EL 29/2009 Cethana

Annual Report on Exploration Activity

September 2010 to September 2011

Frontier Resources Ltd

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1.0 Summary

Frontier Resources Limited's strategic plan is to develop a stand alone mining and milling operation in the Cethana/Moina region in Tasmania's central north based around a central mill and a number of smaller satellite orebodies.

Exploration in the 2010/2011 period consisted of two bodies of work.

- Existing high resolution geophysics (aeromagnetics, radiometrics and gravity) was processed and imaged.
- 1057 soil samples as part of a regional 1271 sample 100m x 50m soil sampling programme.

Imaged helimagnetics (Jervois 1995 data) has defined a numerous of discrete magnetic highs in geologically favourable settings, a number of whom are known to host skarn mineralization.

Soil sampling has been very successful in defining numerous coherent Au, W, Sn, Bi, Mo, Cu, Pb, Zn, Nb and Y soil anomalies in a number of combinations.

EL 29/2009 will be a major focus of exploration by Frontier in the coming term with gridding/flagging of a (proposed) ~35 square kilometre 3D IP survey extending from Round Mountain in the east through to Stormont in the west and taking in ~20+ square kilometres in EL 29/2009.

Results of this survey will be considered in the light of other data sets, particularly magnetics, and drill targets defined.

2.0 Introduction

2.1 Tenure

EL 29/2009 (Cethana), was granted on 12th September, 2009 as a result of a successful tender under the ERA system. In mid 2011 a 500m wide zone was added to the central southern part of the licence.

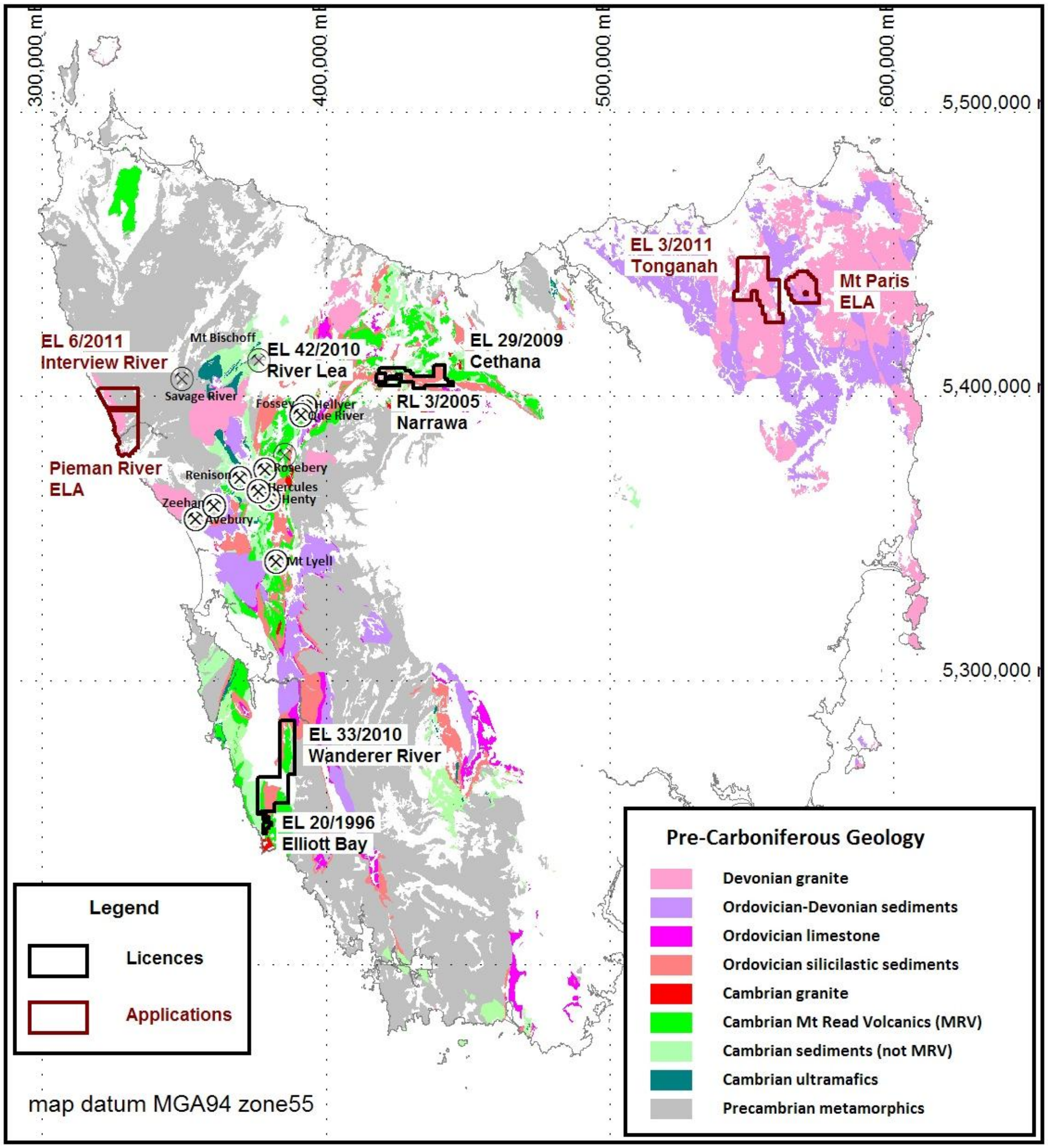

Figure 1. Frontier's Tasmanian tenements and applications (as at May 2011) showing location of EL 29/2009 Cethana in the central north. Map datum is AGD66 zone 55.

2.2 Location/access

The licence lies in Tasmania's central north.

Access to the licence is via B grade bitumen roads. Access within the licence is reasonable in the prospective western half, less so in the eastern half.

2.3 Topography/land uasge

The terrain is rugged and forested for the most part and includes Mt Roland and the Fossey Mountains though these peaks are not prospective. The licence covers a range of land usages. Much of the tenement is crown land and/or forestry.

3.0 Geology

The following is a potted geological history of the licence.

Cambrian calc-alkaline volcanics and associated sediments and intrusive porphyries and granite were deposited/intruded in marine conditions on the northern margin of a Precambrian metasediment hinterland. Uplift of this hinterland in the late Cambrian/early Ordovician followed or accompanied cessation of volcanism with some associated deformation (folding) also affecting the Cambrian rocks.

In the early Ordovician large volumes of siliciclastic sediment derived from this hinterland were deposited unconformably on the volcanics. Changes in sea levels saw sedimentation become more marine with marly sediments followed by limestone.

In the Middle Devonian Tabberrabberran Orogeny the region underwent deformation. The first phase of deformation produced the very broad open (~10km wavelength) east-west trending syncline which occupies most of the region west of Lake Cethana. The region was then put under southwest directed compression with associated folding, thrusting, strike slip faulting and the intrusion of the Dolcoath Granite. This latter phase produced the smaller scale (wavelengths tens to few hundreds of metres) northwest to north-northwest trending folds in which skarn mineralization occurs at Stormont. It also created the regionally significant Machinery Creek thrust fault (associated with Round Mt. base metal/gold mineralization) and associated smaller thrusts.

Emplacement of the Dolcoath Granite occurred late in the orogeny The granite is highly fractionated and fertile and introduced W, Mo, Bi, Sn into discrete quartz veins and in griesen style on the granite margin. It also sent hydrothermal fluids along faults until reactive transition bed were encountered.

Nothing much happened geologically until the Tertiary when basalt (Tb) and intercalated sediments Ts) were deposited. In the Moina Project area this basalt/sediment forms a veneer <100m thick.

Most mineralisation accompanied emplacement of the Dolcoath granite in the Devonian though there is speculation that the intruding granite may have partly stoped out or at least remobilized existing Cambrian mineralization of a VHMS character.

4.0 Exploration Philosophy

Frontier Resources Limited's strategic plan is to develop a stand alone mining and milling operation in the Cethana/Moina region in Tasmania's central north based around a central mill and a number of smaller satellite orebodies. The Narrawa Resource (Higgs mine) of 209,330 tonnes @ 2.1g/t Au, 19.5g/t Ag, 1.32% Pb and 1.12% Zn is one of two such resources Frontier is developing, the other being the Stormont deposit with its resource of 91,400 tonnes @ 4.57g/t Au, 3.52g/t Ag and 0.30% Bi.

The fertile Dolcoath Granite has generated mineralization of a range of commodites and in a range of styles from skarn, griesen, vein and stockwork. Frontier's Cethana project takes in most of the prospective ground over and around the Dolcoath Granite and is a major focus of Frontier's exploration. Understanding the role played by this granite including 3D modellng is an underlying theme in Frontier's exploration in the area.

As at least one major target style, gold skarn, is commonly associated with magnetite, Frontier is utilizing existing high quality geophysical data, particularly magnetics, to help target exploration.

Near surface lower grade higher tonnage, or undiscovered high grade deposits should be expressed in soil geochemical sampling. Frontier has acquired a desktop XRF analytical machine in order to conduct soil analysis in-house.

Lastly, Frontier is committed to ongoing drilling through its own drill rigs and drilling crews.

5.0 Previous Exploration

.A thorough summary of previous exploration is in progress and will hopefully be included in next years annual report.

6.0 Exploration Completed May 2010 to April 2011

6.1 Introduction

Exploration in the 2010/2011 period consisted of two bodies of work.

- Existing high resolution geophysics, aeromagnetics, gravity and radiometrics was processed and imaged.
- 1057 soil samples were collected on a nominally 100m x 50m grid (1271 samples in total including sampling on adjacent RL 3/2005.

6.2 Geophysics

A number of targeted styles of mineralization are associated with magnetite, and in particular gold skarns, a principal target style.

6.2.1 Work done

Helimagnetics data acquired by Jervois in 1995 is high resolution (50m line spacing).. This data was processed by Phil Muir, geophysicist of Blackman’s Bay, and images of total magnetic intensity, 1st vertical and 2nd vertical derivatives.

Existing gravity data and the radiometrics data from the 2001 Western Tasmanian survey was also acquired, enhanced and imaged.

6.2.2 Results

Images generated by Phil Muir are presented herein as figures 3 to 13.

