Liberty Star Geophysical Review

Prepared for

Liberty Star Minerals

by

Geoscience North

(Alan King, P.Geo., M.Sc.)

December 2019

Table of Contents

List of Figures ii

1 Acronyms 1

2 Introduction 1

3 Coordinate system 5

4 Geophysical Review by Geoscience North Ltd. 5

5 Inversions and 3D models 13

5.1 ZTEM 3D model of resistivity/conductivity 13

5.2 3D Magnetic models 14

6 Integrated models 17

6.1 Magnetics and geology 17

6.2 Mag discussion 18

6.3 Magnetics and ZTEM EM 19

6.4 Full Integrated model 22

7 Comments and Discussion 23

8 Conclusions and Recommendations 24

9 Targeting 24

References 25

Statement of Qualifications 26

List of Figures

Figure 1. *Regional Geologic map of south-eastern Arizona (SRK Consulting, 2011). The red star indicates the approximate location of the Hay Mountain survey area.* 3

Figure 2. *Local geologic map of the Hay Mountain survey area including the outlines of geochemical anomalies (after www.libertystar-uranium.com (2019), modified after Gilluly (1956)).* 4

Figure 3. Tombstone Area proposed Caldera and Liberty Star Geochemical anomalies outlines on Regional Arizona State TMI Magnetics. 6

Figure 4. Tombstone Area proposed Caldera and Liberty Star Geochemical anomalies outlines on Regional USGS gravity..7

Figure 5. TMI mag from ZTEM survey inset into Arizona state mag confirms large circular mag anomaly over Liberty Star property The geochemical anomalies are outlined In colour. 8

Figure 6. Outline of Au (yellow), Cu (red) and Mo (blue) geochemistry anomalies over geology (Plate-05 from Gilluly, 1956)..9

Figure 7. Analytic Signal (AS) of TMI mag from ZTEM inset into Arizona state TMI mag. 10

Figure 8. Comparison of ZTEM TMI-IGRF mag (top) and Mag AS (bottom) to estimate the importance of mag remanence. 12

Figure 9. ZTEM In Phase 90 Hz Total Phase Rotated (Total IP_090hz_TPR.grd) shows (red is higher cond) = 1/Resistivity... 13

Figure 10. 2019 Geotech 3D ZTEM survey inversion 50m cell size (Pink = Lower Resistivity < 150 Ohm-m) with geochemistry anomaly contours. 14

Figure 11. Geotech 2019 3D MVI mag inversion 0f ZTEM mag data 100m cell size (blue = higher magnetization > 0.003 Magnetization Units inset into AK 2019 3D MVI inversion of the regional USGS Magnetics (pink= higher magnetization)... 15

Figure 15. ZTEM 2019 Mag MVI higher magnetization = red and ZTEM EM Higher conductivity = pink. View from NE and below. 20

Figure 16. 3D ZTEM Resistivity section across Target Zd1. 2019 Geotech interpretation report. 21

Figure 17. Colour background image is ZTEM 2019 Mag MVI model horizontal slice at about 800m depth and pink overall is ZTEM EM (pink= higher conductivity).. 22

1 Acronyms

Mag	Magnetic/Magnetics
TMI	Total magnetic intensity
CVG	Calculated vertical gradient
1VD (may be used interchangeably with above term)	First vertical derivative
AS	Analytic signal
OGS	Ontario Geologic Survey
EM	electromagnetic
AEM	Airborne electromagnetic

The following: Introduction, History and Geology, were summarized from the Geotech 2019, Report on 3D ZTEM™ & 3D Magnetic Inversion Results Z-AXIS TIPPER ELECTROMAGNETIC (ZTEM™) AND AEROMAG ETIC GEOPHYSICAL SURVEY which in turn relied on SRK Consulting, 2011, Hay Mountain Exploration Report, Tombstone District, Arizona, for Liberty Star.

2 Introduction

The Hay Mountain project area is located approximately 110 km southeast of Tucson and a few kilometers southeast of the town of Tombstone, Cochise County, Arizona.

Liberty Star collected over than 600 soil samples and around 600 vegetation samples between July and November 2011. These samples were analysed by ICP-MS and the results have refined the target areas at Hay Mountain. As a follow-up to the delineated geochemical anomalies, Geotech Ltd conducted a helicopter-borne Z-axis tipper electromagnetic (ZTEM) survey within the Hay Mountain project area for Liberty Star in 2013.

The conceptual exploration target of the (Geotech) *survey was a potential porphyry copper type deposit related to a fracture system in an eroded caldera margin.*

A BRIEF HISTORIC WORK OVERVIEW

Exploration work conducted to date within the Hay Mountain area included regional-scale airborne geophysical surveys, geochemical, and biogeochemical surveys. Previous exploration for gold (Au) in the area included geochemical, geophysical, and geological surveys and drilling on the Zebra and Redrock Canyon projects that lie within the North portion of the Hay Mountain area.

Regional aeromagnetic and gravity surveys have been conducted in the past in south- eastern Arizona by the USGS and others. Additionally, there have been a variety of ground geophysical surveys (IP, CSAMT, etc.) conducted by various contactors in the Hay Mountain area.

In 2014, a preliminary interpretation of the collected Geotech's ZTEM and magnetic data using 2D ZTEM and 3D magnetic inversions suggested the presence of a number of conductive and resistive features.

Sulphide-rich, brecciation and/or clay alteration zones were suggested to explain the conductive anomalies coinciding with the geochemical anomalous halos and resistive anomalies are interpreted as (possibly) *being associated with intrusive bodies.*

Geoscience North also conducted a brief review of the recent geophysics on the property in 2018.

In 2019, a re-interpretation (by Geotech*) of the ZTEM and the magnetic data was performed with more rigorous 3D inversion tools with focus on porphyry targets.*

GENERAL GEOLOGY

The regional geologic setting of southern Arizona is related to the plate tectonic setting of the southwestern United States. Several superimposed orogenic episodes were driven by the position of the area on the leading edge of a continent that was subjected to volcanism and plutonism generated from the plate that was being subducted under the continent.

The Hay Mountain area is composed of a variety of rocks and formations ranging from the Proterozoic to Quaternary in age. They consist of schist, granite, limestone, dolomite, shale, sandstone, and conglomerate of Precambrian through Mesozoic age, and younger granodiorite, tuff or rhyolite sills, plugs and dikes, andesite dikes, (Figure 1a).

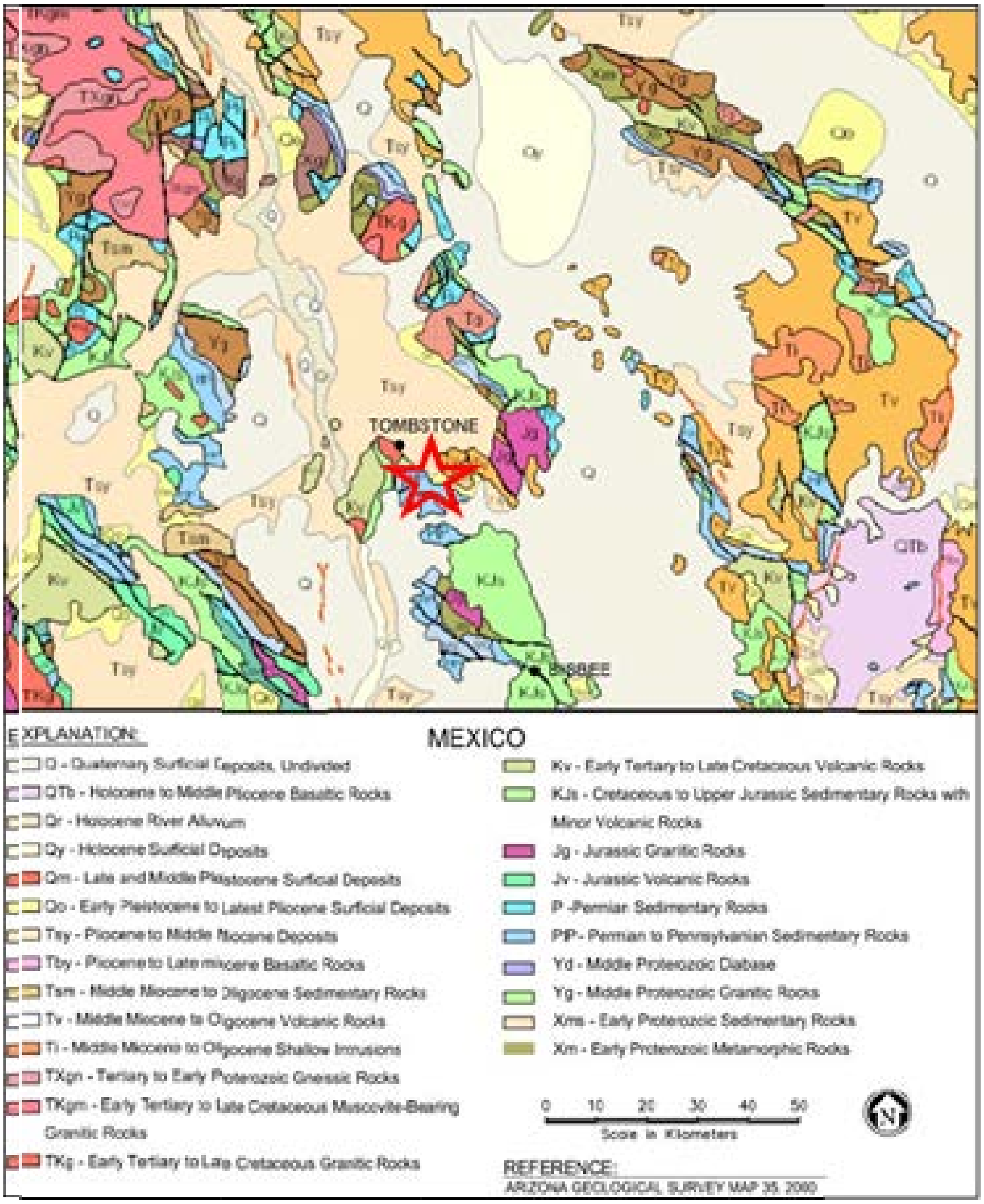


Figure 1. *Regional Geologic map of south-eastern Arizona (SRK Consulting, 2011). The red star indicates the approximate location of the Hay Mountain survey area.*

GEOLOGY AND MINERALIZATION OF THE PROPERTY

The Hay Mountain surface geology (Figure 2a) consists mainly of Late Paleozoic limestone bedrock outcrops, with minor Carboniferous Horquilla Limestone and Escabrosa Limestone, mainly Permian Colina Limestone, Earp Formation limestone-shale and Epitaph Dolomite, and Tertiary rhyolitic sills or intrusions, as well as Cretaceous Bisbee Group volcanic sediments. The depth to Precambrian basement is thought to exceed 1500 m. The overlying Quaternary-Tertiary gravels are 0-120 m thick. Major *structural directions are NW, WNW, EW and particularly NE, with the NE structural direction controlling Ag mineralization during the Laramide Orogeny (SRK Consulting, 2011).*

