SANDFIRE RESOURCES NL

North Costello Prospect SEL 26939

Drilling Completion Report

Author

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1.0 EXECUTIVE SUMMARY

Sandfire Resources NL (Sandfire) completed 23 holes for 3100m testing an EM anomaly in the flat lying pocket 0.5km east of the Costello Range at the North Costello Range prospect. Previous work on the prospect includes geological mapping and geophysical surveys. The tenement has been explored for Cu-Pb-Zn, Mn and U using Percussion and RC drilling. Assays of 2011 drilling have shown there is no anomalous Cu-Pb-Zn at the North Costello Range prospect.

Geological mapping of the Costello Range and the area to the east was done by W. Herrmann (2011) after drilling and generally agrees with the Haines et al (1993).

Previous exploration on the tenement includes:

- Geological mapping;
- Geophysical surveys; and
- Percussion and RC Drilling

Sandfire has explored on the tenement completed the following work on the tenement:

- Geophysical compilation
- Prospect mapping
- RC and Diamond drilling

2.0 INTRODUCTION

Sandfire Resources NL (Sandfire) completed 23 holes for 3100m testing an EM anomaly in the flat lying pocket starting 0.5km east of the Costello Range at the North Costello Range prospect. Previous work on the prospect includes geological mapping and geophysical surveys. The tenement has been explored for Cu-Pb-Zn, Mn and U using Percussion and RC drilling. Assays of 2011 drilling have shown there is no anomalous Cu-Pb-Zn at the North Costello Range prospect.

Geological mapping of the Costello Range and the area to the east was done by W. Herrmann (2011) after drilling and generally agrees with the Haines et al (1993).

Hole ID	Final Depth (m)	Easting	Northing	Nat RL (m)
11BLRC0105	126	548,603	8,294,139	48.06
11BLRC0106	120	548,401	8,294,150	49.72
11BLRC0107	120	548,202	8,294,148	48.48
11BLRC0108	120	548,001	8,294,150	48
11BLRC0109	120	547,794	8,294,151	48.82
11BLRC0110	150	547,602	8,294,143	48.21
11BLRC0111	54	547,420	8,293,161	47.46
11BLRC0112	126	547,459	8,294,162	41.08
11BLRC0113	102	547,817	8,292,148	33.74
11BLRC0114	102	548,003	8,292,143	36.15
11BLRC0115	126	547,813	8,291,146	30.45
11BLRC0116	126	547,604	8,291,149	28.24
11BLRC0117	144	547,394	8,291,152	33.64
11BLRC0118	150	547,201	8,291,151	35.92

11BLRC0119	150	547,801	8,290,149	33.01
11BLRC0120	150	548,398	8,289,150	38.56
11BLRC0121	186	548,196	8,289,150	36.55
11BLRC0122	120	547,915	8,289,147	36.67
11BLRC0123	164	547,800	8,289,150	35.33
11BLRC0124	174	547,604	8,289,147	34.13
11BLRC0125	126	548,009	8,288,157	39.77
11BLRC0126	144	549,506	8,287,053	56.37
11BLRC0129	200	549,601	8,287,201	56.7

Table 2-1. Location and Depth of RC holes at North Costello Range.

3.0 TENEMENT AND ACCESS

The North Costello Range prospect is in tenement SEL 26837 approximately 90km northwest of Borroloola and 13km west of Lorella Springs, Northern Territory (Figure 1). Access is along the Lorella Springs road and then 16km west along access tracks.

The tenement is substitution exploration licence 26837 which was granted in 2009 with details in Table 3-1.

Lease	Status	Current Area	Area Units	Current Commitment	Applied Date	Grant Date	Expiry Date	Group Report Number
SEL 26837	Granted	473	Blocks	$139,000	24-Jun-08	9-Jun-09	8-Jun-13	C121/09 Borroloola

Table 3-1. Tenement Details.