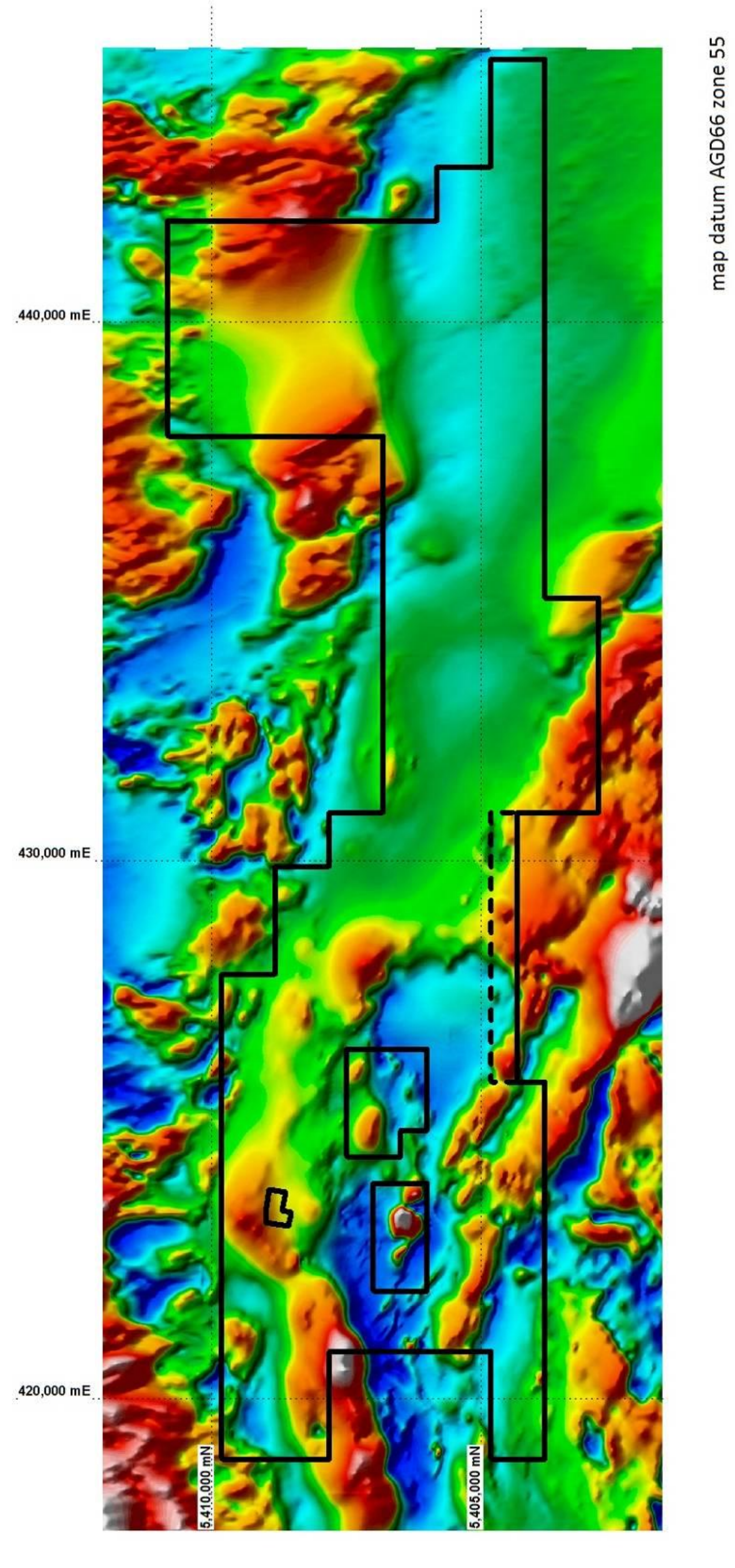

Figure 2: Aeromagnetics Total magnetic intensity

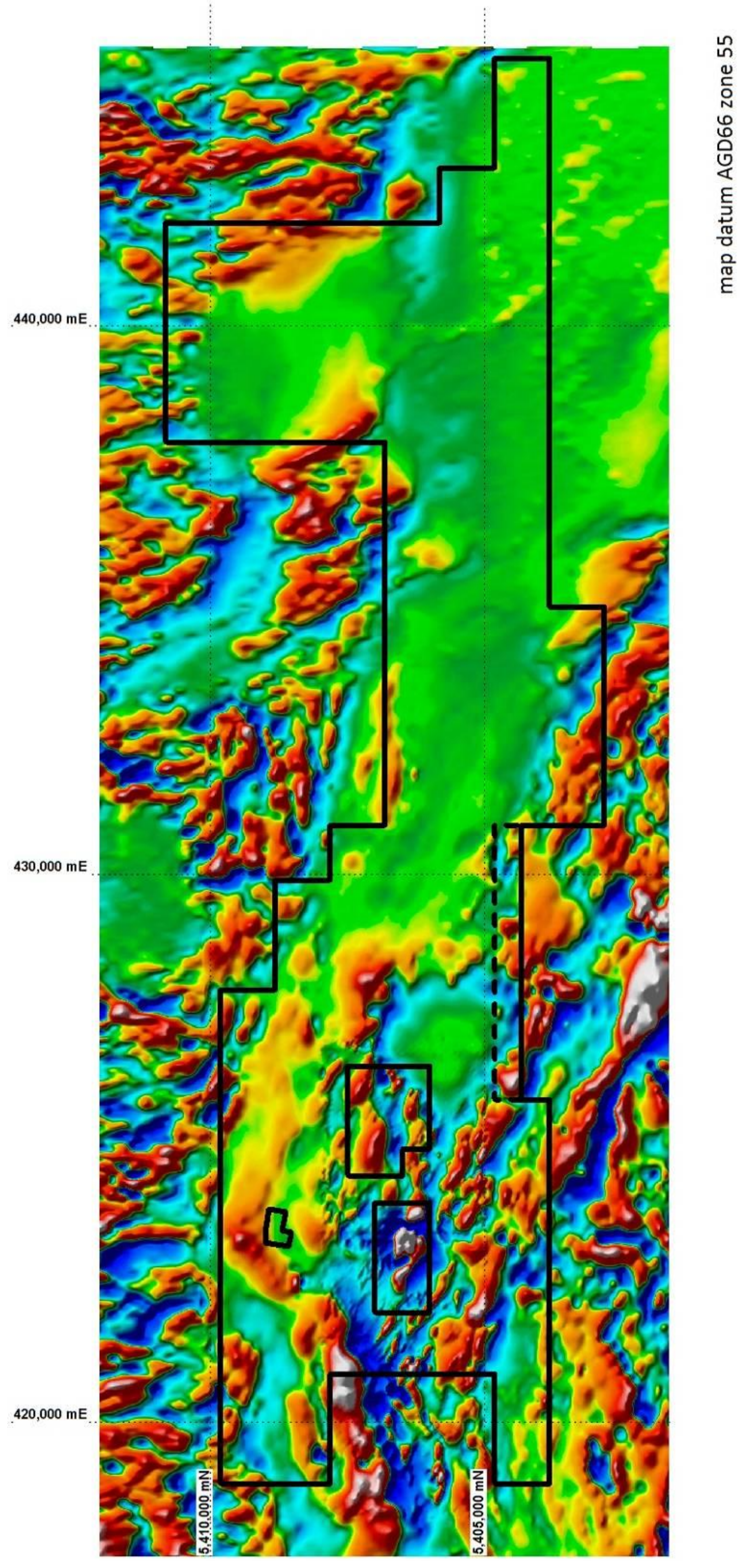

Figure 3: Aeromagnetics 1st vertical derivative

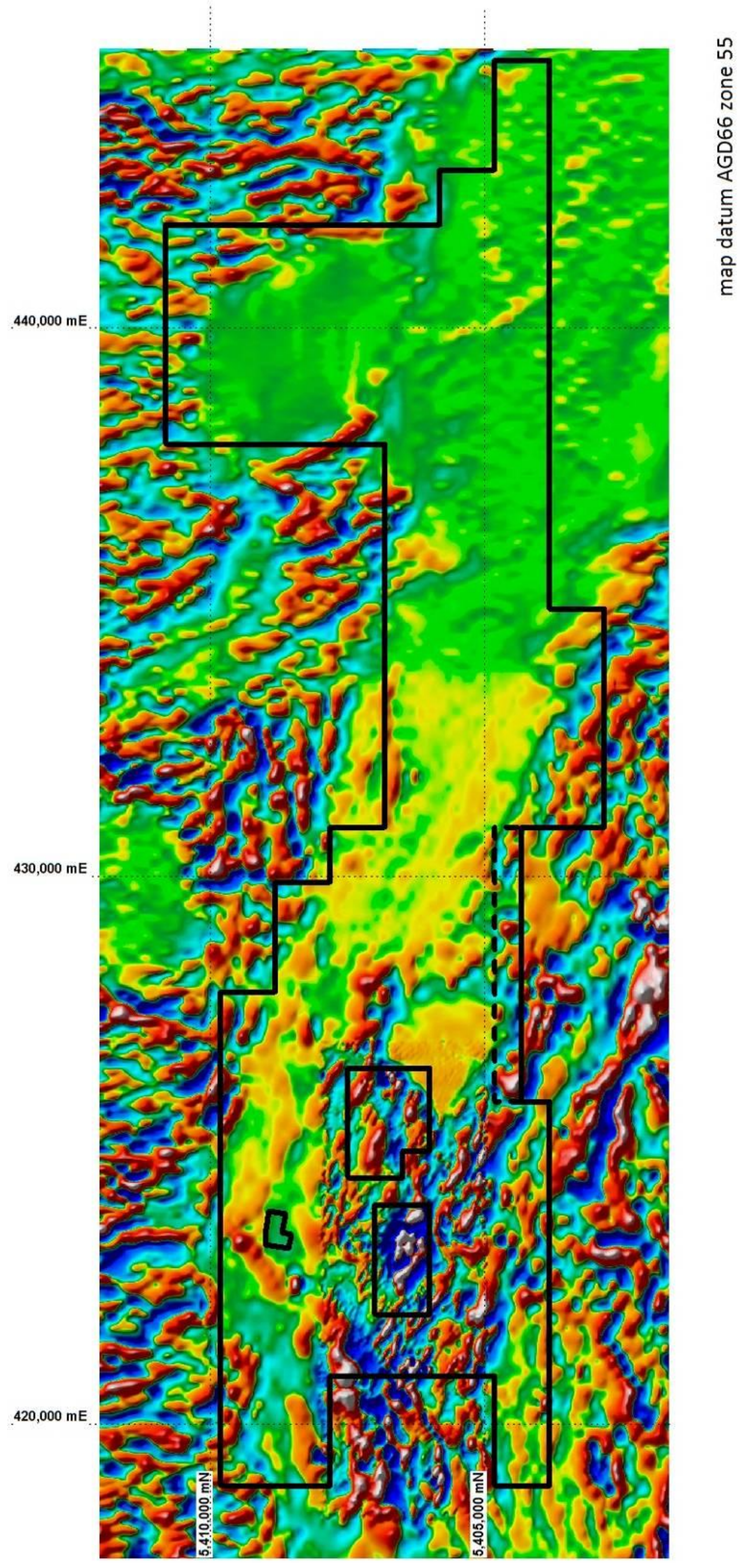

Figure 4: Aeromagnetics 2nd vertical derivative

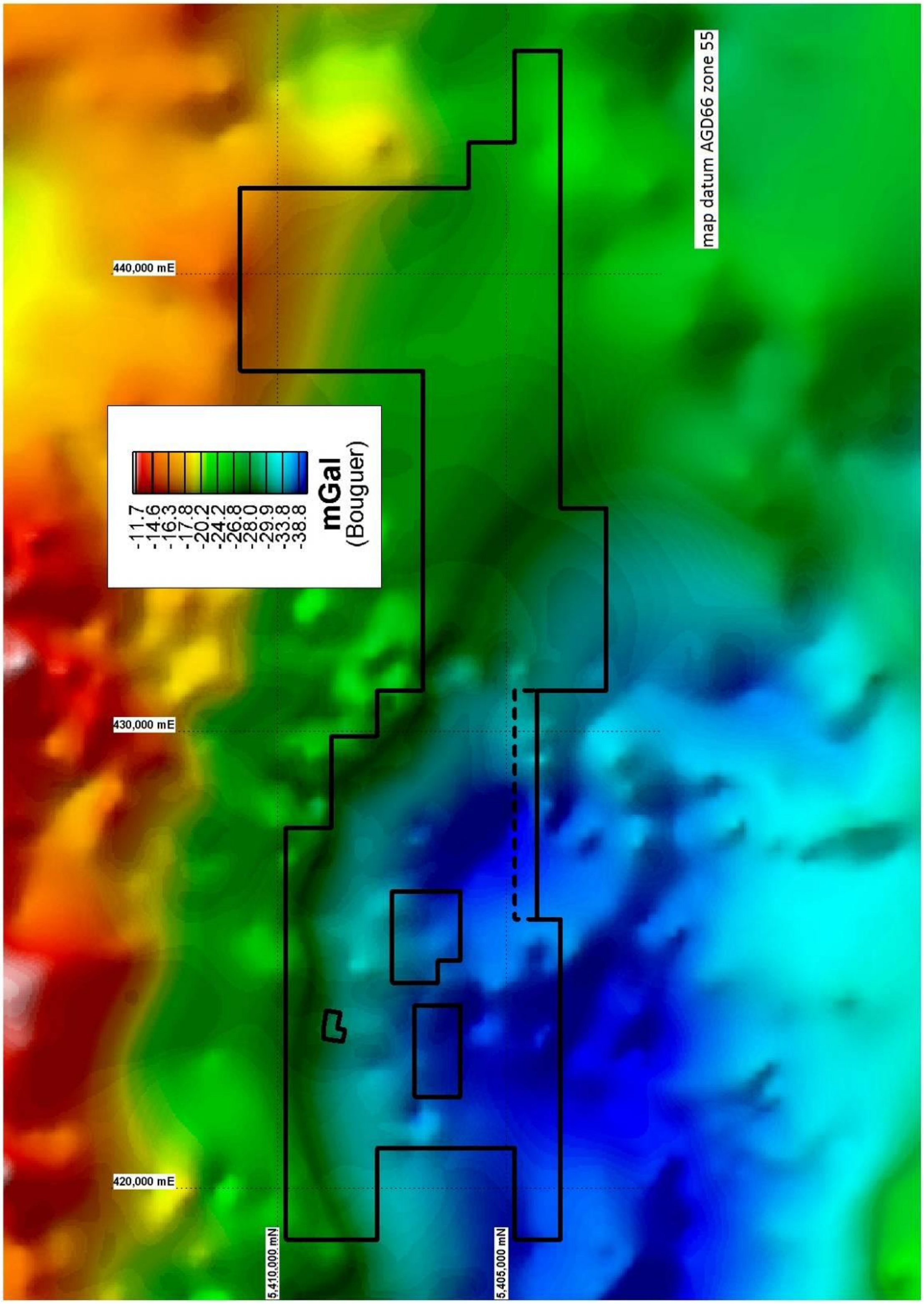

Figure 5: Gravity bouger

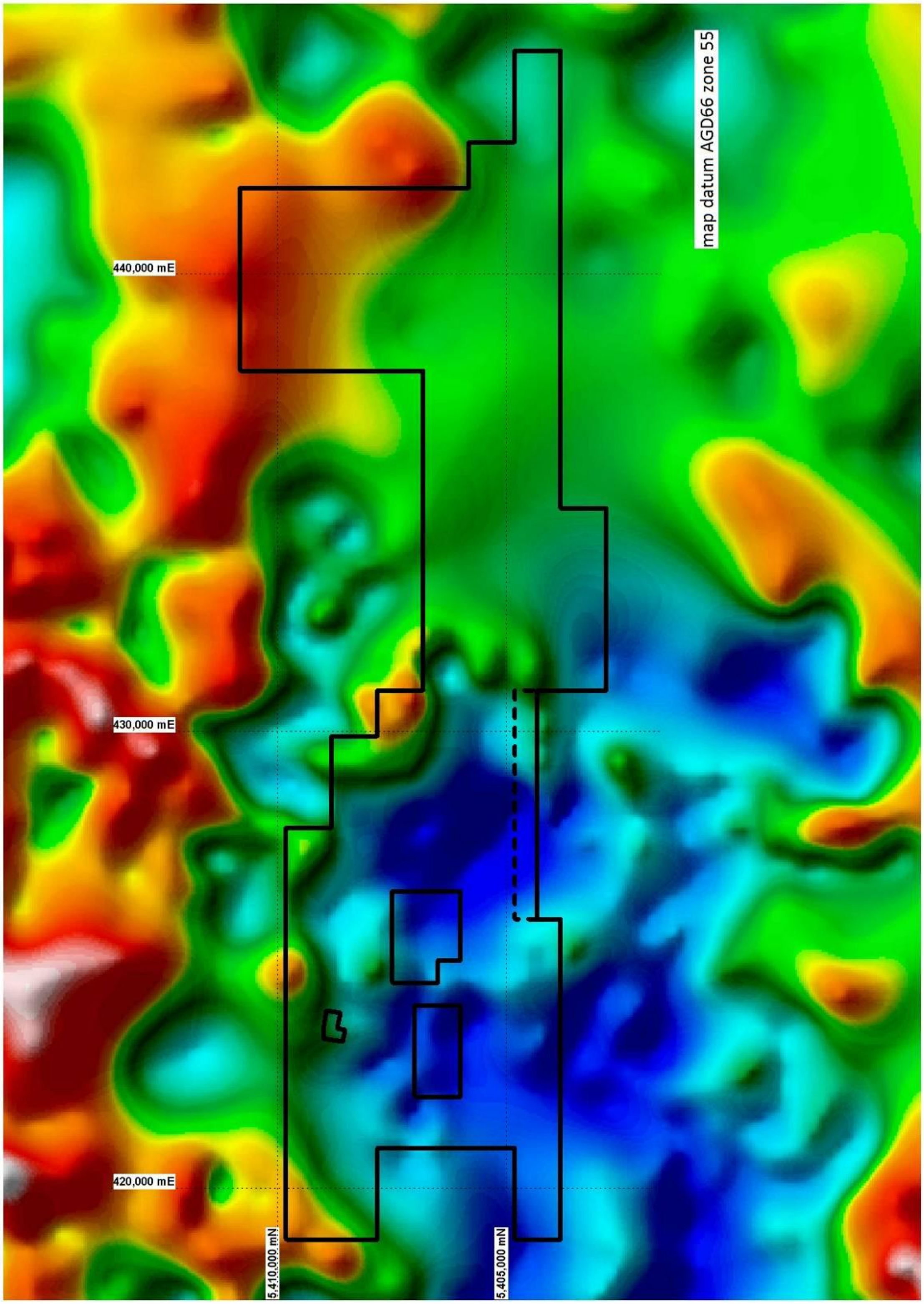

Figure 6: Gravity bouger 1st vertical derivative

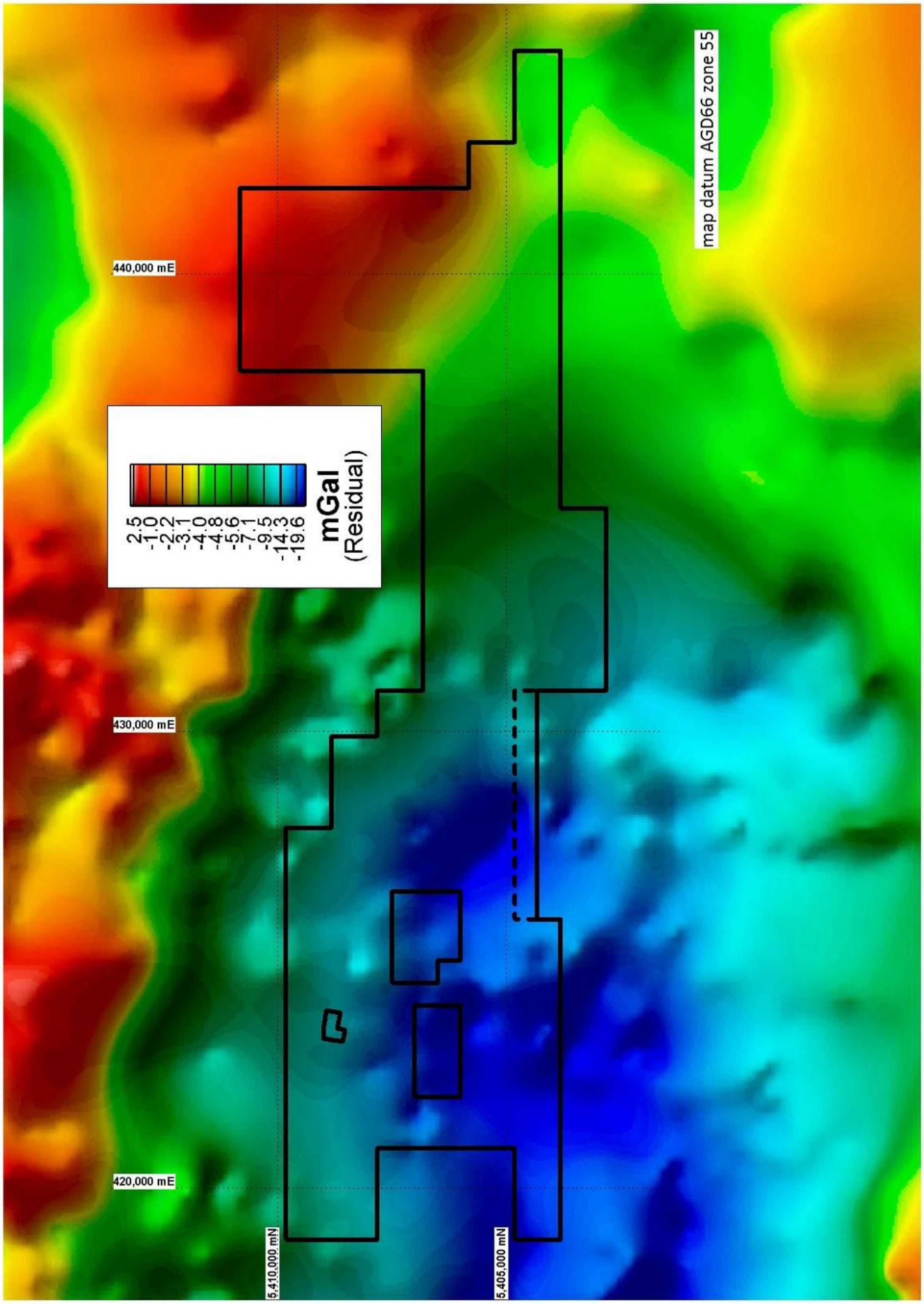

Figure 7: Gravity residual

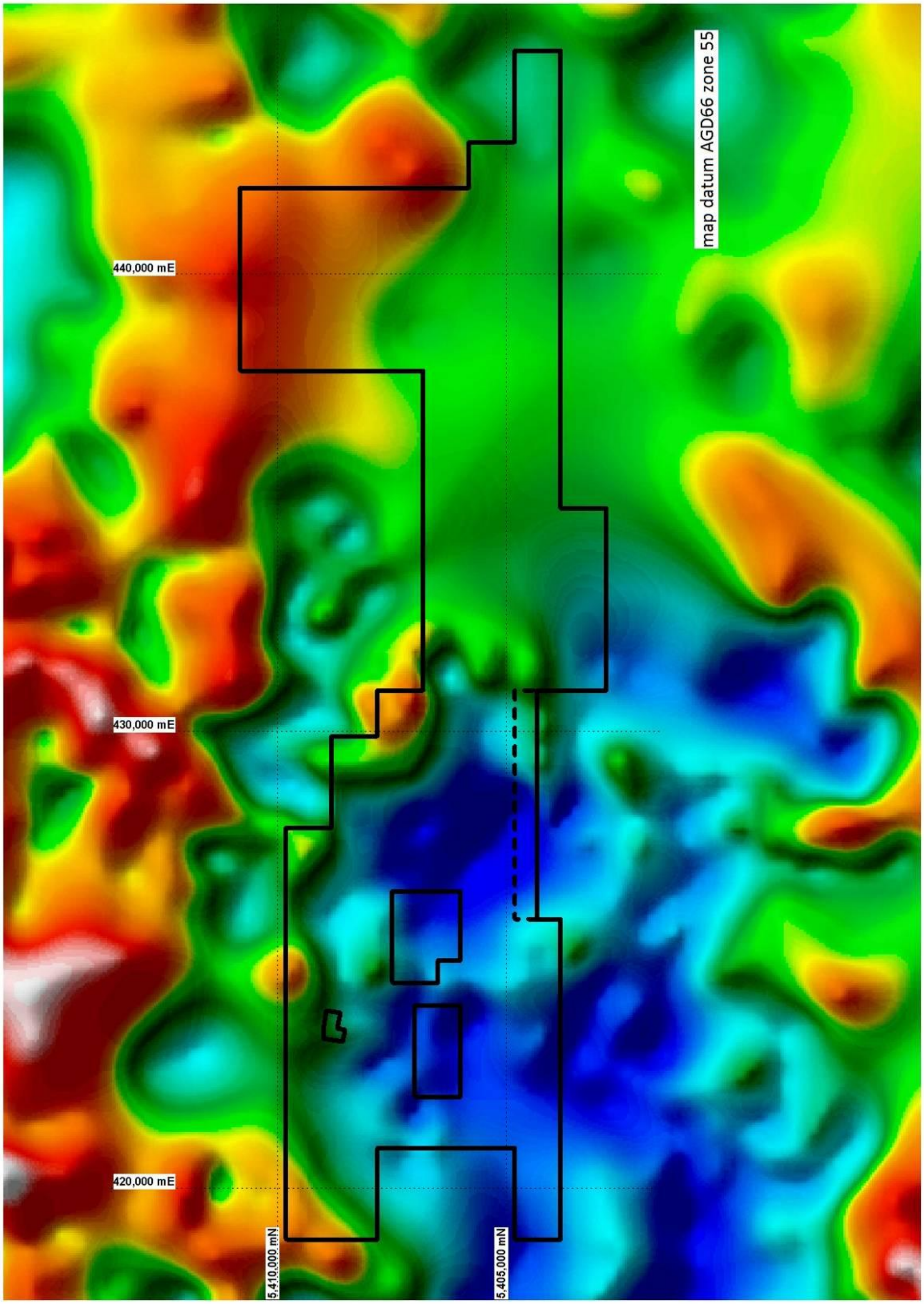

Figure 8: Gravity residual 1st vertical derivative

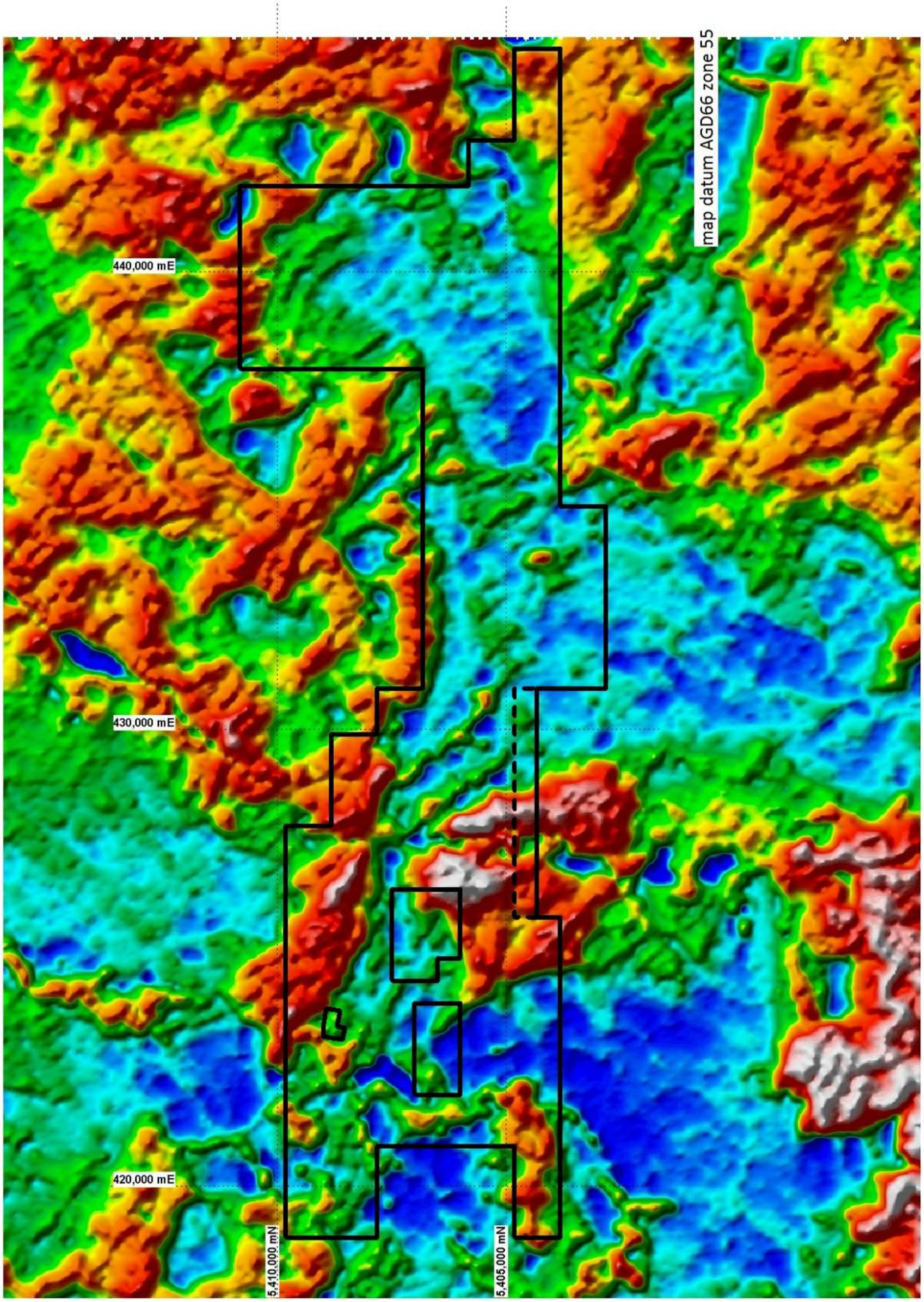

Figure 9: Radiometrics total count

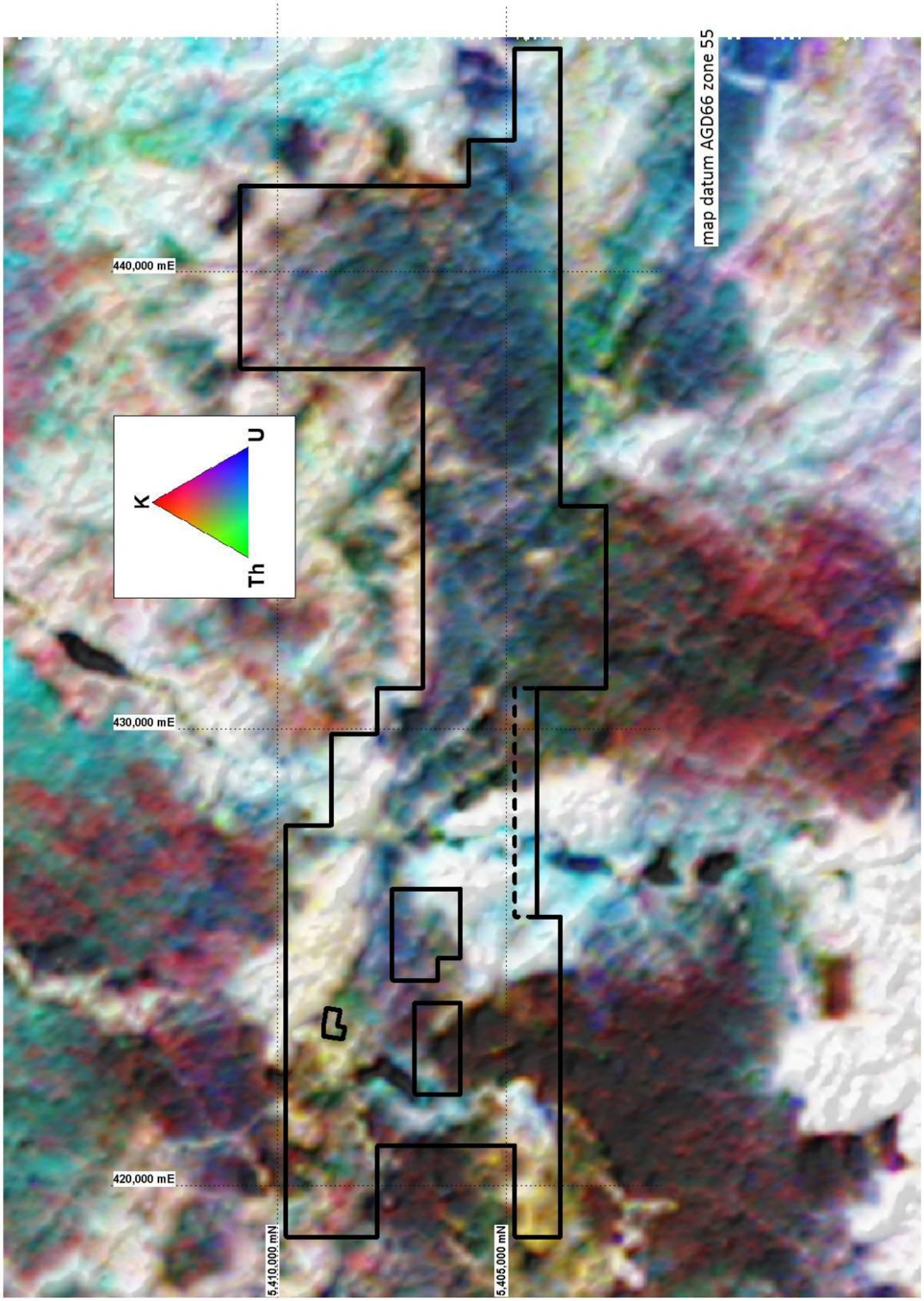

Figure 10: Radiometrics ternary

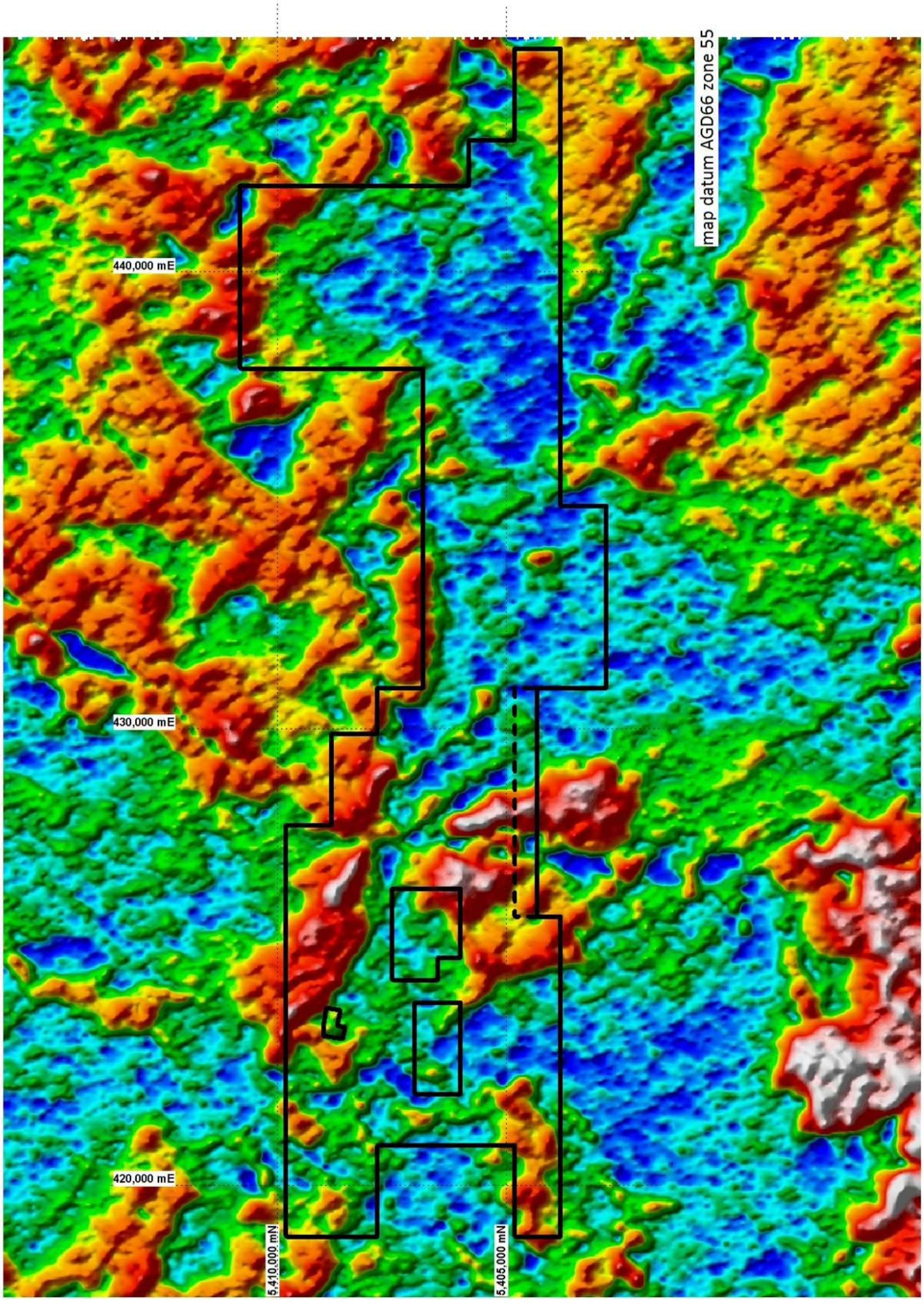

Figure 11: Radiometrics potassium

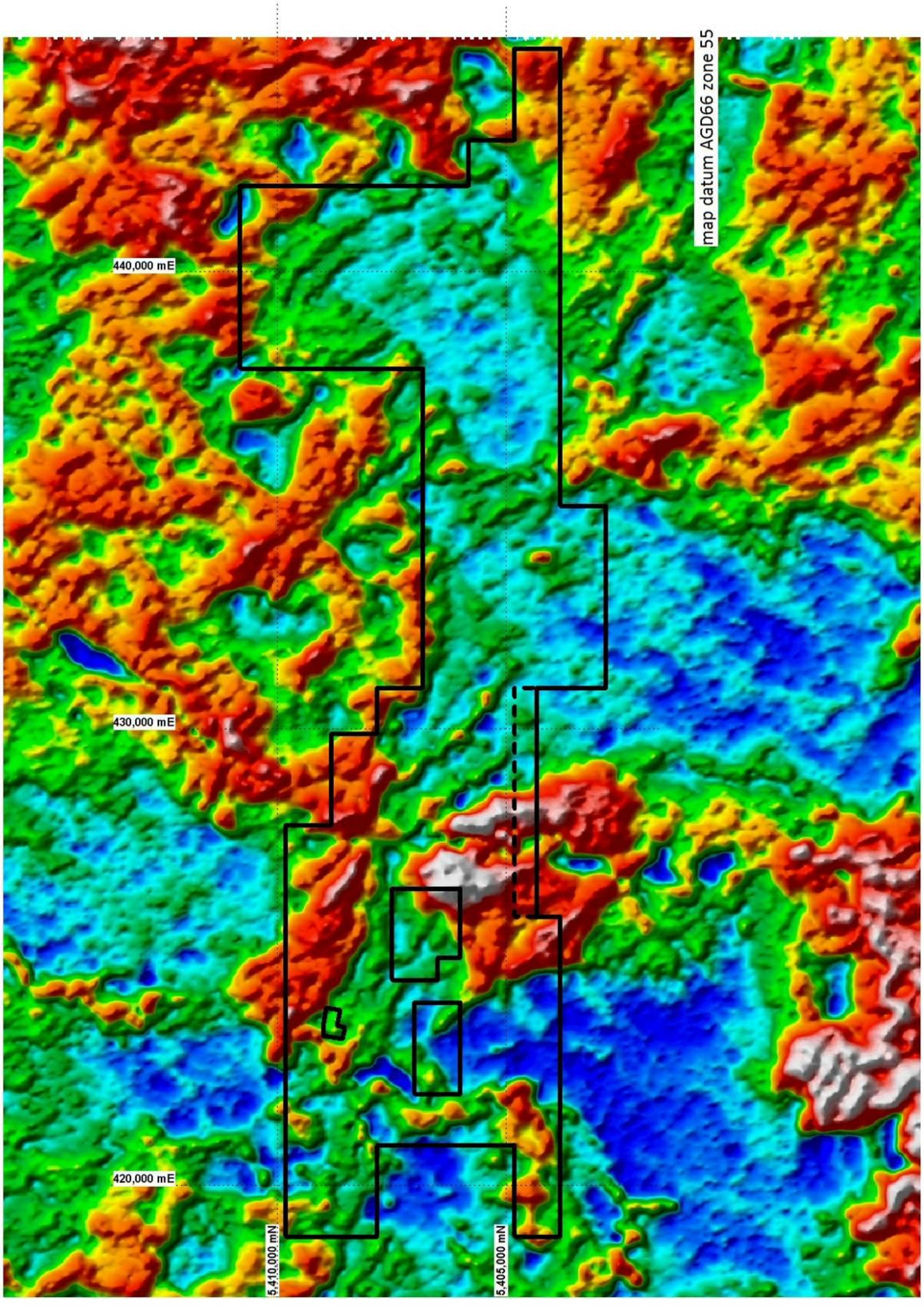

Figure 12: Radiometrics thorium

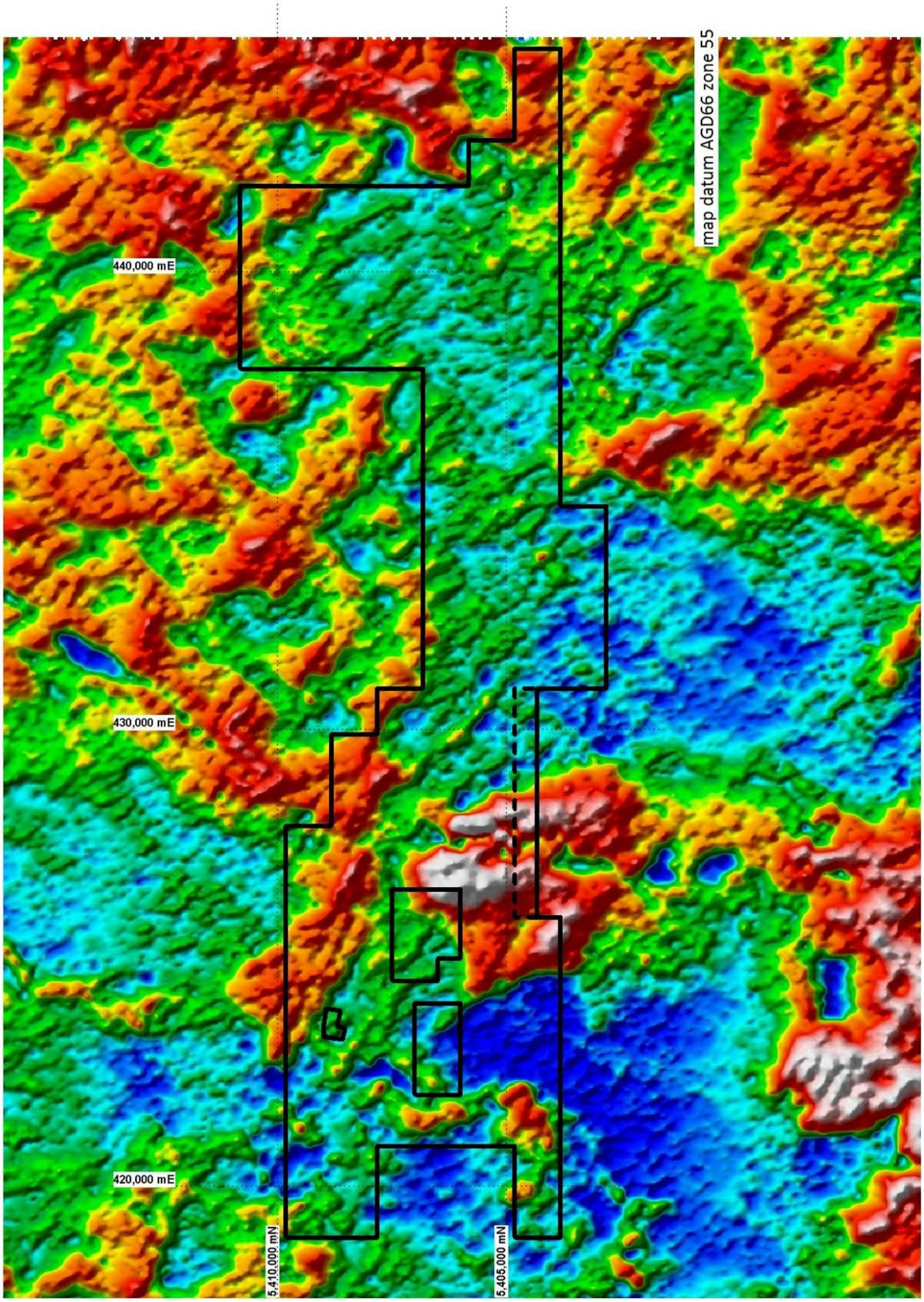

Figure 13: Radiometrics uranium

6.3 Soil sampling

In late 2010 and early 2011 Frontier carried out a major soil sampling programme over the margins of the Dolcoath Granite and prospective rocks on both sides of Lake Cethana.

6.3.1 Sampling Method

Soil samples were collected by two teams of (2) contractors working for Ron Gregory Prospecting. Soil samples were collected by a 4" tree planting/post hole hand auger.

Sample locations were determined by GPS. It was hoped that no gridding would be required with samples collected by scrub bashing to sample points. Thick regrowth over areas of old workings in the southwest part of the licence required grid cutting which.

Samples were collected to depths up to 1 metre with the intention being to collect C-horizon. In many locations soil development was poor.

Samples were collected on a nominal MGA north-south grid with grid lines 100m apart, samples collected every 50 metres along lines.

6.3.2 Assaying (Jane Farrell)

Introduction

A total of 1271 soil samples were taken from across the All Nations/Lorinna area of which 1057 were from the EL 29/2009.

