SANDFIRE RESOURCES NL

Lorella Prospect SEL 26833, 26835, 26939

Drilling Completion Report

Radix No.

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1.0 EXECUTIVE SUMMARY

The Lorella prospect is in tenement SEL 26833, 26835 and 26933 approximately 80km northwest of Borroloola and 5km west of Lorella Springs, Northern Territory (Figure 1). Access is along the Lorella Springs road and then west along access tracks.

In 2011 Sandfire Resources NL (Sandfire) completed six RC holes (three inclined at 60° and four vertical) for 458.6m at the Lorella prospect. The area is prospective for red-bed style copper-lead-zinc mineralisation. Previous work on the tenements includes geophysical surveys, geological mapping and percussion, RAB and RC drilling.

No significant mineralisation was observed and assays show the maximum copper was 4m@682ppm in hole 11BLRC0102. No further work is recommended.

2.0 INTRODUCTION

In 2011 Sandfire completed six RC holes (three inclined at 60° and four vertical) for 458.6m at the the Lorella prospect (Table 2-1). The aim is to test for the potential to host red-beds style SEDEX mineralisation. Drilling intersected units from the lower McAthur Group that dip shallowly to the south-west. Table 2-1 gives details of the drilling.

Hole ID	Final Depth (m)	Easting	Northing	Nat_RL
11BLRC0102	100	565668	8258466	100.91
11BLRC0103	222	565571	8258486	98.8
11BLRC0104	222	565780	8258421	100.76
11BLRC0130	100	554979	8272196	87.65
11BLRC0131	252	555173	8272200	87.02
11BLRC0132	126	561346	8266692	109.71
11BLRC0133	193	461190	8266399	107.89

Table 2-1. Location and Depth of drilling at Lorella (GDA94 53).

3.0 TENEMENT AND ACCESS

The Lorella prospect is in tenement SEL 26833, 26835 and 26933 approximately 80km northwest of Borroloola and 5km west of Lorella Springs, Northern Territory (Figure 1). Access is along the Lorella Springs road and then west along access tracks.

The tenement is substitution exploration licence 26833, 26835 and 26939 which were 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 26833	Granted	282	Blocks	$165,000	24-Jun-08	9-Ju-09	7-May-12	C121/09 Borroloola
SEL 26835	Granted	367	Blocks	$240,000	24-Jun-08	9-Ju-09	8-Jun-13	C121/09 Borroloola
SEL 36939	Granted	393	Blocks	$220,000	3-Sep-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 Tawallah Range 1:100k NTGS geological sheet and details of the geology are in the Mount Young 250k explanatory notes (Figure 2) (Haines et al., 1993). The prospect is 35km west of the Emu Fault Zone in the Mesoproterozoic McArthur Basin. The Emu Fault Zone hosts the McArthur River Mine base metal deposit so Tawallah 1 is considered prospective for base metals.

The Lorella Prospect is in the flat embayment, Lorella Pocket, with low relief and at 100m elevation. Cretaceous submarine cover overlays bedrock in the embayment and is up to 60m thick. Around the edge of the pocket are outcropping ridges of Mesoproterozoic sandstones from the McArthur Group. The dip of the ridges varies from 10-45º south-west (Figure 2).

5.0 PREVIOUS EXPLORATION

5.1 Introduction

Previous exploration on the tenement includes:

- Geological mapping;
- Geophysical surveys; and
- Percussion, RAB and and AC Drilling

5.2 Geological Mapping

Regional mapping at 250k and 100k scale was done by Haines et al (1993) for the Northern Territory Geological Survey (NTGS). Proterozoic rocks from the McArthur Group dip up to 45° west and form small ridges 4km around the Lorella Pocket prospect. Cainozoic and Tertiary cover is up to 40m thick in the pocket but in the northeast some quartz sandstone from the McArthur Group outcrops (1:250k Haines et al., 1993). The general dip of the McArthur Group sediments in the pocket is 5-10 ° southwest.