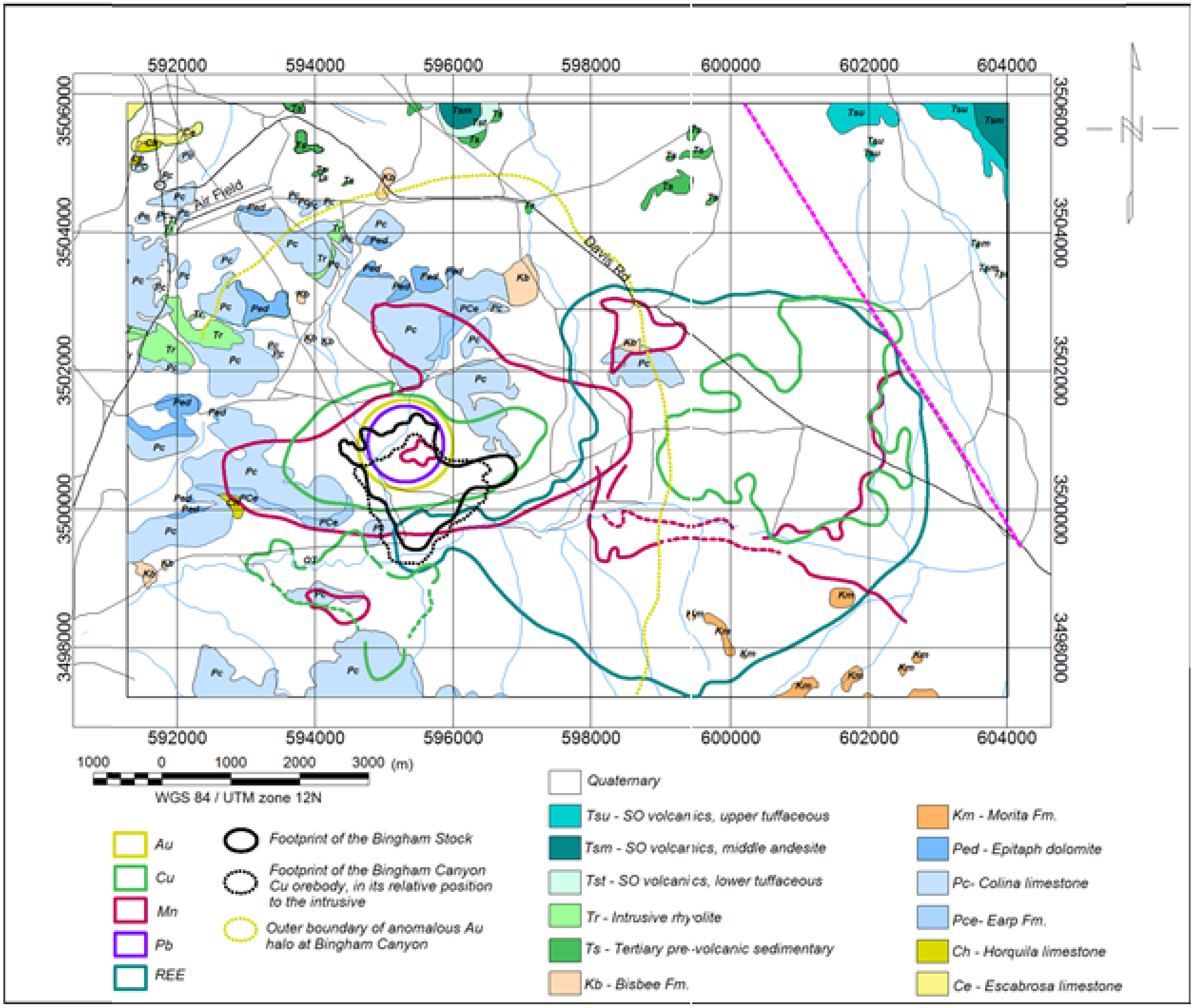


Figure 2. *Local geologic map of the Hay Mountain survey area including the outlines of geochemical anomalies (after www.libertystar-uranium.com (2019), modified after Gilluly (1956)).*

The principal past production from the Tombstone mining district has been silver (Ag) from high- grade veins associated with the intersection of north-northeast-striking fissures and andesite dikes with the fractured crests of northwest-trending anticlines (Butler et al., 1938). This mineralization has been dated at 74.5 million years ago (Ma) and alteration at 72 Ma (Newell, 1974).Mineralisation is probably related to the intrusion of the Schieffelin Granodiorite and associated tuff, the Uncle Sam Tuff, which have been dated at 76 Ma and 73.5 Ma (Creasey and Kistler, 1962; Marvin et al., 1973).

A later period of mineralization was likely associated with the Tombstone rhyolite, and the associated Extension/Comstock (Drewes et al., 1985). quartz monzonite porphyry in the eastern part of the district.

The Liberty Star exploration model focuses on potential deep-seated porphyry copper targets centred on structural intersections associated with 74 Ma calderas in the Tombstone District and under basin-fill formations. There is additional potential for carbonate-hosted replacement (CRD) type porphyry copper at intermediate to moderate depth, as well as shallow chalcocite blanket porphyry-type mineralization. Soil and vegetation geochemical surveys have identified a coincident Au-Pb-Cu anomaly and larger Mo-halo in the centre of the property (Figure 4-2).

Geochemical and geological studies of the Tombstone Mining District indicate that there are two deposit types and ages of mineralization. The early Laramide (74 Ma) magmatism and mineralization is responsible for the past production of major amounts of Ag in the polymetallic replacement deposits. The late Laramide (62-65 Ma) magmatism and mineralization is responsible for the porphyry copper mineralization. Mn occurrences and production are common in the outer zone of both the Ag deposits and the porphyry copper mineralization. Other indications of porphyry copper mineralization are the typical porphyry copper geochemical and geophysical signatures in the southern and eastern parts of the Tombstone Hills. In addition, a granodiorite porphyry and alteration that is common to porphyry copper deposits was intersected in ASARCO drill holes in the Robbers' Roost area in the southwestern Tombstone Hills (SRK, Consulting, 2011).

3 Coordinate system

WGS 1984 UTM Zone 12N

4 Geophysical Review by Geoscience North Ltd.

As a first step in the Geoscience North review, the regional magnetic and gravity data were accessed from USGS sources and combined with Tombstone area geological and Hay Mountain project geochemical data. In figures 3 and 4 the location of the proposed Tombstone Area Caldera, along with the outline of the Hay Mountain project geochemistry anomalies, are is shown superimposed on the Regional Arizona State Total Magnetic Intensity (TMI) colour image and regional gravity respectively. The broad deep gravity anomaly and the well-defined TMI mag high coincident with the Liberty Star geochemical anomalies suggests a deep, large mafic source (like Bingham Canyon) with a shallower magnetic plugs that would be typical of large skarn and/or potassic alteration that could be associated with porphyry copper style mineralization, or a mafic plug.

Both the regional magnetic and gravity show the strong NE trend characteristic in the regional geology.

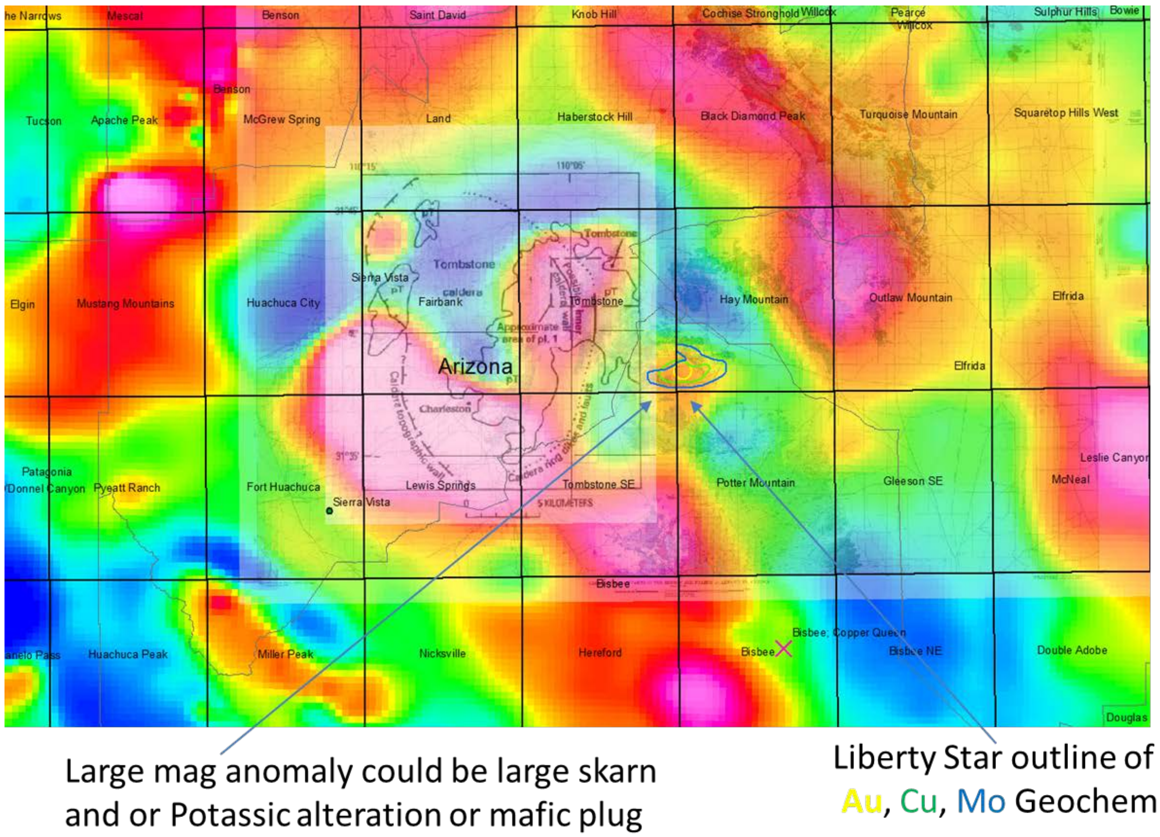


Figure 3. Tombstone Area proposed Caldera and Liberty Star Geochemical anomalies outlines on Regional Arizona State TMI Magnetics.