The samples were sent to Amdel Laboratories in Adelaide where they were pulverised and homogenised in a zirconium bowl to avoid contamination by W. The samples were split and part was used by Amdel for gold assaying using fire assay (40g charge). The other split was returned to Frontier Resources for multi-element analysis using an in-house portable XRF Analyser.

Purchase of Innov-x X-5000 Portable XRF Analyser

Frontier Resources purchased an Innov-x X-5000 Portable XRF Analyser in January 2011 to undertake in-house analysis of soil samples. The use of this equipment was made possible due to improvements in the following:

- Low detection limits
- Ease and speed of sample analysis
- Wide range of elements assayed

However, gold still requires analysis by other methods as detection levels fall below XRF detection limits.

Frontier took delivery of a demo analyser in January 2011, which was replaced by a new analyser in March 2011. The change in machine has had a material effect on analysis as discussed below.

Figure 14: Innov-X XRF analyser

Operation of the Innov-x X-5000 Portable XRF Analyser

Analysing a sample using the analyser is relatively simple.

Before analysing a sample, the correct analytical mode must be selected. In the case of this work the soil mode was selected as the appropriate mode.

Three varying intensity beams are used for optimal analysis of the elements. Test conditions can be modified to suit analysis requirements, e.g.. time taken for each beam to analyse can be varied.

Once the mode is selected and test conditions have been set up, standardization is required using the standardization coupon provided with the machine. This is placed over the measurement window on the test chamber platform using the platform's engraved alignment rings and cross-hairs to position the sample.

After standardization is complete, the machine is ready to undertake analysis of samples.

A bagged sample or sample cup is placed over the measurement window on the test chamber platform. The bagged material has to have a sample thickness of at least 2cm to ensure accurate and repeatable readings. The chamber is closed and the start button is pressed.

