at each station in order to investigate to depths greater than 200 to 300 meters. The low frequency option used low frequency magnetometers, 100 meter electric dipoles, porous pot electrodes (filled with $CuSO_4$ and potable water) and recorded data in two overlapping frequency bands: 0.1 to 75 Hz and 50 to 1,000 Hz. The high frequency option used high frequency magnetometers, 50 meter electric dipoles, stainless steel electrodes and recorded data in three overlapping frequency bands: 10 to 1,000 Hz, 500 to 3,000 Hz, and 750 to 92,000 Hz. For each CSAMT / MT station, or sounding, the magnetic sensors and electric dipoles were oriented with a Brunton field compass so that all components in each direction were parallel (i.e., Ex and Hx were parallel to each other as were Ey and Hy).

The assumed regional geologic strike in the survey area is approximately N30°E and is based upon the N30°E strike of a dominant bedrock trough in the Jackpot Lake area as determined from modeled gravity data from a recently completed survey and on previous professional experience in the Basin and Range geologic province. If geoelectric strike (which may or may not be the same as geologic strike) is known then measured resistivities with the E field oriented parallel to strike are referred to as transverse electric (TE) mode measurements, while resistivities with the E field oriented perpendicular to strike are referred to as transverse magnetic (TM) mode measurements. The Ex and Hx components were originally oriented at N30ºE while the Ey and Hy components were oriented at N60°W so that the data could be processed in either the TE or TM mode. However, with those orientations a high amount of electromagnetic noise was apparent in the first test station and was probably caused by coupling with existing nearby power lines and a petroleum products pipeline as shown in Figure 3. Therefore, it was necessary to rotate the CSAMT/MT array such that the components were approximately 45° to the anticipated noise sources to minimize the noise (i.e., Ex and Hx were orientated at N15°W, and Ey and Hy were orientated at N75°E). During data processing the orientations were rotated back to the original N30°E based directions to facilitate TE or TM modes processing.

For acquisition of data in the low frequency mode, small holes were dug at the end of each electric dipole to a depth of a few centimeters and then the porous pots were firmly placed within the holes. To ensure good grounding and to minimize contact resistances, prior to any readings a weak mixture of table salt (NaCl) and potable water was poured into the holes dug for the low frequency option porous pots, around the high frequency stainless steel electrodes at each end of the electric dipoles, and around the grounding electrodes of the *StrataGem EH-4*'s AFE (see Figure 1) and transmitter. Because of periodic wind, the magnetometers were buried at least 0.3 meters to eliminate micropulsations that will cause signal noise. Digging the holes for the porous pots and burying the magnetometers (particularly the low frequency option magnetometers that are approximately 1.5 meters long) decreased production rates but ensured high quality data. The instrument gains were independently set before collecting data at each station with identification of possible interference and other quality control procedures assessed before recording the data. After adjusting the gains, in the low frequency mode fifty runs of time series data were recorded for the band from 0.1 to 75 Hz and fifteen runs were recorded for the band from 50 to 1,000 Hz. Also, an additional set of fifty runs of low frequency mode data were acquired with increased gains within the band from 0.1 to 75 Hz. For the high frequency option, fifteen runs of time series data were separately obtained in the three frequency bands. Both low frequency option bands and the lowest high frequency band recorded only natural signals, the middle high frequency band encompassed both natural signals and about five separate transmitted frequencies, and the highest high frequency band recorded signals from fifteen separate transmitted frequencies in addition to any natural signals present. The *StrataGem EH-4* is a broadband instrument and as such will record signals of any frequencies within its operating range. The transmitter is used to augment the typically lower amplitude signals in the middle and highest frequency bands. The data from each sounding were stored on the instrument's compact flash drive and downloaded to a laptop PC at the end of each field day.

Figure 2 is a screen dump of example raw data acquired with the *StrataGem EH-4*, although not from this project area. The lower right portion of the figure presents a one-dimensional model, which is labeled as "true" resistivity. This model is generally only useful for simple, layered geologic environments and is only marginally applicable to this project area. The X-axis for each of the three plots within the upper right portion of the figure is logarithmic frequency and the top plot is scalar resistivity ranging logarithmically from 1 to 500 ohm-meters, the middle plot is scalar phase from 0º to 90º, and the bottom plot is scalar coherency from 0 to 1.0. On each plot, data from the X direction are shown as diamonds while the Y direction data are squares. Under ideal circumstances and in areas with no appreciable geologic structures, the X and Y direction data should fall nearly on top of each other in the resistivity plot, have a phase close to 45º, and a coherency around 1.0.

CSAMT/MT data were acquired at 23 stations (resulting in 69 separate readings) along six lines. Initial modeling was done daily to confirm the quality of the data and to determine if additional stations were warranted; however, the initial modeling was not the rigorous type done later and thus was only used as a guide. From the initial modeling it was determined that two of the originally designed 20 station locations had marginal data quality and they were replaced with stations farther away from the power lines and an additional station was added along line 2 near its western end to better define an area of interest. Therefore, a resulting final total of 21 stations are included in this report as shown in Figure 3. Planned station intervals were 450 meters, but because of excessive electromagnetic noise or the results of initial, quick modeling some station intervals were decreased to 225 meters. Overall the CSAMT/MT data were mostly considered good to very good quality. Low natural signal amplitudes adversely affected some of the low and middle frequency band data. Surveys in remote or quasi-remote areas often yield soundings with anomalous impedance phase values for those portions of the soundings where the natural field strength is low. Also, the farther north or south one goes from the Earth's equator the amplitude in the middle band, and also to a certain extent within the other bands, decreases even more. Because of the quality of the data and the relatively large station intervals, the data were processed in the scalar mode.

Over a two-dimensional earth, the TE and TM modes give different apparent resistivity values and are sensitive to different aspects of the subsurface structure. The TE mode is most sensitive to conductors, whereas the TM mode is most sensitive to resistors and shallow structure. The TE mode is purely inductive, while the TM mode additionally has a galvanic component inherent in its response. This makes the TM mode higher resolution with respect to defining lateral contacts. When searching for vertical conductors the TM mode is only weakly excited, while the TE mode can show a very strong response with large spatial extent. Therefore, the interpretation weight of each mode depends on the target orientation (vertical, horizontal), the nature of the target (resistive, conductive) and the quality of the data. Because conductive targets, although with perhaps both vertical and horizontal structure, are the primary targets for this survey the data have been processed and interpreted in the scalar TE mode.

CSAMT / MT data from each station are initially inspected and edited when appropriate. Editing of the data is somewhat subjective but is based upon experience, juxtaposition of X and Y direction resistivity data, phase differences from the optimum value of 45º, and coherency. Generally resistivity values above about 40,000 Hz, around 1,000 Hz and below approximately 0.2 Hz (typical noisy high frequency and low natural signal amplitude frequencies) are often edited out as are a few other selected frequencies where either the phase or coherency of the data is not considered acceptable. Two-dimensional depth sections are then modeled along profiles. These models are constructed through a combined use of Geometrics' *ElectroMagnetic Array Profile (EMAP)* transform software that calculates the Bostick transform resistivities from the CSAMT / MT data and Schlumberger's *WinGLink* software that calculates a two-dimensional smooth inversion using finite difference code. Each depth section consists of logarithmic resistivity versus depth along relatively straight lines. Subsequently, values for each sounding are converted into a format compatible with the *Tecplot Focus 2017 R2* computer program (version 2017.2.0.79771, 64-bit) and presented as two- and three-dimensional cross-sections in depth format. Additionally, data are interpolated into a rectangular cube and horizontal depth slices, referenced to the surface, are shown in movies at intervals of 10 meters from the surface to a depth of 750 meters.

RESULTS

The geologic map prepared by Beard, et al (2007) includes all of the CSAMT / MT survey area. The Arrow Canyon Range to the west of the survey area is composed of PMb (Bird Spring Formation, lower Permian to upper Mississippian) which is described as thin to thick bedded limestone and dolomite with calcareous sandstone, siltstone, and layers and nodules of chert. Also on the west side of the survey area are surficial deposits of QTa (lower Pleistocene to upper Pliocene sidestream alluvium) and Q2a (middle to lower Pleistocene older sidestream alluvium). To the east of the survey area the Dry Lake Range also consists of PMb with relatively large surficial deposits of QTk (lower Pleistocene to upper Pliocene calcrete) and small outcrops of Pr (Permian red beds described as medium- to fine-grained sandstone and siltstone that is locally gypsiferous), Tmf (fine-grained facies of the Tertiary Muddy Creek Formation described as interbedded pink sandstone, siltstone and claystone as well as lesser amounts of gypsum and gypsiferous sandstone and siltstone) and T2k (lower Pliocene calcrete deposits). PMb primarily outcrops to the south of the survey area and it is unknown, but expected, that PMb also outcrops to the north. Surficial deposits within the Dry Lake Valley itself (termed Jackpot Lake for this survey) are primarily Q1a (upper to middle Pleistocene intermediate-age sidestream alluvium), Qa (young Holocene alluvium), Qe (Holocene to Pleistocene eolian deposits) and Qp (Holocene to Pleistocene playa deposits) with small outcrops of QTa.

