MANASIA MINING & METALS LTD
ACN 121511582

EL 9 of 2006

WHYTE RIVER
TASMANIA

ANNUAL REPORT
For period ending September 21st 2010

28th Sept 2010

Prepared by
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SUMMARY

El 9/2006 was acquired to explore for small scale iron ore deposits, Avebury-style nickel deposits and Devonian tin/zinc skarn-type mineralization. The prospectivity of the area was based on the previous mineral exploration history and the proximity to the Meredith granite.

The acquisition of EL 9/2006 was part of a proposed float on the ASX of Manasia Mining & Metals Pty Ltd proposed by Mr. Ali Obaid. Unfortunately the G.F.C. has delayed this float. Whilst the float is still being considered, discussions are being held with other parties. Mr. Obaid the principle of Manasia is self funding exploration in the interim.

Mr. Ron Gregory was engaged to supervise and administer exploration from Waratah in March 2010. The majority of work since work programs were approved by MRT has been to prepare access into the area. Foot access has recently been completed across the Whyte River enabling foot tracks to be cut south of the river in winter. Foot access has been cut into the Godkin/Washington Mines area.

CONTENTS

TENEMENT INFORMATION

EL 9/2006 is 42 square km, located 65 KM WSW of Burnie, in NW Tasmania. The licence is mid way between Savage River and Waratah. The Licence is split in two, namely the Eastern and Western sub areas. (Figure 1)
The Licence was first granted for five years on the 21st September 2007, therefore the final date is 21 Sept 2012.

ACCESS & LAND TENURE

Road access to both areas is via the bitumen Waratah-Savage River Highway. This provides all weather (except snow) 2 wheel drive access to the northern part of both sub areas.

Eastern sub area

2 WD road access via the old Cleveland Mine is possible to near an old boom gate and an old Whyte River log bridge crossing. This provides access to the "old Godkin Tramway", which provides access to the Godkin Mine. The Tramway is of excellent grade but is suitable for foot traffic only. There are some tree falls that have required removal. The North West walking Club/Savage River Caving Club maintain it and have no objection to assistance to keep it clear

The old township/sawmill site of Heazlewood is located adjacent to the Waratah/ Savage River Hwy. Vehicles can be parked there and the old sled track to the Godkin Mine has been opened up for foot traffic. This provides access to the Whyte R., Bells Reward (Result & Maces), Discoverer, Godkin Extended and North Godkin Mines as well as the Godkin.

Western sub area

4WD access is available via the Mt Stewart Track to the old Mt Jasper Mine and a little beyond. However caution must be exercised when wet as it can become slippery. Beyond this only Quad Bike access is possible because of severe rutting of the track. A temporary bridge was constructed over the Whyte River last season by Venture Minerals, but this has since been washed away.
Manasia have recently completed a log bridge across the Whyte River (Plate 1) to allow track cutting and fieldwork in spring. Venture Minerals have a pontoon affair that still exists across the Castray River (Plate 2).

Land Tenure

Please refer to MRT chart at Figure 2.

EXPLORATION PHILOSOPHY & AIMS

Manasia have several targets;

1. Silver lead zinc mineralization close to infrastructure with a view to open cut/ high grade narrow vein mining with shipping of ore to the Hellyer Mill, whilst it is still operating. No modern work has been done to assess the zinc potential of the Whyte R-Godkin-Washington-Confidence area. Old records indicate old workings exist south of the Godkin Mine and south of the Whyte River. No modern exploration has occurred in this area.
2. Tin & copper mineralization of the Cleveland style in the vicinity of the Godkin/Washington/Confidence area. This was postulated by Roy Cox in 1987 as under explored.
3. Gold is reported from the Whyte River Mine, Godkin Mine and creeks draining the area east of the Bells Reward Mine. Gold is also reported at 3 grams per ton in the Confidence Mine. It is unclear at this time if any modern exploration has targeted gold.
4. Allegiance Mining (Newnham, 2002) believed that the large aeromagnetic anomaly which exists over the Whyte River flats has potential for an Avebury like skarn. Although only half of the anomaly is on EL 9/2006 it is believed to be a viable target.
5. Whyte River skarn, Ifield skarn and Mt Youngbuck skarn have potential for a magnetite tonnage, as well being an undrilled nickel targets.
6. Humphries Creek has platinoid and nickel potential.

Manasia intend to access all of the above targets and conduct reconnaissance geology and sampling this coming summer season, with an obvious reassessment of their potential for exploration next season.

SUMMARY OF PREVIOUS EXPLORATION

A good outline of previous exploration is given in Simon Tear's "First Annual Report" for EL 9/2006, lodged in April 2010 This report is not repeated here but an A3 version of the accompanying plan "Previous Exploration Work" is at Figure 3

No field work was conducted by Manasia prior to the engagement of Ron Gregory.

EXPLORATION CONDUCTED TO September 20th 2010

General

Reviewed, downloaded and hard copied all previous exploration reports.
Attempted to locate missing plans from Roy Cox's report (Randell 87_2717), unsuccessfully.

Godkin/Washington area

1.1 Review of previous exploration.
1.2 Cut track into the Godkin Mine.
1.3 Commission a report on the mining history of the area from the Whyte River Mine to the Godkin from Mr. Nic Haygarth.
1.4 Reconnoitre the Godkin Tramway and establish that the lower (No.2 adit) Confidence Adit is located 50 metres east of the EL 9/2006 boundary and therefore excluded from the licence.
1.5 Located a shaft relating to the Whyte R. Mine.

Lindsay's Anomaly, South Godkin workings & Whyte R. Skarn

2.1 Assess and liaise with appropriate authorities regarding boom gate on Mt Stewart Track.
2.2 Locate fallen tree across Whyte River and convert to a safe foot crossing and commence cutting access foot tracks.

PROPOSED EXPLORATION TO Sept 2010

1. Continue access foot tracks from Log Bridge to inspect, sample, geologically map and assess, Lindsay's Anomaly, (a large aeromag anomaly 2 on Figure 4) South Godkin and Whyte R. & Ifield skarns.
2. Locate all major workings at the Whyte R., Bells Reward (Result), Confidence, Godkin North & Extended and the Godkin Mines. Geologically map and assess the further requirement for a full soil sampling grid over the area, specifically targeting zinc and gold as well as the normal silver lead etc.
3. Later in the year as weather permits cut and soil sample 2 lines at Humphries Creek, SW of Mt. Stewart.
4. Locate and assess what part of the Mt Youngbuck skarn that lies within EL 9/2006. Conduct a geological assessment specifically targeting Magnetite.

PROPOSED EXPENDITURE

$50,000 - subject to availability of funds.

EXPENDITURE Sept 2009 and Sept 2010

$17,219

PLAN and PLATE LIST

Location Plan	Figure	1.
MRT land tenure chart	Figure	2.
"Previous Exploration Work" – Simon Tear 2009 – A3 version	Figure	3.
Lindsay's Anomaly location plan	Figure	4.
Whyte River Log Bridge	Plate	1.
Castray River Pontoon - (Venture Minerals)	Plate	2.

REFERENCES

Simon Tear provided a comprehensive list of references in his "First Annual Report" Simon's list reproduced hereafter.

You searched for: Dataset: Company Reports - OnshoreDataset: Company Reports - Offshore HydrocarbonsDataset: MRT Documents, Location: Spatial Criteria Used

Downloaded	02_4819 - Tasmania - Regional Bulk Sampling - Inter-Office Memorandum
	Ellis, P.D.
	03_4912 - Old Mine Plans
	Green, D.
YES	03_4914 - Meredith Granite 1979
	Green, D.
	19_0023 - Mount Jasper Copper Mines Special Report
	Mills, J.A., OConnor, P.J.
YES	49_0101 - Godkin Mine, Drilling.
	Anon
	57_0164 - Miller`s Nickel Prospect North West Tasmania.
	Jensen, H.E.
	57_0167 - R.T.A.E. and E.Z. Exploration Programme Geophysical Surveys in N.W. Tasmania to 31st May 1957 - Project PRP/7/100
	McCarthy, E.
	57_0169 - Programme and Budget for Preliminary Diamond Drilling R.T.A.E. Magnetic Anomaly Savage River Area, North West Tasmania
	Matheson, R.S.
	57_0181 - Discovery of An Ancient Mineralised Rift-Valley in West Tasmania.
	Campana, B.
	57_0183 - Field Work Magnet Quadrangle 35
	Anon
	57_0187 - Field Work Corinna Quadrangle 43
	Anon, Brook, W.
	58_0256 - Exploration Notes and Proposals for Future Work
	Anon
	60_0305 - Cambro-Ordovician Sedimentation and Tectonism in West Tasmania. Age and Control of Mineralisation and Results of the Exploration
	Campana, B., King, D.
	63_0362 - Mount Cleveland Project, Outline of Proposed Exploratory Development and Ore Testing Programme.
	Glasson, K.R., Hopwood, T.P., Mason, A.A.C.
	65_0402 - Airborne Magnetometer Survey Over the Waratah - Zeehan Area Northwest Tasmania
	Zarzavatjian, P.A.
	65_0412 - I.P. Profiles
	Anon

YES

66_0425 - Report on Regional Geology. Summer 1965-1966. (Waratah, Mt Cleveland, Mt Lindsay Areas.)
Ransom, D.M., Wilson, C.J.L.
66_0428 - Report on the Helicopter AFMAG Survey Northwestern Tasmania
Sutherland, D.B.
66_0438 - Report on Planet Mining Co Tasmanian Phosphate Leases
Watts, T.R.
67_0457 - Northwest Tasmania, Proposed Program of Exploration (in Detail)
Anon
67_0469 - The Application of Statistical Analysis in Mineral Evaluation, Utilising Data from Hall`s Lode, Lenses `A`, `B` and `C`, Cleveland Mine, Tasmania.
Cox, R.
67_0488 - Memorandum Report, Reconnaissance Structural Evaluation, Coastal Tasmania.
Barton, R.H.
69_0590 - Review of Summer Exploration Program Exploration Licence 1/68 1968-1969
Anon
70_0644 - Heazlewood Nickel - Tasmania, Australia.
Gilfillan, J.F., Marshall, J.P.
70_0709 - Review of 1969-1970 Summer Exploration Programme Exploration Licence 1/68, Tasmania.
Anon
71_0721 - Espea and Bald Hill Areas, E.L. 1/68, Winter 1970.
Robison, H.R.
71_0795 - The Heazlewood Prospect - Waratah, Tasmania
Dummett, H.T.
71_0803 - Mt Stewart Drilling, Exploration Licence 1/68.
Everett, M.P.
71_0815 - Drill Hole Logs, Mount Jasper Grid
Anon
71_0829 - 1970-71 Annual Report, E.L. 48/70 and E.L. 49/70, North-Western Tasmania.
Newnham, L.A., Woodward, A.J.
71_0838 - 1970-1971 Summer Field Season Report, Exploration Licence 5/63
Chisholm, T., Everett, M.P., Henry, D., Pigott, G.F., Wallis, D.
72_0845 - Report to Tasmanian Mines Department for Period Ending February 9, 1972 on Exploration Licence 1/63, Luina, County of Russel, Tasmania.
Hunt, F.L.
72_0847 - Geochemistry Progress Report E.L. 1/63
Sale, R.V.

