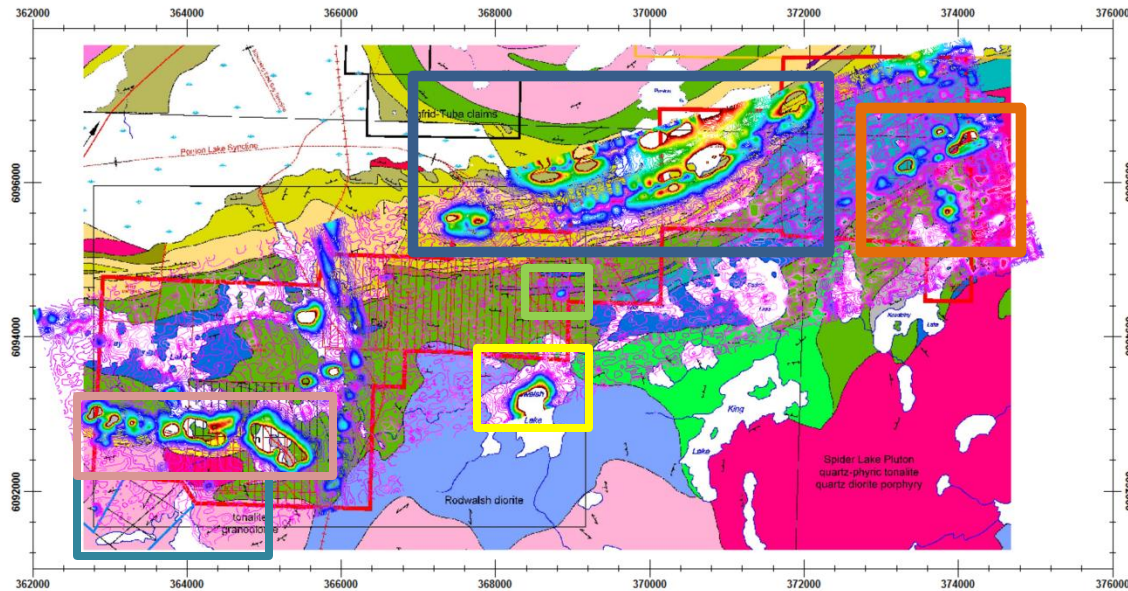


TDEM and Aeromagnetic Airborne Survey Data Analyses and Modeling for Boreal Gold Inc



R.W. Groom, PhD
Eikon Technologies LTD
October 25, 2023 to April 04, 2024

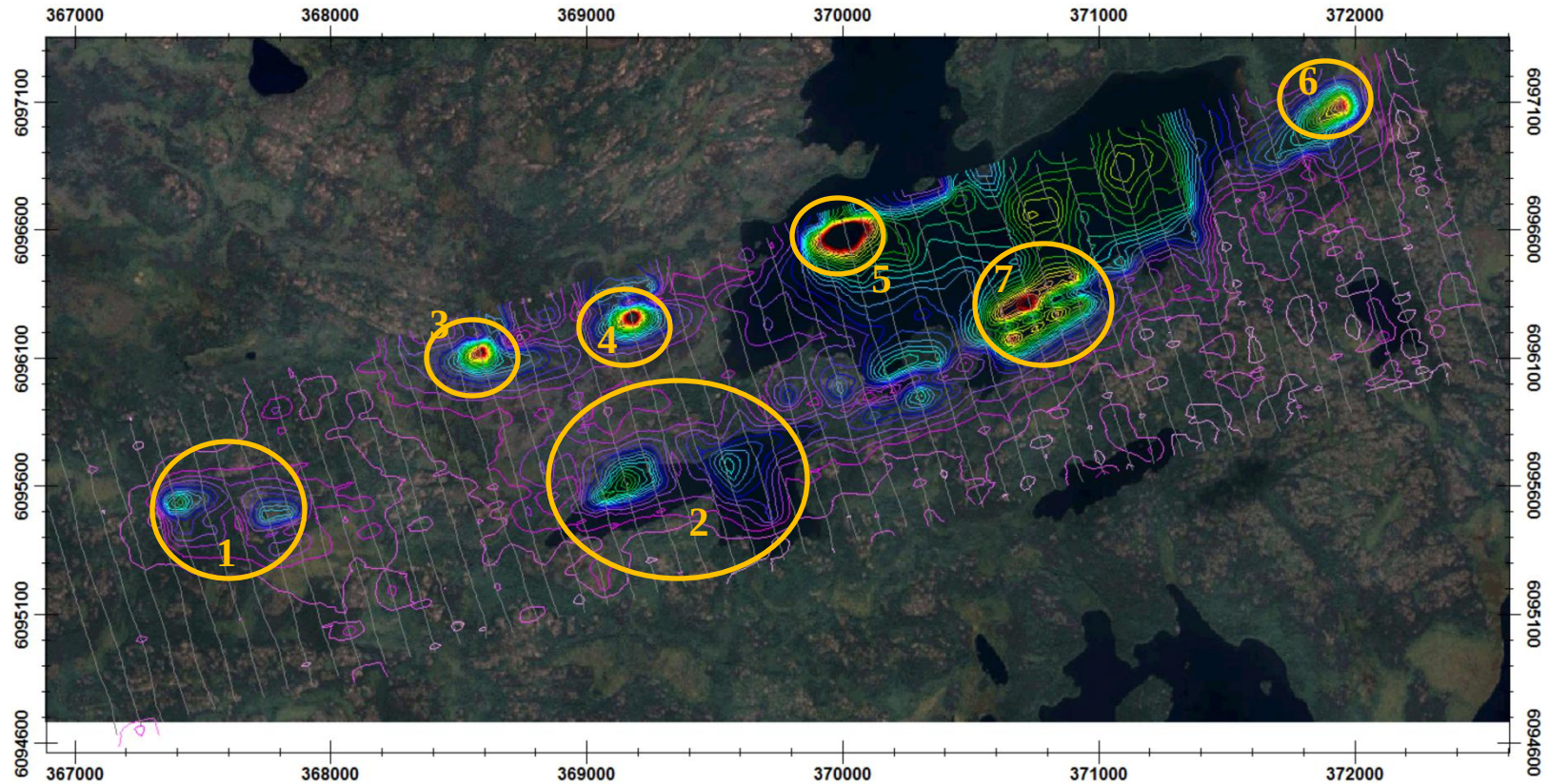
TDEM and Aeromagnetic Airborne Survey Data Analyses and Modeling



This study divides the survey into six parts;

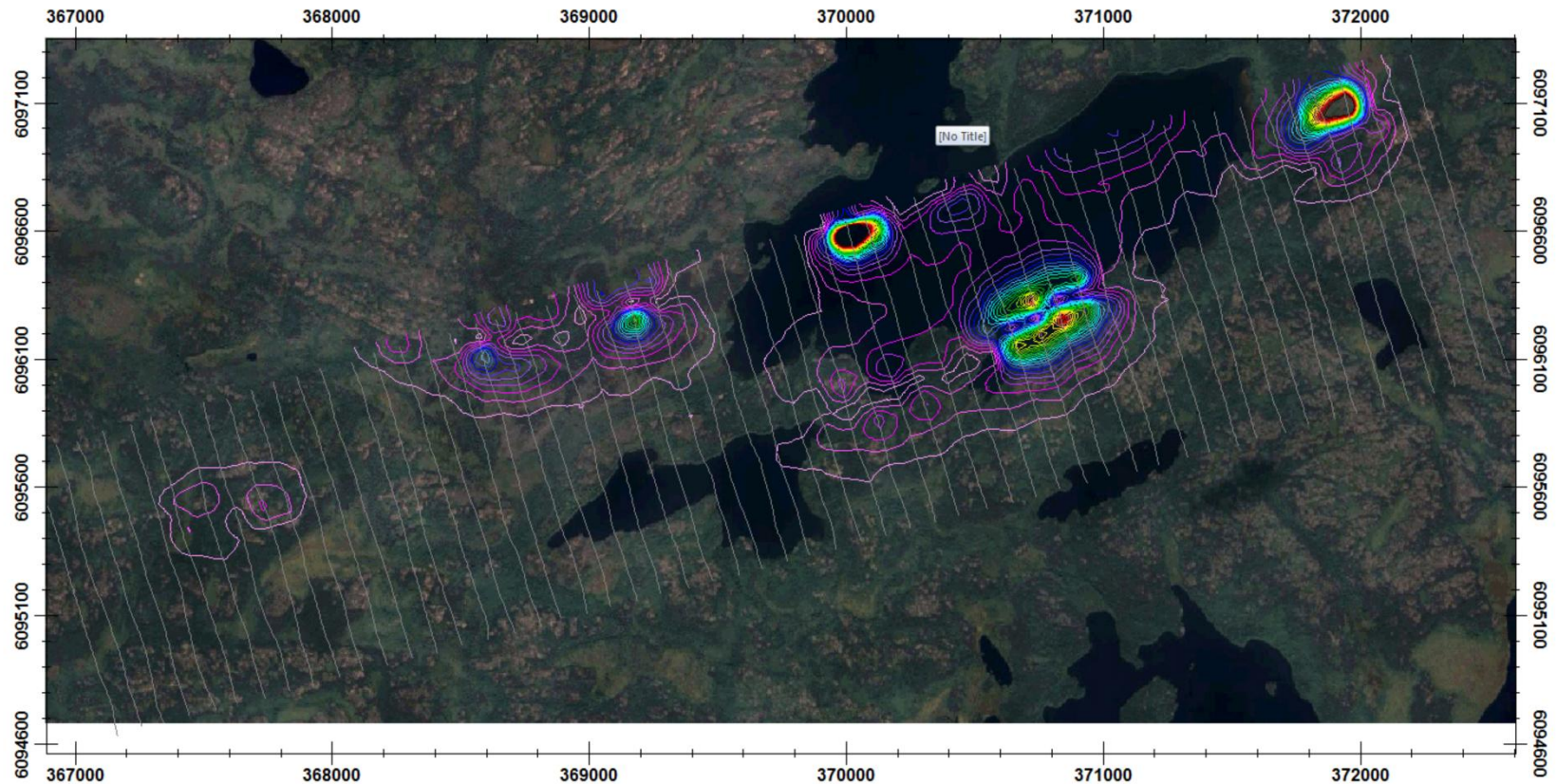
<u>North Central (blue):</u>	<u>Pgs 3 - 23</u>
<u>East (orange):</u>	<u>Pgs 26-36</u>
<u>Central (green):</u>	<u>Pgs 25</u>
<u>South Central (yellow):</u>	<u>Pgs 37-38</u>
<u>South West (blue green):</u>	<u>Pgs 39-43</u>
<u>Main Zone (light brown):</u>	<u>Pgs 44- 54</u>

Ch10 Bz



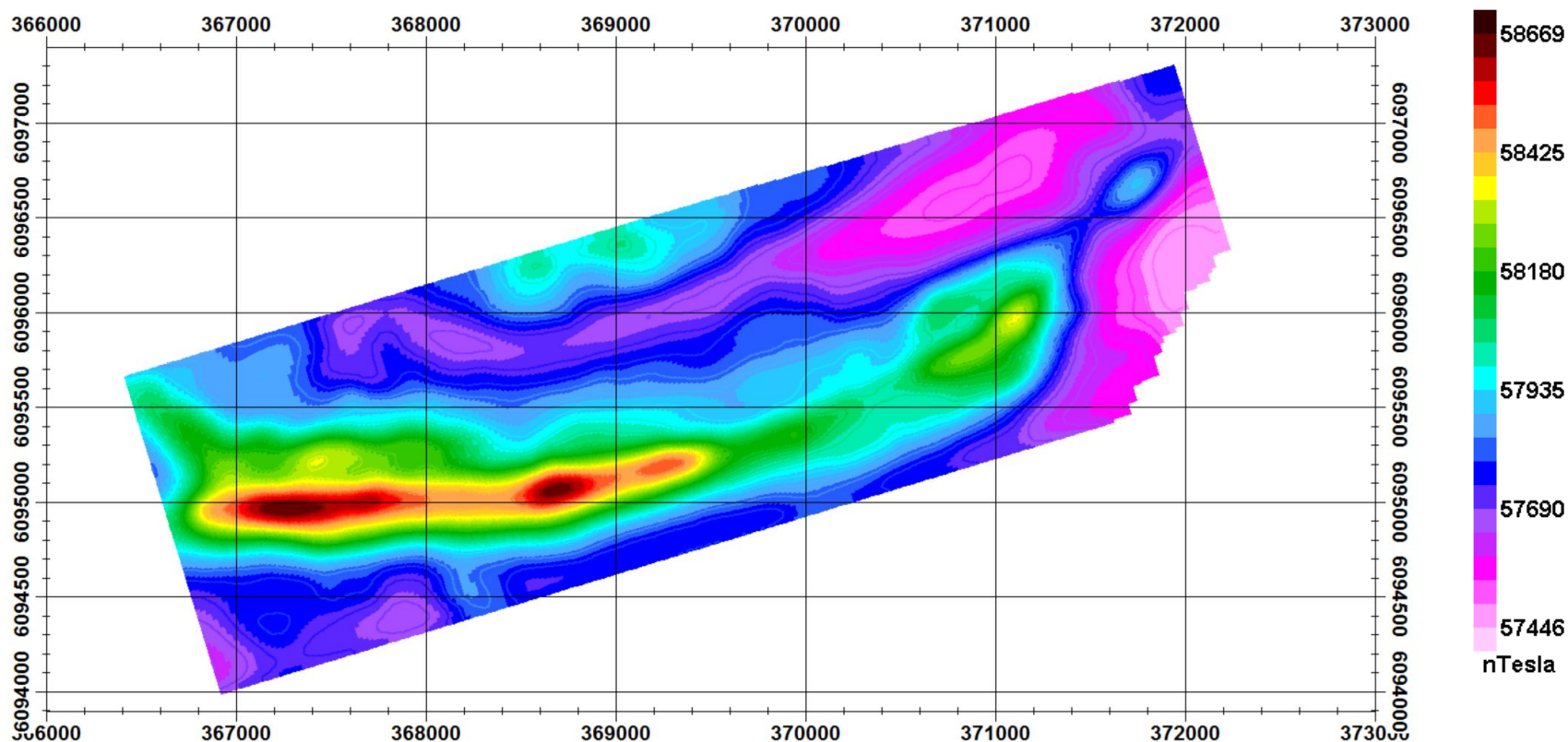
At late early time for the vertical component, seven (7) anomalous areas are indentified. Area 7 could be extended to see if the weaker response to the SW is connected to the main anomalous area. These 7 areas will be studied and modeled individually later in this report.

Ch21 Bz Early late time



Early late time seen here may possibly indicate the areas of the most conductive material or the highest conductivity. Note that area 1 at the far west is very weak by this time compared to five of the other areas. Area 2 to the south over the lake has almost disappeared.

Aeromagnetic data – Total Field (TMI) upward continue to 125m

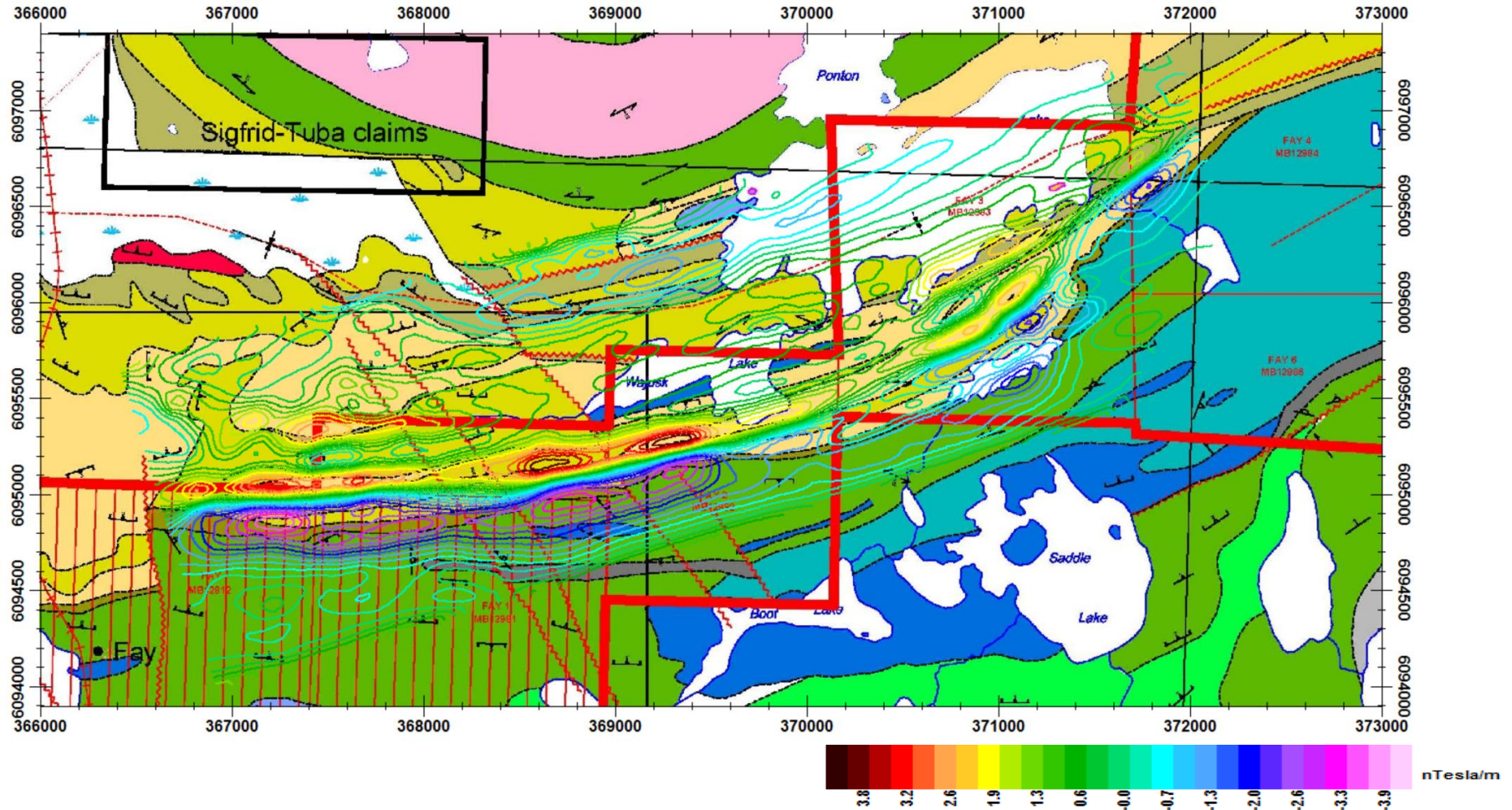


This particular study zone has an unusual magnetic response compared the remainder of the survey and indeed for this region NE of Flin Flon. The data has been upward continued to 125m. This means that the data has been processed to a response that would have been expected had the magnetometer been flown at a height of 125m as opposed to the average of 80m in actuality. Performing this processing has two main advantages, first it minimizes the surficial response while exposes the magnetism of the deeper rocks and thus separating the different structural materials. Secondly, it has the advantage of removing some of the airborne acquisition noise.

The boundaries between the magnetic rocks and the non-magnetic rocks are particularly sharp. But, the strength of the variation can be more than 1200 nT.

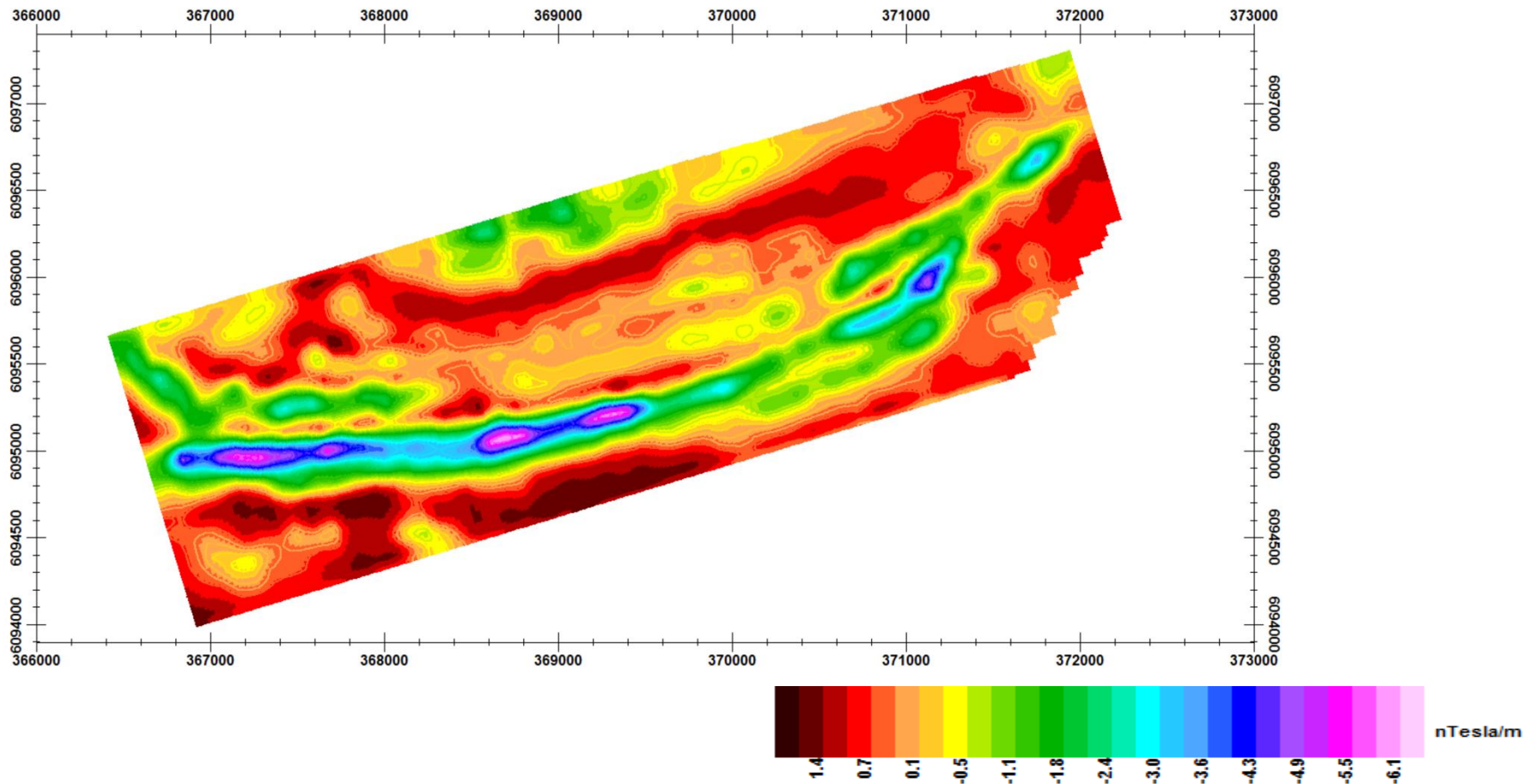
Xcite TDEM Survey Fay Lake North Central Area

Magnetic Horizontal Gradient in NNE direction (-17°)



The horizontal gradient (derivative) is computed in the NNE direction which is the average azimuth of the survey lines. This gradient is useful for identifying boundaries between rocks of different materials. The high magnetic area could be associated with the one portion of the metasedimentary rocks.