There are two main factors that must be considered regarding target areas for lithium mineralization and concentration: 1) where is the source of the lithium, and 2) does a basin environment exist for the concentration of the lithium transported by meteoric water from the source? In the Jackpot Lake vicinity it is thought that the Muddy Creek Formation contains various saline deposits that are rich in lithium as well as other alkali metals and alkaline earths. Once lithium has been liberated into the water system it remains highly mobile and movement of the lithium with surface water and groundwater will follow basic hydrological principles. Hydrologic basins in Nevada consist of basin fill underlain by either low-permeability or permeable rock with water movement through the basin fill, permeable rock and along faults. Nothing more complex than a topographic low or closed basin is required to concentrate lithium-bearing water. For topographic lows with larger catchment areas there is a greater opportunity to accumulate lithium from wider sources. The water trapped in these lows may move through dipping aquifers until it reaches an impermeable barrier such as a fault scarp.

Resistivities along the six CSAMT / MT survey lines range 0.83 to 23.87 ohm-meters as shown in Table 1, in Figures 4 through 9 for the individual lines and for all six lines together in Figure 10. The lower resistivities occur above modeled bedrock depth (which approaches 625 meters as modeled in the April 2017 Lithium Energy Products gravity survey), but in the upper portions of the bedrock the resistivities are still considered relatively low probably because of weathering or fracturing that allows brine or groundwater to infiltrate. Somewhat arbitrary resistivity values for potential lithium-brine occurrence are considered to be less than or equal to 2.7 ohm-meters for possible higher concentration brine and between 2.7 and 5.0 ohm-meters for possible moderate concentration brine. These ranges are based upon experience in other basins and the interpretation that values greater than about 5.0 ohm-meters may be more reflective of clay or considerably reduced brine concentration. Shown in Table 1 are the approximate depth ranges and median depths of the six depth sections for the less than or equal to 2.7 ohm-meters resistivity material and the less than or equal to 5.0 ohm-meters resistivity material (which combines the material with less than or equal to 2.7 ohm-meters resistivities for possible higher concentration brine and the between 2.7 and 5.0 ohm-meters resistivities for possible moderate concentration brine).

Table 1: Depth Range and Thickness Along Survey Lines of Arbitrary Resistivity Values for Possible Higher and Moderate Concentration Lithium-Brine Occurrence

Line	Resistivity Range (ohm-meters)	<=2.7 ohm-m ~Depth Range (meters)	<= 5.0 ohm-m ~Depth Range (meters)
1	0.99 to 17.98	115 – 390 (275 meters thick) Median depth = 252 meters	90 – 480 (390 meters thick) Median depth = 285 meters
2	1.44 to 18.61	120 – 480 (360 meters thick) Median depth = 300 meters	100 – 570 (470 meters thick) Median depth = 335 meters
3	1.82 to 21.64	110 – 220 (280 meters thick) Median depth = 250 meters	20 – 500 (480 meters thick) Median depth = 260 meters
4	1.55 to 19.68	170 – 420 (250 meters thick) Median depth = 295 meters	90 – 530 (440 meters thick) Median depth = 310 meters
5	0.83 to 29.87	50 – 90 (40 meters thick) Median depth = 70 meters 110 – 490 (380 meters thick) Median depth = 300 meters	30 – 540 (510 meters thick) Median depth = 285 meters
6	1.26 to 23.87	150 – 460 (310 meters thick) Median depth = 305 meters	70 – 550 (480 meters thick) Median depth = 310 meters

The resistivity depth sections along lines 1, 2, 4 and 6 are generally straightforward with mostly horizontal layers of low resistivity material, while lines 3 and 5 are more complicated. As seen in Figure 3, the modeled bedrock depth from the previous gravity survey indicates a possible saddle between lines 1 and 3 that is essentially along line 2. It is not possible to see much of an effect of this possible saddle on the CSAMT / MT data because station locations were limited due to the nearby presence of power lines. However, station 3 at the western end of line 2 has a thicker sequence of higher resistivity material to a depth of about 200 meters that could be related to the saddle although it is not evident in the stations to the east.

The modeled bedrock depth from the gravity data also shows that lines 3 and 5 are near the edges of the deepest bedrock and the CSAMT / MT data may be indicating some structure that has extended into the stratigraphic section. Line 3 has the least amount of material with resistivities less than or equal to 2.7 ohm-meters, while line 5 has a shallow low resistivity layer from approximately 50 to 90 meters depth that is not seen on any of the other lines. The median depth of the less than or equal to 2.7 ohm-meter material is essentially at either 250 or 300 meters as seen in Table 1, and is at approximate similar depths for the material with resistivities less than or equal to 5.0 ohm-meters. At a horizontal depth slice of 250 meters, as seen in Figure 11, it is evident that slightly higher resistivities are present along portions of lines 3 and 5. At 300 meters depth, the horizontal slice in Figure 12 indicates that the slightly higher resistivities are essentially only present along line 3. The possible bedrock saddle that is present from the modeled gravity data (Figure 3) may be manifested as the slightly lower resistivities seen along line 3.

The horizontal depth slices shown in Figures 11 and 12 are selected intervals from the movies (in RM and AVI formats) included with this report. The movies are constructed by generating a rectangular cube from the resistivity versus depth data along each line and then creating horizontal slices through the cube at intervals of ten meters. The movies can be stepped through at the ten meter intervals to visualize the horizontal and vertical extent of resistivity values interpreted to indicate possible lithium-brine occurrences. Using the depth sections, tabulated results in Table

1and horizontal depth slices it can be seen that the zones with less than or equal to 2.7 ohm-meter resistivities, that are interpreted to have possible higher concentration brine, have a general range in depth from about 110 to 490 meters, or a thickness of 380 meters, with a predominant distribution from depths of about 180 to 460 meters (280 meters thick). Combined material with resistivities less than or equal to 5.0 ohm-meters, that are interpreted to have possible high and moderate concentration brines, have an approximate predominant depth range from about 90 to 510 meters (420 meters thick).

CONCLUSIONS AND RECOMMENDATIONS

Low resistivities interpreted to indicate possible lithium-brines of different concentrations are present at all of the CSAMT / MT stations predominantly above modeled bedrock depths of 625 meters (as modeled in the April 2017 Lithium Energy Products gravity survey), although slightly higher but still relatively low resistivities are evident in the upper portions of the bedrock probably because of weathering or fracturing that allows brine or groundwater to infiltrate. Based upon experience in other basins, somewhat arbitrary resistivity values for potential lithium-brine occurrence are considered to be less than or equal to 2.7 ohm-meters for possible higher concentration brine and between 2.7 and 5.0 ohm-meters for possible moderate concentration brine. Resistivity values greater than about 5.0 ohm-meters are interpreted to be more reflective of clay or considerably reduced brine concentration.

Using depth sections, tabulated results and horizontal depth slice movies it is interpreted that the zones with less than or equal to 2.7 ohm-meter resistivities, that are interpreted to have possible higher concentration brine, have a general range in depth from about 110 to 490 meters, or a thickness of 380 meters, with a predominant distribution from depths of about 180 to 460 meters (280 meters thick). Combined material with resistivities less than or equal to 5.0 ohm-meters, that are interpreted to have possible high and moderate concentration brines, have an approximate predominant depth range from about 90 to 510 meters (420 meters thick).

The modeled bedrock depth from the previous gravity survey indicates a possible saddle between CSAMT / MT lines 1 and 3 that is essentially along line 2. It is not possible to see much of an effect of this possible saddle on the CSAMT / MT data because station locations were limited due to the nearby presence of power lines; however, the possible bedrock saddle may be manifested as the slightly lower resistivities seen along line 3. The modeled bedrock depth from the gravity data also shows that two of the CSAMT / MT survey lines (numbers 3 and 5) are near the edges of the deepest bedrock and the CSAMT / MT data may be indicating some structure that has extended into the stratigraphic section. Line 3 has the least amount of material with resistivities less than or equal to 2.7 ohm-meters, while line 5 has a shallow low resistivity layer from approximately 50 to 90 meters depth that is not seen on any of the other lines.

In the general survey area, previous geotechnical investigations for solar power installations have encountered large earth fissures zones. Data from several of the CSAMT / MT stations are polarized, which is seen in the data as one electromagnetic pair (e.g., Hx and Ey) having the same general shape but lower, or higher, resistivities than the other electromagnetic pair (e.g., Hx and Ex). It is difficult to determine the depth extent of these possible earth fissures from the CSAMT / MT data and it is also not known what influence they may have on lithium-brine production. It is therefore recommended that reflection seismic surveys be conducted to provide detailed mapping of subsurface units to determine their continuity.

If drilling is preferred as the next step then it is recommended that boreholes be located at station 5 along line 2, and / or station 13 along line 4, and / or station 17 along line 5. A borehole at station 5 along line 2 will investigate an interpreted zone of possible higher concentration brine from about 130 to 480 meters and a combined possible higher and moderate brine concentration zone from approximately 100 to 570 meters. At station 13 along line 4 a borehole is interpreted to intersect the zone of possible higher concentration brine from about 190 to 410 meters and a combined possible higher and moderate brine concentration zone from approximately 100 to 520 meters. Along line 5 at station 17 the shallow, thin possible higher brine concentration zone from about 70 to 80 meters will be investigated in addition to the thicker and deeper zone from about 190 to 440 meters depth. Each of the boreholes should be drilled to at least 600 meters depth. Note that depths estimated from interpretation of CSAMT/MT data have shown a 10% to 15% variation between the actual depths to the anomalies, as verified by test hole drilling, and the depths predicted by the cross-section data models.