72_0856 - Exploration Licence 1/68, 1971/72 Summer Field Season Report, Meredith Granite Project
Yardley, S.R.

YES 72_0878 - Year-End Report for Tasmania Mines Department on Mineral Lease 27M/71, Exploration Licence 1/63, Period: September 1971 to June 1972
Hunt, F.L., Ransom, D.M.

73_0932 - Summary of Exploration Activities in EL 1/63 between 11th August 1972 and 11 Th February, 1973
Anon

73_0942 - Report to Tasmanian Mines Dept. Progress Report - Cleveland Tin N.L., 6 Months Ending June 30, 1973
Ransom, D.M., Simpson, D.C.

73_0964 - Pieman River, Exploration Licence 2/73 - Tasmania, Progress Report for the Period January 31 - July 31, 1973
Neale, R.C.

74_1036 - Report to the Tasmanian Mines Dept., Exploration Licence 1/63. for Six Months to August 11th 1974.
Stuart-Smith, P.G.

75_1072 - Progress Report - Exploration Licence 1/63, Cleveland Tin N.L. Six Months to February 11,1975
Palmer, K.G.

75_1115 - Progress Report, Exploration Licence 1/63, for Six Months Ending August 11, 1975
Palmer, K.G.

76_1153 - Progress Report, Exploration Licence 1/63, for Six Months Ending February 11, 1976
Ransom, D.M.

YES 76_1179 - Exploration Licence 11/75, Mount Stewart Area, Tasmania. Report on Field Season Activity, 1975-76.
Lockhart, J.D.

YES 76_1181 - Progress Report on Exploration Licence 1/63 for Six Months Ending August 11, 1976
Ransom, D.M.

YES 77_1197 - Progress Report, Exploration Licence 1/63 (Cleveland), for Six Month Period Ending February 11, 1977.
Ransom, D.M.

YES 77_1232 - Progress Report, Exploration Licence 1/63, Cleveland, for Six Month Period Ending August 11, 1977
Ransom, D.M.

78_1302 - Progress Report - September 1978, E.L. 17/77 - Wilson River Area, Western Tasmania
Schellekens, R.R.

79_1370 - Meredith Granite Project Preliminary Report 1978/79 Summer Exploration Programme for the Six Months Ending April 20, 1979.
Taylor, J.R., White, J., Young, C.H.

79_1388 - Meredith Granite Project, Report for the Six Months Ending, October 20, 1979.
Young, C.H.

79_1391 - Progress Report on Exploration Licence 1/63 for Period February 1979 to August 1979.
Eadie, A., Tulp, T.

80_1460 - Meredith Granite Project Progress Report for the Six Months Ending April 20, 1980
Joyce, R.M.
80_1476 - Meredith Granite Project, Progress Report for the Six Months Ending October 20, 1980
Joyce, R.M.
80_1476A - DIGHEM II Survey in Western Tasmania
Dvorak, Z., Fraser, D.C.
YES 80_1485 - Progress Report Exploration Licence 1/63 for Six Months Ending 11 August, 1980.
Ellis, P.D.
YES 80_1485A - DIGHEM II Survey in Western Tasmania
Dvorak, Z., Fraser, D.C.
80_1500 - Report Accompanying Licence Renewal Application for Exploration Licence 1/68, Tasmania
Pigott, G.F.
80_1500A - DIGHEM II Survey of Mt Cleveland Area, Tasmania
Dvorak, Z., Fraser, D.C.
81_1517 - Exploration Licence 26/78 (Tasmania), Pieman, Precious Stones, Relinquishment Report.
Hutton, M.J.
YES 81_1539 - Progress Report, Exploration Licence 1/63 for the Period August 12, 1980 - January 13, 1981
Ellis, P.D.
81_1565 - Meredith Granite Project, Progress Report for the Six Months Ending April 20, 1981.
Joyce, R.M.
YES 81_1577 - Progress Report, Exploration Licence 1/63 for the Period January 14, 1981 - August 11, 1981
McArthur, G.J.
YES 81_1577A - DIGHEM II Survey of Cleveland Area, Tasmania
Dvorak, Z., Vergos, S.
YES 81_1605 - Report Accompanying Licence Renewal Application for Exploration Licence 1/68 Tasmania
Pigott, G.F.
YES 81_1605A - Report on Exploration, Heazlewood Area, EL 1/68
Anon
82_1691 - Six Monthly Report to Tasmania Department of Mines for the Period Ended 30 December 1981, Exploration Licence 1/68
Pigott, G.F.
YES 82_1710 - Progress Report Exploration Licence 1/63 for the Period August 12, 1981- February 11, 1982.
McArthur, G.J.
82_1732 - Quarterly Report to the Department of Mines, Tasmania, for the Period 1st January to 31st March, 1982. Exploration Licence 1/68
Jones, C.M.
82_1753 - Notes to Accompany the Photo-Interpretation of the Country between the Arthur and Pieman Rivers, Tasmania.

Carey, S.W.
YES 82_1785 - Meredith Granite Project. Progress Report for the Six Months Ending April 20, 1982
Joyce, R.M.
82_1818 - Exploration Licence 18/80 Arthur River, Tasmania Report for the Six Months Ended 31st July, 1982
Anon
82_1854 - Progress Report, Exploration Licence 16/78, Meredith, Tasmania. for Six Months Ending October 19, 1982
Sise, J.R.
82_1885 - A Summary Report on the 1982 Geophysical Surveys Over the Little Wilson River Infill Grid, EL 17/77
Bishop, J.R.
83_1898 - Annual Report to the Department of Mines, Tasmania for the Period 1 January - 31 December 1982, Summary of Work Completed, in Progress and Proposed for E.L. 1/68
Pigott, G.F.
83_1899 - Progress Report on the Regional Exploration in Exploration Licence 1/68
Pigott, G.F.
83_1900 - Interim Report on Heazlewood Grid 19C, E.L. 1/68
Jones, C.M.
83_1916 - Geophysical Surveys - Tasmania
McCarthy, E.
YES 83_2047 - Annual Report, Exploration Licence 16/78, Meredith, Tasmania, for Year Ended October 20, 1983.
Sise, J.R.
83_2060 - Annual Report to the Department of Mines Tasmania for the Period 1/1/83 to 31/12/83. Summary of Work Completed and Proposed for EL 1/68.
Shaw, R.W.L.
83_2060A - Interim Report on the Heazlewood Project, Exploration Licence 1/68
Roberts, R.H.
84_2169 - The Lower Freshwater Sequence of the Parmeener Supergroup, Tasmania
Summons, T.G.
YES 85_2316 - Final Report to the Department of Mines, Tasmania Exploration Licence 1/68 Heazlewood
Shaw, R.W.L.
YES 85_2390 - Final Report Exploration Licence 16/78 Meredith Tasmania
Sise, J.R.
85_2410 - Relinquishment Report on Exploration Licence 5/84 Mt Meredith
Shannon, C.H.C.
86_2614 - Exploration Licence No. 22/85, Savage River. Report on Exploration Activity 20th November, 1985 to 20th November, 1986.
Mathison, I.J.
87_2634 - E.L. 31/85 Mt Stewart, Progress Report on Exploration for the Period 23/1/86 to 22/1/87

Hall, D.B.
87_2644 - Heazlewood Prospect North West Tasmania E.L. 21/85 Annual Report for the Period Ending 1/12/86

Anon
87_2709 - El 20/85 Mt Cleveland. Annual and Final Report Period Ending 20 October 1987.

Hall, D.B.
YES 87_2717 - Luina Joint Venture EL 34/82. Progress Report for the Period 1/11/86 to 31/10/87 ;

Randell, J.P.
YES 87_2755 - EL 31/85 Mt Stewart, Progress Report on Exploration for the Period 23/1/87 to 22/1/88

Hall, D.B.
88_2770 - Sampling of Ultramafic Rock Types for Monier Ltd, Savage River, N.W. Tasmania

Anon
88_2779 - Relinquishment Report on Exploration Licence 4/61 Savage River. Tasmania

Shannon, C.H.C.
88_2804 - Heazlewood Prospects, North West Tasmania, EL 21/85. Annual Report for the Period Ending 1.12.87. Year 2 (2.12.86-1.12.87).

Morrison, K.C., Summons, T.G.
YES 88_2811 - E.L. 31/85 - Mt. Stewart, Relinquishment Report

Hall, D.B.
88_2854 - Exploration Licence 24/87 - Rapid River, Annual Report : Year 1 (September 1987 - September 1988)

Cromer, W.C., Davidson, J.K., Hofto, V.
YES 88_2876 - Heazlewood Prospects, North West Tasmania, EL 21/85 Annual Report for the Period Ending 1.12.88, Year 3 (2.12.87 - 1.12.88)

Bellairs, P.G., Carthew, S.J.
YES 88_2876A - Preliminary Report on Evaluation of the Gold Potential of the Old Jasper Mine Area, E.L. 21/85 Heazlewood, Tasmania

Bellairs, P.G., Carthew, S.J., Herrmann, W.
89_2959 - E.L. 37/82 Longback, Annual Report on Exploration Activity, April 1988 - April 1989.

