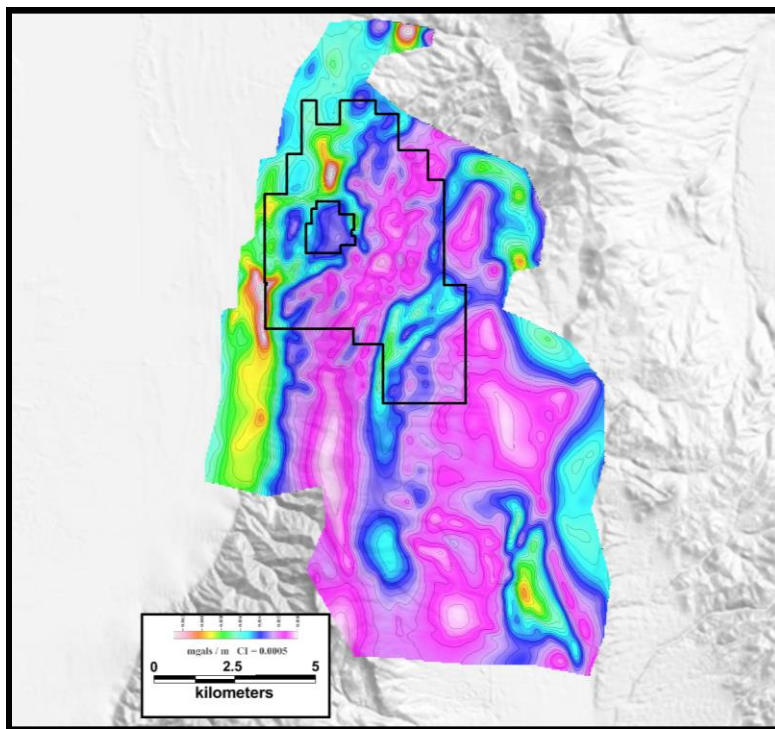


**U. S. GOLD CORPORATION**

**KEYSTONE PROPERTY  
GRAVITY - 2017  
GROUND MAGNETIC SURVEY  
GIS DATABASE**



*CBA Gravity Horizontal Gradient over Gray Shade Topography*



**James L. Wright M.Sc.  
May 23, 2017**

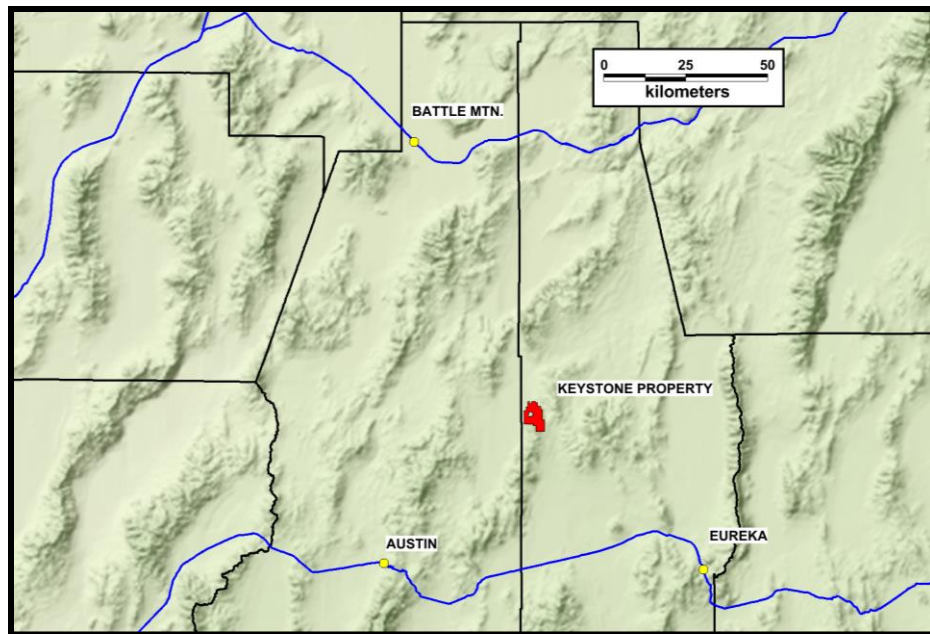
## TABLE OF CONTENTS

INTRODUCTION. . . . .	2
SURVEY PROCEDURE. . . . .	3
Gravity Survey	
Ground Magnetic Survey	
DATA PROCESSING . . . . .	5
Gravity Survey	
Ground Magnetic Survey	
INTERPRETATION . . . . .	6
CONCLUSIONS AND RECOMMENDATIONS . . . . .	14
REFERENCES	
APPENDIX A- GRAVITY SURVEY LOGISTICS	
APPENDIX B- GROUND MAGNETIC SURVEY LOGISTICS	
DVD HOLDER - DATABASE DVD	

## INTRODUCTION

A gravity survey was completed over the KEYSTONE property from May 9 – 15, 2017 with the objective of in-filling a 2016 survey designed to define structural, lithologic and alteration in support of the gold exploration program. Contrasting rock types on the property and large areas of alteration justified gravity survey implementation. Extensive structural complexity is also present. The earlier 2016 gravity survey is reported upon by Wright (2016). In addition to the gravity survey, a ground magnetic survey was completed over a small area north of the Keystone intrusion with the intent of defining the magnetic response of an induced polarization (IP) survey chargeability anomaly detected in a 2003 survey. Coordinates used for the project are **NAD 27 / UTM 11N**.

Figure 1 shows the property outline relative to roads, towns, county boundaries and topography in central Nevada.



***FIGURE 1: Keystone Property Location North Central Nevada***

Results of the gravity and ground magnetic surveys are provided in digital formats. The digital products included all raw data and processed files, as well as MAPINFO and ARCGIS GIS files for all processed data and interpretations. In addition; topography, DEM, geology and geochemical data sets are also included. All files are contained on a DVD located in a sleeve at the rear of the report. A README file on the DVD explains the folder / file organization.

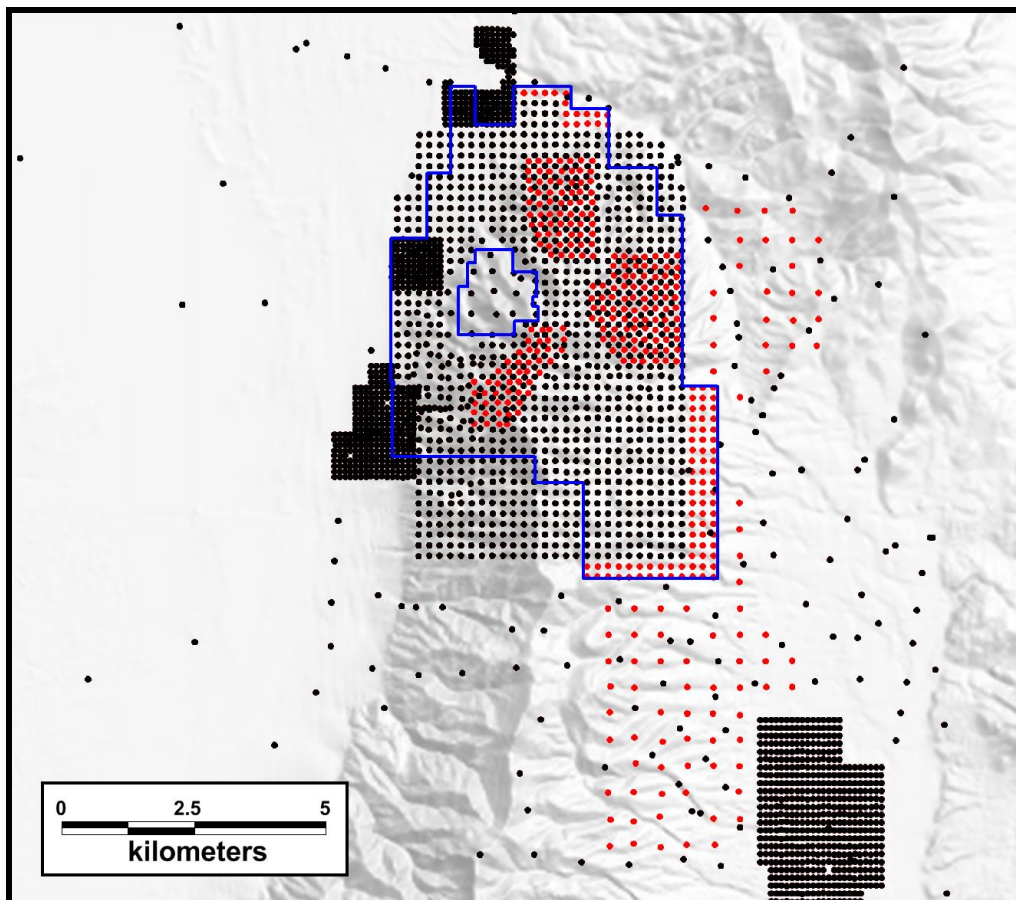
Survey procedures and data processing for both surveys are presented first followed by an integrated interpretation and finally recommendations / conclusions.

