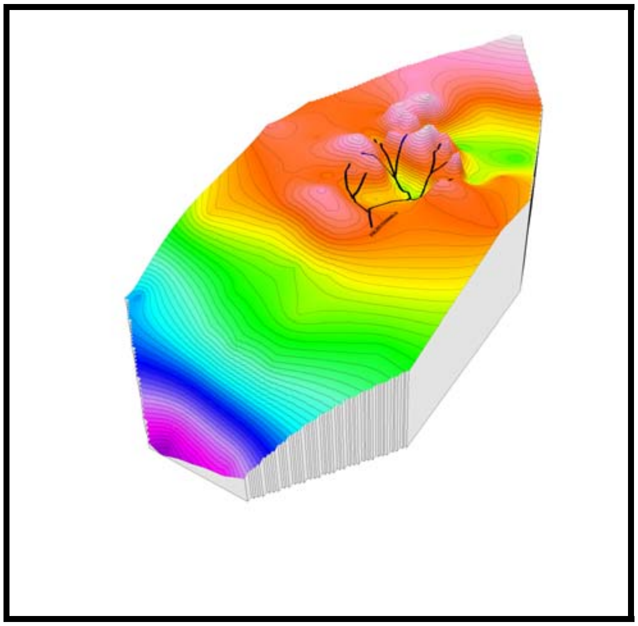
MARY ANN CANYON PROPERTY
GRAVITY SURVEY
GIS DATABASE



RES Gravity & Paleo-Channels Looking East-Northeast

James L. Wright M.Sc.

September 30, 2012

TABLE OF CONTENTS

INTRODUCTION

A gravity survey was completed over the Mary Ann Canyon property controlled by Kapacke Mining Corporation. Objective for the survey is to delineate the bedrock surface beneath the pediment underlying the property. Complexity in this surface should control deposition of alluvial gold.

Survey procedures and data processing for the survey are developed followed by an interpretation leading to conclusions and recommendations. Both map and digital products are provided. The map files are contained in a SURFER SRF plot file at a scale of 1:10000 with prints located in map pockets in the rear. A listing of the map products is provided in the Table of Contents. Digital files also include the raw and processed data, and MAPINFO GIS files. Also included are regional gravity, DEM, and topography files along with NAIP air photos. A DVD located in a sleeve at the rear of the report contains all the digital data along with a README file defining the folder / file structure. The report files are located in the REPORTS folder on the DVD.

Figure 1 shows the property's location within the state relative to towns, topography, counties, and major roads.

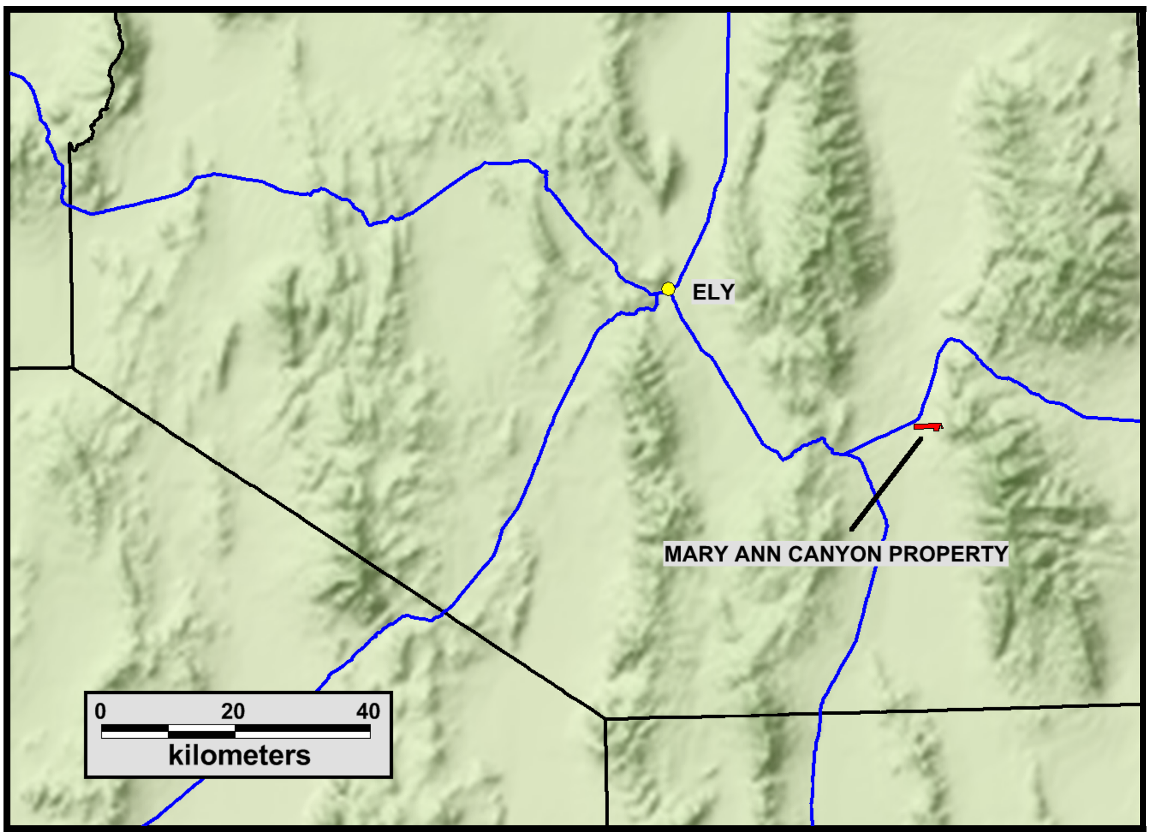


FIGURE 1: Mary Ann Canyon Property Location

SURVEY PROCEDURE

Figure 2 shows a station posting for the gravity survey over the National Agricultural Inventory Program 2006 (NAIP) air photo. Data were acquired on a grid with variable spacing, as well as widely spaced stations on the surrounding public roads during the period Sept. 11 - 15, 2012 by MaGee Geophysical Services LLC. A total of 183 unique stations were acquired using LaCoste and Romberg gravity meters.