4.0 GEOLOGY

The prospect is located on the Mount Young 1:250k and the Mount Young 1:100k NTGS geological sheet and details of the geology are in the Mount Young 250k explanatory notes (Appendix A) (Haines et al., 1993). The prospect is in the Mesoproterozoic McArthur Basin 3km east of the Four Arches Fault and is considered prospective for base metals.

North Costello is east of a prominent ridge of outcropping Sly Creek Formation (Ptl) and Rosie Creek Sandstone (Ptlrs) that dips 20º-50º west. The prospect occurs at 50m elevation in an area of low relief with sandy alluvial cover up to 40m thick. The regional geology mapped by Haines et al. (1993) shows prospect is within 500m of outcropping Mesoproterozoic sandstones from the Tawallah Group (Figure 2).

5.0 PREVIOUS EXPLORATION

Previous exploration on the tenement includes:

- Geological mapping;
- Geophysical surveys; and
- Percussion, RC and AC Drilling (Mn exploration in north of tenement)

5.1 Geological Mapping

Regional mapping at 250k and 100k scale was done by Haines et al. (1993) for the Northern Territory Geological Survey (NTGS) (Appendix A). The prospect is 0.5km east of the Costello Range where the Sly Creek Formation sandstone outcrops. The regional dip of the Palaeozoic rocks is 10º to 20° east and the flat lying Cainozoic cover fills the embayment (1:250k Haines et al., 1993).

5.2 Geophysics

In 2005 a gravity survey was flown by Aerodata Holdings Ltd for the NTGS covering the Mount Young map area (Figure 3) (Haines et al., 1993).

5.3 Drilling

Tenement SEL 26837 has been explored for manganese by Western Mining and BHP with 76 shallow holes drilled (Figure 4). No assay information is available.

6.0 SANDFIRE EXPLORATION

6.1 Introduction

Sandfire has completed the following work on the tenement:

- Geophysical compilation
- Prospect mapping
- RC and Diamond drilling

6.2 Geophysical Compilation

There have been multiple surveys completed in the area including aeromagnetic surveys, EM surveys and regional gravity. The EM images from the 2007 survey are in Appendix B. The survey shows conductivity peaks at around 150mS/m. Some typical images are shown in Figure 5 and Figure 6. A regional magnetic survey was carried out by Golden Cross in 2006. Figure 5 shows there is a magnetic anomaly west of Tawallah 1 associated with the outcropping ridge and the Seigal Volcanics (Pts).

6.3 Prospect Mapping

The North Costello prospect was mapped by W. Herrmann in 2011 and generally agreed with the mapping done by Haines et al. (1993). The report and map are in Appendix C.

6.4 Drilling

The North Costello prospect has not been drilled before.

7.0 2011 DRILLING PROGRAM

7.1 Introduction

In 2011 23 RC holes for 3,100m were drilled at the Tawallah 1 prospect (Table 2-1). The RC holes targeted a shallow EM anomaly (Appendix B).

7.2 Results

7.2.1 Lithology

The drilling intersected a deeply weathered cover of puggy, sometimes carbonaceous, clay above the fresh rock. Below the cover is silicified stromatolitic dolomite and siltstone that are interpreted

as the Mallapunyah Formation in agreement with W. Herrmann (2011) (Appendix D). The carbonaceous mud above the dolomite closely correlates with the shape and depth of the EM feature and is likely to be the cause of the EM anomaly at the prospect.

7.2.2 Mineralisation

No mineralisation was visible in the chip samples. Later inspection of chip trays showed possible oxidised fine pyrite which appeared as white spots on the black carbonaceous clay in hole 11BLRC0121 W. Herrmann (2011).

7.2.3 Geochemistry

The assays from the North Costello holes do not show anomalous geochemistry (Table 7-1). Cu peaks at 500ppm in hole 11BLRC0116 at 116-120m. Copper is concentrated in the siltstone unit at 116-120m depth. The peak Pb is 165ppm in dolomitic siltstone in hole 11BLRC0111 (52-54m depth) and the maximum Zn is 415ppm in a chert unit in hole 11BLRC0123 (88-92m depth).

