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Ontario

NORTHERN GOLD MINING INC

2008 Report
on a

Helicopter-Borne Versatile Time Domain Electromagnetic (VTEM) Geophysical Survey

Kirana Property

Kirkland Lake, Ontario

BERNHARDT, MORRISETTE, TECK & LEBEL TOWNSHIPS

LARDER LAKE MINING DIVISION

Submitted By Brian Madill

June 16, 2009

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Introduction

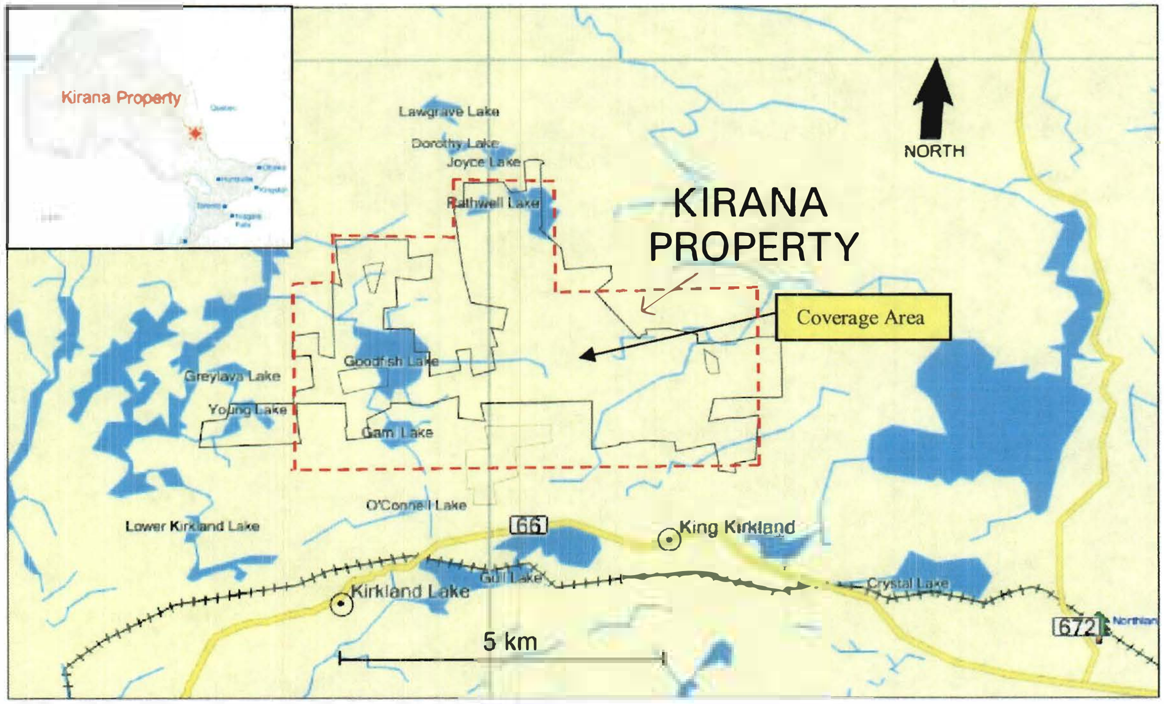
From August 1st to August 5th, 2008 Geotech Ltd. conducted a helicopter-borne geophysical survey for Northern Gold Mining Inc. over its Kirana property. The Kirana Property consists of patented and unpatented mining claims in four townships (Bernhardt, Morrisette, Teck and Lebel townships) in northeastern Ontario. The Kirana Property consists of 57 unpatented mining claims and 4 patented mining claims totalling 150 claim units. (see Map #2) The Kirana property includes claims under option to Northern Gold Mining Inc as well as claims held 100% by Northern Gold Mining. A consortium of prospectors optioned the claims to Northern Gold Mining in 2007; the consortium is comprised of T. O'Connor, M. Sutton, R. Harvey and T. Link. The claim numbers on which the Option Agreement covers are listed below: (see Figure 1)

Figure 1 - Kirana Claim Group

Claim #	Township	Claim Holder	Claim	Units	Hectares
1211969	Bernhardt	Tom O'Connor	1	1	16
1211970	Morrisette	Tom O'Connor	1	1	16
4225600	Bernhardt	Northern Gold	1	1	16
802835	Morrisette	Terry Link	1	1	16
802836	Morrisette	Terry Link	1	1	16
802837	Morrisette	Terry Link	1	1	16
802838	Morrisette	Terry Link	1	1	16
802839	Morrisette	Terry Link	1	1	16
802840	Morrisette	Terry Link	1	1	16
802843	Morrisette	Terry Link	1	1	16
823113	Morrisette	Terry Link	1	1	16
823114	Morrisette	Terry Link	1	1	16
823115	Morrisette	Terry Link	1	1	16
823116	Morrisette	Terry Link	1	1	16
802842	Morrisette	Terry Link	1	1	16
3010040	Lebel	Tom O'Connor	1	2	32
3011753	Morrisette	Terry Link	1	1	16
3010043	Teck	Tom O'Connor	1	1	16
3010044	Bernhardt	Tom O'Connor	1	5	80
3010041	Morrisette	Tom O'Connor	1	3	48
4210202	Lebel	Tom O'Connor	1	2	32
3011222	Morrisette	Tom O'Connor	1	8	128
4202281	Morrisette	Mike Sutton	1	1	16
4220093	Bernhardt	Tom O'Connor	1	1	16
4225071	Bernhardt	Northern Gold	1	1	16
1242855	Morrisette	Tom O'Connor	1	1	16
1047221	Morrisette	Terry Link	1	1	16
1047222	Morrisette	Terry Link	1	1	16
1047223	Morrisette	Terry Link	1	1	16
1013303	Morrisette	Terry Link	1	1	16
1013304	Morrisette	Terry Link	1	1	16
1013305	Morrisette	Terry Link	1	1	16
4211844	Bernhardt	Tom O'Connor	1	3	48
1186591	Morrisette	Mike Sutton	1	3	48

3011754	Lebel	Terry Link	1	10	160
4211845	Teck	Tom O'Connor	1	6	96
1211524	Bernhardt	Tom O'Connor	1	2	32
1211525	Bernhardt	Tom O'Connor	1	1	16
1199683	Bernhardt	Tom O'Connor	1	2	32
1048772	Morrisette	Terry Link	1	1	16
1048773	Morrisette	Terry Link	1	1	16
1048774	Morrisette	Terry Link	1	1	16
1048775	Morrisette	Terry Link	1	1	16
1048776	Morrisette	Terry Link	1	1	16
1049320	Morrisette	Terry Link	1	1	16
1049321	Morrisette	Terry Link	1	1	16
1049322	Morrisette	Terry Link	1	1	16
1047224	Morrisette	Terry Link	1	1	16
1047225	Morrisette	Terry Link	1	1	16
4230172	Bernhardt	Northern Gold	1	4	64
4240395	Bernhardt	Northern Gold	1	16	256
4220048	Bernhardt	Tom O'Connor	1	4	64
4220044	Morrisette	Northern Gold	1	16	256
4220094	Morrisette	Northern Gold	1	2	32
4211797	Morrisette	Northern Gold	1	4	64
4225077	Morrisette	Northern Gold	1	3	48
4225398	Morrisette	Northern Gold	1	13	208
Total			**57**	**146**	**2336**
L2200	Morrisette	Roger Harvey	1	1	16
L2201	Morrisette	Roger Harvey	1	1	16
L2845	Teck	Roger Harvey	1	1	16
L6047	Teck	Roger Harvey	1	1	16
Total			**4**	**4**	**64**

The property is located in the Larder Lake mining division, northeastern Ontario, 5 Km north of the Town of Kirkland Lake. A total of 434 line kilometres were flown consisting of 392 line kilometres in an N 0 E direction and 42 line kilometres in an N 90 E direction covering approximately 2980 hectares. (see Map #1) Of the 434 line km flown approximately 246 km are eligible for assessment credit. (see Figure 2)



Map #1 – Kirana Property General Location Map

2008 VTEM Survey-Distance flown over Kirana Claims

Line #	Length
L1000	1275
L1010	705
L1020	620
L1030	640
L1040	1060
L1050	1240
L1060	845
L1070	825
L1080	805
L1090	1735
L1100	2575
L1110	2865
L1120	3600
L1130	3495
L1140	3485
L1150	3355
L1160	3000
L1170	2335
L1180	2220
L1190	2350
L1200	2590
L1210	2270
L1220	2470
L1230	2460
L1240	1970
L1250	1980
L1260	1995
L1270	1700
L1280	1335
L1290	1345
L1300	1345
L1310	1040
L1320	475
L1330	470
L1340	465
L1350	460
L1360	455
L1370	450
L1380	1895
L1390	2860
L1400	3165
L1410	2890
L1420	2895
L1430	2855
L1440	2670
L1450	2710
L1460	3245
L1470	3465
L1480	3460
L1490	3755
TOTAL	**100070**

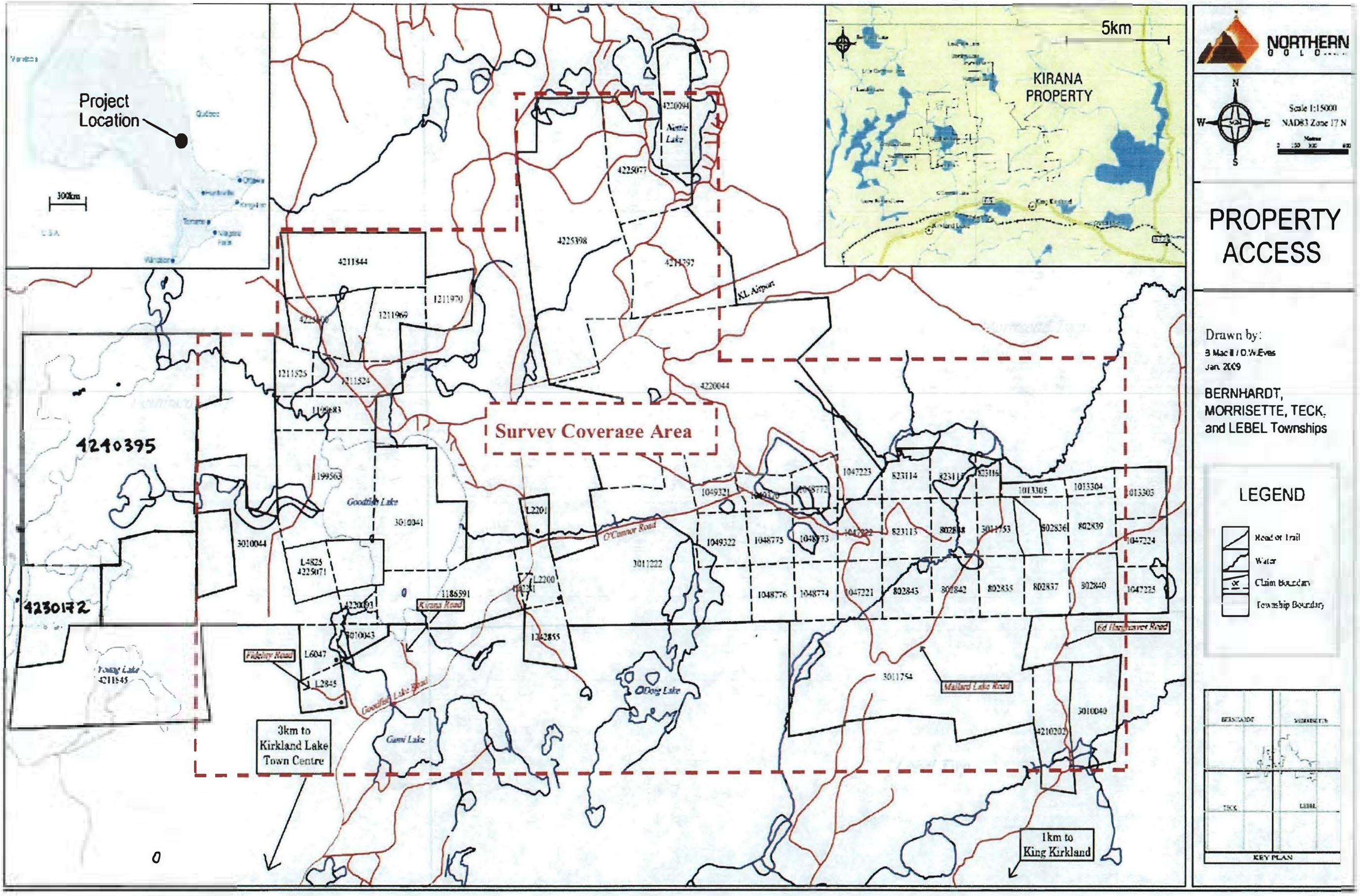
Line #	Length
L1500	3680
L1510	3680
L1520	3685
L1530	3690
L1540	3885
L1550	3865
L1560	3885
L1570	3100
L1580	1885
L1590	1865
L1600	1860
L1610	1880
L1620	1860
L1630	1880
L1640	1860
L1650	1875
L1160	1860
L1670	1875
L1680	1855
L1690	2710
L1700	2680
L1710	2585
L1720	2480
L1730	2390
L1740	2290
L1750	2175
L1760	2080
L1770	1995
L1780	1905
L1790	1820
L1800	1860
L1810	1950
L1820	1960
L1830	1965
L1840	1970
L1850	1975
L1860	1980
L1870	1975
L1880	2120
L1890	2090
L1900	2060
L1910	2030
L1920	2000
L1930	1805
L1940	1790
L1950	1465
L1960	1130
L1970	1220
L1980	1825
L1990	1820
TOTAL	**112105**

Line #	Length
L2000	1860
L2010	1850
L2020	1795
L2030	1800
L2040	1810
L2050	1825
L2060	1830
L2070	1215
TL2500	1340
TL2510	2740
TL2520	2245
TL2530	3470
TL2540	6110
TL2550	3125
TL2560	675
TOTAL	**33690**

Column 1	100070
Column 2	112185
Column 3	33690
Grand Total	**245945**

245.945 km at $145 / Line km =	$35,662.025
Mobilization =	$5,800.000
Report =	$1,250.000
Total Costs =	$42,712.025

Figure 2



MAP #2 - Claim Contiguity and Area Flown

Kirana Claim Group: Work Applied / Claim

Claim #	Township	Claim Holder	Claim	Units	Hectares	m/claim	Km / Claim +	(@ $145.00 / Km) =	Mob/Report = ($ / Unit)	Total (Work/Claim)
1211969	Bernhardt	Tom O'Connor	1	1	16	3395	3.395	$492	$54	$546
1211970	Morrisette	Tom O'Connor	1	1	16	2025	2.025	$294	$54	$348
4225600	Bernhardt	Northern Gold	1	1	16	2895	2.895	$420	$54	$474
802835	Morrisette	Terry Link	1	1	16	2200	2.200	$319	$54	$373
802836	Morrisette	Terry Link	1	1	16	1775	1.775	$257	$54	$311
802837	Morrisette	Terry Link	1	1	16	2200	2.200	$319	$55	$374
802838	Morrisette	Terry Link	1	1	16	3005	3.005	$436	$54	$490
802839	Morrisette	Terry Link	1	1	16	3025	3.025	$439	$54	$493
802840	Morrisette	Terry Link	1	1	16	2655	2.655	$385	$54	$439
802843	Morrisette	Terry Link	1	1	16	2175	2.175	$315	$54	$369
823113	Morrisette	Terry Link	1	1	16	2630	2.630	$381	$54	$435
823114	Morrisette	Terry Link	1	1	16	1775	1.775	$257	$55	$312
823115	Morrisette	Terry Link	1	1	16	1760	1.760	$255	$54	$309
823116	Morrisette	Terry Link	1	1	16	880	0.880	$128	$54	$182
802842	Morrisette	Terry Link	1	1	16	2640	2.640	$383	$54	$437
3010040	Lebel	Tom O'Connor	1	2	32	4945	4.945	$717	$109	$826
3011753	Morrisette	Terry Link	1	1	16	2165	2.165	$314	$54	$368
3010043	Teck	Tom O'Connor	1	1	16	1335	1.335	$194	$54	$248
3010044	Bernhardt	Tom O'Connor	1	5	80	10645	10.645	$1,544	$271	$1,815
3010041	Morrisette	Tom O'Connor	1	3	48	9070	9.070	$1,315	$163	$1,478
4210202	Lebel	Tom O'Connor	1	2	32	3640	3.640	$528	$109	$637
3011222	Morrisette	Tom O'Connor	1	8	128	17975	17.975	$2,606	$434	$3,040
4202281	Morrisette	Mike Sutton	1	1	16	205	0.205	$30	$55	$85
4220093	Bernhardt	Tom O'Connor	1	1	16	1060	1.060	$154	$54	$208
4225071	Bernhardt	Northern Gold	1	1	16	2120	2.120	$307	$54	$361
1242855	Morrisette	Tom O'Connor	1	1	16	2755	2.755	$400	$54	$454
1047221	Morrisette	Terry Link	1	1	16	2580	2.580	$374	$54	$428
1047222	Morrisette	Terry Link	1	1	16	3080	3.080	$447	$54	$501
1047223	Morrisette	Terry Link	1	1	16	2760	2.760	$400	$55	$455
1013303	Morrisette	Terry Link	1	1	16	375	0.375	$54	$54	$108
1013304	Morrisette	Terry Link	1	1	16	935	0.935	$136	$54	$190
1013305	Morrisette	Terry Link	1	1	16	895	0.895	$130	$54	$184
4211844	Bernhardt	Tom O'Connor	1	3	48	8570	8.570	$1,243	$163	$1,406
1186591	Morrisette	Mike Sutton	1	3	48	6995	6.995	$1,014	$163	$1,177
4230172	Bernhardt	Northern Gold	1	4	64					
4240395	Bernhardt	Northern Gold	1	16	256					
3011754	Lebel	Terry Link	1	10	160	23775	23.775	$3,447	$542	$3,989
4220048	Bernhardt	Tom O'Connor	1	4	64	10405	10.405	$1,509	$217	$1,726
4211846	Teck	Tom O'Connor	1	6	96	870	0.870	$126	$325	$451
1211524	Bernhardt	Tom O'Connor	1	2	32	2670	2.670	$387	$109	$496
1211525	Bernhardt	Tom O'Connor	1	1	16	1680	1.680	$244	$54	$298
1199683	Bernhardt	Tom O'Connor	1	2	32	2965	2.965	$430	$109	$539
4220044	Morrisette	Northern Gold	1	16	256	28015	28.015	$4,062	$868	$4,930
4220094	Morrisette	Northern Gold	1	2	32	2040	2.040	$296	$109	$405
4211797	Morrisette	Northern Gold	1	4	64	6530	6.530	$947	$217	$1,164
4225077	Morrisette	Northern Gold	1	3	48	6360	6.360	$922	$163	$1,085
4225398	Morrisette	Northern Gold	1	13	208	20230	20.230	$2,933	$705	$3,638
1048772	Morrisette	Terry Link	1	1	16	1630	1.630	$236	$54	$290
1048773	Morrisette	Terry Link	1	1	16	2335	2.335	$339	$54	$393
1048774	Morrisette	Terry Link	1	1	16	2125	2.125	$308	$55	$363
1048775	Morrisette	Terry Link	1	1	16	2340	2.340	$339	$54	$393
1048776	Morrisette	Terry Link	1	1	16	2105	2.105	$305	$54	$359
1049320	Morrisette	Terry Link	1	1	16	1495	1.495	$217	$54	$271
1049321	Morrisette	Terry Link	1	1	16	1325	1.325	$192	$54	$246
1049322	Morrisette	Terry Link	1	1	16	2810	2.810	$407	$54	$461
1047224	Morrisette	Terry Link	1	1	16	420	0.420	$61	$55	$116
1047225	Morrisette	Terry Link	1	1	16	340	0.340	$49	$54	$103
Total			57	146	2336	239605		$34,743	$6,834	$41,577
L2200	Morrisette	Roger Harvey	1	1	16	1935	1.935	$281	$54	$335
L2201	Morrisette	Roger Harvey	1	1	16	1000	1.000	$145	$54	$199
L2845	Teck	Roger Harvey	1	1	16	1465	1.465	$212	$54	$266
L6047	Teck	Roger Harvey	1	1	16	1940	1.940	$281	$54	$335
Total			4	4	64	6340		$919	$216	$1,135
				Grand Total		245945		$35,662	$7,050	$42,712

Figure 3

Property History

A report written in 1916 titled "Goodfish Lake Gold Area" by A.G. Burrows and P.E. Hopkins gives the earliest accounts of gold prospecting in the vicinity of the Kirana property. According to Burrows and Hopkins the first gold discovery was made in the summer of 1912 on claim number L 2194, which later became the Goodfish Mine (not held by Northern Gold Mining). In 1915 significant prospecting was done in the vicinity of Goodfish Lake, with several gold discoveries; some of the gold showings are located on claims adjacent to the Kirana property claim L-2194 which were later amalgamated as the Goodfish mines. Another gold showing was found on the south shore of Goodfish Lake which later became the Kirana Gold Mine (not held by Northern Gold Mining). Northern Gold Mining's Kirana property surrounds both the Goodfish Mine and the Kirana Mine. Since 1916 significant exploration has occurred on the Kirana property by private prospectors and mining companies. An outline of previous work and gold discoveries are listed chronologically below:

1918 Fidelity Gold Mines

Sunk a 140 ft inclined shaft on a gold mineralized vein on current mining patent # L-2845. The shaft was deepened to 300 ft with 747 ft of lateral development in 1920. The grades of mineralization were not published but it was reported that the mineralized vein widened to 7 ft at a depth of 140 ft.