Mathison, I.J., Virgoe, K.J.
YES 89_3054 - EL 21/85 Annual Report for the Period Ending 1/12/89 Year 4 (2/12/88 - 1/12/89)

Carthew, S.J.
YES 89_3054A - A Report on Geophysical Surveys at Heazlewood, Tasmania

Rutter, H.
89_3067 - Exploration Licence 59/88 - Mount Ramsay. Relinquishment Report.

Hofto, V., Morrison, K.C.
89_3067A - Processing of Aeromagnetic Data, E.L. 59/88. Mt Ramsay.

Leaman, D.E.
91_3212 - E.L. 41/89 Mt Bertha. Report on Exploration Activity January 1990 to November 1990.

	Mathison, I.J., Virgoe, K.J. 91_3213 - Geophysical - Structural Review Rocky Cape Block NW Tasmania.
	Leaman, D.E. 91_3218 - EL 45/89 Savage River. Report on Exploration Activity January 1990 to November 1990.
YES	Mathison, I.J., Virgoe, K.J. 91_3284 - E.L. 12/90 and E.L. 15/90 Waratah Annual Report 1990/91
	Halley, S.W. 91_3299 - EL 21/90 Luina Report on Exploration Activity October 1990 to September 1991
	Mathison, I.J. 92_3357 - EL 12/90 and EL 15/90 Waratah Partial Relinquishment Report for the Period 1990 to 1992.
	Halley, S.W. 92_3357B - An Interpretation Form of Meredith Granite Waratah Area EL 12/90 and 15/90
YES	Leaman, D.E. 92_3363 - EL 12/90 and EL 15/90 Waratah Area Annual Report for the Period July 1991 to June 1992.
	Halley, S.W. 92_3365 - Partial Relinquishment Report Including Report on Exploration Activity December 1991 to June 1992.
	Gardner, D., Mathison, I.J. 92_3371 - Relinquishment Report Including Report on Exploration Activity October 1991 to June 1992.
	Mathison, I.J. 93_3409 - Annual Report 1991-92
	Gardner, D. 93_3428 - Partial Relinquishment Report June 1993
	Halley, S.W. 93_3428A - Interpretation of Regional Aeromagnetic Data from Waratah-Mt Ramsay Area
	Wyatt, B. 93_3428B - An Interpretation Form of Meredith Granite Waratah Area
	Leaman, D.E. 93_3530 - EL 45/89 Savage River - Relinquishment Report and Annual Report December 1992 to December 1993
YES	Gardner, D. 94_3536 - EL 36/92 Heazlewood,Tasmania - Annual Report for the Period Ending 5 March 1994
	Maher, S. 94_3580 - Rehabilitation Surveys Heazlewood (EL 21/85)
YES	Jones, P.A. 94_3619 - List of Transparencies from Portions of EL 4/61 and EL 22/85.
	Anon

YES	95_3705 - EL 36/92 Heazlewood, Tasmania. Annual Report for Period Ending 5 March 1995. Maher, S.
	95_3711 - Assorted Stream Sediment Geochemistry-Tasmania Wide Ellis, P.D.
YES	95_3720 - Annual Technical Report to April 1995 EL 17/93 Luina Poltock, R.
YES	95_3777 - Final and Third Annual Report for the Period Ending 5 March 1996 EL 36/92 Heazlewood. Maher, S.
	96_3822 - Summary Report on Activities in 1993 on EL 35/94 Savage River and EL 36/94 Mt Bertha. Ridge, K.J.
	96_3838 - Annual Report EL 35/94, EL 36/94 Savage River and Mt Bertha Ridge, K.J.
	96_3851 - Annual Report 1996, Luina Joint Venture EL 17/93 McGunnigle, N.K.
	96_3876 - Annual Report EL 35/94 Savage River and 36/94 Mt Bertha Ridge, K.J.
YES	96_3954 - Annual Report - Whyte River EL 49/94 - P.E. Oct 1996 McGunnigle, N.K.
YES	97_4003 - Annual Report - EL 17/93, Luina Basford, P.W., McGunnigle, N.K.
YES	98_4137 - Final Report - Luina EL 17/93 - April 1997-Nov 1997 (Note - Report Submitted Due to Ending of J/V with MPI Gold) Weber, G.B.
YES	99_4406 - Annual Report - P.E. November 1999 - EL 22/98 - Meredith Range - Newnham, L.A.

355,000 mE
360,000 mE
365,000 mE
5,410,000 mN
5,405,000 mN
5,400,000 mN
5,395,000 mN

Jones Creek
Jones Ck B
Burgess Pr
Rachel Creek
19 Mile Ck A
19 Mile Ck B
Fentons Wkgs B
Joint Ck
Hatchet Ck
Fentons Pr
Bald Hill
Nineteen Mile Creek
Mount Cleveland Road
Mutiny Creek
Burgess Ck
Purcells PR
N Brassy N
Lord Brassy
Blindmans Creek
Madeline Creek
Purcell Sth Wkgs
Andrew Creek
Thirteen Mile Creek
Duffs Hill
Whyte R
Mr Wright
Heazlewood
Ten Mile
Cleveland
Washington
Henrys
Khaki
Confidence
Old Jasper
Leven Creek
Godkin Extd
North Godkin
Godkin
Mt Youngbuck
Mt Stewart
Mt Steward; Long Tunnel
Ramsay's
Castray River
Betts Creek - A
Betts Creek -
Yellowband Ck

Base data from theLIST, © State of Tasmania

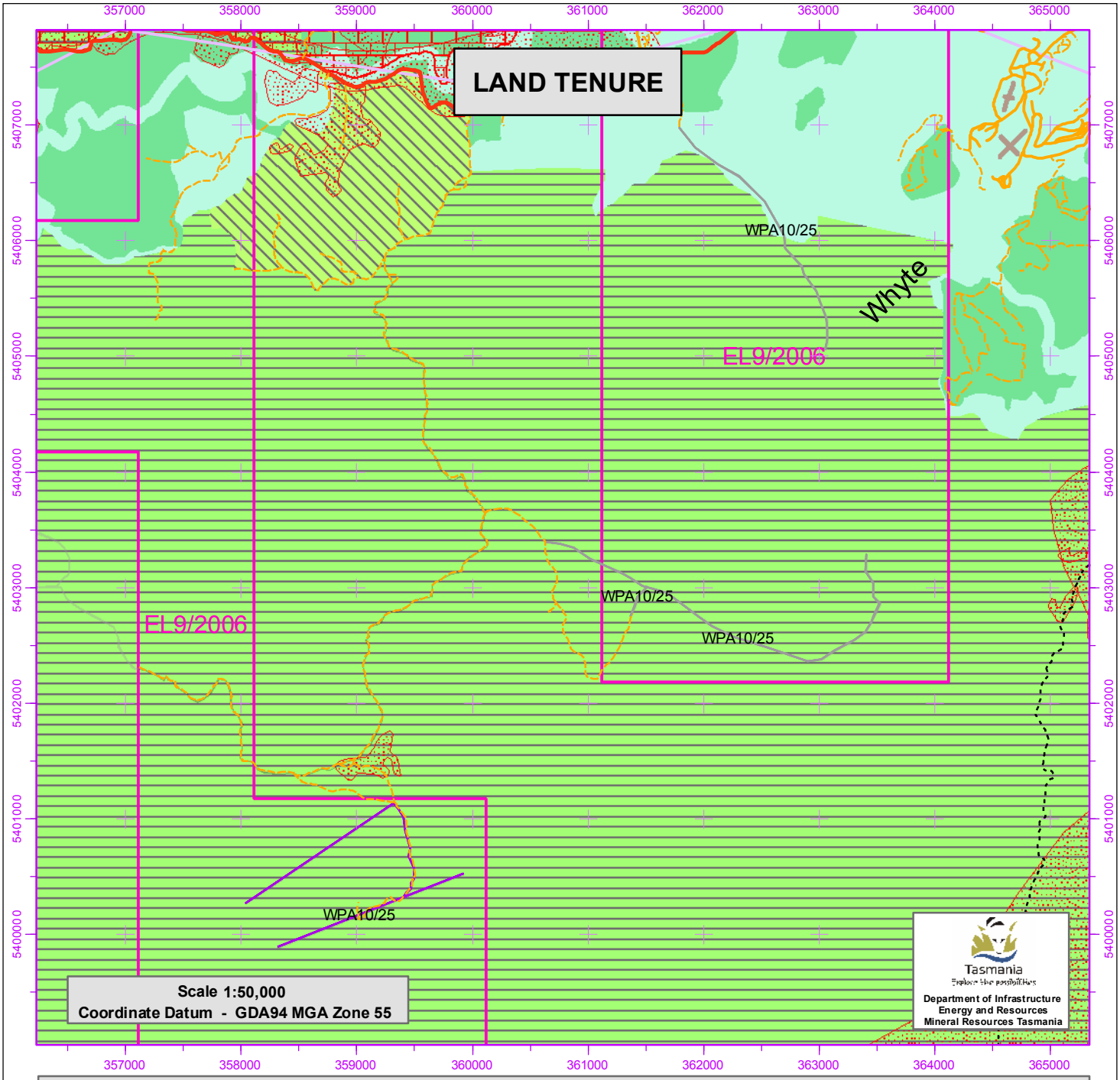
GDA

Ron Gregory
PROSPECTING
ABN 44 845 896 285

Compiled: R. Gregory	MANASIA MINING AND METALS LIMITED
Drawn: G. Bennett	EL 9/2006 - WHITE RIVER
Date:15/2/2010	
Projection: GDA94z55	
Drawing No.:	
File:	

Scale: 1:50,000
0 0.5 1 2 km

Figure No:



Land Tenure / Special Management Areas (Guide Only)