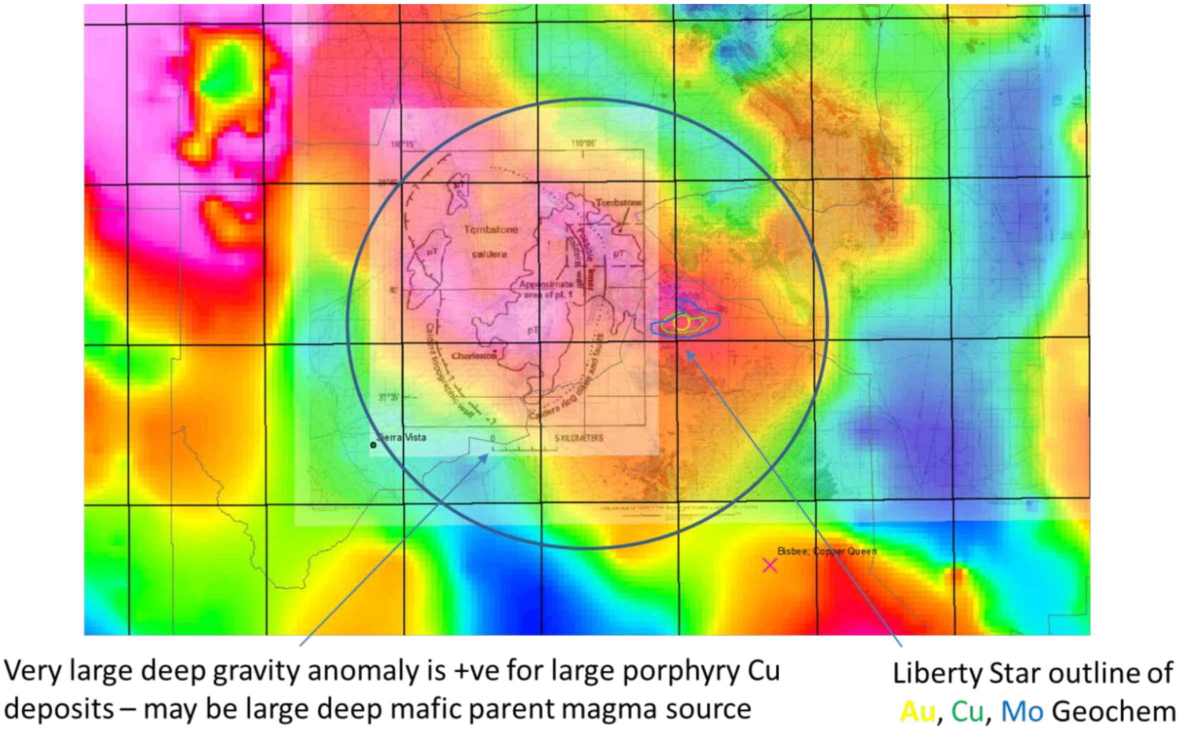


Figure 4. Tombstone Area proposed Caldera and Liberty Star Geochemical anomalies outlines on Regional USGS gravity.

At the property scale, Figures 5 shows the TMI mag from the core 2013 ZTEM/Mag survey inset into the regional Arizona state mag. This confirms the large central circular mag anomaly in both the regional, and property scale aeromagnetic data, however it should be noted that the positive magnetic anomaly and the associated negative ring extend to the edge of the core ZTEM survey area and beyond. Due to the dipole nature of the magnetic field all +ve mag anomalies have associated -ve anomalies which in the case of induced magnetization only are usually due to -ve magnetic poles on the deeper parts of the magnetic body. To do a proper model of an entire magnetic body both +ve and -ve data must be included. Hence modeling was done on the regional data as well.

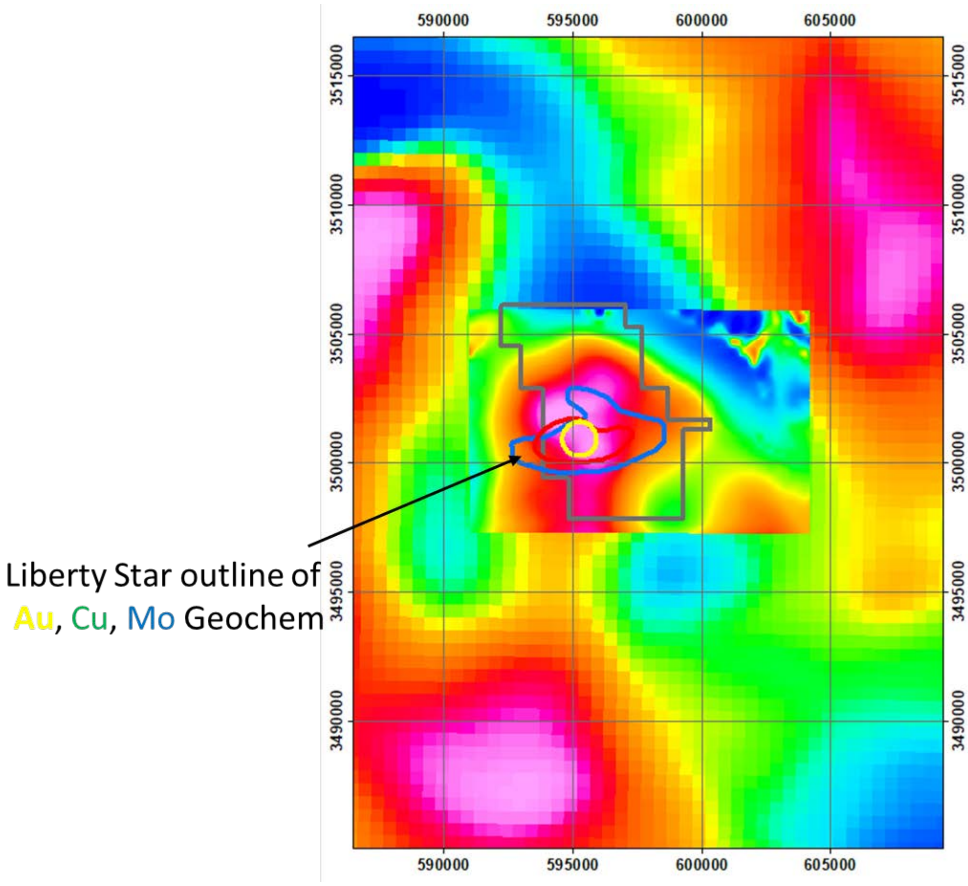


Figure 5. TMI mag from ZTEM survey inset into Arizona state mag confirms large circular mag anomaly over Liberty Star property The geochemical anomalies are outlined In colour.

Figure 6 shows the outlines of the Liberty Star geochemical anomalies over local geology which consists of limited exposures of carbonate rock, overburden and alluvial fill.

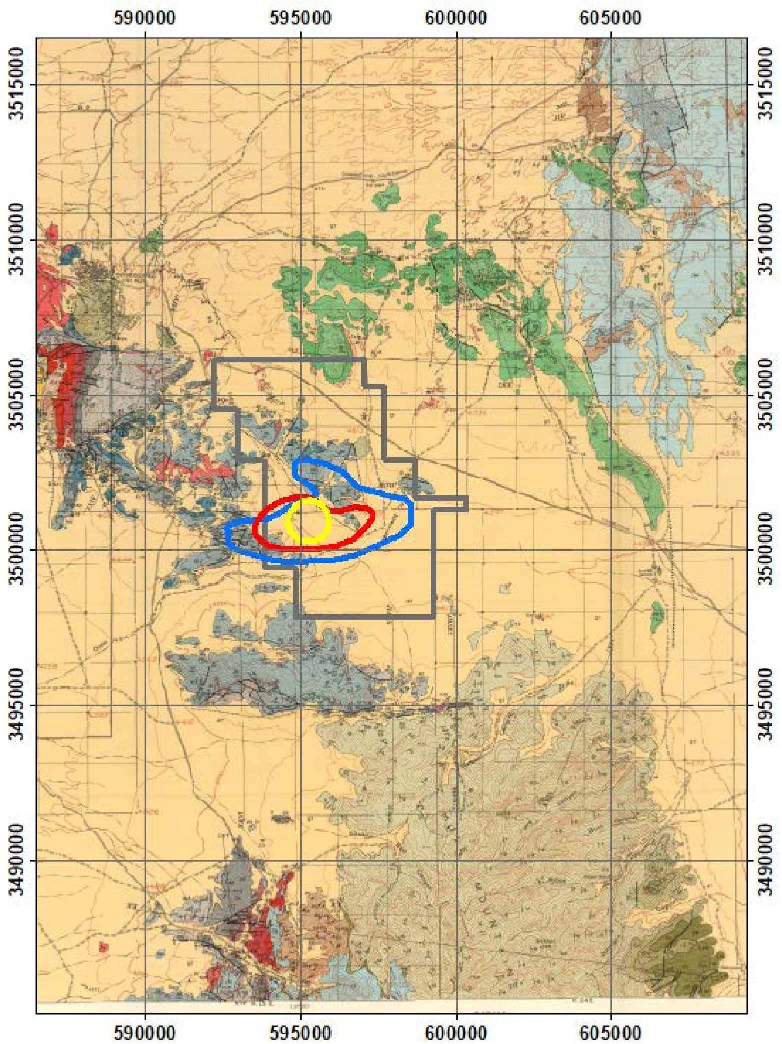


Figure 6. Outline of Au (yellow), Cu (red) and Mo (blue) geochemistry anomalies over geology (Plate-05 from Gilluly, 1956)

Figure 7, shows the Analytic Signal (AS) of the TMI mag from the ZTEM mag inset into Arizona state TMI mag. The differences between the Mag AS and Mag TMI over the central Hay Mountain anomaly and in the surrounding area, suggests that there are a substantial magnetic remanence effects, as could be expected in relatively recent intrusive rocks.