1935 Mallard Lake Gold Mines

Completed work on current claims #3011753 and #823115. Work was done to follow up on a silver, lead, copper, gold and barite showing; they drilled 5 holes to intersect the vein at depths up to 115 ft below the shaft; assays from this drilling were not significant and averaged less than 0.01 oz/ton Au, 2.57 oz/ton Ag, with minor amounts of lead and copper. Mallard Lake gold mines also discovered a gossan zone south of Morrisette Lake; this gossan zone was exposed for a width of 7-8 ft and followed along strike for 200 ft. One pit along this gossan assayed up to 0.45% Cu, however diamond drilling across this zone at 115 ft depth showed only 0.04% Cu across 12 ft.

1936 Kirgood Gold Mines

Held a claim block in north Lebel Township which covered part of the Murdoch Creek fault. They sunk a 40 ft shaft along the Murdoch Creek fault and drilled four holes into this structure. The structure was intersected at depths up to 300 ft. The only gold values occurred in drill hole #4 which intersected 0.35oz/ton over 1 ft and a second intersection of 0.35oz/ton over 1 ft. Both of which occurred in a mineralized syenite unit with quartz fracturing.

1974-1981 Haas Warner Mining Ltd

Held a large group of claims covering the western portion of the Kirana property. This also includes the Kirana mine which in 1974 was the subject of an engineering report; this report outlined a 50,000 ton resource of unlisted grade at the Kirana mine. A stripping program was done on claim# 118591 with no results listed.Theycompleted three drill holes totaling 380m on current claim #118591; no assays are listed for the holes; although it has been reported that 79-1 intersected good gold values.

1980 Rosario Resources

Completed a geological and geophysical survey and drilled 4 holes on the eastern portion of the property. Several conductors were outlined by the VLF survey. These conductors were then tested with four drill holes; mineralization in these holes was negligible.

1985 Lac Minerals

Completed a mag survey over 8 claims in Morrisette Township. Drilled one 170m hole on claim# 1048775. No assays were reported.

1986-1996 T. Link

Held the claim group covering the eastern portion of the Kirana property, and has since optioned the property to Northern Gold Mining. Drilled 5 holes totaling 669.3m on claim# 802838; these holes intersected a mineralized sedimentary unit with gold assays up to 0.05oz/ton over 20 ft. Completed power stripping on the same claim and found gold mineralization up to 883ppb over 3 ft. Completed a VLF-EM survey over the same claim but it failed to delineate the gold zone. Then drilled 2 holes totaling 614.5m on claim# 823114 which intersected minor pyrite and chalcopyrite mineralization but negligible gold. Drilled one 295.7m hole across claims #802834 and 802835 which intersected a pyritic sedimentary unit with negligible gold. Drilled an additional 3 holes on claim# 802838 in 1996; one of which intersected gold mineralization occurring as quartz stringers in a cg mafic unit; one assay from this zone was 234g/t over a 2 ft interval with additional assays being 5.5g/t over 2 ft and another interval assayed 3.8g/t over 5 ft.

1987-1998 F.T. O'Connor

Held claim block covering Goodfish Lake and some of the surrounding lands. Completed a ground magnetic and VLF-EM survey over most of Goodfish Lake. Four conductors were found but were never drill tested. A Geological report was conducted over several claims in 1987; the only sample of significance from this report was on claim L-2845 which was 21g/t and presumably from the Fidelity mine. In 1998 a mechanical stripping was completed north of Goodfish Lake; some significant values were found, the best being 3.4g/t over 2.0m. Conducted a small IP survey over the same property and drilled two holes to test the targets; the best intersection was 2.1g/t over 4.1 ft.

1987 - 1990 Minnova Inc.

Held a large claim group which covers the current Northern Gold claims 1211525, 1211524, 1199683, 4220048, 3010044, 3010041, 3010043, 1186591, L2200 and L2201. They also held the claims which cover the Kirana mine. They completed a considerable amount of exploration with the objective of finding the continuation of the "Kirana break" a known gold bearing structure. The work which was completed includes geological mapping, geophysical surveys, mechanical powerstripping and channel sampling, they also drilled 14 diamond drill holes, 7 of which were drilled on Northern Gold's Kirana property; the best assays from this drilling was in KIR-5 which intersected 6.8g/t Au over 0.5m on claim #1186591.

1999 Medici Minerals

Held a block of claims covering some of the eastern claims on the Kirana property Drilled two holes on claim # 802834; one hole M-99-01 intersected 18.7g/t Au over 1.05m as well as 0.45% Cu over a 0.7m interval.

2003 M. Sutton

Completed work on claim # 118591 which has since been optioned to Northern Gold Mining. Drilled one hole to follow up on previous gold intersections on property. The hole intersected a quartz ankerite vein carrying molybdenite, pyrite and gold; the assay from this vein across 1.1 ft was 47.0g/t Au.

Recent Work

Northern Gold Mining Inc. acquired the current claim group in 2007. Since that time they have completed a small powerstripping program on claim# 802838 in 2007. In 2008 two diamond drill holes were drilled on claim # 118591. 92km of lines were cut which was used for access and points of reference for the geological mapping.

Geography

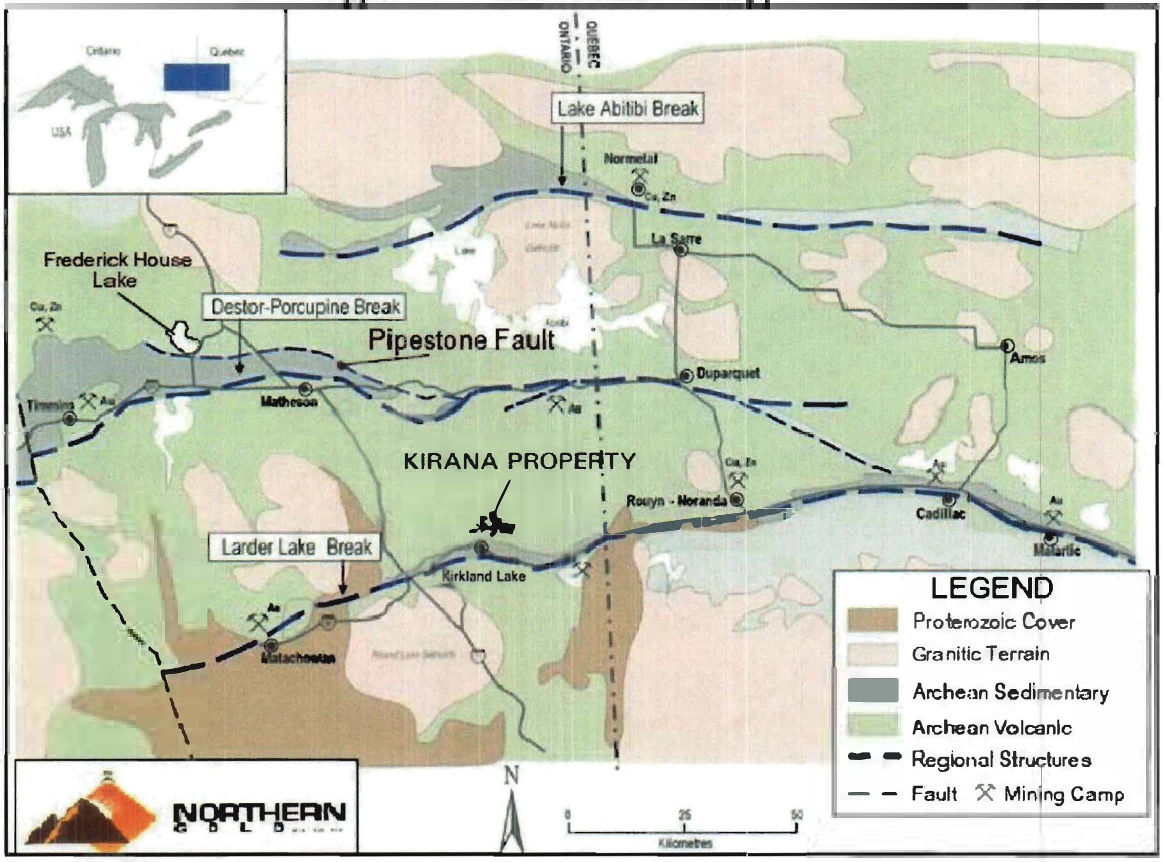
Physiography**:** The project area lies within the central Canadian Shield in the central Abitibi geologic subprovince. The region can be generalized as being in the boreal climactic region, characteristically covered by forest, swamps and lakes with relatively little relief.

Relief on the Kirana property is less than 35m. The western portion of the claim group has moderate bedrock exposure and generally thin overburden. The eastern portion of the claim group is covered by esker sand deposits. Outcrop exposure in the western portion is about 20%; in the eastern portion however outcrop is scarce. Generally the property can be characterized by scattered outcrops and overburden thicknesses of less than 10m. The overburden is comprised of glaciofluvial and proglacial lacustrine sediments: primarily sand and but locally cobble and boulder sized clasts.

Climate: The climatic conditions are typical for the central Canadian Shield with short, mild summers and long, cold winters. Mean temperatures range from –17°C (0°F) in January, to 18°C (64°F) in July, and mean annual precipitation throughout the region ranges from 812 to 876 mm (32-35 inches).

Geology

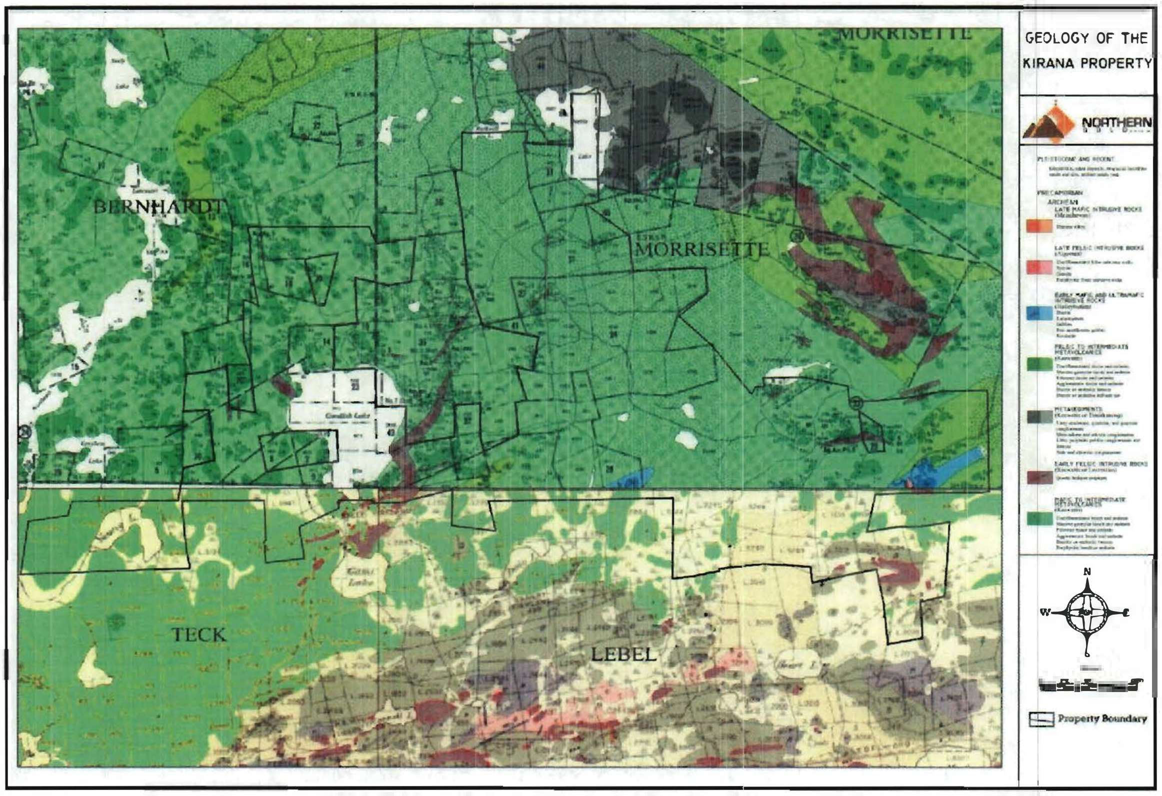
Regional Geology: The Kirana property lies in the Superior Geological province and the Abitibi subprovince. The Abitibi subprovince is an 800 by 300 kilometer area underlain by granite greenstone stratigraphy of Archean age (see map #4). In the Archean of northern Ontario, the supracrustal rocks are divided into rock packages based on their composition, morphology and geographic distribution. Individual "assemblages" consist of stratified volcanic and/or sedimentary rock units built during a discrete interval of time in a common depositional or volcanic setting. According to R. Rupert and H. Lovell the geology in the project area from oldest to youngest is comprised of Keewatin type mafic and felsic volcanic flows, Keewatin or Laurentian age early felsic intrusive rocks, Keewatin or Timiskaming metasediments, Haileyburian type mafic and ultramafic intrusive rocks, Algoman age late felsic intrusive rocks, finally late mafic intrusive rocks. Several of these rock types were found to occur on the Kirana property although Keewatin metavolcanics appear to be the dominant rock type.



Map #3 – Kirana Regional Geology

Property Geology: The Kirana property is comprised entirely of Archean age rocks and quaternary sediments. The property covers parts of Bernhardt, Morrisette, Lebel and Teck townships. Bernhardt and Morrisette were previously mapped at a scale of 1 Inch to ½ Mile by R. Rupert and H. Lovell in 1967; this was then followed by Geological Report 84 by the same authors in 1970. No major discrepancies were found between the 1967 mapping and the current geological mapping; however the 2008 mapping of the Kirana property was completed with greater detail, at a scale of 1:2500. A small portion of the property is in Teck Township which was last mapped in 1945 by Thomsom, Hopkins, Gerrie and Maclean; this is published as map# 1945-1; the current geological mapping concurs with the 1945 mapping of Teck Township.

The dominant rock types are Keewatin mafic metavolcanics and Keewatin or Laurentian age early felsic intrusive rocks. The Keewatin mafic metavolcanics were found to occur in three distinct phases; these are textural features but for the purposes of the current geological mapping they have been mapped as three distinct units; however they are compositionally probably very similar. It has been found that mapping based on textural features can be very useful in establishing gross structural features. Each lithological unit occurring on the property is described below:



Map #4 – Kirana Property Geology, modified from Rupert & Lovell, 1967; Thomson et al, 1945; Maclean & Hogg , 1945.

ARCHEAN

Mafic Metavolcanics

The Kirana property is dominated by volcanic rocks known as "greenstones". Compositionally these rocks are basalt or andesite. They have been metamorphosed to the greenshist facies; which is characterized as having chlorite and epidote alteration. Both chlorite and epidote alteration is found throughout the mafic metavolcanics on the Kirana property. The metavolcanics are classified as being Keewatin and represent the oldest rocks on the property. The mafic metavolcanics range in colour from dark green to dark grey. Most of the mafic metavolcanics are aphanitic although some medium grained sections of individual flows are found locally on the property. Most of the mafic metavolcanics are of the massive flows which range in thickness from 10's of meters to several hundred meters. Quartz and quartz-carbonate fracturing occurs locally in the mafic metavolcanics. A few locations are noted as having chlorite amygdoidular mafic metavolcanics. Trace disseminated pyrite is ubiquitous in the mafic metavolcanics. One outcrop on the southwestern shore of Goodfish lake shows strong carbonate fracturing containing up to 1% black hematite. Sericite alteration is quite common. Two distinct textural features are found in the mafic metavolcanics, one is a variolitic variety and the other a heavily brecciated variety.

The variolitic mafic metavolcanics were only found to occur as small bodies. Compositionally they are very similar to the massive flows found elsewhere on the Kirana property; the variolitic texture shows spherulites which range from 8-12mm in diameter and are probably of feldspathic composition. This textural feature is most likely related to the intrusion of quartz feldspar bodies into the metavolcanics; variolitic mafic volcanic rocks found on the Kirana property primarily occur along contacts with quartz-feldspar porphyries and are thus interpreted as alteration halos there of.

The highly brecciated variety of mafic metavolcanics occurs sporadically throughout the property. The breccia is probably a flow type breccia. Generally the mafic breccia can be described as be a monomictic breccia with highly angular clasts ranging from 1 to 20cm; the clasts are light to dark grey and featureless, the clasts comprise between 50-90% of the rock; the matrix is an aphanitic, dark grey-black variety of chlorite, commonly the matrix is found to contain high amounts of sulphide minerals, up to 30% but typically 5-7%; the sulphide minerals are anhedral pyrite and marcasite. When induced polarization surveys are used this unit is found to have a very high conductivity response. No metals of economic importance are known to occur in the unit. This unit however can be quite useful in mapping gross structural features.