LIMITATIONS OF INVESTIGATION

This investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by an experienced and licensed geophysicist practicing in this or similar locations. No warranty, expressed or implied, is made as to the conclusions and professional advice included within this report.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can and do occur with the passage of time, whether they be due to natural processes or the work of people on this or adjacent properties. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside of our control. Therefore, this report is subject to review and revision as changed conditions are identified.

APPENDIX A: CSAMT/MT SURVEYING METHODOLOGY

The true resistivity of earth materials is dependent upon several factors including composition, grain size, water content and physical characteristics. In general, fine-grained materials such as clays and silts have lower resistivities than coarse-grained materials such as sands and gravels. Unweathered and unfractured hard rocks such as lithified sedimentary rocks (limestone, dolomite, sandstone, chert, etc.), volcanic rocks, plutonic rocks, and some metamorphic rocks generally have high resistivities. The presence of fracturing and weathering lowers the resistivity of these rocks. Additionally, the occurrence of groundwater will greatly reduce the resistivity of all rocks and sedimentary materials (through electrolytic conduction). Clay is also very conductive (low resistivity) as a result of surface-conduction processes. If appreciable amounts of clay occur in an area, low-resistivity anomalies that resemble the presence of groundwater may be present.

CSAMT/MT is an electromagnetic (EM) geophysical method commonly used in the exploration industry. It determines the earth's subsurface electrical resistivity distribution by measuring time dependent variations of the earth's natural electric (E) and magnetic (H) fields, as well as the electric and magnetic fields resulting from high frequency induced waves. The resistivity information is generally used to determine subsurface geologic and hydrogeologic conditions and structure. The CSAMT/MT method is designed to investigate from depths of approximately 20 to 750 meters, or greater, depending upon subsurface resistivity values. Lower resistivity values will decrease the investigation depth while higher values will generally result in greater depths of investigation.

A graphical representation of the field setup of the CSAMT/MT instrumentation used in this project is shown in Figure 1. In essence, electric dipoles and magnetometers are laid out in perpendicular directions (i.e., Ex, Ey, Hx and Hy) and both natural and transmitted frequencies are recorded from distant and non-polarized sources (i.e., the measured EM fields will impinge upon the earth as uniform plane waves). EM waves from sources that are too close will have spherical wave fronts that will not be uniform within a survey area and waves polarized in one direction will limit the type of measurements that can be made in addition to possibly introducing noise. Distance for EM waves is conveniently specified in terms of wavelength. Where EM waves penetrate conductors, one radian is used as the standard distance and is termed skin depth (also defined as the depth at which the amplitude of a plane wave has been attenuated to 1/e or 37%). Since wavelength $\lambda = 2\pi/k$ (where k = wave number) then one skin depth $\delta = 1/k$. Since $k = [\omega\mu_0\sigma/2]^{½}$ where ω = angular frequency, μ_0 = permeability of free space, and σ = conductivity, then $\delta = [2/\omega\mu_0\sigma]^{½} = [1/4\pi^2 10^{-7}]^{½}[\rho/f]^{½} \approx 503[\rho/f]^{½}$ in meters where ρ = apparent (measured) resistivity in ohm-meters and f = signal frequency in Hz. From both experimental results and numerical simulations, at distances greater than 3 skin depths the uniform and plane portion of EM waves are dominant and at 6 to 7 skin depths the EM waves are completely uniform and plane relative to the precision to which they can be measured. Natural sources will be far removed (greater than 7 skin depths) and therefore will be uniform and plane. However, when sources are measured from artificial transmitters, the distance between the transmitter and receiver must be at least 3 skin depths for EM waves to be uniform and plane.

CSAMT/MT measurements may be made in either the tensor or scalar mode. Tensor measurements use all four tensor impedance components (Zxx, Zxy, Zyx and Zyy) and are best utilized in areas where the structure is very complex, when soundings are far apart relative to the size of geologic features under investigation, or where regional anisotropy is strong. The impedance components are defined as follows:

Zxx = [(ExH*x)(HyH*y)- (ExH*y)(HyH*x)]/[(HxH*x)(HyH*y)-(HxH*y)(HyH*x)]
Zxy = [(ExH*x)(HxH*y)- (ExH*y)(HxH*x)]/[(HyH*x)(HxH*y)-(HyH*y)(HxH*x)]
Zyx = [(EyH*x)(HyH*y)- (EyH*y)(HyH*x)]/[(HxH*x)(HyH*y)-(HxH*y)(HyH*x)]
Zyy = [(EyH*x)(HxH*y)- (EyH*y)(HxH*x)]/[(HyH*x)(HxH*y)-(HyH*y)(HxH*x)]

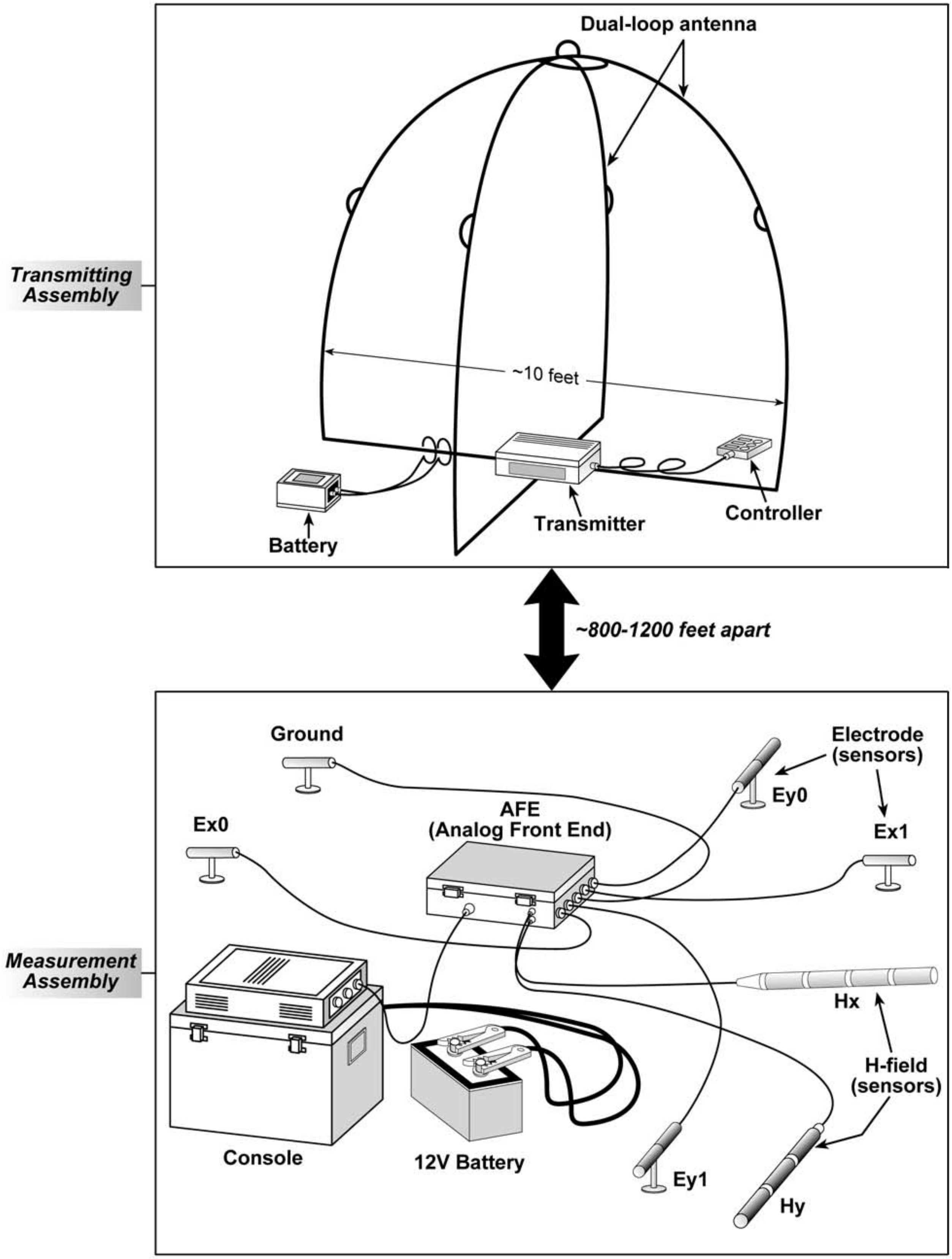
Where * is a complex value formed from real and imaginary parts. An imaginary number is a complex number that can be written as a real number multiplied by the imaginary unit i, which is defined by its property $i^2 = -1$. An imaginary number bi can be added to a real number a to form a complex number of the form a + bi, where the real numbers a and b are called, respectively, the real part and the imaginary part of the complex number.

Scalar measurements use only two components (ρ_x and ρ_y), [where ρ_x = (0.2/frequency) * E_x^2/H_y^2 and ρ_y = (0.2/frequency) * E_y^2/H_x^2], and are generally adequate in one-dimensional (1D) layered environments or more complex areas if measurements are dense. If geoelectric strike (which may or may not be the same as geologic strike) is known then measured resistivities with the E field oriented parallel to strike are referred to as transverse electric (TE) mode measurements while resistivities with the E field oriented perpendicular to strike are referred to as transverse magnetic (TM) mode measurements. Ideally, one would prefer the use of tensor measurements in most areas especially if the direction of strike is unknown or difficult to determine; however, the presence of polarized noise or low signal amplitude often dictates the use of scalar measurements.