## SURVEY PROCEDURE

### Gravity Survey:

A total of 381 new gravity stations comprise the 2017 survey dataset. Combined with the 2016 survey and other merged surveys, the complete gravity dataset comes to 2781 stations. The 2017 in-fill stations were acquired on 200 m and 500 m grids infilling previous coverage. The 200 m grid extends coverage into newly acquired ground and in-fills existing grid coverage over three specific target areas on the property. The 500 m grid in-fills data gaps between Keystone and the North Gold Bar horst, as well as along the east side of the Keystone property. Figure 2 shows a complete data set posting over gray shade topography.

Relative gravity measurements were made with LaCoste & Romberg Model-G gravity meters. Topographic surveying was performed with Trimble Real-Time Kinematic (RTK) and Fast-Static GPS. The gravity survey is tied to the US Department of Defense gravity base EUREKA (DoD reference number 5311-1).



**FIGURE 2: Gravity Stations over Gray Shade Topography with Property Outline  
(Black – 2016 / Red –2017)**

All gravity stations were surveyed using the Real-Time Kinematic (RTK) GPS method or, where it was not possible to receive GPS base information via radio modem, the Fast-Static method was used. A GPS base station, designated KEY1, was used on the project. The coordinates and elevation of this base station location were determined by making simultaneous GPS occupations in the Fast Static mode with Continuously Operating Reference Stations (CORS). Topographic surveying was performed simultaneously with gravity data acquisition.

All gravity data processing was performed with the Xcelleration Gravity module of Oasis montaj (Version 7.0). The gravity data were processed to Complete Bouguer Gravity over a range of densities from 2.00 g/cc through 3.00 g/cc at steps of 0.05 g/cc using standard procedures and formulas.

Terrain Corrections were calculated to a distance of 167 km for each gravity station. Various procedures were used for three radii around each station: 0-10m, 10-200m, and 2-167 km. These include the triangle method, combination of a prism and a sectional ring method, and sectional ring method for the three zones respectively.

Gravity repeat statistics for the 2017 Keystone gravity survey follow.

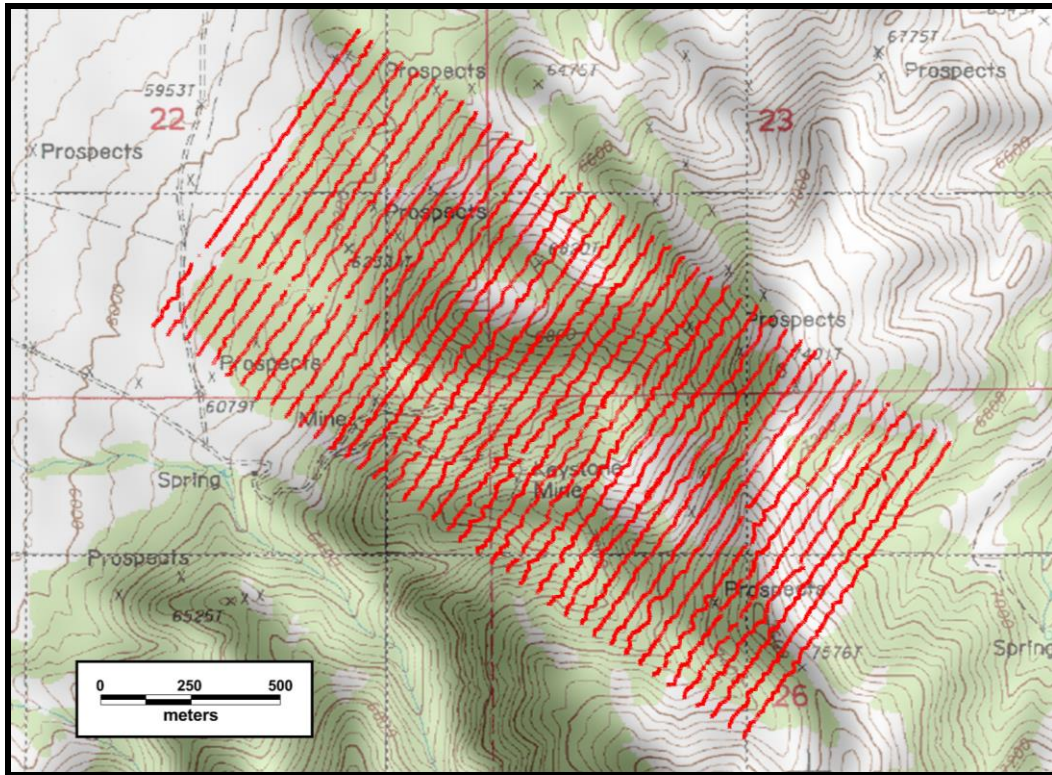
Total number of stations:	381
Number of repeated stations:	21
% stations repeated:	5.5%
Total number of readings:	446
Number of repeat readings:	65
% readings repeated:	14.6%
Maximum repeat error:	0.0373 mGal
Mean repeat error:	0.0111 mGal
RMS error:	0.0161 mGal

The mean of the absolute value of all loop closure errors is 0.03 mGal. Such a low closure error indicates good quality data, which supports the following interpretation. Additional details concerning gravity survey logistics are available in Appendix A.

### **Ground Magnetic Survey:**

The survey was conducted during the period of May 16 - 20, 2017. A total of 41.0 line kilometers of magnetic data were acquired using Geometrics Model G-858 magnetometers. Real-time differentially-corrected GPS was used for positioning. Measurements of the total magnetic intensity were taken in the continuous mode at two-second intervals along lines spaced 50 meters apart and oriented at 035°. A base magnetometer was operated during all periods of data acquisition and recorded readings every two seconds. Figure 3 shows a station posting over topography. Additional details concerning magnetic survey logistics are available in Appendix B.





**FIGURE 3: Ground Magnetic Survey Data Posting over Topography**

## DATA PROCESSING

### Gravity Survey:

Data provided by MaGee Geophysical Services LLC included the gravity data corrected to the complete Bouguer anomaly (CBA) stage for a number of densities. Determination of the most suitable Bouguer density is required for removal of topographic effects in the data. The most appropriate density for processing is that which minimizes the correlation of gravity with terrain. Wright (2016) presents an analysis which concluded the best density for processing the Keystone gravity data is 2.55 g/cc.