Early Felsic Intrusive Rocks

This rock type occurs throughout the western portion of the Kirana property. This is a distinctive type of granite porphyry found as stills, stocks and dykes. The highest concentration of this rock type occurs in the vicinity of Goodfish Lake. These rocks are found to intrude only the Keewatin mafic metavolcanics. They were classified as being either Keewatin or Laurentian by Rupert & Lovell in 1970. The rock can be described as being a quartz-feldspar porphyry; it is coarse grained and bimodal showing two distinctive generations of phenocrysts; the first generation are large euhedral feldspars which are up to 2cm and show a deep red alteration; the second generation is comprised of smaller, euhedral to subhedral feldspar and quartz phenocrysts which range from 5-10mm. The second generation comprises much more of the rock than the first. Phenocrysts total 45-65% of the rock. The feldspar phenocrysts in the second generation show distinct zoning. The matrix is light grey fresh and pink/red in altered rocks; it is aphanitic and is probably composed of alkali feldspar and carbonate. Often the rock shows a strong sericite alteration and is weakly phyllitic owing to the orientation of the sericite. Locally this rock contains up to 1% fine grained disseminated pyrite and occasionally chalcopyrite. This is a rare rock variety in the Kirkland Lake area and is only known to occur in vicinity of Goodfish Lake. This rock is closely related to gold mineralization in the vicinity of Goodfish Lake, the Goodfish, Kirana and Fidelity mines and numerous other gold showings all occur along the contacts of this rock with the mafic metavolcanics.

Late Mafic Intrusive Rocks

This rock type is not prevalent on the Kirana property by does occur in two locations. They are narrow diabase dykes, probably related to the Mattachewan swarm. This is a fine grained dark grey/black rock which shows intrusive contacts with all rock types on the property.

QUATERNARY

The Kirana property has seen several periods of glaciation. This can be recognized by sometimes thick sections of glacial till. The central portion of the property is overlain by deep sand layers (esker deposits). The western portion and the far eastern portion have thinner overburden comprised of mainly glaciofluvial sediments.

STRUCTURAL GEOLOGY

Faults

There is only one known fault zone to extend through the Kirana property; this is the northeast trending Murdoch creek fault zone which has been postulated as being the continuation of the Kirkland Lake fault. This structure crosses the southeast portion of the Kirana property in the Township of Lebel. This structure is known to host gold deposits although it was not investigated during the current geological mapping. The Murdoch creek fault zone is thought to be a pre and post ore fault in the Kirkland Lake gold camp.

It has been proposed that the Lakeshore north fault may continue into the Kirana property; based on a straight line projection this structure would pass through the western portion of the property. A wide N20˚E shear zone was noted to pass through the property west of the Fidelity shaft (see map #6), it is unknown if this structure is in fact the Lakeshore north fault.

Shear Zones

Several shear zones were found to occur on the Kirana property. Most of these shear zones appear to be stratabound and trend east-northeast. These zones are often marked by a strong sericite alteration and carbonatization; they are quite rubbly on surface exposure. Iron carbonates often occur along these zones owing to their rusty appearance. Many of the shear zones were traced for 10's of meters. Several of the shear zones in the Goodfish lake area are known to host gold mineralization; the most prominent of these occurs at the #1 shaft of the Kirana mine (not on the Kirana Property) according to Rupert and Lovell this shear is a "20 to 30 foot wide shear zone trending north-northeast into Morrisette township." It is not known if the Kirana shear zone extends east into the Kirana property but several parallel structures have been found. A strong shear zone 200m east of the Fidelity shaft trends N60˚E and is up to 6m wide; this zone continues eastward onto the Kirana minesite; this is most likely the western extension of the Kirana shear zone. This zone was found to be associated with a strong 0.5m wide slip plane which produces quartz-carbonate lenses containing considerable pyrite and minor gold mineralization.

A second major gold mineralized shear zone is know to occur at the #1 shaft of the Goodfish gold mine. This shear zone trends N70˚E and has been traced southwest for over 450 ft. This shear zone most likely trends onto the Kirana property although it would project underneath of Goodfish Lake; therefore very little investigation of this structure could be done.

ECONOMIC GEOLOGY

Gold is the principal metal sought after on the Kirana property although lesser amounts of copper, silver, lead and zinc are known to occur on the property. There is also a known barite occurrence in the far eastern section of the property.

Gold is known to occur in several locations on the Kirana property and its adjacent lands. According to A.G Burrows and P.E. Hopkins in their report *Goodfish Lake Gold Area* "Gold...occurs in narrow quartz veins and replacement deposits along the contact of porphyry with other rocks. The veins or stringers are generally an inch or less in thickness, but there may be a series of them forming a lode deposit. Often two or three parallel slip planes coated with quartz and a thin film of molybdenite may form the ore body. The large amounts of molybdenite and pyrite give the deposits a dark and rusty appearance. Visible gold, in a state of fine division, occurs in many parts of the area." There are two ore bodies of significance that occur near the boundaries of the Kirana property; both of these deposits occur along porphyry contacts and are associated with northeast trending shear zones. 2008 gold exploration on the Kirana property has focused on extending these known gold zones into the Kirana property. Particular attention has been paid to extending the known length of the Kirana shear zone. The Kirana mine is located in the northeast corner of Teck Township on a shear zone trending N70˚E; the deposit itself was described by Burrows and Hopkins as "ore deposit occurs along the contact of quartz porphyry and basalt. The porphyry lies to the north, and forms the hanging wall of the deposit, which occurs in the altered basalt. The shaft, which inclines 60˚ N for 80 feet, and 70˚ N. below this level, is on the dip of the ore body, which is also approximately the angle of the contact of the porphyry and basalt. The basalt near the contact is greatly altered to a greyish rock high in silica, calcite and other carbonates... In this altered basalt area there are streaks or bands of blackish material which form the higher grade portion of the deposit. These streaks contain films of molybdenite, to which the dark colour is due, and abundant iron pyrite, quartz and calcite, while visible gold is occasionally seen. A dark band near the foot wall was persistent in the shaft, while other bands toward the hanging wall are more lenticular, but have similar characteristics to the foot-wall streak. The silicified material between the streaks or bands carries low values in gold."

The second ore body which occurs on claims adjacent to the Kirana property is the Goodfish Mine #1 shaft. This deposit was worked to a depth of 620 ft and is described by Burrows and Hopkins as "...Keewatin greenstone, which has been intruded by small irregular masses of quartz-feldspar porphyry. The basalt has been greatly altered to rusty-weathering carbonate. The gold occurs in rusty quartz and calcite veinlets, which are more or less irregularly distributed in a mineralized zone."

Several regions of the Kirana property were found to be highly prospective for gold and silver/lead/zinc mineralization.

CONCLUSIONS and RECOMMENDATIONS

In conclusion the VTEM Survey failed to show any prominent amomalies with plenty of cultural responses especially along the main Goodfish Road and around Goodfish and Nettie Lakes due mainly to hydro electric lines and a high density of homes in and around these lakes. There are however, some interesting trends on both the west and east portions of the property that should be prospected and mapped in more detail to determine their possible cause.

CERTIFICATE OF AUTHOR

I, Brian Madill, 142 Carter Avenue of the town of Kirkland lake, Ontario hereby certify that:

1) I am a Prospector/Geological/Geophysical Technician and have been practicing my profession for the past 30 years.

2) I am a graduate of Cambrian College, Sudbury, Ontario having received a Geological Engineering Technician Diploma in 1979.

3) My knowledge of the property described herein was obtained by field work and documentation.

4) I do not have or expect to receive any interest in the property that forms the basis of this report.

5) I am qualified to author this report.

Dated June 16, 2009

Brian Madill

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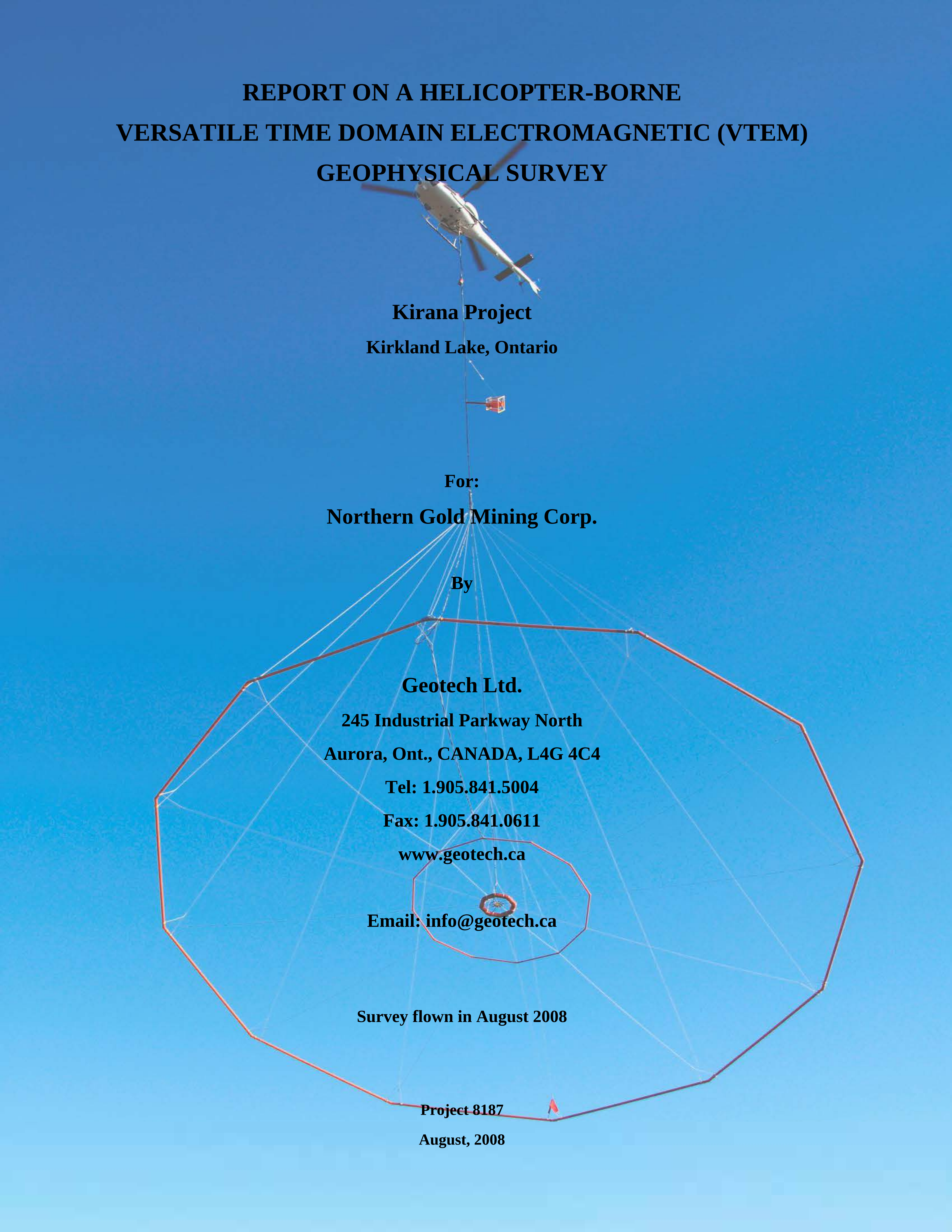
Appendix



REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN ELECTROMAGNETIC (VTEM) GEOPHYSICAL SURVEY

Kirana Project

Kirkland Lake, Ontario

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By

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Survey flown in August 2008

Project 8187

August, 2008

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REPORT ON A HELICOPTER-BORNE VERSATILE TIME DOMAIN ELECTROMAGNETIC SURVEY

Kirana Project
Kirkland Lake, Ontario

Executive Summary

During August 1st to 5th, 2008 Geotech Ltd. carried out a helicopter-borne geophysical survey for Northern Gold Mining Corp. over one (1) block near Kirkland Lake in Ontario, Canada.

Principal geophysical sensors included a versatile time domain electromagnetic (VTEM) system and a cesium magnetometer. Ancillary equipment included a GPS navigation system and a radar altimeter. A total of 434 line-km were flown.

In-field data processing involved quality control and compilation of data collected during the acquisition stage, using the in-field processing centre established at the Howard Johnson Hotel, in Kirkland Lake, Ontario. Preliminary and final data processing, including generation of final digital data and map products were undertaken from the office of Geotech Ltd. in Aurora, Ontario.

The processed survey results are presented as electromagnetic stacked profiles and the following grids:

- Total magnetic intensity
- B-field time gate 1.151 ms

Digital data includes all electromagnetic and magnetic products, plus ancillary data including the waveform.

This report describes the logistics of the survey acquisition phase and the final data processing phase. No formal interpretation is included in this report.

1. INTRODUCTION

1.1 General Considerations

These services are the result of the Agreement made between Geotech Ltd. and Northern Gold Mining Corp. to perform a helicopter-borne geophysical survey over one block near the town of Kirkland Lake in Ontario, Canada.

434 line-km of geophysical data were acquired during the survey.

The survey area is shown in Appendix A.

The crew was based at the town of Kirkland Lake, Ontario for the acquisition phase of the survey, as shown in Section 2 of this report.

Survey flying was completed on August 5th, 2008. Preliminary data processing was carried out daily during the acquisition phase of the project and final data processing followed immediately after the end of the survey. Final data presentation and data archiving were completed from the Aurora office of Geotech Ltd. in August, 2008.

1.2 Survey and System Specifications

The block was flown at a 75 metre traverse line spacing with a flight direction of N 0 °E while the tie lines were flown perpendicular to the traverse lines at a spacing of 750 metres in the direction of N 90 °E. For more detailed information on the flight spacing and direction see Table 1.

Where possible, the helicopter maintained a mean terrain clearance of 76 meters, which translates into an average height of 41 meters above ground for the bird-mounted VTEM system and 63 metres for the magnetic sensor.

The survey was flown using a Eurocopter Aerospatiale helicopter. The Aerospatiale 350 B2 helicopter, registration C-FDEV was used to fly the survey. Details of the survey specifications may be found in Section 2 of this report.

1.3 Data Processing and Final Products

Data compilation and processing were carried out by the application of Geosoft OASIS Montaj and programs proprietary to Geotech Ltd.

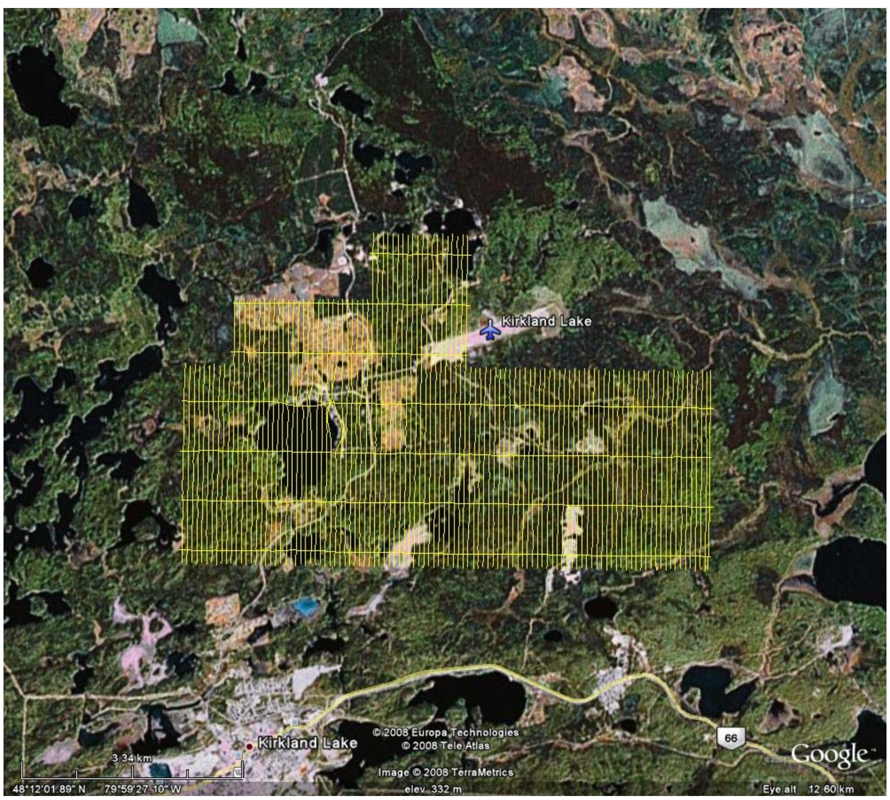
Databases, grids and maps of final products are presented to Northern Gold Mining Corp.

The survey report describes the procedures for data acquisition, processing, final image presentation and the specifications for the digital data set.

1.4 Topographic Relief and Cultural Features

The block is located in north eastern Ontario. The base of operations for the survey was in Kirkland Lake, Ontario. The block (Figure 1) is located 3 kilometers north of the town of Kirkland Lake, in Ontario. Topographically, the area exhibits a moderate relief, with an elevation ranging from 313-367 metres above sea level. There are power lines detected by the 60Hz power line monitor that intersect the block in the N-S direction. Special care is recommended in identifying cultural features from other sources that might be recorded in the data.

Figure 1 - Google Image with Flight Path



2. DATA ACQUISITION

2.1 Survey Area

The block (see Location map, Appendix A) and general flight specifications are as follows:

Table 1 - Survey block

Survey block	Line spacing (m)	Area (Km^2)	Line-km	Flight direction	Line number
Kirana	Line:75	29.6	392	N 0° E	L1000-L2070
	Tie:750		42	N 90° E	T2500-T2560

Survey block boundaries coordinates are provided in Appendix B.

2.2 Survey Operations

Survey operations were based out of the Howard Johnson Hotel in Kirkland Lake, Ontario from August 1st to 5th, 2008. The following table shows the timing of the flying.

Table 2 - Survey schedule

Date	Flight #	Flown KM	Block	Crew location	Comments
30-July-08				Sudbury, ON	Crew mobilization – delay, low ceiling and thunder.
31-July-08				Kirkland Lake, ON	Crew mobilization and arrival.
01-Aug-08	1 - 3	225	Kirana	Kirkland Lake, ON	Production.
02-Aug-08	4	61	Kirana	Kirkland Lake, ON	Production aborted – strong winds and low clouds.
03-Aug-08	5 - 6	148	Kirana	Kirkland Lake, ON	Production.
05-Aug-08			Kirana	Kirkland Lake, ON	Job complete.

2.3 Flight Specifications

The helicopter was maintained at a mean height of 76 meters above the ground with a nominal survey speed of 80 km/hour for the survey. This allowed for a nominal EM sensor terrain clearance was 41 meters and a magnetic sensor clearance of 63 meters. The data recording rates of the data acquisition was 0.1 second for electromagnetics and magnetometer, 0.2 second for altimeter and GPS. This translates to a geophysical reading about every 2 meters along flight track. Navigation was assisted by a GPS receiver and data acquisition system, which reports GPS co-ordinates as latitude/longitude and directs the pilot over a pre-programmed survey grid.

The operator was responsible for monitoring of the system integrity. He also maintained a detailed flight log during the survey, tracking the times of the flight as well as any unusual geophysical or topographic feature.

On return of the aircrew to the base camp the survey data was transferred from a compact flash card (PCMCIA) to the data processing computer.

2.4 Aircraft and Equipment

2.4.1 Survey Aircraft

The survey was flown using a Eurocopter Aerospatiale 350 B2 helicopter, registration C-FDEV. The helicopters were operated by Expedition Helicopters Ltd. Installation of the geophysical and ancillary equipment was carried out by Geotech Ltd.

2.4.2 Electromagnetic System

The electromagnetic system was a Geotech Time Domain EM (VTEM) system. The configuration is as indicated in Figure 2 below.