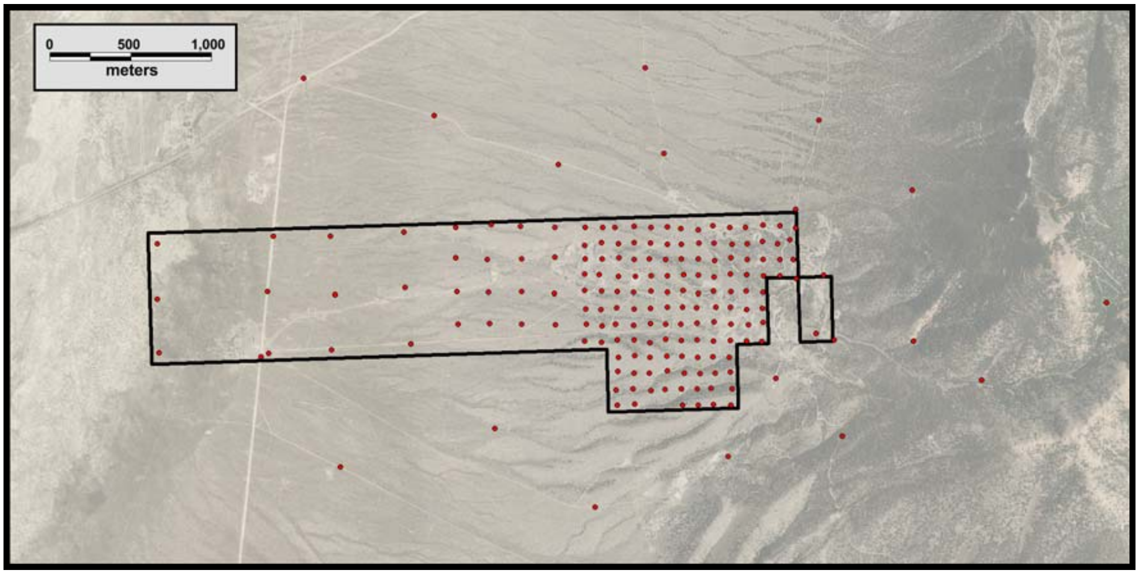


FIGURE 2: Gravity Survey Station Posting (●), Property Outline over NAIP Photo

The gravity survey is tied to a single U.S. Department of Defense gravity base located at the Eureka, Nevada court house Airport (DoD reference number 5311-12). 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. Trimble Geomatics Office (Version 1.63) was used for GPS data processing. A single GPS base station, designated *OSCEOLA*, was used on this project. The coordinates and elevations of this base stations location was determined by making simultaneous GPS occupations in the Fast Static mode with Continuously Operating Reference Stations (CORS). All topographic surveying was performed simultaneously with gravity data acquisition.

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 Xcelleration Gravity module of Oasis montaj (Version 7.0). Terrain Corrections were calculated to a distance of 167 km for each gravity station.

Gravity Repeat Statistics follow.

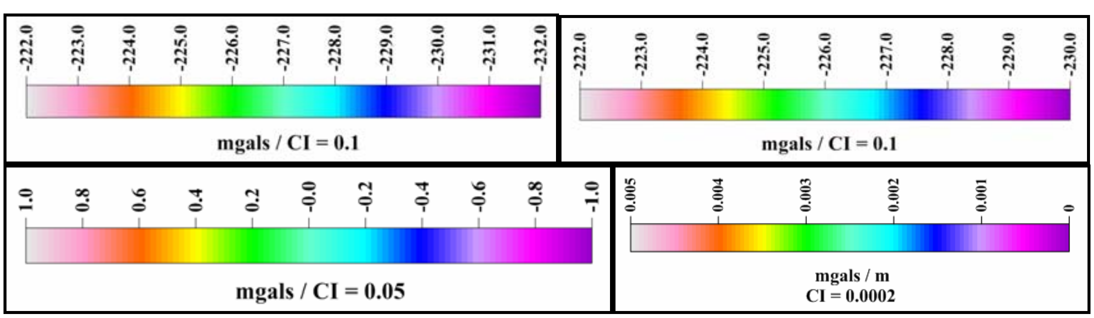
Total number of stations:	183
Number of repeated stations:	11
% stations repeated :	6.0%
Total number of readings:	202
Number of repeat readings:	30
% readings repeated:	14.9%
Maximum repeat error:	0.0424 mGal
Mean repeat error:	0.0166 mGal
RMS error:	0.0207 mGal

The mean of the absolute value of all loop closure errors is 0.049 mGal. Such closure errors are indicative of good data quality. Additional details concerning survey logistics are available in the Appendix.