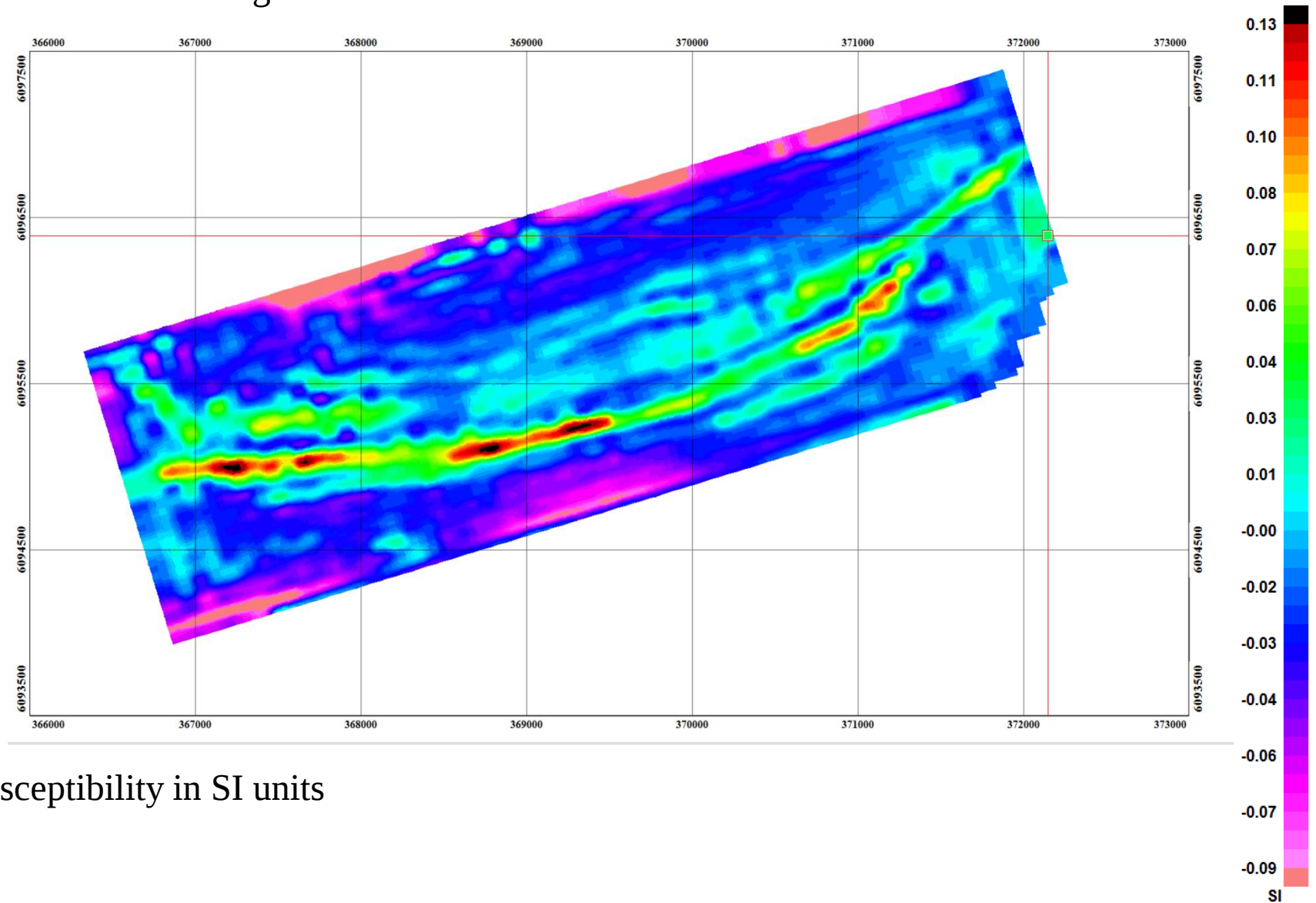
Magnetic Vertical Gradient



The vertical gradient (derivative) of the magnetic data is computed. The vertical derivative locates the principle areas of magnetization. Also, it helps identify the variation in depths. Larger negative values indicate deeper structures. From inversion, the depths to top of the pink values are about 150m. Again, the zones of high negative magnetic gradients appear correlated with the Mississippi metasedimentary rocks

Xcite TDEM Survey Fay Lake North Central Area

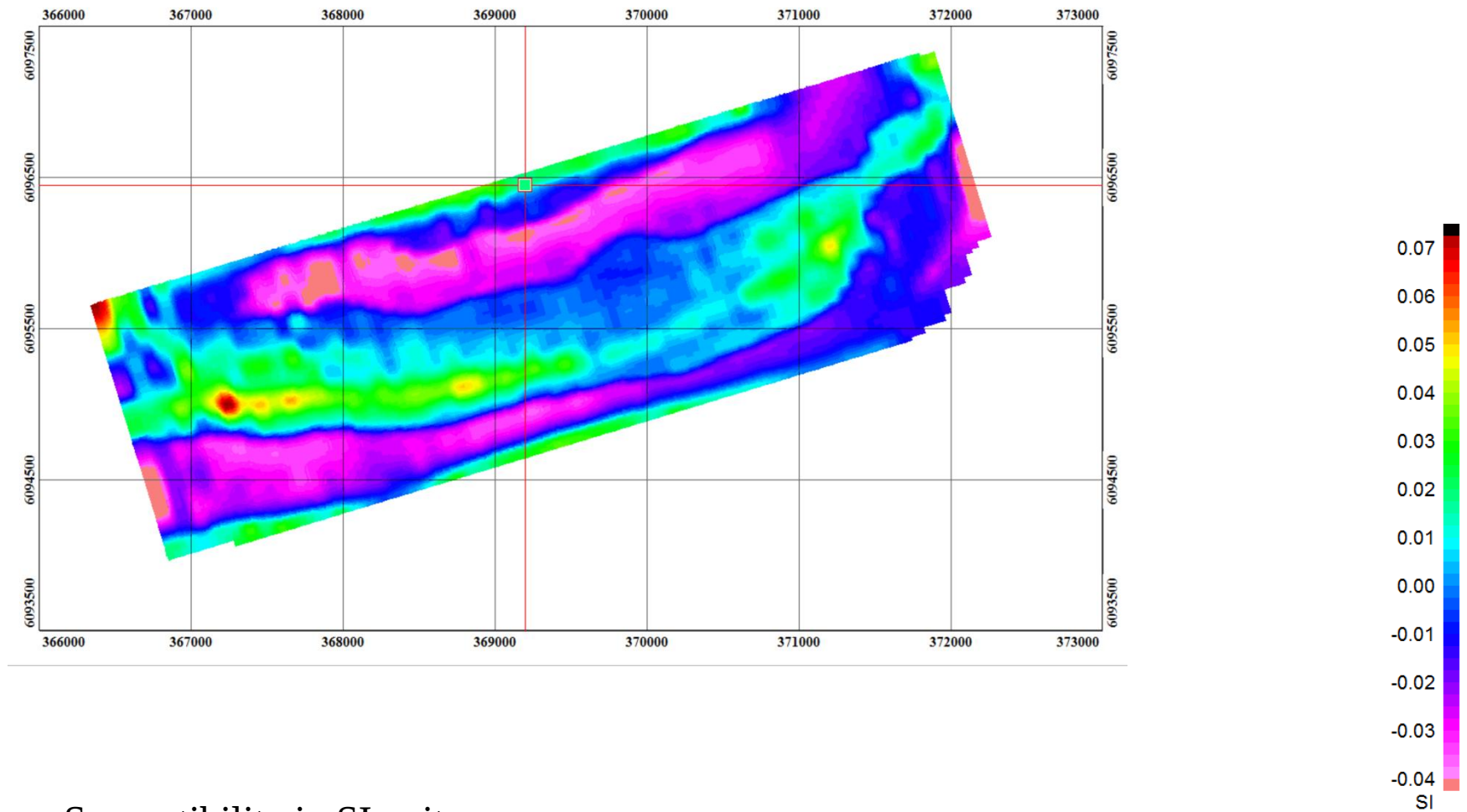
magnetic structure – 50m



Susceptibility in SI units

Xcite TDEM Survey Fay Lake North Central Area

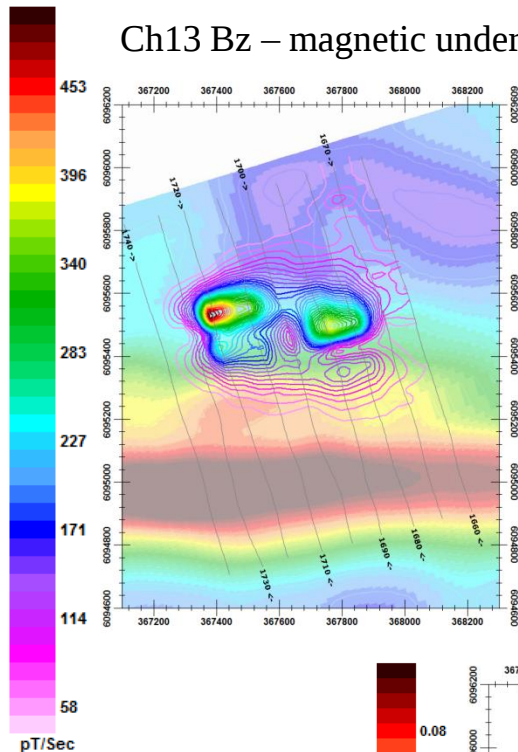
magnetic structure – 150m



Xcite TDEM Survey Fay Lake North Central Area

Target 1

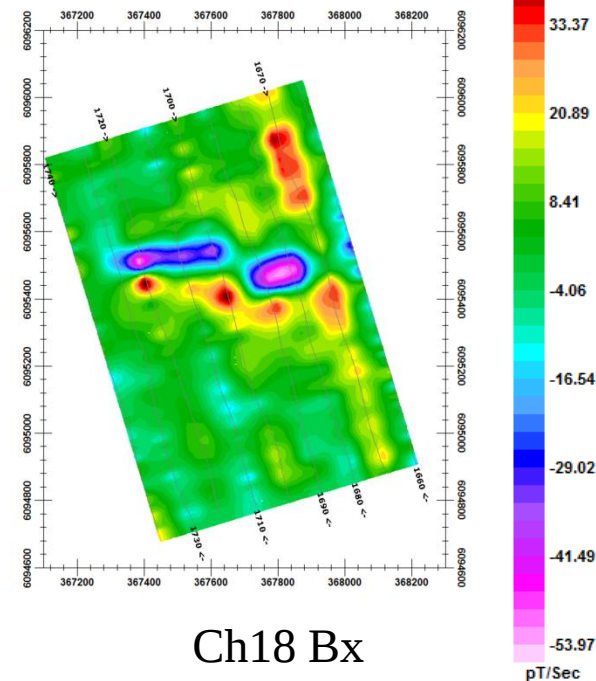
Ch13 Bz – magnetic underlay



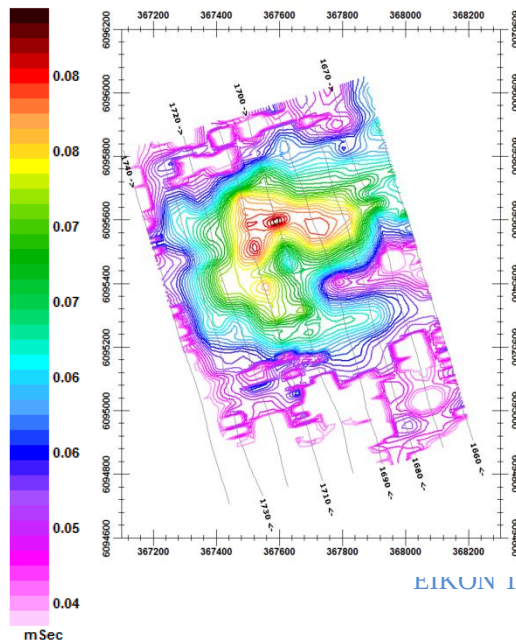
These two anomalies are indicated as pelites are indicated as pelites in information provided by the client. They appear to be embedded in what is indicated as arkosic sandstone.

Mid to late mid-time data indicates the structures as mostly vertical but slightly dipping towards the north. The Bx component (right figure) appears to indicate these as two distinct structures.

The decay rate (late early to late mid-time) indicates a very rapid decay constant. This implies these are weak conductors.



Ch18 Bx

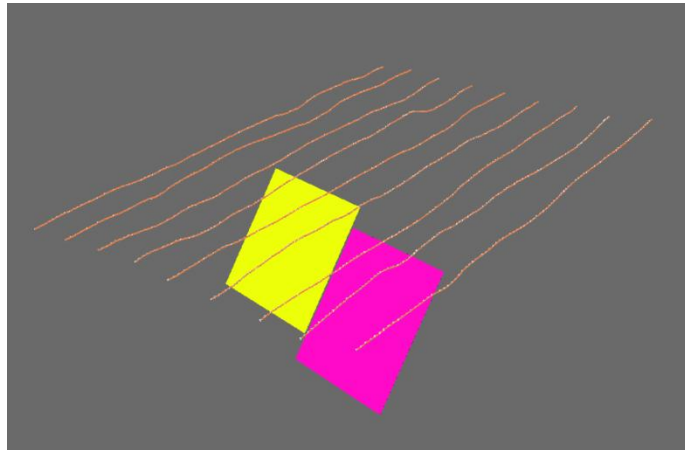


Decay Rate Bz
Ch8-18, Max=0.09msec

Xcite TDEM Survey Fay Lake North Central Area

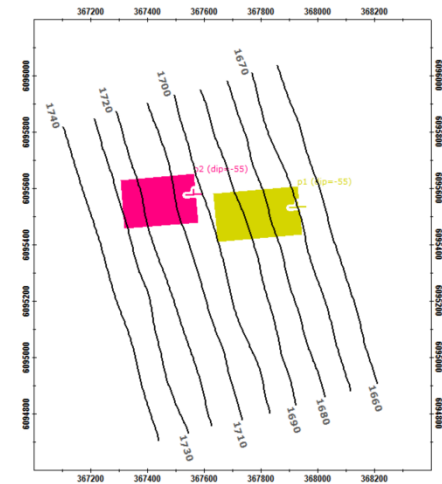
Target 1

View from North West



Anomaly NC T1A
Strike Length: 300m
Dip Extent: 300m
Strike Angle: 85° East
Dip Angle: 55° NNW
Conductance: 4 S
Depth to Top: 30m
Depth to Bottom: 270m

Anomaly NC T1B
Strike Length: 260m
Dip Extent: 300m
Strike Angle: 85° East
Dip Angle: 55° NNW
Conductance: 4 S
Depth to Top: 30m
Depth to Bottom: 270m



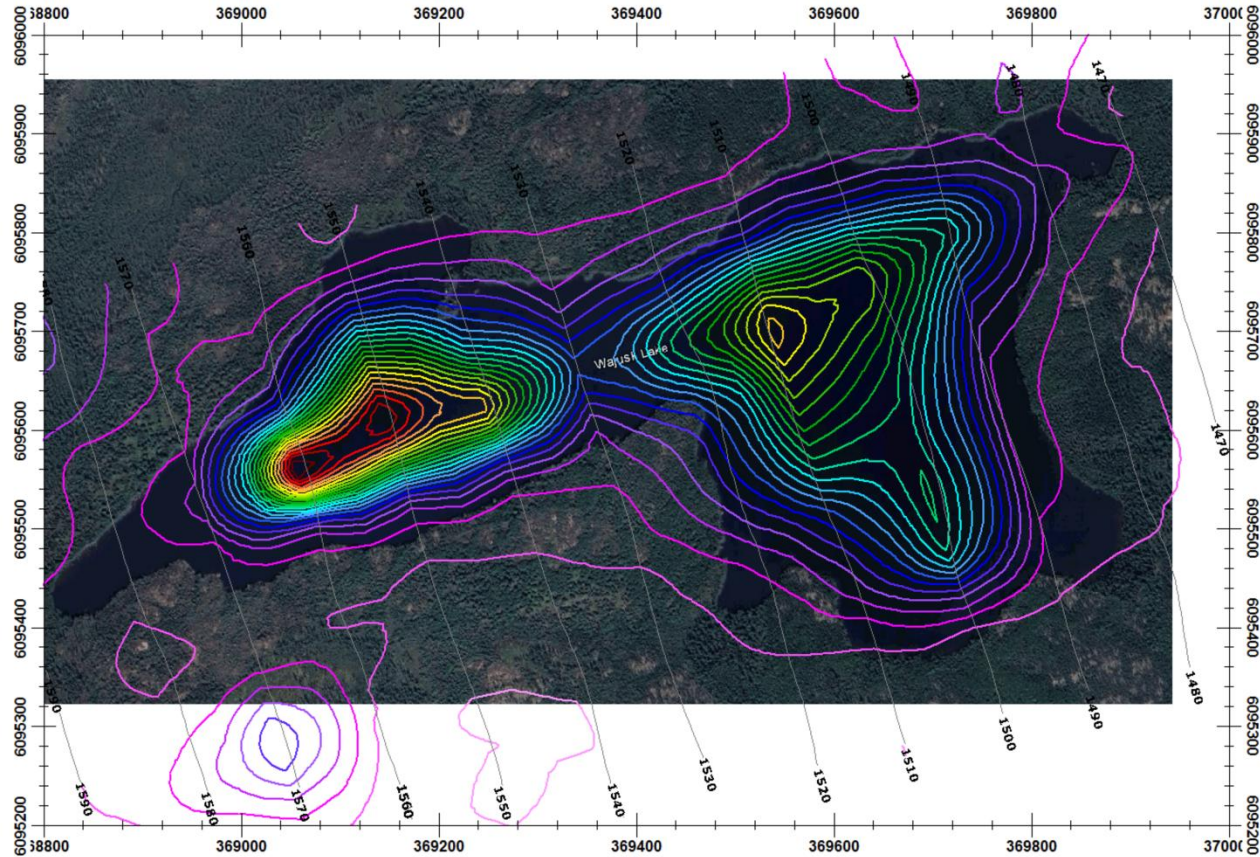
The models of the anomalies represent the data from mid-time to late time (Ch24). Particularly, over the western anomaly NC T1B, there is flat lying conductive material of weaker conductivity. The flat lying more weakly conductive material decays more quickly than the sub-vertical structures.

While pelites are known to be highly resistive in the laboratory when dry they could be expected to be of low conductivity when wet particularly if coarse grained and depending upon the degree of metamorphism.

Xcite TDEM Survey Fay Lake North Central Area

Target 2

Bz Ch1 with satellite image underlay

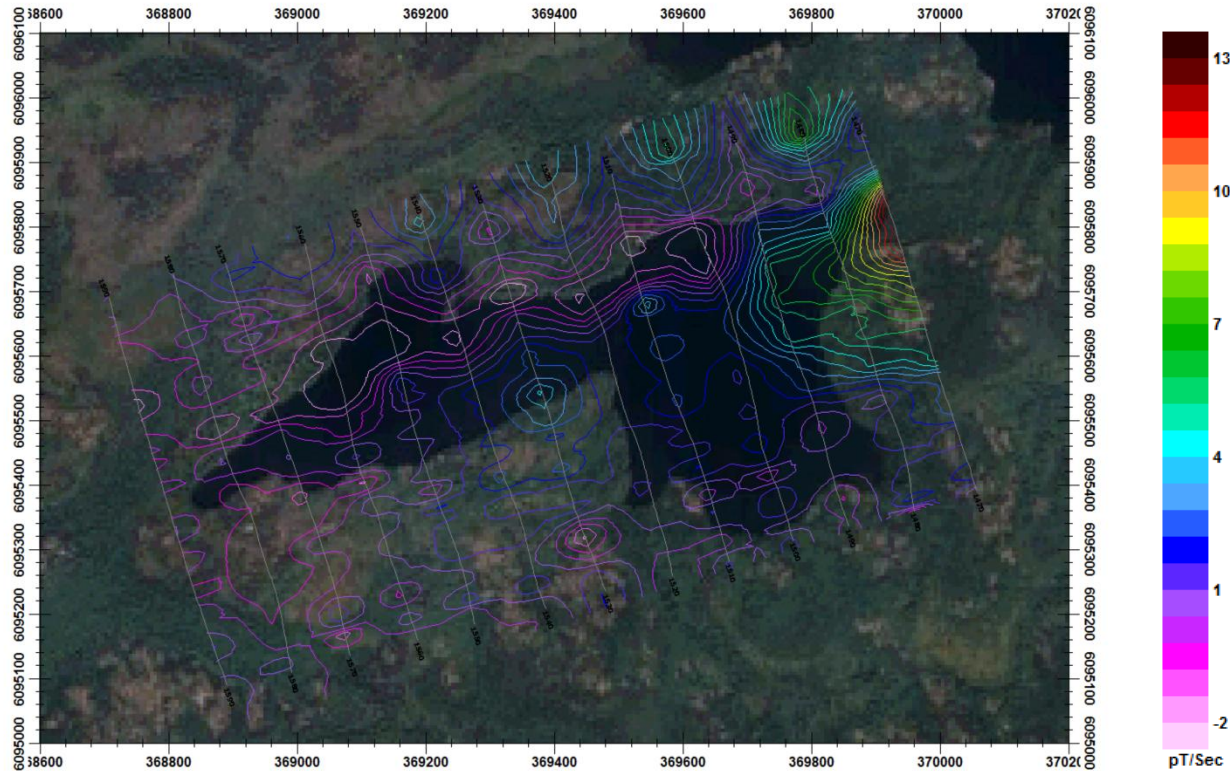


It would appear that the early time response is caused by lake bottom sediments.

Xcite TDEM Survey Fay Lake North Central Area

Target 2

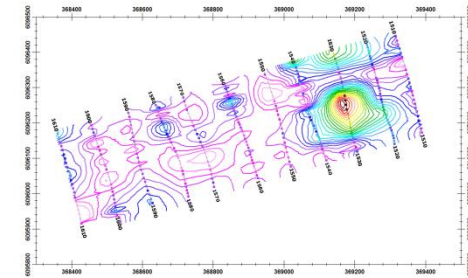
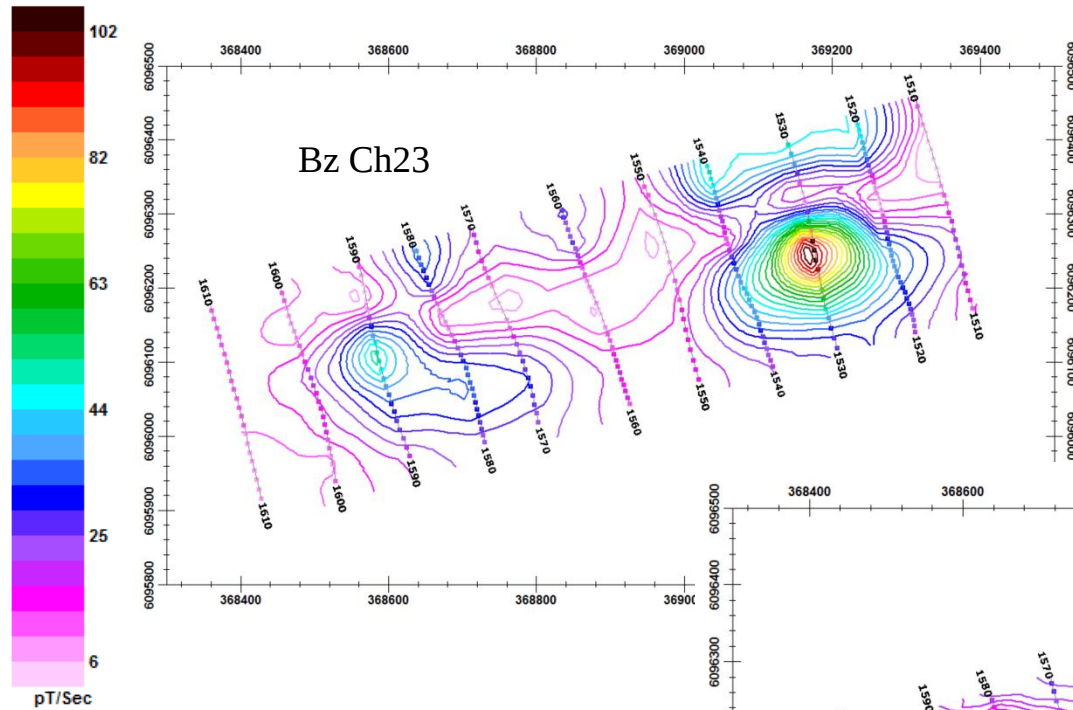
Bz Ch22 with satellite image underlay



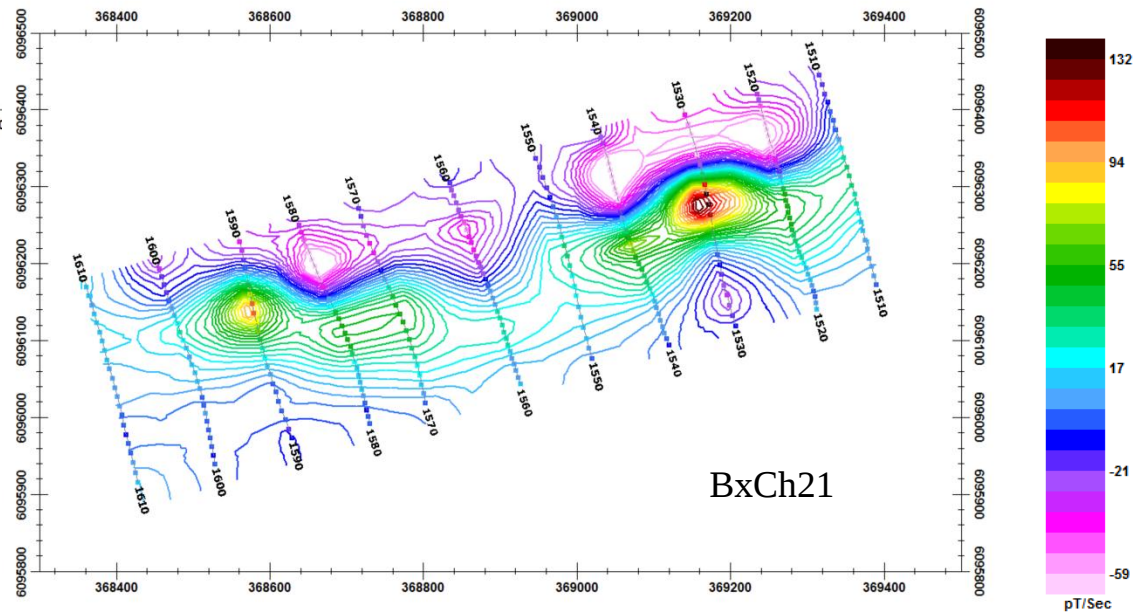
There are no conductors beneath the sediments. There is modest conductive material just to the east of the lake but only a weak conductor. This conductor is along strike with Target 7 to the north east.

Xcite TDEM Survey Fay Lake North Central Area

Target 3&4

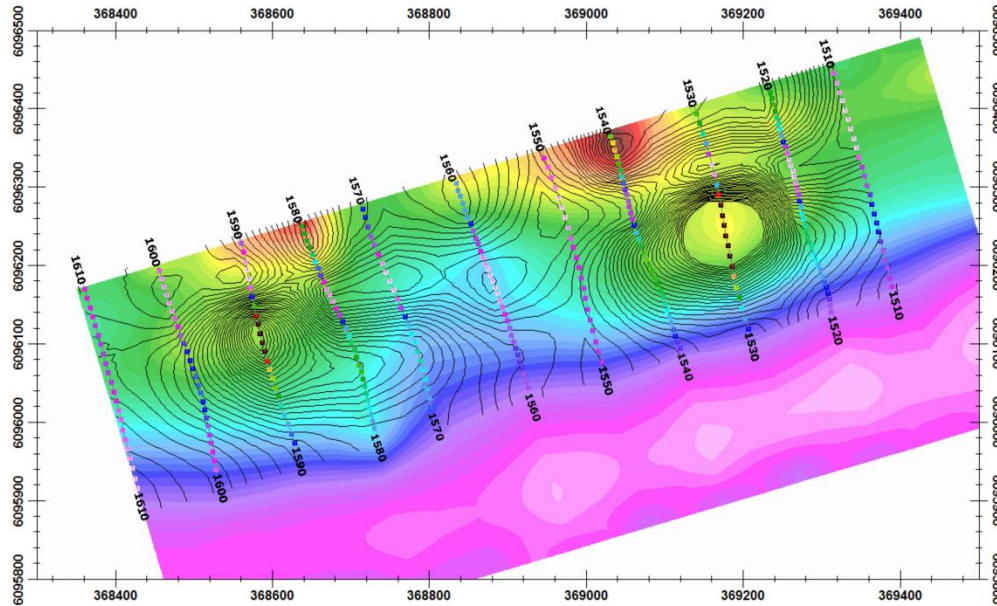


Target 3 and Target 4 are primarily observed on L1590 and L1530 respectively with a moderate high seen on L1540. While there is still a reasonable response of both anomalies at Ch23 (above left) by Chn28 (right) only Target4 still has a detectable response. There appears to be 2 additional anomalies to the north just outside the survey area.