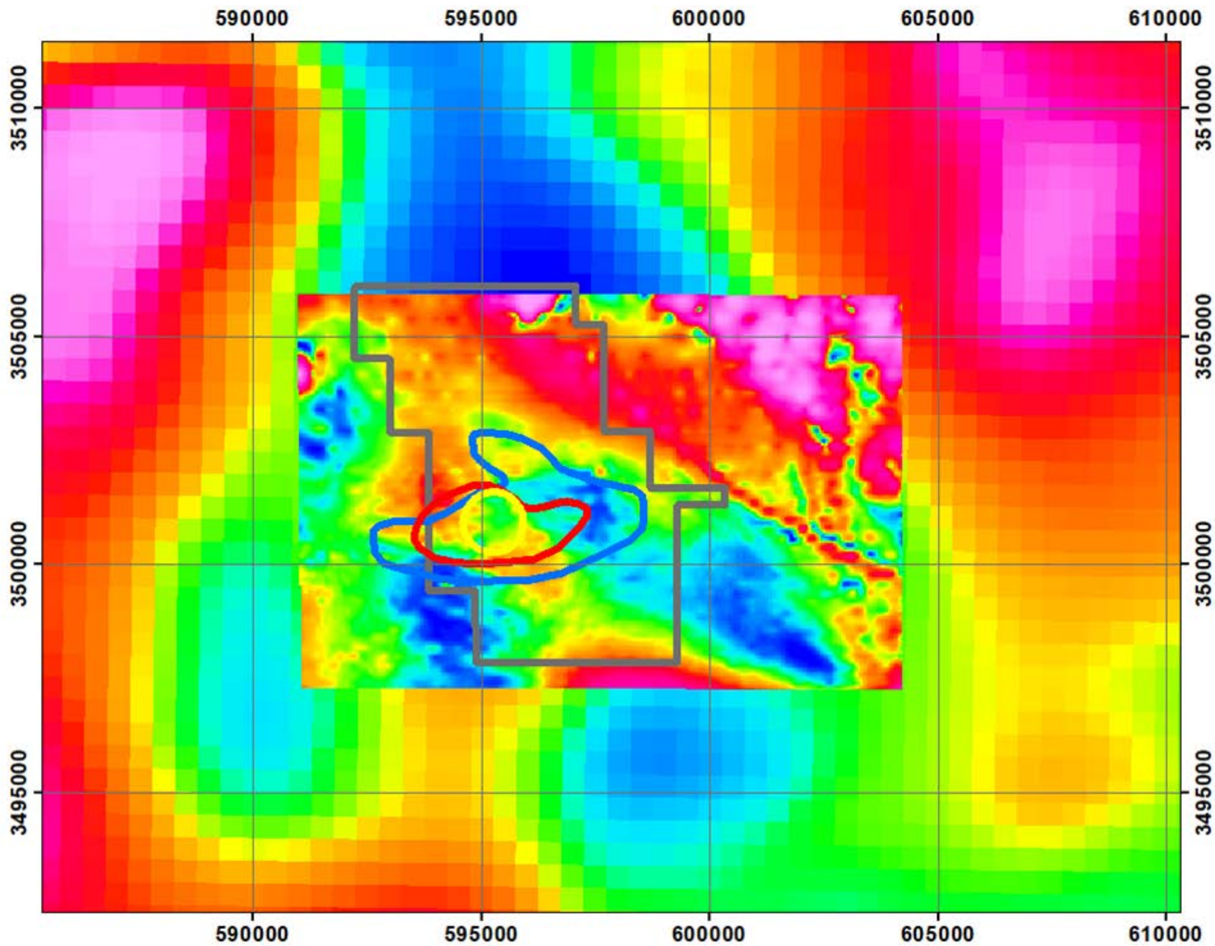
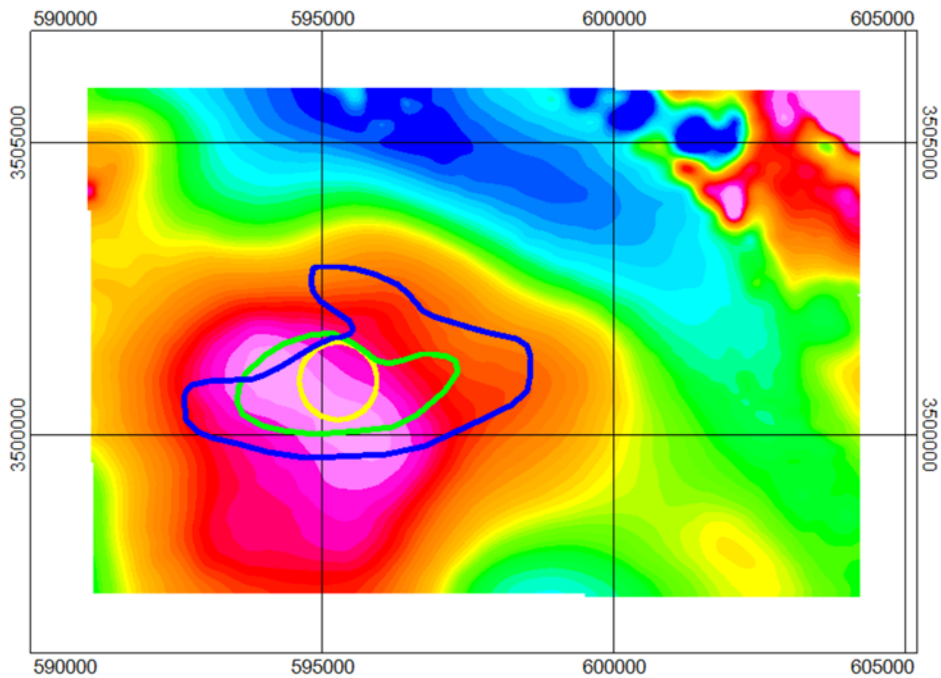


Figure 7. Analytic Signal (AS) of TMI mag from ZTEM inset into Arizona state TMI mag.

The presence of remanent magnetism is further illustrated by the images in Figure 8 which show the significant differences between the location and polarities of the main AS and TMI anomalies in the ZTEM core survey area, and confirms that special processing, such as Geosoft's VOXI MVI magnetic inversion software which specifically handles remanent magnetization, is needed to model this anomaly.

In the AS image the main, central, and apparently simple, positive TMI anomaly breaks up into more complicated magnetized bodies with ENE trends that likely more accurately reflect geology with a magnetization low directly under the gold anomaly flanked by magnetization highs that extend along the geological trend direction. Assuming a porphyry copper model, this could be interpreted as a core are of low magnetization. due to magnetic destruction by alteration or a felsic intrusive plug. The flanking more-magnetic areas could be due to local skarns formed by interaction of an intrusive body with the host carbonate rocks. They could also be could be due to magnetic potassic alteration, but this is less likely as potassic alteration is usually deep in the core of porphyry copper systems.

It should also be noted that the AS is a second derivate product of the TMI and hence is strongly biased to the near surface. Under the near surface Mag AS trends described above, there is broad moderate mag high (in green) that follows the regional NE trend, The variation of magnetization and how it interacts with 3D conductivity structure, as mapped by the ZTEM system, will be explored more in the 3D modeling below. The extension of the local magnetic anomalies in the NE direction could represent a more tabular source which is compatible with structurally/stratigraphically controlled emplacement of one or more intrusive phases.



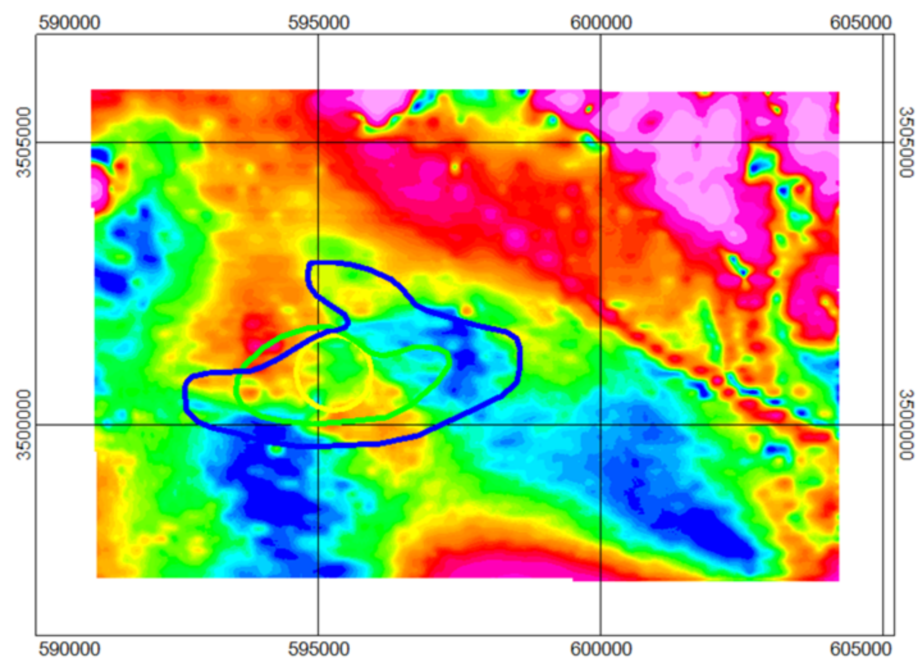


Figure 8. Comparison of ZTEM TMI-IGRF mag (top) and Mag AS (bottom) to estimate the importance of mag remanence.

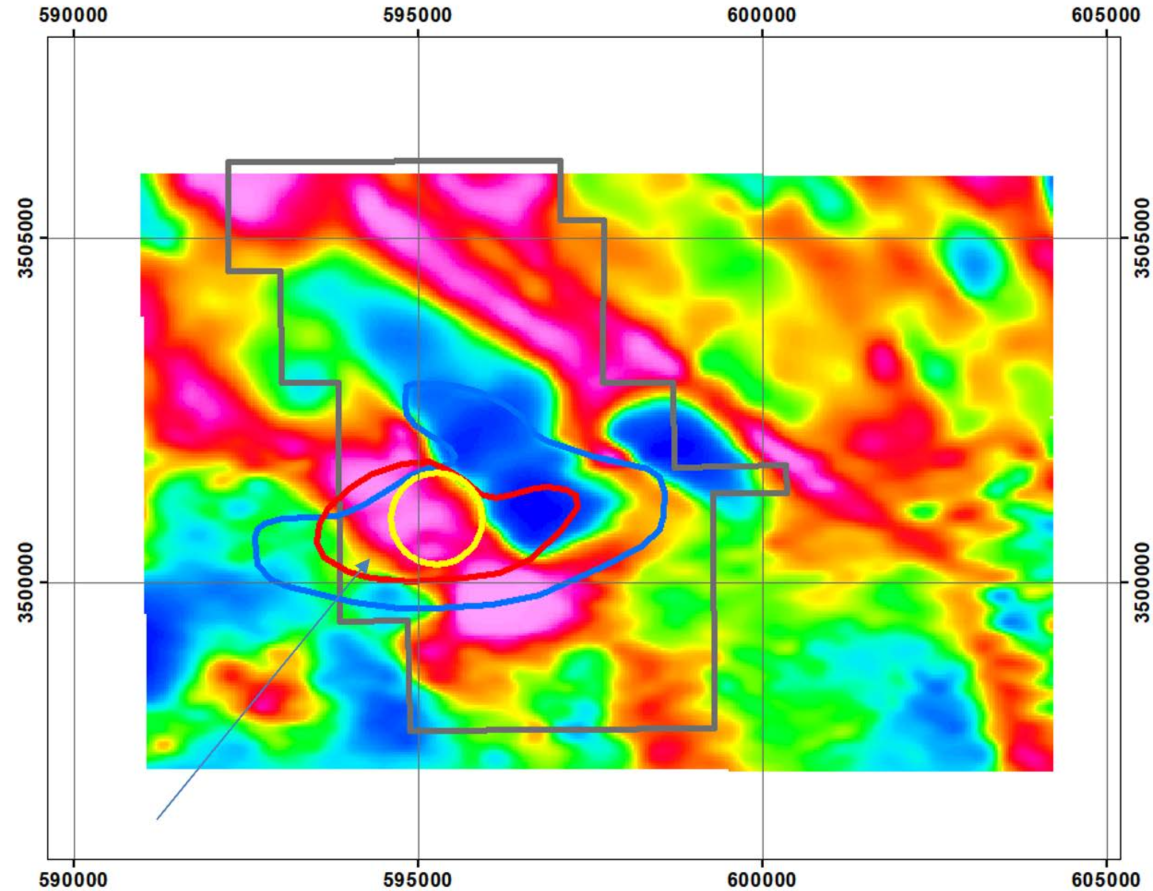


Figure 9. ZTEM In Phase 90 Hz Total Phase Rotated (Total IP_090hz_TPR.grd) shows (red is higher cond) = 1/Resistivity.

The ZTEM plan map of average conductivity at 90 Hz shown in Figure 9 indicates NE trending bands of higher conductivity (which could be due to a combination of lithology and topo/overburden effects) This includes a discrete, thicker tabular NE trending conductive band, roughly centered over the core geochem anomalies. Again, this is compatible with alteration/mineralization associated with a steeply dipping tabular intrusive system at this location.

5 Inversions and 3D models

5.1 ZTEM 3D model of resistivity/conductivity

Figure 10 shows a plan view of the 2019 Geotech 3D resistivity model based on the 2013 ZTEM survey data.