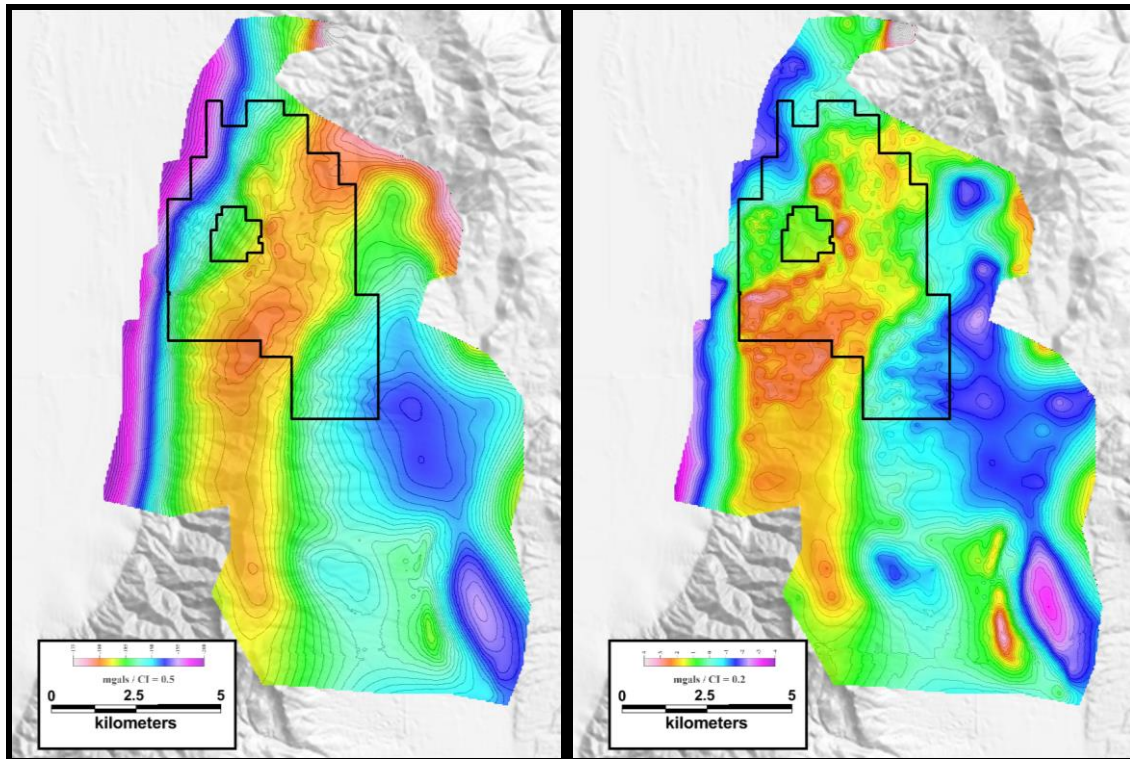
The 2.55 g/cc data were gridded with a Kriging algorithm using a spacing of 50 m, which is 25% of the detail grid station spacing. This product is termed the CBA or GRAV. The CBA data were processed with a proprietary procedure to produce a smoothed regional grid (GRAV\_UC), which subtracted from the CBA grid produced a residual (GRAV\_RES) grid. Finally, the total horizontal (GRAV\_HG) and first vertical derivatives (GRAV\_VD) were computed from the CBA. All five grids were mask to the data limits and imaged / contoured for import into MAPINFO and ARCGIS. The images and contours were imported into the GIS as separate files. Color bars, measurement units and contour intervals are embedded directly into the images for each data product. All data conform to the **NAD 27 / UTM 11N** coordinate system.

## Ground Magnetic Survey:

The diurnally corrected total field data were gridded with a kriging algorithm at a spacing of 10m or 20% of the 50 m line spacing. The resulting grid was then filtered with a nine point Gaussian filter to yield the final total field (TF) product. This product was reduced to the pole (RTP) with a USGS algorithm. In addition, a first vertical derivative (VD) was computed directly from the RTP. The three (3) grids (i.e. TF, RTP, and RTP\_VD) were mask to the data limits and imaged / contoured for import into MAPINFO / ARCGIS as separate file sets for the images and corresponding contours. Color bars, map units and contour intervals were embedded directly on the GIS images. All data conform to the **NAD 27 / UTM 11N** coordinate system.

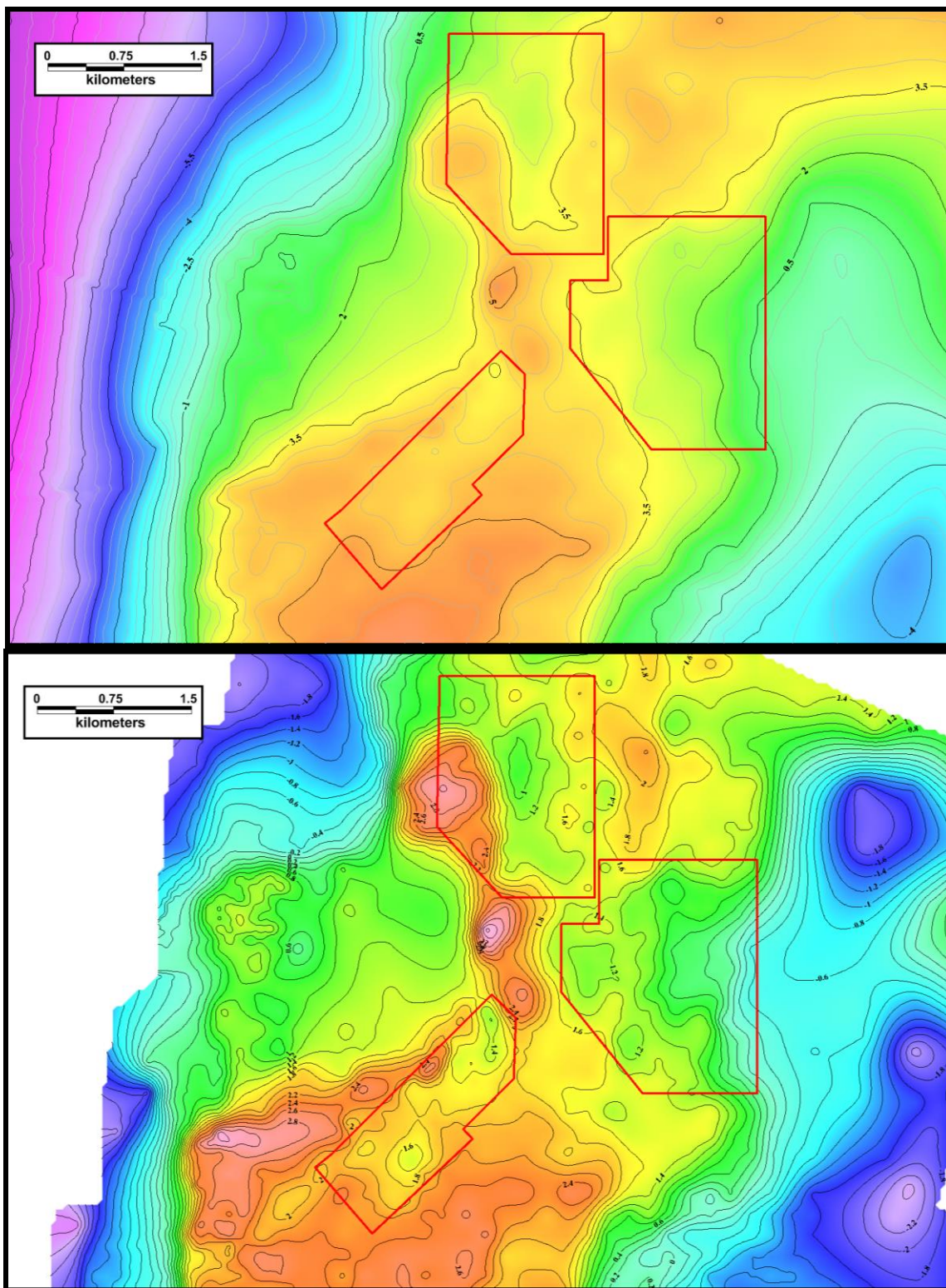
## INTERPRETATION

The report by Wright (2016) should be reviewed at this time to place the following discussion into context. The basic complete Bouguer anomaly (CBA) of gravity and the associated residual of the gravity are presented side-by-side in Figure 4. Even at this large scale, enhanced resolution is evident in areas detailed by the 2017 in-fill gravity. Figure 5 presents images comparing the 2016 and 2017 residual coverage for the three northern in-fill areas outlined in red and the broader scale additional coverage to the east (see Figure 2). Contour intervals differ as do coloration; however, the increased detail is evident.



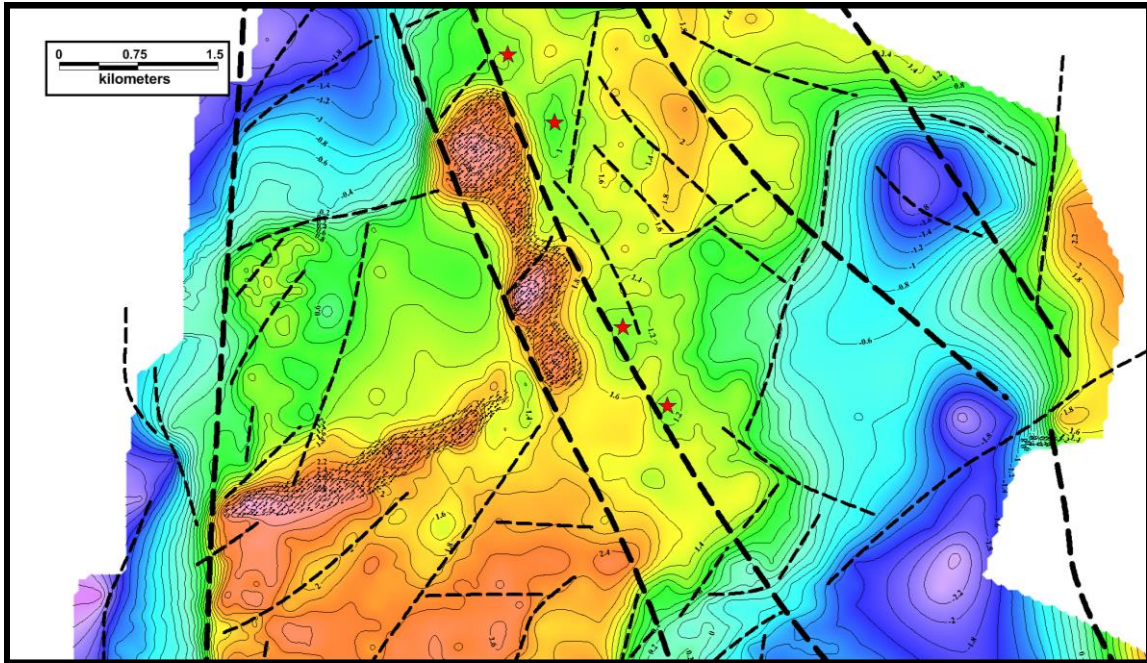
**FIGURE 4: CBA (Left) and Residual (Right) Gravity over Gray Shade Topography**