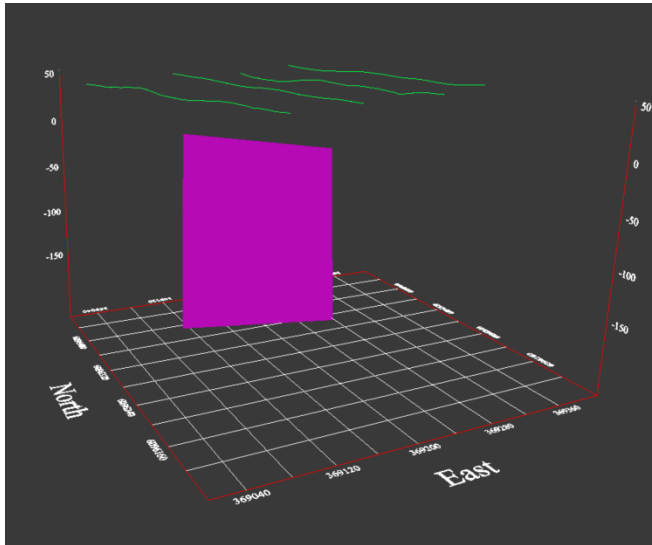
The horizontal component (Bx) shown on the right for Ch21, appears to show there may be a deeper structure connecting the 2 anomalies.

Bz Ch21 Contoured in back with aeromagnetics TMI underlain



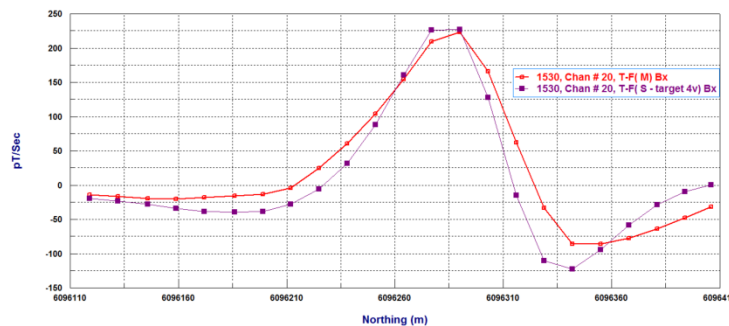
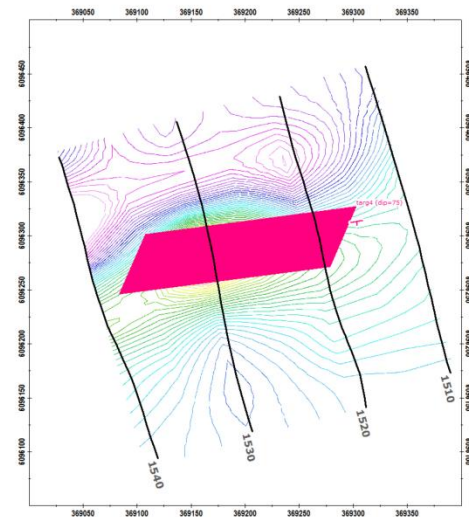
There is weak magnetic response associated with both anomalies but in particular Target 4. Stronger (also circular) magnetic anomalies appear at the very edge of the magnetic survey coincident with the EM responses in previous figures. This would appear to confirm the presence of 2 other anomalies just outside the survey.

View from South West



Anomaly NC T4
Strike Length: 200m
Dip Extent: 300m
Strike Angle: 80° East of N
Dip Angle: 10° SSE
Plunge: East
Conductance: 13 S
Depth to Top: 5m
Depth to Bottom: 225m

Bx Ch20 underlain



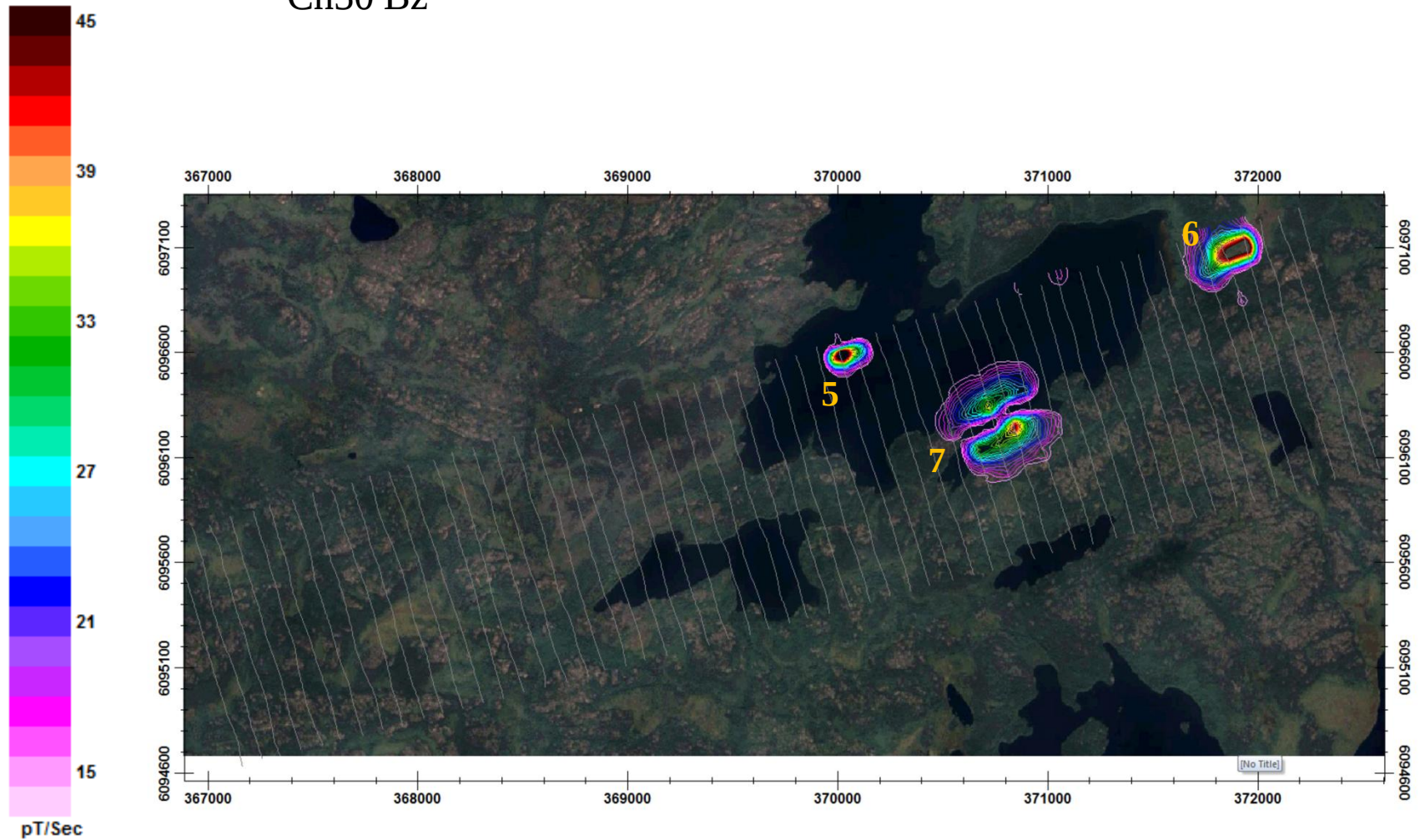
Data vs Model response including background response, L1530 Bx Ch 20.

Conductor is modest at only 13 Siemens. At the peak of the anomaly along L1530, the Bz becomes very noisy by Ch29. The top of the target is very shallow with little other associated shallow 3D response .

Xcite TDEM Survey Fay Lake

North Central Area

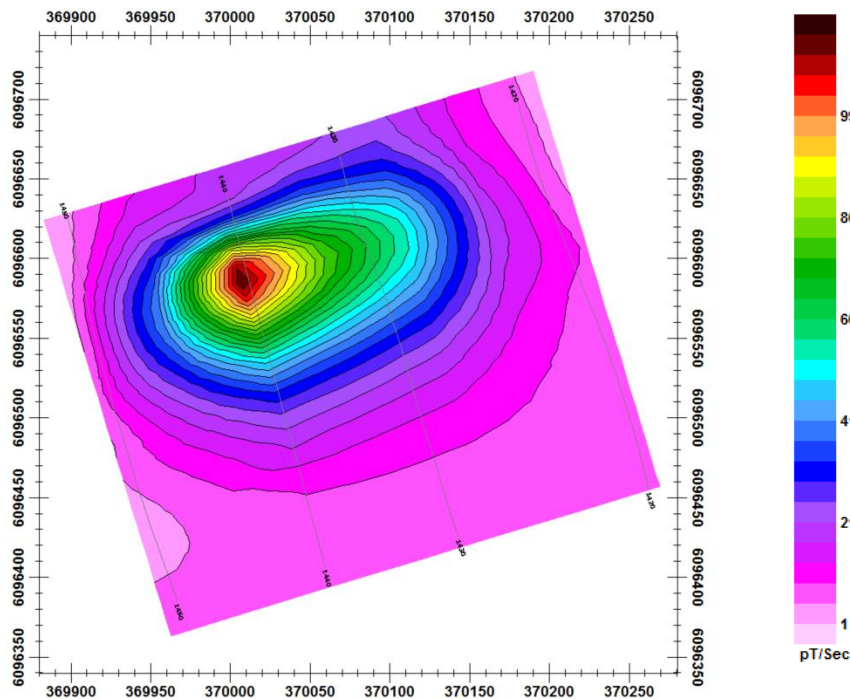
Ch30 Bz



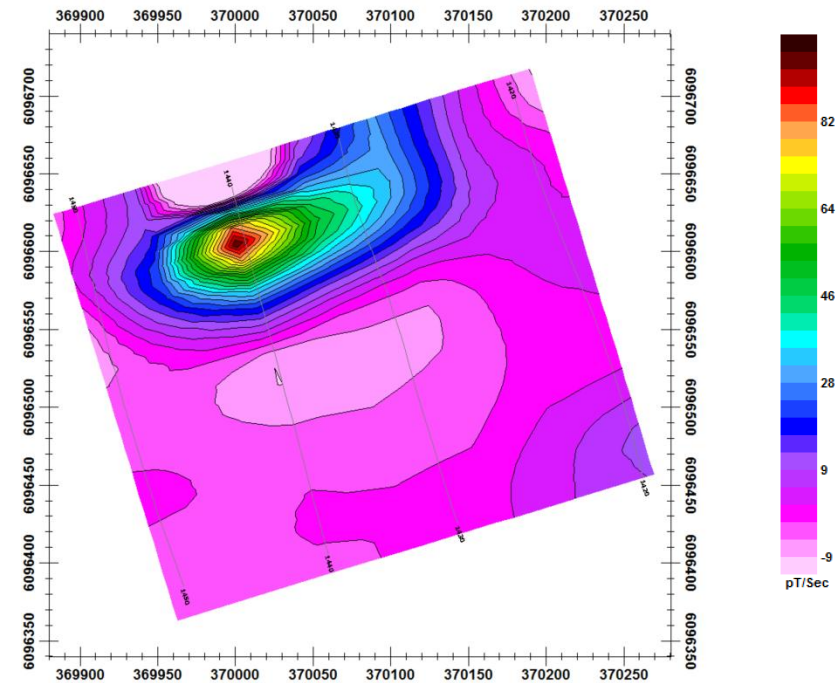
Xcite TDEM Survey Fay Lake North Central Area

Target 5

Bz Ch28



Bx Ch28



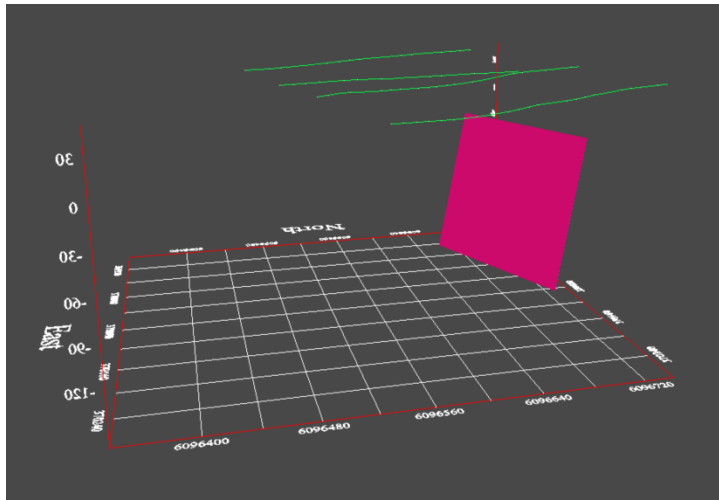
Target 5 is beneath lake Ponton at the northwest edge and on the edge of the claims. Target5 has a relatively strong response to Ch30 and still a coherent response to Ch35. are primarily observed on L1590 and L1530 respectively with a moderate high seen on L1540. However, te response is primarily on one line, L1440 with a small response on L1430.

The anomaly is on the edge of 2 magnetic domains but there is no specific magnetic response to this anomaly.

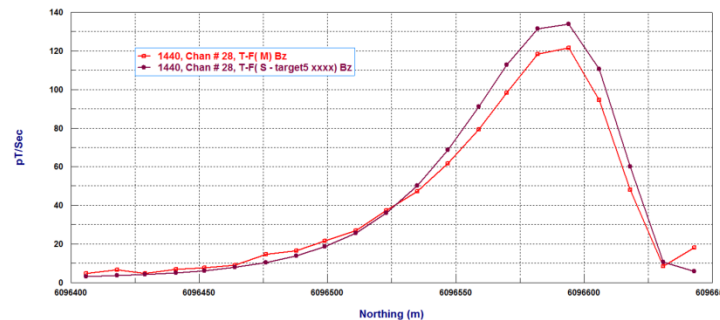
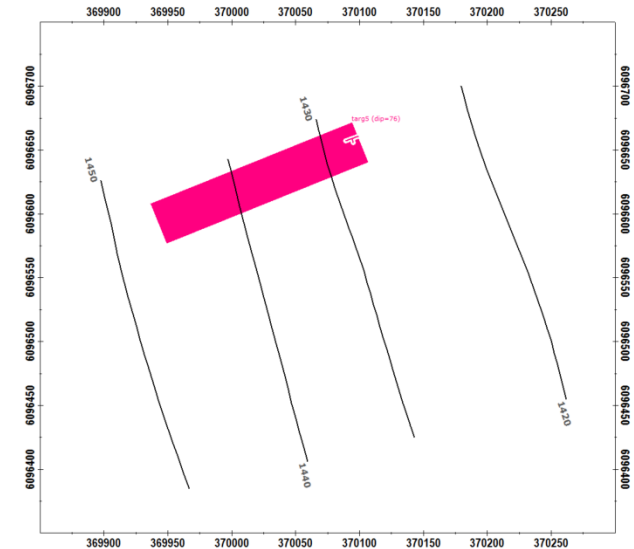
Xcite TDEM Survey Fay Lake North Central Area

Target 5

View from South



Anomaly NC T5
Strike Length: 170m
Dip Extent: 140m
Strike Angle: 68° East of N
Dip Angle: 76° SSE
Conductance: 25 S
Depth to Top: 15m
Depth to Bottom: 145m



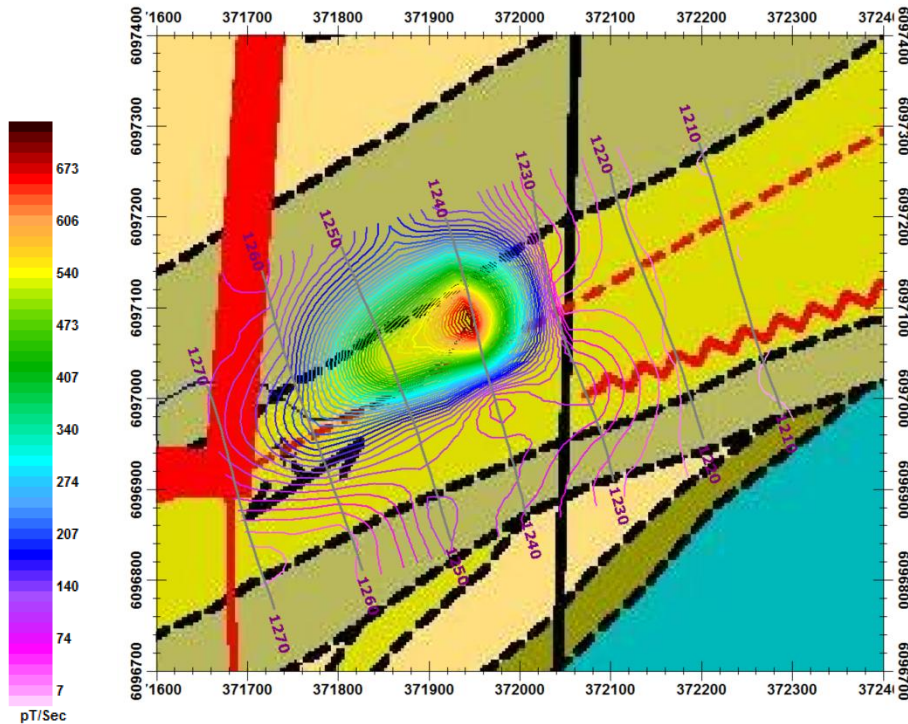
Data vs Model response including background response, L1440 Bz Ch 28.

This conductor is isolated from other anomalies. The conductance is moderate at 25 Siemens. There is no associated magnetic response with this target.

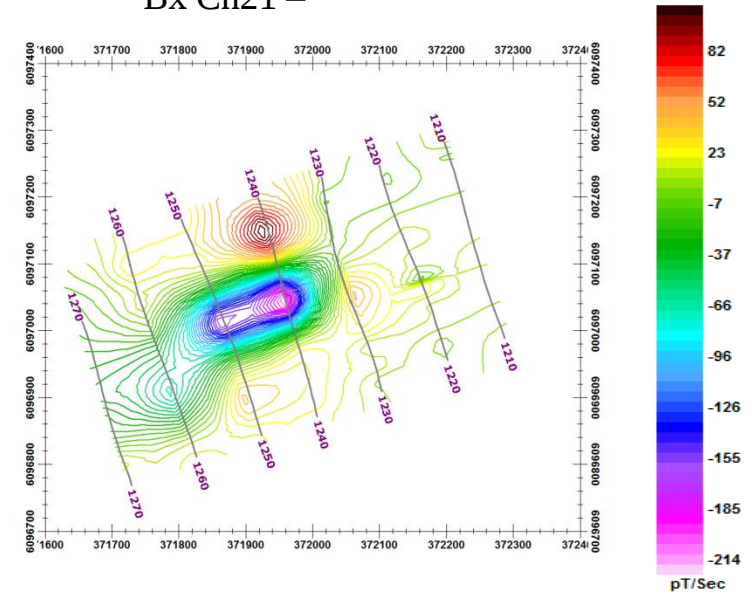
Xcite TDEM Survey Fay Lake North Central Area

Target 6

Bz Ch18 – Geology with claim boundaries underlain



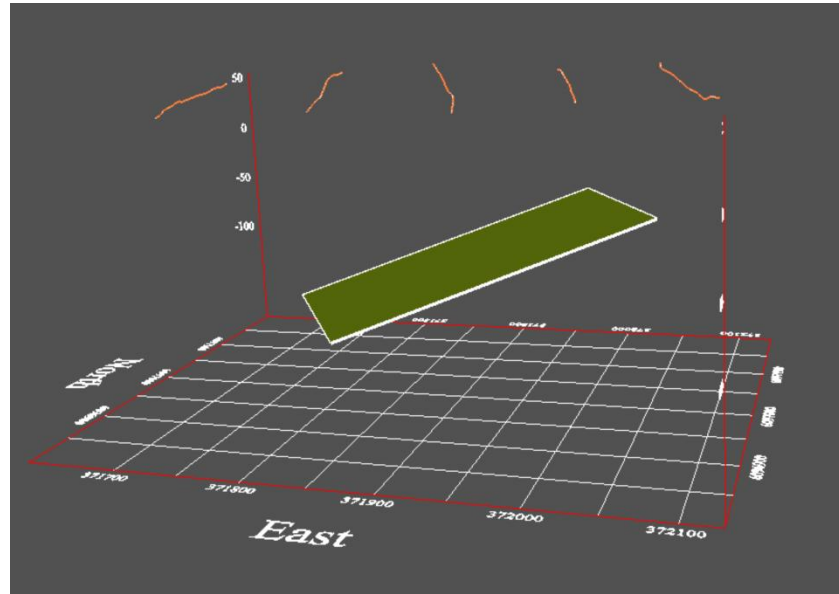
Bx Ch21 –



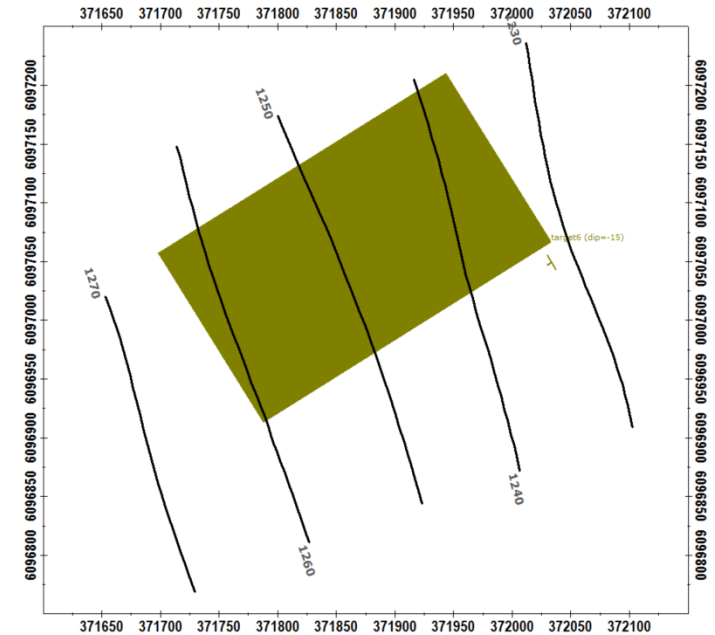
Target 6 is to the NE of the survey on an edge of the claims. Initially, the target appears to be striking along the survey line and dipping to the SW. There is a good coherent response down to Ch35.

The background resistivity changes from a surface resistivity of about 626 Ωm to 400 Ωm at about 60m depth.

View from South



Anomaly NC T6
 Strike Length: 170m
 Dip Extent: 300m
 Strike Angle: 32° West of N
 Dip Angle: 15° SE
 Conductance: 30 S
 Depth to Top: 75m
 Depth to Bottom: 150m



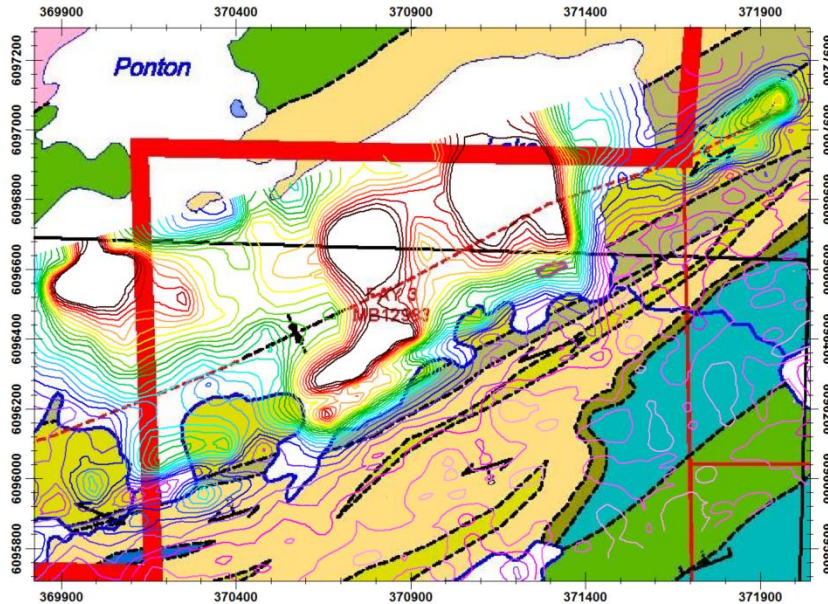
Data vs Model response including background response, L1440 Bz Ch 28.

This conductor is isolated from other anomalies. The conductance is more significant at 30 Siemens. There is no associated magnetic response with this target. It is buried deeper beneath the resistive top rock in the slightly less resistive basement. The response is seen predominantly on L1240, 1250 and 1260 but also is seen on slightly on L1270 and L1230.