Receiver and transmitter coils are concentric and Z-direction oriented. The loops were towed at a mean distance of 35 meters below the aircraft as shown in Figure 4. The receiver decay recording scheme is shown diagrammatically in Figure 3.

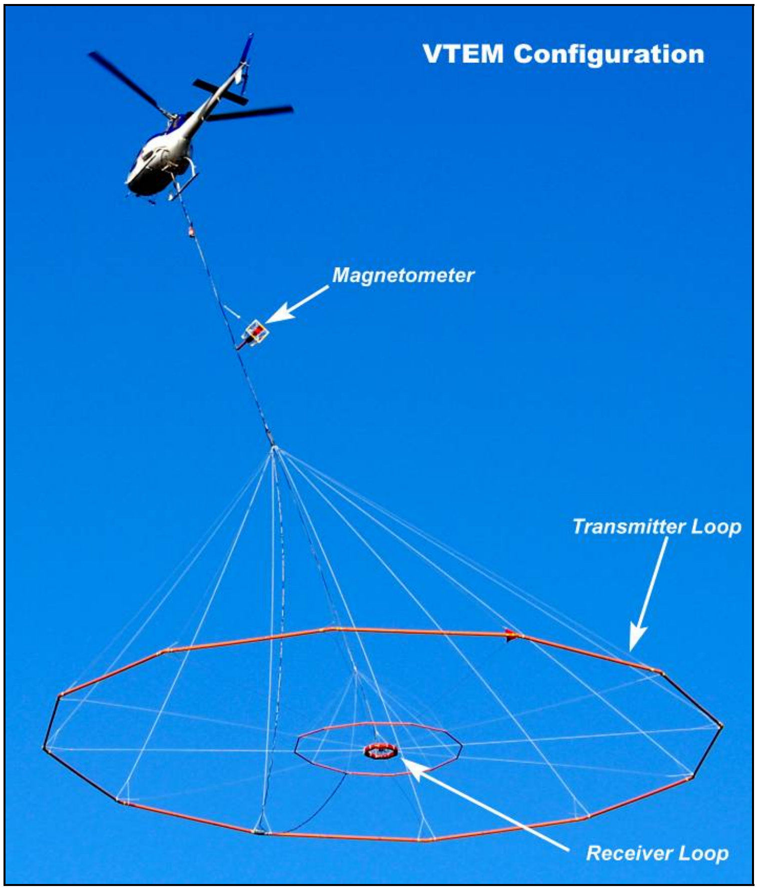


Figure 2 - VTEM Configuration

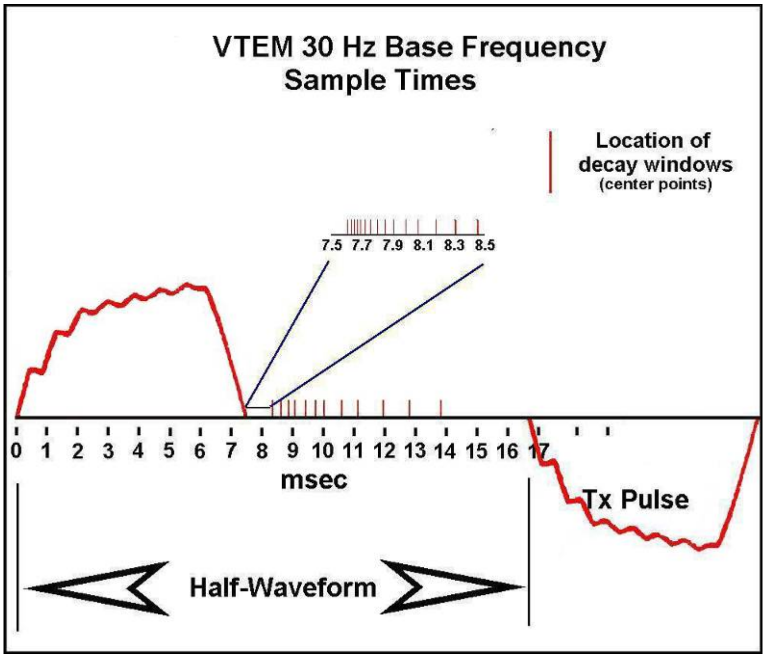


Figure 3 - VTEM Waveform & Sample Times

The VTEM decay sampling scheme is shown in Table 3 below. Twenty-four time measurement gates were used for the final data processing in the range from 120 ms to 6578 ms, as shown in Table 5.

Table 3 – Decay Sampling Scheme

VTEM Decay Sampling scheme				
Array	(Microseconds)			
Index	Time Gate	Start	End	Width
0	0			
1	10	10	21	11
2	21	16	26	11
3	31	26	37	11
4	42	37	47	11
5	52	47	57	10
6	62	57	68	11
7	73	68	78	11
8	83	78	91	13
9	99	91	110	19
10	120	110	131	21
11	141	131	154	24
12	167	154	183	29
13	198	183	216	34
14	234	216	258	42
15	281	258	310	53
16	339	310	373	63
17	406	373	445	73
18	484	445	529	84
19	573	529	628	99
20	682	628	750	123
21	818	750	896	146
22	974	896	1063	167
23	1151	1063	1261	198
24	1370	1261	1506	245
25	1641	1506	1797	292
26	1953	1797	2130	333
27	2307	2130	2526	396
28	2745	2526	3016	490
29	3286	3016	3599	583
30	3911	3599	4266	667
31	4620	4266	5058	792
32	5495	5058	6037	979
33	6578	6037	7203	1167
34	7828	7203	8537	1334
35	9245	8537	10120	1584

VTEM system parameters:

Transmitter Section

- Transmitter coil diameter: 26 m
- Number of turns: 4
- Transmitter base frequency: 30 Hz
- Peak current: 172 A
- Pulse width: 7.2 ms
- Duty cycle: 43%
- Peak dipole moment: 365,000 nIA
- Nominal terrain clearance: 41 m
-

Receiver Section

- Receiver coil diameter: 1.2 m
- Number of turns: 100.
- Effective coil area: 113.1 m^2
- Wave form shape: trapezoid
- Power Line Monitor: 60 Hz
-

Magnetometer

- Nominal terrain clearance: 63 m

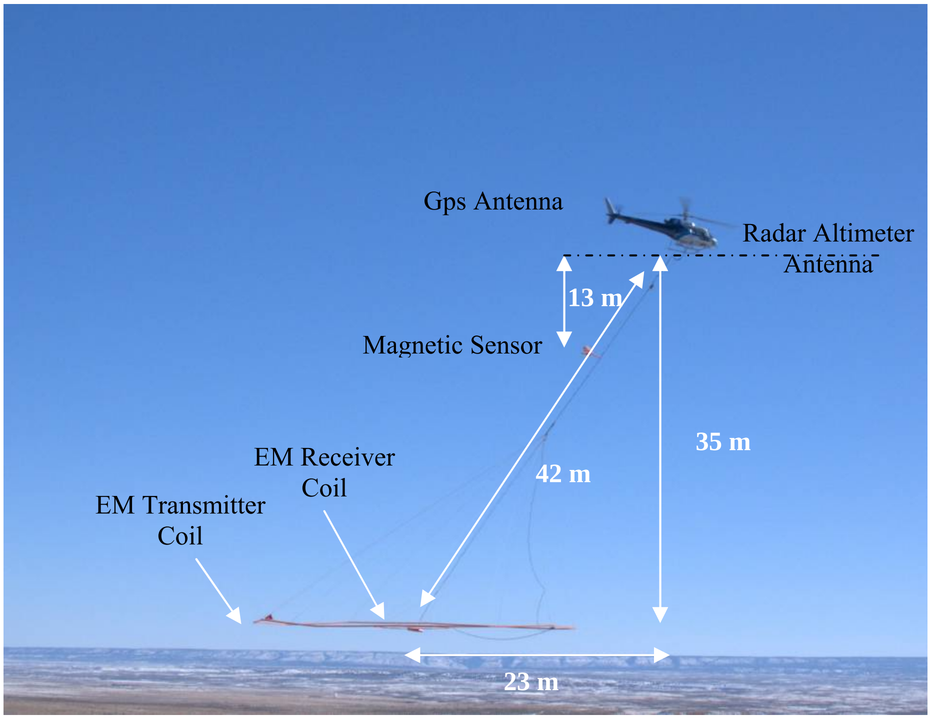


Figure 4 – Conventional VTEM system configuration

2.4.3 Airborne magnetometer

The magnetic sensor utilized for the survey was a Geometrics optically pumped caesium vapour magnetic field sensor, mounted in a separated bird, 13 metres below the helicopter, as shown in Figure 4. The sensitivity of the magnetic sensor is 0.02 nanoTesla (nT) at a sampling interval of 0.1 seconds. The magnetometer sends the measured magnetic field strength as nanoTesla to the data acquisition system via the RS-232 port.

2.4.4 Radar Altimeter

A Terra TRA 3000/TRI 40 radar altimeter was used to record terrain clearance. The antenna was mounted beneath the bubble of the helicopter cockpit.

2.4.5 GPS Navigation System

The navigation system used was a Geotech PC based unit consisting of a NovAtel's CDGPS (Canada-Wide Differential Global Positioning System Correction Service) enabled OEM4-G2-3151W GPS receiver, The Geotech navigate software, a full screen display with controls in front of the pilot to direct the flight and a NovAtel GPS antenna mounted on the helicopter tail. As many as 11 GPS and two CDGPS satellites may be monitored at any one time. The positional accuracy or circular error probability (CEP) is 1.8 m, with CDGPS active, it is 1.0 m. The co-ordinates of the block were set-up prior to the survey and the information was fed into the airborne navigation system.

2.4.6 Digital Acquisition System

A Geotech data acquisition system recorded the digital survey data on an internal compact flash card. Data is displayed on an LCD screen as traces to allow the operator to monitor the integrity of the system. The data type and sampling interval as provided in Table 4.

Table 4 – Acquisition Sampling Rates

DATA TYPE	SAMPLING
TDEM	0.1 sec
Magnetometer	0.1 sec
GPS Position	0.2 sec
Radar Altimeter	0.2 sec

2.4.7 Base Station

A combined magnetometer/GPS base station was utilized on this project. A Geometrics Caesium vapour magnetometer was used as a magnetic sensor with a sensitivity of 0.001 nT. The base station was recording the magnetic field together with the GPS time at 1 Hz on a base station computer.

The base station magnetometer sensor was installed in an isolated area in the field near the hangar and runway by the Kirkland Lake base (Lat 48 12/Long79 59), away from electric transmission lines and moving ferrous objects such as motor vehicles. The base station data were backed-up to the data processing computer at the end of each survey day.

3. PERSONNEL

The following Geotech Ltd. personnel were involved in the project.

Field:

Project Manager:	Les Moschuk
Crew chief:	Calin Cosma
Operator:	Robert Rus

The survey pilot and the mechanical engineer were employed directly by the helicopter operator – Great Slave Helicopters Ltd.

Pilot:	Alex Parra

Office:

Data QC and Processing:	Neil Fiset
Reporting/Mapping:	Wendy Acorn

Data acquisition phases were carried out under the supervision of Andrei Bagrianski, P. Geo, Surveys Manager; Processing phases were carried out under the supervision of Jean Legault, P. Geo, Manager of Processing and Interpretation. The overall contract management and customer relations were by Paolo Berardelli.

4. DATA PROCESSING AND PRESENTATION

4.1 Flight Path

The flight path, recorded by the acquisition program as WGS 84 latitude/longitude, was converted into the UTM coordinate system (UTM Zone 17N) in Oasis Montaj.

The flight path was drawn using linear interpolation between x, y positions from the navigation system. Positions are updated every second and expressed as UTM easting's (x) and UTM northing's (y).

4.2 Electromagnetic Data

A three stage digital filtering process was used to reject major sferic events and to reduce system noise. Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major sferic events. The filter used was a 16 point non-linear filter.

The signal to noise ratio was further improved by the application of a low pass linear digital filter. This filter has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 1 second or 15 metres. This filter is a symmetrical 1 sec linear filter.

The results are presented as stacked profiles of EM voltages for the time gates, in linear - logarithmic scale for both B-field and dB/dt response. B-field time channel recorded at 1.151 milliseconds after the termination of the impulse is also presented as colour image.

Generalized modeling results of VTEM data, written by consultant Roger Barlow and Nasreddine Bournas, P. Geo., are shown in Appendix E.

Graphical representation of the VTEM output voltage of the receiver coil is shown in Appendix C.

4.3 Magnetic Data

The processing of the magnetic data involved the correction for diurnal variations by using the digitally recorded ground base station magnetic values. The base station magnetometer data was edited and merged into the Geosoft GDB database on a daily basis. The aeromagnetic data was corrected for diurnal variations by subtracting the observed magnetic base station deviations.

Tie line levelling was carried out by adjusting intersection points along traverse lines. A micro-levelling procedure was applied to remove persistent low-amplitude components of flight-line noise remaining in the data.

The corrected magnetic data was interpolated between survey lines using a random point gridding method to yield x-y grid values for a standard grid cell size of approximately 0.25 cm at the mapping scale. The Minimum Curvature algorithm was used to interpolate values onto a rectangular regular spaced grid.

5. DELIVERABLES

5.1 Survey Report

The survey report describes the data acquisition, processing, and final presentation of the survey results.

The survey report is provided in two paper copies and digitally in PDF format.

5.2 Maps

Final maps were produced at a scale of 1:10,000. The coordinate/projection system used was NAD83, UTM zone 17 north. All maps show the flight path trace and topographic data; latitude and longitude are also noted on maps.

The preliminary and final results of the survey are presented as EM profiles, a late-time gate gridded EM channel, and color magnetic TMI contour maps.
The following maps are presented on paper:

- VTEM B-field profiles, Time Gates 0.234 – 6.578 ms in linear - logarithmic scale with TMI colour image.
- VTEM dB/dt profiles, Time Gates 0.234 – 6.578 ms in linear – logarithmic scale.
- VTEM B-field late time, Time Gate 1.151 ms colour image.
- Total magnetic intensity (TMI) colour image and contours.

5.3 Digital Data

- Two copies of the data and maps on DVD-ROM were prepared to accompany the report. Each DVD -ROM contains a digital file of the line data in GDB Geosoft Montaj format as well as the maps in Geosoft Montaj Map format.

- Two copies of DVD-ROMs were prepared.

There are two (2) main directories;

Data contains databases, grids and maps, as described below.
Report contains a copy of the report and appendices in PDF format.

Databases in Geosoft GDB format, containing the channels listed in Table 5.

Table 5 – Geosoft GDB Data Format.

Channel Name	Description
X:	X positional data (meters – NAD83, UTM zone 17 north)
Y:	Y positional data (meters – NAD83, UTM zone 17 north)
Z:	GPS antenna elevation (meters - ASL)
Radar:	Helicopter terrain clearance from radar altimeter (meters - AGL)
RadarB:	EM Bird terrain clearance from radar altimeter (meters - AGL)
DEM:	Digital elevation model (meters)
Gtime:	GPS time (seconds of the day)
Mag1:	Raw Total Magnetic field data (nT)
Mag2:	Diurnal corrected Total Magnetic field data (nT)
Mag3:	Leveled Total Magnetic field data (nT)
Basemag:	Magnetic diurnal variation data (nT)
SF[10]:	dB/dt 120 microsecond time channel ($pV/A/m^4$)
SF[11]:	dB/dt 141 microsecond time channel ($pV/A/m^4$)
SF[12]:	dB/dt 167 microsecond time channel ($pV/A/m^4$)
SF[13]:	dB/dt 198 microsecond time channel ($pV/A/m^4$)
SF[14]:	dB/dt 234 microsecond time channel ($pV/A/m^4$)
SF[15]:	dB/dt 281 microsecond time channel ($pV/A/m^4$)
SF[16]:	dB/dt 339 microsecond time channel ($pV/A/m^4$)
SF[17]:	dB/dt 406 microsecond time channel ($pV/A/m^4$)
SF[18]:	dB/dt 484 microsecond time channel ($pV/A/m^4$)
SF[19]:	dB/dt 573 microsecond time channel ($pV/A/m^4$)
SF[20]:	dB/dt 682 microsecond time channel ($pV/A/m^4$)
SF[21]:	dB/dt 818 microsecond time channel ($pV/A/m^4$)
SF[22]:	dB/dt 974 microsecond time channel ($pV/A/m^4$)
SF[23]:	dB/dt 1151 microsecond time channel ($pV/A/m^4$)
SF[24]:	dB/dt 1370 microsecond time channel ($pV/A/m^4$)
SF[25]:	dB/dt 1641 microsecond time channel ($pV/A/m^4$)
SF[26]:	dB/dt 1953 microsecond time channel ($pV/A/m^4$)
SF[27]:	dB/dt 2307 microsecond time channel ($pV/A/m^4$)
SF[28]:	dB/dt 2745 microsecond time channel ($pV/A/m^4$)
SF[29]:	dB/dt 3286 microsecond time channel ($pV/A/m^4$)
SF[30]:	dB/dt 3911 microsecond time channel ($pV/A/m^4$)
SF[31]:	dB/dt 4620 microsecond time channel ($pV/A/m^4$)
SF[32]:	dB/dt 5495 microsecond time channel ($pV/A/m^4$)
SF[33]:	dB/dt 6578 microsecond time channel ($pV/A/m^4$)
BF[10]:	B-field 120 microsecond time channel ($(pVms)/(Am^4)$)
BF[11]:	B-field 141 microsecond time channel ($(pVms)/(Am^4)$)
BF[12]:	B-field 167 microsecond time channel ($(pVms)/(Am^4)$)

Channel Name	Description
BF[13]:	B-field 198 microsecond time channel (pVms)/(Am^4)
BF[14]:	B-field 234 microsecond time channel (pVms)/(Am^4)
BF[15]:	B-field 281 microsecond time channel (pVms)/(Am^4)
BF[16]:	B-field 339 microsecond time channel (pVms)/(Am^4)
BF[17]:	B-field 406 microsecond time channel (pVms)/(Am^4)
BF[18]:	B-field 484 microsecond time channel (pVms)/(Am^4)
BF[19]:	B-field 573 microsecond time channel (pVms)/(Am^4)
BF[20]:	B-field 682 microsecond time channel (pVms)/(Am^4)
BF[21]:	B-field 818 microsecond time channel (pVms)/(Am^4)
BF[22]:	B-field 974 microsecond time channel (pVms)/(Am^4)
BF[23]:	B-field 1151 microsecond time channel (pVms)/(Am^4)
BF[24]:	B-field 1370 microsecond time channel (pVms)/(Am^4)
BF[25]:	B-field 1641 microsecond time channel (pVms)/(Am^4)
BF[26]:	B-field 1953 microsecond time channel (pVms)/(Am^4)
BF[27]:	B-field 2307 microsecond time channel (pVms)/(Am^4)
BF[28]:	B-field 2745 microsecond time channel (pVms)/(Am^4)
BF[29]:	B-field 3286 microsecond time channel (pVms)/(Am^4)
BF[30]:	B-field 3911 microsecond time channel (pVms)/(Am^4)
BF[31]:	B-field 4620 microsecond time channel (pVms)/(Am^4)
BF[32]:	B-field 5495 microsecond time channel (pVms)/(Am^4)
BF[33]:	B-field 6578 microsecond time channel (pVms)/(Am^4)
Lon:	Longitude data (degree – WGS84)
Lat:	Latitude data (degree – WGS84)
PLM:	60 Hz power line monitor

Electromagnetic B-field and dB/dt data are found in array channel format between indexes 10 – 33, as described above.