DATA PROCESSING

Data provided by MaGee Geophysical Services included the gravity data corrected to the complete Bouguer anomaly (CBA) stage for several densities. The data were processed to generate CBA data for a density of 2.65 g/cc, which is most representative of the rock types found in the area of the survey. These include both carbonate and metamorphic rocks, which compose the majority of the proximal topography (Stewart and Carlson, 1978).

The CBA data were gridded with a Kriging algorithm using a spacing of 25m, which is 25% of the 100m grid station spacing. The gridded CBA data were upward continued 300m with a USGS algorithm to produce a regional (REG), which was subtracted from the CBA grid to produce a residual (RES). Finally, a total horizontal gradient (HG) was computed from the CBA. The CBA, REG, RES and HG grids were mask to the data limits and imaged / contoured for import into MAPINFO. Color bars for the four with units and contour intervals included follow. All data conform to the **NAD 27 / UTM 11N** coordinate system.



Gravity Survey Color Bars (CBA, REG, RES & HG)

As noted previously, SURFER V10 SRF plot files are provided for the various survey products at a scale of 1:10000 along with paper prints. Figure 3 shows an example plot.

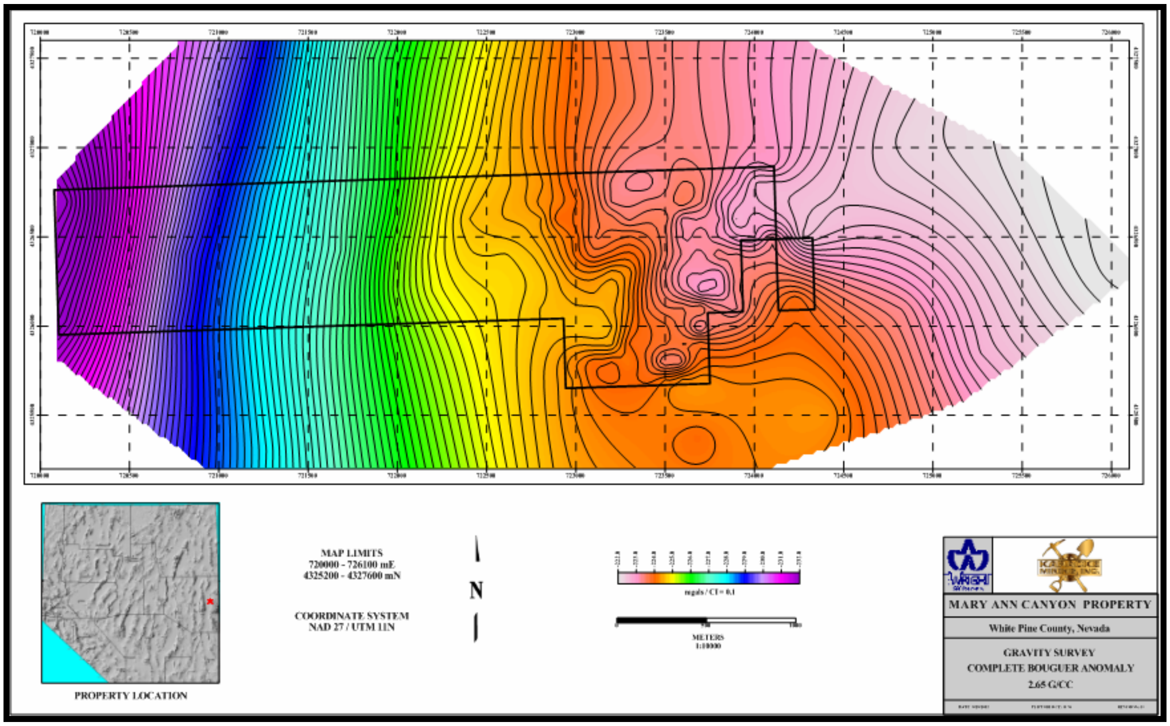


FIGURE 3: Example Plot

A basin model, or model of the depth of basin fill, was constructed for the portion of the survey covering the property. The modeling procedure is based upon a concept first proposed by Cordell and Henderson (1968). This basic approach was specialized and optimized for basin modeling. The basin and surrounding area is discretized as a collection of vertical, square prisms with adjustable heights and densities. These parameters are adjusted to fit the observed gravity. The residual gravity, which was gridded on a 100m interval, was resampled to 50m and a model constructed with 5151 prisms. Figure 4 shows the 50m spaced cells with dots marking tops of the vertical prisms along with the property outline. The frame outline defines the final model limits. Due to edge effect distortions; removal of corrupted cells along the outer limits of the model was facilitated by masking to the property boundary.

The gravity response calculated from the final model is compared with the observed gravity in Figure 5. The observe gravity is shown with black contours and the model response in red contours. A perfect model would produce a gravity response which exactly matches the observed data. That is, the black and red contours would match perfectly. Examination of the figures reveals reasonable agreement between the model response and observed data. Poorest agreement is noted in the southeast corner off the property. This is an area of poor gravity coverage (see Figure 2). Masking of the final depth model to the property boundary removes most of this portion of the model.