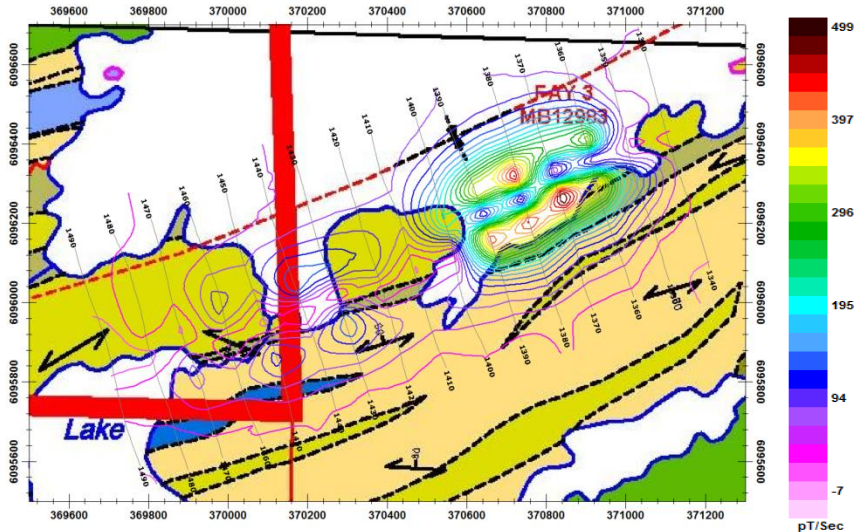
Xcite TDEM Survey Fay Lake North Central Area

Target 7

Bz Ch8 – Geology with claim boundaries underlain

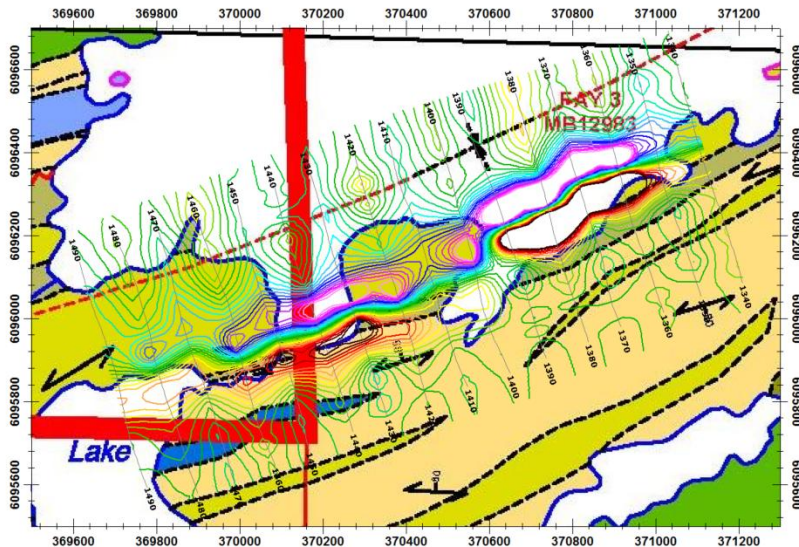


Bz Ch18

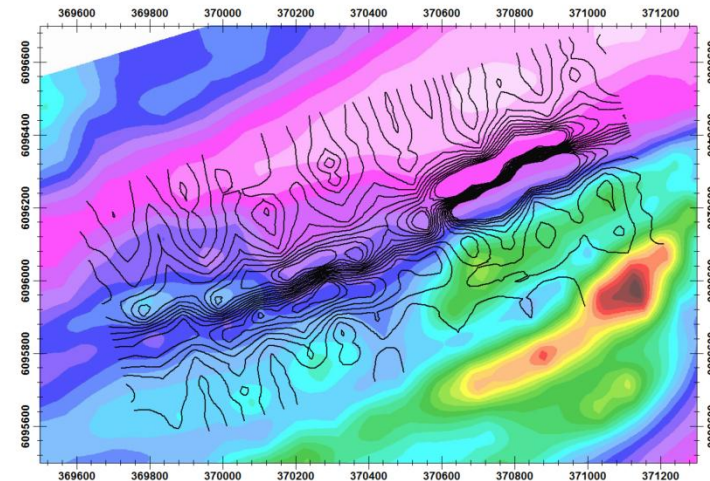


Target 7 is below Ponton Lake at the very southern edge. In early time (left figure), there is considerable response from the lake bottom sediments. By mid-times, the anomaly becomes isolated and appears to consist to two portions having the same strike. However, upon modeling it is demonstrated that this is almost a perfectly vertical conductor! There is also an indication of a SW extension further south along strike.

Bx Ch15 – Geology with claim boundaries underlain



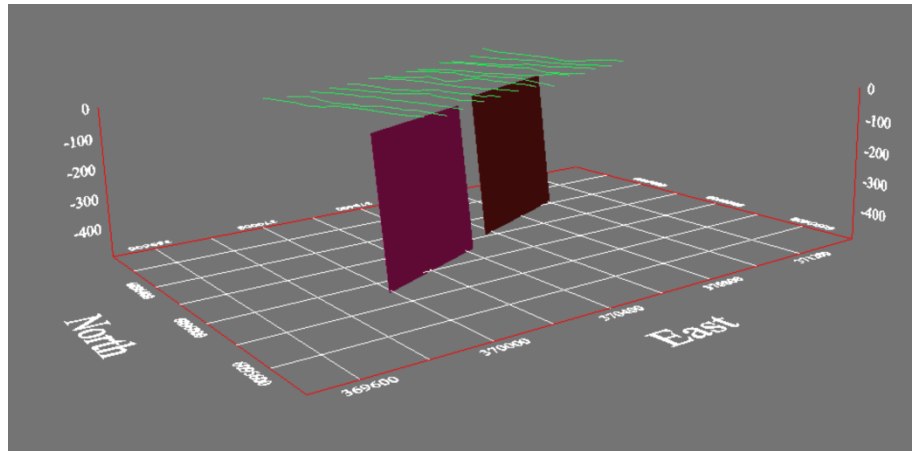
Bx Ch15 – aeromagnetics underlay



The horizontal EM component, Bx, indicates more clearly the extension along strike to the SW. This extension disappears in the data at later times indicating either weaker conductive material or the strike is dipping to the SW.

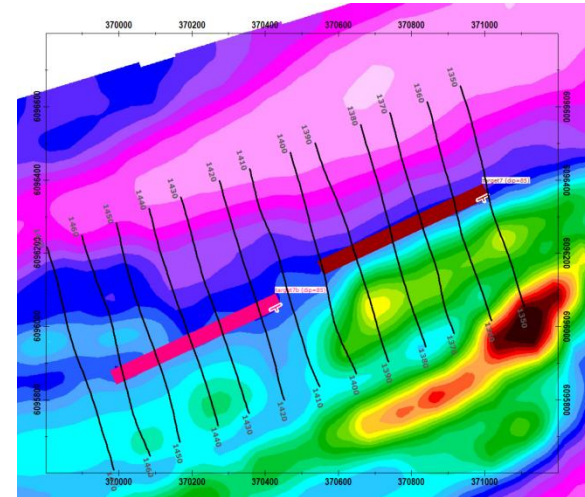
The horizontal component correlates with a magnetic structure (dark blue) as shown in the right figure. The thickness of the magnetic structure as indicated by this thin blue response striking SW to NE has a thickness comparable to Burnwood sedimentary rocks shown in the geology map (left figure).

View from South West



Anomaly NC T7A
Strike Length: 500m
Dip Extent: 480m
Strike Angle: 65° East of N
Dip Angle: 85° SE
Conductance: 15 S
Depth to Top: 24m
Depth to Bottom: 500m

Anomaly NC T7B
Strike Length: 500m
Dip Extent: 480m
Strike Angle: 65° East of N
Dip Angle: 85° SE
Conductance: 5 S
Depth to Top: 30m
Depth to Bottom: 506m



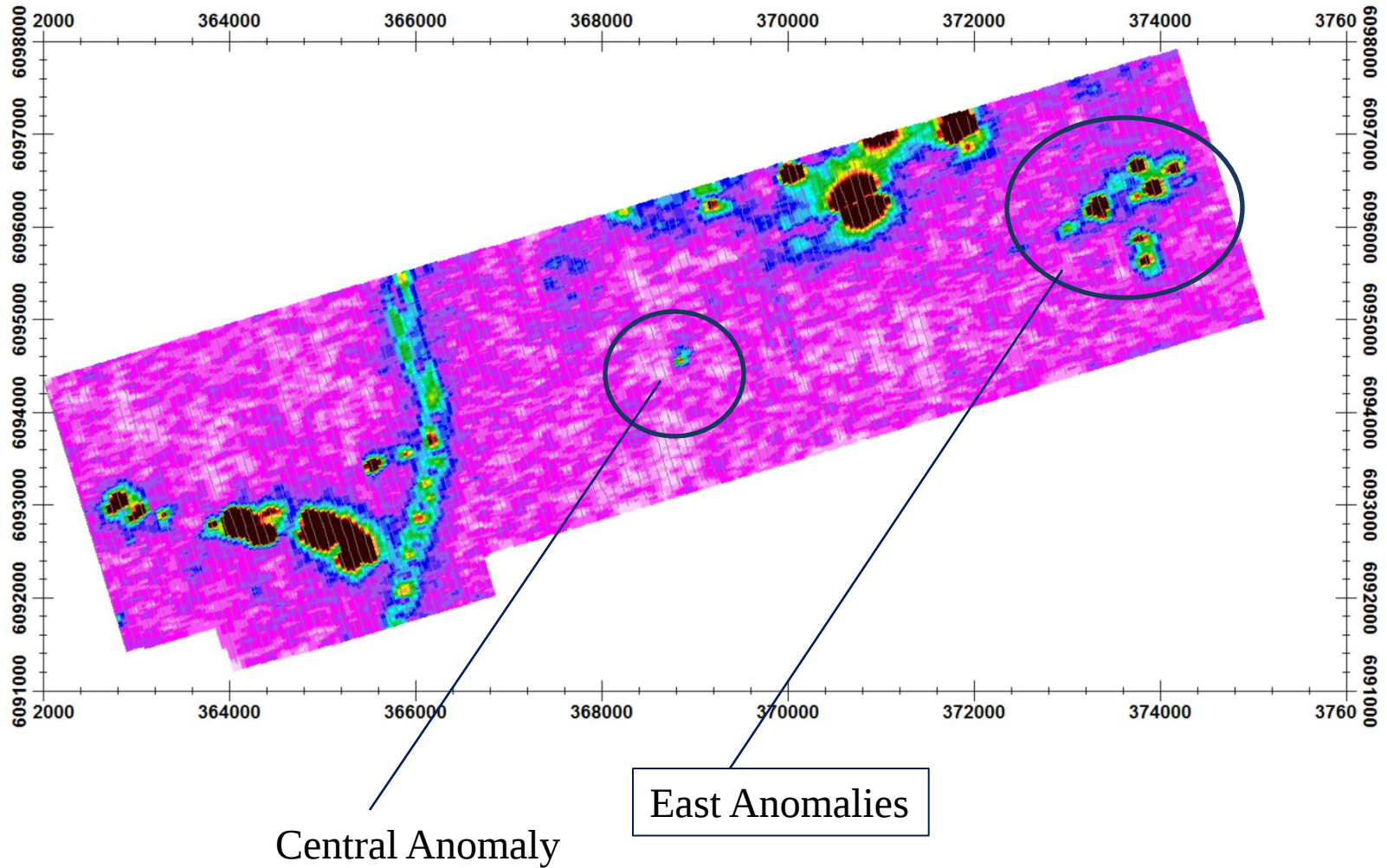
Projection of model with aeromag underlay

The two conductors follow the same strike. However, the SW anomaly T7B is much weaker in conductance than the NE anomaly. As such, the model for T7B is more approximate than for T7A. The model parameter, dip, is not well determined in this data for either conductor. The dip is almost vertical but not clear if there is a single dip to the structure.

These conductors are obviously quite vertical in their orientation thus suggesting some type of fracture or fault. The coincidence of a weak magnetic structure with the same strike might suggest a mixture of sulphides.

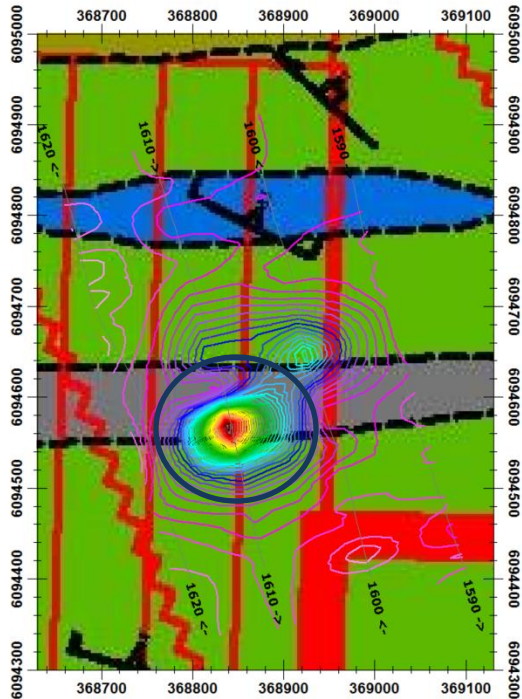
Xcite TDEM Survey Fay Lake Central and East Area

Ch28 Bz

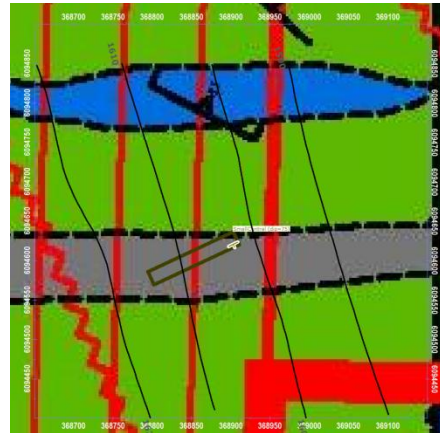


Xcite TDEM Survey Fay Lake Central Anomaly

Ch22 Bz

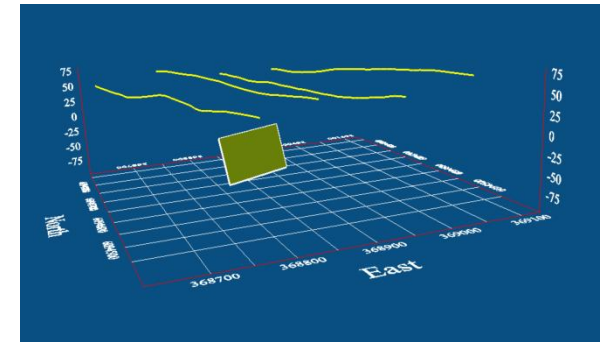


Central Anomaly Geology Underlay



Model Projection

View from South



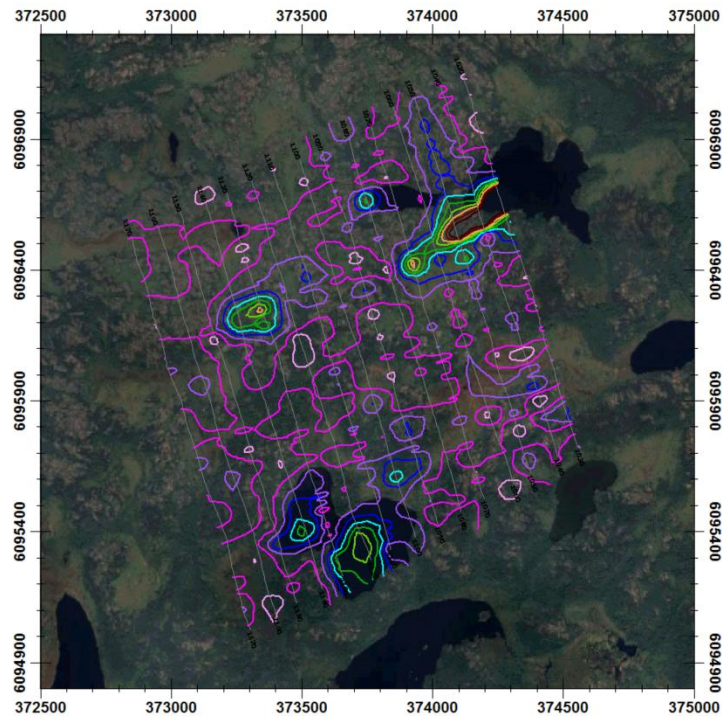
Anomaly C T8
Strike Length: 120m
Dip Extent: 70m
Strike Angle: 65° East of N
Dip Angle: 75° SE
Conductance: 22 S
Depth to Top: 20m
Depth to Bottom: 83m

This conductor is small and does not appear clearly in early times. It is associated as per the geology map with a mafic schist. The cover rock 600 Ω m and is roughly 50m thick. The basement resistivity cannot be determined from the data.

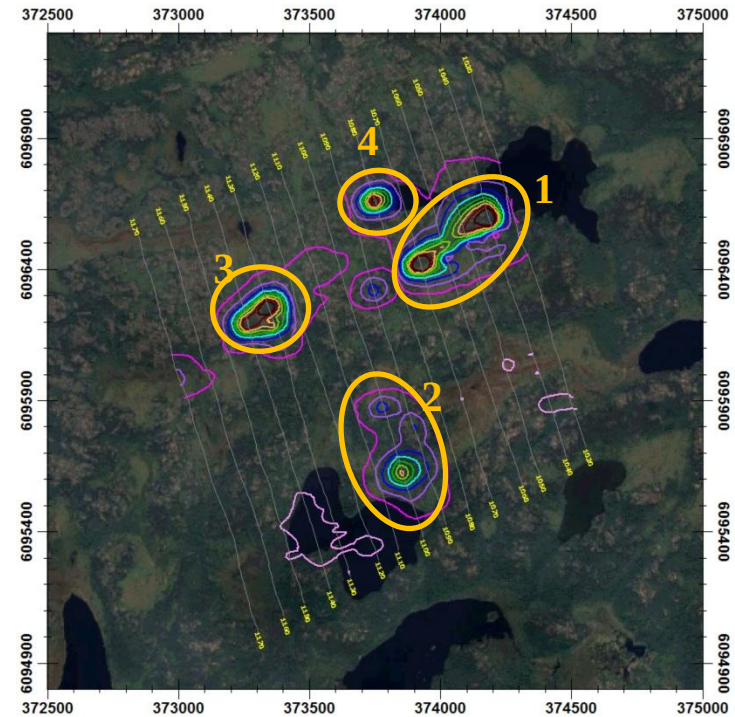
The structure is relatively small both in strike and depth extent. The depth to top is indicated at 20m but the structure becomes larger with depth as indicated by the Bz response. It is semi-vertical dipping southwards.

Xcite TDEM Survey Fay Lake East Area

Ch8 Bz



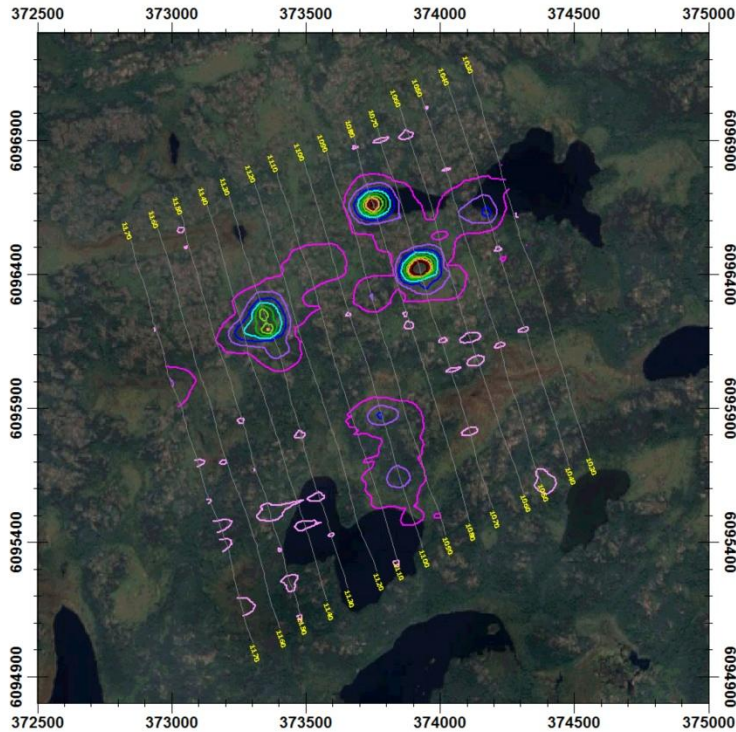
Ch15 Bz



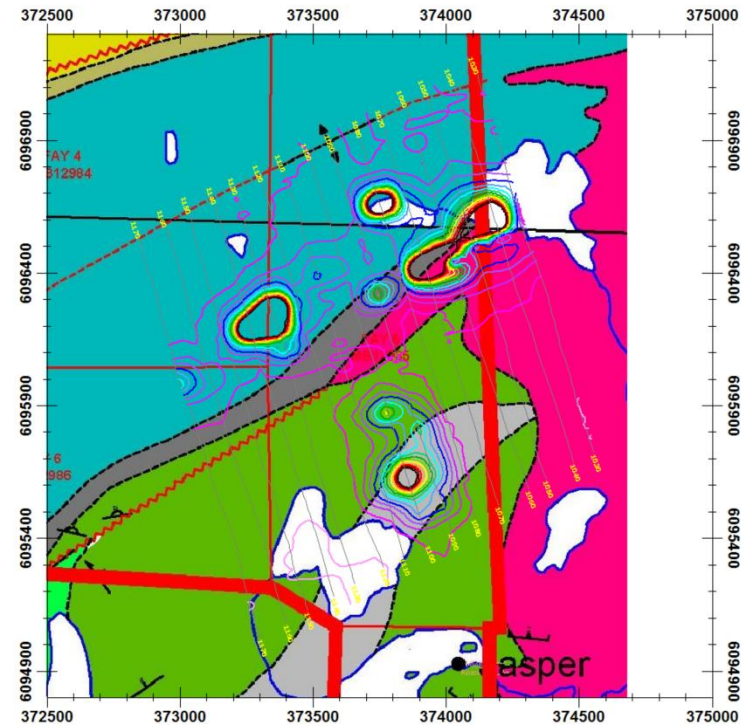
Early time data shows responses over several lakes but by Ch15, there is only one lake (north most anomaly) with a response over it.

Xcite TDEM Survey Fay Lake EastArea EM

Ch30 Bz



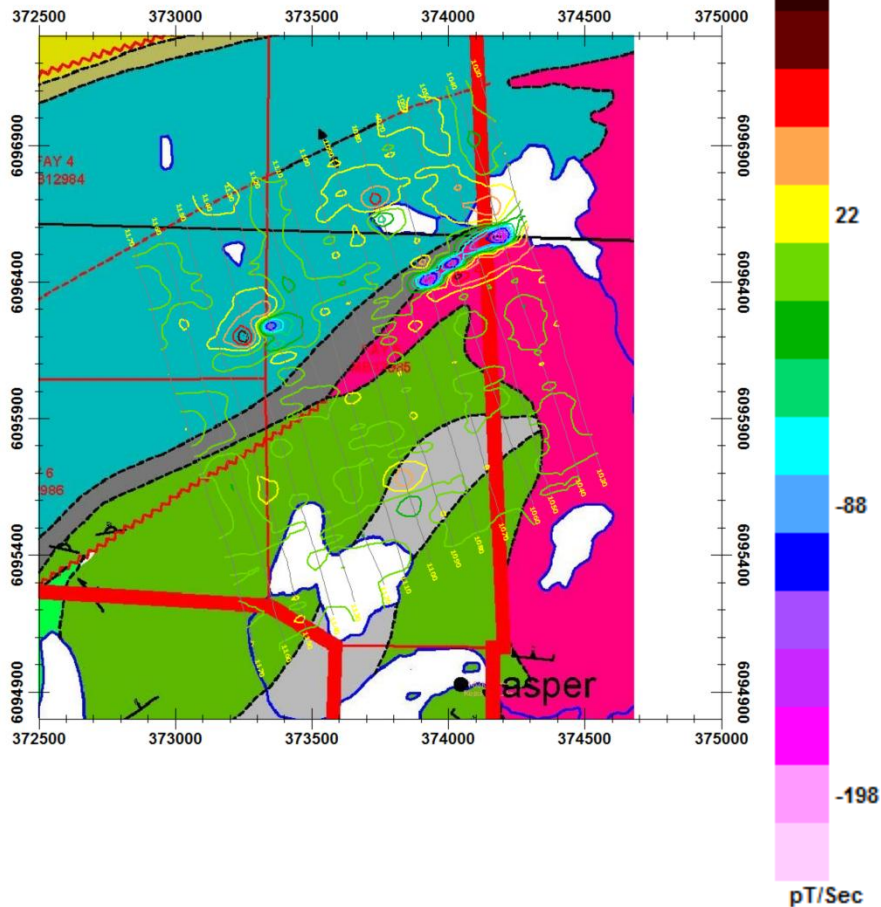
Ch18 Bz



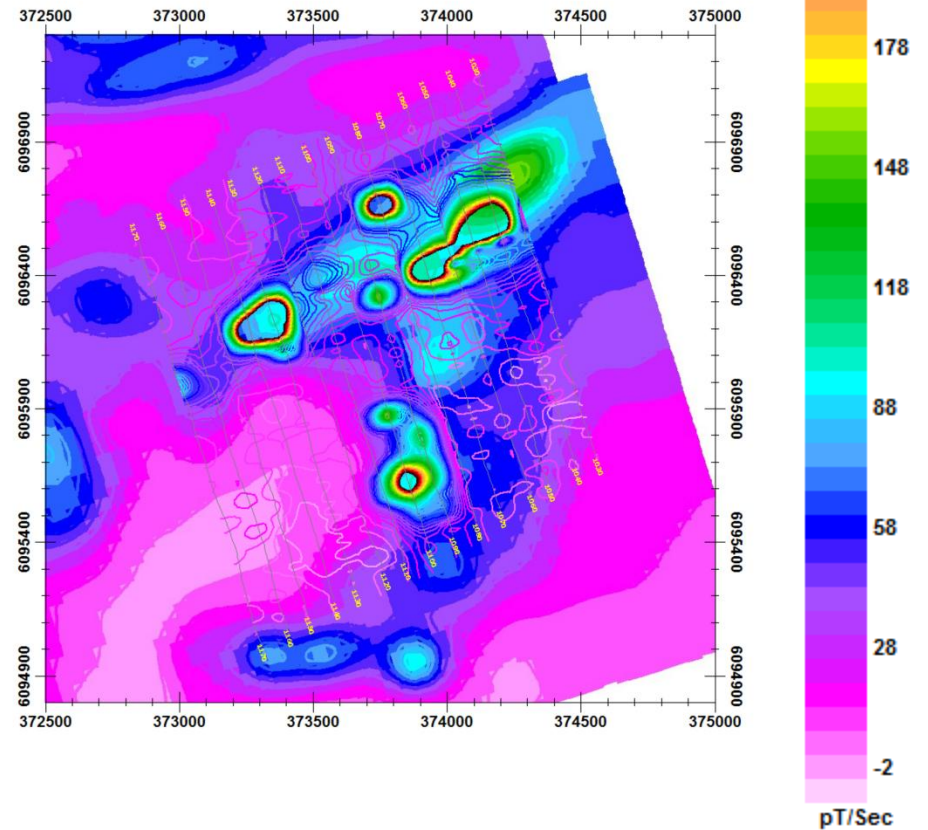
By late middle time (right figure), 6 anomalies remain. Only one is of any size and this one is associated with mafic schist and strikes along the geological maps surface expression of the schist. By late time (left figure), only three anomalies survive.