5.3 Geophysics

Western Mining Corporation (WMC) completed reconnaissance geophysical surveys in 1982 and 1983 targeting shale-hosted base metal deposits. In 1989 a radiometric survey was flown by Aerodata Holdings Ltd for the NTGS covering the Mount Young map area (Figure 3) (Haines et al., 1993). There have been multiple surveys completed in the area including aeromagnetic surveys, EM surveys and regional gravity (Figure 4).

5.4 Drilling

In 1978 the tenement was explored for manganese and 21 percussion holes for 386.5m were drilled. Company information is not available. Figure 5 shows the location of all drillholes prior to 2011 drilling around the prospect.

6.0 SANDFIRE EXPLORATION

6.1 Introduction

Sandfire has completed the following work on the prospect:

- Mapping at 1:20,000 scale;
- Airborne EM; and

- Diamond, RAB and AC drilling

Sandfire have explored in the tenement since 2008 for Cu, Pb, Zn and Mn deposits.

6.2 Geophysical Compilation

A wide-spaced airborne EM survey has identified shallow features at the Tawallah 1 and Tawallah 2 prospects in the Lorella Pocket which are discussed in separate reports. The Lorella targets and not associated with geophysical features.

6.3 Prospect Mapping

The perimeter of Lorella Pocket was mapped by W. Herrmann in 2011 and generally agreed with the mapping done by Haines et al. (1993). The report and maps are in Appendix A.

6.4 Drilling

Figure 5 shows previous drilling around the Lorella Prospect and Table 6-1 gives details of the drilling.

Hole ID	Max depth (m)	Northing mN	Easting mN	Max Cu (ppm)	Max Pb (ppm)	Max Zn (ppm)
BLRC001	196	8261856	563774	1630	213	174
BLRC002	300	8261462	563442	592	166	88
BLRC003	208	8261092	563135	709	27	121
BLRC004	202	8261534	564162	452	22	168
BLRC005	240	8262167	563425	890	356	124
BLRC006	300	8262624	564416	330	19	48
BLRC007	228	8262248	564094	387	22	146
BLRC008	300	8260701	562806	426	22	64
BLRC009	242	8260336	562489	214	30	22
BLRC010	66	8260125	564295	188	174	31
BLRC011	250	8260453	563899	306	337	93
BLRC012	204	8261732	562374	421	52	52
BLRC013	240	8261424	562745	443	25	85
BLRC014	300	8259936	562184	309	47	56
BLRC015	300	8260273	561784	390	57	59
BLRC016	258	8260589	561395	247	54	53
BLRC017	6	8260777	563515	n/a	n/a	n/a

Table 6-1. 2010 Assay Results.

7.0 2011 DRILLING PROGRAM

7.1 Introduction

In 2011 Sandfire completed six RC holes (three inclined at 60° and four vertical) for 458.6m at the the Lorella prospect (Table 2-1). The hole was designed to determine the stratigraphy and test the the potential to host red-beds style SEDEX mineralisation. Figure 6 shows the drill locations.

Hole ID	Final Depth (m)	Hole angle (°)	Easting	Northing	Nat_RL
11BLRC0102	100	-60	565668	8258466	100.91
11BLRC0103	222	-60	565571	8258486	98.8
11BLRC0104	222	-60	565780	8258421	100.76
11BLRC0130	100	-90	554979	8272196	87.65
11BLRC0131	252	-90	555173	8272200	87.02
11BLRC0132	126	-90	561346	8266692	109.71
11BLRC0133	193	-90	461190	8266399	107.89

7.2 Results

7.2.1 Lithology

Summaries of the lithology of each hole are in Appendix B.

7.2.2 Mineralisation

There was minor pyrite in 11BLRC0130 (0.01%) from 67-79m in the siltstone unit but significant mineralisation was observed.

7.2.3 Geochemistry

The assay results show copper is slightly anomalous at 682ppm in hole 11BLRC0102 over a short interval (84-88m depth) and Zn levels are very slightly elevated in 11BLRC0103 (4m @ 385ppm). Lead is not anomalous (Table 7-1).