Once samples have been analysed a report can be generated showing elements present in ppm plus the standard deviation for each element.

Report Test Conditions

For this work, samples were the pulps bagged in paper bags by Amdel and then returned to Frontier Resources. These bags were placed directly over the measurement window on the test chamber platform. Each sample was analysed for 60 seconds on each beam, giving a total analysis time of 180 seconds/sample. This analysis time was chosen to provide optimal results.

Evaluation of XRF Results

As part of the analysis procedure, tests were also undertaken on a number of standards.

Standards nist2702 and nist2781 were provided by Innov-x as sample cups. Results from XRF analyses of these standards were compared with the certificated values for these standards.

Using the demo machine, xrf results showed a number of anomalies, especially in the As, Th and Hg values which were consistently higher in the xrf results (Table 1). This suggested that the calibration of the machine might be incorrect.

Table 1. Comparison of nist standards with Demo machine data

Date	Reading Number	sample_id	As	As +/-	Th	Th +/-	Hg	Hg +/-
Demo Machine								
Standard			45.3	1.8	20.51	0.96	0.4474	0.007
2/11/2011	#6	nist2702	64	3	429	27	12	3
02/14/11	#11	nist2702	74	2	326	26	14	2
02/15/11	#6	nist2702	69	2	449	27	13	2
Standard			7.82	0.28	n/a	n/a	3.64	0.25
02/14/11	#12	nist2781	29	2	330	28	13	2
2/11/2011	#7	nist2781	25	3	302	27	16	3

02/15/11	#7	nist2781	28	2	325	28	17	2

n/a – not analysed

Results for the standards on the new machine, showed the xrf values to align more closely with the standards. (Table 2)

Table 2. Comparison of nist standards with new machine data

Date	Reading Number	sample_id	As	As +/-	Th	Th +/-	Hg	Hg +/-
New machine								
Standard			45.3	1.8	20.51	0.96	0.4474	0.007
03/23/11	#12	nist2702	48	2	23	3	<LOD	3
03/30/11	#7	nist2702	48	2	24	3	<LOD	3
4/08/2011	#78	nist2702	45	2	16	3	<LOD	3
Standard			7.82	0.28	n/a	n/a	3.64	0.25
03/23/11	#13	nist2781	15	2	47	3	5	1
03/30/11	#8	nist2781	14	2	55	3	6	1
4/08/2011	#8	nist2781	16	2	53	3	10	1

n/a - not analysed

Comparison of demo XRF data and new XRF data for the All Nations/Lorinna area.