- Exploration Licence
- Mining Lease
- Fossicking Area
- Fossil Site
- Suspected Phytoph Cin Locations 2005
- Phytoph Cin Locations
- Phytoph Cin Management Zone
- Nationally Significant Wetlands
- RAMSAR Site
- Administratively Excluded Areas
- Gas Pipeline Corridor
- Forest Communities Managed by Prescription
- Aurora / Hydro / Transend Lands
- Commonwealth Land
- Private Land
- Private Reserve
- Private Reserve - Availability Unknown
- Private Reserve - Unavailable under MRDA
- Informal Reserve (Forestry Operations) - Private Land
- Public Reserve
- Proposed Public Reserve - CLAC
- Aboriginal Administered Land
- Indigenous Protected Areas
- Protected Area
- Wellington Park
- Conservation Area - Unavailable under MRDA
- Conservation Area
- Proposed Conservation Area - CLAC
- Game Reserve
- Proposed Game Reserve - CLAC
- Historic Site
- Proposed Historic Site - CLAC
- National Park
- Proposed National Park - CLAC
- Nature Recreation Area
- Proposed Nature Recreation Area - CLAC
- Nature Reserve
- Proposed Nature Reserve - CLAC
- * Regional Reserve
- Proposed Regional Reserve - CLAC
- State Reserve
- Proposed State Reserve - CLAC
- Forest Reserve - Unavailable under MRDA
- Forest Reserve
- State Forest
- Informal Reserve - State Forest / FT Managed Land
- Crown Land - Authority Land
- * Crown Land (DPIWE)
- Timberlands Pacific Land
- Threatened Native Vegetation Communities
- Heritage Sites

GDA

Relevant tenement land tenure / land management area indicated *

Note: Land Tenure is derived from the LIST and other sources and may be incomplete. Not all Land Tenure depicted in legend may appear on the map.

WPA10/25

- Drill Site
- Drilling Area
- Costean
- Costeaning Area
- * Grid
- Gridding Area
- Seismic Line
- Geophysics Loop Line
- Geophysics Survey Area
- Camp Site
- Helipad Site
- Helicopter Drop Point
- Helicopter Drill Site
- Shaft Site
- Survey Mark Site
- Soil Sample Area
- Soil Sample Site
- Stream Sediment Sample Site
- Stream Sediment Sampling Area
- Geological Mapping Area
- Bulk Sample Site
- Vehicular Track
- Quad Bike Track
- * Walking Track

356,000 mE
358,000 mE
360,000 mE
362,000 mE
364,000 mE
366,000 mE
5,412,000 mN
5,410,000 mN
5,408,000 mN
5,406,000 mN
5,404,000 mN
5,402,000 mN
5,400,000 mN
5,398,000 mN
Tb
Cg
Csd
Csp
Cba
Cbt
Ct
Cs
Ccw
Ccwb
Loq
Ts
Qh
Cb
SDc
SD
SDa
Ol
Os
Dga
Dgaa
water
Jones Creek B
Heazlewood Rd
Warners Creek A
Nineteen Mile Creek C
Warners Ck B
Nineteen Mile Creek B
Fenton Creek A
Hatchet Ck
Nineteen Mile Creek A
Warners Creek C
Warners Creek D
Joint Creek
Fenton Creek B
Warners Creek E
Unnamed
Fentons Prospect
Bald Hill
Fentons Knob
Burgess Creek
Burgess
Caudrys Creek
Caudrys Prospect
Purcells Prospect
Purcells South Workings
Brassy North
Lord Brassey Mine
Clupps
Heazlewood Bridge
Duffs Hill
Mt Wright
Heazlewood
Boxing Day Shaft
Old Jasper
Claxton's Find
Western Blow
Millers Shaft
Lever Creek
New Jasper
Mt Youngbuck
New Castray
Castra River
Mt Stewart
Mt Stewart; Long Tunnel
Stanton and Loughnan
Tunbridge and Kellys
Humphries Creek
Ramsay`s
Castray River
Whyte River Mine
Maces
Bells Reward
Discoverer
Godkin Extended
North Godkin
Godkin
Whyte River Prospect
Whyte River Tin Mine
Ten Mile Water
Washington Hay
Washington
Confidence
Pikes
Gregory
Crescent
Paul Behrs Adit
Thornes Adit
North Adit
CounRrousesAdit
Henrys
Al Hills
Khalicks
Ingrids Find
Cleveland Mine
Battery
Unnamed

Legend

- Mineral Occurrence
- Drillhole
- Soil Sample Grid or Lines
- Trench Samples - Ifield
- CRAE Stream Sediment Sample Site
- Pan Concentrate
- Rock Chip Sample Site
- Stream Sediment Sample Site
- Airborne EM Dighem - Aberfoyle
- Soil Sample & Sirotem Lines - Aberfoyle
- Whyte River Soil & Ground Mag - RGC
- IP and Soil Sample Lines - Cleveland Tin
- Airborne Geophysical Survey
- Geological Boundary
- Geological Fault
- Road
- Creek

Geological Legend

Water

Quaternary & Tertiary

- Qh — Sand gravel and mud of alluvial, lacustrine and littoral origin.
- Tb — Basalt (tholeiitic to alkalic) and related pyroclastic rocks.
- Ts — Dominantly non-marine sequences of gravel, sand, silt, clay and regolith.

Devonian

- Dgaa — Dominantly adamellite/granite (I-type).
- Dga — Undifferentiated alkali-feldspar granite/granite/adamellite (I-type).

Silurian to Cambro-Ordivician

- SDc — Shallow marine quartz sandstone and pebble conglomerate
- SD — Undifferentiated shallow marine quartz sandstone, siltstone and shale
- SDa — Siltstone, shale and minor quartz sandstone
- Ol — Shallow marine limestone sequence with minor siltstone and sandstone
- Os — Shallow marine sandstone- mudstone +/- conglomerate +/- limestone sequences, typically grey, trace fossils and tubicular burrows in places.

Cambrian

- Cg — Gabbroic rocks.
- Ccw — Mafic volcaniclastic sandstone- siltstone- mudstone- chert- minor carbonate sequences with intercalated tholeiitic basalt flows.
- Cs — Layered peridotite, serpentinite and associated rocks.
- Ct — Tonalite and associated rocks.
- Cb — Undifferentiated low-Ti tholeiitic and boninitic lavas.
- Cba — Boninitic lavas
- Cbt — Low-Ti Tholeiitic lavas.
- Csd — Dominantly serpentinised layered dunite and harzburgite
- Csp — Dominantly layered pyroxenite and dunite
- Ccwb — Tholeiitic basalt within Cleveland- Waratah Association and correlates.

Neo-Proterozoic

- Lo — Unmetamorphosed quartzwacke turbidite sequences
- Let — Quartz-mica-schist, quartzite, phyllite and rare dolomite
- Loq — Quartzwacke of high-grade metamorphic provenance