**FIGURE 5: North Area Detail In-fill Comparison of Residual Gravity  
(2016 – Upper / 2017 – Lower)**



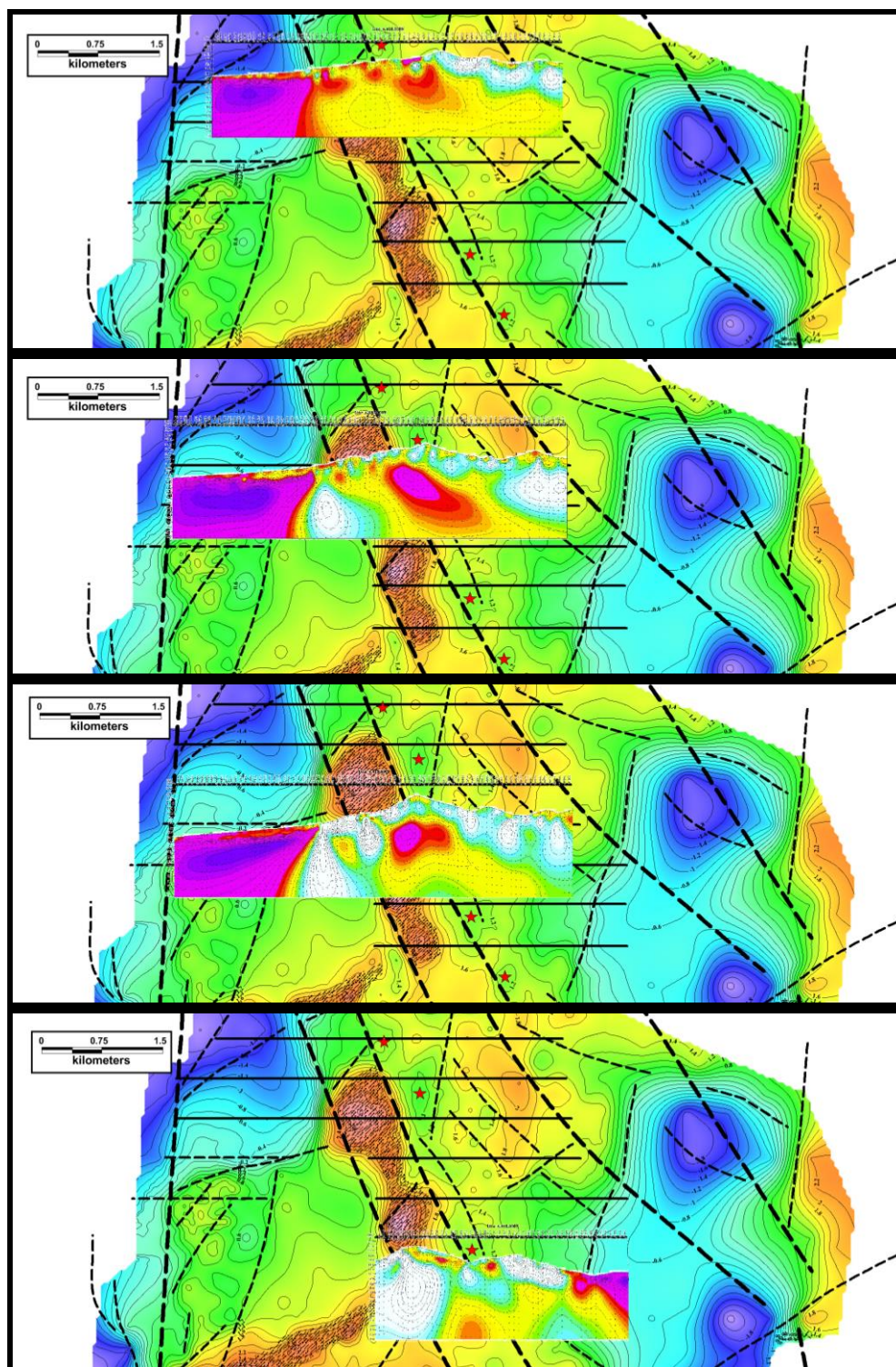


***FIGURE 6: North In-fill Residual Gravity Coverage with Interpreted Structures***

Interpreted structures developed in Wright (2016), and updated for the 2017 survey results, are present in Figure 6 over the residual gravity with contact alteration as two hatched polygons. Adjacent to the major northwest structural corridor is a row of gravity lows, the centers of which are marked with red stars. These are areas of density reduction likely related to alteration along the structural corridor. The prominent gravity embayment, slightly further east of the corridor, is well defined in the new coverage, as is the basin further to the east.

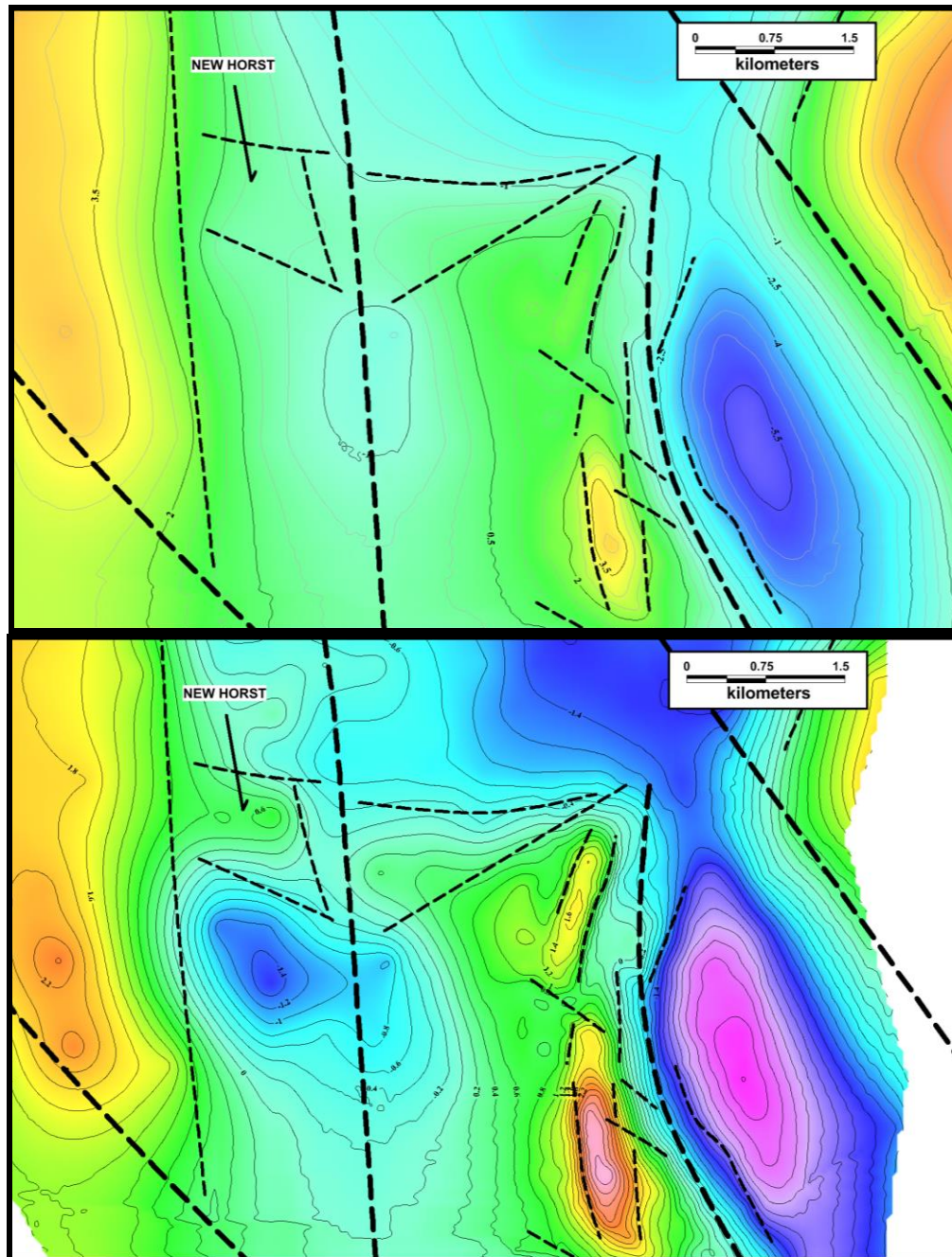
Controlled source audio magneto-telluric (CSAMT) inverted resistivity sections are presented in plan format in Figure 7. The sections cross in the vicinity of the four gravity lows. In all four cases, the gravity lows correlate with low resistivity features either immediately east of the structural corridor or within the corridor. In fact, the corridor appears to facet the low resistivity zones in some cases. A low resistivity correlation with reduced density is characteristics of some alteration types (i.e. decalcification, argillization).