Hole ID	Max Cu (ppm)	Max Pb (ppm)	Max Zn (ppm)
11BLRC0105	120	47	175
11BLRC0106	120	27.5	210
11BLRC0107	120	25.5	175
11BLRC0108	135	75	70
11BLRC0109	370	33	260
11BLRC0110	110	35.5	285
11BLRC0111	49	165	80
11BLRC0112	275	28.5	160
11BLRC0113	70	18	310
11BLRC0114	20	21.5	105
11BLRC0115	30	21	125
11BLRC0116	500	38.5	210
11BLRC0117	120	44.5	185
11BLRC0118	390	37	175
11BLRC0119	125	45.5	235
11BLRC0120	30	49.5	330
11BLRC0121	90	45.5	310
11BLRC0122	41	31	260
11BLRC0123	135	33.5	415
11BLRC0124	170	42	135
11BLRC0125	365	20	220
11BLRC0126	225	65	180
11BLRC0129	485	32.5	110

Table 7-1. Assay Results.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The drilling at North Costello intersected deep weathering down to 135m (hole 11BLRC121) with silicified stromatolitic dolomite overlying pink siltstone at depth.

Geochemical analysis of the RC chips found low levels of Cu, Pb and Zn that are consistent with background levels and there were no anomalous results.

The max levels were 500ppm Cu in hole 11BLRC0116, 165ppm Pb in hole 11BLRC0111 and 415ppm Zn in hole 11BLRC0123.

The EM anomaly at North Costello is likely to be caused by the black carbonaceous mud that is intersected in 7 holes, which closely correlates with the shape and depth of the EM feature.

A combination of poor geochemical results and unprospective geology means no further work is recommended on the prospect.

9.0 REFERENCES

Haines, P.W., Pietsch, B.A., Rawlings, D.J., and Madigan, T.L., 1993, 1:250,000 Geological Map Series, Explanatory Notes, Mount Young SE53-15. NTX