Xcite TDEM Survey Fay Lake East Area EM

Ch17 Bx



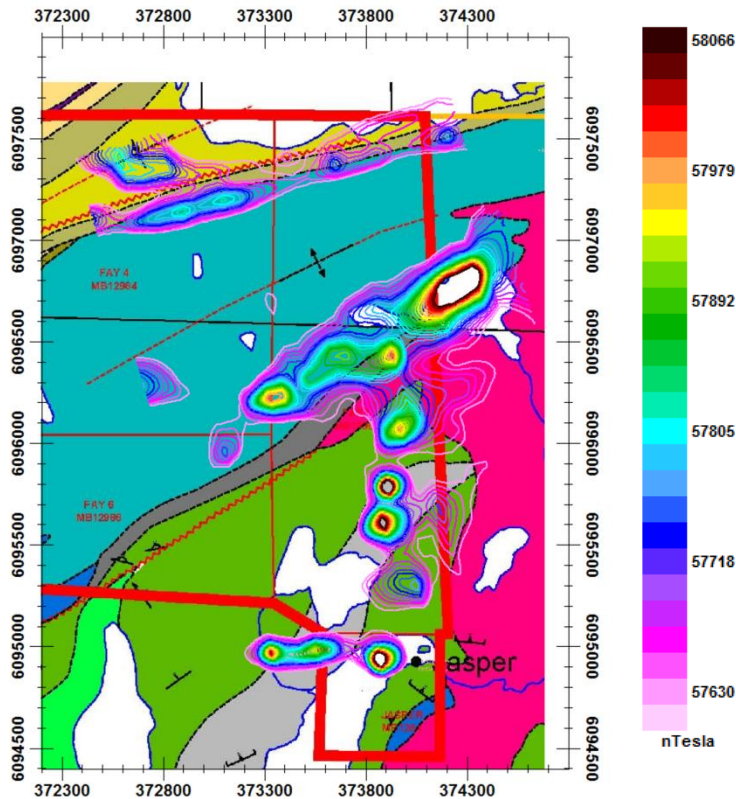
Ch15 Bz



Bx at mid-time (Ch17, left figure) shows the most interesting anomaly along the contact between the schist and intrusive rocks. The figure to the right is Bz at mid-time with the aeromagnetic data underlain. All of the EM anomalies are associated with a magnetic anomaly..

Xcite TDEM Survey Fay Lake East Area Magnetics

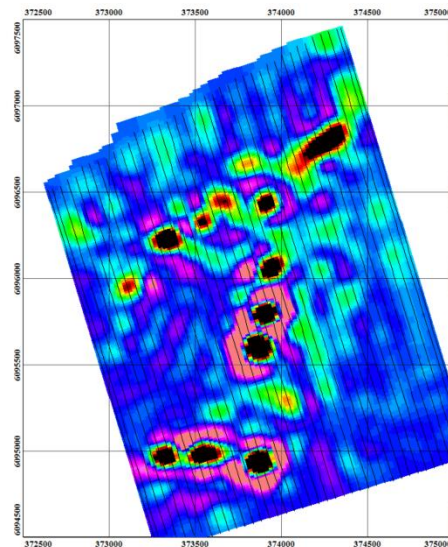
Aeromagnetics RTP



The inversion model reveals that the tops of the magnetic structures are quite shallow but there is depth extent to the anomalies. The susceptibilities are quite high at over 0.25 units SI at depths of 40m.

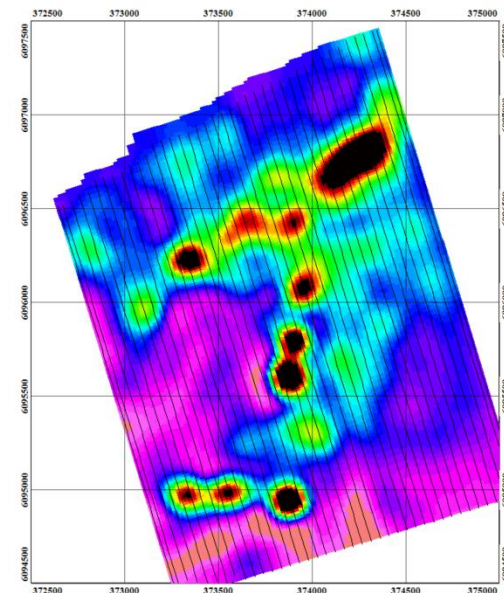
However, the inversion reveals that these small defined anomalies lie within a larger region of less magnetic material. It would appear that the mapping of the metasediments indicates but a thin surficial representation of the metasediments (following page).

Aeromagnetics Inversion Model



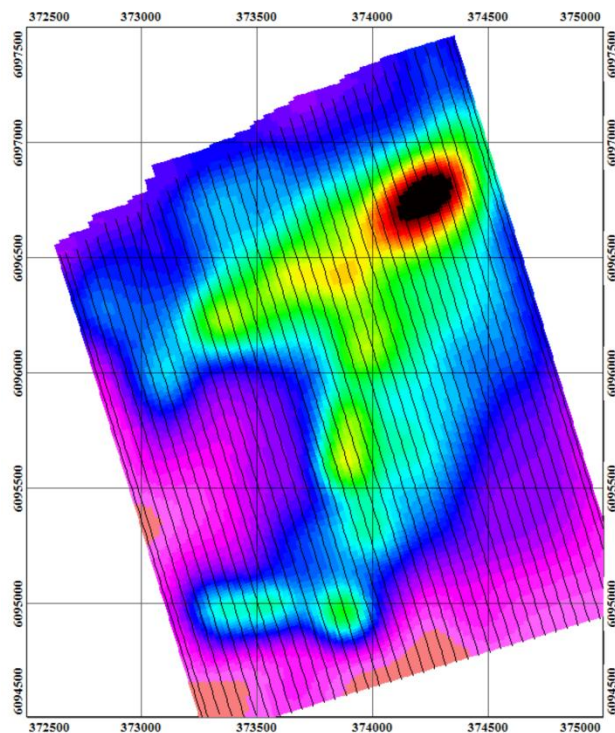
Z=40m
below surface

Z=160m



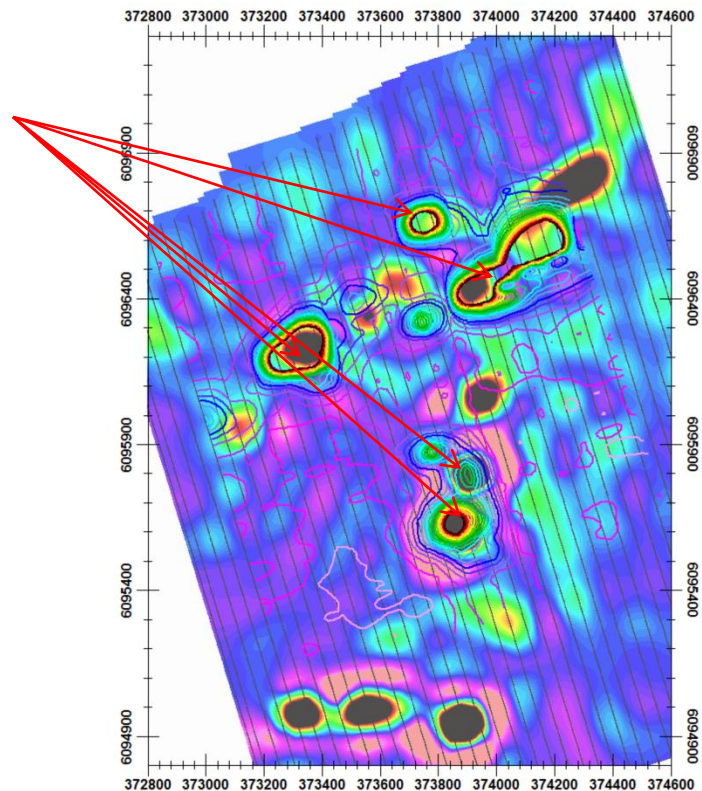
Xcite TDEM Survey Fay Lake East Area Magnetics

Aeromagnetics Inversion Model



Z=260m

Ch15 Bz – Magnetics inversion model underlay



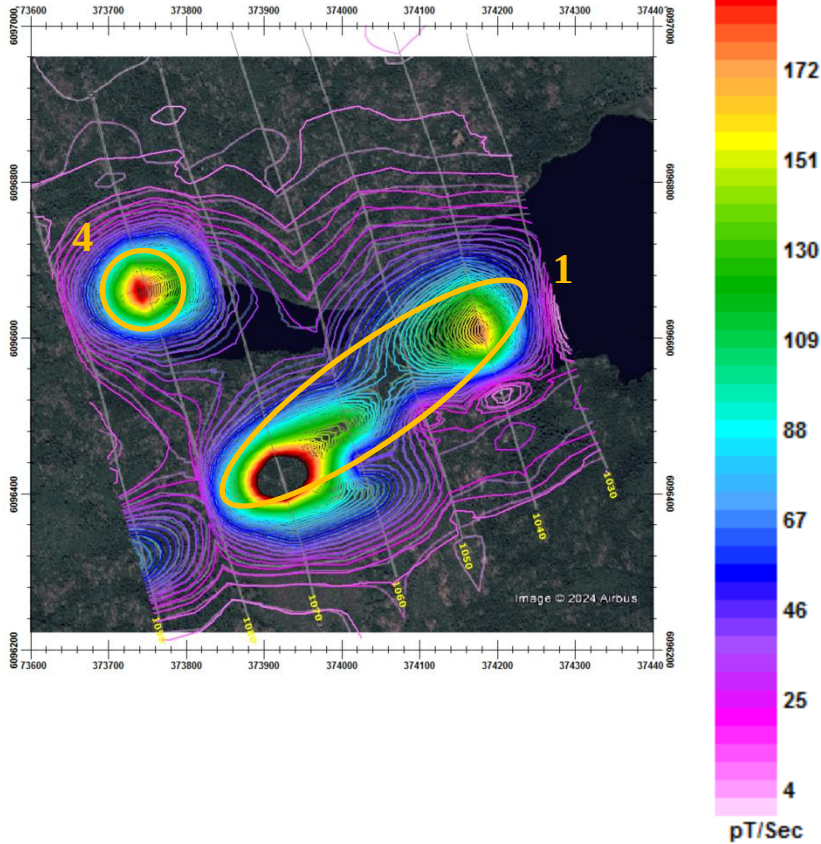
Z=60m

The figure to the left is the magnetic inversion model at a depth of 260m below surface. This would indicate weaker magnetic material over a large area in which the stronger magnetic anomalies are hosted.

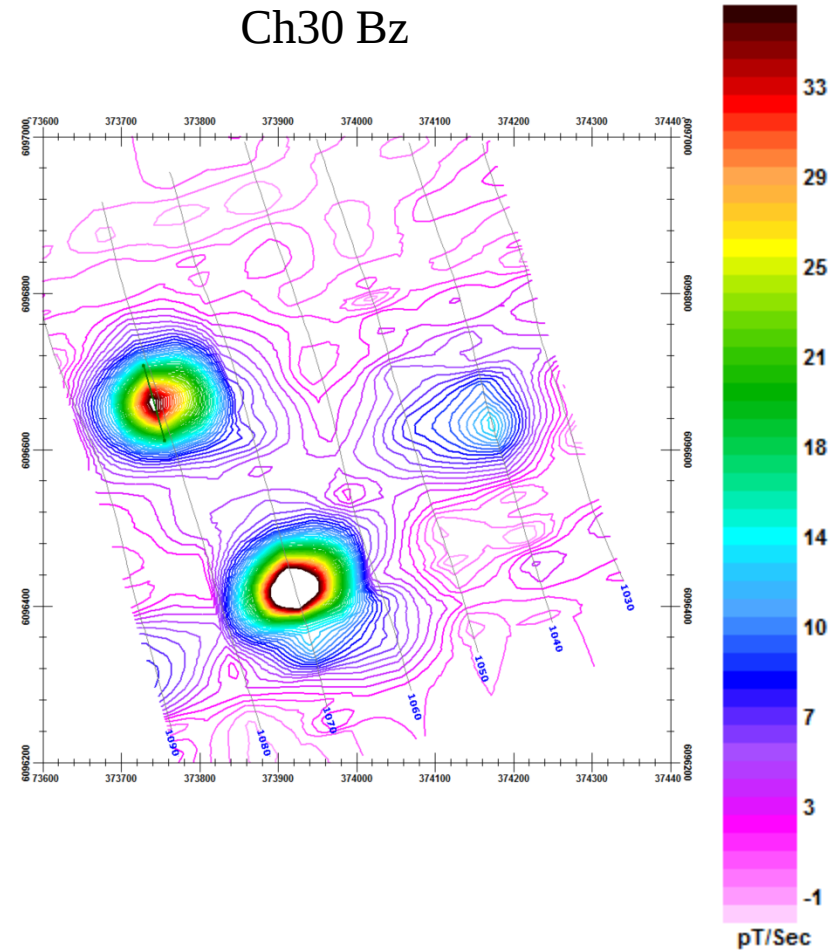
The figure on the right has Bz (Ch15) as contour lines overlain over the aeromagnetic inversion at a depth of 60m. There is a strong correlation between several of the EM anomalies and magnetic structure (red arrow). If the isolated magnetic structures are sulphides then this correlation might indicate the presence of chalcopyrites.

Xcite TDEM Survey Fay Lake East Area EM Targets 1 and 4

Ch20 Bz



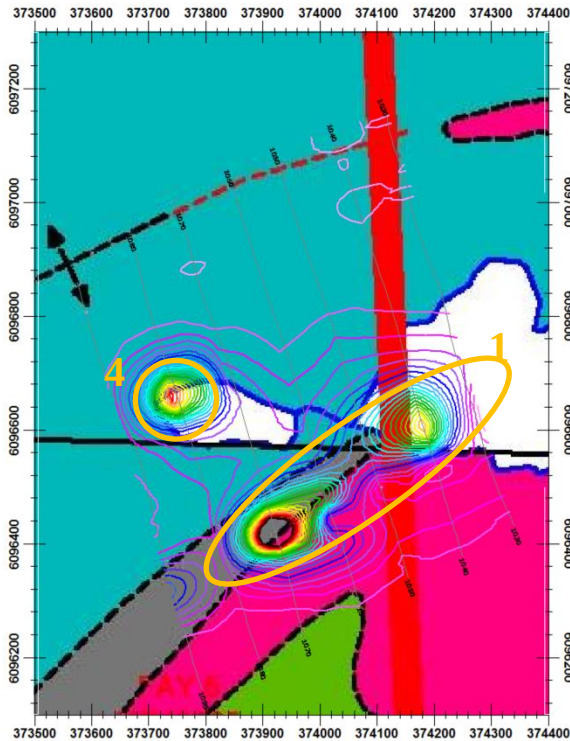
Ch30 Bz



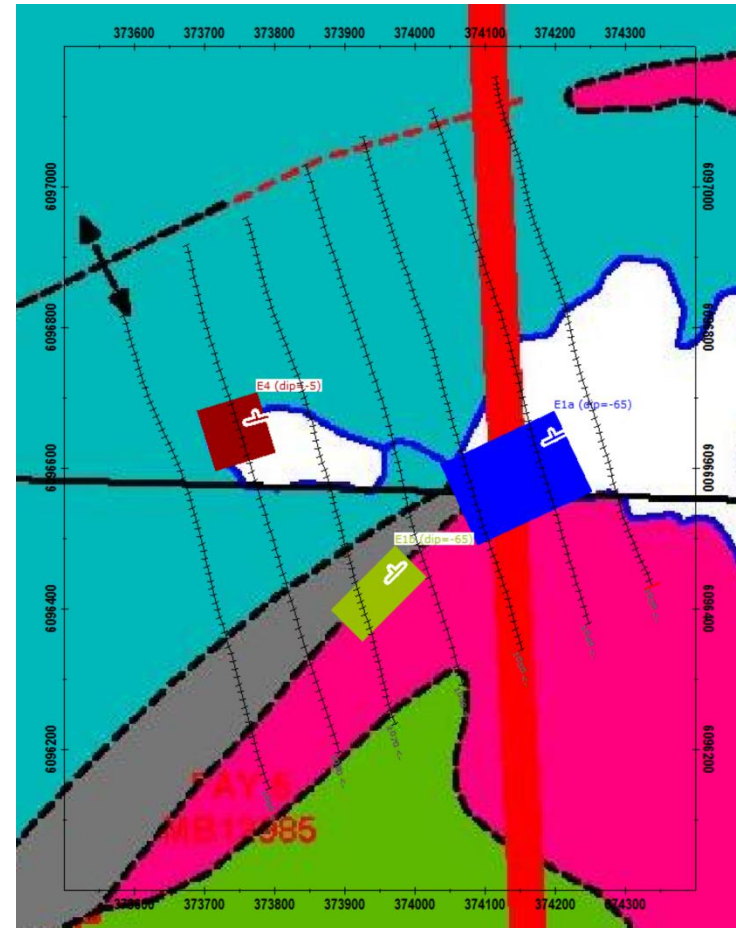
Bx at mid-time (Ch17, left figure) shows the most interesting anomaly along the contact between the schist and intrusive rocks. The figure to the right is Bz at mid-time with the aeromagnetic data underlain. All of the EM anomalies are associated with a magnetic anomaly..

Xcite TDEM Survey Fay Lake East Area EM Targets 1 and 4

Ch20 Bz

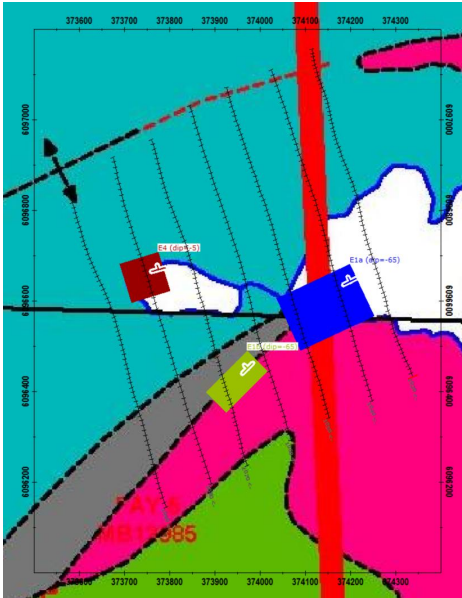


Target 1a
Target 1b
Target 4



The tops of Targets 1a and 1b are both near the edge of the geological mapped metasediments and dip towards the NNW and NW respectively. Target 4 is apparently within mafic volcanic rocks. Target 4 is almost flat lying and the top is much deeper than the other two targets.

Xcite TDEM Survey Fay Lake East Area EM Targets 1 and 4

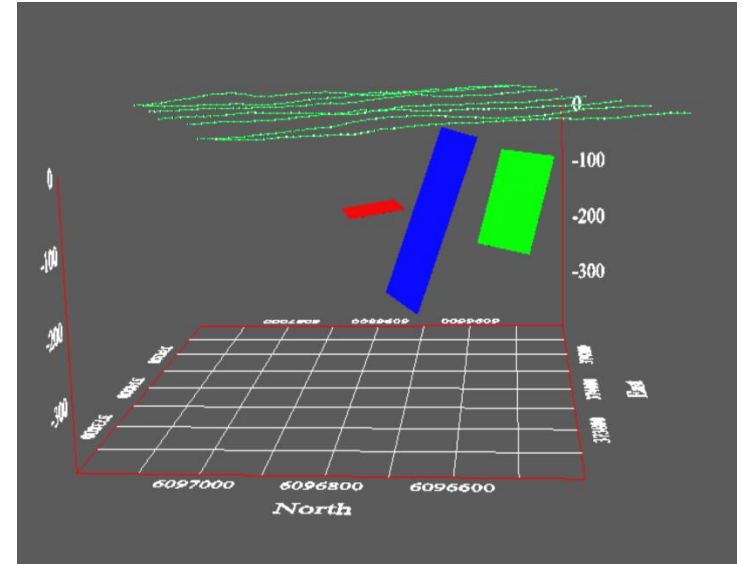


Target 1a
Target 1b
Target 4

Anomaly East T1A
Strike Length: 180m
Dip Extent: 300m
Strike Angle: 65° East of N
Dip Angle: 65° NW
Conductance: 15 S
Depth to Top: 20m
Depth to Bottom: 290m

Anomaly East T1B
Strike Length: 130m
Dip Extent: 150m
Strike Angle: 45° NW
Dip Angle: 65° SE
Conductance: 35 S
Depth to Top: 30m
Depth to Bottom: 165m

View from West

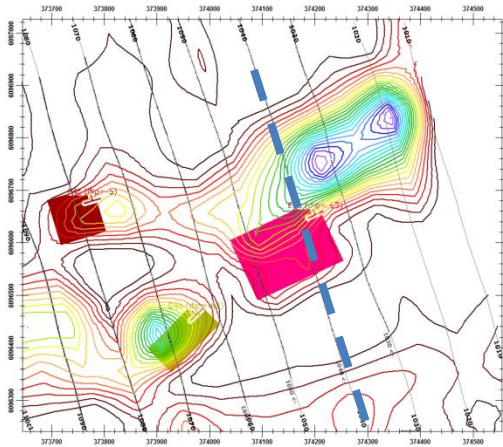


Anomaly East T4
Strike Length: 90m
Dip Extent: 80m
Strike Angle: 73° East of N
Dip Angle: 5° N
Conductance: 55 S
Depth to Top: 70m
Depth to Bottom: 77m

Targets East 1A and East 1B are approximately along the same strike and dip at the same angle. Target 1B is significantly stronger and 1B. Target 4 is buried much deeper at about 70m and is significantly more conductive at 55 Siemens which is why it does not appear as well as the other two targets until later time.

Xcite TDEM Survey Fay Lake East Area EM Targets 1 and 4

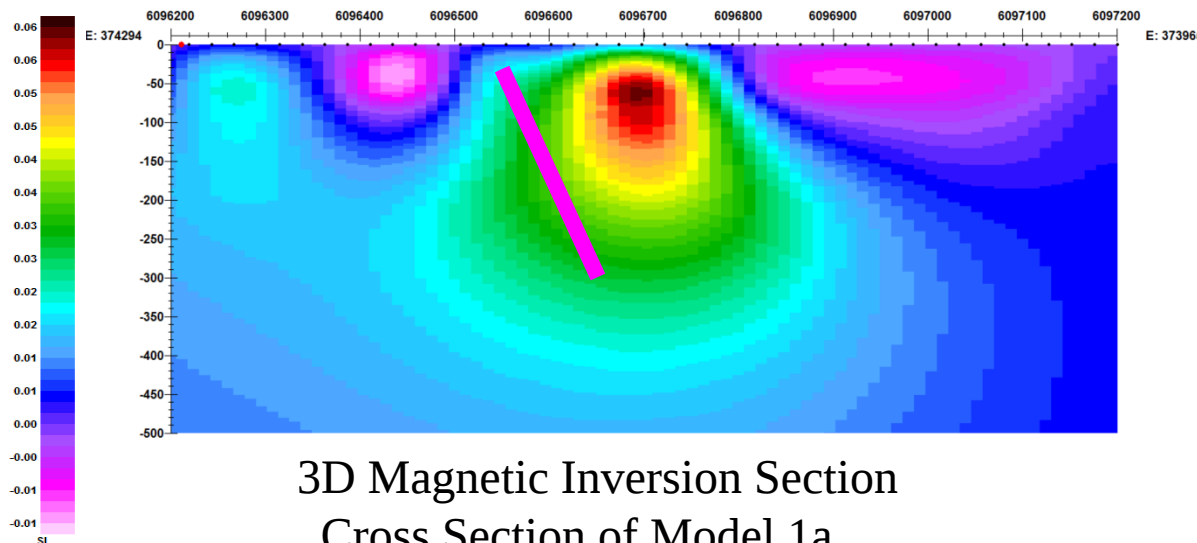
Location of magnetic model section



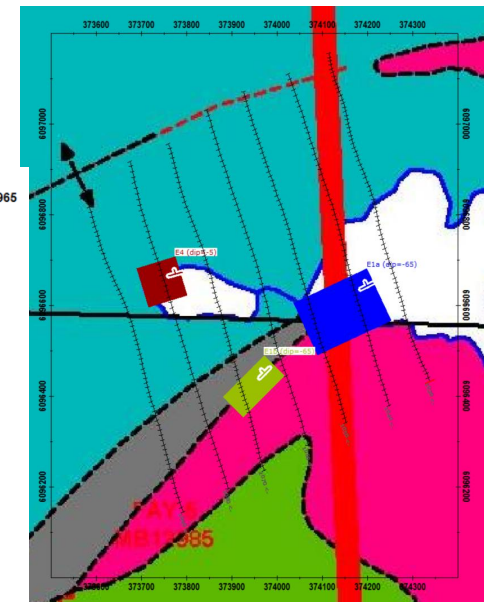
It is worthwhile to examine the relationship between the magnetics and the EM in regard to these two targets. On the geology map shown below to the right, the mafic volcanic rocks to the north of the mapped metasediments and the quartz intrusive rocks to the south are shown on the surface. These rocks would have no magnetic signature and likely are the pink areas shown in the inversion section below. However, the metasediments could well have a weak magnetic signature and have been shown in previous parts of this report to be very likely magnetic in this area. Thus, it might be expected that the light blue in the section are metasediments.

An approximate cross section of target East 4a is shown for illustration against the inversion model. The conclusion might be either that the conductor is not magnetic or there are positional errors in the processing between the EM and the magnetic data.