Hellman & Schofield Pty Ltd

EL 9/2006 Whyte River Project

Previous Exploration Work

Drawn by : S.J.Tear May 2009 Scale 1:15000

CAINOZOIC
QUATERNARY
Qhm Mine tailings and man-disturbed ground (Qhm).
Qha Stream alluvium, swamp and marsh deposits (Qha).
Erosional surface.
TERTIARY
Tb Basalt (Tb); transitional olivine basalt (Tbr).
Tssc Sand, silt and conglomerate, interlayered with basalt (Tssc).
Tcgs Siliceous conglomerate, grit, occasional fossiliferous sandstone and clay (Tcgs).
Tss Interbedded sand and clay (Tss).
Angular unconformity.
PALAEOZOIC
SILURIAN
SDa Siltstone, mudstone and calcareous siltstone (correlate of Amber Formation, including Austral Creek Siltstone and Keel Quartzite) (SDa)
SDcg Quartz sandstone with minor mudstone and granule conglomerate (correlate of Crotty Formation) (SDcg).
ORDOVICIAN
Ol Limestone and impure limestone (correlate of Gordon Group) (Ol).
Osm Poorly sorted quartz sandstone and minor mudstone (probable correlate of Moina Sandstone) (Osm).
LATE CAMBRIAN
€Omsc Marine conglomerate with some sandstone and mudstone (€Omsc).
Faulted contacts attributed to major thrusting.
EARLY CAMBRIAN(?)
€cwq Micaceous quartzose lithicwacke with interbedded siltstone and mudstone (including Crescent Spur Sandstone) (€cwq).
€cwc Interbedded grey, brown and maroon chert, shale and argillite (€cwc).
€cwm Volcaniclastic lithicwacke with interbedded siltstone, mudstone and minor mafic tuff (€cwm).
€cwb Tholeiitic basalt with locally developed pillows and minor intercalated tuff (€cwb). Dominantly planar flow basalt indicated (€cwbf). (Includes Deep Creek Volcanics). (€cw – undifferentiated lithicwacke, basalt, chert and sedimentary rocks, locally hornfelsed).
Faulted contacts attributed to major thrusting.
€ba Porphyritic (pseudomorphed clinoenstatite, orthopyroxene, chromite) boninitic lava (basalt and high magnesium andesite), commonly with interbedded breccia and pillow flows (€ba).
€bm Massive and pillowed aphyric basalt flows (low-titanium tholeiite), commonly brecciated. Individual flows graded from coarse-grained bases to pillowed tops (€bm).
€bc Minor intercalated chert and sedimentary rocks (€bc). (€b: undifferentiated mafic and ultramafic rocks).
Faulted contacts of €w attributed to major thrusting.
PROTEROZOIC
NEOPROTEROZOIC
Pom Thinly bedded calcareous siltstone and conglomerate, with minor quartzwacke and mudstone (correlate of upper Oonah Formation) (Pom).
ELDON GROUP
CORRELATE OF OWEN GROUP
WURAWINA SUPERGROUP
INCLUDES HALL FORMATION
CLEVELAND-WARATAH ASSOCIATION
ALLOCHTHONOUS SEQUENCES
INTRUSIVE ROCKS
DEVONIAN
Dgoci Very coarse-grained equigranular biotite granite, with very abundant intrusions of fine- to coarse-grained porphyritic (quartz, K-feldspar, plagioclase) biotite granite. (More felsic phase of Meredith Granite) (Dgoci).
Dgoeh Fine- to medium-grained equigranular to sparsely porphyritic (quartz, K-feldspar and plagioclase), biotite and minor hornblende-bearing adamellite (Wombat Flat phase of Meredith Granite) (Dgoeh). (Dg – undifferentiated granitic rocks).
EARLY(?) CAMBRIAN
€ddg Dolerite and microgabbro (€ddg).
€bap Coarse-grained pyroxenite associated with boninitic lavas (€bap).
€bs Massive ultramafic cumulate (€bs).
€gfc Fine to coarse-grained gabbro (€gfc).
€spsh Serpentinized interlayered orthopyroxenite, dunite and pyroxene-bearing dunite (€spa). Dominantly harzburgite, plagioclase harzburgite and subordinate dunite, orthopyroxenite and plagioclase lherzolite (€spsh).
€spsl Dominantly plagioclase dunite-harzburgite-lherzolite, troctolite and minor anorthosite (€spsl). (€sps, €spsh, €spsl – layered pyroxenite-dunite association, LPD).
€sd Serpentinized interlayered dunite, harzburgite and minor orthopyroxenite. (Layered dunite-harzburgite succession, LDH) (€sd).
€sm Massive serpentinite (€sm).
€spw Serpentinitic melange (€spw).
€tt Tonalite (€tt).
ALLOCHTHONOUS SEQUENCES
ALTERATION
DEVONIAN
Dm Magnetic skarn (Dm).
Geological boundary – position approximate.
Geological boundary – inferred from airborne magnetic data.
Geological boundary – inferred from airborne radiometric data.
Fault – position accurate or approximate.
Fault – inferred from airborne radiometric data.
Thrust fault (teeth on upper plate) – position accurate or approximate.
(white line) Limit of mapping of sub-unit within undifferentiated rock unit.
360,000 mE
361,000 mE
362,000 mE
363,000 mE
364,000 mE
365,000 mE
5,410,000 mN
5,409,000 mN
5,408,000 mN
5,407,000 mN
5,406,000 mN
5,405,000 mN
5,404,000 mN
5,403,000 mN
5,402,000 mN
5,401,000 mN
MOUNT CLEVELAND
CLEVELAND MINE
Luina
Heazlewood
MOUNT BELL
EL 9/2006 BOUNDARY
HEAZLEWOOD RIVER
MOUNT CLEVELAND ROAD
Mount Cleveland Road
Waratah Road
WARATAH RD
Thirteen Mile Creek
Blindmans Creek
Bog O'Bones Ck
Provan Creek
Quinton Creek
Crescent Spur
Hobbit Ck
Reward Creek
Bells Creek
Whyte River
Little Castray River
Castray River
Betts Track
Godkin Track
Duffs Hill
Mr Wright
Heazlewood
Old Jasper
Leven Creek
New Jasper
Mt Stewart
Mt Steward; Long Tunnel
Whyte R
Bells Rwd
Discoverer
Godkin Extd
North Godkin
Godkin
Washington
Washington Bay
Ten Mile
Smith's Battery
Cleveland
Henrys
Hall's
Khaki
Luck's
Confidence
Aeromagnetic Anomaly 2
Whyte River Skarn
Oldfield Skarn
Qhm
Qha
€bm
€ba
€b
€bc
€gfc
€cw
€cwq
€cwm
€cwc
€cwb
SD
SDa
SDcg
Ol
Osm
€sd
Dm
Dgoci
RON GREGORY Prospecting
MANASIA MINING and METALS
EL 9/2006 - GODKIN
GEOLOGY
(From MRT 1:25,000 Series - Luina)
Compiled : Ron Gregory
Drawn : Gillian Bennett
Date : 30/07/2010
Projection : GDA94 Zone 55
Scale : 1:10,000
Drawing No. : MAN-GK-GLG-0008-00
Figure No. 7A
0 125 250 500 m
GDA
Base data from theLIST, © State of Tasmania
Geology From 1:25,000 Series, MRT © State of Tasmania

The 13-Mile line of lode

Heazlewood or Whyte River district, western Tasmania

Geology and mining history

Nic Haygarth

August 2010

Contents

List of maps and diagrams

The 13-Mile line of lode

General geology

The Godkin, Godkin Extended, Bell's Reward Discoverer and Whyte River silver mine were opened to exploit a 'persistent line of gossan which occurs on the faulted contact between the Silurian sedimentary sequence and Cambrian igneous rocks.' At the Godkin mine, according to Groves, the geology was complicated by several small vertical faults which cut the prominent north-west fault which forms the Silurian-Cambrian contact. Several subsidiary lodes are the result. A small patch of ore was discovered on the most easterly lode on the Godkin southern section, a dislocated part of the main north-western fault. Only barren gossanous material was intersected by sinking and driving on the Godkin northern section. The lode was worked from three levels at the Godkin Extended. Two lines of gossan were investigated at the Discoverer, the most westerly being entirely superficial and the other giving way to a barren ferruginous lode. At the Bell's Reward, 'a few feet of gossanous lode were cut with some sulphide impregnations in limestone wallrock for 15 feet from the lode.'[1] The Whyte River silver mine produced nothing more than some rich silver chlorides.

Montgomery 1892
Montgomery's 1892 examination of the southern section of the Godkin has been repeated by all who followed him. On this, his third visit to the line of lode, Montgomery had the opportunity to focus specifically on the Godkin. Realising his previous mistaken idea that in its southern section the Godkin Co was working a dyke of soft igneous rock, Montgomery now recognised a 'contact lode' rather than a 'fissure vein'. At the northern shaft was a 'very large outcrop of ferruginous gossan, consisting of oxides of iron and manganese intermixed with a good deal of clayey matter and fragments of country rock, and containing a little silver at times'. This was the main line of lode, which could be traced north-westerly through the Godkin Extended, Bell's Reward and Discoverer sections. The line of gossan lay 'at the contact of the two main formations of the district, sandstone, slate and limestone lying to the west of it, and decomposed igneous rocks to the east…' The Godkin Co was concentrating on its southern section, however, where

[1] DI Groves, *The Geology of the Heazlewood-Godkin Area*, Department of Mines, Hobart, 1965 pp.36-37

the masses of limestone and sandstone lying east of the supposed dyke [the soft igneous rock seen in the Godkin no.4 tunnel and on the Bell's Reward property] are either portions detached from the main mass or tongues projecting from it into the igneous formation. The line of gossan closely coincides with the edge of the latter, and the lode therefore is a "contact lode." The features presented by it in the underground workings…quite agree with this interpretation, and a proper understanding of the conditions under which the ore is found and is likely to be found can only be attained by remembering this, and discarding the belief that the lode is of the ordinary "fissure vein" type. Instead of having to deal with a mass of lodestuff deposited in a comparatively regular and even plane, as in the case of typical fissure veins, we have here a lode formed at the irregular contact surface between a mass of once molten rock and the older sedimentary strata through which it has been thrust. Except for the main fact that the ore·bodies are likely to lie between the two rock formations, no regularity of occurrence may be expected, the course and underlay of the lode being liable to sudden and erratic changes. Detached pieces of the sedimentary rock may often be met with inclosed in the igneous matter, and round these there may be ore; and, again, tongues and dykes of the plutonic rock are to be expected penetrating into the sandstones and limestones, and ore may often lie along the boundaries of these. The main cause of formation of a contact vein between a plutonic and an aqueous rock appears to be that the heated masses shrink in cooling, leaving at the contact surface space for the circulation of water carrying metalliferous solutions. The main vein is likely to follow the main line of contact in consequence, the opportunities for deposition of ore being there greater than along the boundaries of small dykes…

The rock was locally termed "diorite," from its resemblance to some of the decomposed diorite dykes found in Victoria, but it is now seen that this is a misnomer. "Dolerite" would be more correct, as the rock is a basic one and belongs to the group of which gabbro and dolerite are the most thoroughly crystalline members. It is very difficult to give a thoroughly satisfactory name to the formation because it varies very much, and one name will not cover all the varieties. The main body of the igneous body lies to the west and north west of the Heazlewood field, and there is often very coarsely crystalline, becoming a gabbro, but between the Godkin line of lode and the Magnet Range, on the eastern side of the silverfield, it is generally quite fine-grained, and would rather be termed basalt. Throughout the whole district there is a great deal of serpentine in it, the result of chemical alteration of the original rock, but this, too, varies very

much, some specimens being almost pure serpentine rock and others not containing much. In the eastern portion of the silverfield we appear to be on the outskirts of the plutonic outburst, the cuttings on the main road showing frequent alternations of igneous rock with slate and sandstone. The slate is frequently brick-coloured and hardened by heat, and in the vicinity of the dykes is often altered to hornstone. In this part of the field the intrusive rock appears to have issued in numerous dykes which broke through the slates; but in the western part we have the main central mass of plutonic matter, and, as is usual in such cases the large mass is the most thoroughly crystalline and the most homogeneous in composition. Probably the dykes on the outskirts have absorbed much of the strata through which they passed into their own substance, which would account for many of the differences now observable in their texture and composition. The main fact to be noted is that the weathered, somewhat fine-grained igneous rock found in the Godkin and other mines is only a variety of the serpentine rock found in the Heazlewood mine and westward from it. The clayey character is merely the result of atmospheric influences, and will disappear soon after the mines reach the water level of the District, when the solid rock will change to a more or less serpentinous dolerite. This change is already visible very plainly in the Whyte River mine, in the lower levels driven from the Godkin shaft, and in the eastern end of the No. 5 tunnel.

The sedimentary strata on the west side of the Godkin lode consist of sandstones of generally white colour and harsh feel, quartzites, limestones, and slates. They are often fossiliferous, encrinital stem joints being very common. Two or more species of trilobites, and several small brachiopods have been collected, but not yet described and named. The fossils show the strata to be of the same age as those of the Zeehan field, where identical species are found. There is a somewhat large patch of these strata lying immediately west of the Godkin line of lode, of roughly triangular shape, running to a point towards the north, and widening going south. Along the Whyte River they extend from the Godkin mine to within half a mile of the junction with the Castray River. To the north they are seen crossing the main road at the Saddle, about half a mile east of the Heazlewood Extended Company's sections. The formation here, however, is only about a quarter of a mile wide, and runs out altogether, and is replaced by the serpentinous dolerite to the northward.