The majority of wide spaced in-fill coverage along the east side of the 2017 survey is intended to locate other horsts akin to the North Goldbar Horst (NGH). Figure 8 presents a comparison of the 2016 and 2017 surveys in the vicinity of the NGH. Coloration and contour intervals differ, but the increased detail of the area west of the NGH is obvious. A new horst is confirmed by the in-fill data. The area is mapped as Tertiary basin fill. Furthermore, a structural bridge extends east-southeast to the NGH. Basin and Range extension could well have simply separated the two, meaning the two could have the same genetic origin and indeed be portions of the same horst block.



**FIGURE 7: Inverted CSAMT Sections over Residual Gravity and Structures  
(Lines 4420500N, 4420000N, 4419500N & 4418000N Top to Bottom)**

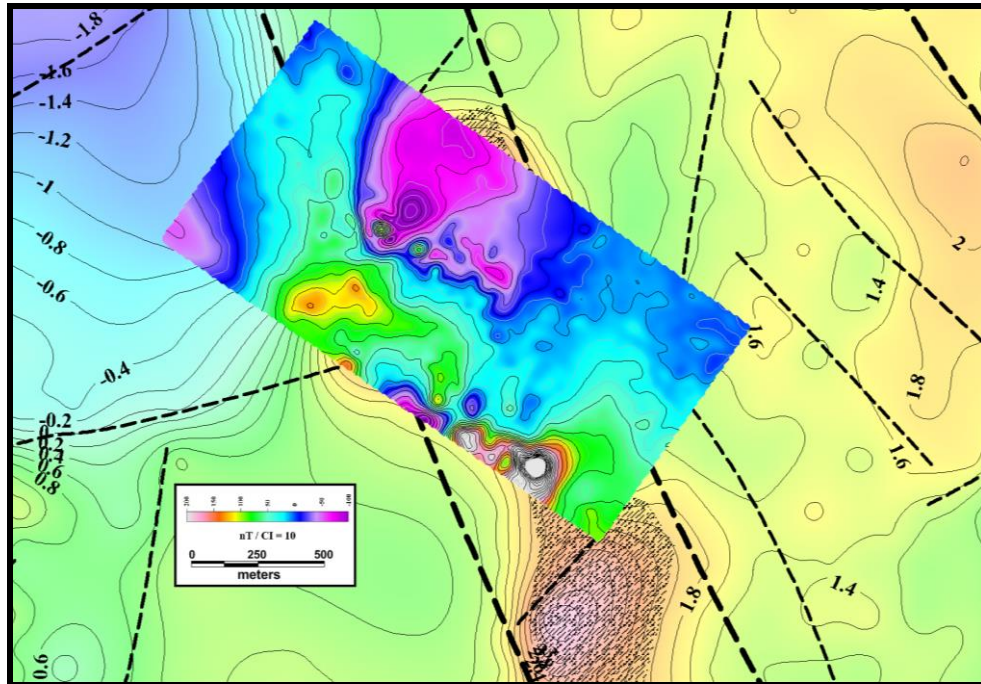




***FIGURE 8: Southeast Area Detail In-fill Comparison of Residual Gravity  
(2016 – Upper / 2017 – Lower)***

The reduced to pole (RTP) ground magnetic data are presented in Figure 9 over the residual gravity with interpreted structures and contact alteration depicted with a hatched pattern. The magnetic survey straddles the major northwest structural corridor adjacent to the northeast side of the Keystone intrusion. Elevated magnetic values extend along the edge of the intrusion in approximate correlation with elevated gravity interpreted as being produced by contact alteration.