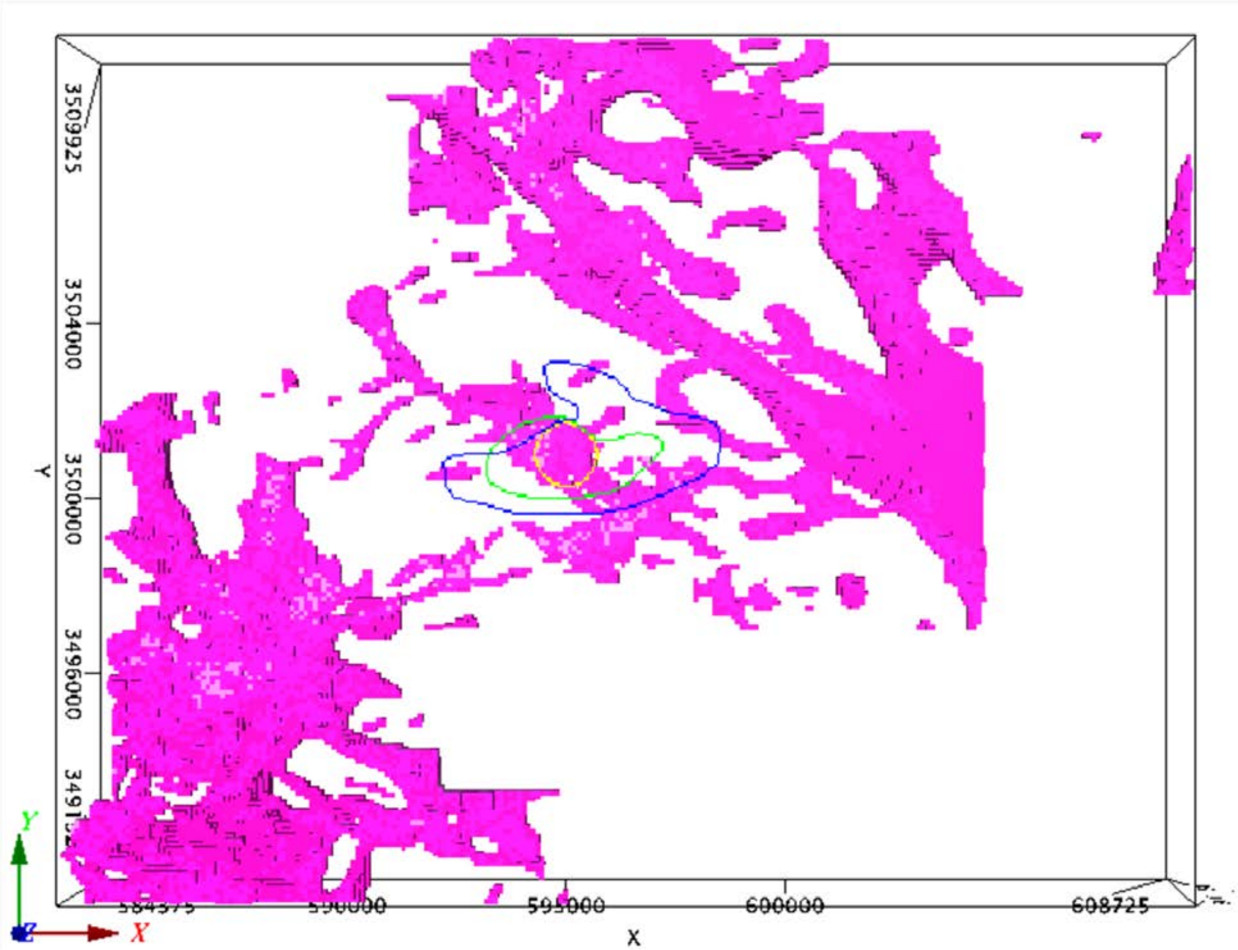


Figure 10. 2019 Geotech 3D ZTEM survey inversion 50m cell size (Pink = Lower Resistivity < 150 Ohm-m) with geochemistry anomaly contours.

In this image the general geological trend is apparent as a series of NW trending zones of higher conductivity due to some combination of more conductive lithologies, structure and possibly thicker/more conductive overburden all controlled by the dominant NW geological/topographic trends. However, there is also a thickened tabular conductive anomaly, similar in shape and trend direction to the MVI magnetization, centered on the geochemistry anomalies. There are also a few lower resistivity /more conductive NE trending lineament. These are likely structurally controlled features and may be related to the later Ag mineralization event that primarily occupies NE trending structures in the Tombstone area.

5.2 3D Magnetic models

As discussed above, the apparent remanent magnetic effects complicate the magnetic interpretation and require specialized modelling methods, such as Geosoft MVI inversions, that explicitly handle remanent magnetism. Geotech in their 2019 interpretation did a 3D MVI mag inversion over the core ZTEM area. As part of this review by Geoscience North a 3D MVI inversion was done on the regional USGS Magnetics over the larger Hay Mountain area. The purpose of this regional model was to capture the full magnetic effects of the large central magnetic anomaly which extend beyond the Geotech survey boundary as shown in figure 5. The more local Geotech inversion should provide detail at relatively shallow depths while the regional model will more accurately reflect the full regional and depth extent of the core magnetic features.

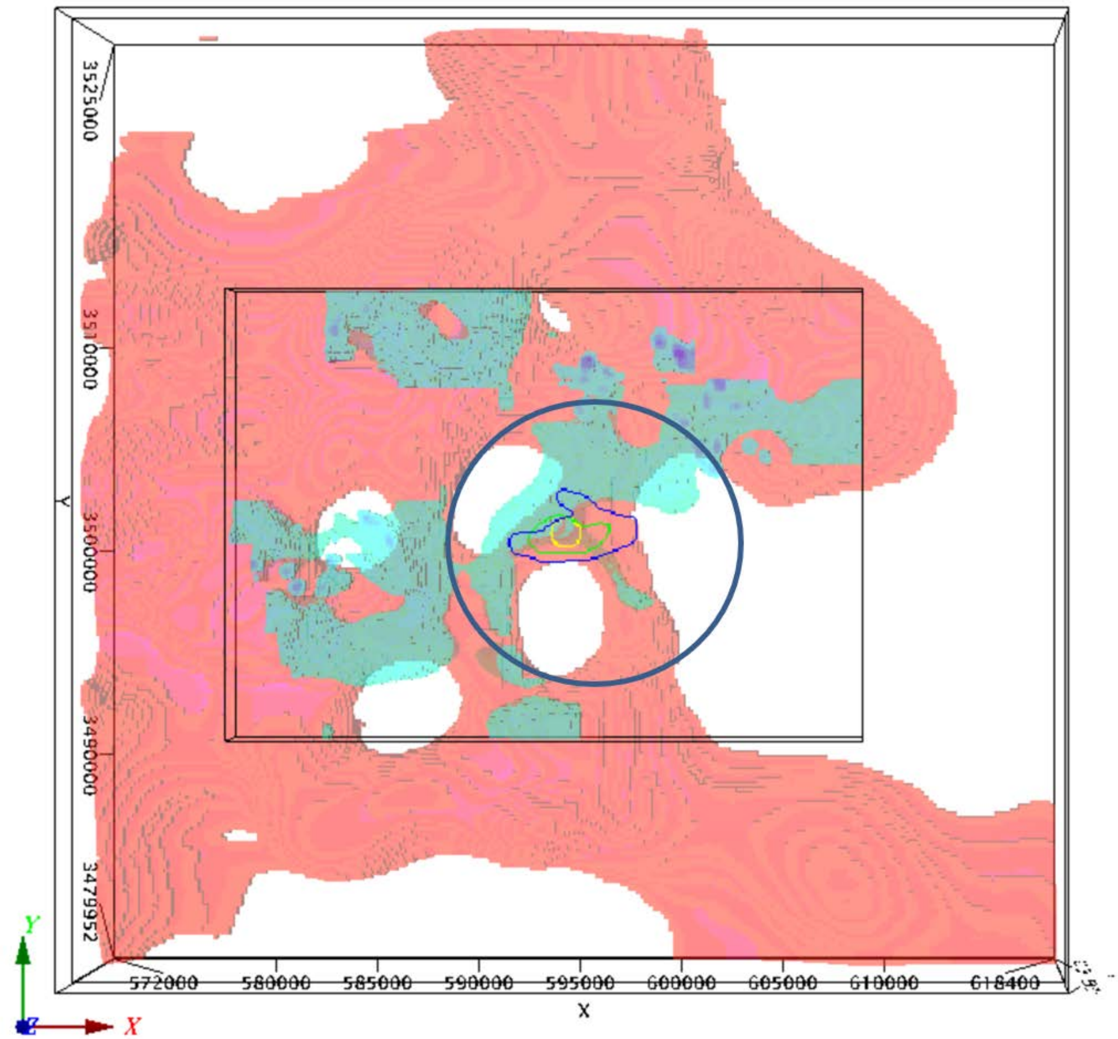


Figure 11. Geotech 2019 3D MVI mag inversion 0f ZTEM mag data 100m cell size (blue = higher magnetization > 0.003 Magnetization Units inset into AK 2019 3D MVI inversion of the regional USGS Magnetics (pink= higher magnetization)

Both local and regional magnetization inversion models (Figure 11) show anomalous magnetism in the vicinity of the core Geochem anomalies, with the local Geotech model providing more shallow detail and the regional inversion showing a large circular area of lower magnetization which would be consistent with large scale mag destruction due to alteration. This is somewhat clearer in Figure 12 where the local and regional MVI inversions are plotted at slightly different magnetization cut-offs.

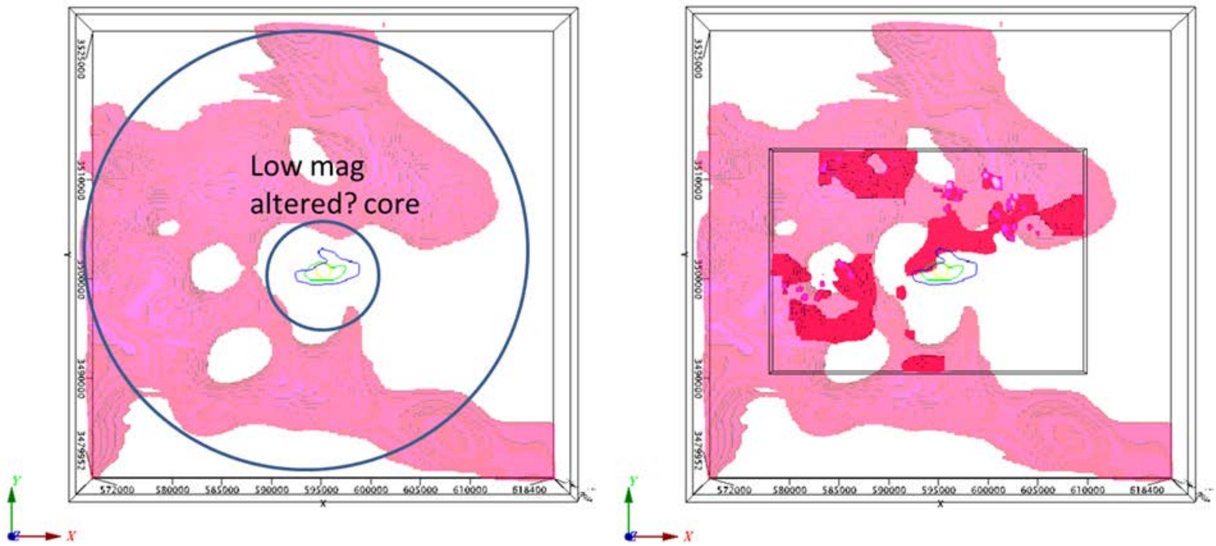


Figure 12. Left - AK 2019 regional 3D MVI mag inversion of regional Arizona state mag data with low cutoff 0.005 units. Right- Geotech 2019 local MVI inversion with low cutoff magnetization 0.004 units.