It may be here noted that in the Heazlewood and Whyte River field there is the same association of probably Silurian sedimentary strata with serpentinous rocks that prevails in the Zeehan and Dundas fields. In the ease of the latter the

> serpentinous rocks also vary from nearly pure serpentine to gabbro and dolerite, as in the former. The sedimentary strata are much contorted, and generally dip at high angles. The strike is about north-west and south-east, and the line of contact with the dolerite follows this line pretty closely. As might be expected, however, the intrusive rock has not altogether closely followed the bedding planes of the older strata in bursting through them, which has resulted in a feature that has caused some perplexity to those interested in the district, namely, the apparently irregular occurrence of a band of limestone. This limestone is well seen in Bell's Reward Mine, again in the north end of theGodkin Extended tunnel and round the Godkin engine shaft, but not in the Godkin No. 5 tunnel, which extends right across the line connecting the two last occurrences. Just before reaching the lode, however, in this tunnel we find occasional bands of siliceous limestone interstratified with quartzite, and as in the Godkin Extended tunnel these transition beds lie between the quartzite and the limestone, it is pretty clear that the latter once existed in very much the present position of the lode, and that the bulk of it has been destroyed by the dolerite intrusion. The patch near the engine shaft is another portion of the same band which has escaped destruction: no doubt the limestone was continuous right along prior to the igneous outburst.
>
> It has been necessary to go somewhat fully into these geological particulars in order to explain some of the very puzzling features met with in the workings, which have been the cause of a great deal of work being done without much good resulting therefrom. It is also necessary for the future working of the mine that they should be borne in mind.[2]

Twelvetrees 1903: He believed there was a contact lode-belt running south-easterly from the Bell's Reward through the Discoverer and Godkin Extended to the Godkin.

> The hornblende Granite, or syenite country is on the east side of the creek, and impinges on the Silurian sandstones, slates, and limestones on the west, or Bell's Reward side. The result of this contact is seen in parallel lines of gossan in veins of galena, zinc carbonate, and sulphide, and disseminations of silver and zinc and lead ores in the sedimentary rocks. All these are due to processes connected with the granite intrusion, and the strong

[2] Alexander Montgomery, *Report on the Godkin Silver Mine*, Geological Surveyor's Office, Launceston, 1892, pp.1-3

> bodies of gossan have nourished a belief that remunerative deposits exist at depth…[3]

Nye 1923 believed that the geology of all the mines within the leasehold of the Victorian Magnet Company were very similar, one or two lines of gossan existing between the Godkin and Bell's Reward mines, with a general strike from south-east to north-west. 'The gossan', he wrote,

> occurs in sedimentary strata of Silurian age at or near their junction with intrusive igneous rocks, and is parallel to this junction when not actually along it. The Silurian strata consist of sandstones, limestones, and shales, and occur to the south-west of the lines of gossan. The igneous rocks are of Devonian age, two distinct types being present, and they occur to the north-east of the gossan. At the Godkin and the Bell's Reward Mines the rock is a decomposed pyroxenite, while between these two localities it is a syenite. Both rocks have intruded the Silurian strata, and the syenite is later than the pyroxenite. A small dyke of pyroxenite projects from the main mass into the Silurian strata near the man shaft on the Godkin lease. [4]

Groves 1965: While referring to the wide variety of Cambrian igneous rocks in the area, Groves specified 'extensive intrusions of albite gabbro and albite quartz-syenite' in the Godkin area.

> A large mass of basic and intermediate rock crops out in a belt between the Whyte River at the Godkin mine and the logging tracks N of the main road. The mass, which includes Cambrian sedimentary rocks to the E and is in contact with ultrabasic rocks to the W reaches a maximum width of nearly 2 miles along the main road. The western margin of the mass is faulted against Silurian (?) sedimentary rocks S of the road, and is only about ¼ mile wide at the Godkin mine.
>
> An extremely weathered rock with granitic texture is exposed along the greater part of the main road section of this area. Boulders of a granite rock are found just S of the road and along the Godkin Track and prove to be an albite quartz-syenite. The actual extent of this rock type is difficult to assess due to poor exposure…Albite quartz-syenite is found elsewhere in small dykes apparently intruded into basic and ultrabasic rocks. It is possible that a network of such dykes exists in the Godkin area

[3] WH Twelvetrees, *Report on Mineral Fields Between Waratah and Long Plains*, Government Geologist's Office, Launceston, 1903, p.20
[4] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.111

rather than an extensive intrusion, as creeks draining also contain boulders of basic intrusive and extrusive rocks.

The syenite has a granular texture and comprises predominantly sericitized albite, hornblende and quartz with minor perminite, orthoclase, magnetite and sphene. The percentage of quartz and hornblende-chlorite is variable, generally with an inverse relationship with the quartz reaching a maximum 25%. A feature of the rock is the strongly developed graphic intergrowth of quartz and feldspar. Analyses of the rock (Nye 1923, p.39) indicate a rock intermediate in composition between an albite granite and a soda syenite.

The albite-quartz syenite is bounded to the N and S by massive basic rocks, predominantly albite dolerite and gabbro. These rocks do not exhibit the same degree of alteration as the albite gabbro of the Whyte River area. They comprise interlocking albite laths 0.25-2 mm in length with intergranular pyroxene and larger pathes of perminite and serpentine. The albite is ophitic towards the chloritized material and is subophitic towards larger crystals of pyroxene in places. Pyrite is extremely common throughout the rock as disseminations and small veinlets.

In general the syenite appears to resemble a slightly later phase of intrusion than the dolerite and gabbro, as dykes of syenite protrude the basic rocks and probable xenoliths of basic rock occur within weathered syenite near their contact.[5]

Allegiance Mining acquired EL 14/2001 in the search for nickel sulphide deposits.

> Within EL 14/2001, the extensive (but minor) sulfide mineralisation present at Mt Jasper, Mt Wright, Heazlewood, Mt Stewart and Godkin mines can be interpreted as being part of a SW extension of the major hydrothermal through Bischoff, Mt Magnet [sic] and Cleveland…The Godkin mines are possibly associated with a thrust structure along the eastern margin of the Huskisson Syncline.[6]

[5] DI Groves, *The Geology of the Heazlewood-Godkin Area*, Department of Mines, Hobart, 1965 pp.30-31

[6] Allegiance Mining, *EL 14/2001 Heazlewood Area, Tasmania: Partial Relinquishment Report*, 2002, p.4

GEOLOGICAL SKETCH MAP OF THE WARATAH DISTRICT

SCALE

5 cm

20 10 0 20 40 60 80 CHAINS

1000 500 0 1000 2000 3000 4000 5000 FEET

G.I.E.

LEGEND

SEDIMENTARY

- RECENT — Alluvium
- TERTIARY — Gravels
- SILURIAN — Sandstones, Shales and Limestones
- CAMBRO-ORDOVICIAN — Bischoff Series — Slates, Sandstones, and Quartzites
- CAMBRO-ORDOVICIAN — Dundas Series — Slates and Breccias or Tuffs

IGNEOUS

- TERTIARY — Basalt
- UPPER MESOZOIC — Diabase
- DEVONIAN — Quartz Felspar Porphyry Dyke
- Granite
- Syenite
- Serpentine
- Gabbro
- Pyroxenites & Peridotites

CHARACTERISTICS

- Main Roads
- Roads
- Pack Tracks
- Faults
- Contour Lines
- Geological Boundaries
- Strike and Dip of Strata
- Water Races
- Railways
- Tramways

Photo Micrographed by John Veal Government Printer Hobart Tasmania.