Vertical Derivative of Magnetic Data with surface projection of targets



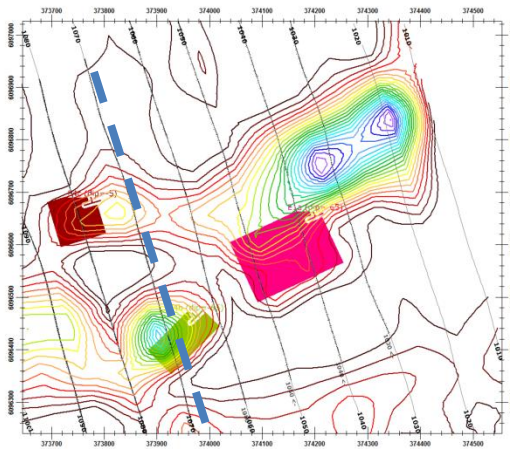
3D Magnetic Inversion Section
Cross Section of Model 1a



Targets East 1 and 4

Xcite TDEM Survey Fay Lake East Area EM Targets 1 and 4

Location of magnetic model section

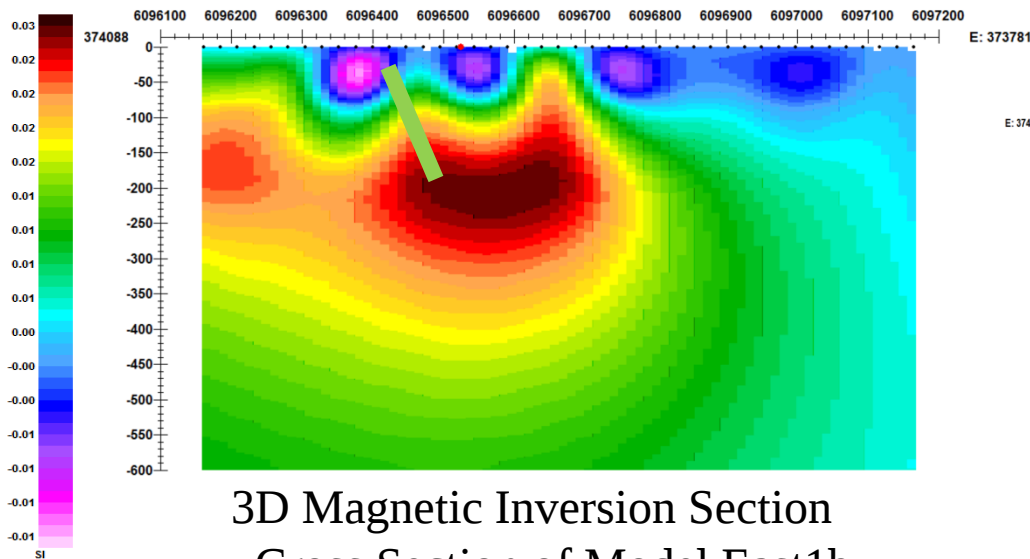


Two magnetic inversion sections are shown below for Target East 1b. The location of the first section is shown to the right by the blue dashed line. This section is displayed below to the left with cross section of the conductive model for Target East 1a superimposed.

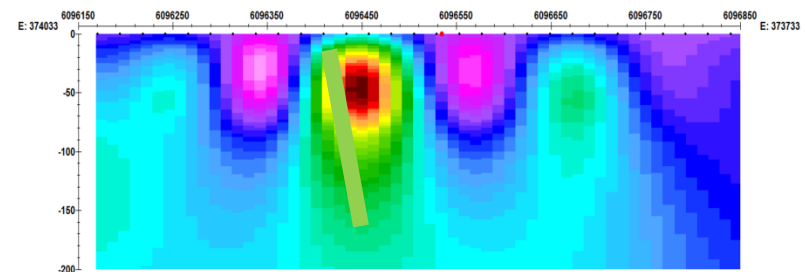
A second section 55m to the west of the first section is shown below to the right with a cross section of the conductive model again superimposed on the section.

Again, it should be remembered the first the modeling algorithm for the conductors only interprets the conductance and not the thickness and conductivity separately. Also, given these levels of conductance it is unlikely that the EM system sees anything but the thin top surface of the target. In short, the EM field from the towed transmitter only penetrates a small distance into the conductor.

Vertical Derivative of Magnetic Data with surface projection of targets



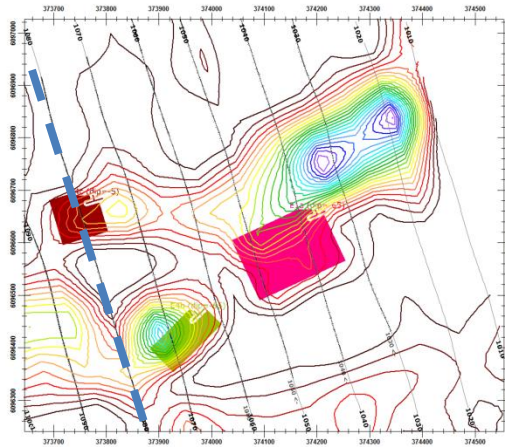
3D Magnetic Inversion Section
Cross Section of Model East1b



3D Magnetic Inversion Section 55m West

Xcite TDEM Survey Fay Lake East Area EM Targets 1 and 4

Location of magnetic model section

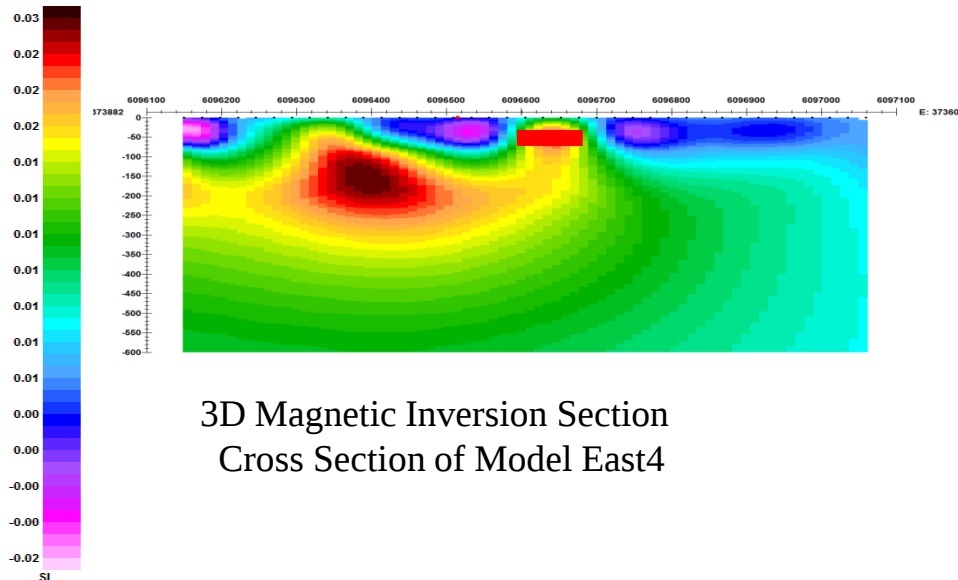


Two magnetic inversion sections are shown below for Target East 4. The location of the first section is shown to the right by the blue dashed line. This section is displayed below to the left with cross section of the conductive model for Target East 4 superimposed. A second section 55m to the west of the first section is shown below to the right with a cross section of the conductive model again superimposed on the section.

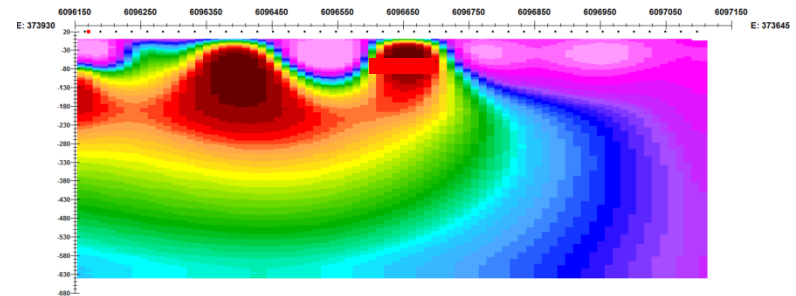
In this case, the EM conductor location and the magnetic anomaly model are virtually the same. The figure to the right indicates the anomaly is stronger on the east side of the target. This would indicate the likelihood of sulphides at this location.

The magnetic inversion indicates that the non-magnetic rocks indicated by pink and dark blue lie above the weakly magnetic rocks. Again, it is likely that the non-magnetic rocks are what is mapped as mafic volcanics and the underlying rocks are metasediments.

Vertical Derivative of Magnetic Data with surface projection of targets

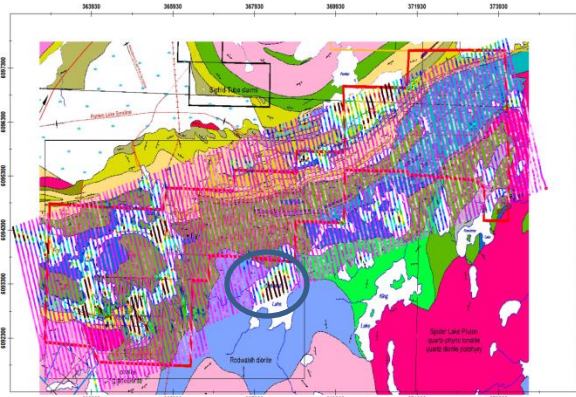


3D Magnetic Inversion Section
Cross Section of Model East4

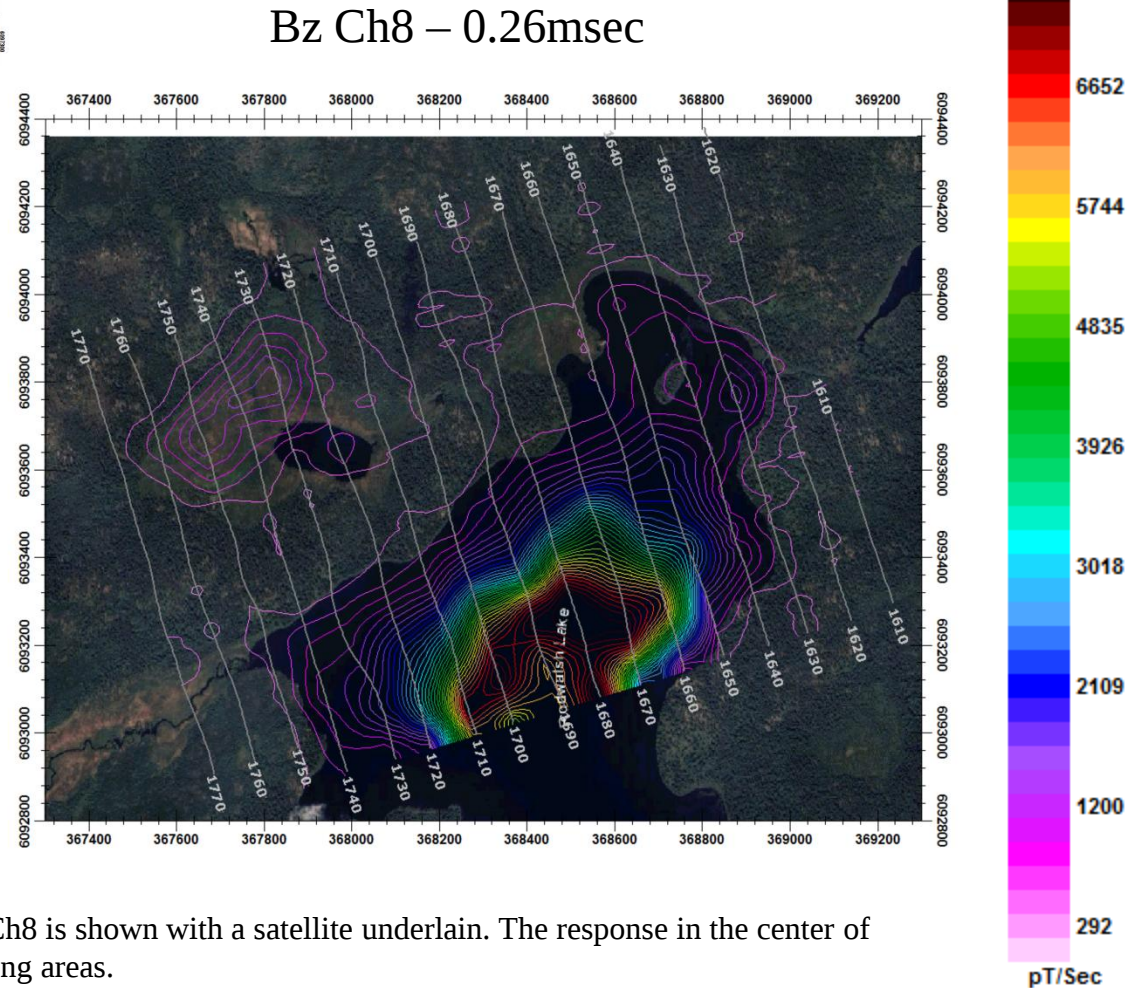


3D Magnetic Inversion Section 55m West

Xcite TDEM Survey Fay Lake South Central EM



South Central Anomaly



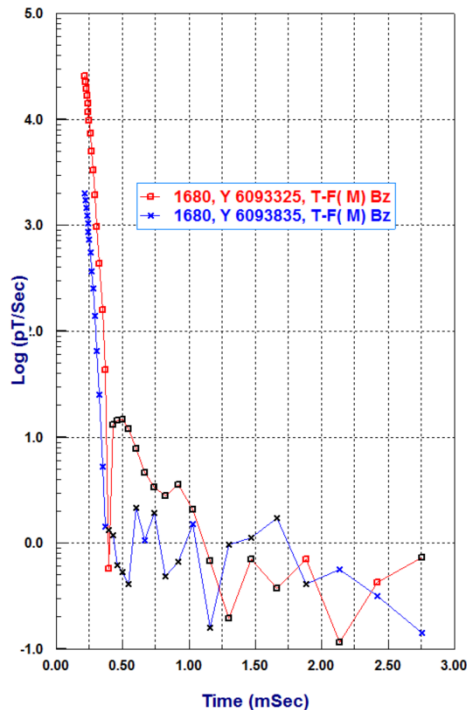
The response of the vertical component (Bz) at Ch8 is shown with a satellite underlain. The response in the center of the lake is 20 times the response of the surrounding areas.

This channel is extremely early in time at only 0.26msec after the quoted turn off and still within the system response of the instrument.

Xcite TDEM Survey Fay Lake South Central EM

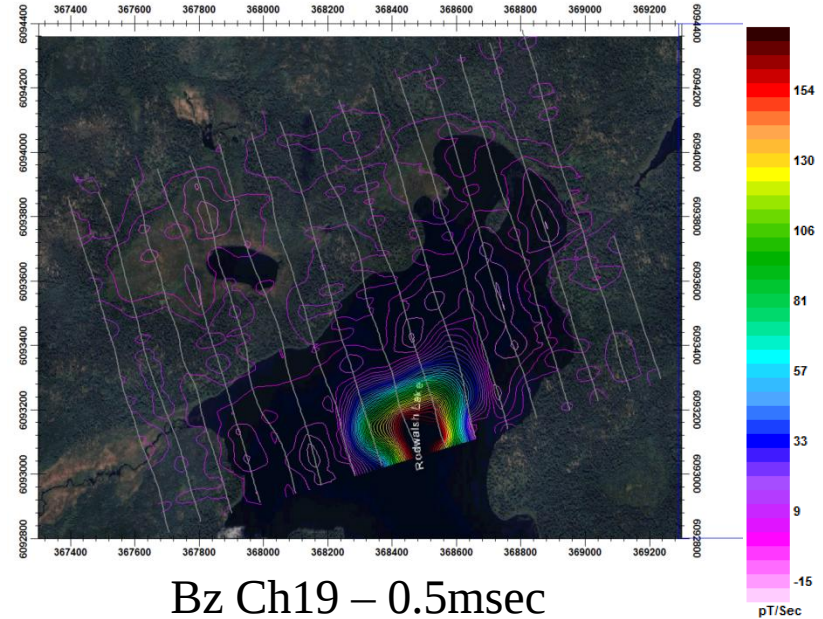
Bz Ch15 – 0.37msec

The response of the vertical component (Bz) at Ch15 is shown to the right above. The response at the center of the lake has decayed by a factor of 50 indicating very little conductance. The response over the lake at Ch19 or 0.5msec after turn off (bottom right) is all below zero and thus below the noise level of the instrument. The Bx component shows a coherent response only for Ch 15-17. (Ch15 is the earliest channel for Bx)

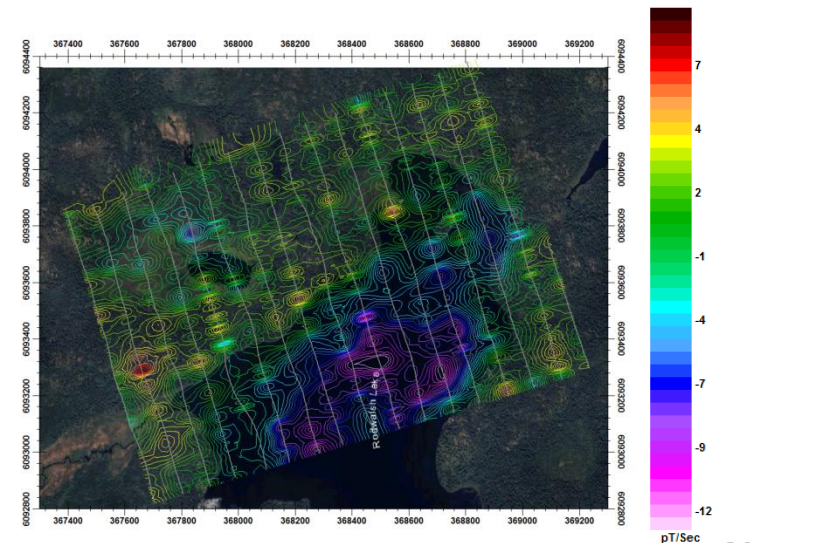


The Bz data is shown to the left for the station (red) near the peak of the response in the center of the lake and for a station (blue) several hundred metres north of the lake.

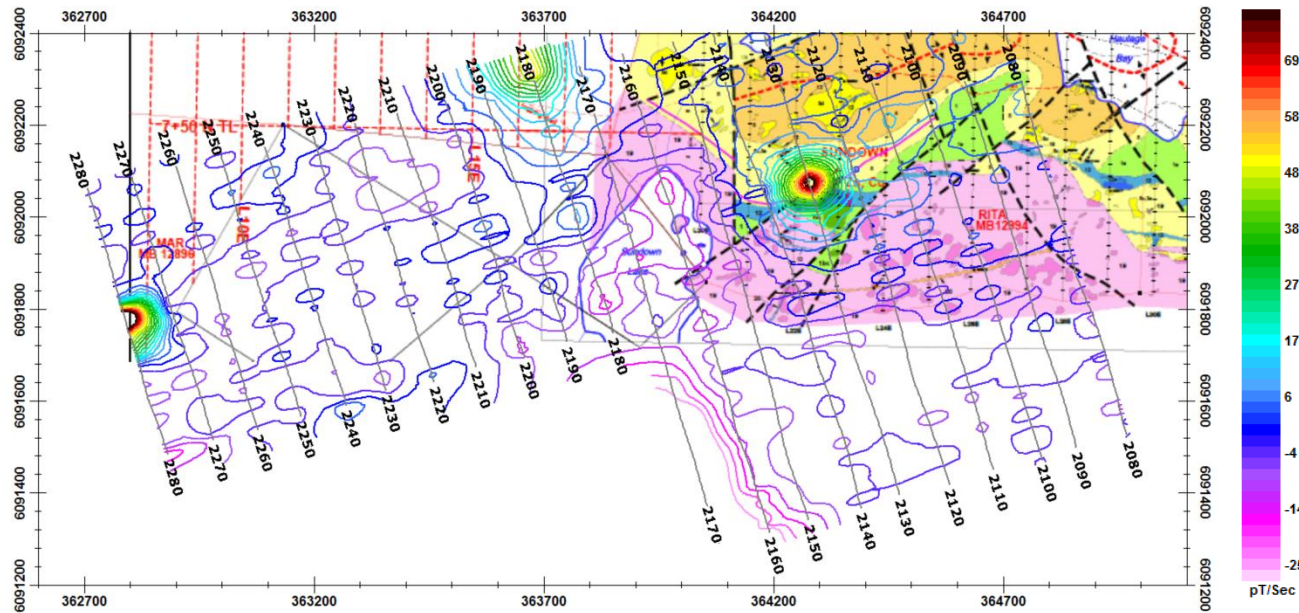
After Ch16 (0.4msec) the data at both stations is simply noise. {Here when the data is plotted as logarithm, negative values are plotted as black}. What is striking is that the responses both over the conductive material in the lake bottom and over the very resistive rock north of the lake have the same decay. Only the amplitude is changed. Thus, no ground decay can be detected in early time. For me this is indicative that the early time data is simply the system response apart from a DC amplitude effect or the immediate surface resistivity.



Bz Ch19 – 0.5msec



Xcite TDEM Survey Fay Lake South West



Xcite TDEM Survey Fay Lake South West

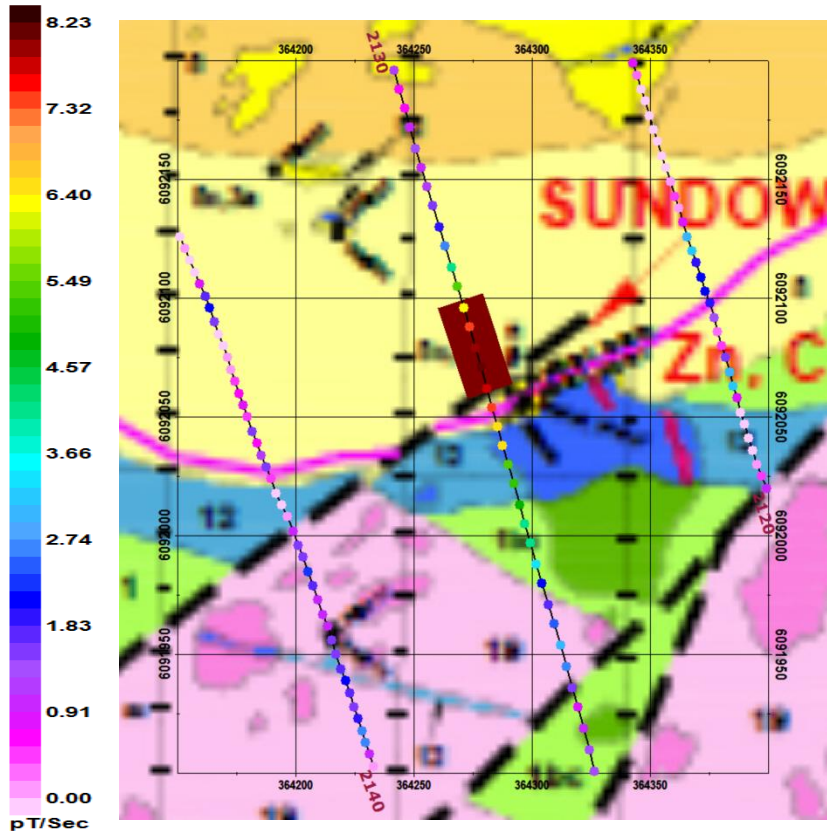


Two anomalies have been noted, the first along Line 2130 has been termed the Sunshine anomaly and the second on the last line to the west (L2280), we identify as the SSW anomaly.

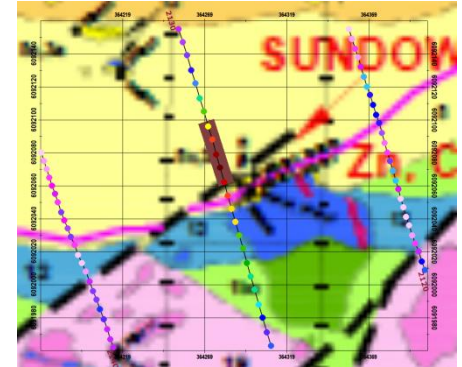
The two anomalies persist in Bz to Ch25 but the response is small particularly at the Sunshine anomaly. The response anomalies remain coherent until Ch28.

Xcite TDEM Survey Fay Lake South West Sunshine Target

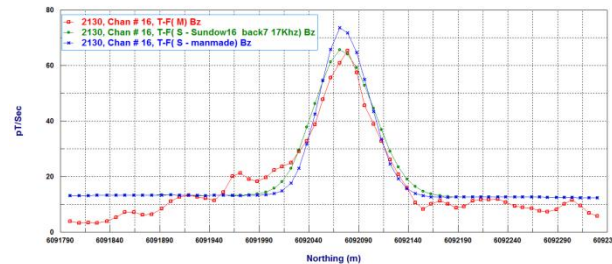
Bz – Ch15



Anomaly Sunshine1
 Strike Length: 40m
 Width: 20m
 Strike Angle: 18° West of N
 Dip Angle: 0° N
 Conductance: 85 S
 Depth to Top: 45m
 Depth to Bottom: 45m



Anomaly Sunshine2
 Strike Length: 40m, Width: 10m
 Strike Angle: 18° West of N
 Dip Angle: 0° N, Conductance: 175 S
 Depth to Top: 25m, Depth to Bottom: 25m

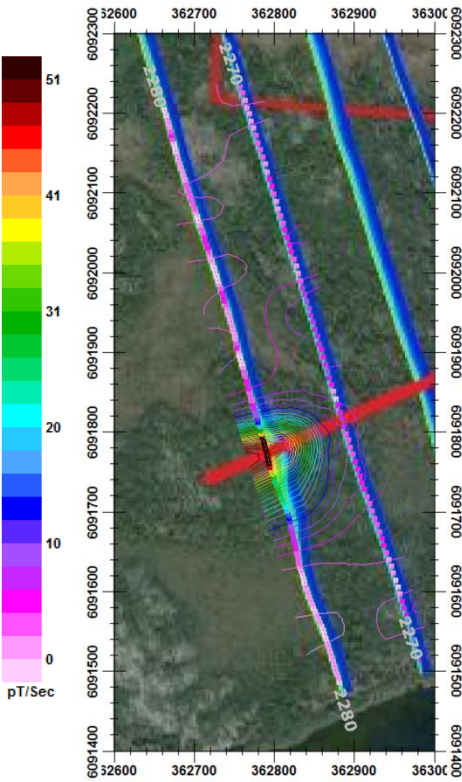


Data Bz, Ch16
 Sunshine 1 response
 Sunshine 2 response

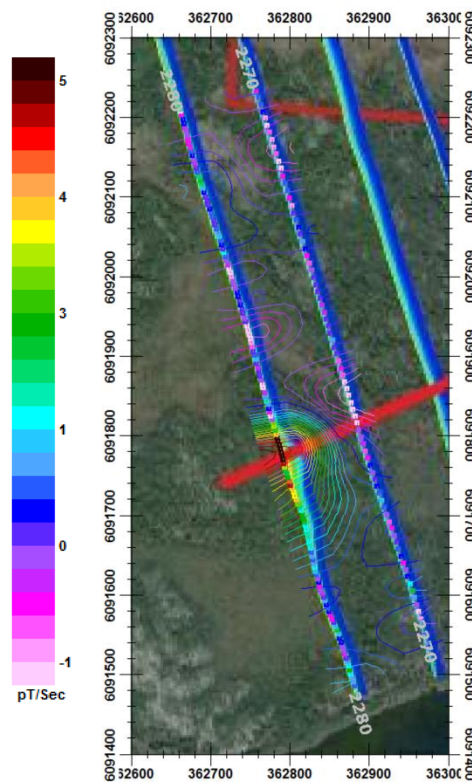
The anomaly can only be seen on one line (L2130) and there is no horizontal Bx response. The former fact makes it impossible to determine a single model as multiple models will fit the data. The latter fact implies the anomaly is flat lying. The Bz data also indicates it is flat lying. Two models are provided. Both models are 40m in length along the profile and both flat lying. However, Sunshine 1 is 20m wide, has a conductance of 85S and is at a depth of 45m. Sunshine 2 has a conductance of 175S, a width of 10m and is buried at 25m. This latter model indicates the possibility that this is a man-made target.