A total of 1366 samples were analysed in the Lorinna area. They were analysed using the following:

Demo machine: 1092 samples

New machine: 274 samples, including 95 rerun from demo machine

Because of the difference in the standard analysis results between the demo machine and the new machine, 95 samples analysed by the demo machine were rerun on the new machine. A comparison was then made of the results. Table 3 shows the results for selected elements within samples from the Licence area.

Table 3. Comparison of demo and new machine results for selected samples within Licence area.

sample_id	Cu_d	Cu +/-	Cu_n	Cu_sdv	Zn_d	Zn +/-	Zn_n	Zn_sdv	As_d	As +/-	As_n	As_sdv
6952	3	2	6	1	1	1	4	1	4	1	4	1
6957	20	2	21	2	23	1	23	1	17	1	8	1
7620	112	3	115	3	113	3	102	2	980	6	1018	6
7756	14	2	24	2	7	1	6	1	16	1	9	1
7761	18	2	22	2	16	1	7	1	26	1	21	1
7766	29	2	38	2	23	2	17	1	34	2	37	2
7768	35	2	34	2	40	2	32	1	49	2	44	2
7842	-1	2	<LOD	4	1	1	5	1	5	1	<LOD	2
sample_id	**Mo_d**	**Mo +/-**	**Mo_n**	**Mo_sdv**	**Sn_d**	**Sn +/-**	**Sn_n**	**Sn_sdv**	**Pb_d**	**Pb +/-**	**Pb_n**	**Pb_sdv**
6952	3	1	<LOD	3	32	3	31	2	0	0	<LOD	3
6957	37	2	27	1	25	3	32	2	18	1	27	1
7620	87	2	77	2	89	4	112	3	1	2	28	2
7756	60	1	45	1	33	3	33	2	0	0	3	1

7761	82	2	70	2	24	3	26	2	12	1	20	1
7766	43	2	40	1	19	3	22	2	16	2	32	2
7768	95	2	84	2	18	3	21	2	16	2	31	2
7842	11	1	9	1	17	3	21	2	1	1	3	1
sample_id	**Bi_d**	**Bi +/-**	**Bi_n**	**Bi_sdv**	**Th_d**	**Th +/-**	**Th_n**	**Th_sdv**	**W_d**	**W +/-**	**W_n**	**W_sdv**
6952	0	0	<LOD	9	36	11	15	3	16	5	22	2
6957	0	0	<LOD	10	126	14	24	3	52	7	44	3
7620	0	0	<LOD	11	124	16	22	3	200	13	218	5
7756	0	0	<LOD	10	325	16	29	3	220	8	167	4
7761	33	4	46	4	281	17	40	3	266	9	212	4
7766	333	5	245	4	652	23	81	3	167	8	144	4
7768	203	5	162	4	312	17	42	3	96	8	80	3
7842	-20	4	<LOD	9	58	11	<LOD	8	48	6	39	2

_d = demo machine _n = new machine

The table shows that there is some variability in readings between the demo machine and the new machine. These variations could be accounted for by the following:

- the difference in the x-ray tube anodes used by the 2 machines.
  The demo machine has a rhodium (Rh) anode. This configuration is most suitable when the application calls for optimized analysis of light elements including Al, Si, S, Mg and P, along with mid range transition metals.
  The new machine has a tantalum (Ta) anode. This configuration shows excellent sensitivity measuring 25+ transition metals including Cd, Ag, Au, Pb, Cr, and Rare Earth Elements.
  Because the two anodes target slightly different element ranges, detection limits vary between the two machines as do the number of elements analysed.
- the element suite analysed by the two machines:
  Demo machine: P, S, Cl, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Zr, Mo, Ag, Cd, Sn, Sb, Pb, Bi, **LE**, Se, Rb, Sr, Ba, Hg, Th, U & W
  New Machine: P, S, Cl, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Zr, Mo, Ag, Cd, Sn, Sb, Pb, Bi, Se, Rb, Sr, **Y, Nb**, Ba, **La, Ce,** Hg, **Tl,** Th, U & W

Sample receptacle

The reduced values for some XRF analysis can be explained by the sample analysis method and the receptacle in which the sample is stored. Using paper sample bags has a 'dampening' effect on the results as the x-rays have to pass through the paper before interacting with the elements. Paper bags contain high levels of Ca which may interfere with results. Table 4 shows the effect on readings for standard nist2702 when it is analysed through a plastic bag and a paper bag. Table 5 shows the elements present in a paper bag.

Table 4. Comparison of XRF readings for nist2702 in paper and plastic bags

	Sn	**As**	**Cu**	**Hg**	**Mo**	**Pb**	**Zn**
Nist2702	40	67	119	11.3	20	98	424
nist2702+plastic bag	33	65	108	15	16	96	420
Nist2702+paper Bag	24	59	92	15.1	13.8	85	348

Table 5. Paper Bag composition

sample	S	K	Ca	Ti	Mn	Fe
blank	0	0	0	0	0	21
blank+bag	494	60	98388	9	39	102

All other elements were<LOD

Comparison of XRF data with ICP data for All Nations/Lorinna area

As part of the calibration process, full ICP analysis was undertaken by Amdel on 116 samples from 2 discrete areas of interest within the All Nations area in order to determine if there was a linear relationship between ICP and XRF analyses and if the XRF analysies could be adjusted by some factor to correspond with ICP levels. At a gross level comparison of ICP results with XRF showed that the XRF results were generally lower than the ICP.

Comparison between the XRF and ICP data showed that there is a strong linear relationship between the two sets of data for most elements. Regression equations expressing these relationships were determined separately for the xrf data generated by the demo machine and the new machine due to the variations between the two data sets. Table 6 shows the coefficient of correlation (r^2) values and linear regressionequations for each element analysed. Where more than 50% of readings were <LOD no equation was generated.

Table 6. r2 values and y equations for the xrf data.

Element	**R2 Demo machine**	**y=**	**R2 New machine**	**y=**
P	<LOD on more than 50% samples		<LOD on more than 50% samples	
S			<LOD on more than 50% samples	
Cl	no ICP analysis			
K	0.9182	0.2665x+501.73	0.9559	0.2453x+853
Ca	values not used due to effect of paper bag on readings			
Ti	0.8855	0.4182x-109.24	0.9564	0.415x-59.295
V	0.7048	0.3986x+4.373	<LOD on more than 50% samples	
Cr	0.7337	0.4607x-13.633	0.9445	0.5642x-19.424
Mn	0.977	0.6745x-3.3281	0.9981	0.6734x+2.5981
Fe	0.9537	0.8308x-3673	0.9682	0.9548x-7027.1
Co	ICP <LOD on >50% samples			
Ni	<LOD on all samples		<LOD on all samples	
Cu	0.8578	0.8333x+1.5616	0.7609	0.6223x+8.3806
Zn	0.9748	0.7177x-2.4595	0.9922	0.673x-1.147
As	0.9819	1.1589x+0.9005	0.9943	1.1464x-5.458
Zr	0.9264	1.1509x-6.4022	0.944	0.6804x+4.1752
Mo	0.9971	1.0468x+0.538	0.9989	0.8463x-0.4554
Ag	ICP <LOD on all samples			
Cd	ICP <LOD on all samples			

Sn	0.9043	0.8609x+5.0118	0.9629	1.0812x-0.3976
Sb	ICP<LOD on all samples			
W	0.7903	0.7384x+11.167	0.9358	0.6996x+1.6983
Pb	0.8181	0.7363x-5.2764	0.8514	0.8196x-0.6567
Bi	0.8485	0.7425x-9.9174	0.9425	0.796x-7.7495
Se	no ICP analysis			
Rb	0.9948	0.9175x+0.7801	0.9952	0.8887x-5.0741
Sr	0.9274	0.8966x+4.5711	0.9732	0.8517x+4.0384
Ba	0.9866	0.9038x+2.175	0.993	0.9449x-10.651
Hg	no ICP analysis			
Th	0.9752	7.9585x+39.226	0.9805	0.9486x+6.6185
U	0.385	0.0349x+2.6409	<LOD for all samples	
Y	not detected		0.897	1.0474x+2.7269
Nb	not detected		0.923	0.9454x+3.1738
La	no ICP analysis			
Tl	no ICP analysis			

Where such equations exist they have been used to adjust analysis to bring them up to “ICP” levels.

Such adjustments were not possible where;

- There was no ICO analysis for this element
- The coefficient of correlation is <0.75
- >50% of samples are <LOD

6.3.3 Results

The results of these analyses are included as appendix A. Figures graphically representing anomalous results of those elements considered significant from all soil sampling to date (i.e. 1982/83 CRAE, 1987 GFEL and 2010/11 Frontier) are included below as figures 15 to 27.

A number of coherent anomalies have been defined for the following elements.

Au – spotty anomalism over Tin Spur, weak anomalism over granite, associated with Sn on CRAE Narrawa Creek grid.

Bi – over granite and southwest slope Tin Spur, some anomalism in southwest corner of grid.

W – granite margins and adjacent Moina Sandstone (west side of Lake Cethana), also All Nations and to southwest corner of grid.

Sn – Tin Spur, in linear trend on northeastern slopes Tin Spur, in southwestern corner of grid and associated with Au(?) in CRAE Narrawa Creek grid.

Mo – on margins of granite and southwestern corner of grid

Pb and Zn – Tin Spur

Nb and Y – coherent discrete zone on northern margin of granite on western side Lake Cethana.

These anomalies are produced in part by known mineralization styles e.g. quartz+/-W+/-Sn+/-Mo+/-Bi veins, disseminated Au+Sn(?) in sandstone and skarn of variably W+/-Sn+/-Bi+/-Zn+/-Au composition, however, a number of instances these are not explained. The size of the anomalies also supports the potential for larger tonnage deposits.

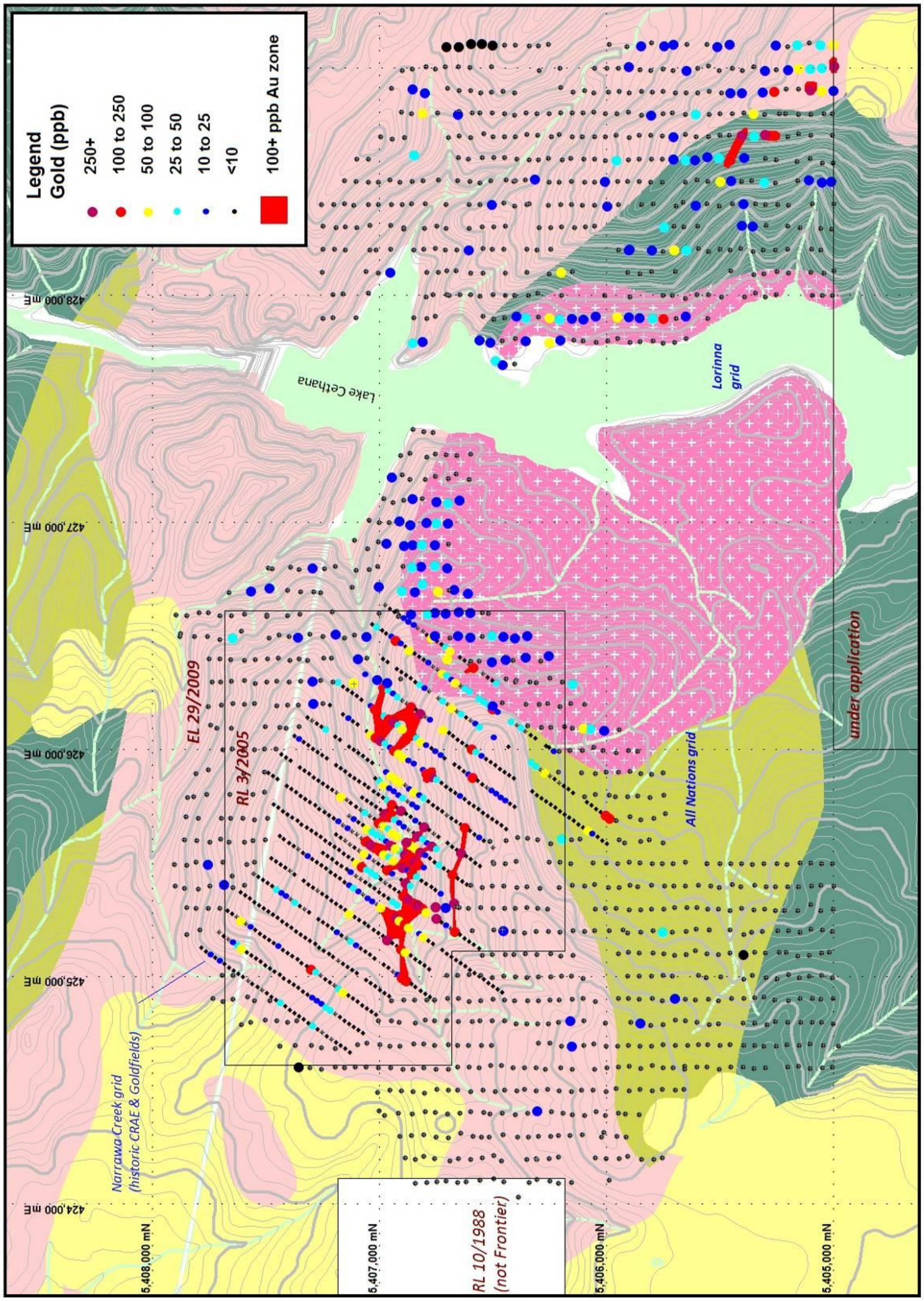

Figure 15. Au soil results, 1987 GFEL survey and 2010/2011 Frontier sampling.