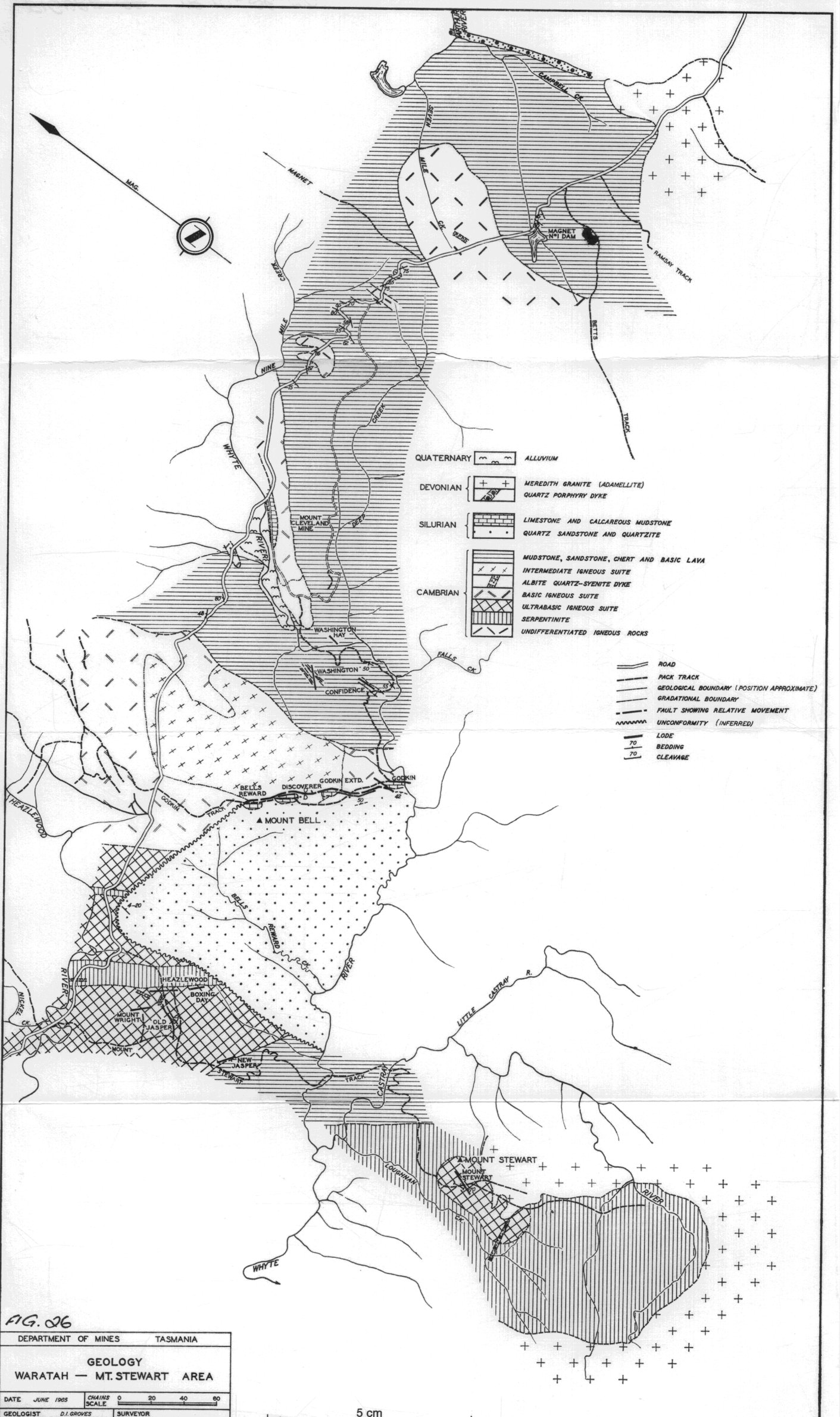


FIG. 26

DEPARTMENT OF MINES TASMANIA

GEOLOGY
WARATAH — MT. STEWART AREA

DATE JUNE 1905	CHAINS SCALE 0 20 40 60
GEOLOGIST D.I. GROVES	SURVEYOR
DRAUGHTSMAN J.S. PEPPER	MAPSHEET & No CORINNA 49
REVISIONS	FILE No 2535

TR10-26-40

GEOLOGICAL SURVEY OF TASMANIA

REGIONAL GEOLOGY OF THE MT YOUNGBUCK — MAGNET AREA

Geology and compilation by
A.V. BROWN B.Sc. (Hons)
1984

1 0 1 2 KILOMETRES

1:25 000

5 cm

REFERENCE

QUATERNARY — Qro — Marsh and swamp deposits; alluvium; river gravels.

TERTIARY — Erosional Break
Tsa– Sand, silt and volcanic breccia.
Tb– Tholeiitic and alkali olivine basalt.
Tsc– Sediments and conglomerate; silcrete indicated (Tscs).

Ts– Sediments

Angular Unconformity

DEVONIAN / SILURIAN — Siltstone; mudstone and calcareous siltstone(correlate of the Amber Formation).
Quartz sandstone with minor mudstone and granule conglomerate (correlate of the Crotty Formation).

ORDOVICIAN — Limestone and impure limestone with variable texture (correlate of the Gordon Limestone).
Quartzwacke and minor mudstone.

Erosional Break
EOCAMBRIAN — Volcaniclastic lithicwacke, siltstone, mudstone and tholeiitic basalt (correlate of the Crimson Creek Formation) Areas of dominantly basalt indicated Ecb.

Quartzwacke and minor mudstone (possible correlate of the Success Creek Group

Angular Landscape Unconformity

PRECAMBRIAN — Eo Indurated quartz sandstone , siltstone and mudstone (correlate of the Oonah Formation)
Ews Schistoze quartz sandstone, siltstone and mudstone (correlate of the "Whyte Schist")

Igneous Rocks

TERTIARY — Tholeiitic and alkali olivine basalt.

DEVONIAN — Porphyritic fine to coarse–grained biotite granite/adamellite

Fine to coarse–grained gabbro

Massive ultramafic cumulate.

CAMBRIAN — Massive and pillow aphyric basalt flows, commonly brecciated (low–titanium Tholeiitic) Individual flows graded from coarse–grained base to pillow tops./interbasalt sandstone and siltstone indicated Cbms.
Porphyritic (orthopyroxene , chromite), high –magnesium andesite, commonly with pillow and breccia flows. Associated coarse–grained pyroxenite ( ) Cbop

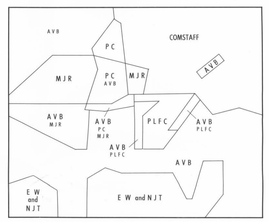
Tonalite and associated rocks.

Serpentinized, layered peridotite and pyroxenite . Serpentinitic melange indicated(.) Cum.

Serpentinized dunite with areas of interlayered pyroxene–bearing dunite.

- Geological boundary–position approximate
- Geological boundary–inferred.
- Geological boundary–transitional.
- Fault–position approximate
- Fault–inferred.
- Strike and dip of bedding–facing known; vertical, facing known; overturned; facing unknown; vertical, facing unknown.
- Strike and dip of compositional banding–in sedimentary rocks; in igneous rocks.
- Strike and dip of cleavage of unspecified type or relative age; vertical.
- Type of cleavage–slaty, crenulation.
- Fold hinge, with plunge and dip of axial surface; vertical axial surface.

RESPONSIBILITY DIAGRAM



AVB 1:10 000 regional mapping

AVB Reconnaissance and or traverse mapping

PLFC Collins, P.L.F., 1983. Geology and Mineralization at the Cleveland Mine, Western Tasmania. *Unpubl. Ph.D. Thesis, Univ. of Tasm.*

PC Creenaune, P., 1980. The Volcanics of the Heazlewood River Complex. *Unpubl. B.Sc. Thesis, Univ. of Tasm.*

COMSTAFF Information supplied by Comstaff Pty Ltd on a scale of 1:50 000

MJR Rubenach, M.J., 1973. The Tasmanian Ultramafic–Gabbro and Ophiolite Complexes. *Unpubl. B.Sc. (Hons.) Thesis, Univ. of Tasm.*

E W and N J T Williams,E., and Turner,N., 1974. Geological Atlas 1:250 000 Series. Sheet SK–55/3 Burnie.

LOCALITY MAP

GS862

FIG 2.

CARTOGRAPHY BY P.B. NANKIVELL

Early history

In 1885 the mineral prospector William Robert (WR) Bell (1830-1911) returned to Tasmania from an exploratory tour of the Barrier Ranges silver field — later to become famous as the Broken Hill field — in western New South Wales. From his hut at the Hampshire Hills he ventured south-west beyond Waratah to the 13-Mile Camp on the Corinna Track. Here, resuming prospecting work for one of many syndicates arranged by his friend and employer James 'Philosopher' Smith, over two years he made a series of silver, galena and lead discoveries.

The most prominent of these, the Heazlewood silver mine, took its name from being about 2 kilometres east of the Heazlewood River. Here in 1887 Bell made the first discovery of crocoite in Tasmania. The Heazlewood Silver Mining Company was floated in March 1888 during the Broken Hill silver boom which also invigorated the Zeehan-Dundas field.

Bell had already discovered silver at the Emu River in 1875 (the Hampshire silver mine), and lead and silver east of the Waratah River in 1878 (the Mount Bischoff silver-lead mine). Neither of those proved payable deposits. Later, in early 1891, he would uncap the very profitable Magnet silver-lead lode on the Magnet Range west of Waratah. However, it was Bell's discovery of silver at what became known as Smith and Bell's (later Bell's Reward), by 1887, presumably with James Smith, that initiated the line of lode near the 13-Mile Camp on which the Discoverer, Godkin Extended, Godkin Amalgamated, Whyte River and Godkin claims were also established.

The initial development of these mines must be seen in the context of the Broken Hill silver boom and the early 1890s depression, with its declining silver price and curtailment of investment. Any silver mine discovered was compared to Broken Hill. The original Godkin and Bell's Reward mine managers had Broken Hill experience, although Bell would have preferred the trusted local mine manager George Bottriell. With lack of capital hampering mining operations even of companies which were successfully floated, investment was sought in Victoria and in England. The Godkin SM Co's grandiose plans for a tramway to Waratah and on-site smelters reflected comparisons to Broken Hill and developments on the Zeehan-Dundas field. Physical isolation was also a hindrance to these mines.

A gossan outcrop on the surface was regarded as a sure sign of a mineral deposit beneath it. Unfortunately, on this particular line of lode the oxidised zone went far deeper than usual, and the presence of limestone made sinking even more problematical. Not having the funds to sink at depth, the Bell's Reward, Godkin and Godkin Extended Companies could not prove their properties. They spent their capital prospecting the oxidised portions of their lodes above water level. The Discoverer claim was never floated and therefore never had the opportunity to try to avoid this mistake by securing much greater capital. The

Godkin Amalgamated and Whyte River Silver Mining Company appear to have done very little work on unpromising claims.

In June 1887 WR Bell and James Smith were granted 20-acre reward leases: Bell's was 44-87M and Smith's 45-87M. In March 1888 Bell took up section 888-87M of 40 acres, and Smith section 916-87M of 40 acres.[7] Bell's sections became known as Smith and Bell's (Bell's Reward), while Smith's became the Discoverer. Bell was mine manager of the nearby Heazlewood silver-lead mine until August 1888, so had little time to explore the Bell's Reward. Hence the Godkin Extended, Godkin, Whyte River and Godkin Amalgamated, all discovered after it, were floated before it. The Godkin Extended claim supposedly originated in a discovery made in March 1888.

In April 1888 23-year-old New Norfolk prospector Norman Godkin was engaged by the Dunrobin Prospecting Association, with an assistant named Arthur Spencer.[8] Working south from Bell's discovery, Godkin found a gossan outcrop close to the northern side of a small tributary flowing into the Whyte River. Establishment of a company to work it was delayed by his employer obtaining an injunction in October 1888 to stop him and Spencer selling the two 40-acre sections 1599-87M and 1615-87M.[9] Other sections were soon taken up.