- Database of the VTEM Waveform "VTEM_waveform.gdb" in Geosoft GDB format, containing the following channels:

  Time: Sampling rate interval, 10.416 microseconds
  RX_Volt: Output voltage of the receiver coil (volt)
  TX_Curr: Output current of the transmitter (amps)

- Grids in Geosoft GRD format, as follow,

  Mag.grd: Total magnetic intensity (nT)
  BF1151: B-Field Time Gate 1.151 ms
  DEM: Digital Elevation Model (Metres)

  A Geosoft .GRD file has a .GI metadata file associated with it, containing grid projection information. A grid cell size of 20 metres was used.

- Maps at 1:10,000 scale in Geosoft MAP format, as follows:

  8187_Bfield: B-field profiles, Time Gates 0.234 – 6.578 ms in linear logarithmic scale, with TMI colour image.
  8187_dBdt: dB/dt profiles, Time Gates 0.234 – 6.578 ms in linear logarithmic scale.
  8187_BF23: B-field late time, Time Gate 1.151 ms colour image.
  8187_TMI: Total magnetic intensity colour image and contours.

  1:50,000 topographic vectors were taken from the NRCAN Geogratis database at; http://geogratis.gc.ca/geogratis/en/index.html.

- Google Earth files *8187_NorthernGold.kml* showing the flight path of the block.

  Free version of Google Earth software can be downloaded from, http://earth.google.com/download-earth.html

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

A helicopter-borne versatile time domain electromagnetic (VTEM) geophysical survey has been completed over the block as part of the Kirana Project study near the town of Kirkland Lake Ontario, Canada.

The total area coverage is 29.6 km^2. Total survey line coverage is 434 line kilometres. The principal sensors included a Time Domain EM system and magnetometer. Results have been presented as stacked profiles and contour colour images at a scale of 1:10,000.

6.2 Recommendations

Based on the geophysical results obtained, a number of interesting EM and magnetic anomaly groupings were identified across the properties. We therefore recommend a more detailed interpretation of the EM and magnetic data using inversion and modelling techniques to characterize the observed anomalies and to accurately determine their parameters (depth, conductance, dip, etc.) prior to ground follow-up and drill testing.

Respectfully submitted[1],

Wendy Acorn
Geotech Ltd.

Jean Legault, P. Geo, P. Eng
Geotech Ltd.

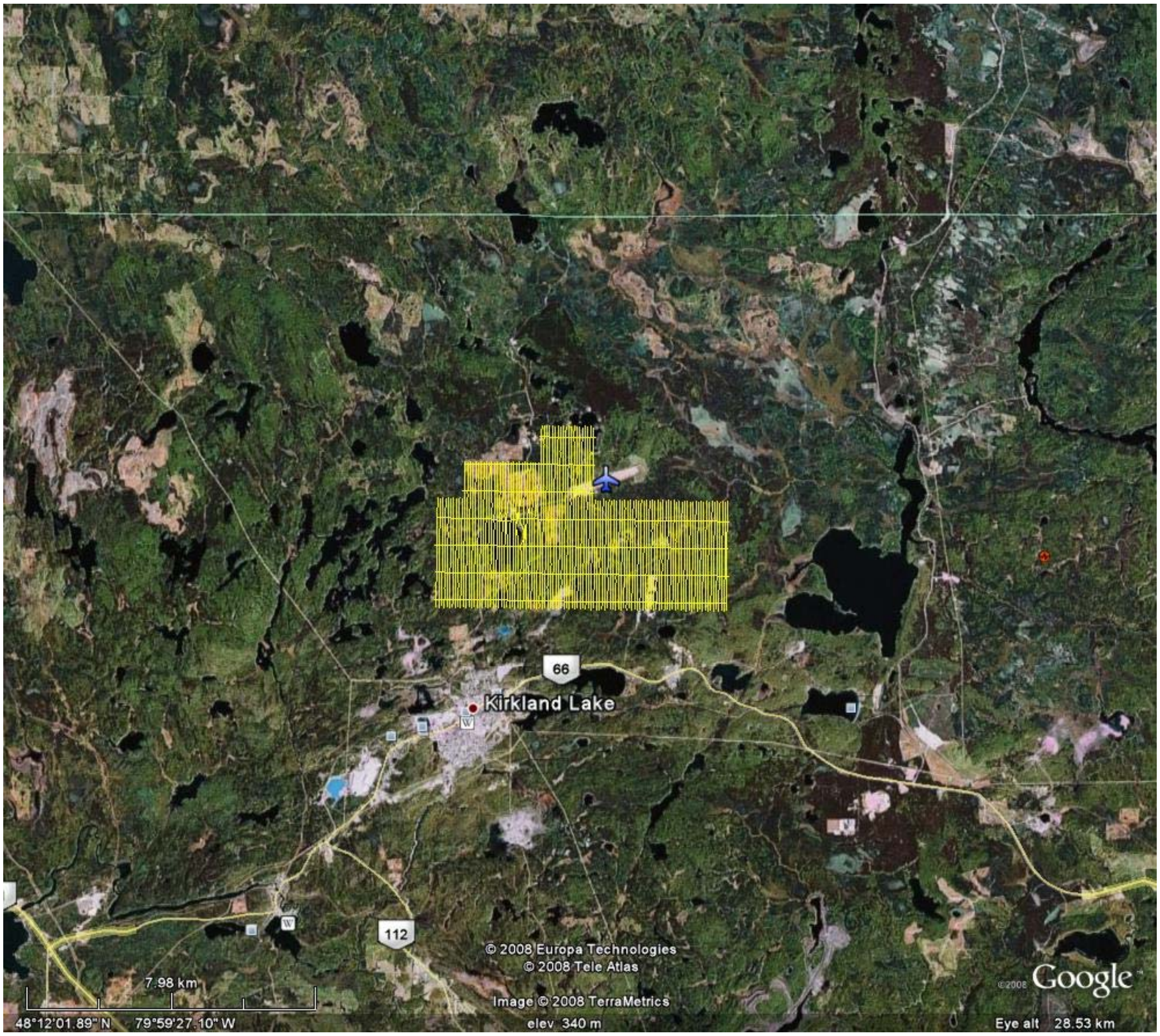
Neil Fiset
Geotech Ltd.

August 2008

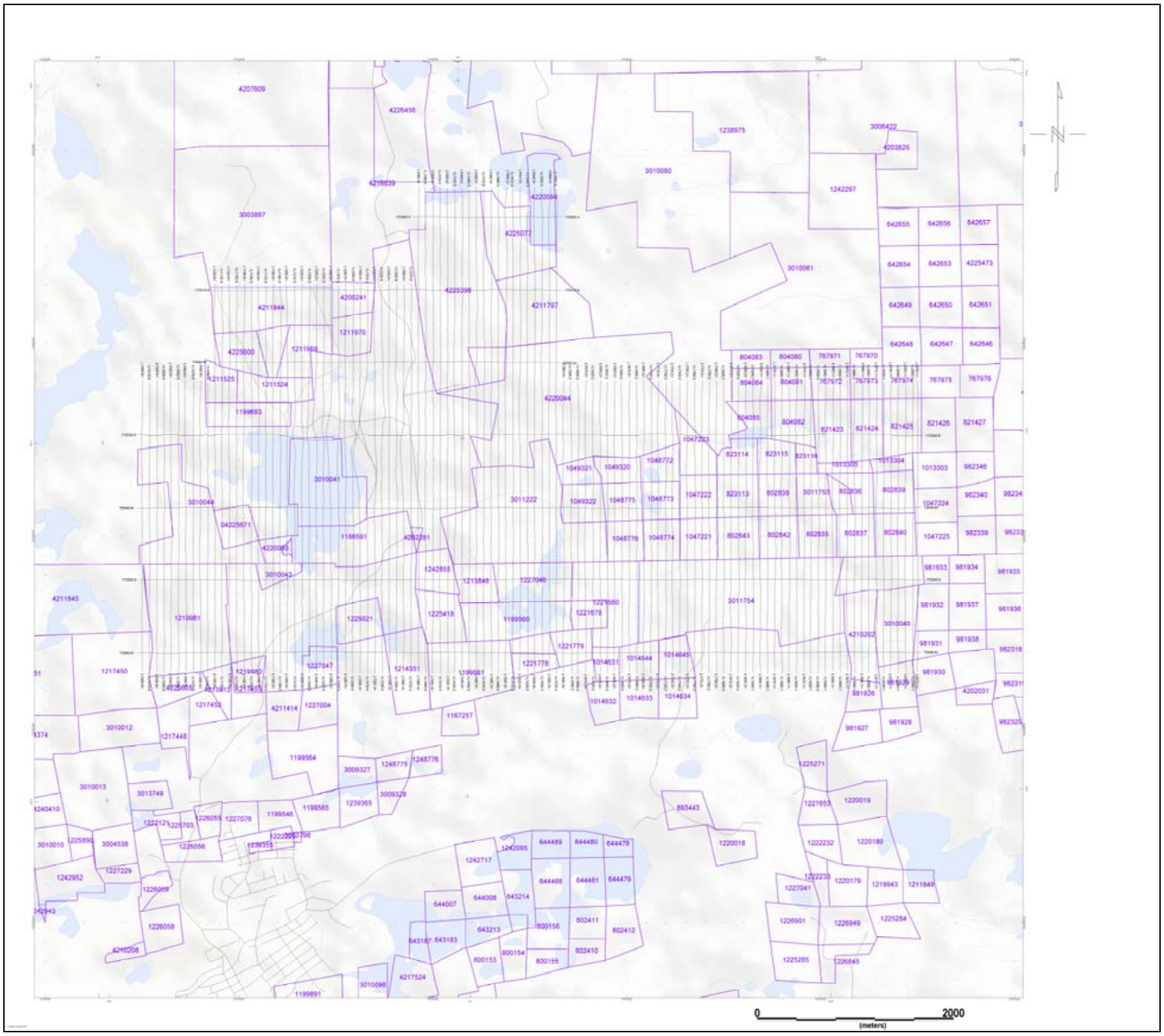
[1]Final data processing of the EM and magnetic geophysical data were carried out by Neil Fiset, from the office of Geotech Ltd. in Aurora, Ontario, under the supervision of Jean Legault, P. Geo, Manager of Data Processing and Interpretation.

APPENDIX A

SURVEY BLOCK LOCATION MAPS



Google Earth Location map of Block



Block with mining claims.

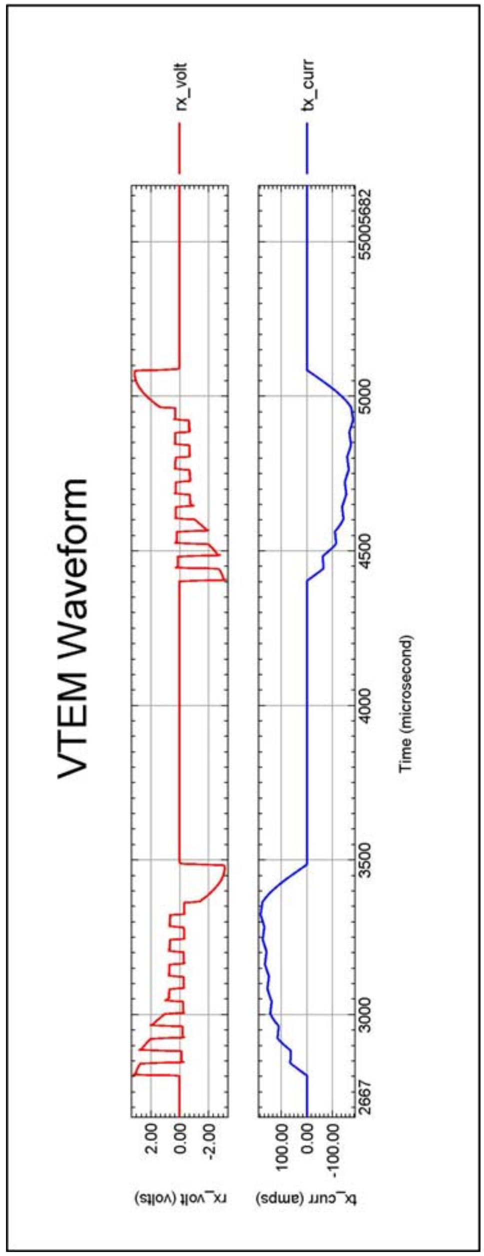
APPENDIX B

SURVEY BLOCK COORDINATES

(NAD83, UTM zone 17 north)

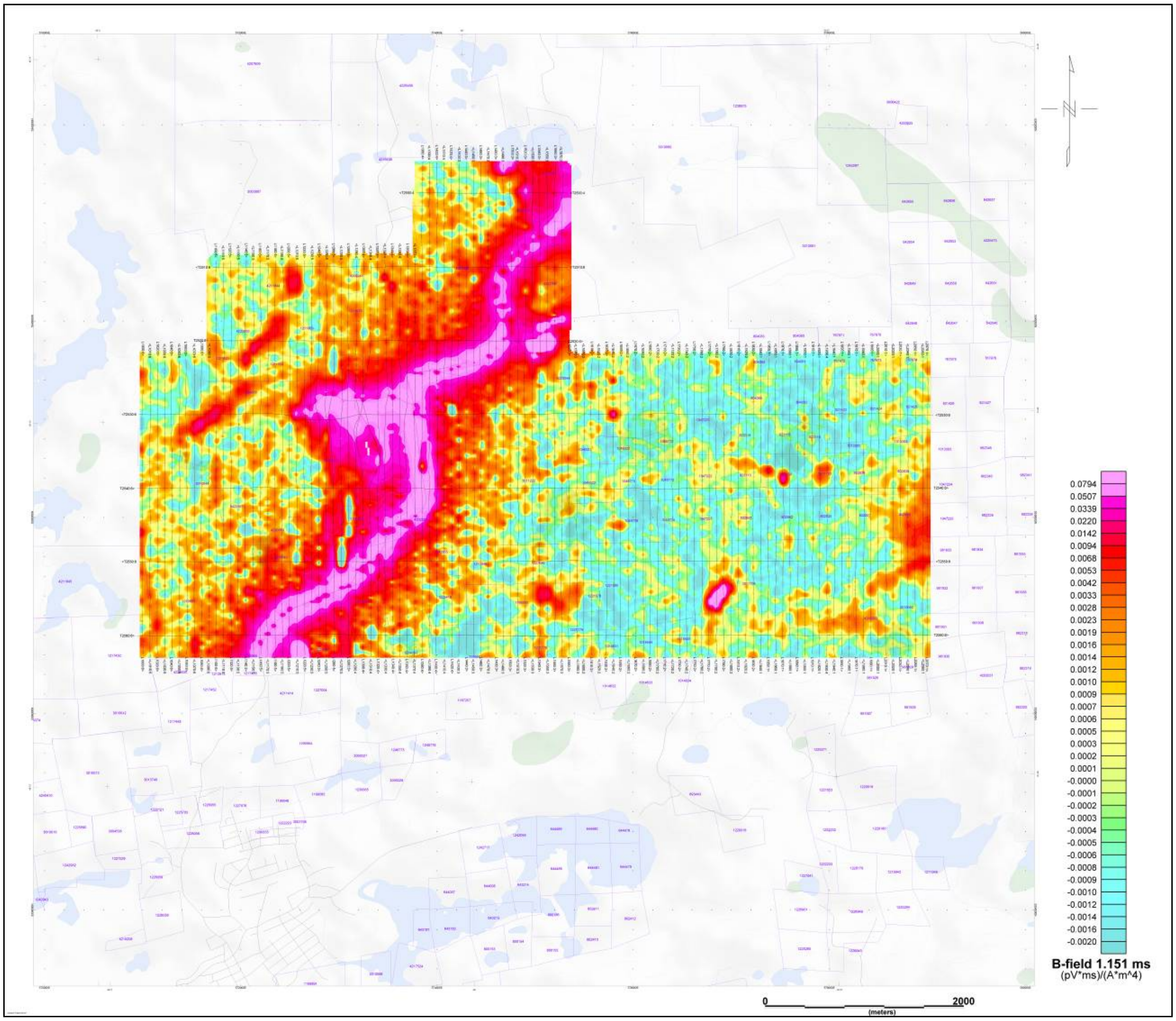
X	Y
571000	5339600
571700	5339600
571700	5340600
573800	5340600
573800	5341600
575300	5341600
575300	5339600
579000	5339600
579000	5336600
571000	5336600