Xcite TDEM Survey Fay Lake South South West

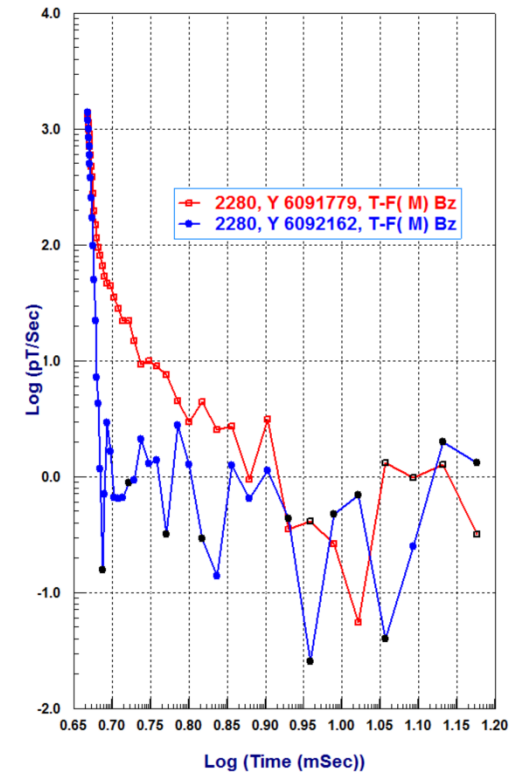
Bz – Ch17



Bz – Ch29



Bz Response at 2 stations

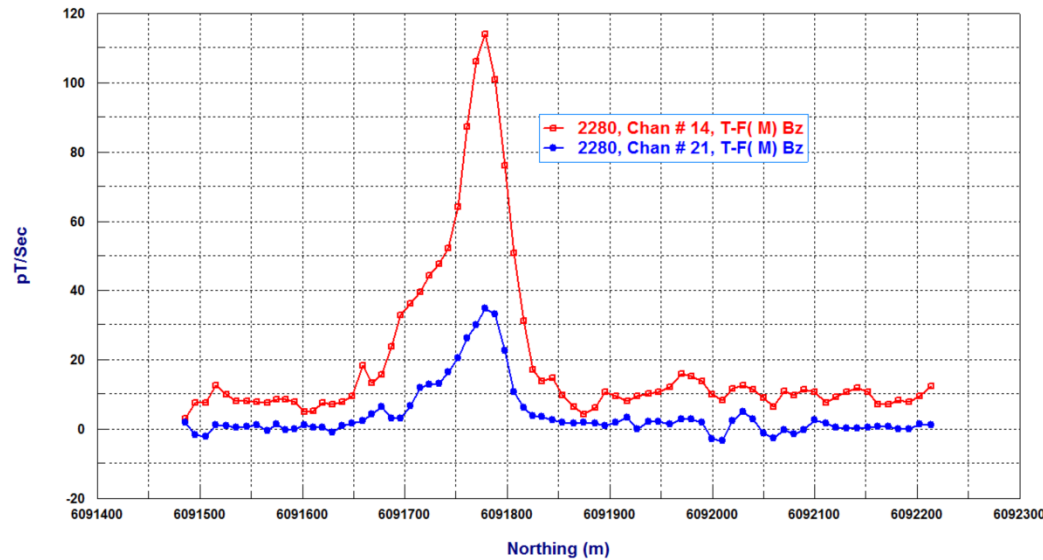


The anomaly appears only on the most western line (L2280). There is no indication of a response on the next line to the east (left figure). Also, there is no discernible horizontal response (Bx). Thus, the anomaly is apparently flat lying and given the width of the peak portion of the response the anomaly probably cannot continue much further west. The response lasts with coherence until Ch29 but extends further south at later times (central figure).

The response at the peak of the anomaly is shown to the right (red) along with a typical response away from the anomaly. Blue is the response 400m further north along the line. Again, it is demonstrated that the early time (Ch 1-10) are dominated by the system response. However, the response over the anomaly begins to decay slower at Ch13. However, the data falls into significant noise by Ch23 and is only approximately reliable at later times.

Xcite TDEM Survey Fay Lake South South West

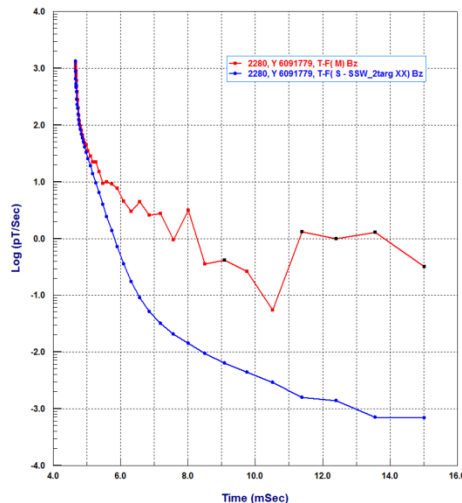
Bz L2280 – Ch14 and Ch21



Visual analyses indicates the anomaly consists of two parts, a larger portion of weak conductance and a smaller portion of much stronger conductivity.

The model response diverges from the data at Ch22 but the data beyond Ch22 is not considered quantitatively reliable. .

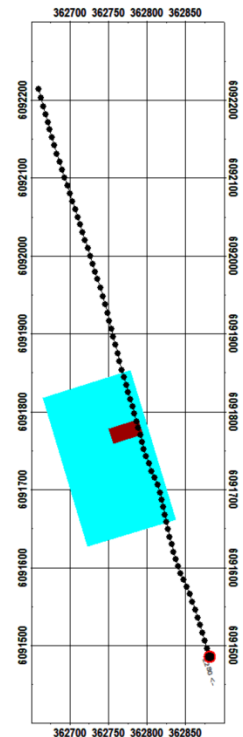
Weak portion
Conductive portion



Data vs Model response
at peak of anomaly
(6091779N)

Data
Model Response

Anomaly SSW Strong
Strike Length: 40m
Width: 20m
Strike Angle: 73° East of N
Dip Angle: 0° N
Conductance: 80 S
Depth to Top: 50m

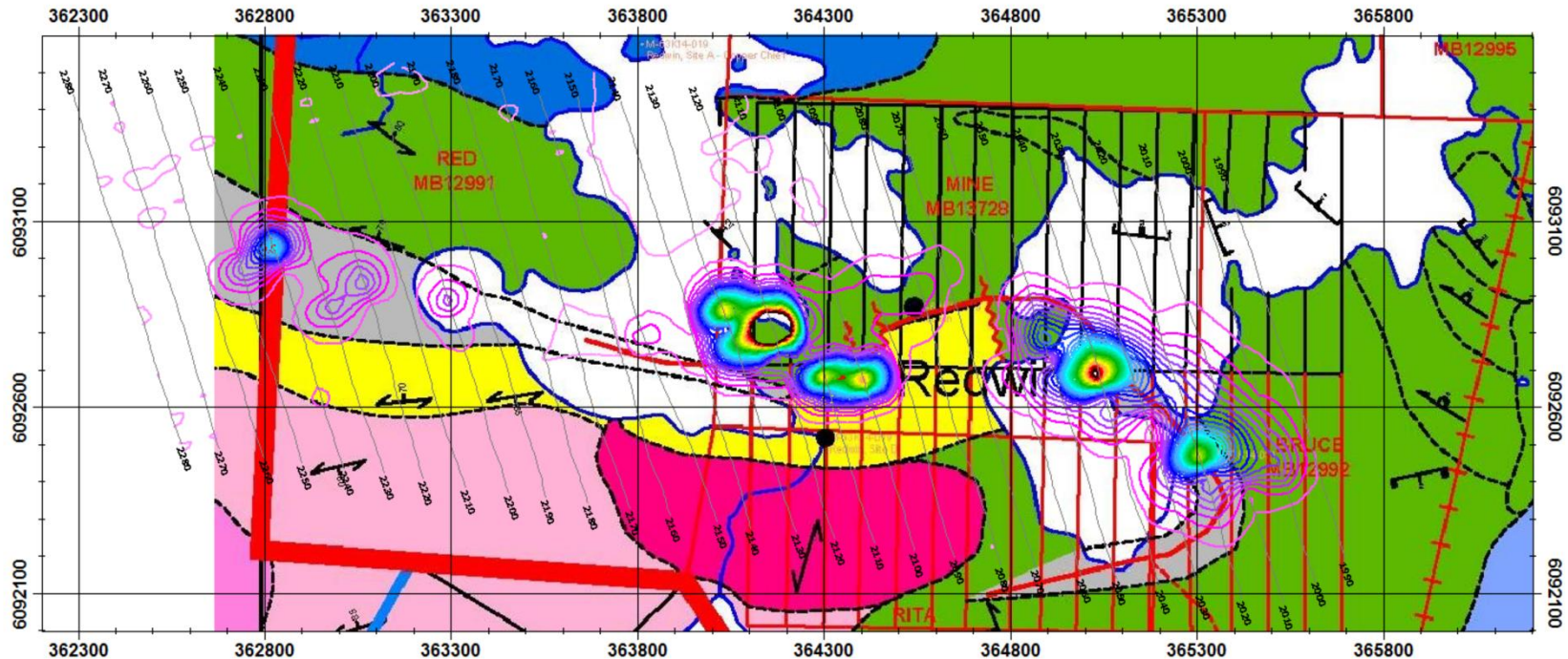


Xcite TDEM Survey Fay Lake - Main Zone

West Targets

Central Targets

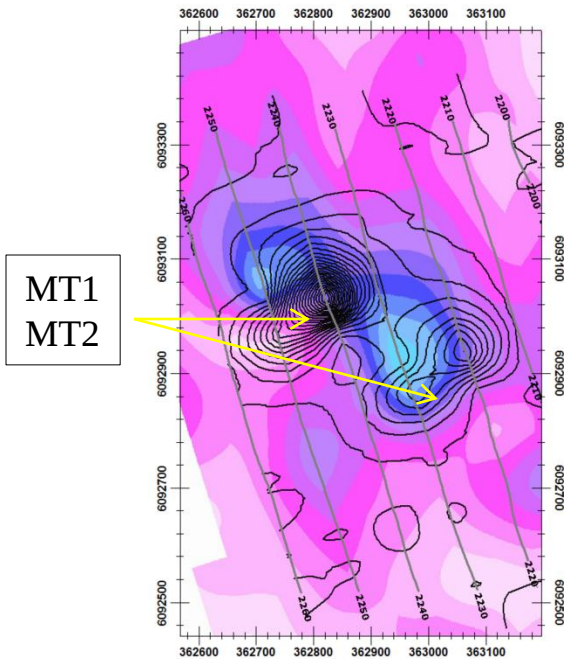
East Targets



We divide the initial area of interest into three parts.

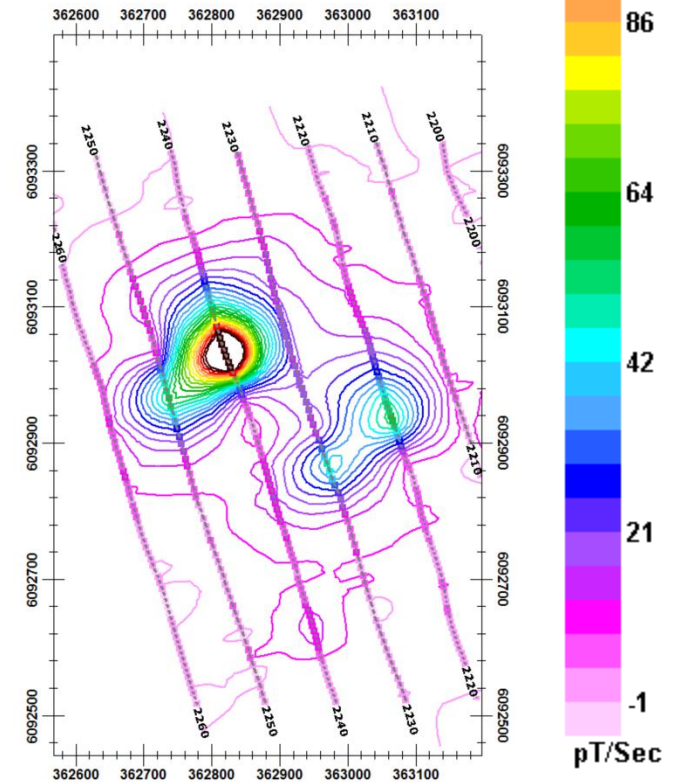
Xcite TDEM Survey Fay Lake Main Zone – West Structures

Bz Ch25 – Late time

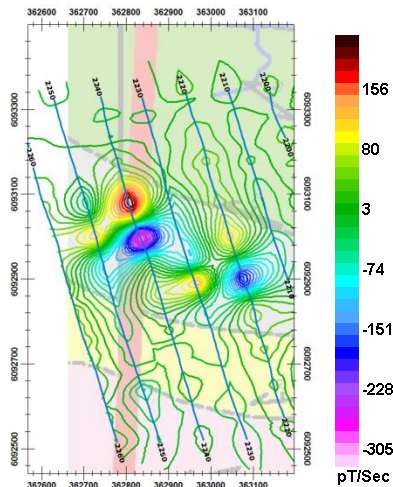


The analytic signal of the aeromagnetic data is underlain. This signal is used to identify the edges of a magnetic structure and identify the most anomalous material. Both, MT1 and MT2 are associated with a magnetic signal.

Bz Ch25 – Late time



Bx Ch15 – Mid- time

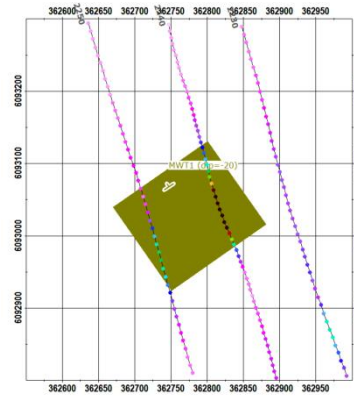
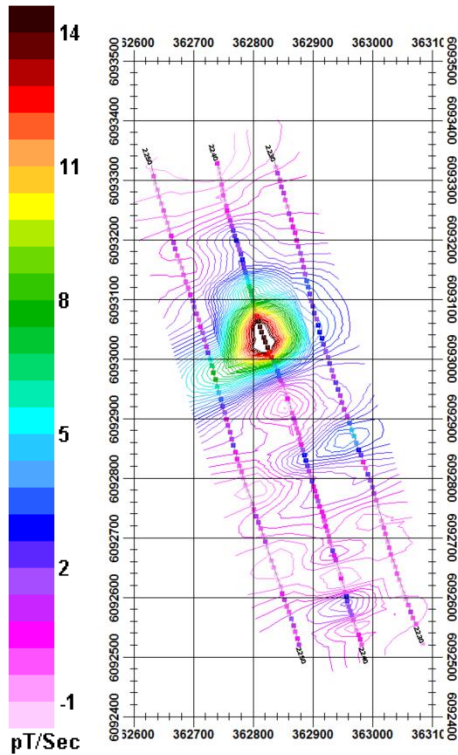


Both structures strike approximately SW to NE. MT1 is observed principally on L2240 but extending to L2250. There is a slight response on L2230 north of MT2. MT2 is seen primarily on L2220 but extending with the same approximate strength to L2230 and having a slight effect on L2240 which can be observed earlier than Ch25.

Both targets have a good horizontal response (Bx) indicating that they are not flat lying. The Bx response indicates both are dipping northward approximately along the profile lines. The Bx responses also indicate they are within the mapped metasediments.

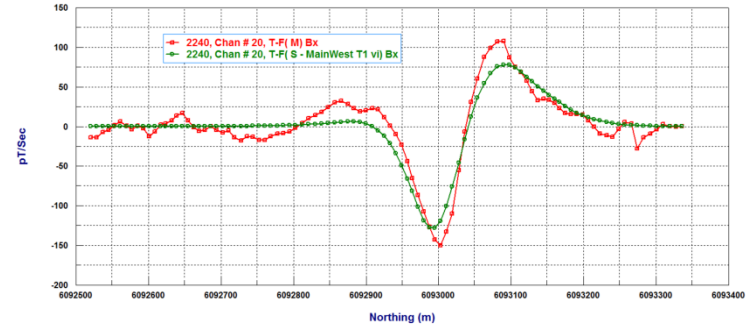
Xcite TDEM Survey Fay Lake Main Zone – West Structures MT1

Bz Ch34 – Late time

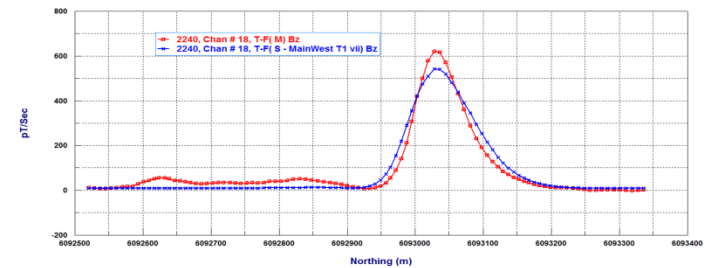


Anomaly MT1
Strike Length: 160m
Depth Extent: 150m
Strike Angle: 55° East of N
Dip Angle: 20° N
Conductance: 80 S
Depth to Top: 55m
Depth to Bottom: 107m

Bx Ch20 – Late time
Data vs Model Response



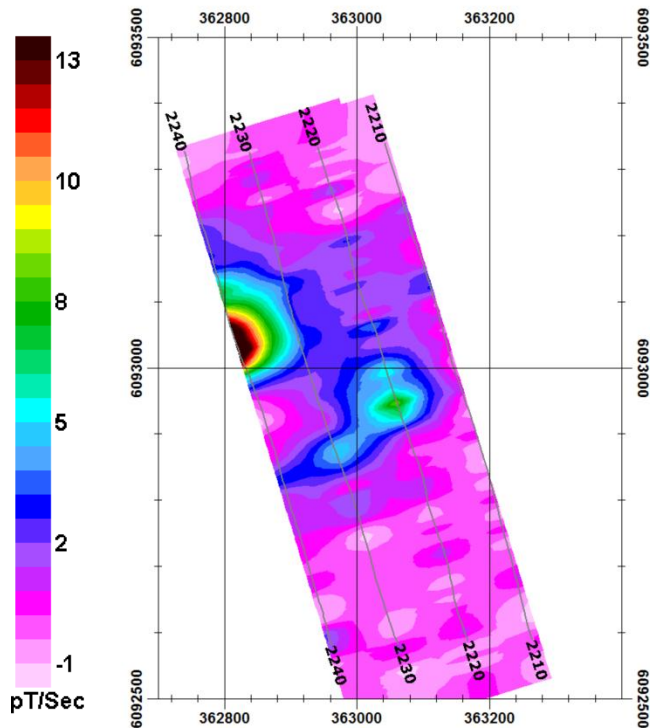
Bz Ch18 Mid-Time
Data vs Model Response



MT1 is relatively strong, dipping slightly towards the NNW but not large but there is a similar anomaly striking roughly parallel 200m south along the profiles.

Xcite TDEM Survey Fay Lake Main Zone – West Structures MT2

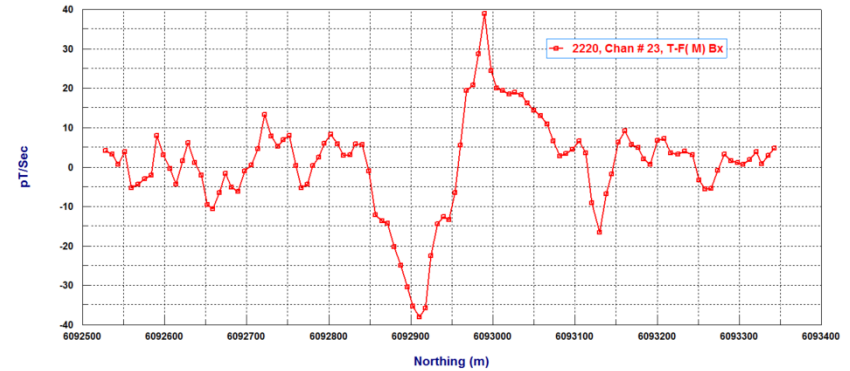
Bz Ch34 – Late time



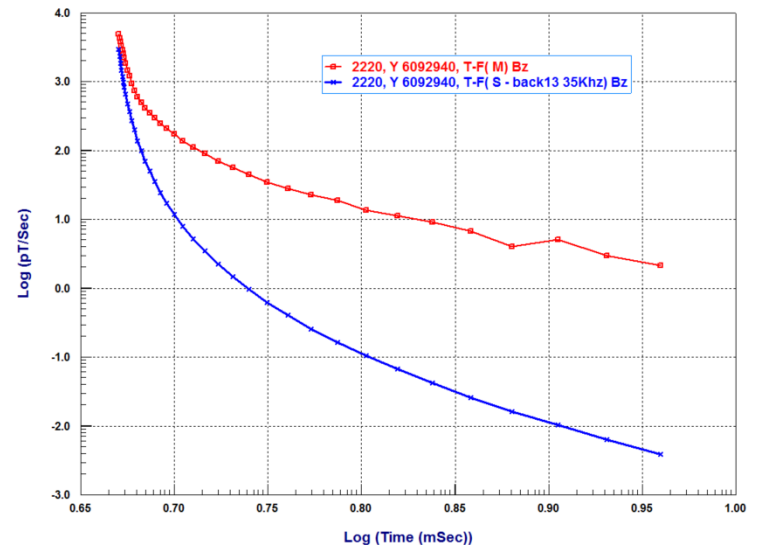
MT2 is much weaker than MT1. By Ch34, MT2 is no longer coherent for the vertical component as compared to MT1 (upper left figure). The horizontal channel which is due entirely to 3D structures and noise has become very incoherent and noisy even at early late time (upper right figure).

The response in time at the peak response on L2220 is shown on the bottom to the right in red while the determined response of the background is displayed in blue. There is a shallow amplitude effect for the decay in mid and late times is only slightly slower than the background. As such, it could be simply a local thickening of the cover material.