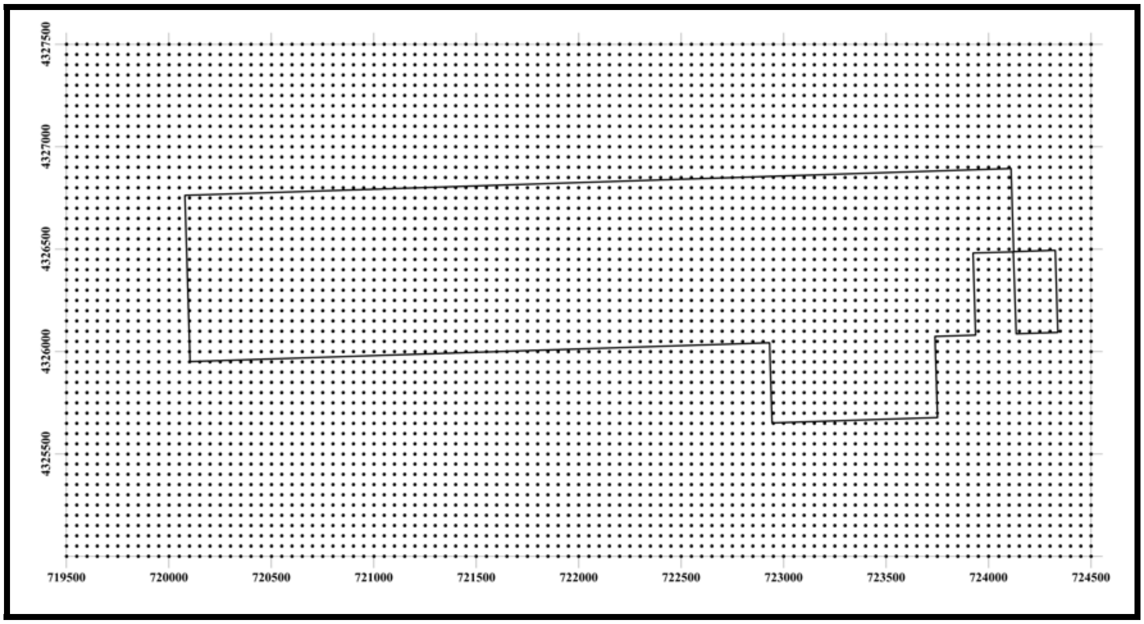


FIGURE 4: Basin Model Cell Locations

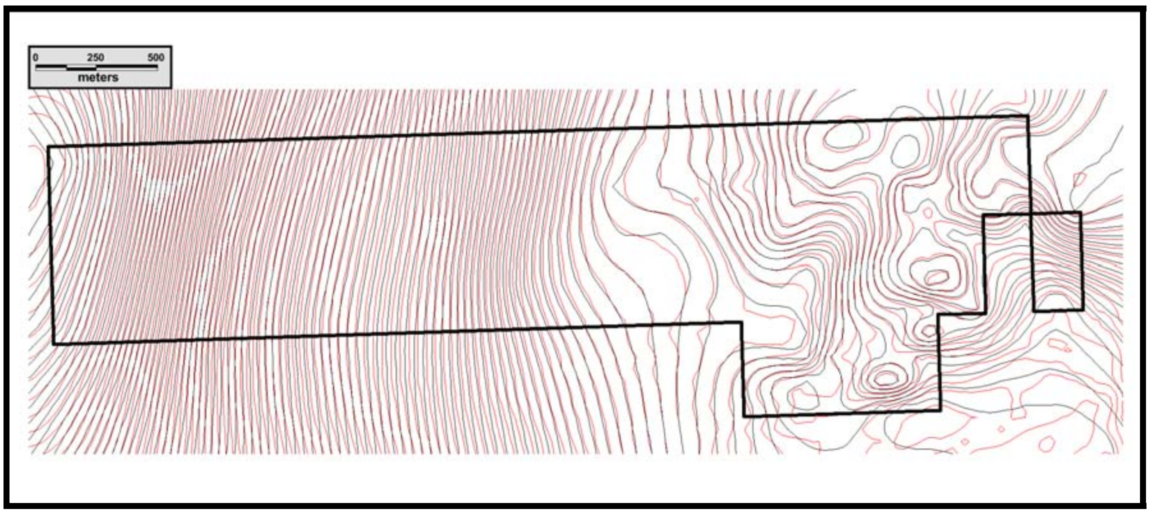


FIGURE 5: Comparison of Observed (Black) and Calculated (Red) Gravity

INTERPRETATION

The basic survey product, complete Bouguer anomaly (CBA), is presented over the National Agricultural Inventory Program (NAIP) air photo in Figure 6. As should be the case, gravity diminishes from the range front west into Spring Valley as a result of lower density gravels / sediments filling the basin. The total reduction is on the order of ten milligals (see color bars). Near the range front considerable complexity is evident in the results. This is results from bedrock variations beneath the relatively thin basin cover. As the basin fill thickens to the west the complexity diminishes. This is a result of the gravity meter being removed from the basement variations by the thicker cover. **It does not**

mean the complexity has ceased, it means the survey simply cannot resolve smaller scale basement features at depth. Figure 7 presents the residual (RES) gravity over the NAIP photo. The residual product is designed to enhance finer detail in the data by removing long / smooth features. Therefore, the residual accentuate the aforementioned complexity along the east side of the property.