APPENDIX C
VTEM WAVEFORM

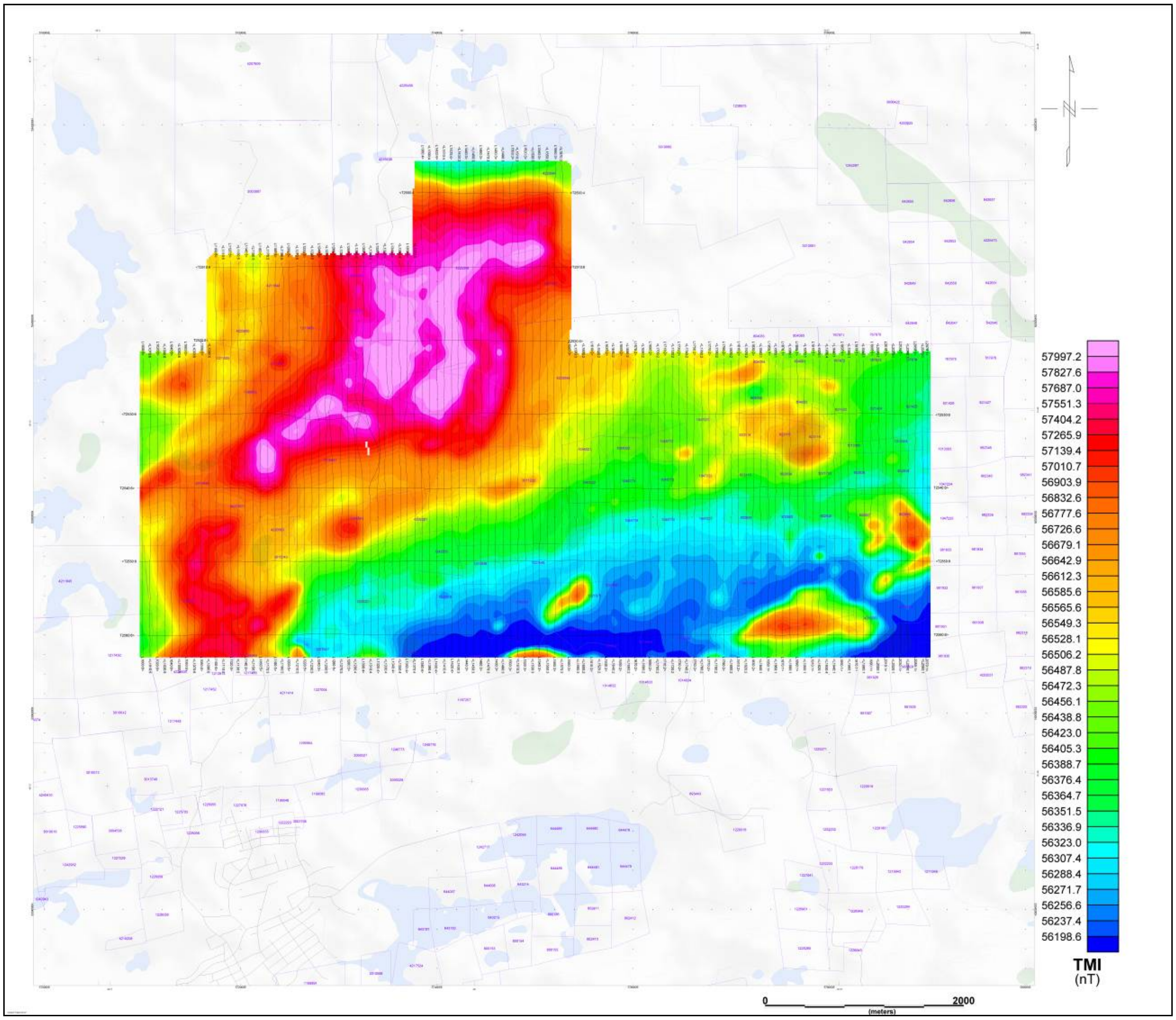


APPENDIX D

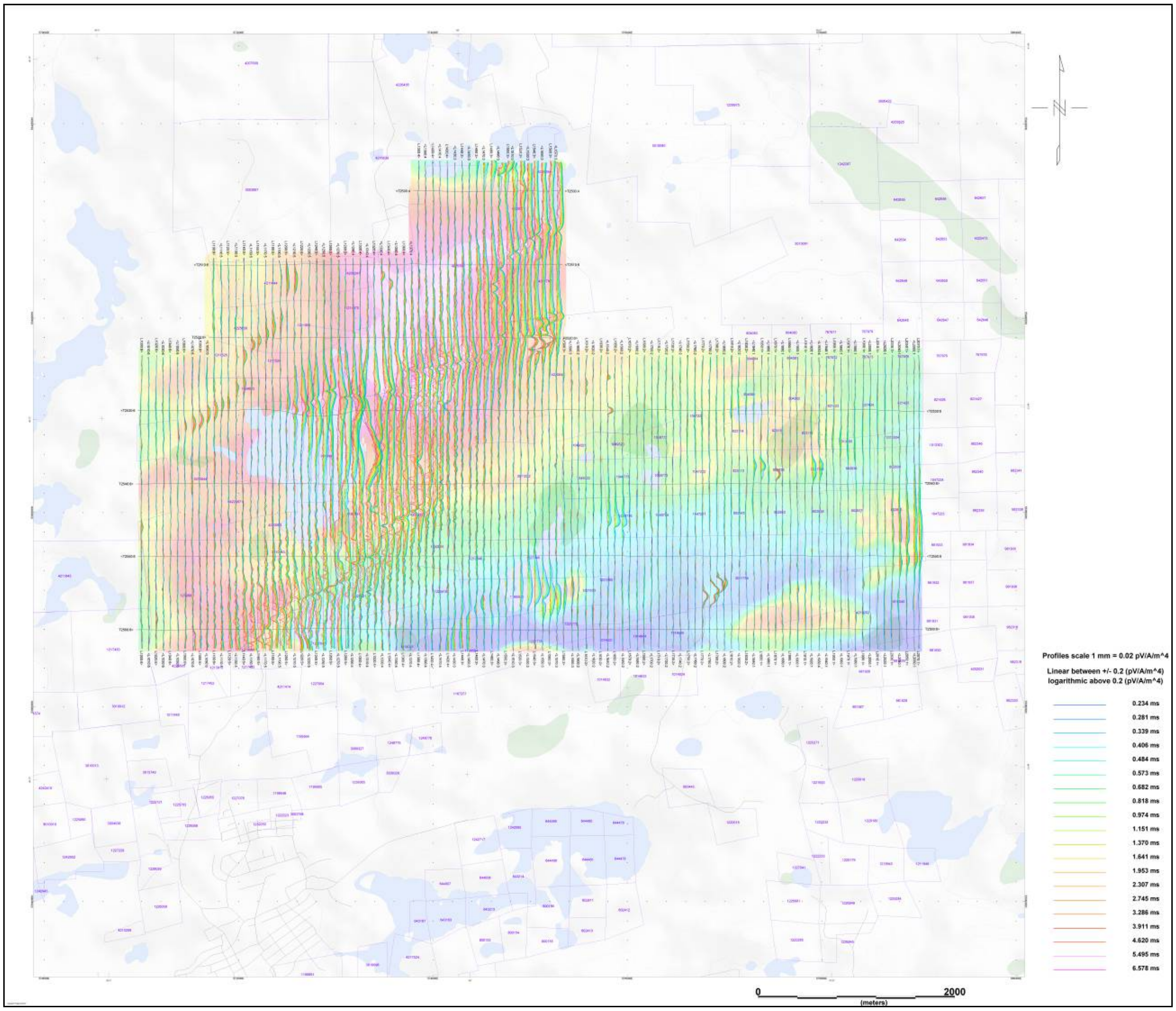
GEOPHYSICAL MAPS



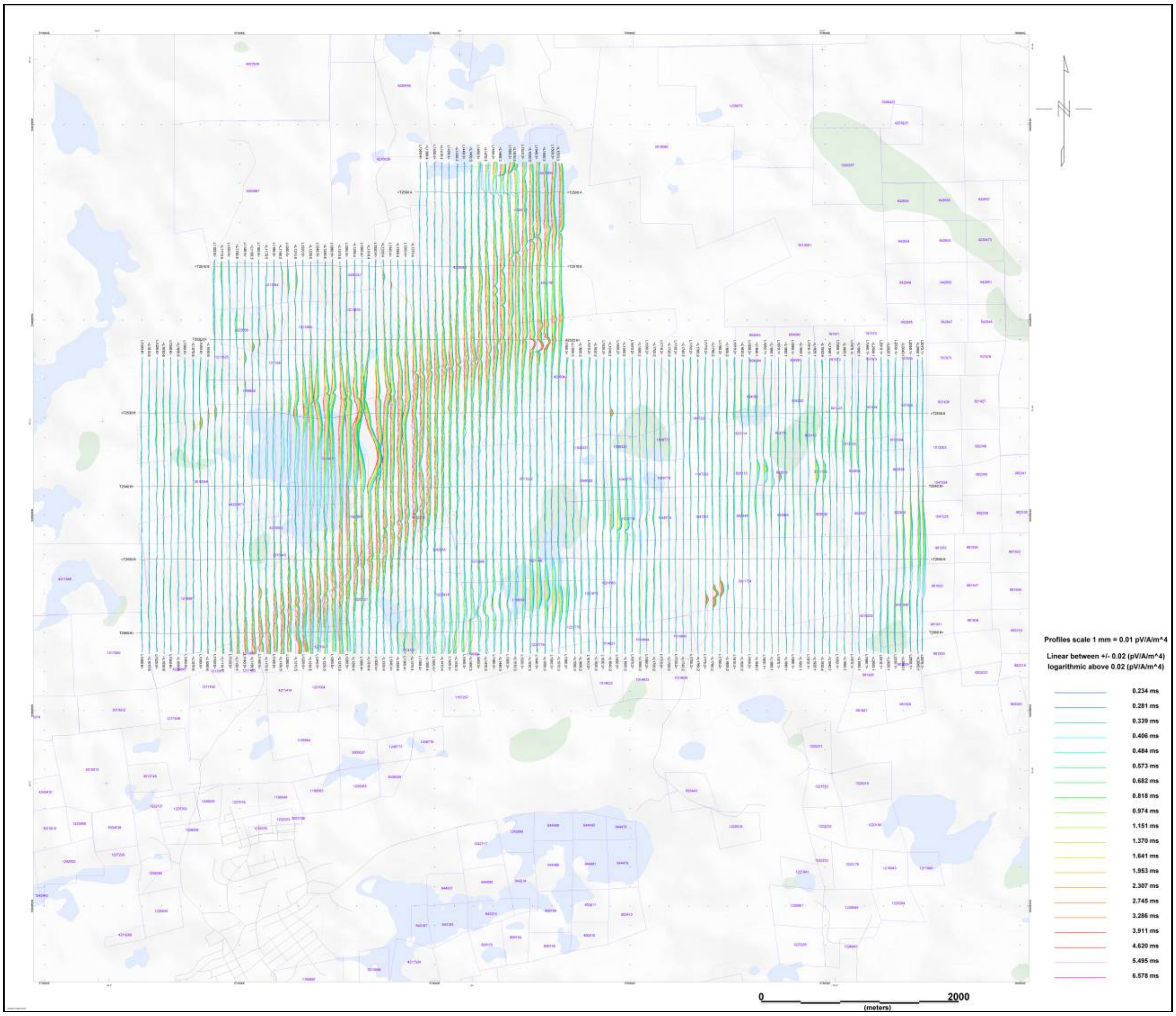
B-Field Grid - Time Gate 1.151 ms.



Total Magnetic Intensity Grid.



B-Field Profiles with TMI Color Image.



dB/dt Profiles.

APPENDIX E

GENERALIZED MODELING RESULTS OF THE VTEM SYSTEM

Introduction

The VTEM system is based on a concentric or central loop design, whereby, the receiver is positioned at the centre of a 26.1 meters diameter transmitter loop that produces a dipole moment up to 625,000 nIA at peak current. The wave form is a bi-polar, modified square wave with a turn-on and turn-off at each end. With a base frequency of 30 Hz, the duration of each pulse is approximately 6.8 milliseconds followed by an off time where no primary field is present.

During turn-on and turn-off, a time varying field is produced (dB/dt) or B-field and an electro-motive force (emf) is created as a finite impulse response. A current ring around the transmitter loop moves outward and downward as time progresses. When conductive rocks and mineralization are encountered, a secondary field is created by mutual induction and measured by the receiver at the centre of the transmitter loop.

VTEM measurements are made partly during the transmitter On but primarily during the Off-time, when only the secondary fields representing the conductive targets encountered in the ground are present. The secondary fields are displayed both as dB/dt and calculated B-field responses.

Efficient modeling of the results can be carried out on regularly shaped geometries, thus yielding close approximations to the parameters of the measured targets. The following is a description of a series of common models made for the purpose of promoting a general understanding of the measured results.

General Modeling Concepts

A set of models has been produced for the Geotech VTEM® system with explanation notes (see models C1 to C18). The reader is encouraged to review these models, so as to get a general understanding of the responses as they apply to survey results. While these models do not begin to cover all possibilities, they give a general perspective on the simple and most commonly encountered anomalies.

When producing these models, a few key points were observed and are worth noting as follows:

- For near vertical and vertical plate models, the top of the conductor is always located directly under the centre low point between the two shoulders in the classic **M** shaped response.

- As the plate is positioned at an increasing depth to the top, the shoulders of the **M** shaped response, have a greater separation distance.

- When faced with choosing between a flat lying plate and a prism model to represent the target (broad response) some ambiguity is present and caution should be exercised.

- With the concentric loop system and Z-component receiver coil, virtually all types of conductors and most geometries are most always well coupled and a response is generated. Only concentric loop systems can map these varieties of target geometries.

The Maxwell ™ EM modeling program (IMIT Technologies Ltd. Pty, Midland WA, AU) used to generate the following dB/dt and B-field off-time responses all assume a conductive plate in an infinitely resistive half-spaced host rock

Variation of Plate Depth

Geometries represented by plates of different strike length, depth extent, dip, plunge and depth below surface can be varied with characteristic parameters like conductance of the target, conductance of the host and conductivity/thickness and thickness of the overburden layer.

Diagrammatic models for a vertical plate are shown in Figures C-1 & C-2 and C-5 & C-6 at two different depths, all other parameters remaining constant. With this transmitter-receiver geometry, the classic **M** shaped response is generated. Figures C-1 and C-2 show a plate where the top is near surface. Here, amplitudes of the duel peaks are higher and symmetrical with the zero centre positioned directly above the plate. Most important is the separation distance of the peaks. This distance is small when the plate is near surface and widens with a linear relationship as the plate (depth to top) increases. Figures C-5 and C-6 show a much deeper plate where the separation distance of the peaks is much wider and the amplitudes of the channels have decreased.

Variation of Plate Dip

As the plate dips and departs from the vertical position, the peaks become asymmetrical. Figures C-3 & C-4 and C-7 and C-8 show a near surface plate dipping 80º at two different depths. Note that the direction of dip is toward the high shoulder of the response and the top of the plate remains under the centre minimum.

As the dip increases, the aspect ratio (Min/Max) decreases and this aspect ratio can be used as an empirical guide to dip angles from near 90º to about 30º. The method is not sensitive enough where dips are less than about 30º. For example, for a plate dipping 45º, the minimum shoulder starts to vanish. In Figures C-9 & C-10 and C-11 & C-12, a flat lying plate is shown, relatively near surface. Note that the twin peak anomaly has been replaced by a symmetrical shape with large, bell shaped, channel amplitudes which decay relative to the conductance of the plate.

In the special case where two plates are positioned to represent a synclinal structure. Note that the main characteristic is that the centre amplitudes are higher (approximately double) compared to the high shoulder of a single plate. This model is very representative of tightly folded formations where the conductors where once flat lying.

Variation of Prism Dip

Finally, with thicker, prism models, another algorithm is required to represent current on the plate. A plate model is considered to be infinitely thin with respect to thickness and incapable of representing the current in the thickness dimension. A prism model is constructed to deal with this problem, thereby, representing the thickness of the body more accurately.

Figures C-13 & C-14 and C-15 & C-16 show the same prism at the same depths with variable dips. Aside from the expected differences asymmetry prism anomalies show a characteristic change from a double-peaked anomaly to single peak signatures.

I. THIN PLATE

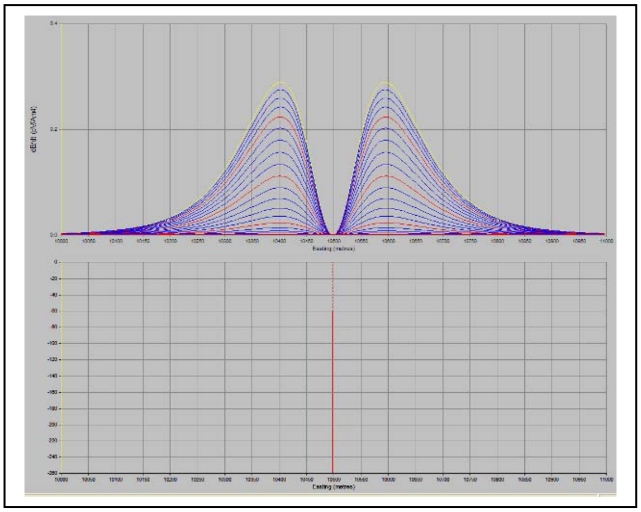


Figure C-1: dB/dt response of a shallow vertical thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

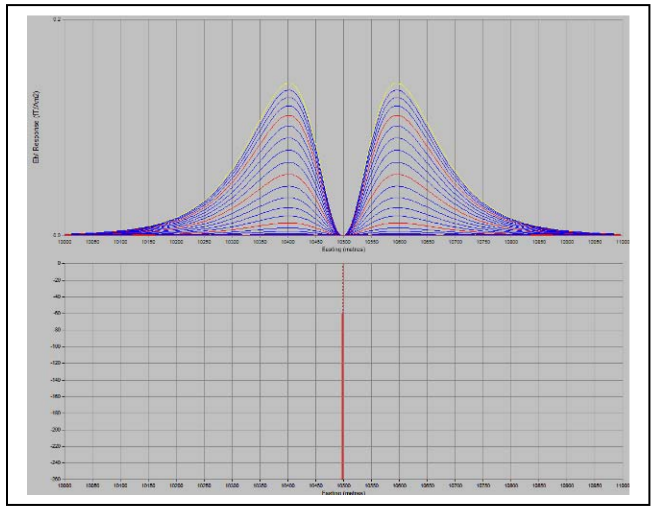


Figure C-2: B-field response of a shallow vertical thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

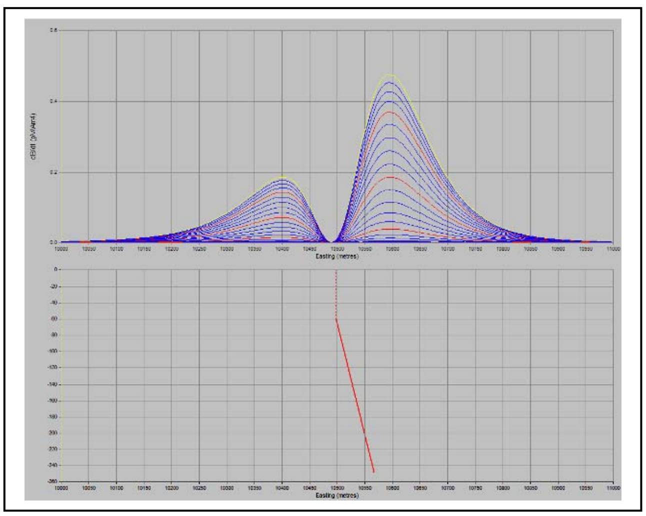


Figure C-3: dB/dt response of a shallow skewed thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

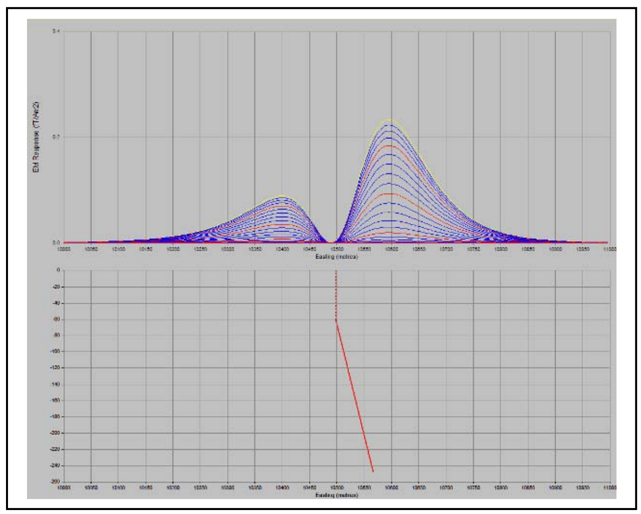
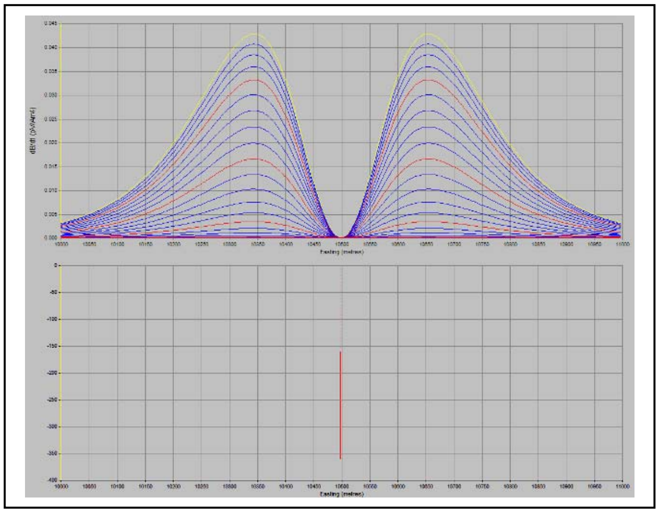


Figure C-4: B-field response of a shallow skewed thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.