Hole ID	Max Cu (ppm)	Max Pb (ppm)	Max Zn (ppm)
11BLRC0102	685	24	38
11BLRC0103	195	27	385
11BLRC0104	370	18	195
11BLRC0130	145	12	31
11BLRC0131	440	19	48
11BLRC0132	10	10.5	60
11BLRC0133	31	16.5	70

Table 7-1. 2011 Assay Results.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The Lorella prospect is a target for red-beds style mineralisation of copper-lead-zinc. There was no significant mineralisation observed and assays show the maximum copper is 4m @ 682ppm in holes11BLRC0102. No further work is recommended.

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.

Herrmann, W, 2011, Geology of Lorella Pocket, Borroloola Exploration

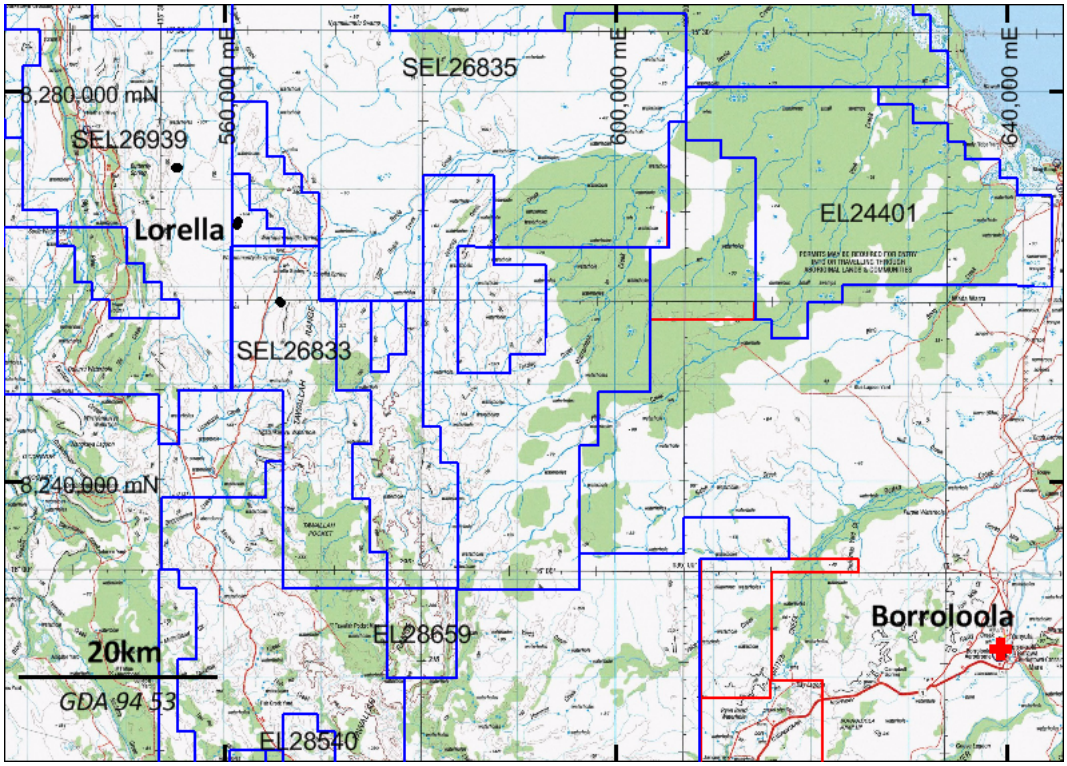

Figure 1. Location of Lorella. Live tenements in blue, applications in red.