Herrmann, W, 2011, Geology of Lorella Pocket, Borroloola Exploration. NTX 0071

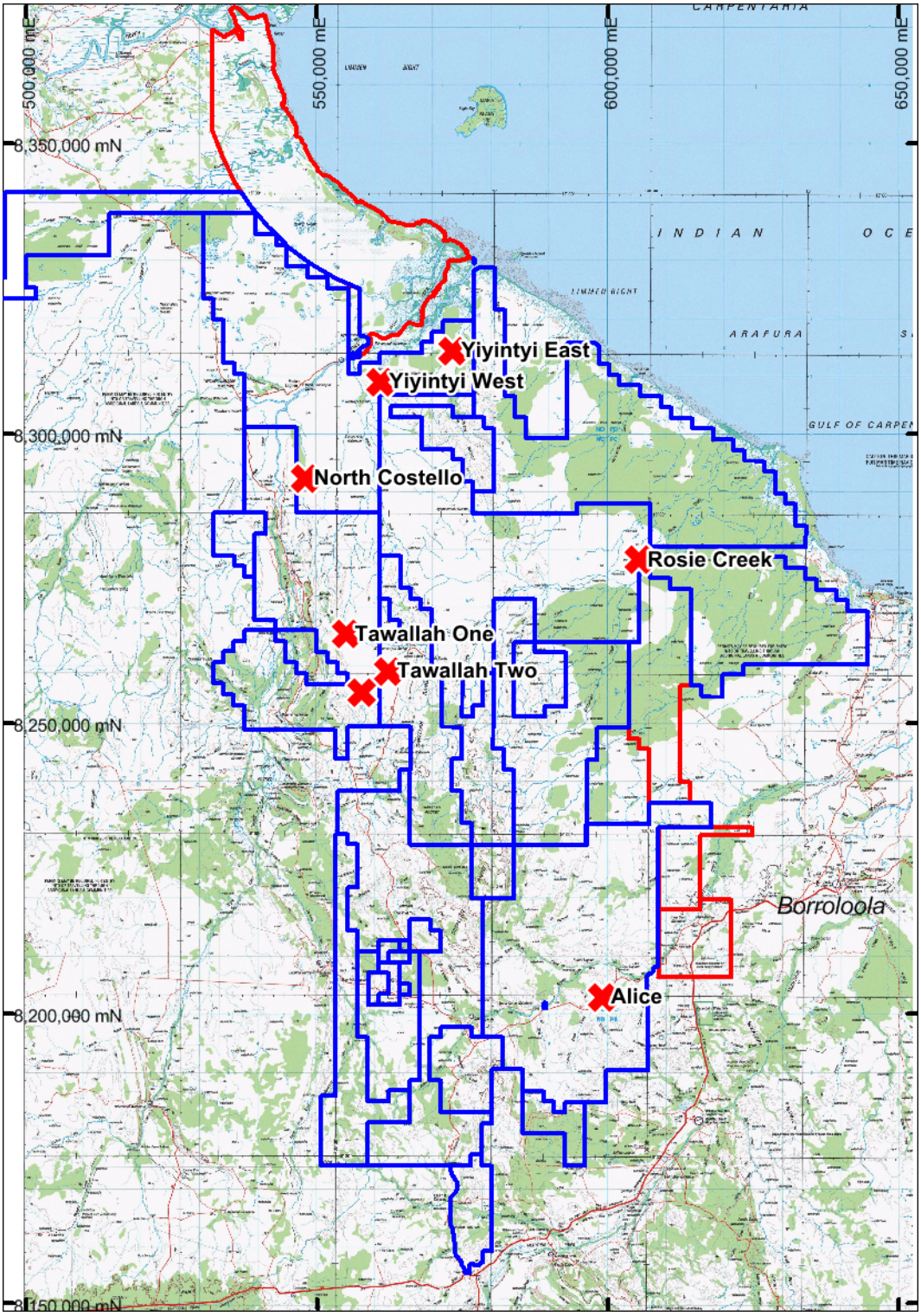


Figure 1. Borroloola prospects.