CSAMT/MT measurements are adversely influenced by the presence of EM noise caused by overhead or underground power lines, grounded metal fences, metallic pipelines, other underground or aboveground utilities, and structures that contain metal (such as reinforced concrete). The influence of these EM noise sources on CSAMT/MT data may be minimized by orienting the E and H field components at approximately 45º to the sources; however, noise may still be present within the data thus scalar measurements must be used rather than the preferred tensor mode.

The electric and magnetic data from either tensor or scalar CSAMT/MT measurements are used to assess surface impedance and estimate subsurface resistivity at various frequencies. Surface impedance *Z* is the ratio of electric to magnetic fields ($Z_{ij} = E_i/H_j$) and is the basis for defining apparent resistivity $\{\rho_{ij} = [1/\omega\mu_0]|Z_{ij}|^2 = [0.2/f]|Z_{ij}|^2\}$ and impedance phase $\{\varphi_{ij} = \tan^{-1}[\mathrm{Im}(Z_{ij})/\mathrm{Re}(Z_{ij})]\}$. CSAMT/MT field data consist of sounding curves that are logarithmic plots of apparent resistivity versus frequency. Apparent resistivities at high frequencies correspond to generally shallow investigation depths, and apparent resistivities at low frequencies correspond to deeper investigations. Apparent resistivities are bulk resistivities with contributions from different heterogeneous materials. Model transformations of the data calculated with forward and inverse computer software are good first-order approximations of the resistivity structure / layering beneath each station or sounding and are presented as cross sections of subsurface resistivity. These cross sections are used for interpretation of geologic and hydrogeologic conditions and can be combined into three-dimensional representations of the data if sufficient and appropriately spaced data are acquired. In general, at previous field projects CSAMT/MT data have shown a 10% to 15% variation between the actual depths to the anomalies, as verified by test hole drilling, and the depth predicted by the cross-section data models.

Typical field setup of Geometrics StrataGem EH4 CSAMT/MT System



Modifed from Geometrics 2001

Figure 1

MTFieldSetup.cdr

CSAMT/MT Survey
Raw Data Example

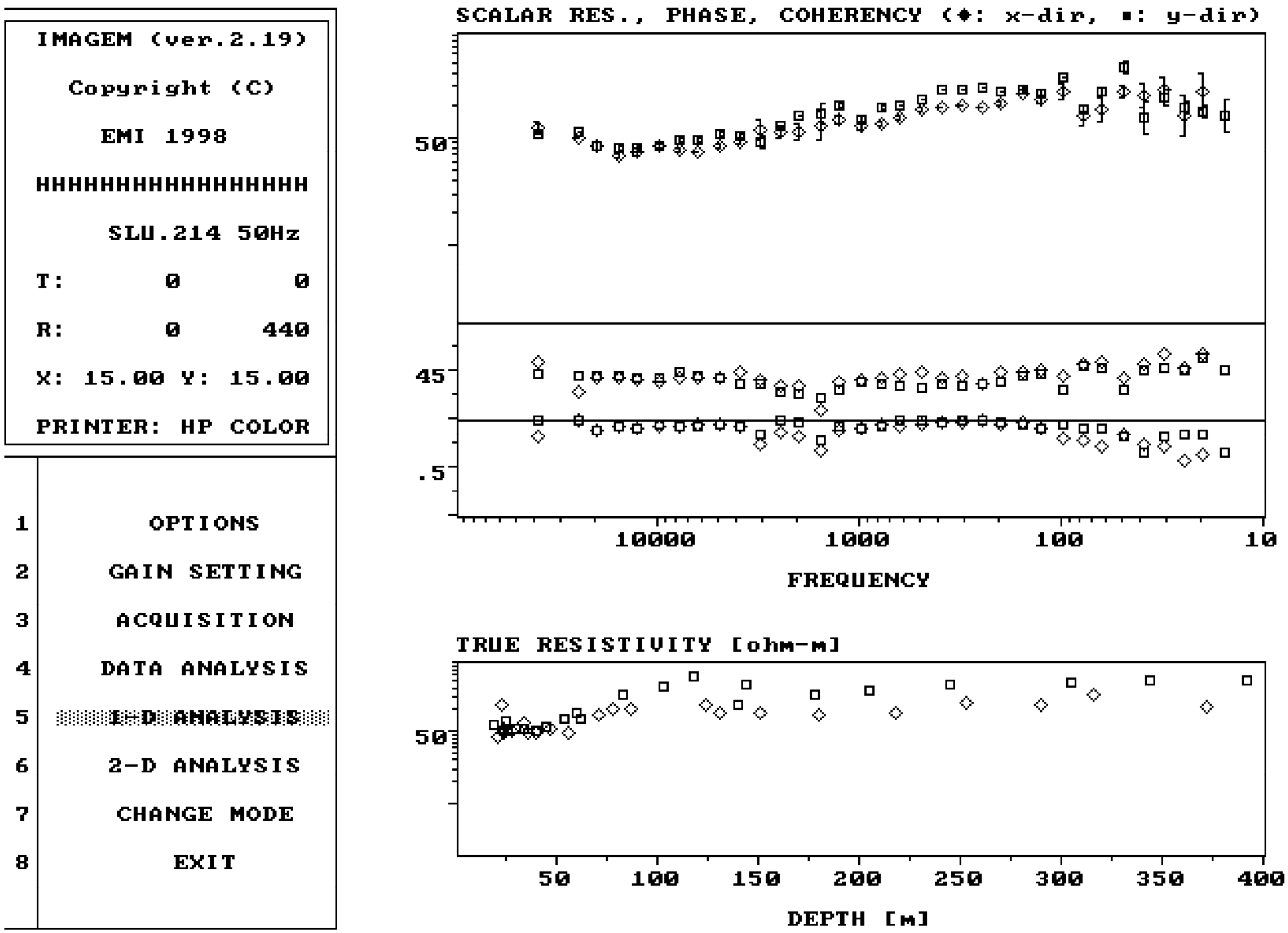


Figure 2

Lithium Energy Products Inc.
Jackpot Lake, Nevada, CSAMT/MT Survey
Station and Line Locations Over Modeled Bedrock Depth Map With Utility Locations