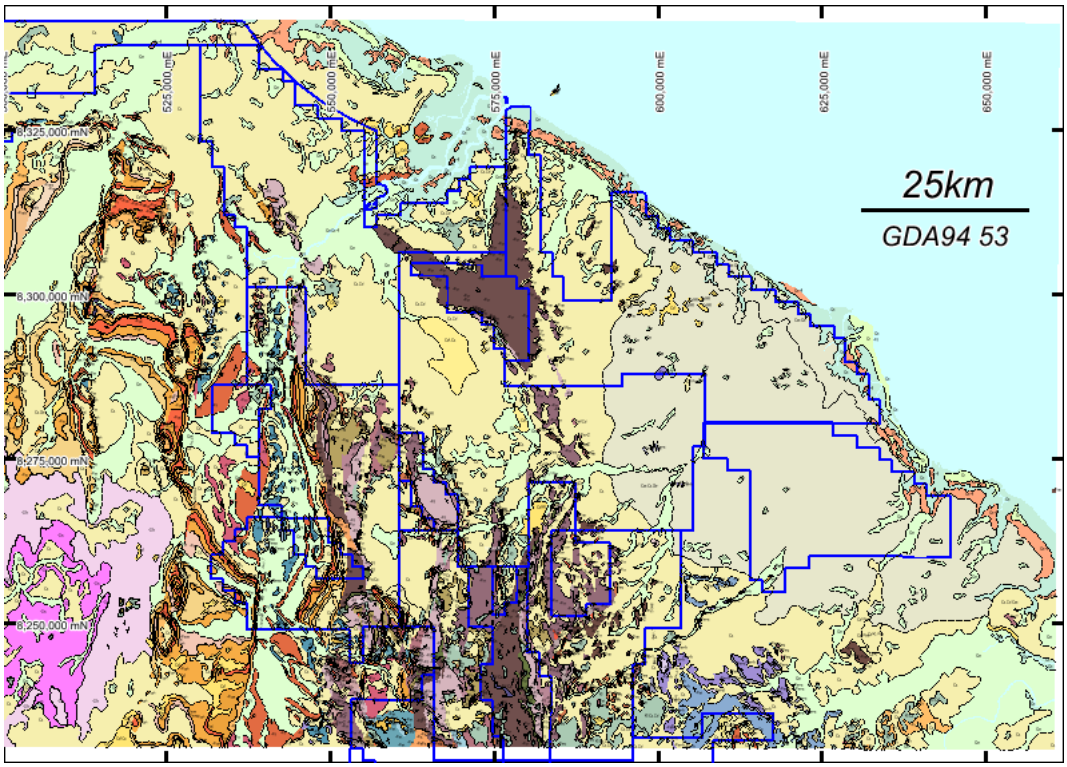

Figure 2. Regional geology, Mount Young 1:250k (NTGS).

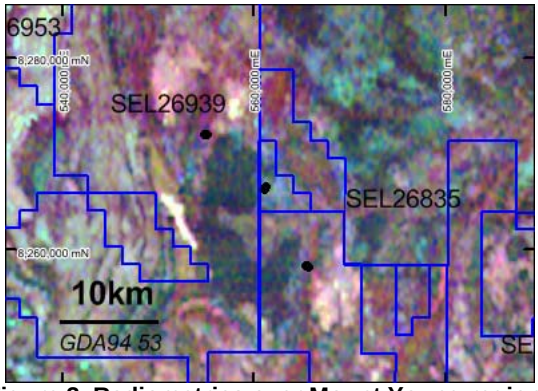

Figure 3. Radiometrics over Mount Young region. Black dots mark 2011 drilling at Lorella.

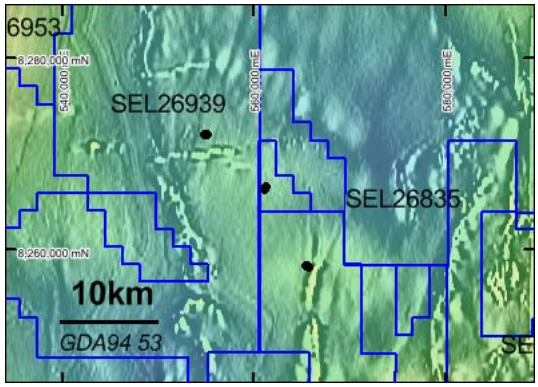

Figure 4. Magnetics over Mount Young region. Black dots mark 2011 drilling at Lorella.