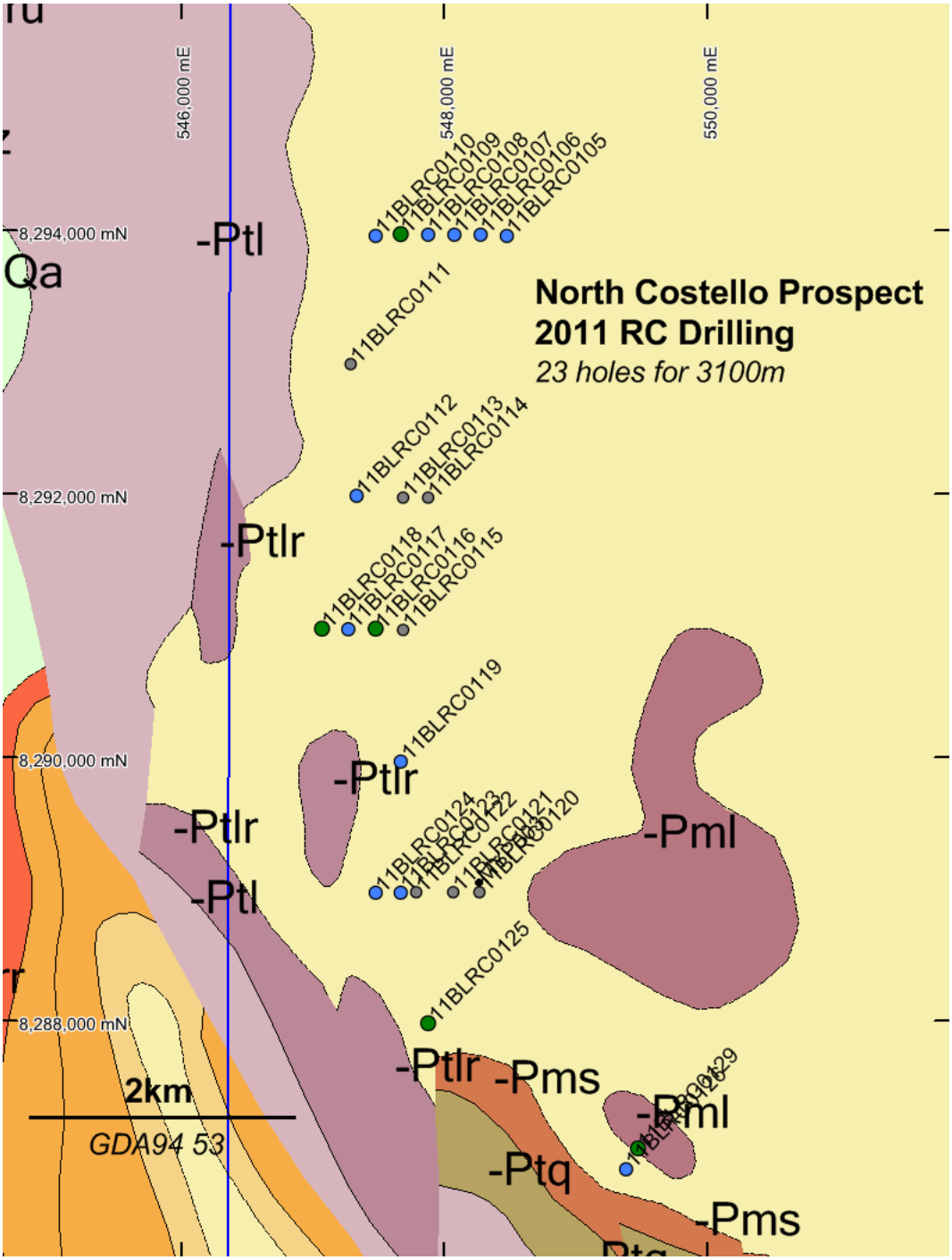


Figure 2. Geology and 2011 RC Drilling. Maximum copper indicated.

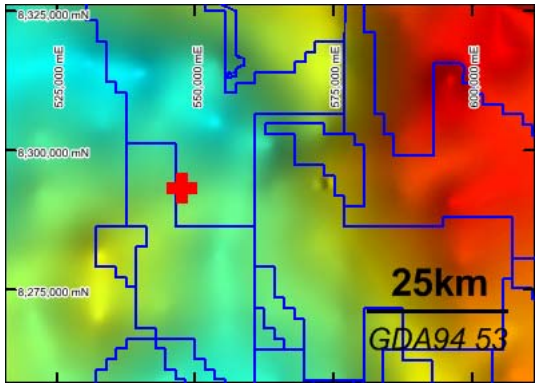


Figure 3. Gravity. Red cross marks North Costello prospect.