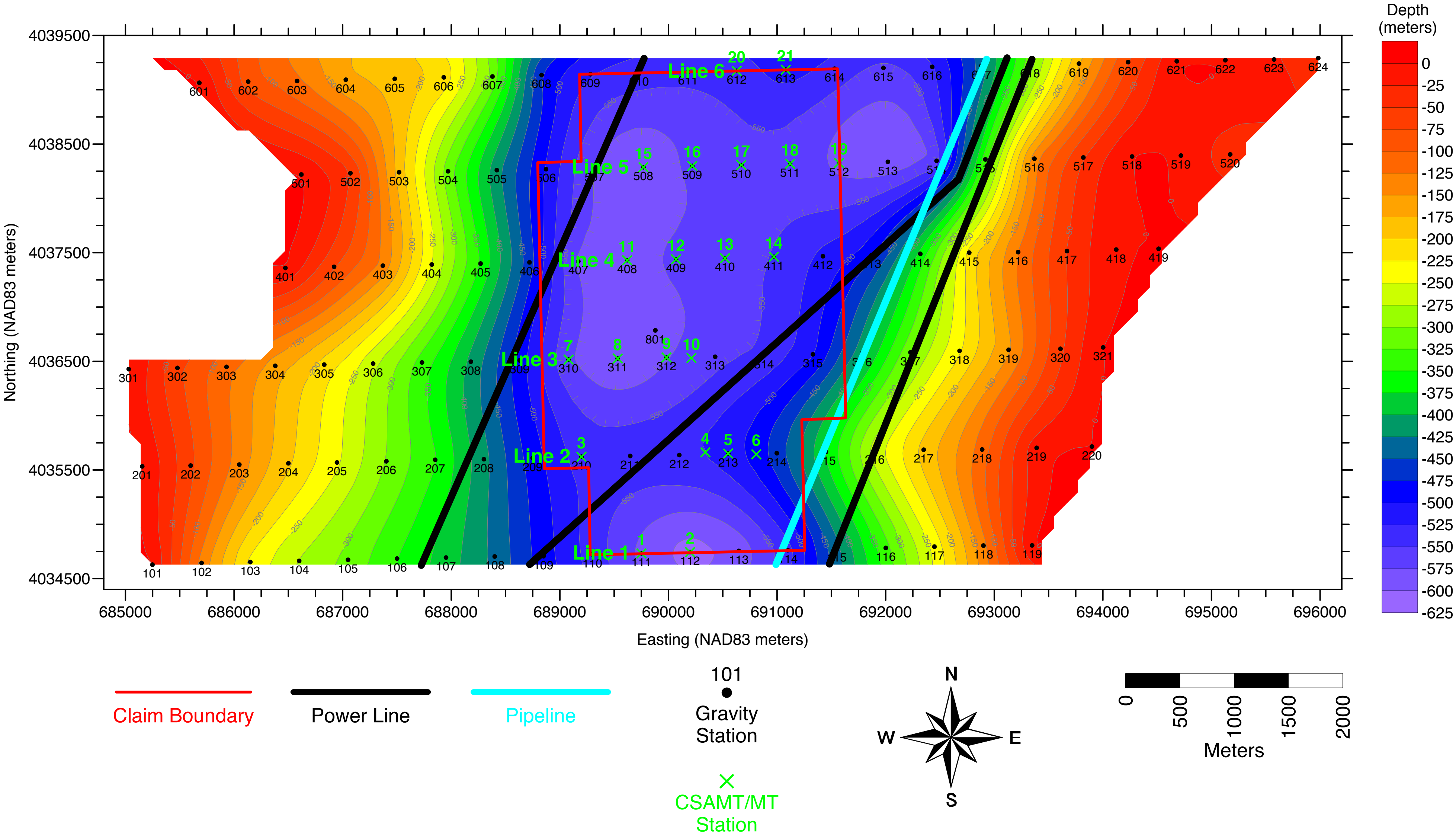
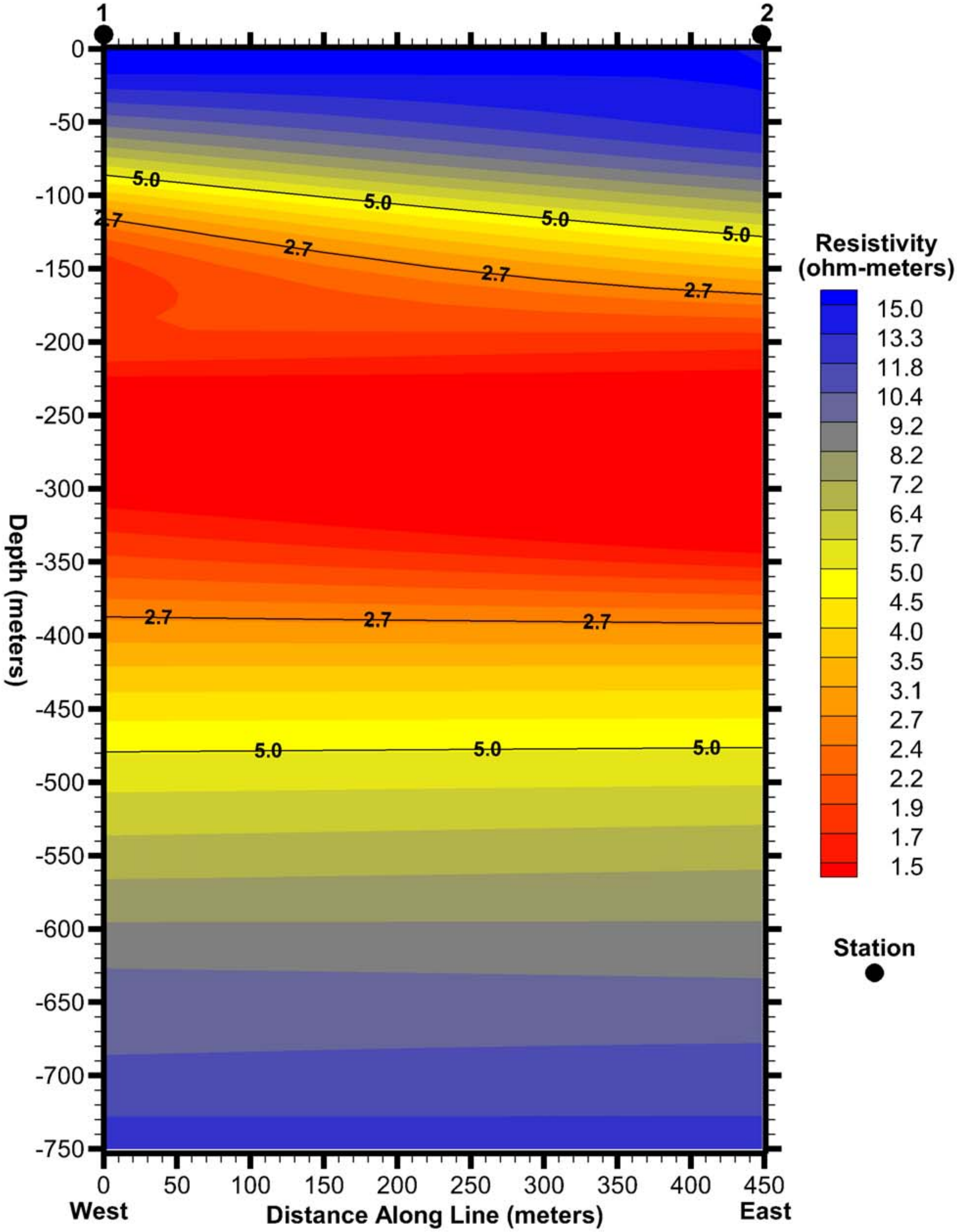


Figure 3

Hasbrouck Geophysics, Inc.

Field Data Acquisition by:
SOUTHWEST GEOPHYSICS, INC.
YOUR SUBSURFACE SOLUTION

Lithium Energy Products Inc.
Jackpot Lake, Nevada, CSAMT/MT Survey
Line 1 Resistivity Depth Section



Field Data Acquisition by: SOUTHWEST GEOPHYSICS, INC. YOUR SUBSURFACE SOLUTION

HG Hasbrouck Geophysics, Inc.

Figure 4

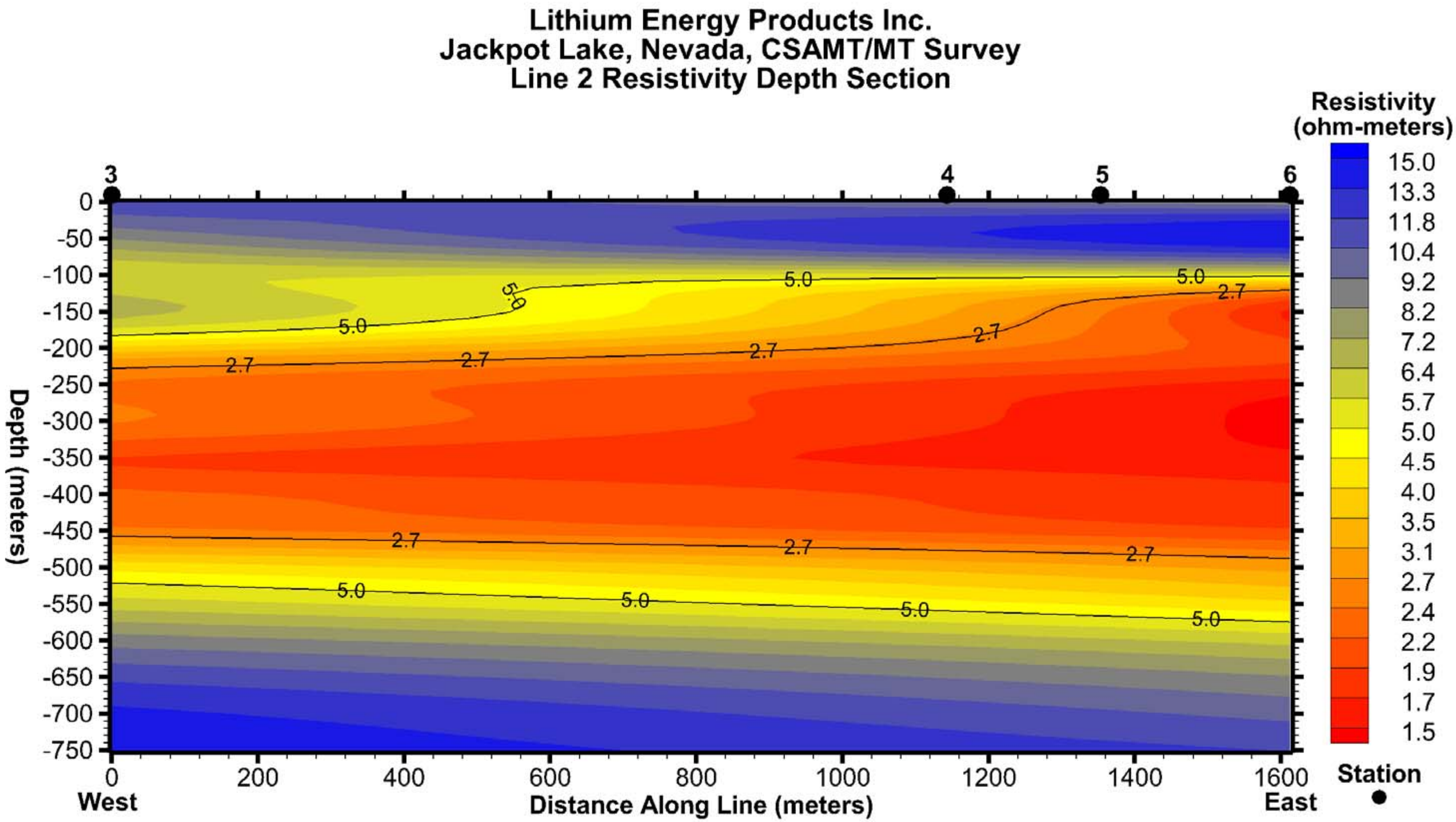
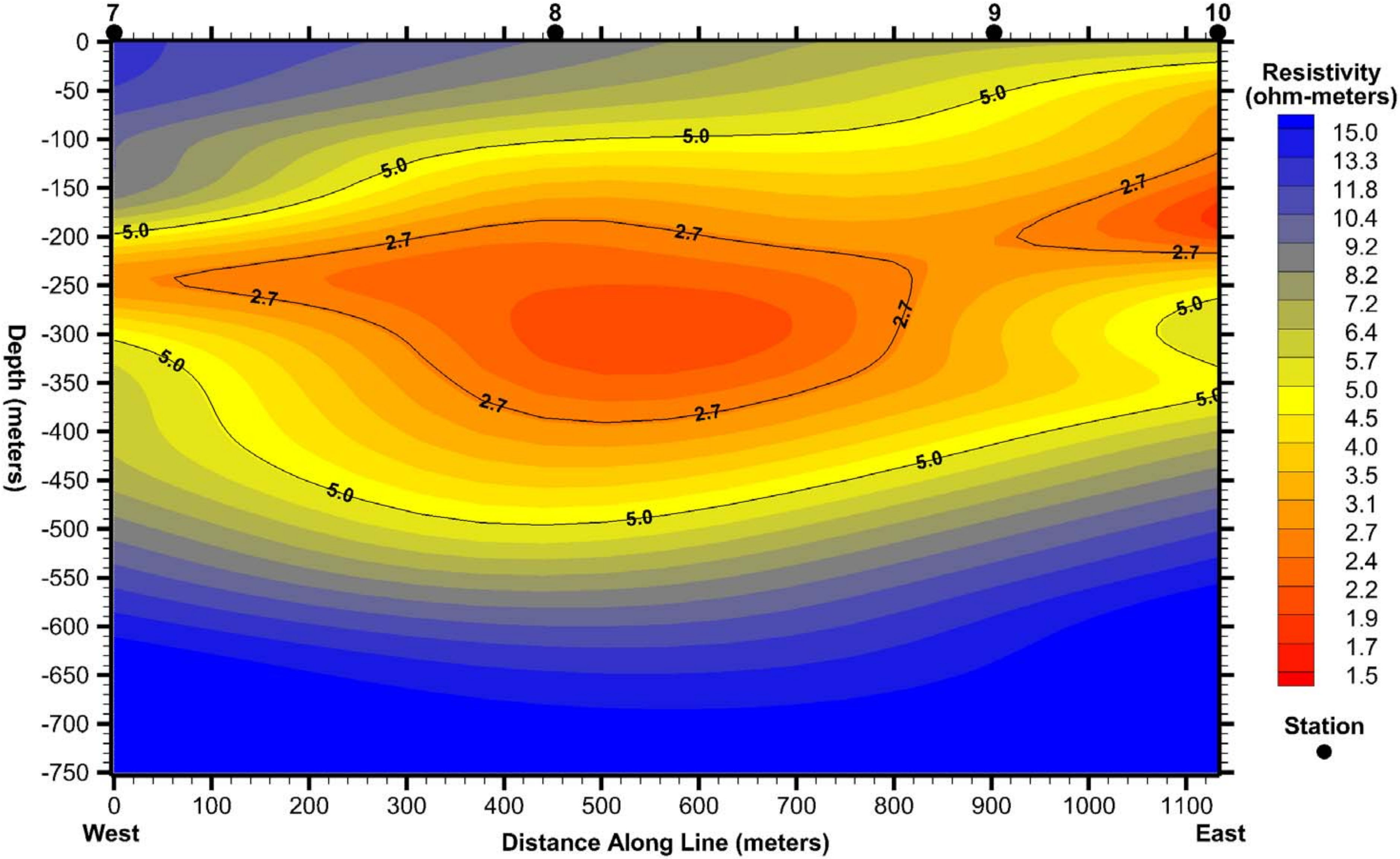