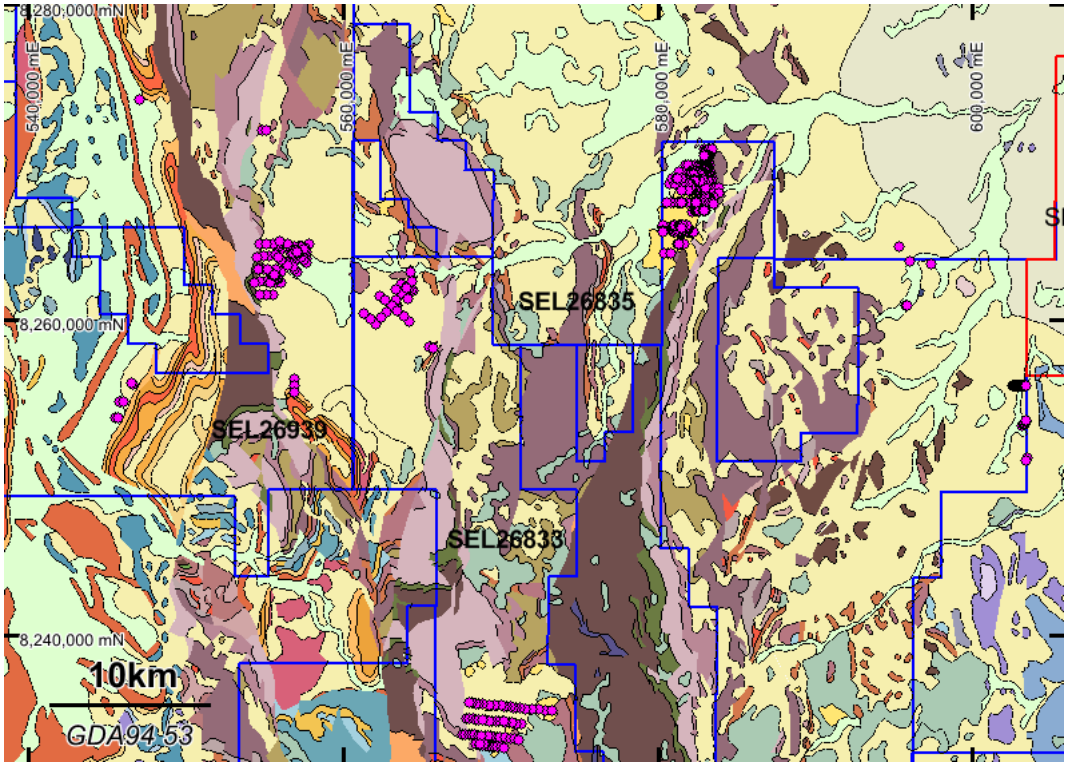

Figure 5. Location of all drilling on tenements.