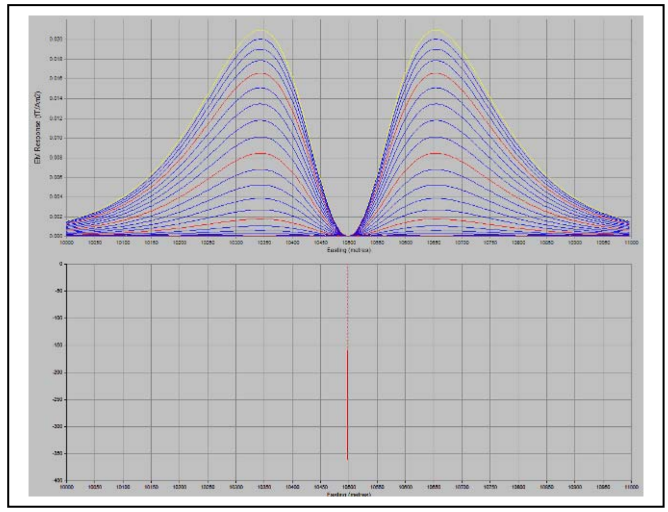
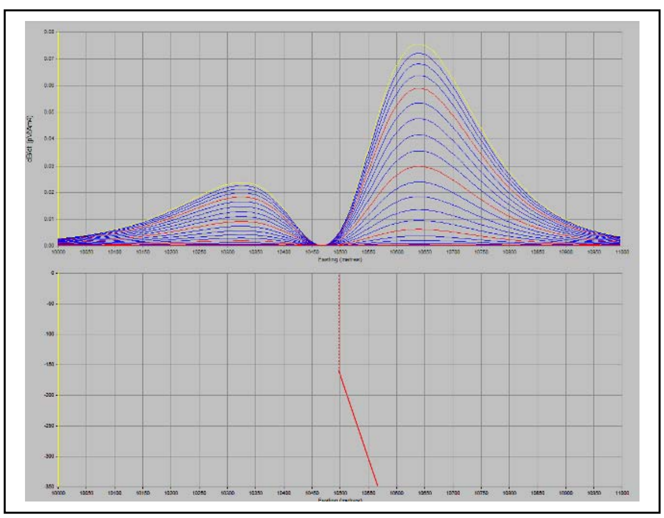


Figure C-5: dB/dt response of a deep vertical thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

Figure C-6: B-Field response of a deep vertical thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.



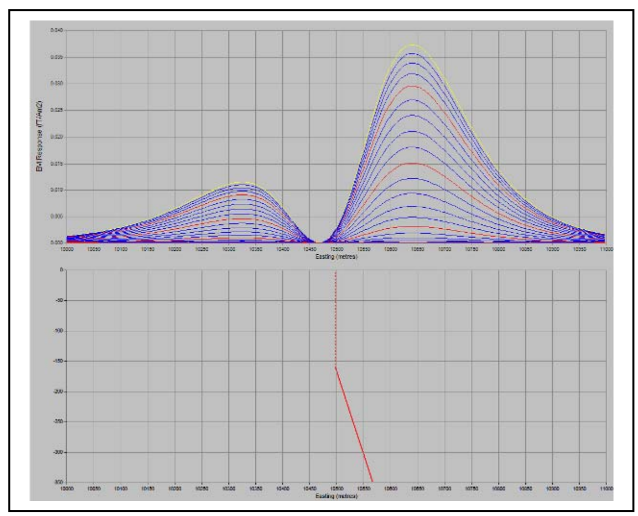


Figure C-7: dB/dt response of a deep skewed thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

Figure C-8: B-field response of a deep skewed thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.

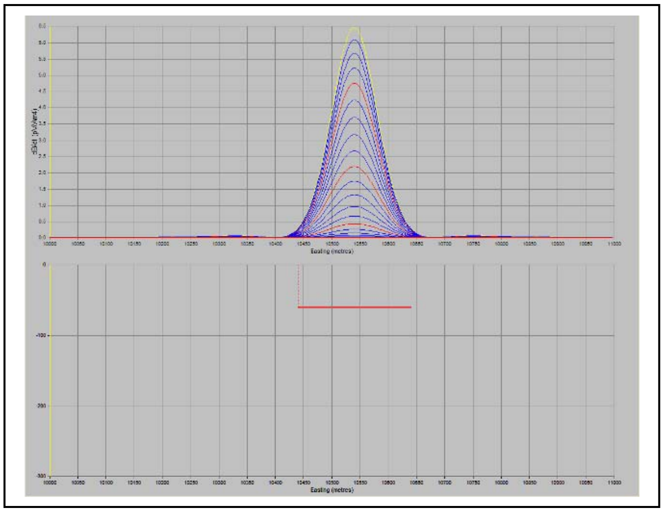


Figure C-9: dB/dt response of a shallow horizontal thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

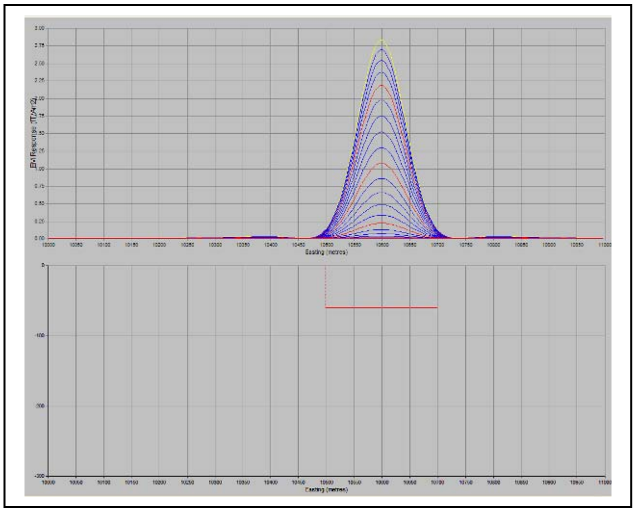


Figure C-10: B-Field response of a shallow horizontal thin plate. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

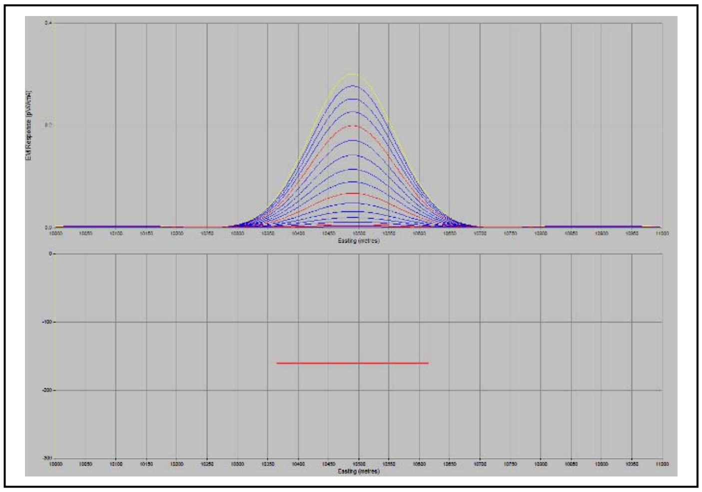


Figure C-11: dB/dt response of a deep horizontal thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

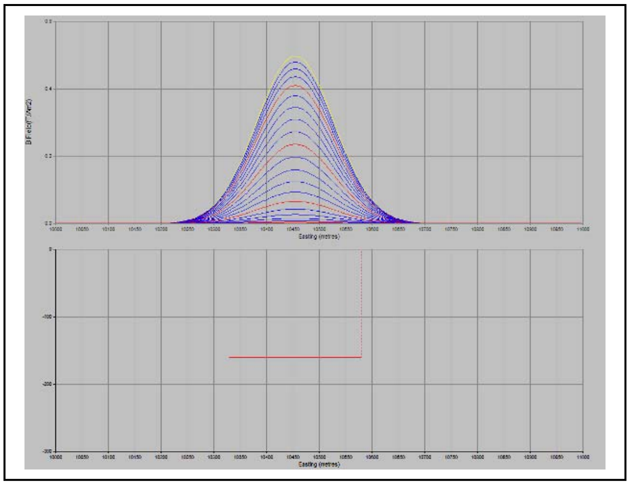


Figure C-12: B-Field response of a deep horizontal thin plate. Depth=200 m, CT=20 S. The EM response is normalized by the dipole moment.

II. THICK PLATE

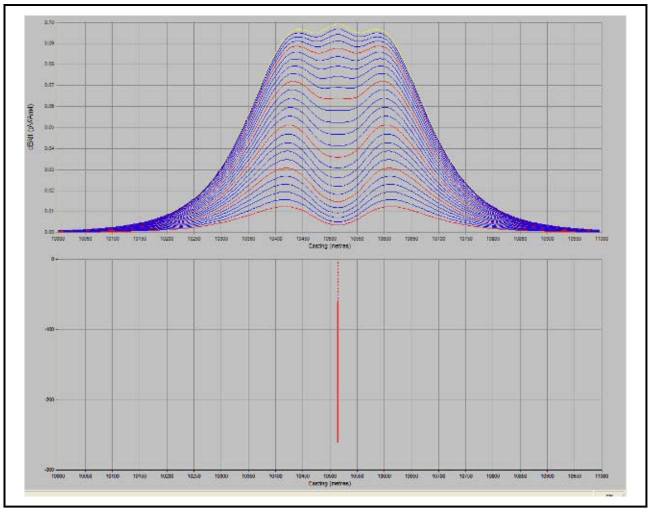


Figure C-13: dB/dt response of a shallow vertical thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment and the Rx area.

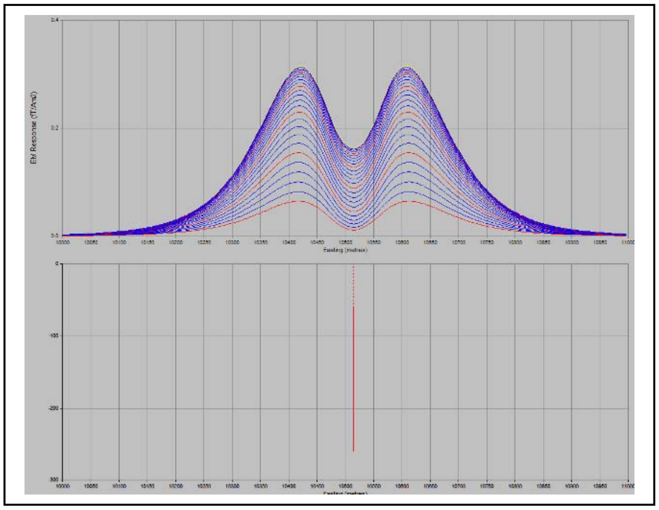


Figure C-14: B-Field response of a shallow vertical thick plate. Depth=100 m, C=12 S/m, thickness= 20 m. The EM response is normalized by the dipole moment.

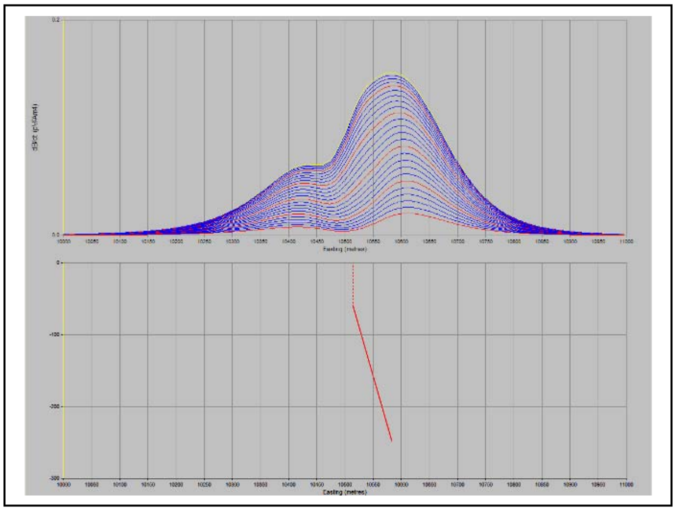


Figure C-15: dB/dt response of a shallow skewed thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment and the Rx area.

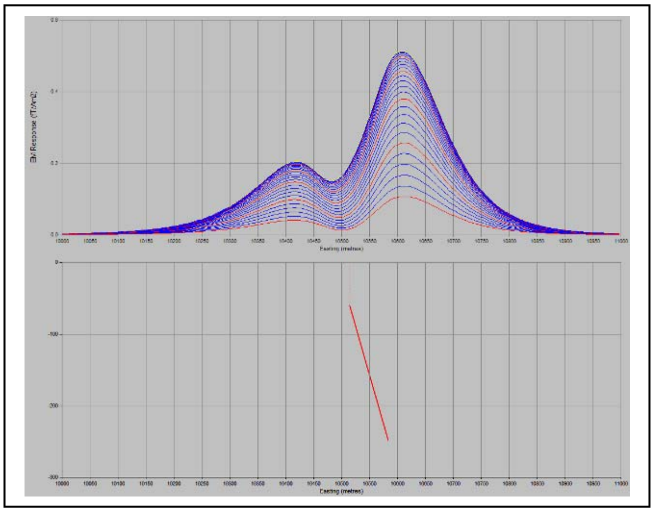


Figure C-16: B-Field response of a shallow skewed thick plate. Depth=100 m, C=12 S/m, thickness=20 m. The EM response is normalized by the dipole moment.

III. MULTIPLE THIN PLATES

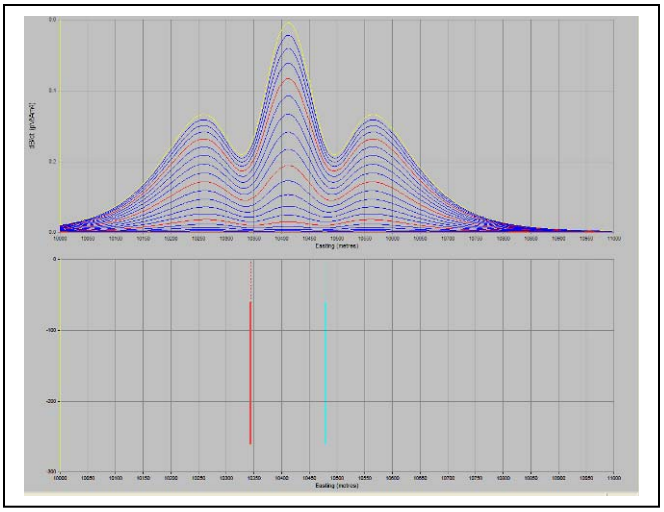


Figure C-17: dB/dt response of two vertical thin plates. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment and the Rx area.

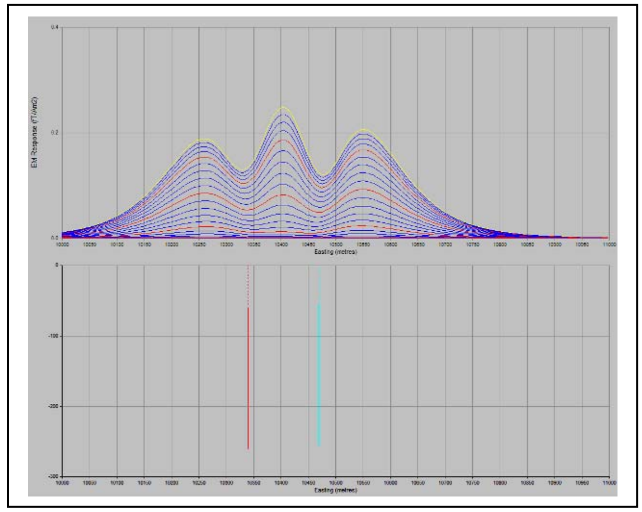


Figure C-18: B-Field response of two vertical thin plates. Depth=100 m, CT=20 S. The EM response is normalized by the dipole moment.

General Interpretation Principals

Magnetics

The total magnetic intensity responses reflect major changes in the magnetite and/or other magnetic minerals content in the underlying rocks and unconsolidated overburden. Precambrian rocks have often been subjected to intense heat and pressure during structural and metamorphic events in their history. Original signatures imprinted on these rocks at the time of formation have, it most cases, been modified, resulting in low magnetic susceptibility values.

The amplitude of magnetic anomalies, relative to the regional background, helps to assist in identifying specific magnetic and non-magnetic rock units (and conductors) related to, for example, mafic flows, mafic to ultramafic intrusives, felsic intrusives, felsic volcanics and/or sediments etc. Obviously, several geological sources can produce the same magnetic response. These ambiguities can be reduced considerably if basic geological information on the area is available to the geophysical interpreter.

In addition to simple amplitude variations, the shape of the response expressed in the wave length and the symmetry or asymmetry, is used to estimate the depth, geometric parameters and magnetization of the anomaly. For example, long narrow magnetic linears usually reflect mafic flows or intrusive dyke features. Large areas with complex magnetic patterns may be produced by intrusive bodies with significant magnetization, flat lying magnetic sills or sedimentary iron formation. Local isolated circular magnetic patterns often represent plug-like igneous intrusives such as kimberlites, pegmatites or volcanic vent areas.

Because the total magnetic intensity (TMI) responses may represent two or more closely spaced bodies within a response, the second derivative of the TMI response may be helpful for distinguishing these complexities. The second derivative is most useful in mapping near surface linears and other subtle magnetic structures that are partially masked by nearby higher amplitude magnetic features. The broad zones of higher magnetic amplitude, however, are severely attenuated in the vertical derivative results. These higher amplitude zones reflect rock units having strong magnetic susceptibility signatures. For this reason, both the TMI and the second derivative maps should be evaluated together.

Theoretically, the second derivative, zero contour or color delineates the contacts or limits of large sources with near vertical dip and shallow depth to the top. The vertical gradient map also aids in determining contact zones between rocks with a susceptibility contrast, however, different, more complicated rules of thumb apply.

Concentric Loop EM Systems

Concentric systems with horizontal transmitter and receiver antennae produce much larger responses for flat lying conductors as contrasted with vertical plate-like conductors. The amount of current developing on the flat upper surface of targets having a substantial area in this dimension, are the direct result of the effective coupling angle, between the primary magnetic field and the flat surface area. One therefore, must not compare the amplitude/conductance of responses generated from flat lying bodies with those derived from near vertical plates; their ratios will be quite different for similar conductances.

Determining dip angle is very accurate for plates with dip angles greater than 30º. For angles less than 30º to 0º, the sensitivity is low and dips can not be distinguished accurately in the presence of normal survey noise levels.

A plate like body that has near vertical position will display a two shoulder, classic **M** shaped response with a distinctive separation distance between peaks for a given depth to top.

It is sometimes difficult to distinguish between responses associated with the edge effects of flat lying conductors and poorly conductive bedrock conductors. Poorly conductive bedrock conductors having low dip angles will also exhibit responses that may be interpreted as surfacial overburden conductors. In some situations, the conductive response has line to line continuity and some magnetic correlation providing possible evidence that the response is related to an actual bedrock source.

The EM interpretation process used, places considerable emphasis on determining an understanding of the general conductive patterns in the area of interest. Each area has different characteristics and these can effectively guide the detailed process used.

The first stage is to determine which time gates are most descriptive of the overall conductance patterns. Maps of the time gates that represent the range of responses can be very informative.

Next, stacking the relevant channels as profiles on the flight path together with the second vertical derivative of the TMI is very helpful in revealing correlations between the EM and Magnetics.

Next, key lines can be profiled as single lines to emphasize specific characteristics of a conductor or the relationship of one conductor to another on the same line. Resistivity Depth sections can be constructed to show the relationship of conductive overburden or conductive bedrock with the conductive anomaly.