Bx Ch23 – Early Late time

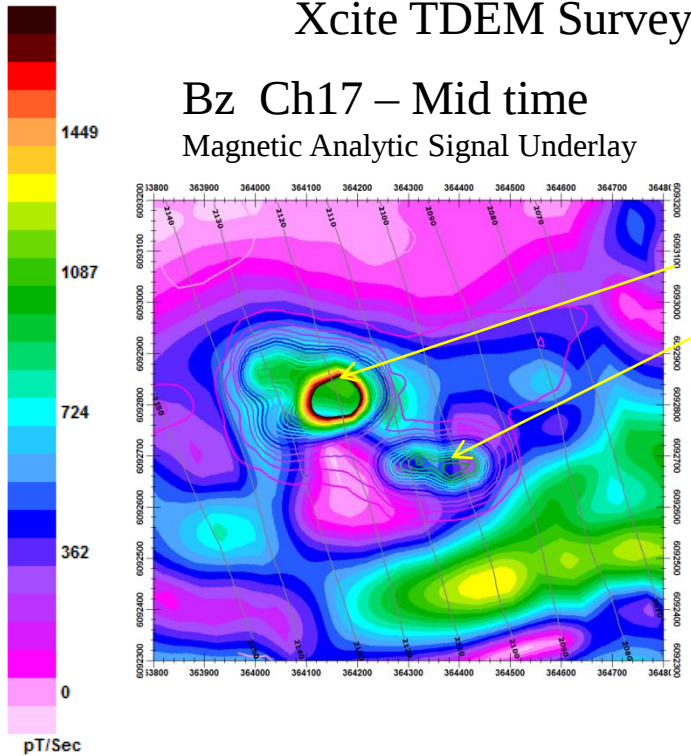


Bz Decay at Peak L2220
vs determined background response

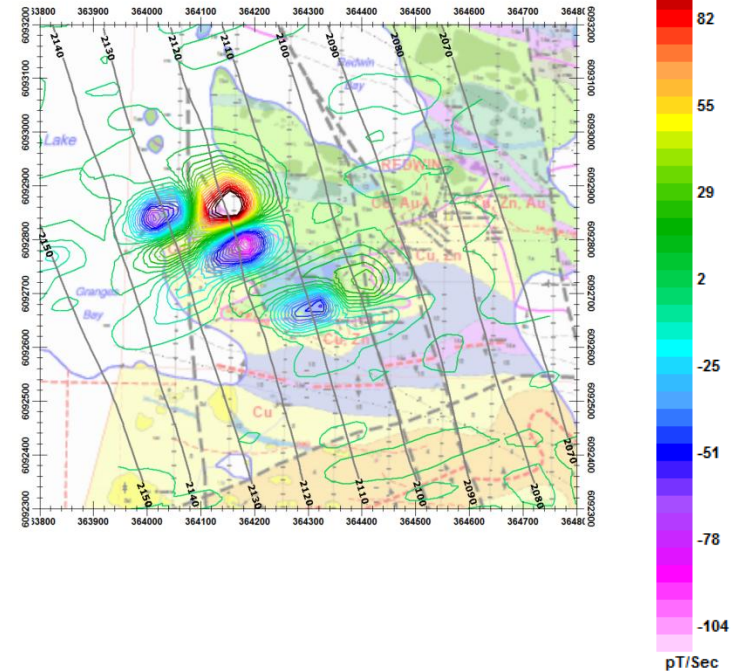


Xcite TDEM Survey Fay Lake Main Zone – Central Structures

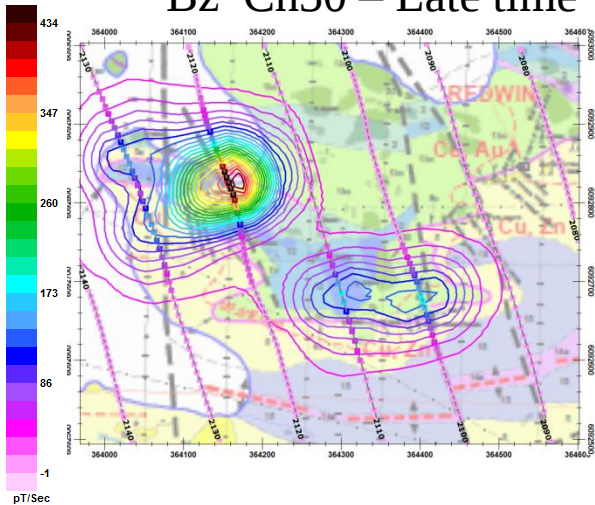
Bz Ch17 – Mid time
Magnetic Analytic Signal Underlay



Bx Ch29 – Late time



Bz Ch30 – Late time



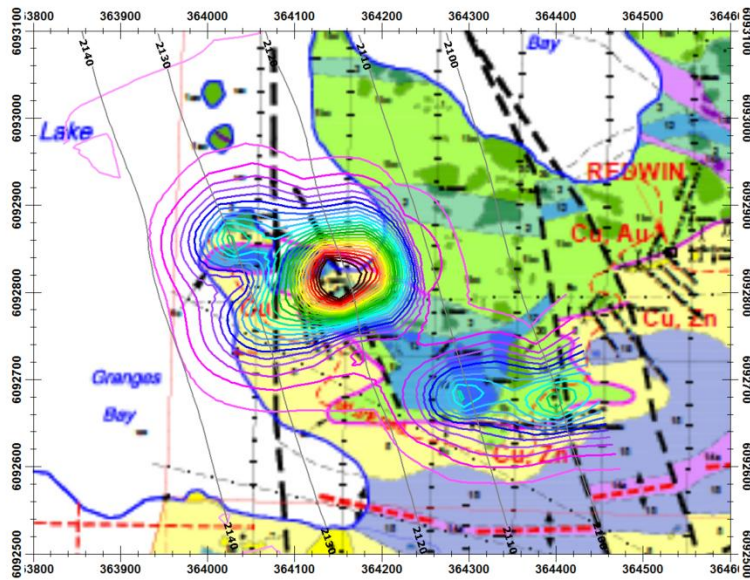
MT3 is the strongest anomaly of the two in terms of amplitude and the slowness of the decay rate. MT3 is associated with a magnetic anomaly as indicated in the upper right with the underlay of the analytic signal. MT3 has a definite and strong horizontal component response (upper right figure) while MT4 has a weaker horizontal response.

MT3 is seen predominately on L2120 with a weak late time response on 2130. MT4 is seen well on both line 2110 and 2100.

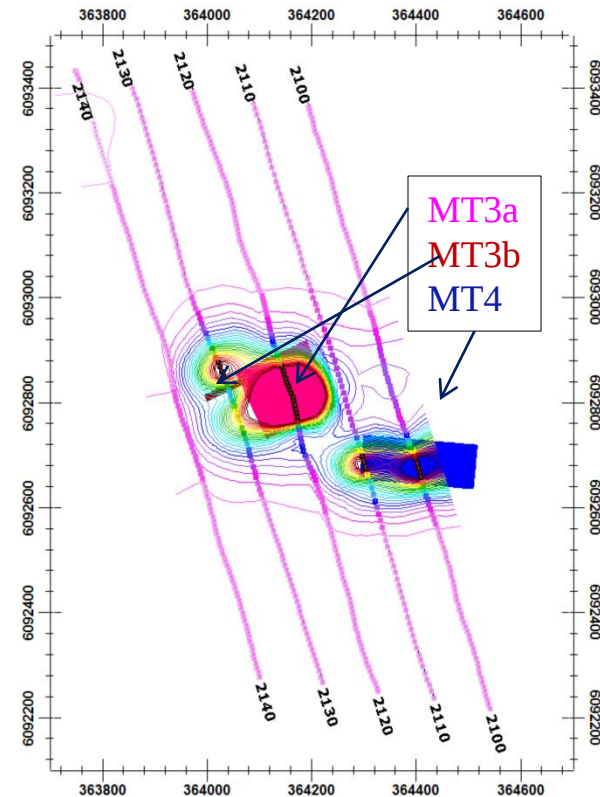
The peak of MT3 is on the very edge of Fay Lake on a bay north of Granges Bay.

Xcite TDEM Survey Fay Lake Main Zone – Central Structures

Bz Ch24 – Late Mid-time



Bx Ch15 – mid time

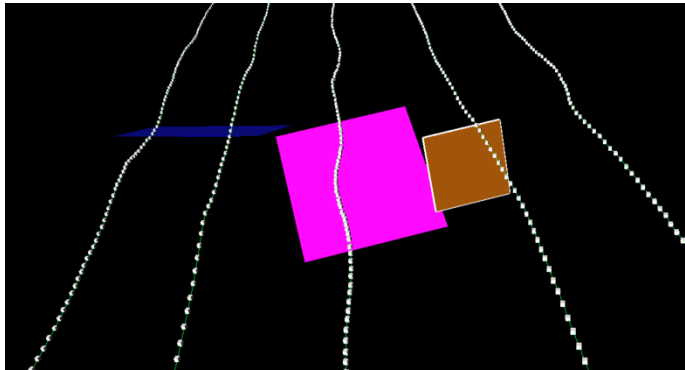


During the modeling exercise, it was found that MT3 consisted of two parts. The main anomaly is MT3a while the minor anomaly to the NW is MT3b. While it appears that MT3a continues on L2130, the characteristics of the response along L2130 indicate that there is a single anomaly.

Xcite TDEM Survey Fay Lake Main Zone – Central Structures

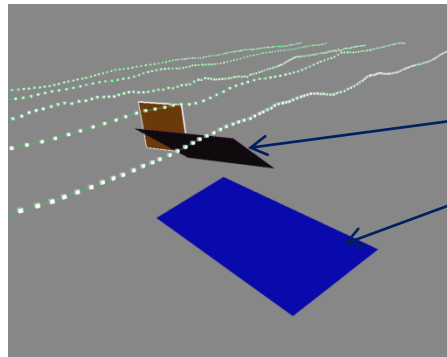
MT3 , MT4

View from North



Anomaly MT4
Strike Length: 220m
Depth Extent: 90m
Strike Angle: 95° East of N
Dip Angle: 18° S
Conductance: 50 S
Depth to Top: 40m
Depth to Bottom: 67m

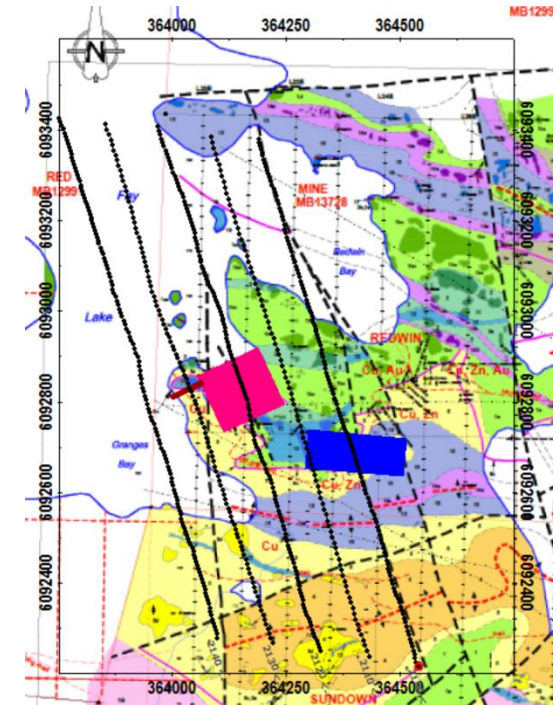
View from South West



MT3A
MT3b
MT4

Anomaly MT3A
Strike Length: 150m
Depth Extent: 160m
Strike Angle: 65° East of N
Dip Angle: 30° N
Conductance: 50 S
Depth to Top: 15m
Depth to Bottom: 94m

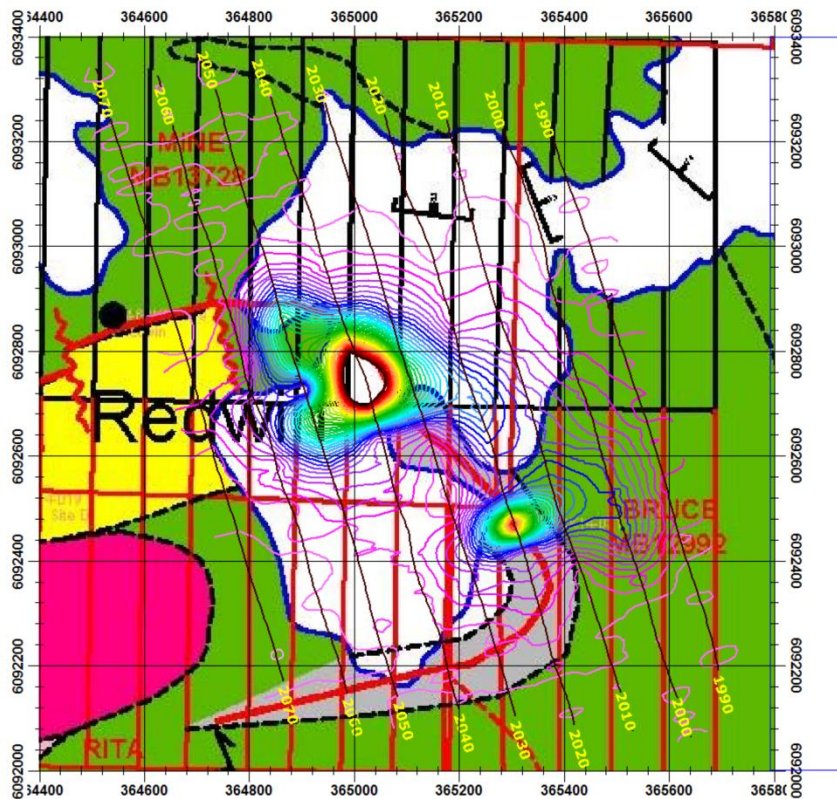
Anomaly MT3B
Strike Length: 80m
Depth Extent: 80m
Strike Angle: 65° East of N
Dip Angle: 30° N
Conductance: 80 S
Depth to Top: 3m
Depth to Bottom: 79m



MT4 has the longest strike of the structures and has the shallowest dip and the only structure dipping southward. MT3B has the strongest conductance. It is almost vertical but the smallest of the three anomalies and the shallowest. MT3A appears the most significant target when displaying data but this is because its top is relatively shallow (15m), the conductance is the same as MT4 and its surface area is the largest. MT3B has the strongest conductance but is the smallest structure both in strike and depth extent.

Xcite TDEM Survey Fay Lake Main Zone – East Structures

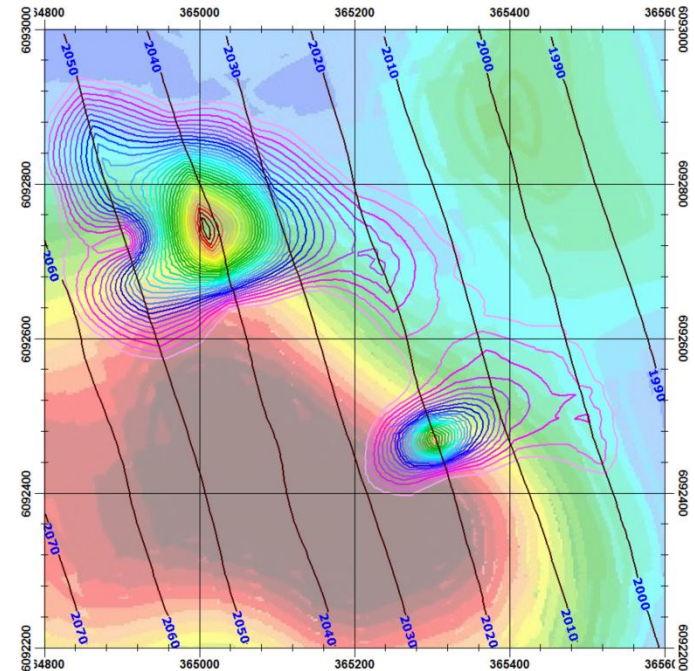
Main East Structures – MT5 and MT6



Bz Ch30 – Late Time

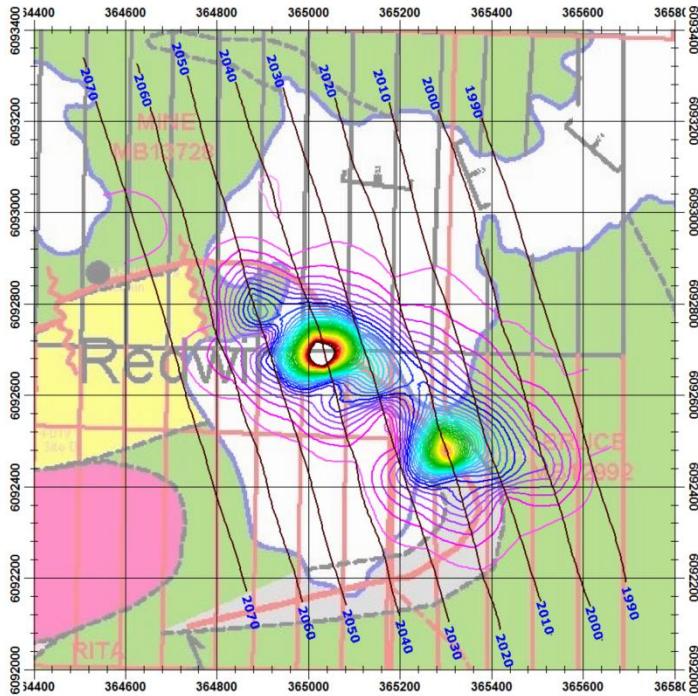
In the late time (e.g. Ch30), the anomalies become quite small and concentrated. MT5 is under the lake and MT6 just at the edge of the lake. Apparently both are associated with metasediments. Both anomalies are also on the edge of a very strong magnetic feature (upper right).

Aeromagnetic Underlay

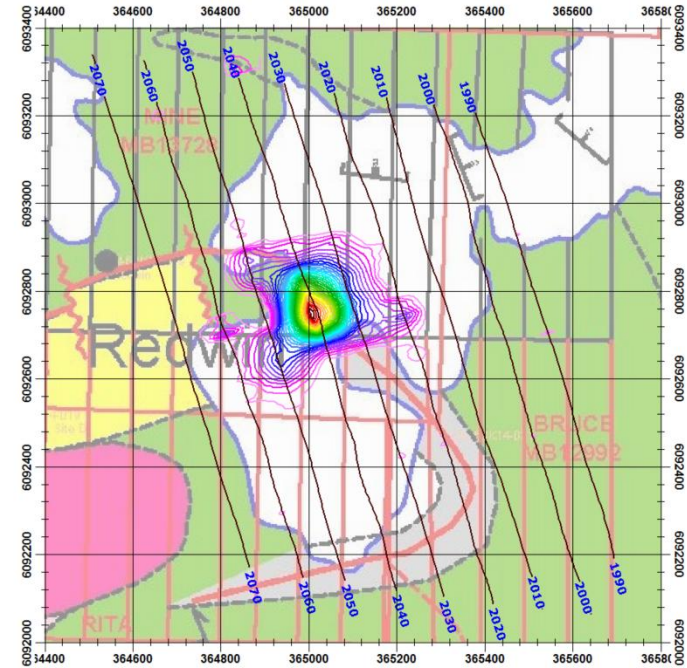


Xcite TDEM Survey Fay Lake Main Zone – East Structures

Bz Ch15 – Mid Time

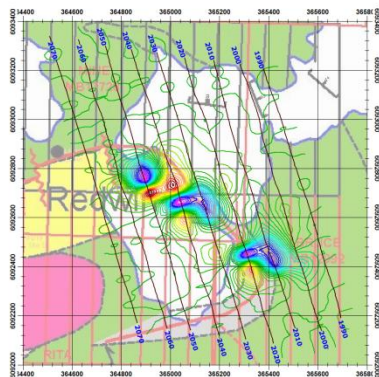


Bz Ch40 – Late Time



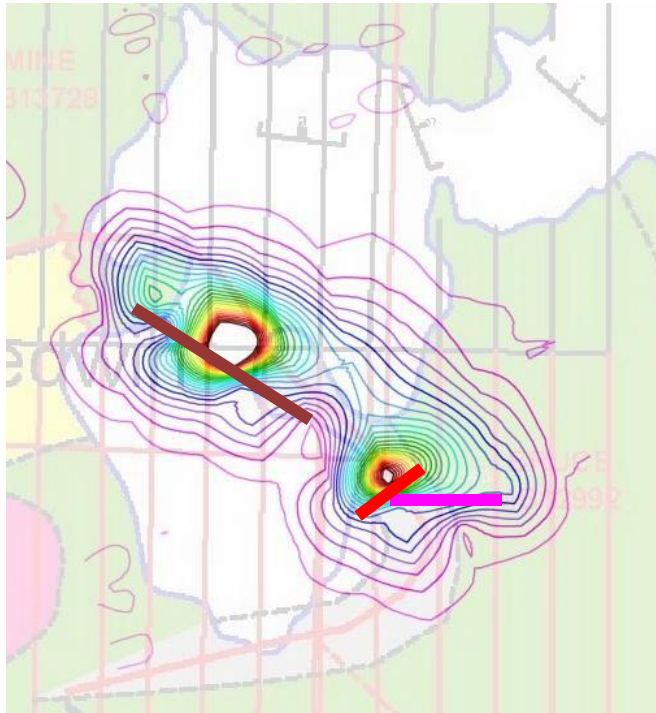
In the late time (e.g. Ch30) , the anomalies become quite small and concentrated. MT5 is under the lake and MT6 just at the edge of the lake. Apparently both are associated with magnetic feature (upper right).

Bx Ch20 – Early Mid Time

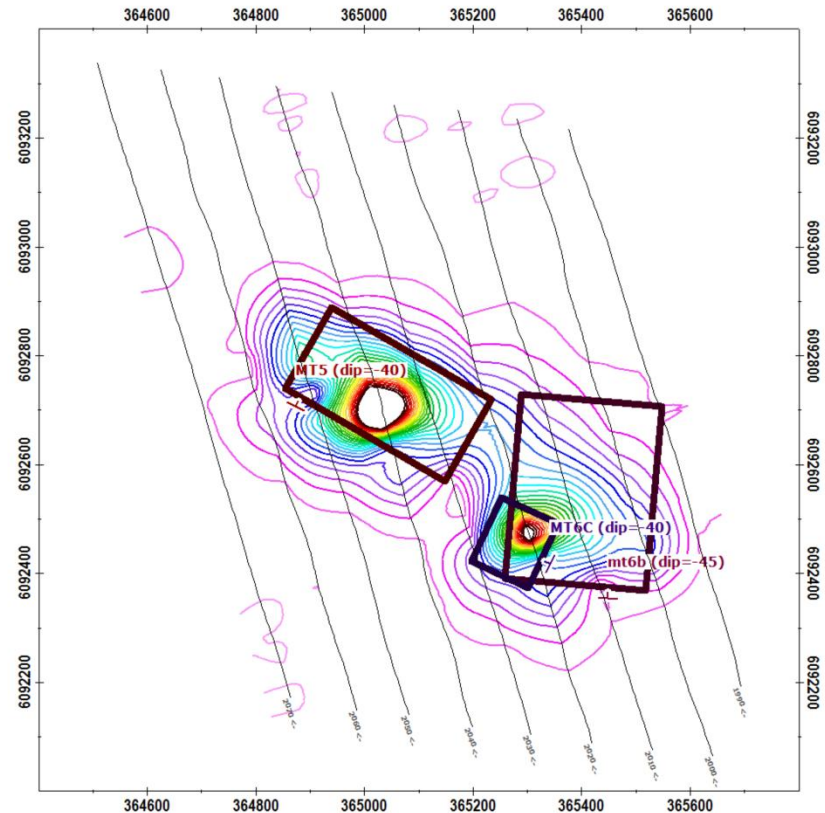


Xcite TDEM Survey Fay Lake Main Zone – East Structures

Bz Ch21 – Early Late Time



MT5, MT6B, MT6C

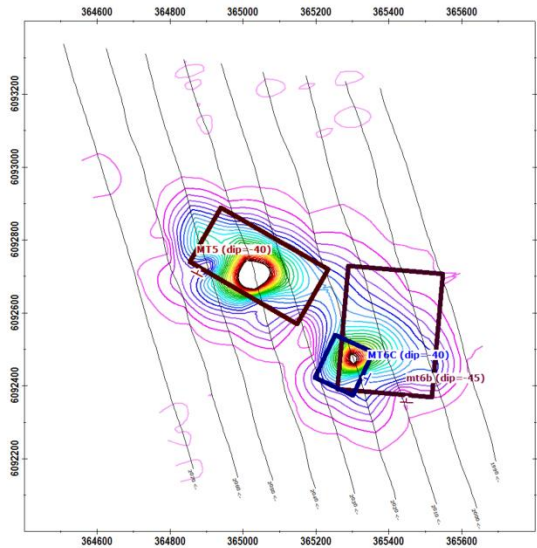


This anomaly consists of three distinct stronger anomalies; MT5 under the lake and MT6B and MT6C on the eastern edge of the lake. All of the structures have a moderate dip but are not flat lying. All three dip roughly to the NE. The use of rectangular model anomalies is only an approximation.

The top edges are outlined to the left above and the surface projection of the edges of the models is shown on the right.

Xcite TDEM Survey Fay Lake Main Zone – East Structures

MT5, MT6B, MT6C

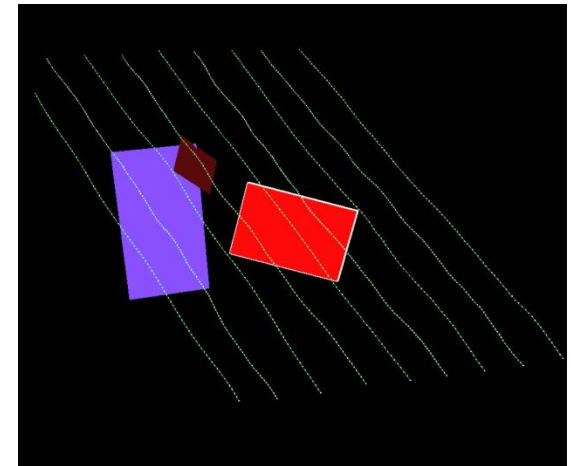


Anomaly MT6B
Strike Length: 260m
Depth Extent: 480m
Strike Angle: 95° East of N
Dip Angle: 45° N
Conductance: 20 S
Depth to Top: 50m
Depth to Bottom: 388m

Anomaly MT6A
Strike Length: 340m
Depth Extent: 225m
Strike Angle: 30° South of E
Dip Angle: 40° N
Conductance: 250 S
Depth to Top: 35m
Depth to Bottom: 177m

Anomaly MT6C
Strike Length: 130m
Depth Extent: 150m
Strike Angle: 25° East of N
Dip Angle: 40° N
Conductance: 250 S
Depth to Top: 20m
Depth to Bottom: 110m

View from NE



From examination of the data, MT6A twists at its NW end to become more vertically oriented.

COMMENTS:

1. The airborne data quality is very limited.

- A: The useful data is very much limited to comparatively early time data. The data provided ran from 4.683msec to 15msec in 43 data channels. In this area of study, the last 13 channels were immediately removed as they were simply noise. Over this immediate area of modeling, no data beyond the 22nd channels or 1.445msec was useful. In areas where the edges of the conductors needed to be resolved, no data beyond the 16th channel (0.7msec) could generally be relied upon.
- B: Additionally, the first 9 time windows have very evident system response. Some information on this system response is provided and a quick approximation was introduced into the modeling to represent it. However, these 9 early channels are not particularly relevant to these larger conductors. If more detailed discrimination of smaller targets is required, it may be possible to improve the simulation of the instrument response.
- C: It seems evident that the individual time channels were filtered to improve smoothness which results in adjustment of target locations with varying time windows. This will make interpretation of the smaller anomalies difficult if attempted.

2. Structure

- A: Both the magnetic and EM data from the survey indicate a structural boundary running approximately parallel to the flight lines on the eastern portion of the area of interest and continuing perpendicular to the flight lines in the south of the area. This structure is apparently shallow as it is only imaged utilizing the magnetic gradients. The quartz veining found in the NE of the outlining box may be associated with this structural boundary.

3. Drill Holes:

- A: A drill hole running from the southern trenches to the NE to run across the quartz horizon has a strong possibility of not intersecting the main conductor (conductor 2) but could be designed to intersect the smaller more northerly conductor. Stepping the collar, back to the SE corner of the outlining box could possibly be designed to intersect both conductors and also run beneath the trench with the exposed quartz vein.