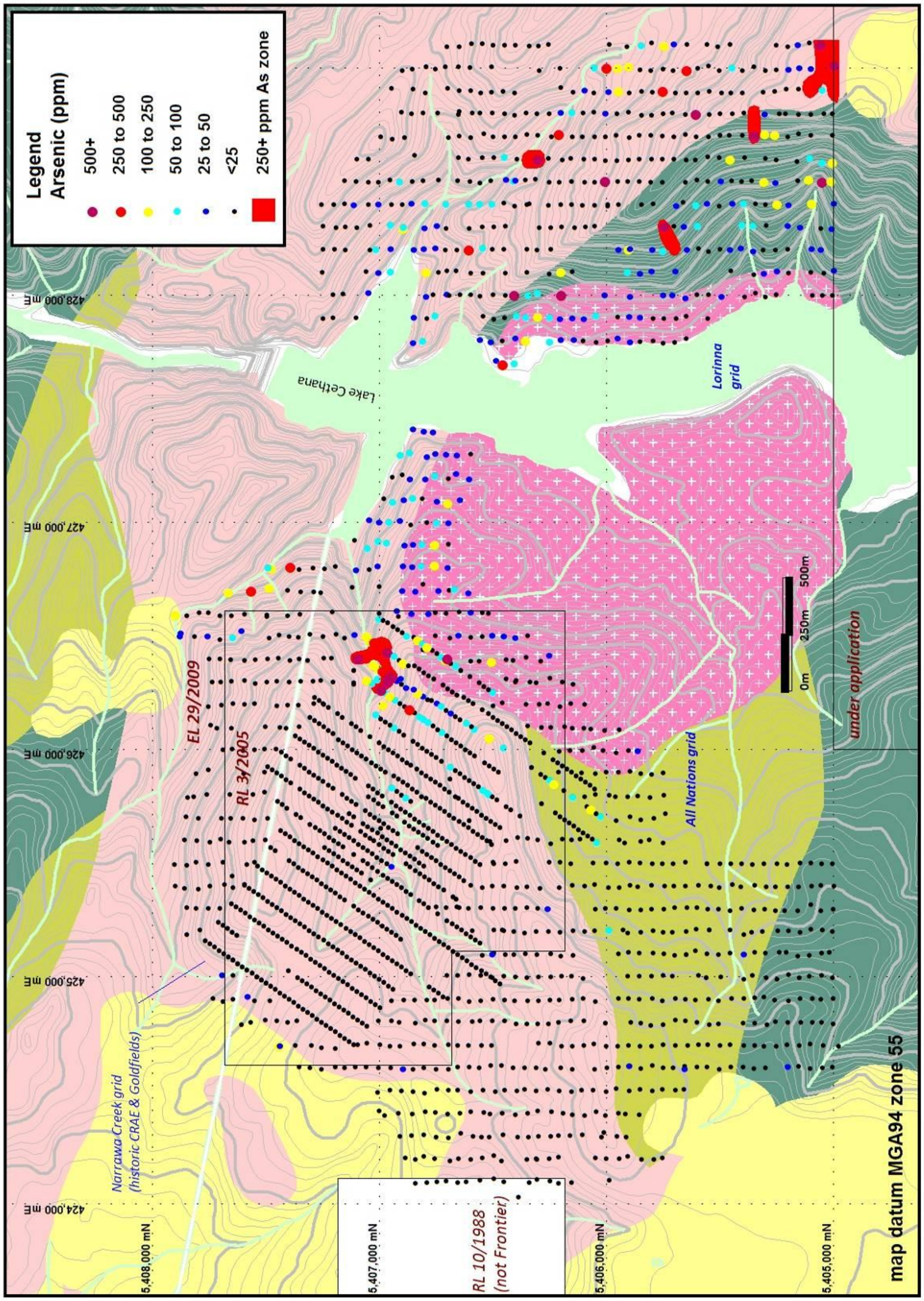

Figure 16. As soil results, 1987 GFEL survey and 2010/2011 Frontier sampling.