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Roger Barlow
Consultant

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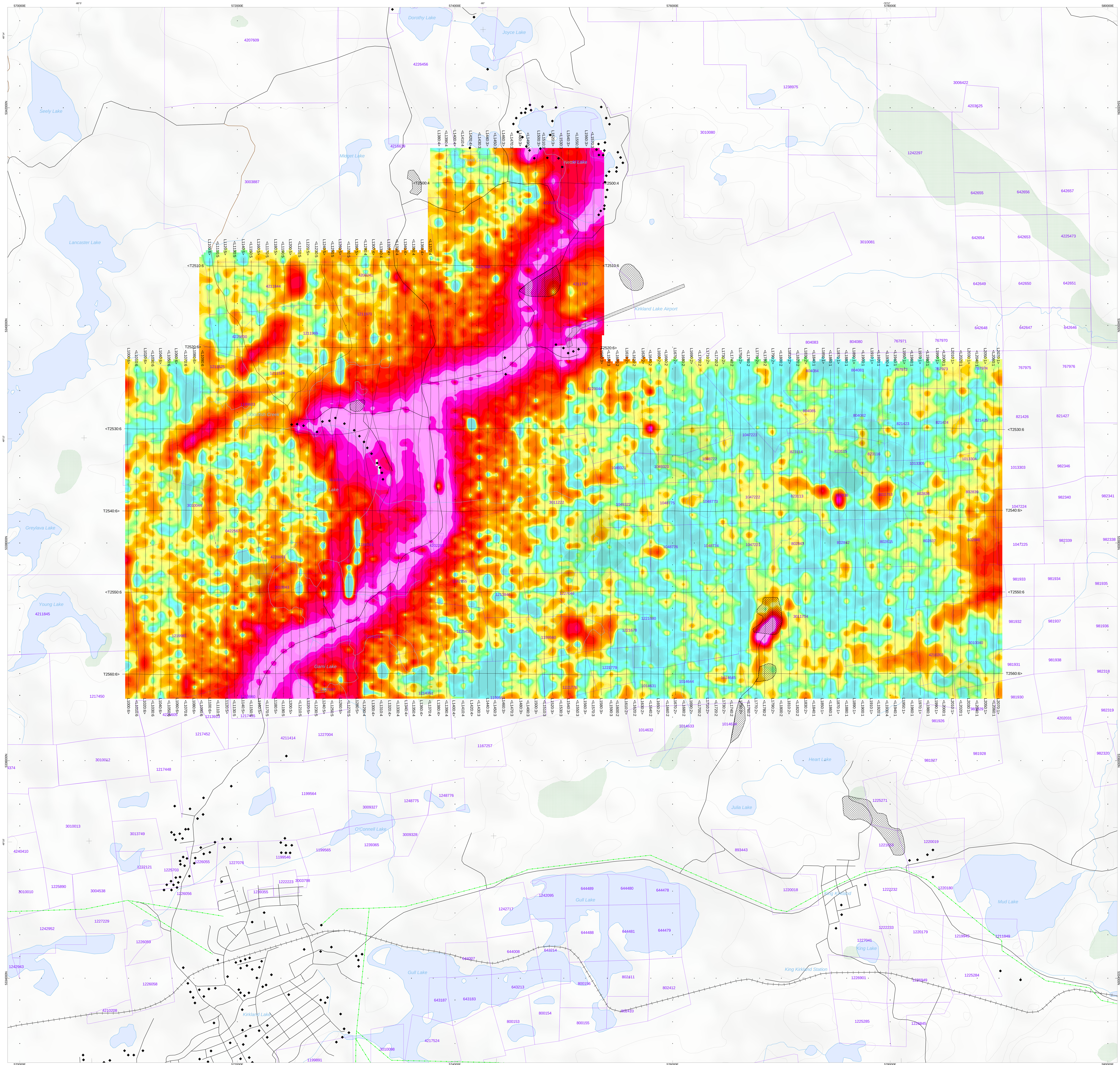
Nasreddine Bournas, P. Geo.
Geophysicist
Geotech Ltd.

August 2008



SURVEY SPECIFICATIONS:
Survey Date: August 1st to 5th, 2008
Survey Base: Kirkland Lake, Ontario
Aircraft: Aerospatiale A-Star 350 B2 (c-FDEV)
Nominal Survey Line Spacing: 75 Meters
Nominal Survey Line Direction: N 0° E
Nominal Tie Line Spacing: 750 Meters
Nominal Tie Line Direction: N 90° E
Nominal Terrain Clearance: 76 Meters
EM Loop: Towed at a mean distance of 35 meters below the Helicopter
Magnetic Sensor: Towed at a mean distance of 13 meters below the Helicopter

INSTRUMENTS
Geotech Time Domain Electromagnetic System (VTEM)
Concentric Rx/Tx Geometry
Transmitter Loop: Diameter 26 Meters,Base Frequency 30 Hz
Dipole Moment: 365,000 nIA
Transmitter Wave Form: Trapezoid, Pulse Width 7.2 ms.
Geometrics High Sensitivity Cesium Magnetometer
Mag Resolution: 0.02 nT at 10 samples/sec

MAP PROJECTION
Datum: NAD 83
Projection: Universal Transverse Mercator
Central Meridian: 81°W (Zone 17)
Central Scale Factor: 0.9996
False Easting/Northing: 500,000m/0m
Major Axis: 6378137.000
Eccentricity: 0.081819191
042A01 & 032D04

B-field 1.151 ms
(pV*ms)/(A*m^4)

TOPOGRAPHIC LEGEND:
Buildings
Utility Lines
Railways
contours
Rivers
Roads
Lakes
Wetlands
Mining Areas
Ontario Mining Claims

Scale 1:10000
100 0 100 200 300 400 500
(meters)
NAD83 / UTM zone 17N

The topographic data base was derived from 1:50000 NRC (Natural Resources Canada) NTDB data
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Mining Claims are derived from Ontario Ministry of Northern Development and Mines
(www.geocomm.com)(www.geogratis.ca)(http://www.mndm.gov.on.ca)

Northern Gold Mining Inc.
Kirana Project
Kirkland Lake, Ontario

Geotech VTEM System
B-Field Time Gate 1.151 ms

Flown and processed by Geotech Ltd.
245 Industrial Parkway North,
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

August 2008

GEOTECH LTD.

SURVEY SPECIFICATIONS:
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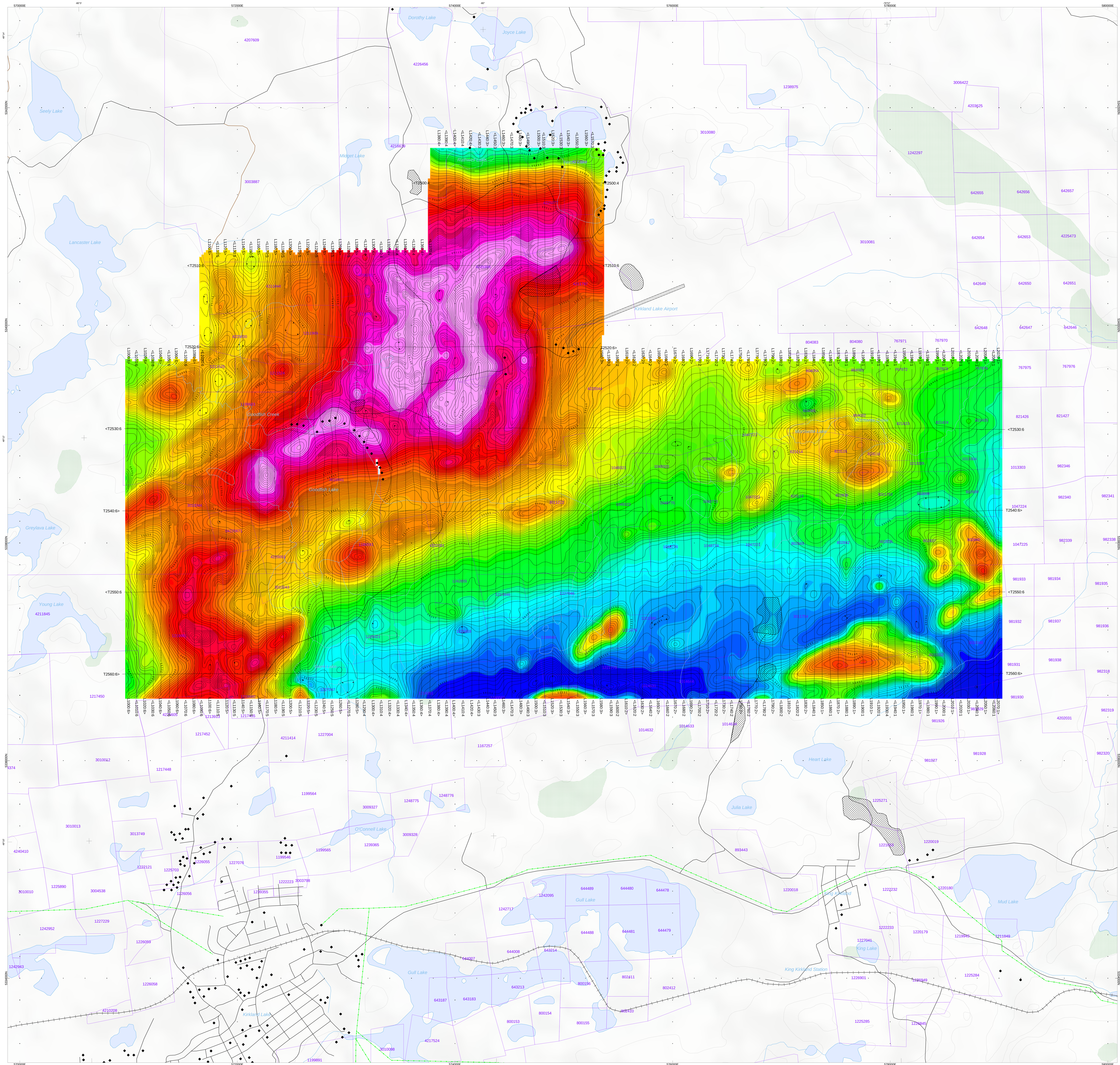

TMI Contour Intervals:
- 10 nT
- 50 nT
- 100 nT

TOPOGRAPHIC LEGEND:
- Buildings
- Utility Lines
- Railways
- contours
- Rivers
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- Lakes
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Scale 1:10000

100 0 100 200 300 400 500

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Northern Gold Mining Inc.
Kirana Project
Kirkland Lake, Ontario

Geotech VTEM System
Total Magnetic Intensity

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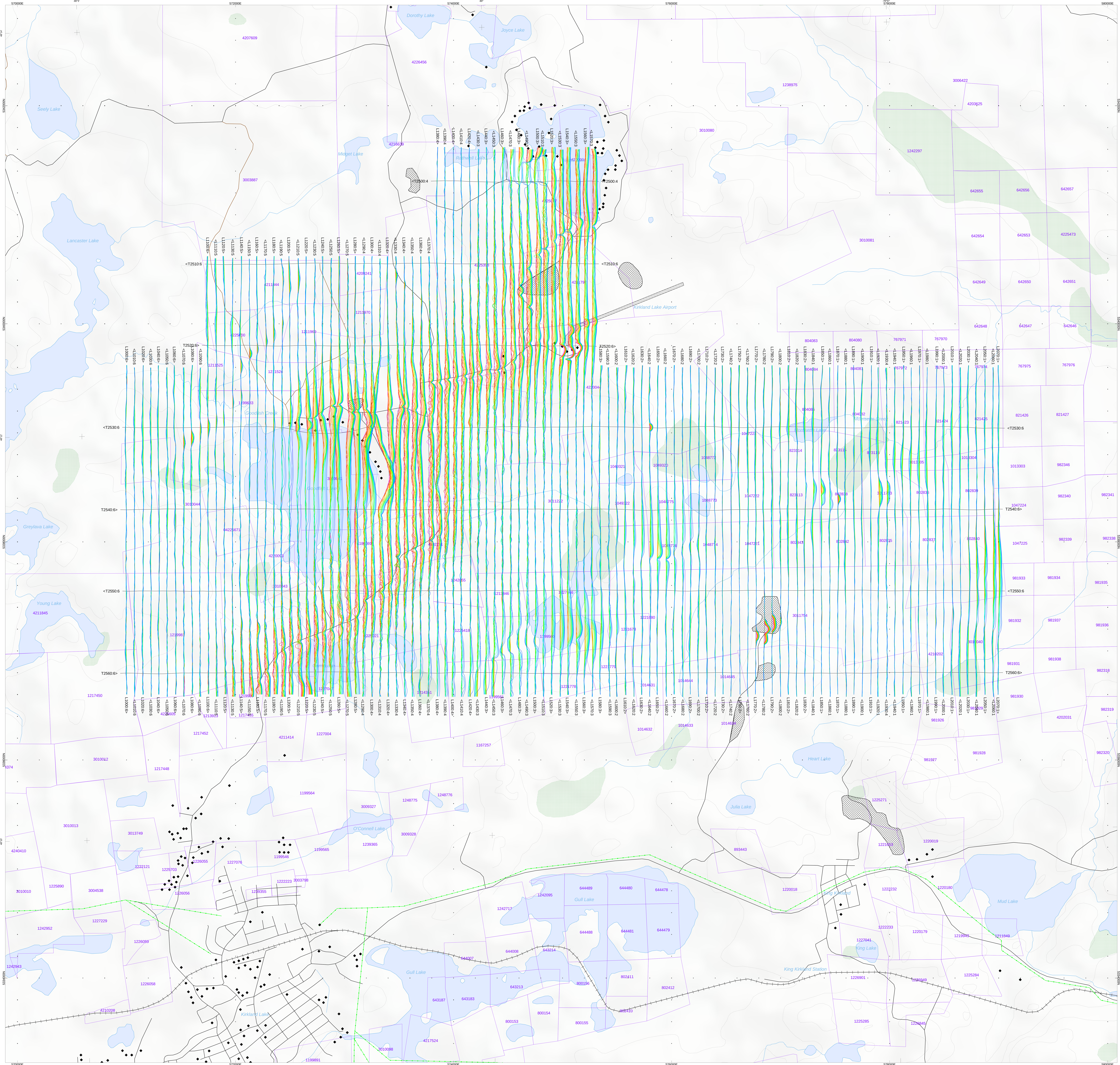
August 2008



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- 042A01 & 032D04

Profiles scale 1 mm = 0.01 pV/A/m^4

Linear between +/- 0.02 (pV/A/m^4)
logarithmic above 0.02 (pV/A/m^4)

0.234 ms
0.281 ms
0.339 ms
0.406 ms
0.484 ms
0.573 ms
0.682 ms
0.818 ms
0.974 ms
1.151 ms
1.370 ms
1.641 ms
1.953 ms
2.307 ms
2.745 ms
3.286 ms
3.911 ms
4.620 ms
5.495 ms
6.578 ms

TOPOGRAPHIC LEGEND:
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- Railways
- contours
- Rivers
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- Mining Areas
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100 0 100 200 300 400 500

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Northern Gold Mining Inc.
Kirana Project
Kirkland Lake, Ontario

Geotech VTEM System
dB/dt Profiles
Time Channels 0.234 - 6.578 ms

Flown and processed by Geotech Ltd.
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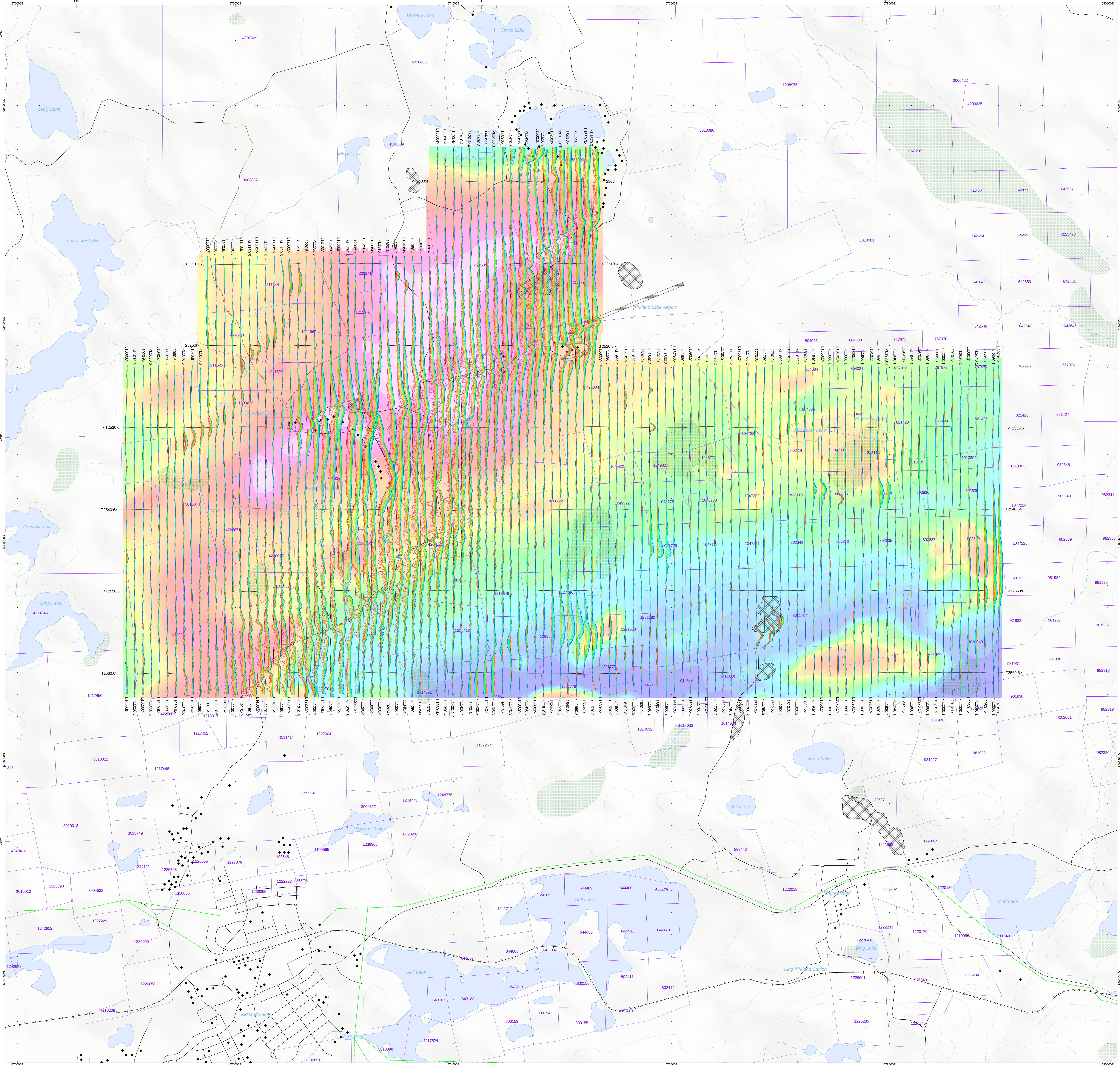
Aurora, Ontario, Canada L4G 4C4
www.geotech.ca

August 2008



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Geotech VTEM System
B-Field Profiles
Time Channels 0.234 - 6.578 ms
Over Total Magnetic Intensity

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