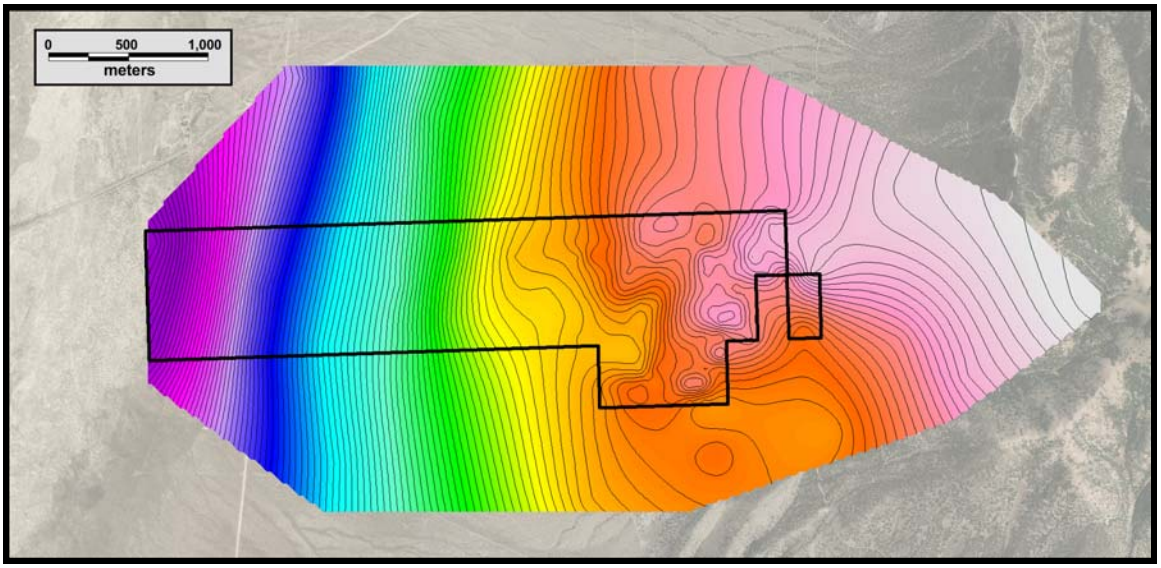


FIGURE 6: CBA Gravity over NAIP Air Photo

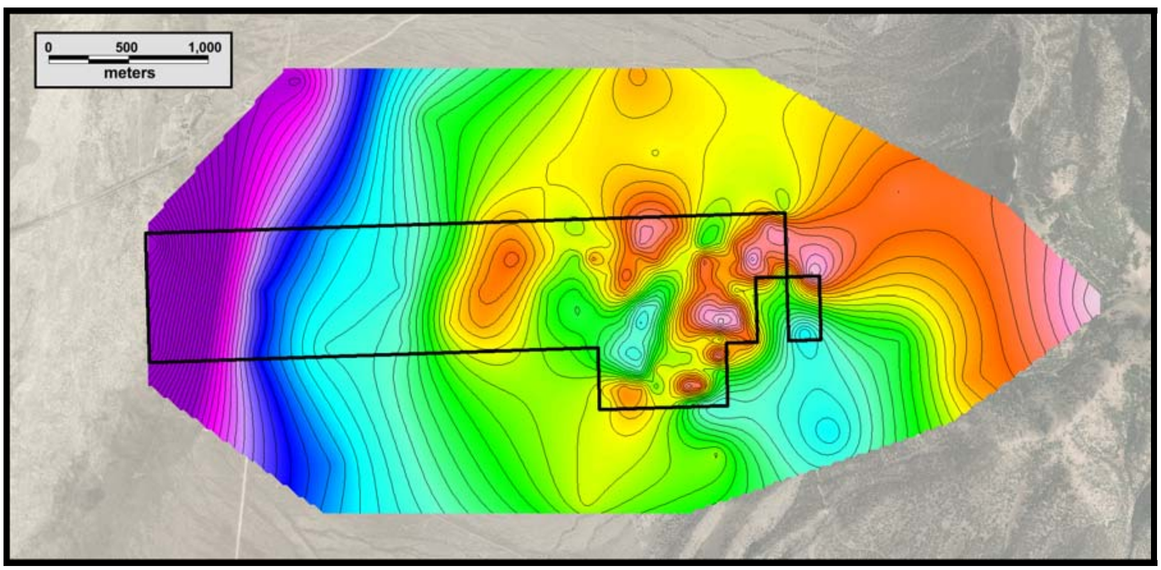


FIGURE 7: RES Gravity over NAIP Air Photo

Figure 8 and 9 present interpreted structures and paleo-channels over the NAIP photo for entire survey and detail of the eastern portion. The various localized gravity highs are interpreted to be blocks of basement rock protruding upward into the basin fill. Separating the blocks are several channels which connect to form a dendritic pattern draining to the west. This pattern is interpreted as reflecting paleo-channels, denoted with blue lines, incised into the bedrock and later covered with basin fill. Fill in the channels is thicker than over the blocks, thus the gravity is less along the channels.