6 Integrated models

6.1 Magnetics and geology

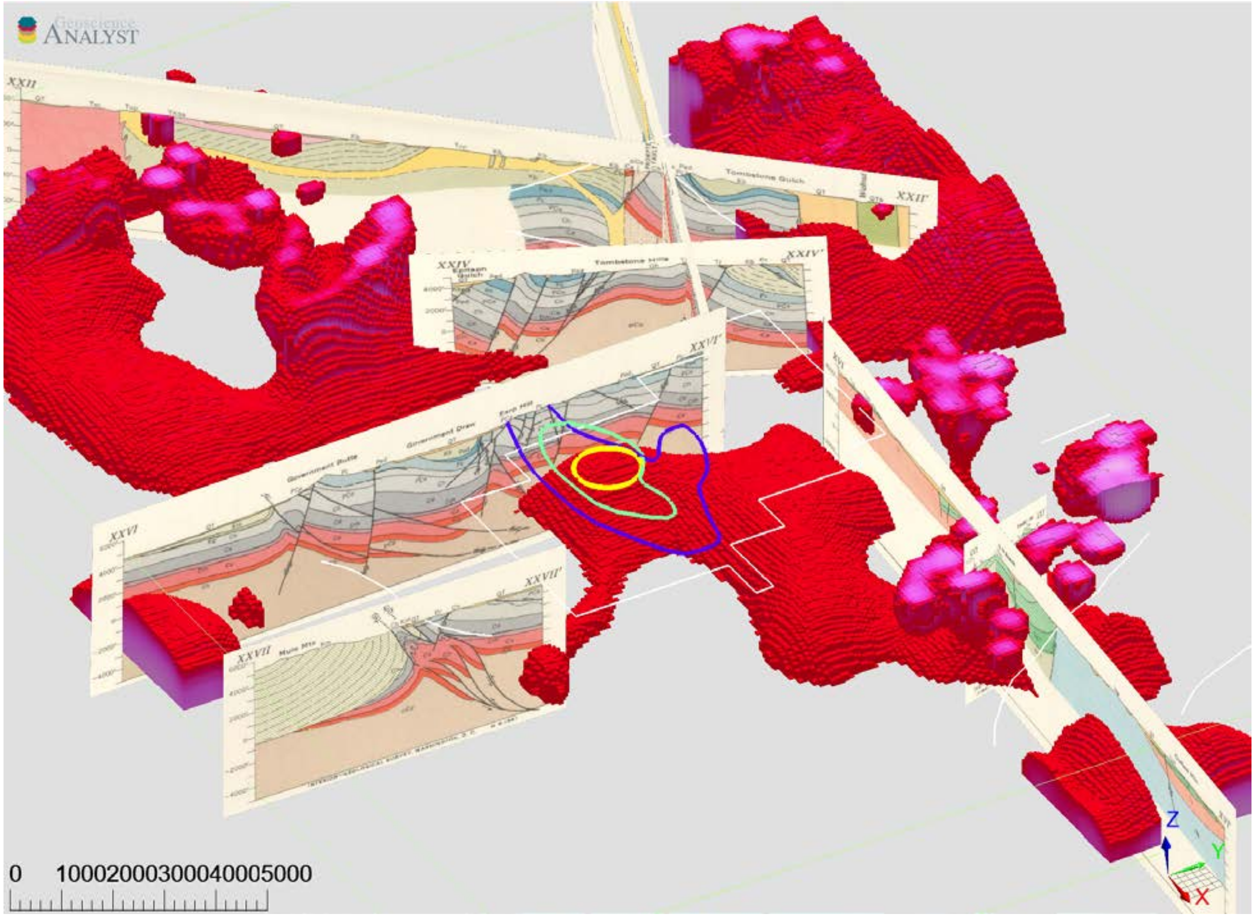


Figure 13. Geological sections (from Gilluly, 1956) and Geotech 2019 3D MVI mag inversion of ZTEM mag data (red = higher magnetization > 0.003 Magnetization Units. Inclined view from above and SE.

Figure 13 taken from the 3D Geoscience Analyst (GA) integrated model, shows the Geotech 2019 3D MVI mag inversion of the ZTEM mag data together with the available geological sections (from Gilluly, 1956). Note in the lower right, the coincidence of near surface magnetic areas with the green volcanics in the section. Assuming that the geological section is correct this gives us confidence that the magnetic model is correctly mapping magnetic units under cover. Note how the area of anomalous geochemistry coincides with an area of interpreted complex structure in the nearest geological section.

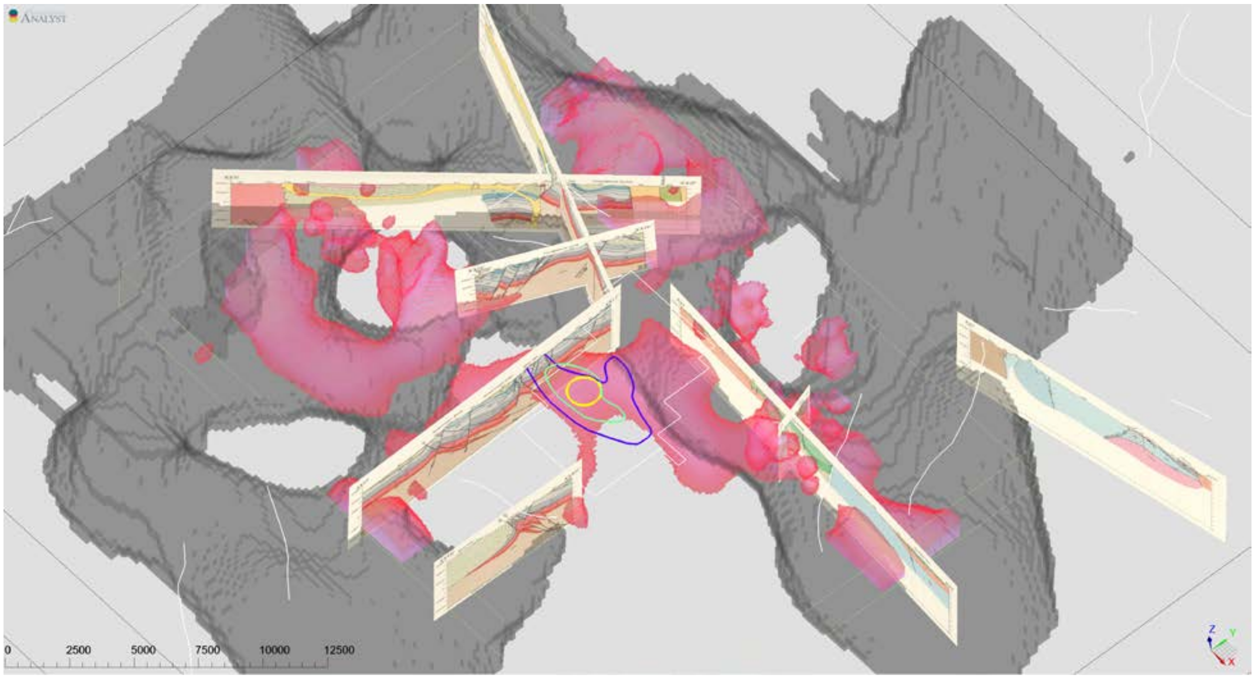


Figure 14. Geological sections with Geotech 2019 3D MVI mag inversion of ZTEM mag data (red = higher magnetization > 0.003 Magnetization Units and AK 2019 3D MVI inversion of the regional USGS Magnetics (dark grey = higher magnetization > 0.003 Magnetization Units. Inclined view from above and SE.

Figure 14 shows the same view but with the regional MVI inversion as well and illustrates the detailed local magnetic features in red and the larger complex but generally circular magnetic low in the regional inversion.

6.2 Mag discussion

- Needed regional data to see the negative roots of the large central mag anomaly
- The strong central high mag TMI anomaly breaks up into more complicated anomalies in the Mag AS image and in the MVI inversion, both of which account for magnetic remanence.
- We lose the obvious large central mag TMI high target once mag remanence is included.
- This makes targeting somewhat more complex. Instead of a single large central Mag TMI anomaly skarn coincident with the geochemistry anomalies we have a more complex remanent magnetic signature. This is not necessarily negative for a porphyry copper target as it indicates a possible some complex, multiphase, intrusive system which would be consistent with the geological complexity in this area as mapped in the geological sections

6.3 Magnetics and ZTEM EM

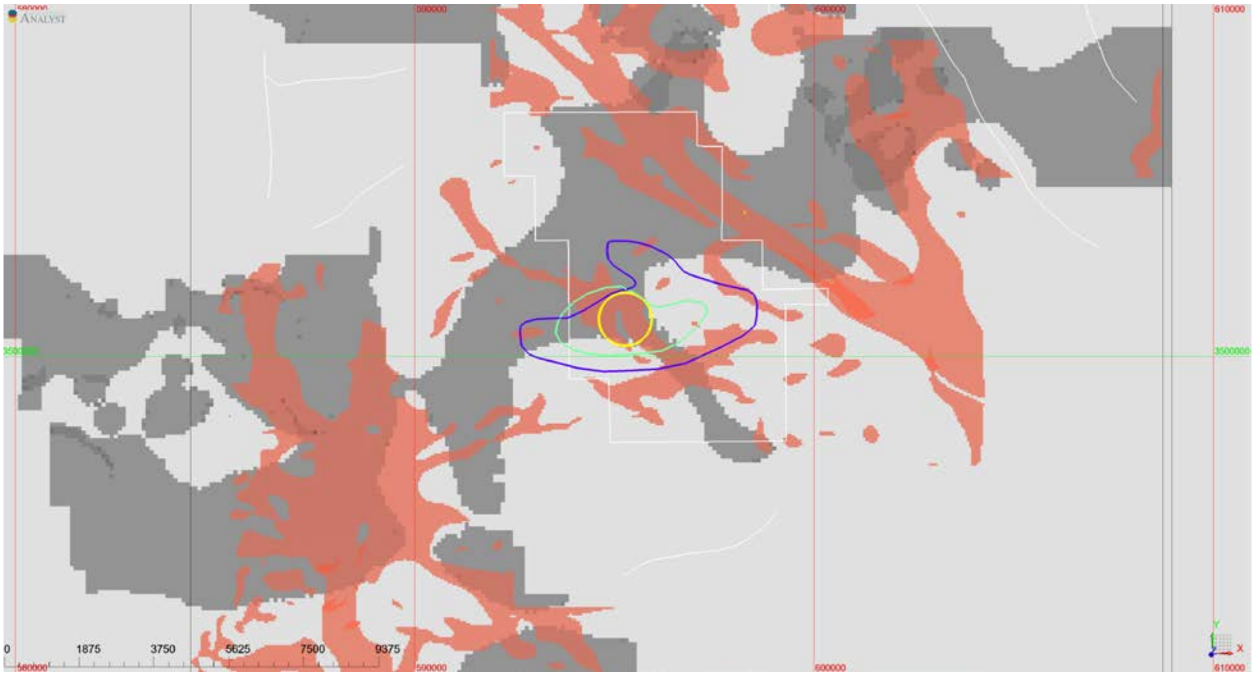


Figure 15. 2019 3D ZTEM inversion 50m cell size (orange = Lower Resistivity < 100 Ohm-m) with Geotech 2019 3D MVI mag inversion of ZTEM mag data 100m cell size (darker grey > 0.0025 mag Units) and 2018 Geochem contours. Plan view.