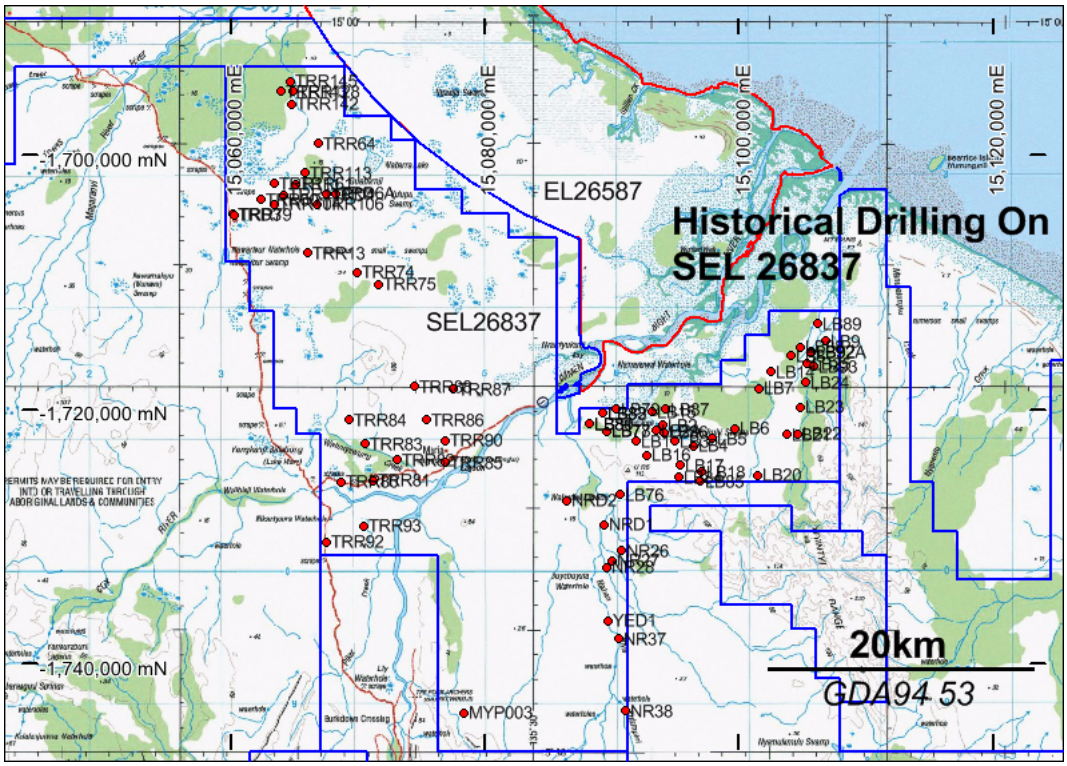


Figure 4. Historical drilling on tenement SEL 26837.

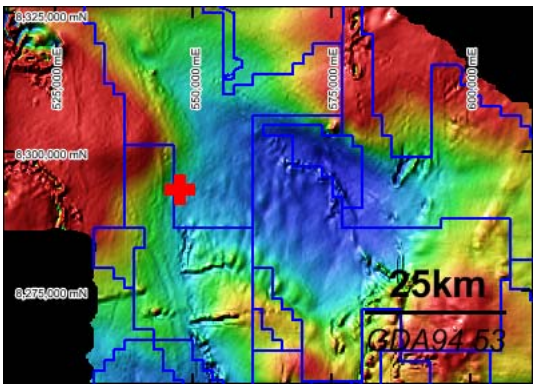


Figure 5. Magnetics. Red cross marks North Costello prospect.