Figure 5

Field Data Acquisition by:
SOUTHWEST GEOPHYSICS, INC.
YOUR SUBSURFACE SOLUTION

Lithium Energy Products Inc.
Jackpot Lake, Nevada, CSAMT/MT Survey
Line 3 Resistivity Depth Section



Field Data Acquisition by: SOUTHWEST GEOPHYSICS, INC. YOUR SUBSURFACE SOLUTION

Hasbrouck Geophysics, Inc.

Figure 6

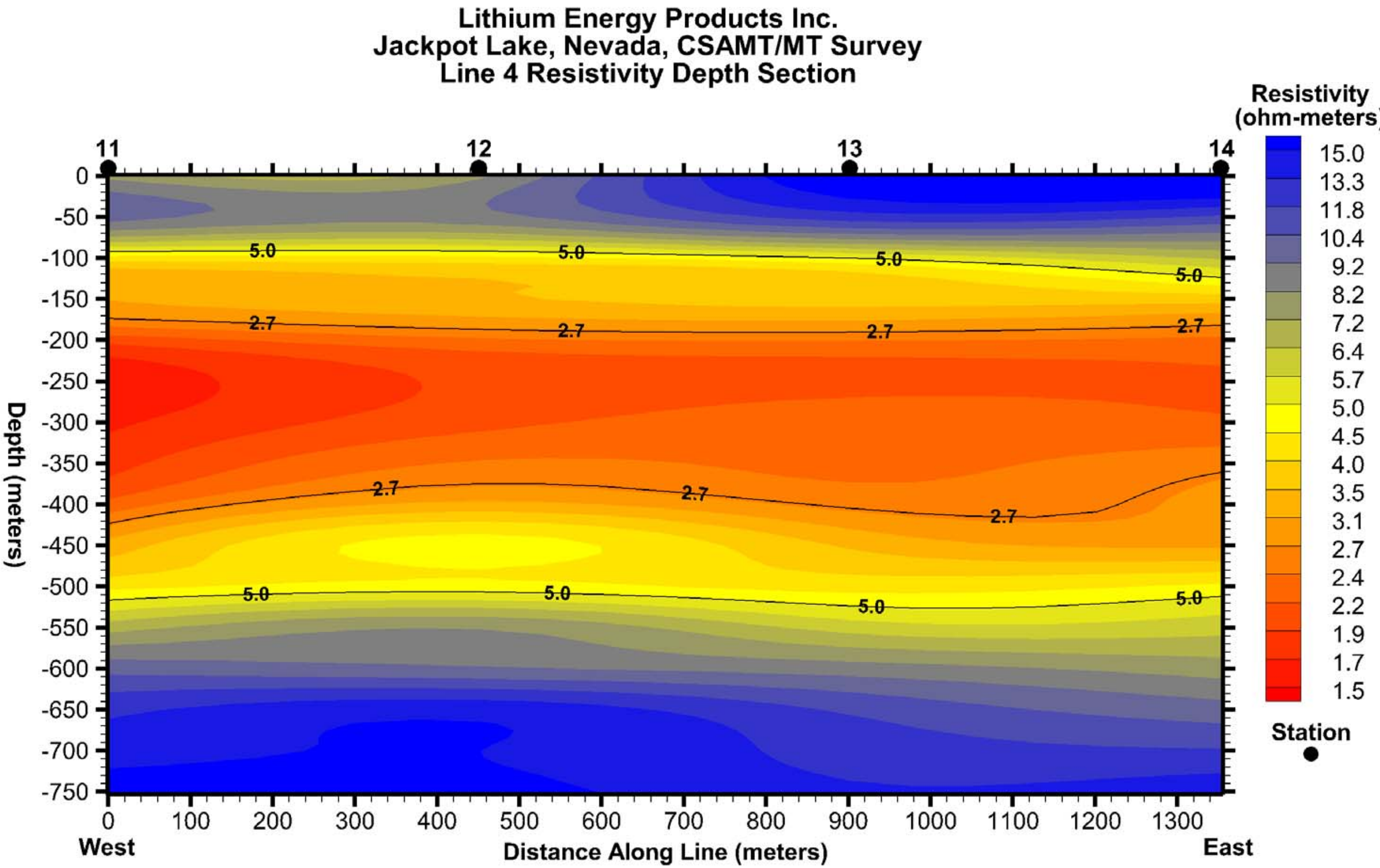
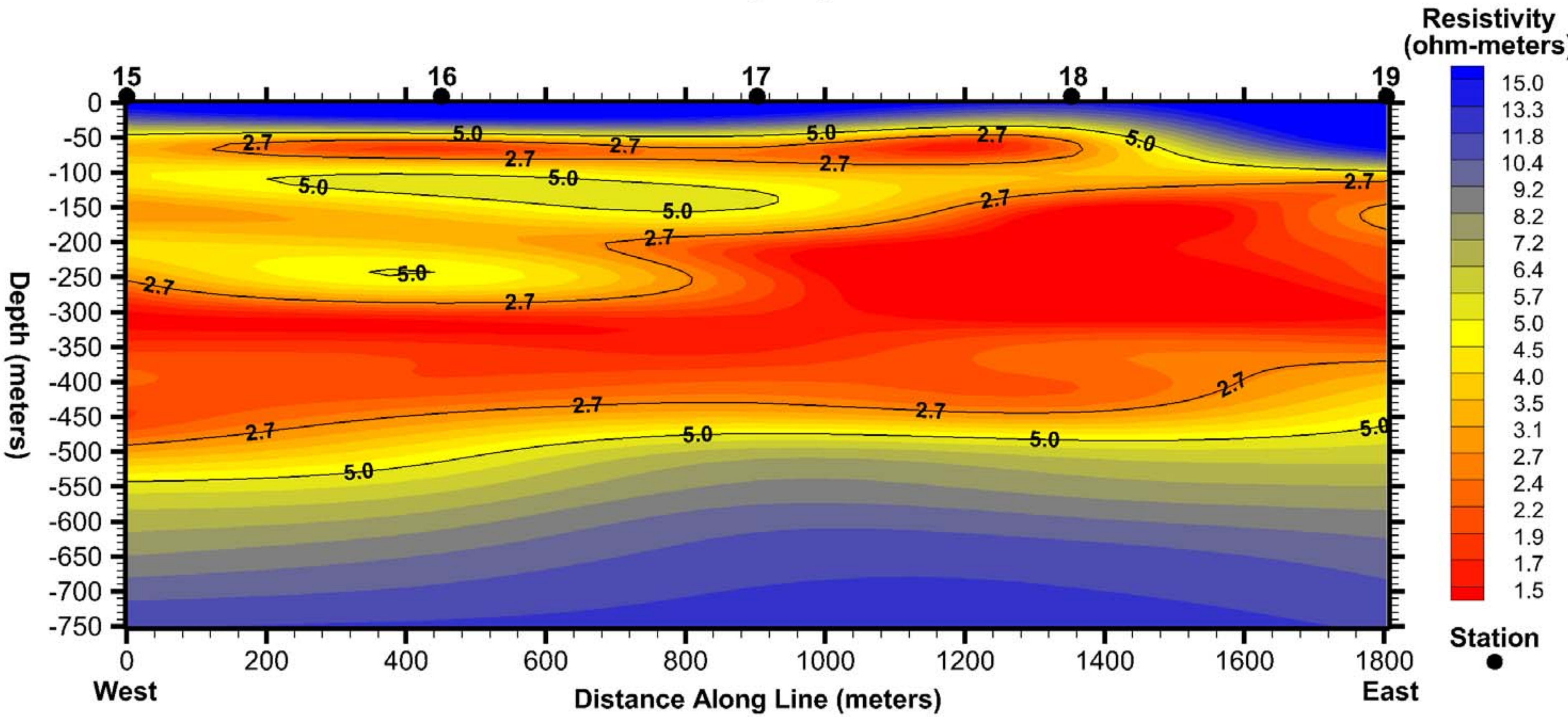