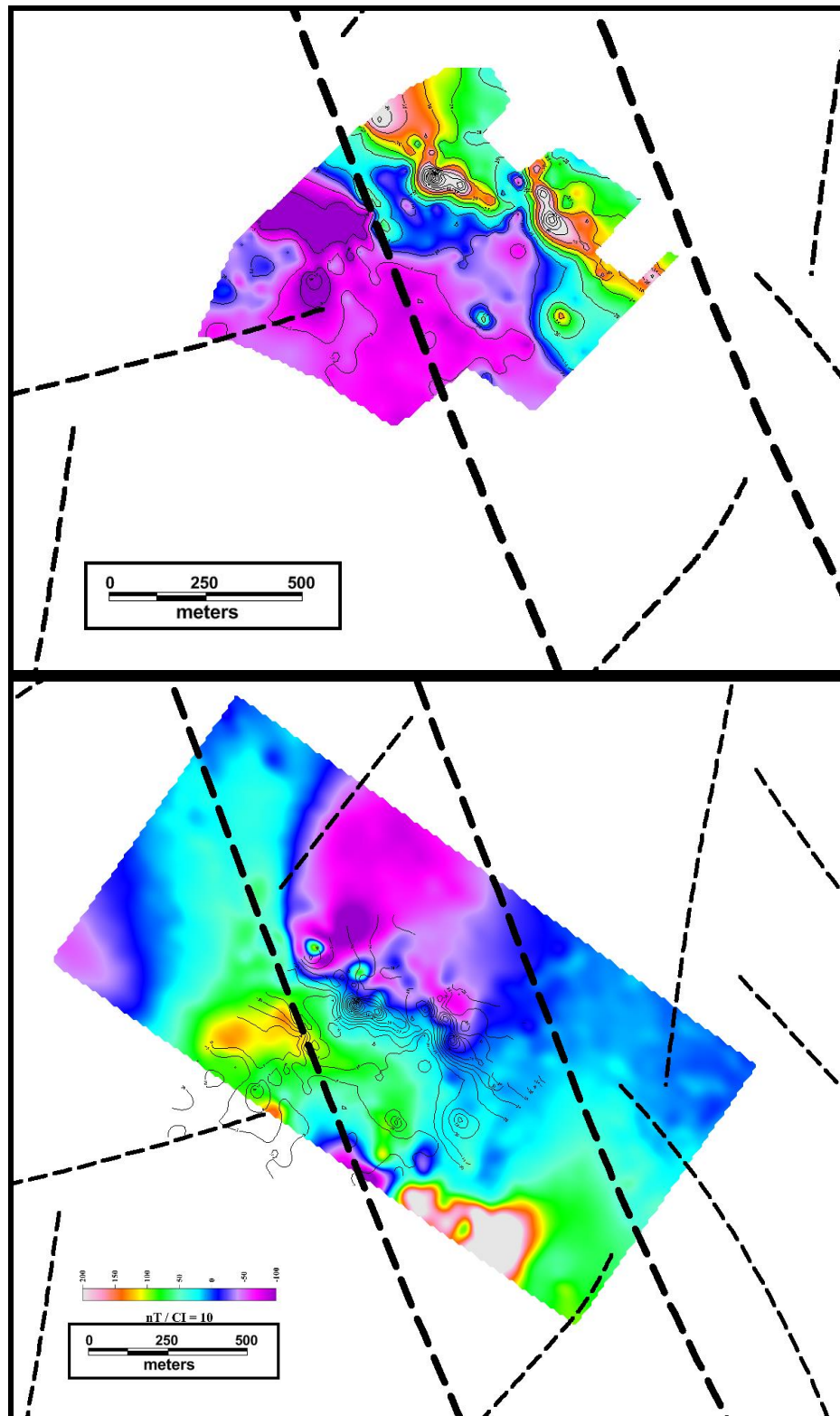


**FIGURE 9: RTP Magnetics over Residual Gravity**

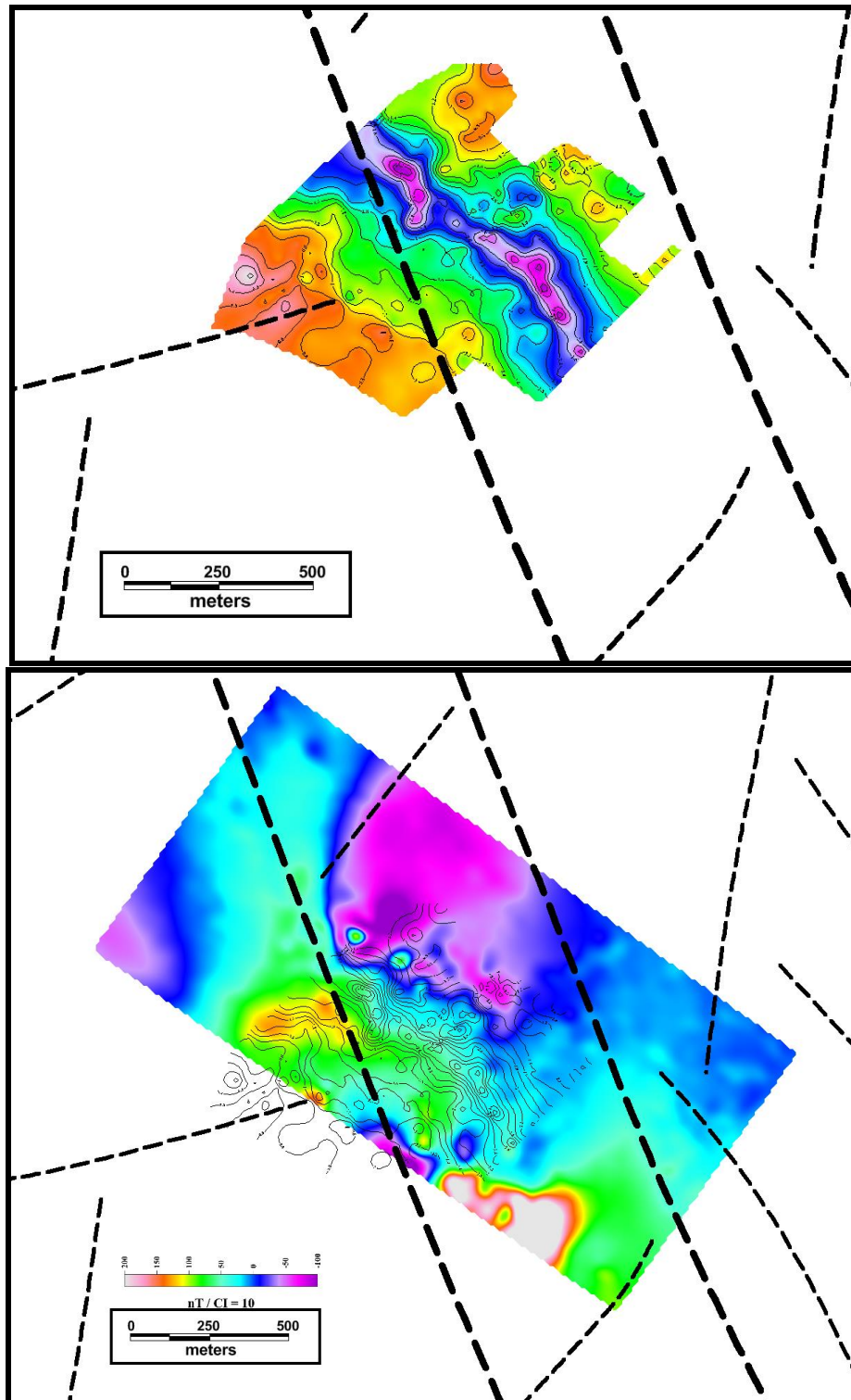
The primary objective of the ground magnetic survey is to determine any magnetic correlation with a prominent chargeability anomaly detected in a 2003 gradient array IP survey. Figures 10 and 11 present the chargeability and resistivity data from the IP survey along with the RTP magnetics overlain by the **chargeability and resistivity contours**. This permits identification of features which correlate between the IP and magnetic surveys.

A chargeability high traverses the center of the ground magnetic survey in a northwest – southeast trend and correlates very well with a transition from low (blues) to moderate (green) magnetic values. The most obvious feature in the gradient resistivity data is a high which parallels the chargeability high, but offset to the southwest. This also correlates very well with the magnetics. Both features parallel the intrusive contact.

In the analysis of the gravity results, several gravity lows are noted to extend along immediately east of the major northwest structural zone (see Figure 7). Figure 12 shows a more detailed view of the CSAMT inverted resistivity section for Line 4419500N over the gradient array chargeability and residual gravity. An approximate correlation of the chargeability highs with small scale resistivity lows within an overall zone of high resistivity is noted. The overall resistivity high correlates with a gravity high interpreted as being produced by contact alteration along the rim of the Keystone intrusion. One of the red star gravity lows (see Figure 6) is located to the east of the contact zone and, as noted previously, correlates with a larger scale resistivity low at depth as the CSAMT section demonstrates.