The combined ZTEM EM and local magnetic MVI inversion are shown in Figure 15. The thicker tabular conductive feature coincident with core of the geochem anomalies has associated local magnetic anomalies but is near the center of the large zone of magnetic depletion as shown in Figure 12.

The same data are shown in the next figure which as a view from the NE and below and includes a vertical scale. A few things should be noted in this figure:

1) The ZTEM lower resistivity/higher conductivity anomaly under the core of the core geochem anomalies extends to greater depth than many of the other conductive features. This supports the the possibility that this anomaly to be due to alteration that extend deep into bedrock rather than to just conductive overburden.
2) The most magnetic regions are located at greater depth than the conductive anomaly. Since the carbonate rocks noted at surface in this area are not expected to be magnetic (or conductive) if they are not altered, this magnetism is likely related to deeper magnetic features,

The significant depth of the central conductive anomaly and it's overlap with the deeper magnetic anomaly is emphasized in Figure 16 which is taken from the 2019 Geotech interpretation report and shows vertical sections through this anomaly from the ZTEM resistivity model and the 2019 Geotech MVI magnetization model.

In Figure 17 the ZTEM EM and mag data sets have been used to interpret some major structural blocks. Together with the geological sections this could be used to support a domed area, or up-thrust block around the geochem anomalies due possibly to an underlying intrusive source.

The combined EM and magnetic models show a thicker tabular conductive feature together with an area of high magnetic/structural complexity coincident with the core of the geochem anomalies.

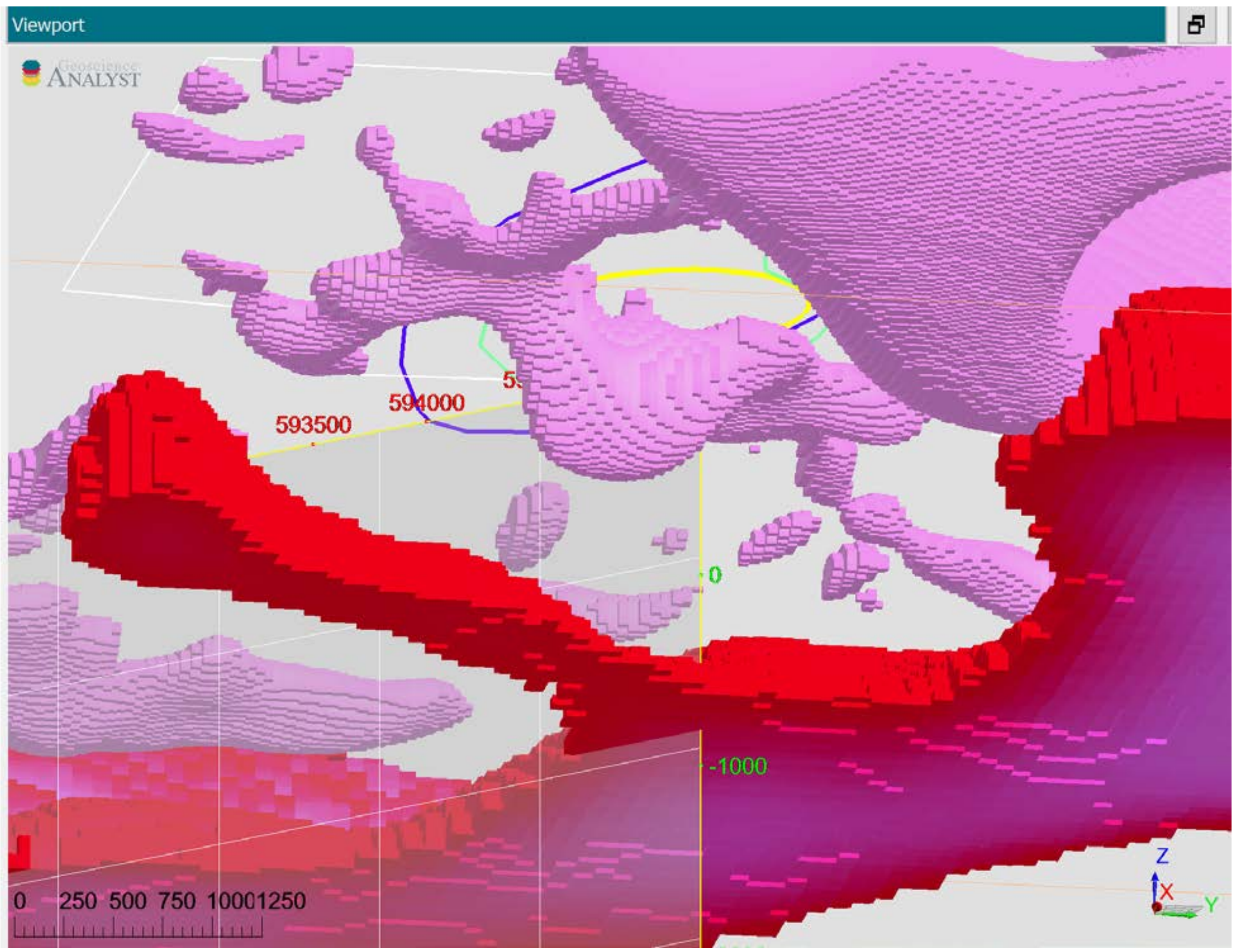


Figure 12. ZTEM 2019 Mag MVI higher magnetization = red and ZTEM EM Higher conductivity = pink. View from NE and below.

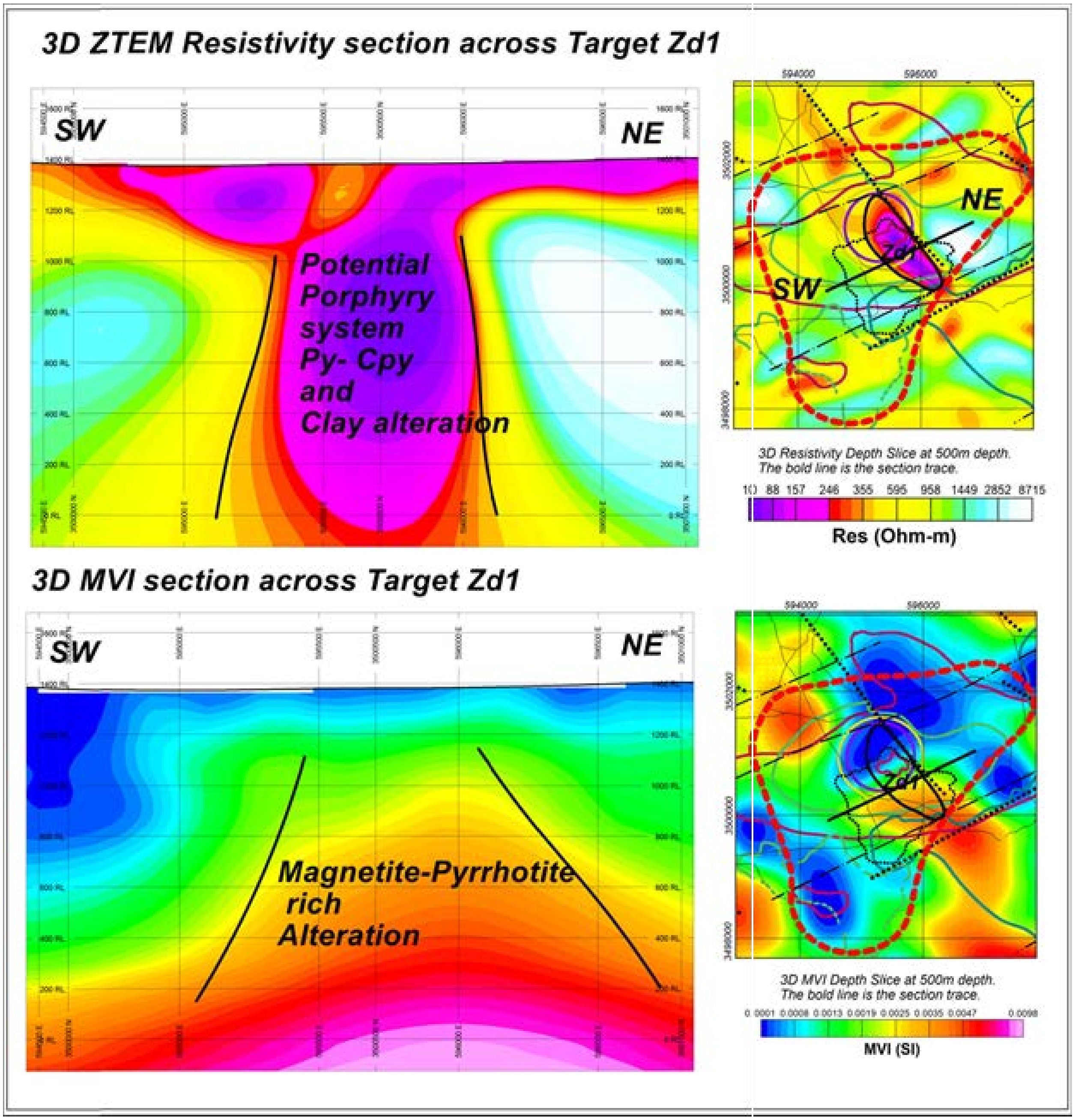


Figure 13. 3D ZTEM Resistivity section across Target Zd1. 2019 Geotech interpretation report.