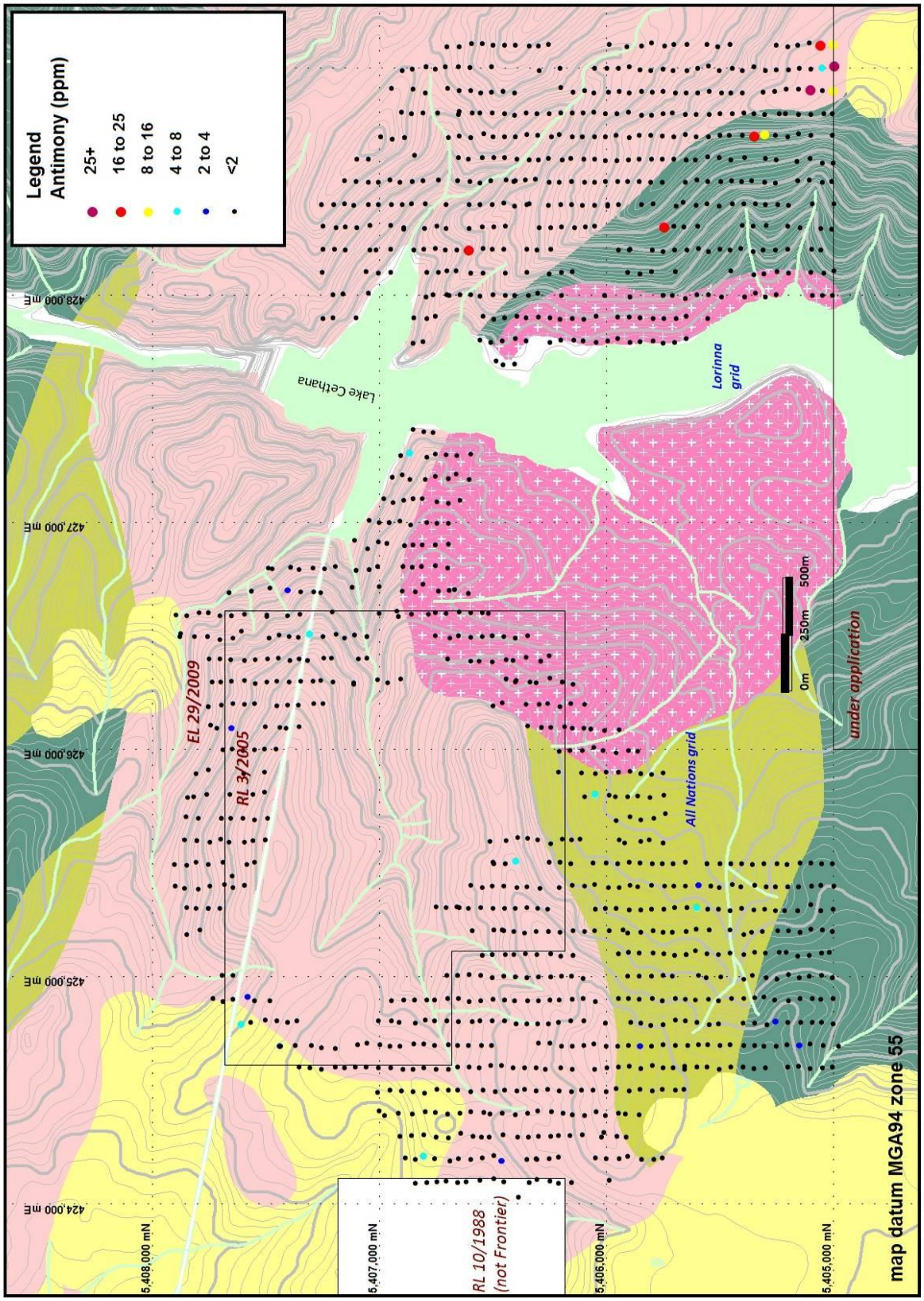

Figure 17. Sb soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

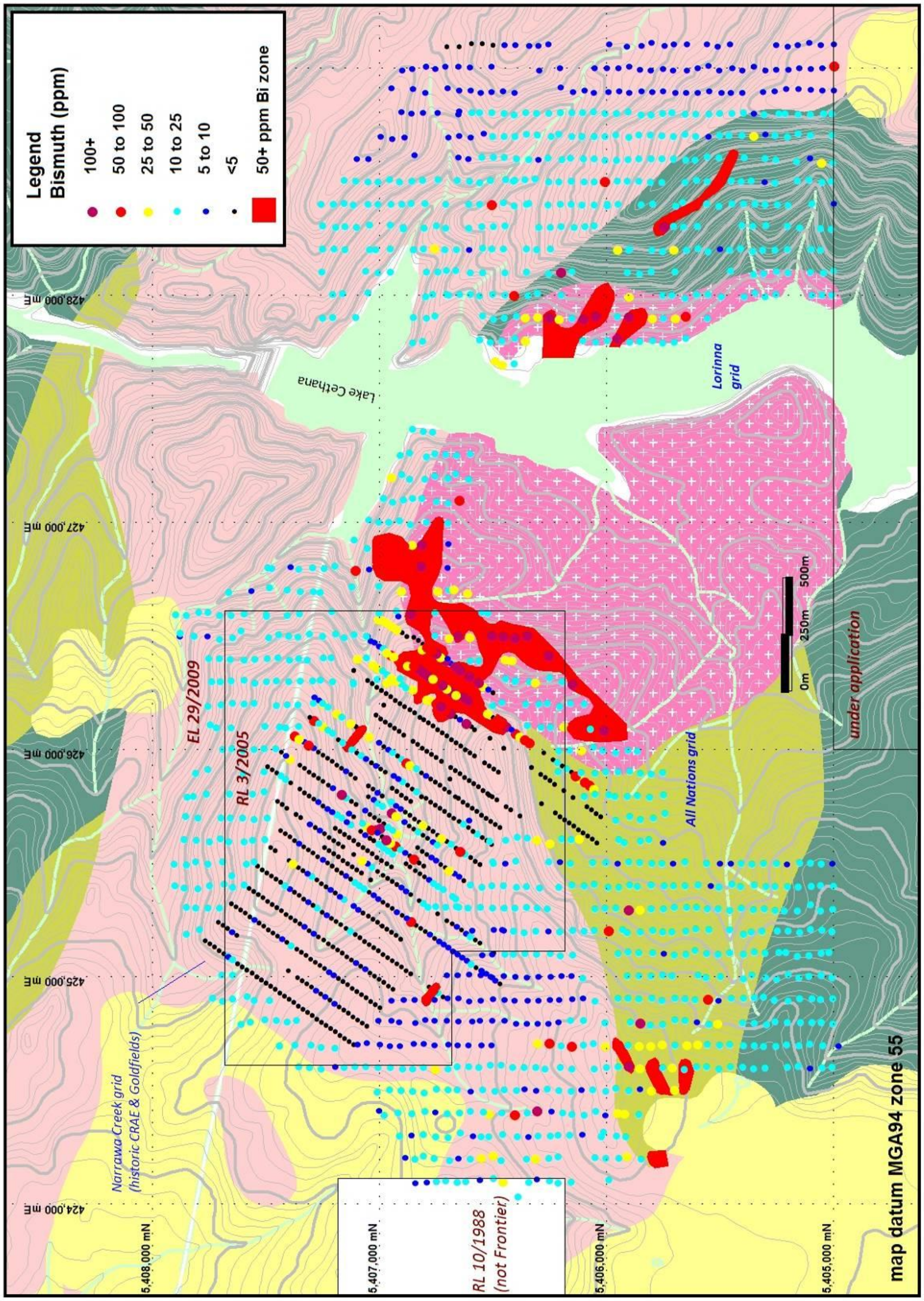

Figure 18. Bi soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

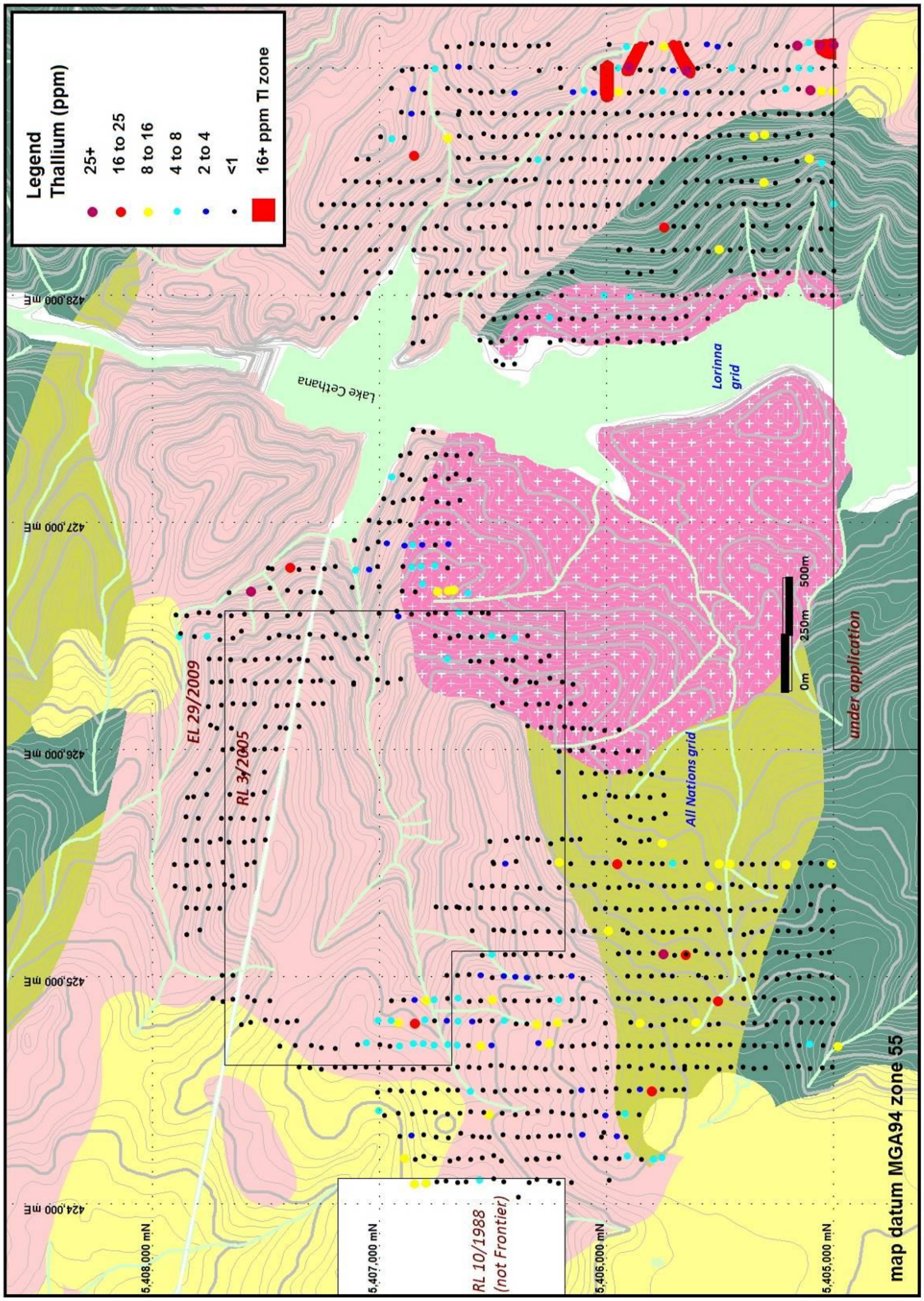

Figure 19. Tl soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

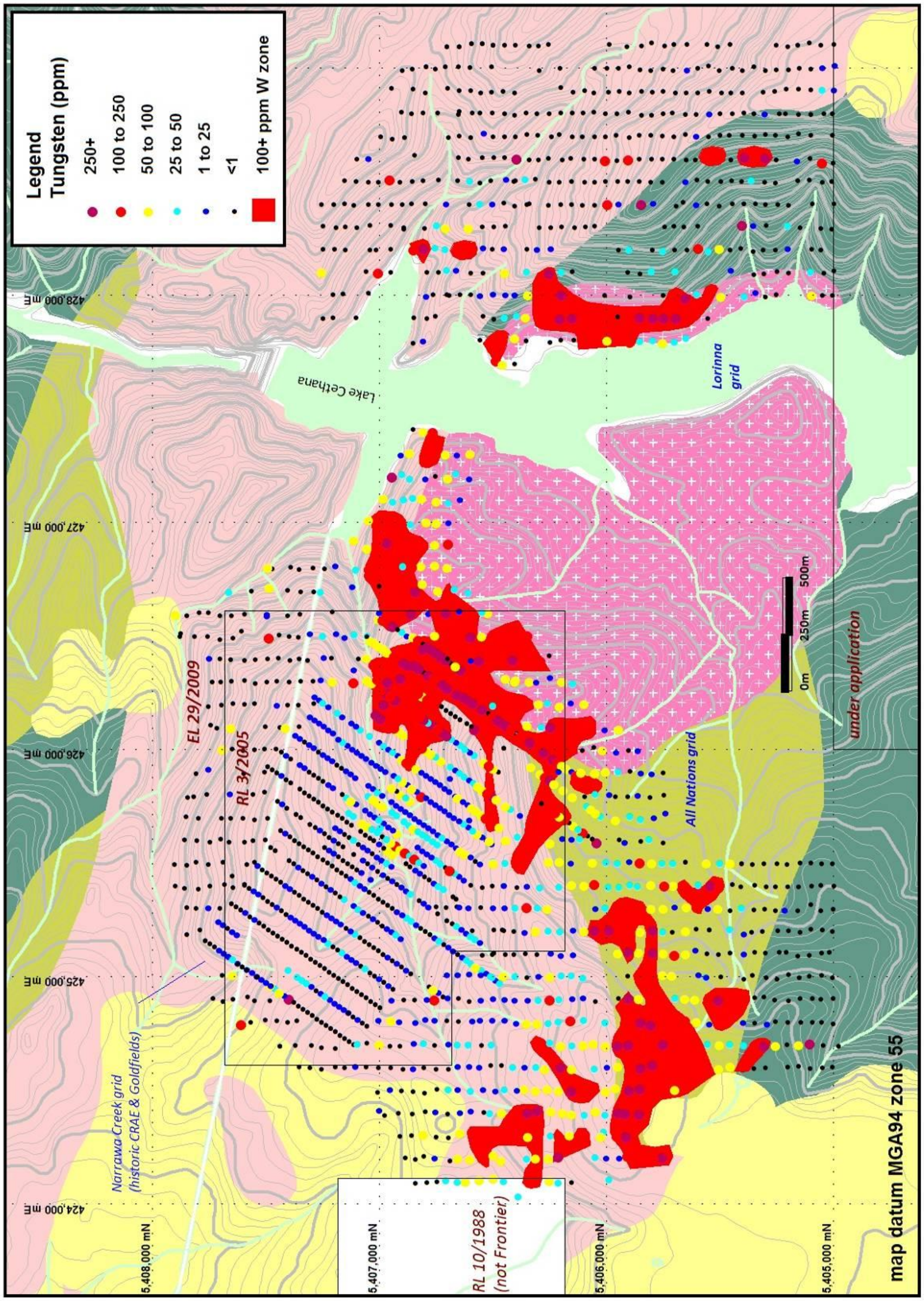

Figure 20. W soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

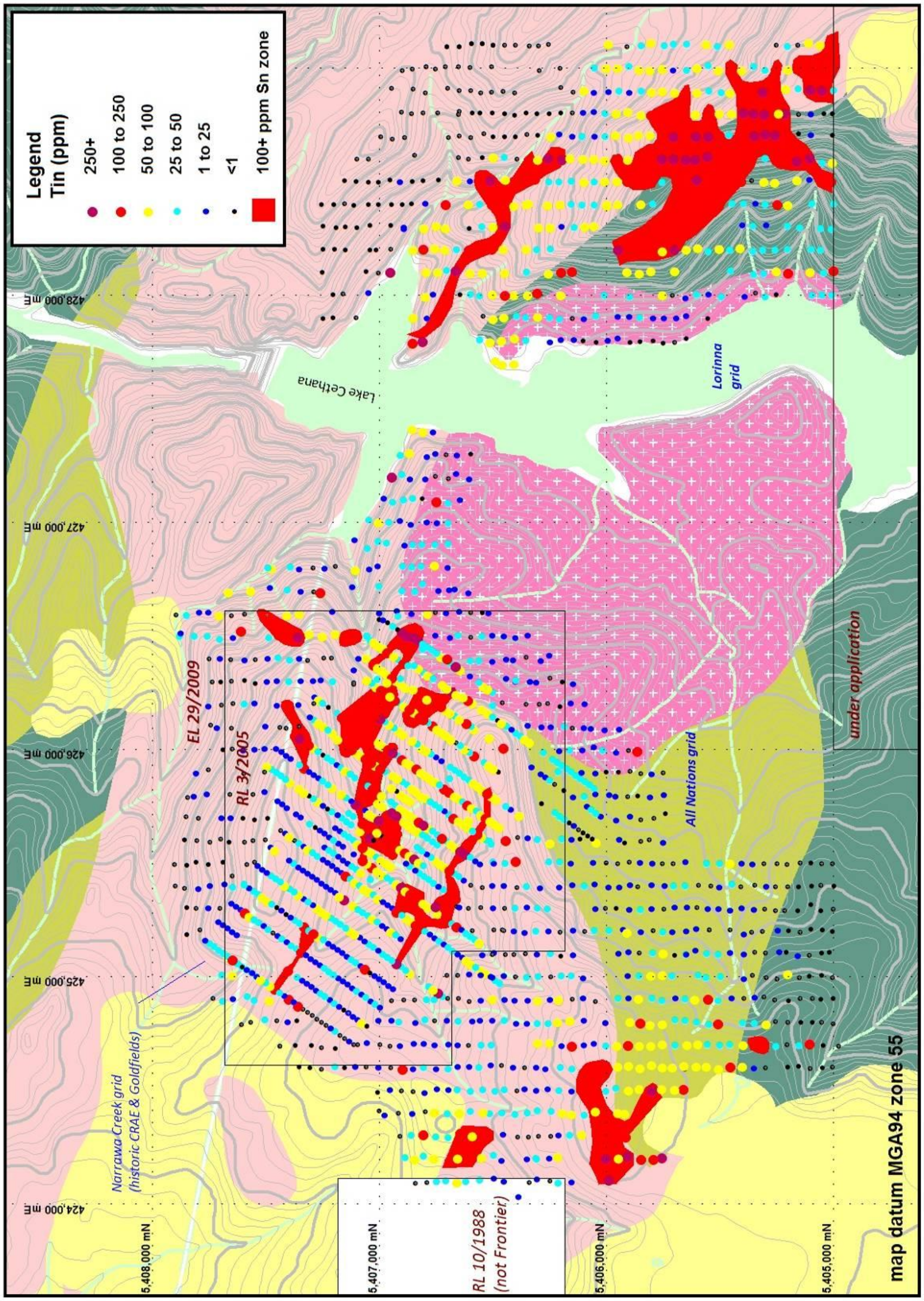

Figure 21. Sn soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

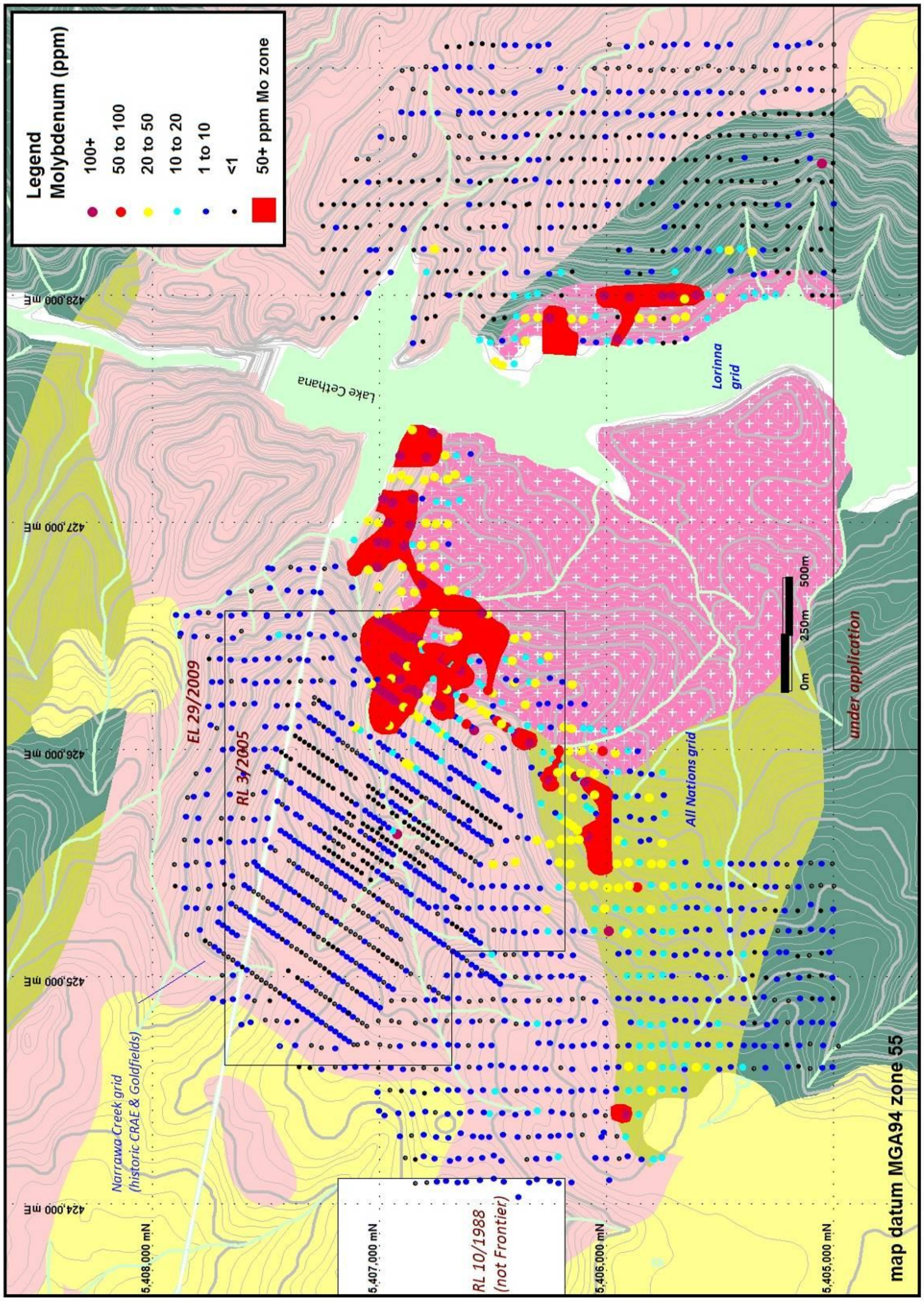

Figure 22. Mo soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

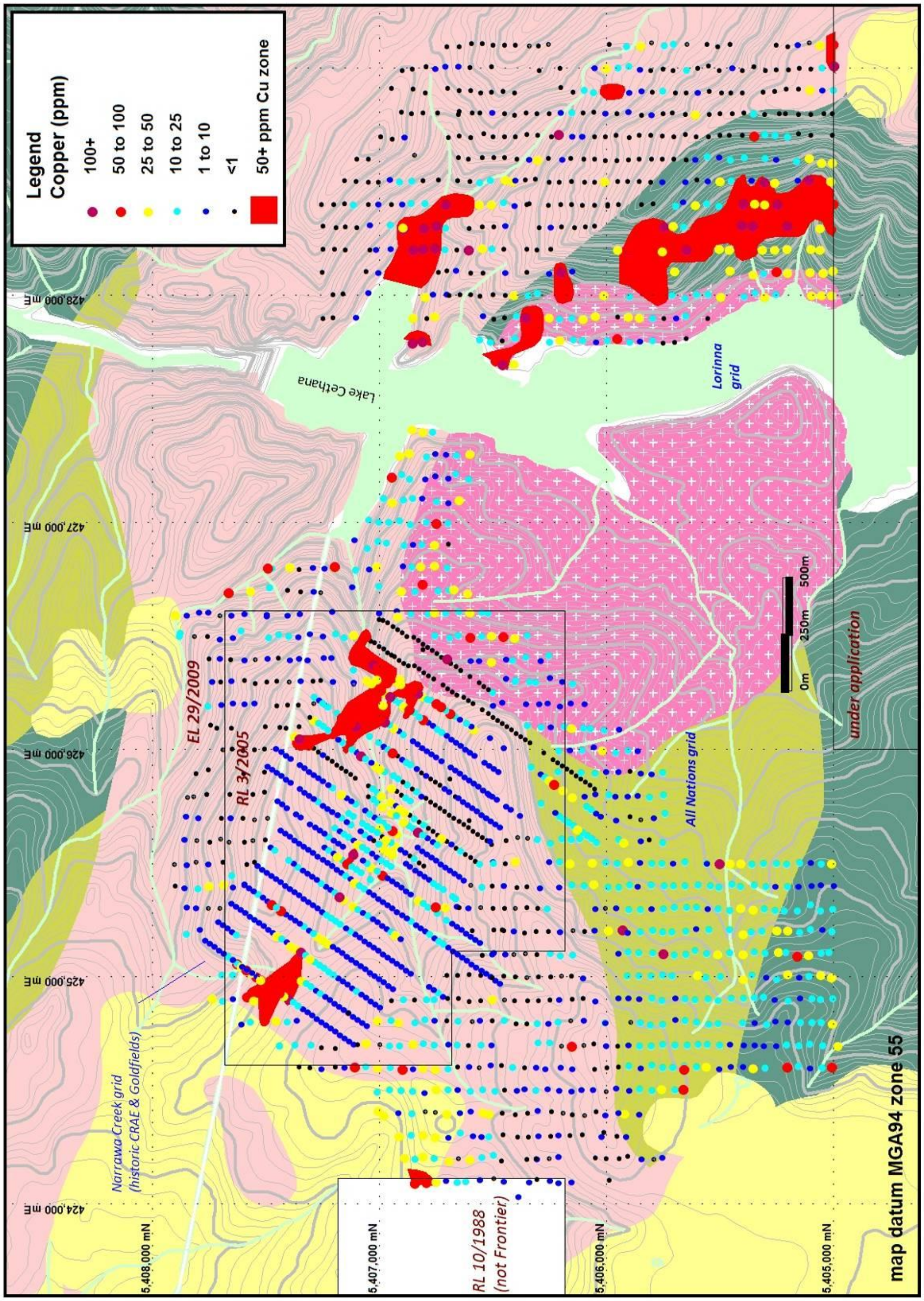

Figure 23. Cu soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

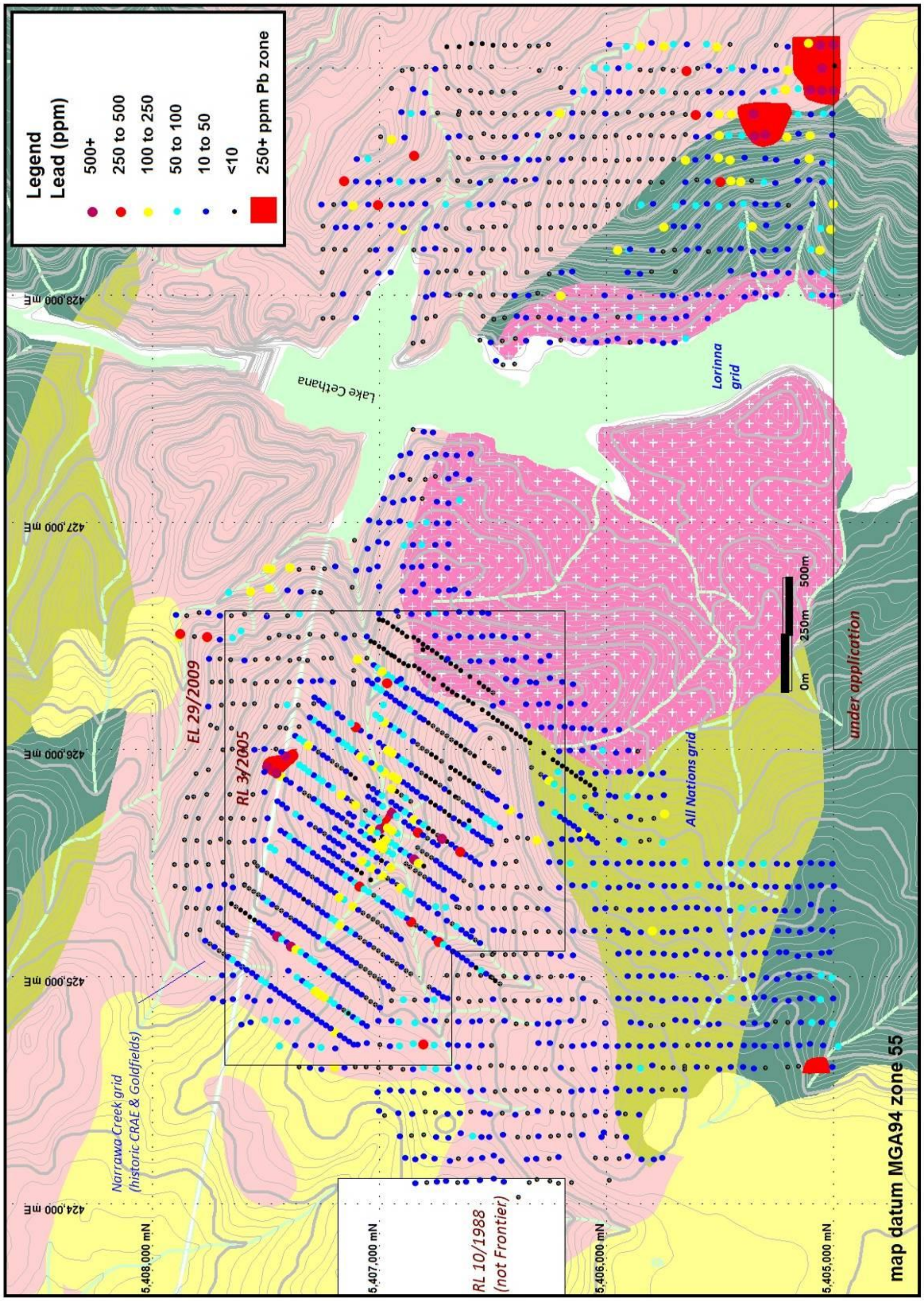