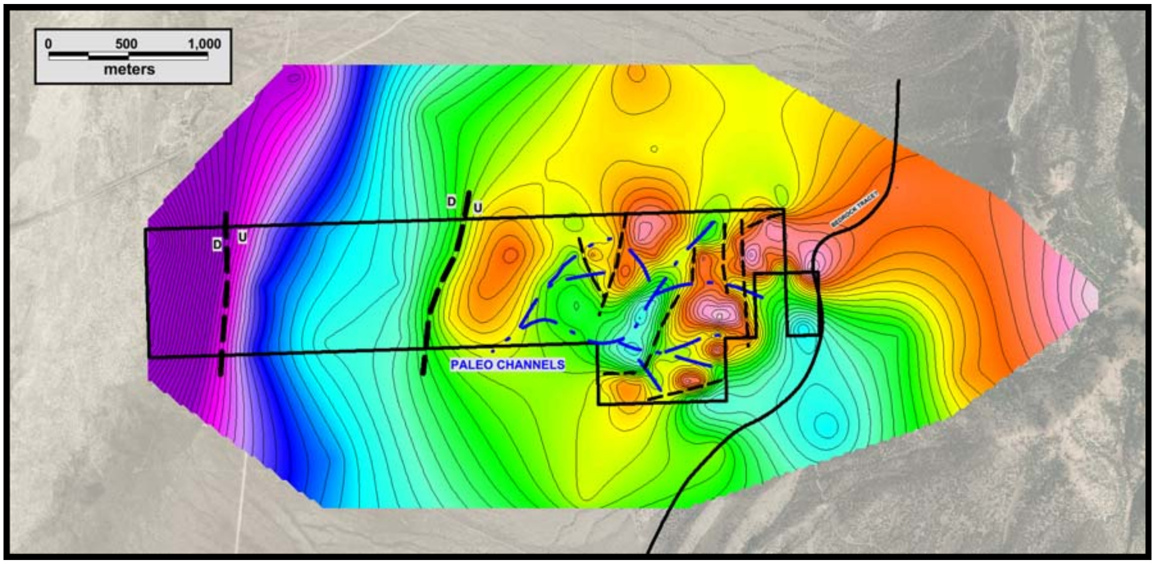
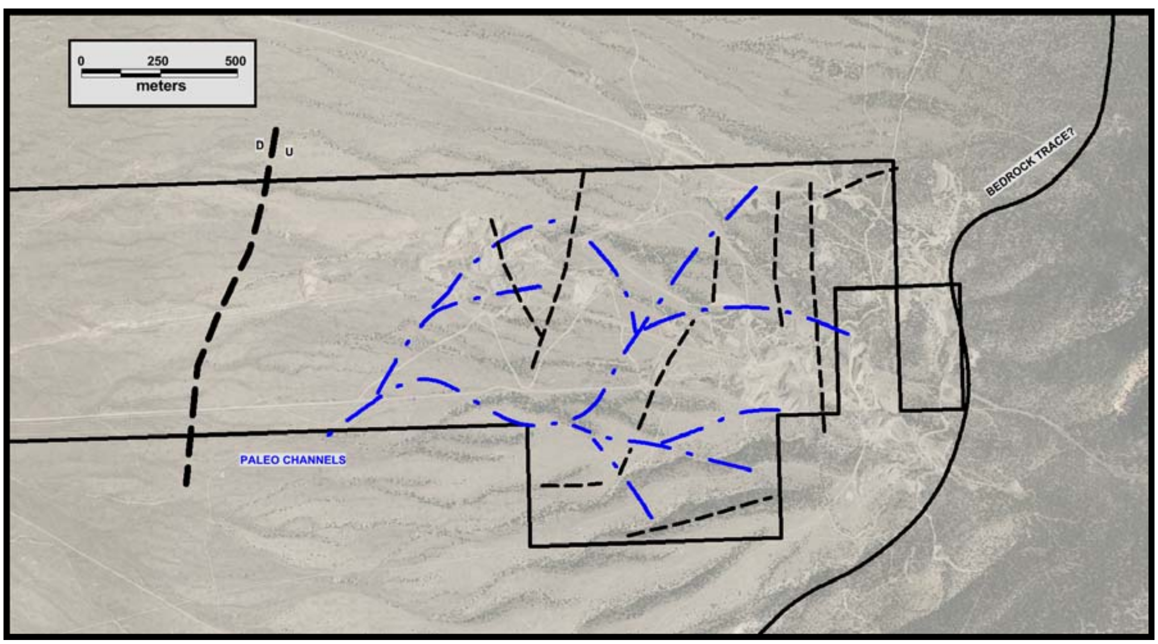


FIGURE 8: RES Gravity, Interpretation over NAIP Air Photo



FIGUR 9: Interpretation Detail over NAIP Air Photo

Several smaller scale structures, denoted with black dashed lines, parallel the range front and down-drop basement rocks to the west. Further west are two north-south oriented structures which exhibit larger scale offsets. These are denoted with heavier black lines marked with sense of movement indicators (i.e. U and D). Such larger scale structures are termed “basin bounding structures” and form boundaries to the inner basin. The relatively thin basin fill area between these structures and the range front is termed the “pediment”. These are important controlling features to sediments in the basin. The pediment is generally dominated by coarse locally derived sediments spilling into the basin from drainages. In the inner basin, young lake sediments and/or surface material such as sand dunes could be present. Also air fall material such as tuffs from areas well removed will accumulate more in the inner basin as opposed to the pediment. These materials can cover and/or dilute placer bearing gravels from the range. **Therefore, it is more effective to concentrate exploration efforts on the pediment as opposed to the inner basin.**