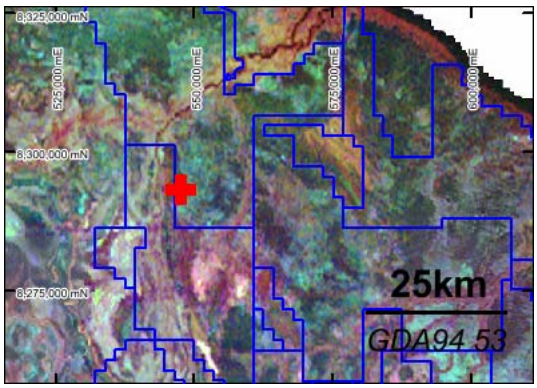
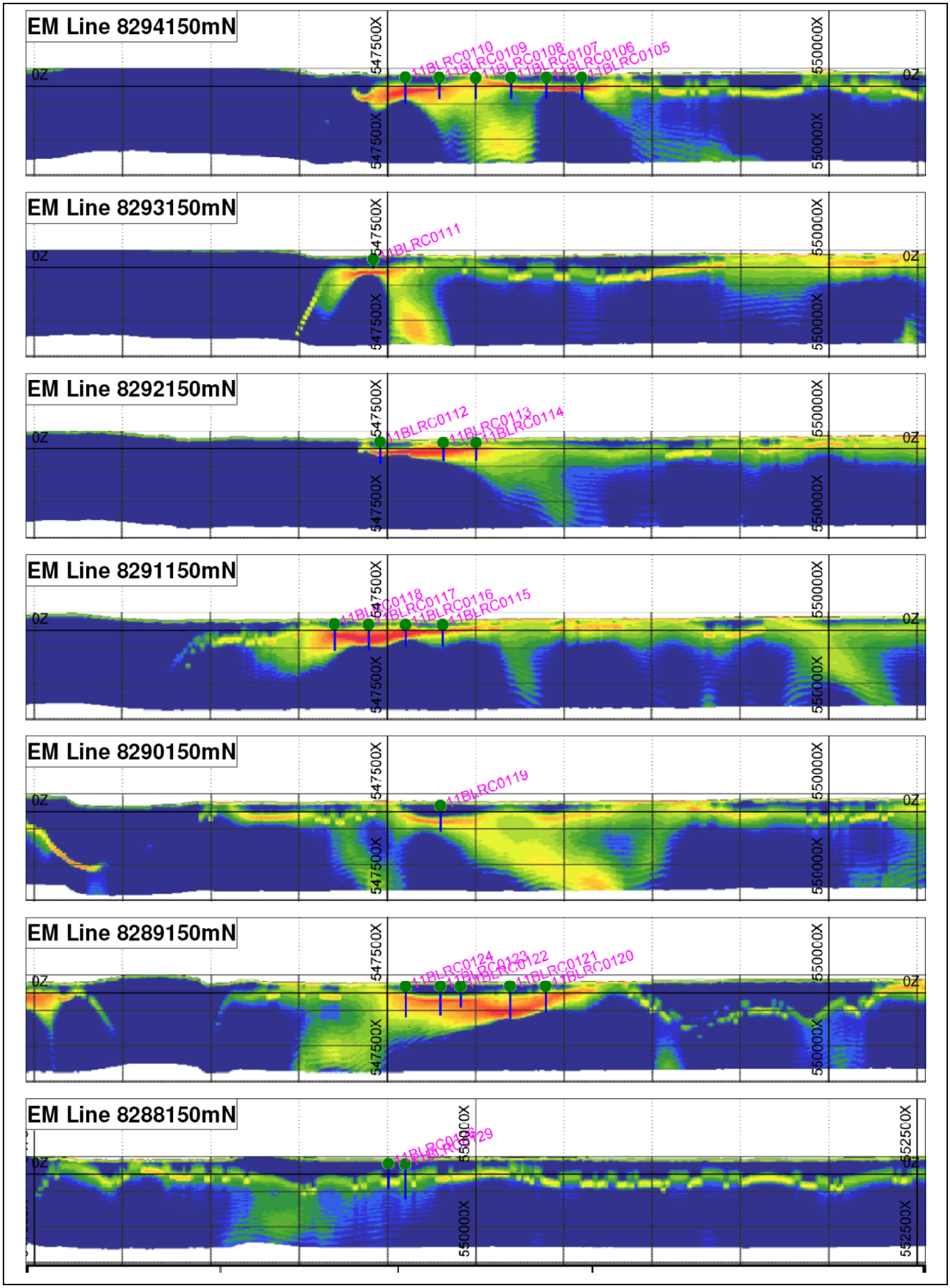


Figure 6. Radiometrics. Red cross marks North Costello prospect.

APPENDIX A – MOUNT YOUNG 1:250K MAP SHEET

APPENDIX B – EM IMAGES, FUGRO.


EM Line 8294150mN
11BLRC0110
11BLRC0109
11BLRC0108
11BLRC0107
11BLRC0106
11BLRC0105
EM Line 8293150mN
11BLRC0111
EM Line 8292150mN
11BLRC0112
11BLRC0113
11BLRC0114
EM Line 8291150mN
11BLRC0118
11BLRC0117
11BLRC0116
11BLRC0115
EM Line 8290150mN
11BLRC0119
EM Line 8289150mN
11BLRC0124
11BLRC0123
11BLRC0122
11BLRC0121
11BLRC0120
EM Line 8288150mN
0Z
547500X
550000X
552500X

APPENDIX C – GEOLOGY OF NORTH COSTELLO PROSPECT, W. HERRMANN (2011).

NTX 0071

APPENDIX D – CROSS SECTIONS.