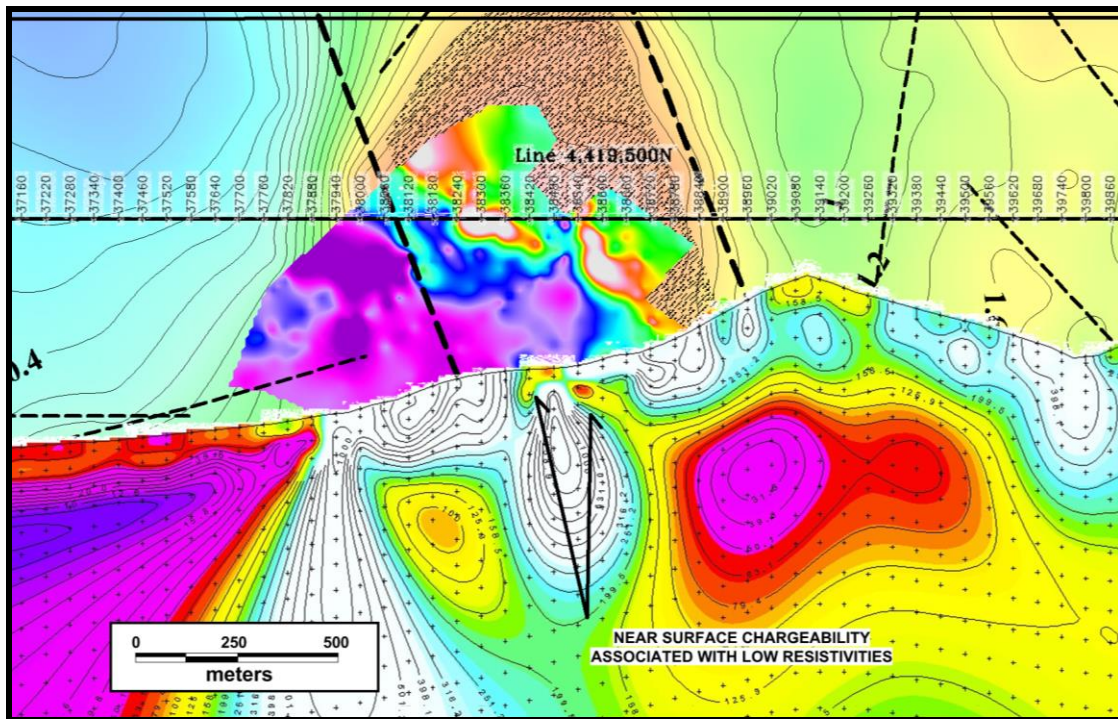


**FIGURE 10: Gradient Array Chargeability (Upper) and RTP Magnetics (Lower)**



**FIGURE 11: Gradient Array Resistivity (Upper) and RTP Magnetics (Lower)**

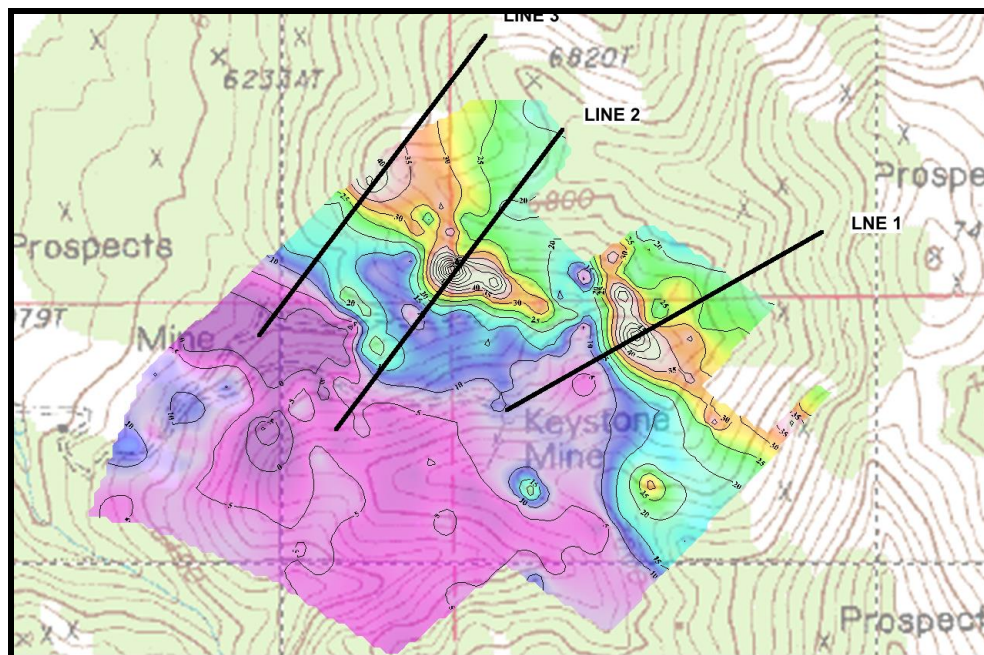




To the southeast, in-fill of widely spaced gravity coverage revealed another possible horst block west of the North Goldbar horst. A gravity bridge connects the two suggesting a structural / genetic connection.

The ground magnetic survey agrees well with other geophysical data in an extremely complex area along the northeast side of the Keystone intrusion. A chargeability anomaly detected in a 2003 IP survey traverses the ground magnetic coverage. No direct magnetic correlation is noted with the chargeability anomaly. However, the anomaly does correlate with the northeast flank of a magnetic high, indicating some form of genetic relationship. Furthermore, the chargeability anomaly correlates with smaller scale resistivity lows within an overall region of high resistivities produced by contact metamorphism / metasomatism related to the Keystone intrusion. Recent drill core analysis of two 2016 drill holes is report upon by Wright (2017). The analysis involves six samples and reveals low resistivity and high chargeability correlate with samples identified as containing some carbonaceous material. This raises the possibility of graphite as the source of the chargeability anomaly. In fact, it also raises the possibility of carbon flooding as the source of the aforementioned gravity lows along the northwest structural corridor.

A ground examination of the new horst west of NGH is recommended, as well as the four gravity lows. **The source of the chargeability anomaly is indeterminate with equal possibilities of sulfides or graphite.** A detailed IP survey is recommended in preparation for drill testing. Three pole-dipole IP lines are proposed across the main part of the anomaly as Figure 13 shows.



**FIGURE 13: Proposed IP Lines over Gradient Array Chargeability**

## **REFERENCES**

Wright, J. L., 2016, Keystone Property, Gravity Survey – 2016, Geophysical Compilation: U. S. Gold Corporation company report.

Wright, J. L., 2017, Keystone property, Physical properties, Induced Polarization: U. S. Gold Corporation company report.



**APPENDIX A**

**GRAVITY SURVEY**

**over the**

**KEYSTONE PROSPECT  
EUREKA & LANDER COUNTIES, NEVADA**

**for**

**U.S. GOLD CORP  
May 2017**

**SUBMITTEDBY**

Magee Geophysical Services LLC  
465 Leventina Canyon Road  
Reno, Nevada 89523 USA  
TEL 775-742-8037  
FAX 775-345-1715  
Email: [chris\\_magee@gravityandmag.com](mailto:chris_magee@gravityandmag.com)  
Website: [www.gravityandmag.com](http://www.gravityandmag.com)

## **INTRODUCTION**

Gravity data were acquired at the Keystone Prospect in Eureka and Lander Counties, Nevada for U.S. Gold Corp. The gravity survey was conducted from May 09 through May 15, 2017. A total of 381 new gravity stations were acquired.

Relative gravity measurements were made with LaCoste & Romberg Model-G gravity meters. Topographic surveying was performed with Trimble Real-Time Kinematic (RTK) and Fast-Static GPS. Field operations were based out of Eureka, Nevada.

Gravity data were processed to Complete Bouguer Anomaly (CBA), merged with existing and public domain USGS data, and forwarded to consulting geophysicist Jim Wright for further processing and interpretation.

## **DATA ACQUISITION**

### **Survey Personnel**

Data acquisition and surveying were performed by Brian Page, Lukas Magee, Trevor Bianchi and Matt Basile. Brian Page and Christopher Magee supervised all operations and completed final data processing.

### **Gravity Meters**

LaCoste & Romberg Model-G gravity meters, serial numbers G-018, G-392, G-406, and G-603, were used on the survey. Model-G gravity meters measure relative gravity changes with a resolution of 0.01 mGal. The manufacturer's calibration tables used to convert gravity meter counter units to milliGals are included with the delivered data.

### **Gravity Base**

The gravity survey is tied to a single U.S. Department of Defense gravity base located in Eureka (DoD reference number 5311-1). The information on this base is listed below.

<u>Base</u>	<u>Absolute Gravity</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Elevation</u>
EUREKA	979527.55 mGal	39.51267°	-115.96000°	1975 m

### **GPS Equipment**

All gravity stations were surveyed using the Real-Time Kinematic (RTK) GPS method or, where it was not possible to receive GPS base information via radio modem, the Fast-Static method was used. The following GPS equipment was used on the project:

Trimble SPS880/R8/5700 receivers

Trimble Model TSC2 Data controllers

Trimble TrimMark III base radio

Trimble Zephyr GPS antennas

Trimble Business Center (Version 3.82) was used for GPS data processing.

### **Geodetic Survey Control**

A single GPS base station, designated *KEYI*, was used on this project. The coordinates and elevation of this base station location were determined by making simultaneous GPS occupations in the Fast Static mode with Continuously Operating Reference Stations (CORS). GPS data for this station was submitted to the National Geodetic Survey (NGS) OPUS service which is an automated system that uses the three closest CORS stations to determine coordinates and elevations for unknown stations. The coordinates and elevations of station *KEYI* are listed below.

Station	WGS-84 Latitude	WGS-84 Longitude	WGS-84 Ellipsoid Ht.
<i>KEYI</i>	N39° 53' 30.44136"	W 116° 29' 55.05221"	2133.378 m
	<b>NAD27UTMNorthing</b>	<b>NAD27UTMEasting</b>	<b>Elevation (NAVD29)</b>
	4415666.531 m	542943.631 m	2152.541 m

### Topographic Surveying of Gravity Stations

All topographic surveying was performed simultaneously with gravity data acquisition. The gravity stations were surveyed in NAD27 UTM Zone 11 North coordinates in meters. The Datum Grid method (NADCON) was used to transform from the WGS-84 (NAD83) datum to the NAD27 datum and the GEOID12B geoid model was used to calculate NAVD88 elevations from ellipsoid heights. The elevations were then converted to North American Vertical Datum of 1929 (NAVD29) using the NGS program VERTCON. The coordinate system parameters used on this survey are summarized below.

#### Datum

Datum Name	NAD27
Ellipsoid	Clarke 1866
Semi-Major Axis	6378206.4 m
Eccentricity	0.082271854
Transformation	NADCON (CONUS)

#### Projection

Type	Universal Transverse Mercator
Zone	UTM 11 North
Origin Latitude	00° 00' 00.00000" N
Central Meridian	117° 00' 00.00000" W
Scale Factor	0.9996
False Northing	0
False Easting	500000 m
Geoid Model	GEOID12A (CONUS)

### Gravity Stations

A total of 381 new gravity stations were acquired. Stations were reached by ATV or on foot.



## DATA PROCESSING

Field data including station identifier, local time, gravity reading, measured slope, and operator remarks were recorded in the field in notebooks. The recorded data were then entered into a notebook computer in the form of Geosoft RAW gravity files. Survey coordinates were transferred digitally.