Figure 7

Hasbrouck Geophysics, Inc.

Field Data Acquisition by:

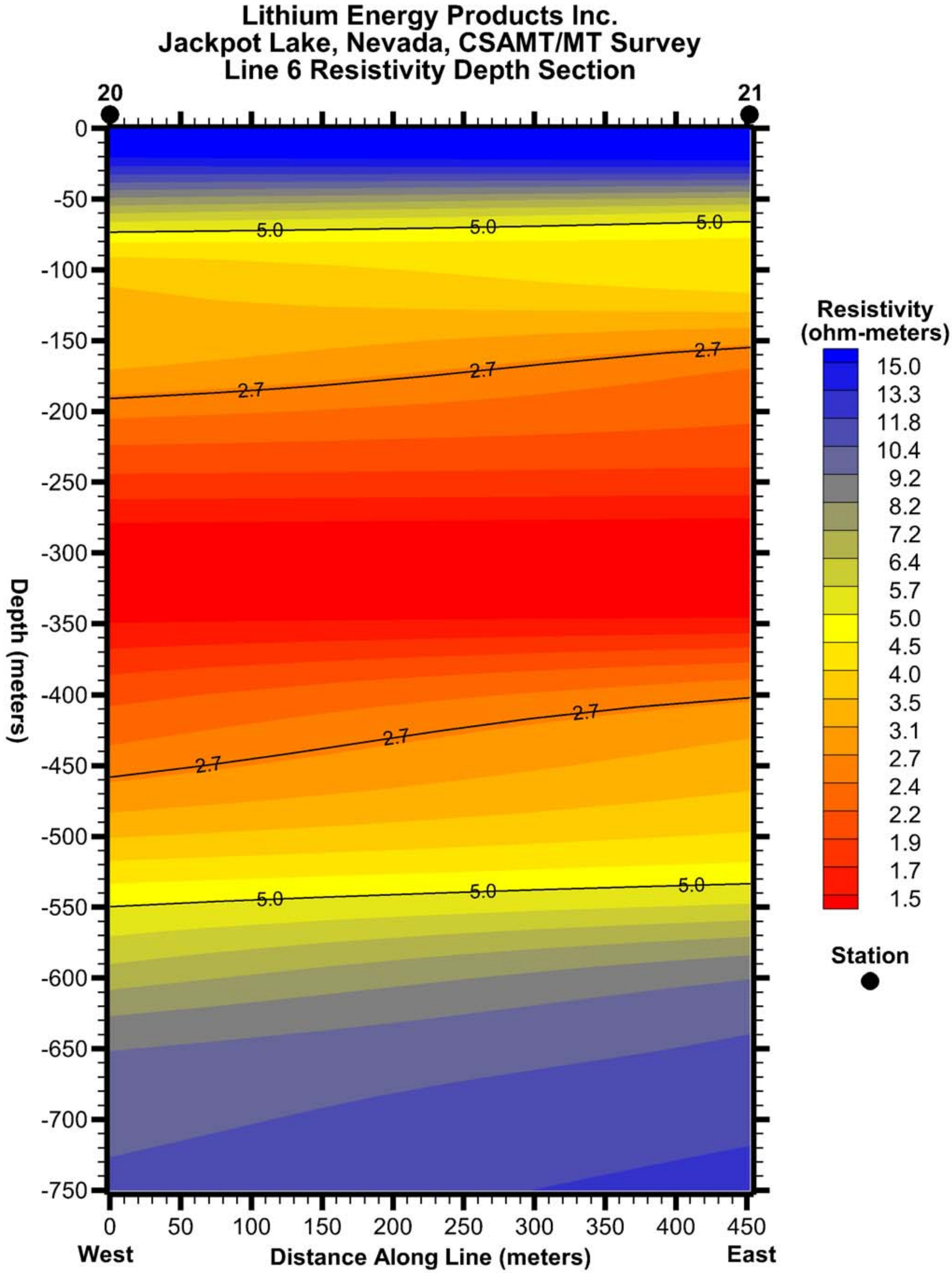
Lithium Energy Products Inc.
Jackpot Lake, Nevada, CSAMT/MT Survey
Line 5 Resistivity Depth Section



Hasbrouck Geophysics, Inc.

Figure 8

Field Data Acquisition by:
SouthWest Geophysics, Inc.



Field Data Acquisition by: SouthWest Geophysics, Inc.

Hasbrouck Geophysics, Inc.