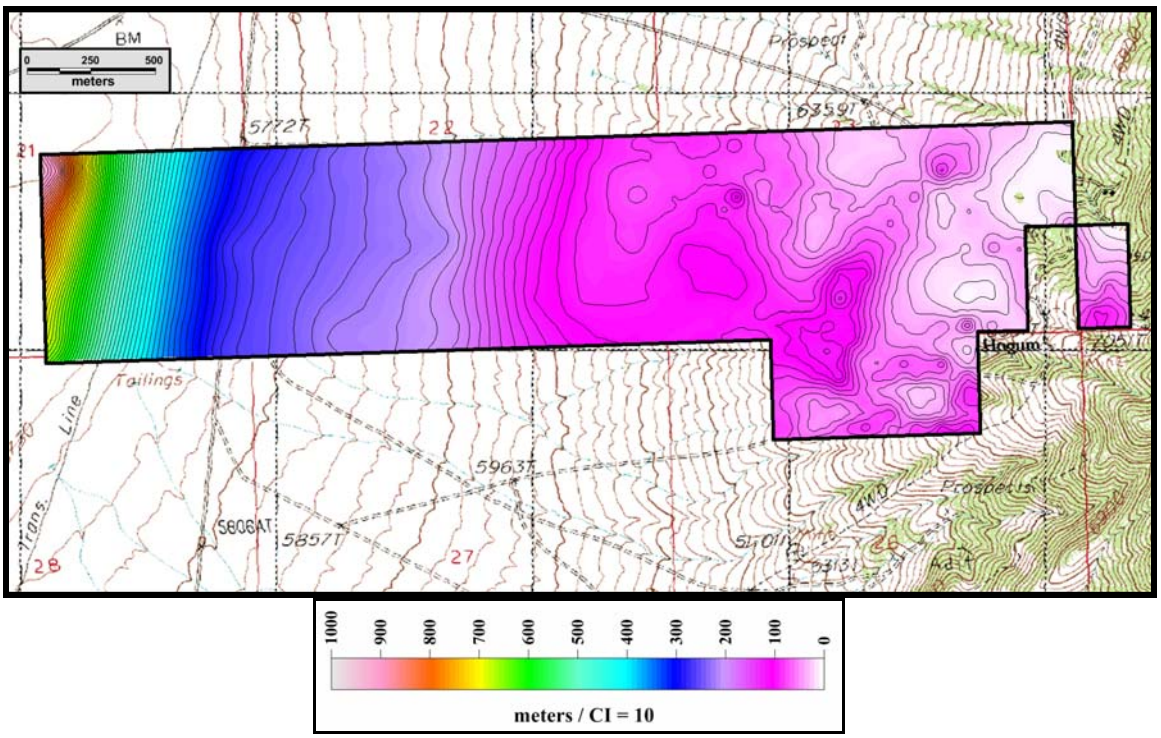


FIGURE 10: Basin Fill Thickness Model over 7.5’ Quadrangle Topography

The basin fill model is presented in Figure 10. Thickness of modeled basin fill thickness is shown as a color image with contours over the topography. Contour interval is 10m and ranges from zero at the range front to 1000m at the far west end of the property. However, due to model edge distortion, the 1000m is likely a high estimate. Comparing Figures 8 and 10 reveals the two larger scale structures correspond to pitches or step-downs in the basin, as should be the case. Offset on the easterly of the two is on the order of 100m. A more substantial offset is noted on the westerly of the two.

Some comments on the accuracy of the basin model are in order. The model is an unconstrained model, which means no know depths to bedrock were available within the basin. Furthermore, the bedrock basin trace, shown in Figure 9, was interpreted from air photos and thus not exact. These are important factors and impact the accuracy if such basin models. **Thus the basin model should be considered provisional pending additional information concerning depths within the basin and its margin.**

CONCLUSIONS AND RECOMMENDATIONS

The gravity survey delineates a pediment sloping westward into Spring Valley for approximately 2.2 kilometers, then offset by two basin bounding faults which cumulatively down-drop bedrock to approximately 1000m. Several localized gravity highs, near the range front, are interpreted as bedrock blocks protruding upward into the basin fill and separated by paleo-channels incised into bedrock. These channels served to deliver sediments from Mary Ann Canyon into Spring Valley and were eventually filled by sediments and buried. Smaller scale structures also offset the pediment down-dropping bedrock to the west.

Reasons for concentrating the exploration effort east of the major basin bounding faults are presented. To this end, Figure 10 shows proposed ground magnetic survey coverage confined east of the first basin bounding fault. Lines spaced at 20m and oriented north-south are recommended for a total of approximately 90 line-km. The objective of the survey is to delineate black sand (magnetite) concentrations in the area of the bedrock blocks / paleo-channels. If successful, the survey should yield highly specific targets suitable for testing.