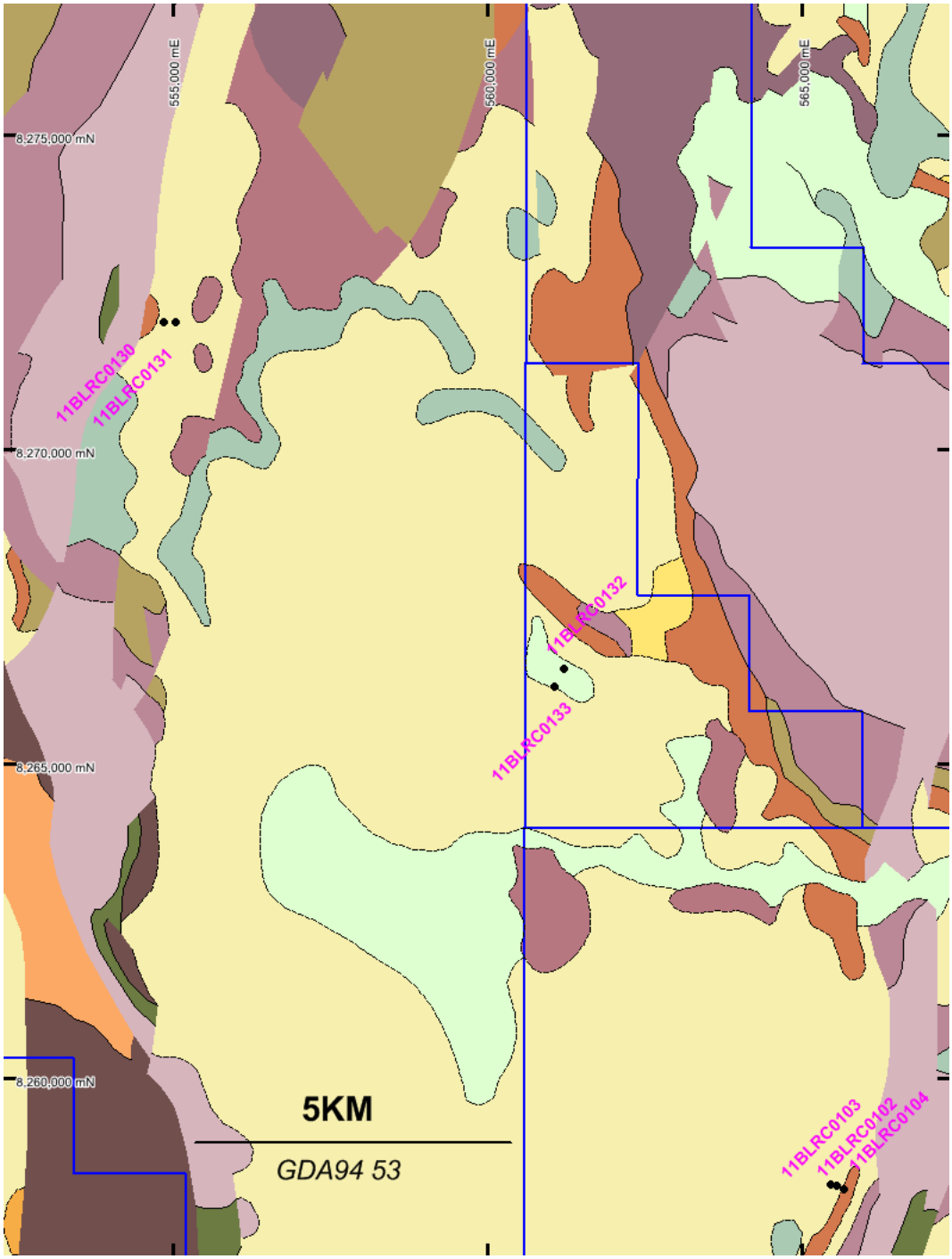

Figure 6. 2011 Drilling.

APPENDIX A – WALLY HERRMANN MAPPING 2011, GEOLOGY OF LORELLA POCKET, BORROLOOLA EXPLORATION, W. HERRMANN. NTX30705.

APPENDIX B – SUMMARY OF LITHOLOGY

Summary of Lithology - Lorella Prospect Drilling 2011

mFrom	mTo	Lithology	Description	Unit
0	4	Cover	Completely weathered, red, gravelly	
4	7	Sandstone	Massive, red, slightly weathered	Masterton Sandstone
7	24	Sandstone	Massive, red, fresh rock	Masterton Sandstone
24	81	Dolomitic siltstone	Massive, red-grey	Masterton Sandstone
81	88	Sandstone	Massive, khaki, medium grained.	Masterton Sandstone
88	91	Dolomitic sandstone	Medium grained, grey.	Masterton Sandstone
91	100	Sandstone	Medium grained, red.	Masterton Sandstone