Figure 24. Pb soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

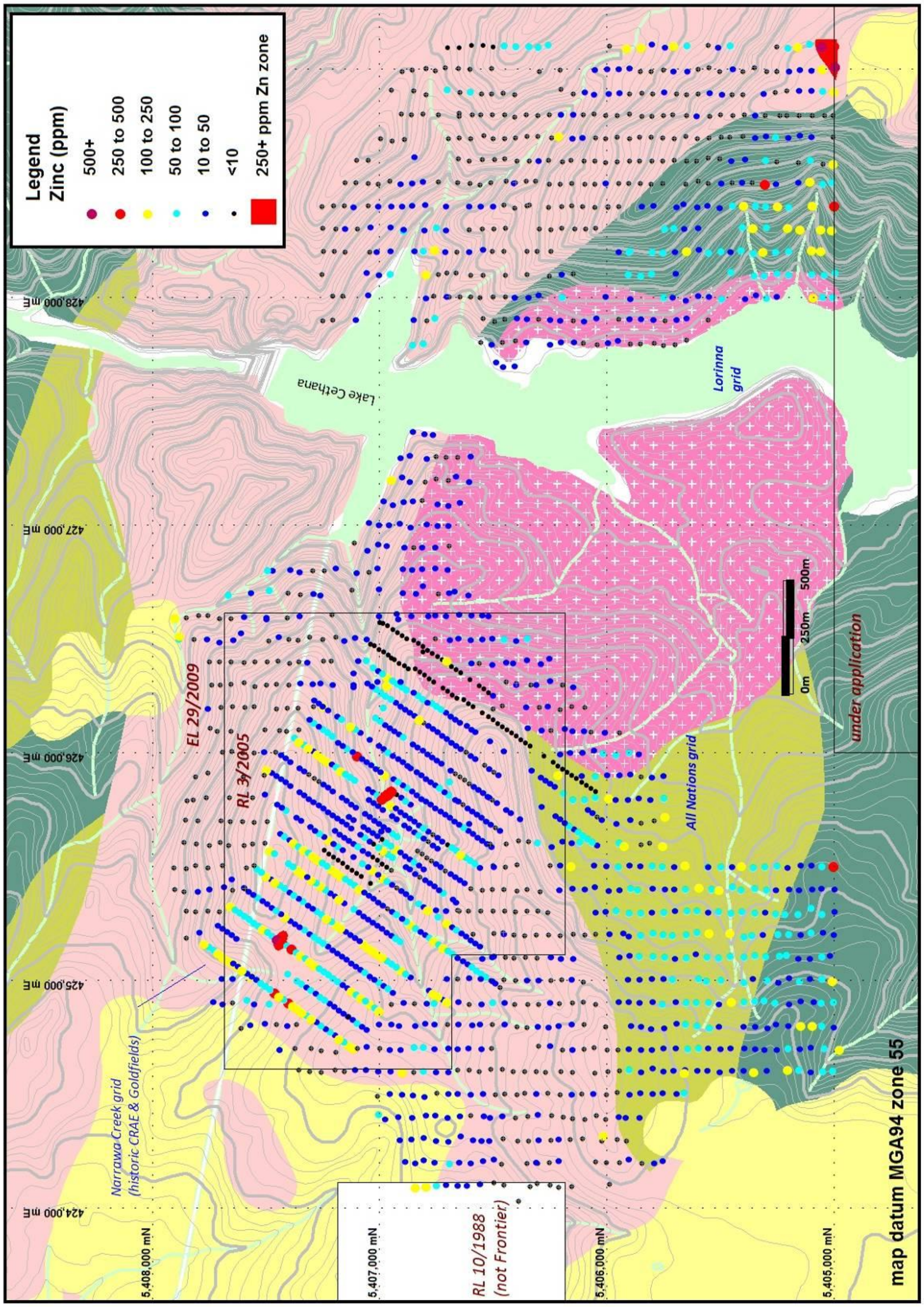

Figure 25. Zn soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

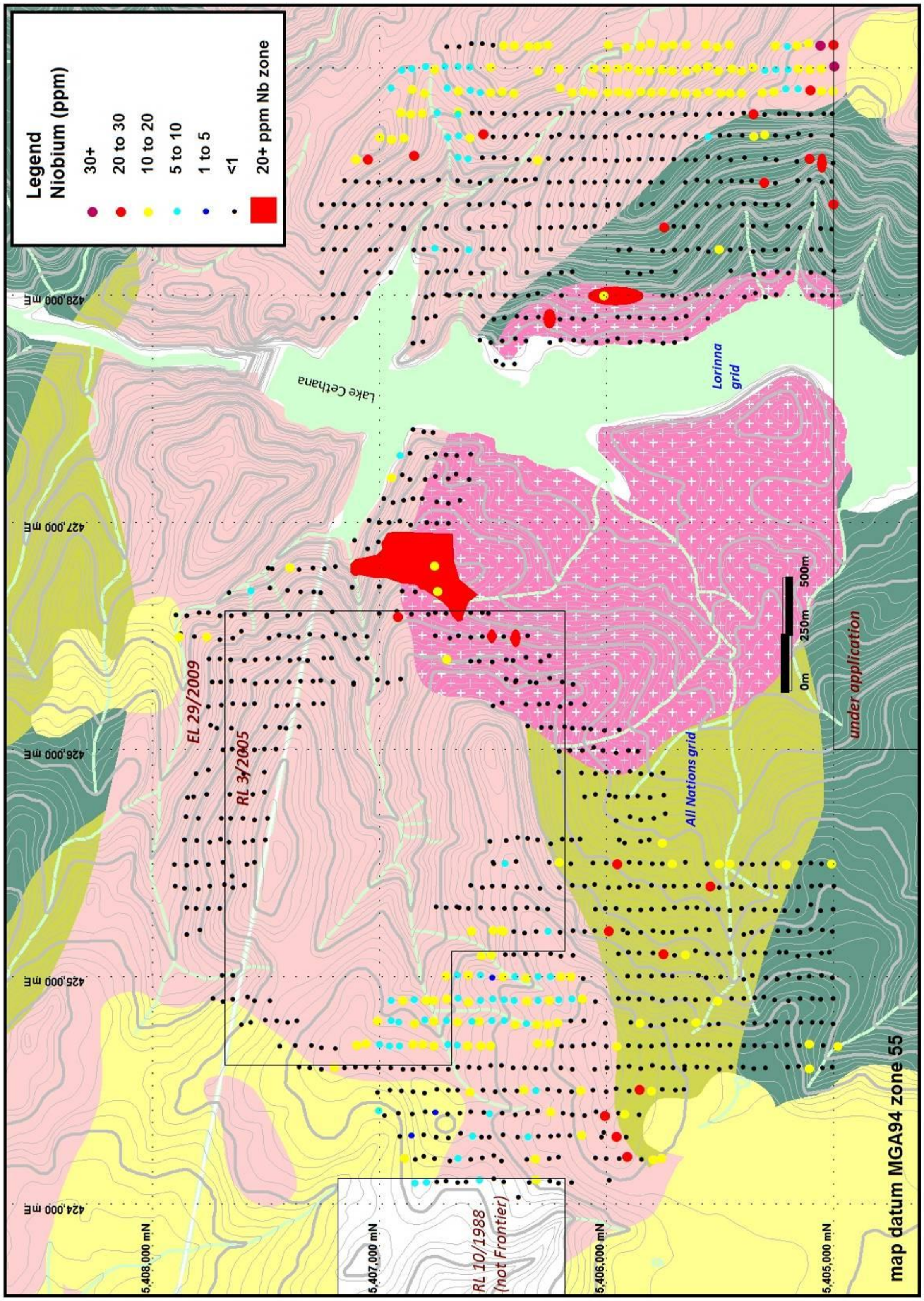

Figure 26. Nb soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

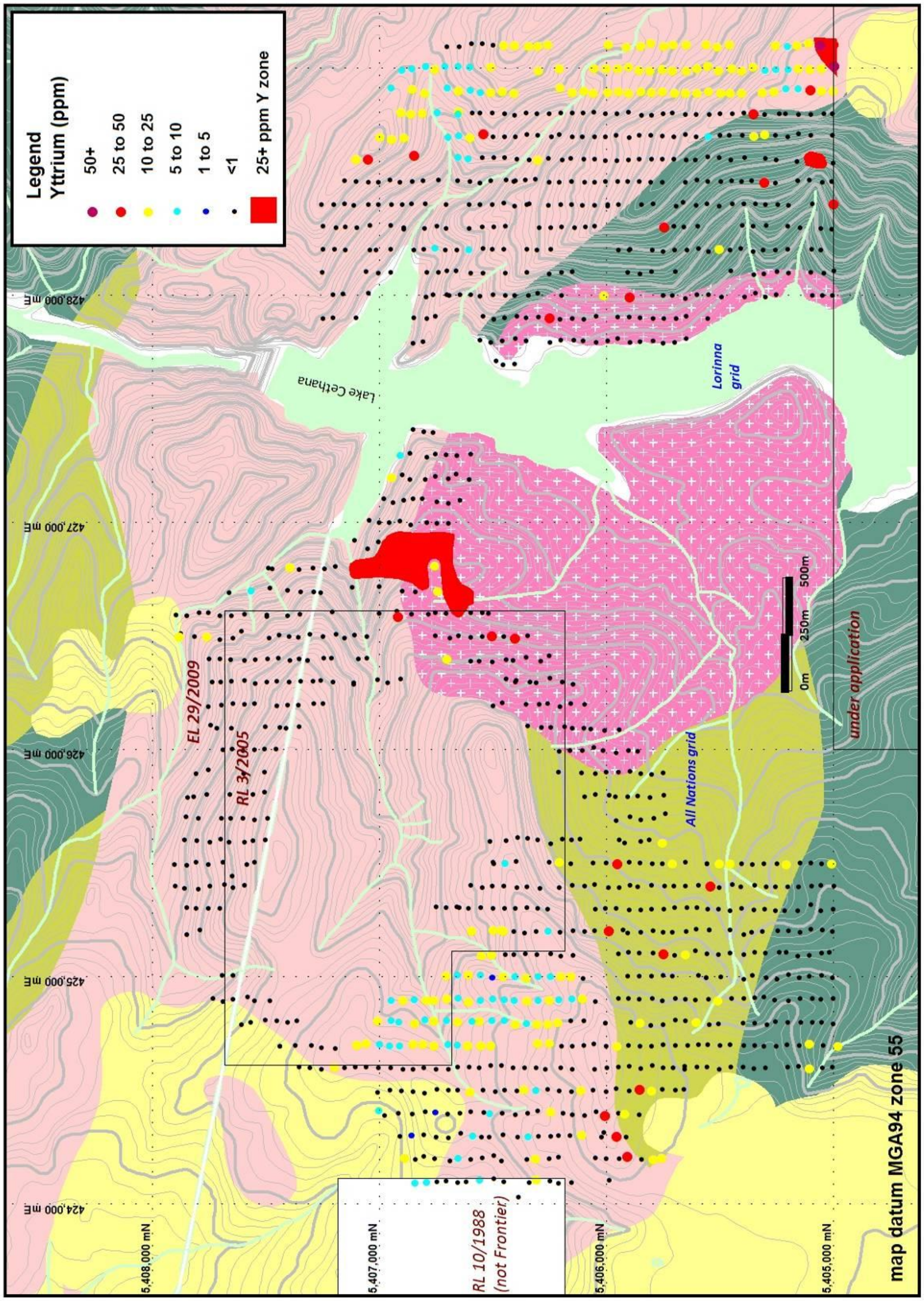

Figure 27. Y soil results, 1982/1983 CRAE and 2010/2011 Frontier sampling.

7.0 Proposed work September 2011 to September 2012

Frontier has commenced the gridding for as large scale 3D IP survey over ~35 square kilometres including ~20+ square kilometres in EL 29/2009. The survey will be done on 250m line spacings with infill in anomalous zones.

Results of the survey will be considered in the light of existing datasets, particularly magnetics, and drill targets defined.