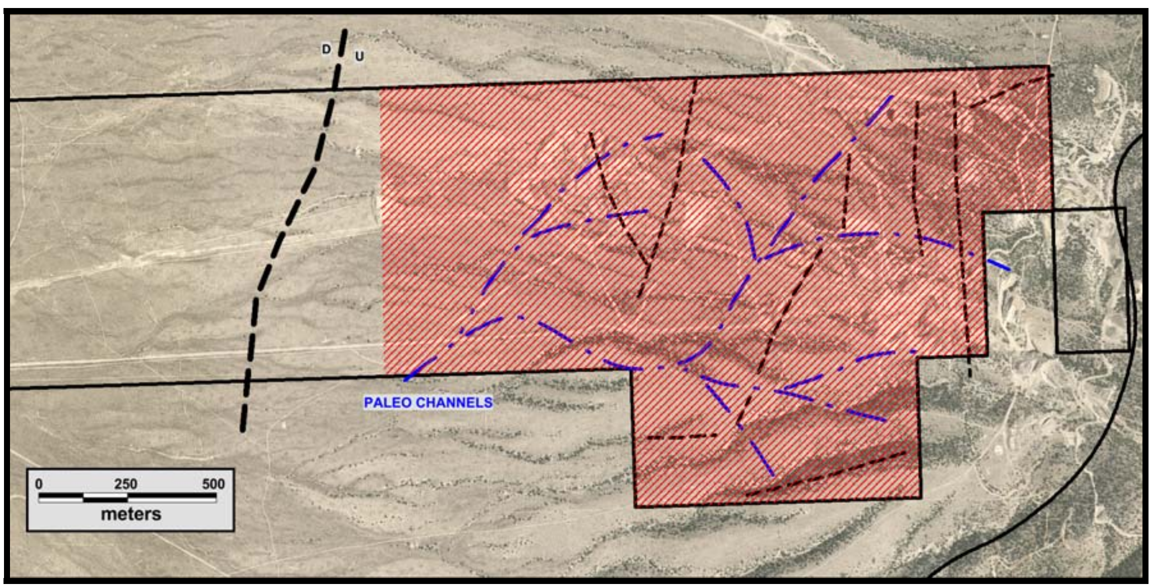


FIGURE 11: Proposed Ground Magnetic Survey Coverage over NAIP Air Photo

REFERENCES

Cordell, L. and Henderson, R. G., 1968, Iterative three-dimensional solution of gravity anomaly data using a digital computer: Geophysics, v. 33, pp. 596-601.

Stewart, J. H., and Carlson, J. E., 1978, Geologic Map of Nevada: USGS Map in cooperation with the Nevada Bureau of Mines.

APPENDIX

GRAVITY SURVEY

over the

MARY ANN CANYON PROSPECT
WHITE PINE COUNTY, NEVADA

for

KAPACKE MINING INC.
SEPTEMBER 2012

SUBMITTED BY

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
Website: www.gravityandmag.com

INTRODUCTION

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 Elko, Nevada. Gravity data were processed to Complete Bouguer Gravity and forwarded to consulting geophysicist Jim Wright for further processing and interpretation.

DATA ACQUISITION

Survey Personnel
Data acquisition and surveying were performed by Sean Watters and Lisa Siegel. Christopher Magee supervised all operations and completed final data processing.

Gravity Meters
Two LaCoste & Romberg Model-G gravity meters, serial numbers 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 at the Eureka Courthouse (DoD reference number 5311-1). The information on this base is listed below.

Base	Absolute Gravity	Latitude	Longitude	Elevation
EUREKA	979527.55	39.511667°	-115.960000°	1975.00m

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 Model 5700 Dual-Frequency GPS Receivers with built in UHF radios
Trimble Model R8 Receivers
Trimble Model TSCe & TSC2 Data Collector/controllers
Trimble TrimMark III base radio
Trimble Zephyr GPS antennas

Trimble Geomatics Office (Version 1.63) and Trimble Business Center (Version 2.63) were used for GPS data processing

Geodetic Survey Control

A single GPS base station, designated *OSCEOLA* was used on this project. The coordinates and elevations of this base station's locations were determined by making simultaneous GPS occupations in the Fast Static mode with Continuously Operating Reference Stations (CORS). GPS data for these stations were 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. Coordinates and elevations of station *OSCEOLA* are listed below.

Station	WGS-84 Latitude	WGS-84 Longitude	WGS-84 Ellipsoid Ht.
OSCEOLA	N39º03'25.78471"	W 114º 26'55.71314"	1742.909 m
	NAD27 UTM N	**NAD27 UTM E**	**Elevation (NAVD29)**
	4326017.987m	720827.200m	1762.418m

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 GEOID12 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.

<u>Datum</u>

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

<u>Projection</u>

Type	Universal Transverse Mercator
Zone	UTM 11 North
Origin Latitude	00º 00' 00.00000" N
Central Meridian	117º 00' 00.00000" W
Scale Factor	0.9996
False Northing	0
False Easting	500000 m
Geoid Model	GEOID12 (CONUS)

Gravity Stations

A total of 183 new gravity stations were acquired. Stations were reached by ATV or on foot.

DATA PROCESSING

Overview
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 Xcelleration Gravity module of Oasis montaj (Version 7.0). 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.

Data Processing Parameters
The following parameters were used to reduce the gravity data:

GMT Offset	Gravity Formula	Gravity Datum
-7 hours	1967	ISGN-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:	183
Number of repeated stations:	11
% stations repeated :	6.0%
Total number of readings:	202
Number of repeat readings:	30
% readings repeated:	14.9%
Maximum repeat error:	0.0424 mGal
Mean repeat error:	0.0166 mGal
RMS error:	0.0207 mGal

The mean of the absolute value of all loop closure errors is 0.049 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_2012_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 file and GeoSoft database file (.gdb) for each day's data are included with the delivered data.

Final Gravity XYZ File

The final XYZ file with all principle facts for the Mary Ann Canyon Gravity Survey is named *Mary_Ann_Canyon_Gravity_SEP_24_2012.csv*. 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 grid

CBG_240_Sep_16_2012.grd

Local terrain files

Mary_Ann_10m_DEM_Sep_13_2012.grd

Regional terrain files

NV_90m_ID_CA_UT.grd

Regional terrain correction output file

Mary_Ann_167km_TC_Out_Sep_2012.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

Coords_MaryAnn_Canyon_Thru_Sep_16_Navd29.gdb

Master gravity database

Master_MaryAnn_Canyon_Sep_2012edits

Gravity Base Station database

MaryAnn_Grav_Base.gdb

GPS Data Files

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