Figure 9

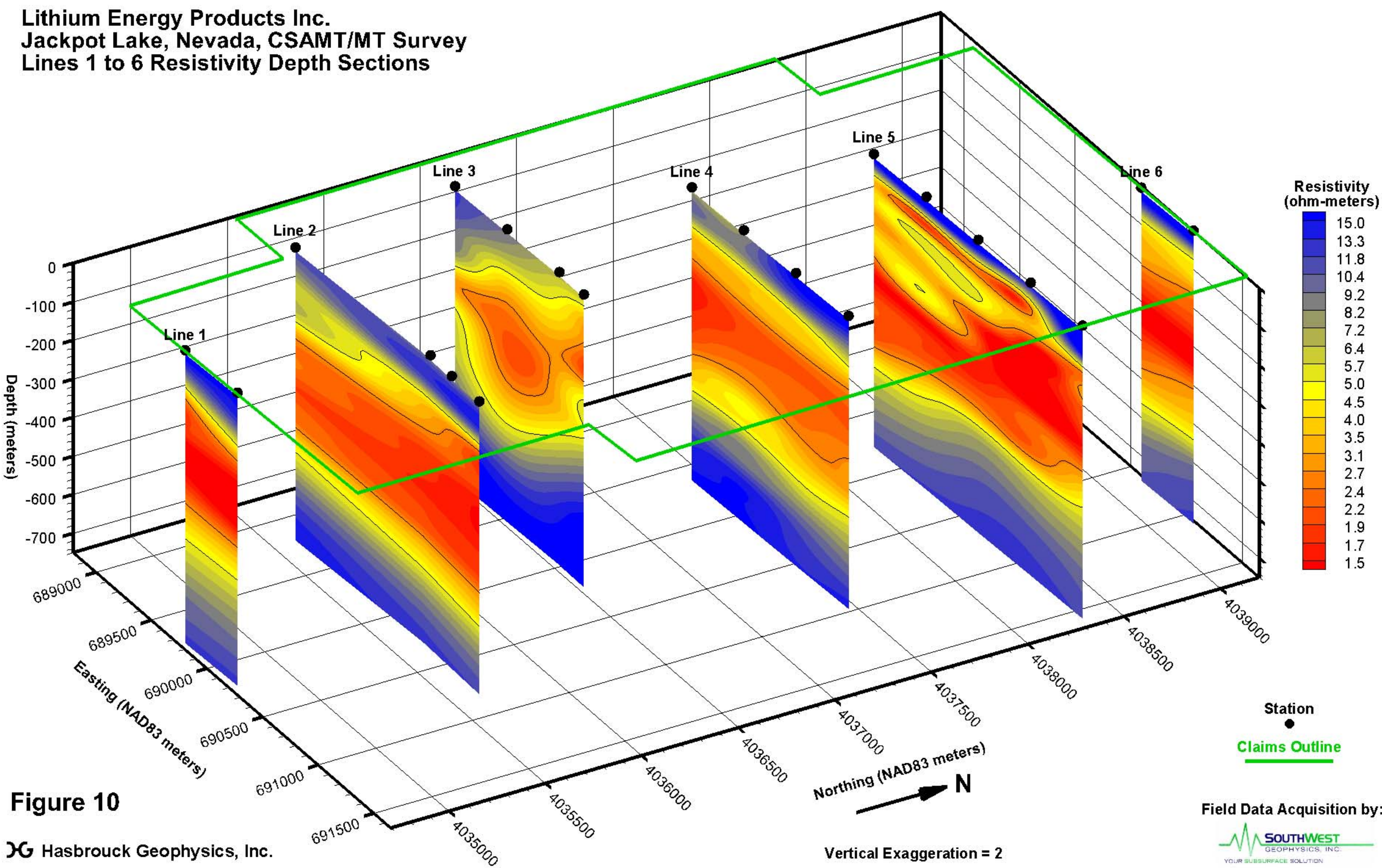
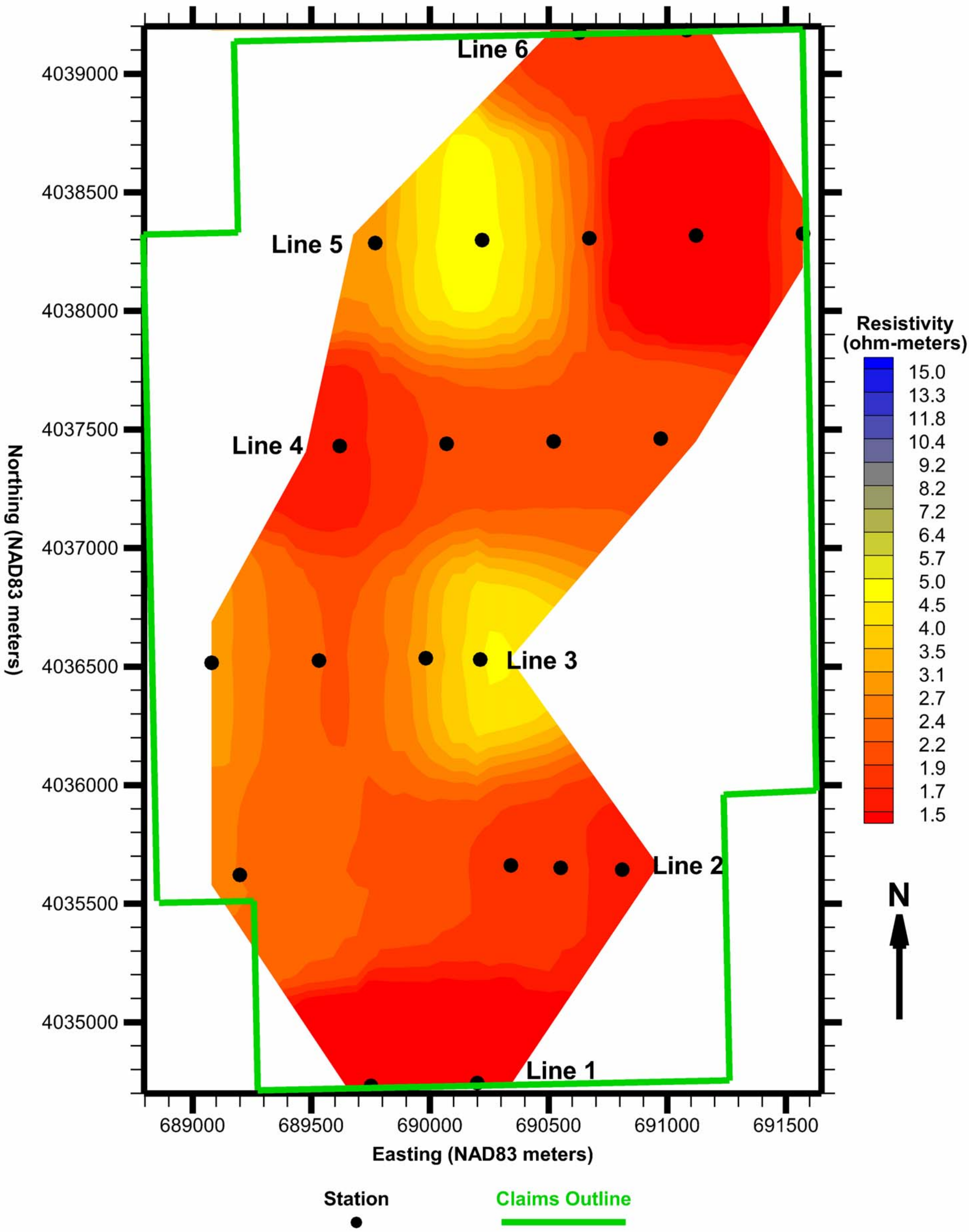


Figure 10

Hasbrouck Geophysics, Inc.

Lithium Energy Products Inc.
Jackpot Lake, Nevada, CSAMT/MT Survey
Horizontal Depth Slice of Resistivity Values (relative to surface)



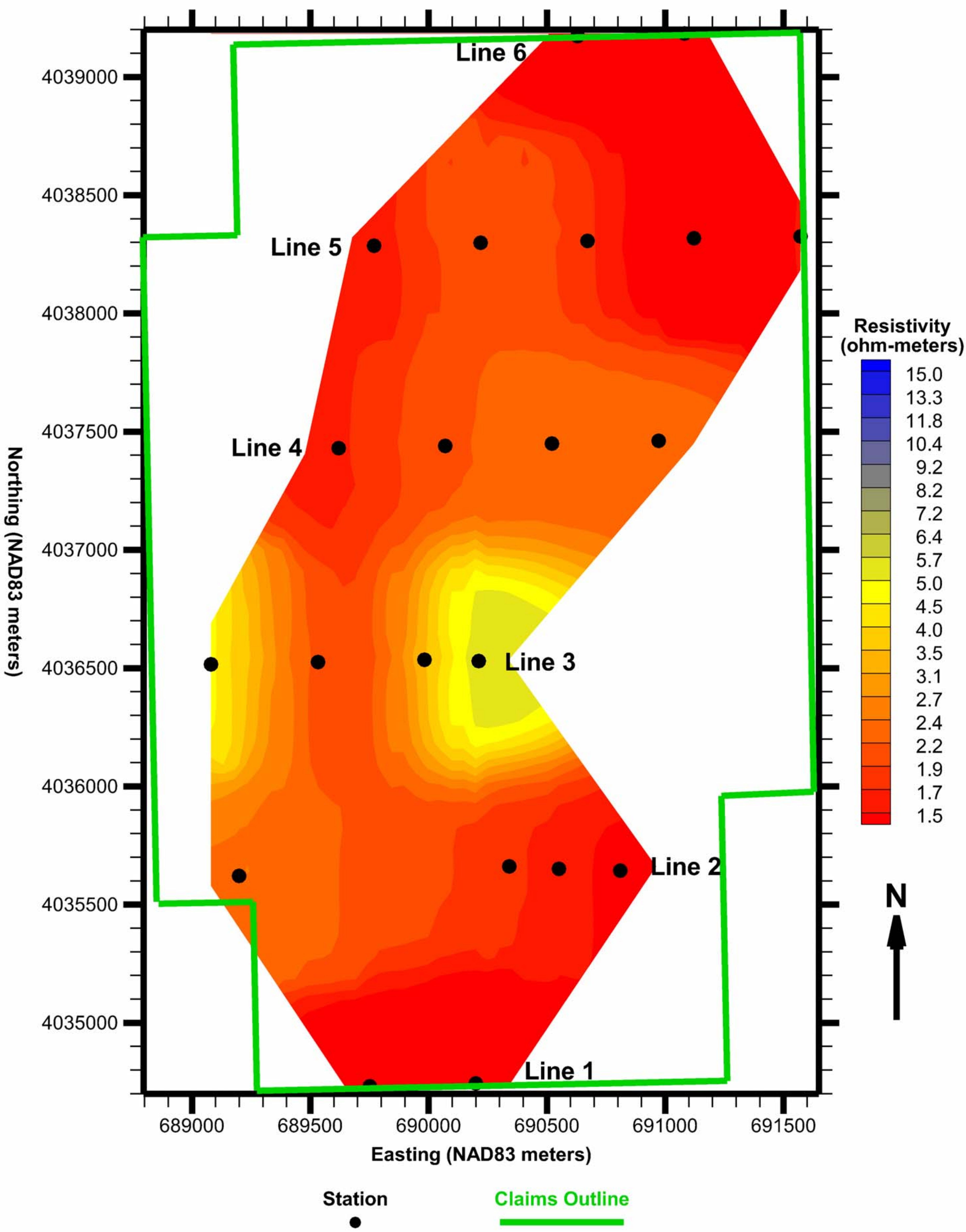
Depth = -250 meters

Figure 11

Hasbrouck Geophysics, Inc.

Field Data Acquisition by:
SOUTHWEST GEOPHYSICS, INC.
YOUR SUBSURFACE SOLUTION

Lithium Energy Products Inc.
Jackpot Lake, Nevada, CSAMT/MT Survey
Horizontal Depth Slice of Resistivity Values (relative to surface)



Depth = -300 meters

Hasbrouck Geophysics, Inc.

Figure 12

Field Data Acquisition by: SouthWest Geophysics, Inc.