All gravity data processing was performed with the Gravity and Terrain module of Oasis montaj (Version 8.5.2). Gravity data were processed to Complete Bouguer Gravity (CBG) over a range of densities from 2.00 g/cc through 3.00 g/cc at steps of 0.05 g/cc using standard procedures and formulas.

### Data Processing Parameters

<u>GMT Offset</u>	<u>Gravity Formula</u>	<u>Gravity Datum</u>
-7 hours	1967	IGSN-71

### Terrain Corrections

Terrain corrections were calculated to a distance of 167 km for each gravity station. The terrain correction for the distance of 0 to 10 meters around each station was calculated using a sloped triangle method with the average slopes measured in the field. The terrain correction for the distance of 10 meters to 2000 meters around each station was calculated using a combination of a prism method and a sectional ring method with digital terrain from 10-meter Digital Elevation Models (DEM). The terrain correction for the distance of 2 to 167 kilometers around each station was calculated using the sectional ring method and digital terrain from 90-meter DEMs.

### Gravity Repeats and Loop Closures

Total number of stations:	381
Number of repeated stations:	21
% stations repeated:	5.5%
Total number of readings:	446
Number of repeat readings:	65
% readings repeated:	14.6%
Maximum repeat error:	0.0373 mGal
Mean repeat error:	0.0111 mGal
RMS error:	0.0161 mGal

The mean of the absolute value of all loop closure errors is 0.03 mGal.

## DATA FILES

### Raw Data Files

The raw data files are named with the gravity meter serial number, date, and operators initials. The format is *gnnn\_mmm\_dd\_2017\_iii.txt* where *gnnn* is the serial number of the gravity meter, *mmm* is the month, *dd* is the date on which the gravity loop was acquired, and *iii* are the operator's initials. The raw data files and Geosoft database file (.gdb) for each day's data are included with the delivered data.

## **Final Gravity XYZ File**

The final GDB file with all principle facts for the May 2017 Keystone Gravity Survey is named [\*Keystone2017\\_Master.gdb\*](#) with a corresponding XYZ file named [\*Keystone2017\\_Master.xlsx\*](#). The merged GDB is named [\*Keystone2017\\_MasterMerge\\_May16.gdb\*](#) with a corresponding XYZ file named

[\*Keystone2017\\_MasterMerge\\_May16.xlsx\*](#). The data columns in the file include headers identifying the value of each column.

## **Grid and Terrain Files**

The file names for the grid files used to create the images in this report and to calculate the terrain corrections are as follows and are included with the delivered data.

Complete Bouguer Gravity grids

[\*Keystone2017\\_CBA250\\_Merged.grd\*](#)

Local terrain files

[\*Keystone\\_10m\\_DEM\\_Expand.grd\*](#)

Regional terrain files

[\*Nevada\\_90m\\_NAD27UTM11.grd\*](#)

Regional terrain correction output file

[\*Keystone\\_167\\_tc\\_expand.grd\*](#)

## **Geosoft Database Files**

All of the additional Geosoft database (.gdb) files associated with the data processing are also included with the delivered data, these are:

Final coordinate and elevation listing

[\*Keystone2017\\_Locations\\_27z11\\_v.gdb\*](#)

Master gravity database

[\*Keystone2017\\_Master.gdb\*](#)

[\*Keystone2017\\_MasterMerge\\_May16.gdb\*](#)

Gravity Base Station database

[\*EUREKA\\_GRAV\\_BASE.gdb\*](#)

## **GPS Data Files**

The raw and processed GPS data are included with the delivered data as Trimble Business Center projects and/or included in folders organized by date.

**APPENDIX B**

**GROUND MAGNETIC SURVEY**

**Over the**

**KEYSTONE PROSPECT  
EUREKA COUNTY, NEVADA**

**for**

**U.S. GOLD CORP.  
MAY 2017**

**SUBMITTED BY**

Magee Geophysical Services LLC  
465 Leventina Canyon Rd  
Reno, Nevada 89523 USA  
TEL 775-742-8037  
FAX 775-345-1715  
Email: [chris\\_magee@gravityandmag.com](mailto:chris_magee@gravityandmag.com)  
Website: [www.gravityandmag.com](http://www.gravityandmag.com)

## **Introduction**

A ground magnetic survey was conducted over the Keystone Prospect in Eureka County, Nevada for U.S. Gold Corp. during the period of May 16-20, 2017. A total of 41 line-kilometers of magnetic data were acquired using Geometrics Model G-858 magnetometers. Real-time differentially-corrected GPS was used for positioning.

Measurements of the total magnetic intensity were taken in the continuous mode at two-second intervals along southwest-northeast oriented lines spaced 50 meters apart. A base magnetometer was operated during all periods of data acquisition and recorded readings every two seconds. The field operations were based out of Eureka, Nevada.

Magnetic data from this survey have been diurnally corrected, and all raw and processed data are included with the delivered data.

## **Survey Personnel**

Lukas Magee, Matt Basile and Brian Page acquired the ground magnetic data and operated the GPS for navigation and positioning. Brian Page and Christopher Magee supervised survey operations, performed quality-control analysis and processed all of the magnetic data.

## **Roving Magnetometer**

Geometrics G-858 Cesium Vapor magnetometers were used on this project. The magnetometer sensors were mounted on aluminum poles attached to backpacks with a sensor height of about 2.9 meters above ground level. The relatively high sensor height was necessary to maximize the distance between the sensor and the GPS antenna and minimize the heading errors caused by the presence of the GPS antenna. The heading error with this system is on the order of one to two nT. The magnetometer was set up to record the total intensity of the magnetic field every two seconds resulting in an average sample spacing of two to three meters or less.

## **Base Magnetometer**

A Geometrics Model G-858 magnetometer was also used as a base magnetometer to record diurnal changes in the Earth's magnetic field. The base magnetometer was set up in an area where the gradient of the magnetic field is low as determined by a quick site survey that was performed. The base magnetometer sensor was secured to a 6-foot staff and the unit was set up to automatically record a total field measurement every 2 seconds.

The NAD 27, UTM zone 11 North coordinates, in meters, of the base magnetometer location are 537492.11 East and 4419895.09 North with an elevation of 1845 m. A value of 50380 nT was assigned to the base magnetometer location on May 16, 2017. The base magnetometer was operated at all times that magnetic data were being acquired with the roving magnetometer.



## GPS Positioning

Trimble Model GeoExplorer XT and XH GPS receivers were used to provide navigation and positioning. The receiver was configured to receive differential corrections in real-time from WAAS (Wide Area Augmentation System) geo-stationary satellites. This system is operated by the United States Government Federal Aviation Administration. The resulting positions usually have an accuracy of about two meters. The GPS receiver was set up to output a NMEA string of positional data to be recorded on the magnetometer along with the magnetic readings. The positions of the magnetic readings were recorded on the G-858 magnetometer in WGS-84 latitude and longitude.

## Magnetic Profile Lines

A total of 41 line kilometers were surveyed along 41 southwest-northeast profiles. Lines were 1.0 kilometer in length. Some lines had to be offset slightly or have gaps in coverage due to the presence of fences, trees or old mining junk.

## Data Processing

After downloading the magnetic data from the magnetometers onto a notebook PC, diurnal corrections were applied (by assigning the appropriate value in nT to the base magnetometer location) using the Geometrics software package *MagMap2000*. Geosoft compatible XYZ files were then generated with WGS-84 geographic coordinates for each magnetic measurement. After importing the XYZ files into a Geosoft Oasis montaj database, NAD27 UTM zone 11 coordinates were generated, profiles were prepared, and additional editing was performed as necessary. The editing mostly consists of deleting readings affected by cultural noise and deleting dropouts which are large-amplitude negative spikes that occur when the magnetometer sensor is tilted too far from a vertical orientation.

## Raw Data Files

All of the raw data files for the project are included with the delivered data. Field and base magnetometer files are in binary format with the filename extension *.bin*. The *.bin* files are unedited. XYZ files are output from MAGMAP 2000 and contain the raw measurements, diurnal corrections, and WGS-84 latitude and longitude. Files are named with the date and operators initials.

## Geosoft Database File and Final XYZ File

The Geosoft database file with all of the processed and edited ground magnetic data is named [\*Keystone2017\\_GMAG.gdb\*](#). Additionally, the Geosoft database file and grid file were exported as XYZ files and are named, respectively, [\*Keystone2017\\_GMAG.XYZ\*](#) and [\*Keystone2017\\_TMI.XYZ\*](#).

## Map and Grid Files

The file names for the grid files used to create the maps in this report are as follows and are included with the delivered data: [\*Keystone2017\\_TMI.grd\*](#)