Figure 1. Summary of 11BLRC0102 lithology

mFrom	mTo	Lithology	Description	Unit
0	4	Cover	Pisolitic cover	
4	7	Sandstone	Massive, medium-grained,	Masterton Sandstone
7	19	Dolomitic siltstone	Massive, khaki-cream.	Masterton Sandstone
19	40	Siltstone	Massive, laminated, red.	Masterton Sandstone
40	108	Sandstone	Massive, fine-grained, red.	Masterton Sandstone
108	126	Shale	Massive, black, laminated	Masterton Sandstone
126	133	Sandstone	Massive, fine-grained interbedded with mudstone.	Masterton Sandstone
133	222	Silstone	Massive, red-green, interbedded with mudstone.	Masterton Sandstone

Figure 2. Summary of 11BLRC0103 lithology

mFrom	mTo	Lithology	Description	Unit
0	14	Cover		
14	34	Dolomite	Dolomite interbedded with siltstone	Masterton Sandstone
34	90	Shale and dolomite	Interbedded layered shale and dolomite	Masterton Sandstone
90	120	Dolomitic siltstone	Massive, fine-grained, red	Masterton Sandstone
120	126	Shale	Fine grained, grey	Masterton Sandstone
126	135	Dolomitic siltstone	Siliceous, fine grained, light grey	Masterton Sandstone
135	161	Siltstone	Massive, fine grained, light green	Masterton Sandstone
161	203	Mudstone	Massive, fine grained, light red	Rosie Creek Sandstone Member
203	215	Mudstone	Massive, pink (60%) interbedded with quartzite (40%)	Rosie Creek Sandstone Member
215	222	Quartzite	Massive, medium grained (60-%) interbedded with mudstone.	Rosie Creek Sandstone Member

Figure 3 Summary of 11BLRC0104 lithology

mFrom	mTo	Lithology	Description	Unit
0	4	Cover	Alluvial cover	
4	14	Siltstone	Massive, completely weathered, brown	Masterton Sandstone
14	22	Sandstone	Bedded, fine grained, light cream	Masterton Sandstone
22	62	Siltstone	Fine grained brown-pink, moderately weathered	Masterton Sandstone
62	67	Dolomitic siltstone	Bedded, fine-grained, light grey	Masterton Sandstone
67	79	Silstone	Fine-grained, light grey, interbedded with minor mudstone	Masterton Sandstone
79	100	Dolomitic siltstone	Fine-grained, light pink with minor dendritic manganese	Masterton Sandstone

Figure 4. Summary of 11BLRC0130 lithology

mFrom	mTo	Lithology	Description	Unit
0	43	Sandstone	Massive, medium grained.	
43	78	Dolomitic siltstone	Massive, light khaki-red.	Masterton Sandstone
78	143	Silty dolomite	Massive, grey-khaki with stromatolites.	Masterton Sandstone
143	210	Dolomitic siltstone	Massive, stromatolitic, pink-grey.	Masterton Sandstone
210	252	Mudstone	Banded, veins, light grey.	Masterton Sandstone

Figure 5. Summary of 11BLRC0131

mFrom	mTo	Lithology	Description	Unit
0	4	Sandstone	Massive	
4	10	Sandstone	Siliceous, medium grained	Masterton Sandstone
10	36	Siltstone	Banded, interbedded with sandstone, white.	Masterton Sandstone
36	126	Sandstone	Massive, medium grained, white-grey, quartz rich	Masterton Sandstone

Figure 6. Summary of 11BLRC0132 lithology

mFrom	mTo	Lithology	Description	Unit
0	4	Sandstone	Massive, medium grained, completely weathered, hematitic	
4	15	Sandstone	Massive, fine grained, highly weathered	Masterton Sandstone
15	63	Sandstone	Massive, fine grained, moderately weathered.	Masterton Sandstone
63	132	Sandstone	Massive, fresh rock, white	Masterton Sandstone
132	138	Mudstone	Massive, pink, interbedded with sandstone (15%)	Masterton Sandstone
138	193	Sandstone	Massive, medium grained, grey.	Masterton Sandstone

Figure 7. Summary of 11BLRC0133 lithology