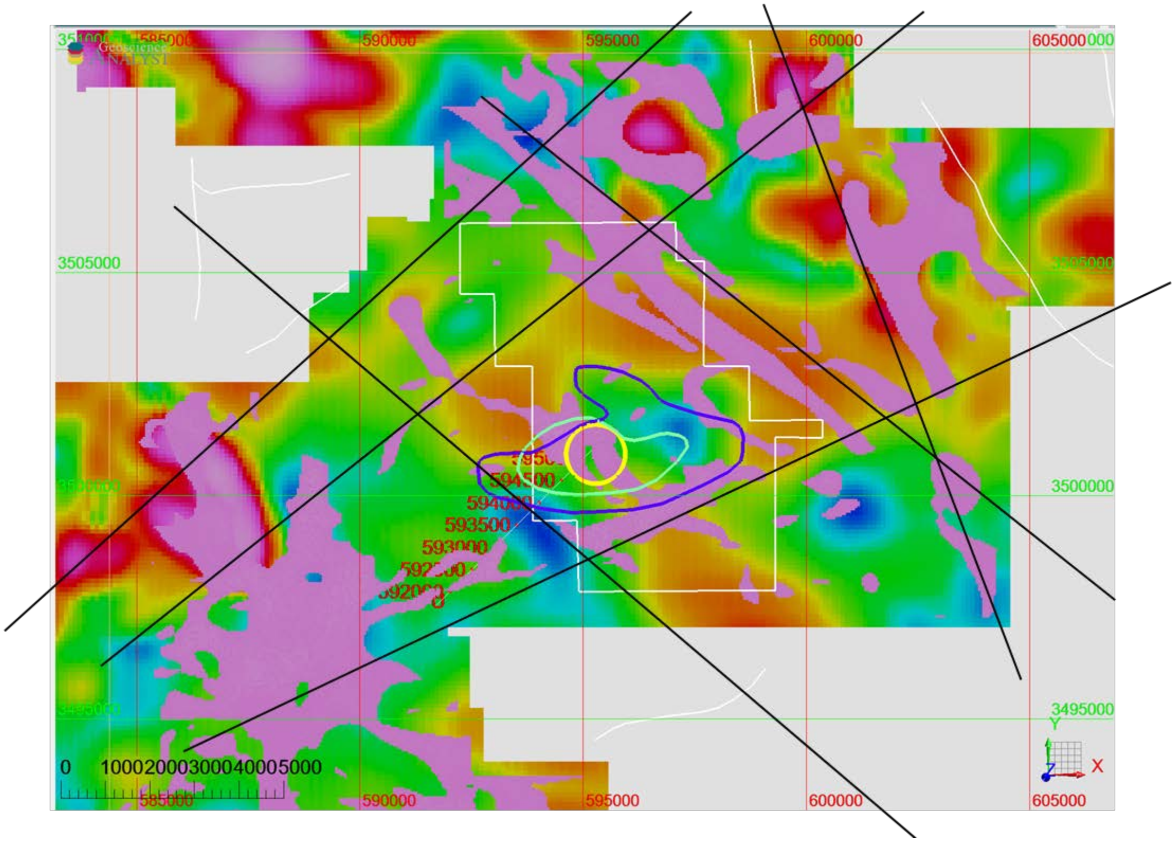


Figure 14. Colour background image is ZTEM 2019 Mag MVI model horizontal slice at about 800m depth and pink overall is ZTEM EM (pink= higher conductivity).

6.4 Full Integrated model

Finally, in Figure 18 the ZTEM EM, Magnetization models and geological sections are presented together. This view, with cut-off values for the mag and EM Volumes optimized, shows a complex annular conductivity anomaly about one kilometre across coincident with the core of the geochemistry anomalies in a broad zone of lower magnetization, with local magnetization highs.

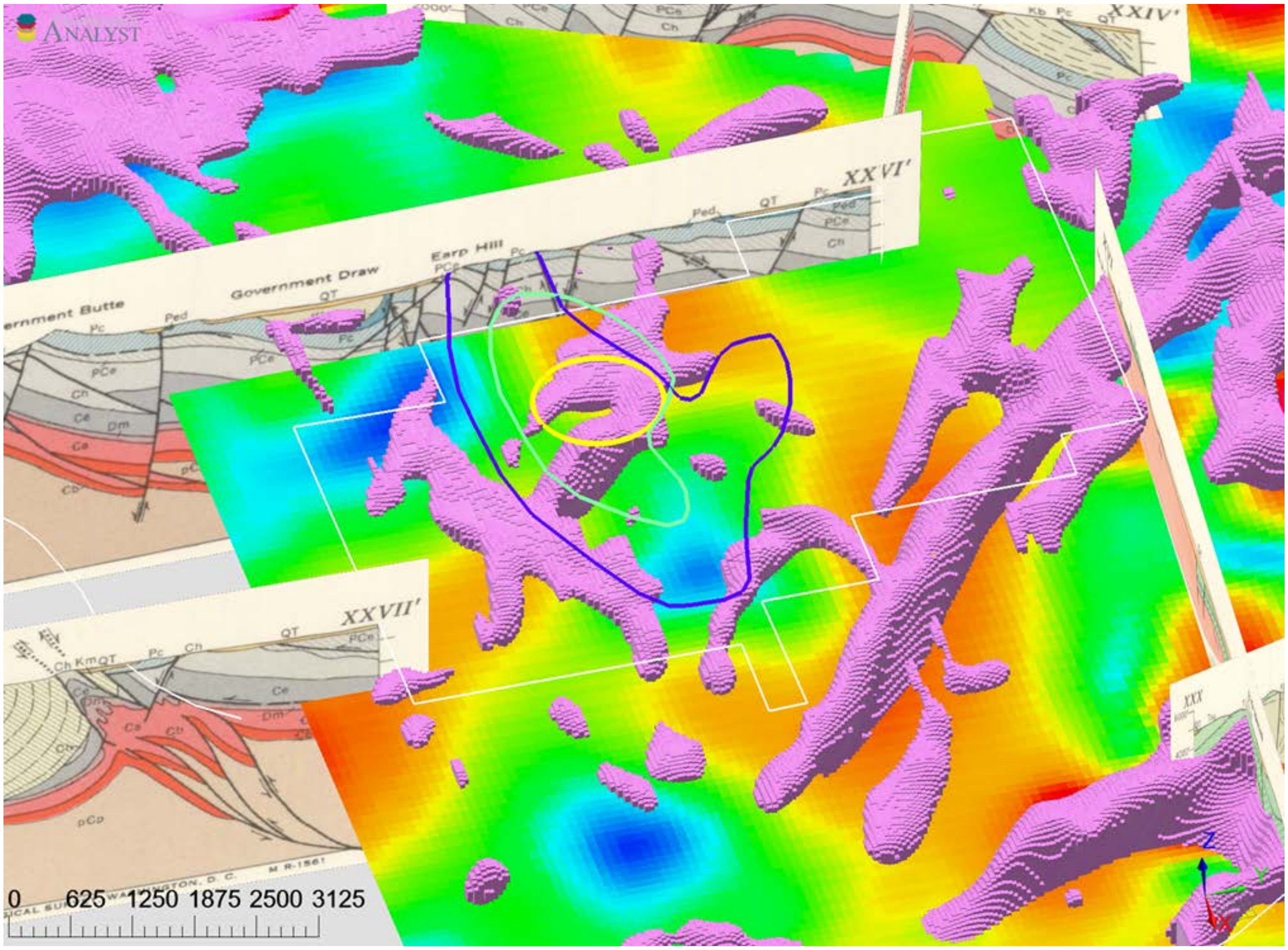


Figure 18 Integrated 3D model with a horizontal slice from the ZTEM 2019 Mag MVI model(colour background image), ZTEM 3D EM Inversion Low resistivity volumes (pink) and sections from USGS 1956 Prof Paper 281 Gilluly General geology of central Cochise County, Arizona

7 Comments and Discussion

- The remanent magnetism evident in the TMI- AS comparison requires appropriate magnetic modeling software, such as the Geosoft MVI magnetic inversion package, that explicitly handles magnetic remanence. This was recognized by Geotech as well and they used the MVI inversion modelling software on the core of the ZTEM mag area. This software was also used in this review on the USGS regional mag data over a larger area to capture the full extent of central mag anomaly.

- The ZTEM conductivity anomalies can be due to more conductive lithologies, structures, alteration, as well as thicker/more conductive overburden which would be controlled to some extent by geology and topography

- The magnetic data is generally independent of overburden effects and can be used to help filter EM anomalies for possible overburden effects,

- In this review the standard Porphyry Copper (PC) model and its associated physical properties were used as a guide in the interpretation. There can be significant variations in this model with different PC deposit sub-types, different host rocks and depth of erosion in the PC model. It should be noted that there are other geological models that could fit the data.

- The main focus of this work has been on the prominent central Geochem/Magnetic target that was identified in the existing data. Other possible targets could be examined with additional work but the central historical target remains the prime initial target for any follow-up work.

8 Conclusions and Recommendations

- The full 3D Geoscience Analyst (GA) integrated model, which is provided as part of this review, should be used for targeting as there is much more detail and dynamic viewing available in the live 3D model than in the 2D screen captures of the model shown in this report.
- The new 3D models based on the ZTEM data should be reviewed with respect to the previous ground IP/Res, CSAMT etc. data, which were mentioned in the SRK report.
- The core anomalous area has complex Magnetic and EM signatures in an area of structural complexity, with associated well defined geochem anomalies. Drill testing is recommended to test this area.
- Physical properties such as mag susceptibility, electrical conductivity, density and IP effect would be helpful for further interpretation. These could be acquired on existing rock samples from the area or in on core samples from any new drilling or with in-situ borehole geophysical surveys in any new Drill holes.

9 Targeting

- The main target remains the core geochem anomaly area and drill testing of this target is recommended, The combined EM and magnetic models show a thicker tabular conductive feature together with an area of high magnetic/structural complexity in the core of a large magnetic depletion zone, coincident with the core of the geochem anomalies.

- It is suggested that, after Liberty Star has a chance to review this report and model, that a joint targeting conference call be set up to locate the first DH location. This would ensure that all earth science data, ideas and experience in the area are included in the process,

- Other targets could also be considered in this joint targeting exercise.

References

Geotech 2019, Report on 3D ZTEM™ & 3D Magnetic Inversion Results Z-AXIS TIPPER ELECTROMAGNETIC (ZTEM™) AND AEROMAG ETIC GEOPHYSICAL SURVEY

SRK Consulting,2011, Hay Mountain Exploration Report, Tombstone District, Arizona, for Liberty Star Uranium & Metals Corp.

Gilluly, 1956, Geology Map of Benson and Pearce Quadrangles USGS Prof Paper 281.

Statement of Qualifications

I, Alan R. King, B.Sc, M.Sc, P.Geo, declare that:

1) I am a Consulting Geophysicist with residence in Sudbury, Ontario and am presently employed in this capacity with Geoscience North Ltd., Sudbury, Ontario;

2) I obtained a Bachelor of Science Degree (B.Sc.), in Geology from the University of Toronto in 1976, and a Master of Science Degree (M.Sc.), in Geophysics from Macquarie University in 1989;

3) I am a registered geophysicist with a license to practice in the Province of Ontario (APGO member # 1178);

4) I have practiced my profession continuously since 1976 in North and South America, Australasia;

5) I am a member of the Society of Exploration Geophysicists, and the Australian Society of Exploration Geophysicists;

6) I have no interest, nor do I expect to receive any interest in the properties or securities of the company, its subsidiaries or its joint-venture partners;

7) I am the Professional Geologist/(Geophysicist) and a member in good standing of APGO who has coauthored this Report;

8) The statements made in this report represent my professional opinion in consideration of the information available to me at the time of reviewing this report.

Dated this Jan 2020

Signature

Alan King

Geophysicist

Geoscience North Ltd.