Keep tunnelling – Thureau's report 1888

In December 1888 Government Mining Geologist Gustav Thureau examined the Mount Zeehan Prospecting Association (2053-87M and 1221-87M, on the Corinna track) sections, the Mystery Co's 999-87M, James Thorne's (later the Godkin Extended's 1076-87M) section and the Godkin Co's southern block 1615-87M, on which 'Godkin's new discovery' was situated. Thureau described the

> extensive surface outcrop, capped chiefly by black and soft ferro-manganese ores. Beneath these a semi-decomposed silicious mineral deposit occurs, stained deep green and spotted by manganites. In this deposit there were found, more or less frequent, nodules of blackish silver ores (sulphides). I question, however, whether the so very vivid green stains are exclusively caused by chlorides of silver, as I did not succeed in discovering any of them; more likely that nickel hydrates caused portions of this distinctive colouring matter. Across the presumable strike of the deposit, the eastern limestone forming one wall, the deposit may be from over 35 feet wide…The ore possesses great specific gravity, owing probably to the presence of baryta.

[7] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.109
[8] 'In Chambers', *Mercury* 7 November 1888, Supplement p.1
[9] 'Mining', *Mercury* 8 October 1888, p.3

"THE SIXTEEN MILES"

0 10 20 30

180 Al 40 / 87 C.H. Hall

169 Al / 87 R.J. Rogers

1696 M 42 J. Patterson New discovery Rivy.

Heazlewood

Bell

Hall

ROAD

1697 Al / 87 T.H. Jones now Heazlewood Extended S.L.Co

ROAD

1597 M 40 J.W.N. Smith New discovery

825 M 82 / 87 H.G.D. Hill now Heazlewood Extended S.L.Co

1598 M 40 E. Quiggin

1309 Al Air Tunnel W.R. Bell Main Shaft now Heazlewood S.L.M.Co Slope Tunnel

20.00

1310 M 80 T. Smith now Heazlewood S.L.M.Co

27 / 87 M 40 W. Crosby & H. Turner

1620 M 40 J. McCall

1619 Al 40 C. Boltrell

1221 / 87 M 80 Richard Mapley

13 MILE PEG

1051 / 87 M 80 James Adams

1050 / 87 M 37 L.J. Martin M.L.

1220 / 87 M 60 H. New appt

1085 / 87 M 34 ac Stewart & Hart appts

1044 / 87 M 62 Steel Traill

1045 / 87 M 54 Benjamin Waters

999 / 87 M Mystery S.M.C.

887 / 87 M 40 W.R. Bell Galena assaying 200 oz to Ton

1048 / 87 M 40 J.J. Martin

W.T. Burt 20 1027 / 87 M

44 / 87 M 20 W.R. Bell

46 / 87 M 20 James Smith

Gossan two to three Chains wide

916 / 87 M 40 James Smith

1000 / 87 M 80 Mystery S.M.Co.

Manganese Outcrop

1076 / 87 M 80 James Thorne

1599 / 87 M 40 A. Spencer

1625 / 87 M 40 Godkins new discovery A. Spencer

White River

HEAZLEWOOD

Scale 16 Chains to One Inch

"THE THIRTEEN MILES"

0 10 20 30

SKETCH PLAN

Shewing workings of Mines examined ○

Rept: G. Thureau F.G.S. Mining Geologist

Launceston Decbr 1886.

HEAZLEWOOD

Scale 16 Chains to One Inch

5 cm

Whyte River

11 G / 87 10 ac

10 G / 87 10 ac

Castray River

Although little work had been done at the Godkin, Thureau concluded that it was 'the cap of a very large mineral formation, and has most likely been caused by hydro-thermal action'. He advised its proprietors to take advantage of the natural facilities for tunnelling. Thorne had driven an adit 35 ft through ferro-manganese. The Mystery Co had achieved poor results driving on a quartz leader showing some pentagonal iron pyrites. The Mount Zeehan Prospecting Association had obtained an assay of 220 oz silver per ton from a mineral vein 9 to 12 inches thick. The sections leased by Bell and Smith (887-87M, 44-87M, 45-87M and 916-87M) were not examined.[10]

[10] Gustav Thureau, *Report on the Heazlewood Silver-Lead and Other Ore Deposits in the County Russell, West of Tasmania*, Mining Geologist's Office, Launceston, December 1888

Section 2: initial development of the Godkin

Godkin Silver Mining Co 1889-93

Summary: From 1889-92 the company worked the eastern spur of the main line of lode on its southern section 1615-87M, discovering native silver in the no.4 adit. Its winding and pumping machinery were set up here in 1891. In 1893, after advice from Alexander Montgomery, it diverted to the main lode on the northern block 1599-87M and tried to follow his advice to put a tunnel in from the Whyte River to the 110-ft level of the northern shaft. It appears to have run out of money before this work was completed. The company spent a lot of money on its horse-drawn tramway that could have been spent on underground exploration. It had insufficient capital to prove the property at depth.

Production: 34 tons of ore (Godkin Co). Groves reports that 52.3 tons of lead were produced by this mine 1889-1924.

Geology: Northern section on main line of lode. Southern section on eastern spur of main line of lode. Groves calls this 'a dyke of pyroxenite extending out from the main mass'.

Workings: Numerous adits and two shafts. 800 ft of an eventual 4,000-ft drainage tunnel cut from the 110-ft level of the north shaft to the Whyte River.

Having been delayed by a court injunction, the Godkin Silver Mining Company was finally formed in September 1889 with a capital of £100,000 in £1 shares to develop sections 1559-87M and 1615-87M, which were transferred to the company in 1890. Directors were chosen to give Hobart, Launceston and Melbourne shareholders representation in the company. AR Browne of South Australia was chosen as mining manager from a number of applications. Securing a man of Browne's experience was thought to be something of a coup for a Tasmanian silver mine. He had studied at the Royal Saxon School of Mines in Germany and managed mines in North America and Broken Hill.[11] Initial work consisted of driving (the no.1 adit) beneath the oxidised cap discovered by Norman Godkin — which revealed no ore lode.

Alexander Montgomery's report 1890

Government Geological Surveyor Montgomery examined the Whyte River Company section (1083-87M), 'WR Bell's sections' 887-87M and 44-87M, the Godkin Extended (1076-87M) and the two Godkin sections (1599-87M and 1615-87M). The Godkin Co had driven one 100-ft tunnel on its northern section, but was focused on intersecting what Montgomery initially called the 'igneous dyke' cut in its 300-ft no.1 tunnel on the southern section. About 40 ft north of the mouth of this tunnel a shaft had been sunk 60 ft on the edge of the dyke. Limestone was struck 40 ft down. An air shaft was sunk 36 feet through dioritic

[11] 'Banquet at Waratah', *Wellington Times* 11 October 1890; 'Mining: Scientific Mining', *South Australian Advertiser* 3 January 1889, p.6

clay into loose broken limestone to service no.4 tunnel. This was driven from Silver Creek through 200 feet of dioritic clays, then 30 to 35 feet of limestone to cut the same dyke and lode exposed in the no.1 tunnel. (In August 1890 the discovery of native silver in the no.4 tunnel caused excitement.[12]) A cross-cut from this adit revealed the so-called Chlorite Lode. There was also the no.3 tunnel, 90 feet higher up the hill than no.1. It passed through 12 feet of dioritic clay, then sandstone, slate, coarse grit and into hard white sandstone. Montgomery was non-committal about all the claims on this line of lode, stating only that while

> it may be said that while they all have been proved to contain silver, not one of them is yet opened sufficiently to warrant any glowing estimate of their value….the erection of works for recovering the silver is quite premature, as the nature of the ore to be dealt with is yet uncertain.[13]

A ministerial party alighting from the train at Waratah in January 1890 was greeted with jeers of 'Cab, sir? Cab to Heemskirk? Cab to Whyte River?' During winter the dray track between Waratah and the Heazlewood field was a sea of mud. The Godkin Co exerted pressure to get a new road built directly to the Godkin mine, but it eventually followed the old route beyond Whyte River. From this main 'road', a branch 'road' was cut towards the Godkin for one mile before it was realised that this was not authorised. That left 2.5 miles to the Godkin claim which there was no prospect of the Government providing.[14]

The Godkin Co took transport matters into its own hands, engaging Huon tramway builder John Hay no.2 to construct the three-foot-six-inch gauge Godkin tramway as the mine's outlet at a cost of about £7,000. The *Godwin Tramway Act 1891* enabled the company to charge others for freight on the line.

The Godkin Co's early half yearly reports are a litany of grand installation plans fed by Browne's delusional ore values: £10,000 worth of ore were said to be on the claim in September 1890; £70,000-£80,000 worth in March 1891.[15] Browne wanted the Godkin to control not only the field's transport but to be its custom smelter.[16] Perhaps he told directors what they wanted to hear, or perhaps, buoyed by the Broken Hill boom, he really believed that 'a large quantity of bullion would be sent out'.[17] A shareholder, Lawder, who dared suggest that the

[12] 'Mining', *Mercury* 12 August 1890, p.3
[13] Alexander Montgomery, 'Report on the State of the Mining Industry on the West Coast', *Report of the Secretary of Mines for 1889-90*, Parliamentary Paper 64/1890, p.25
[14] 'Meetings: Godkin's SM', *Mercury* 29 March 1890, Supplement, p.1
[15] 'Meeting: Godkin SM Co', *Mercury* 26 September 1890, p.3; 'Godkin SM Co', *Mercury* 26 March 1891, p.3
[16] 'Meeting of the Company', *Mercury* 8 January 1891, p.3
[17] 'Banquet at Waratah', *Wellington Times* 11 October 1890;


PLAN
OF THE
GODKIN MINE
SCALE 200 FT TO AN INCH.
A. Montgomery
Geological Surveyor
1712
87M
40 ac: T. C. Lempriere
Limestone
Quartzite
Sandstone
1599
87M
40 ac:
Gossan
North Shaft
Air shaft
Serpentinous
1076
87M
80 ac:
1713
87M
40 ac:
T. C. Lempriere
Godkin Extended
S. M. C.o No Liab.y
Godkin S. M. C.o No Liab.y
Dolerite
Sandstone
1721
87M
20 ac:
1195
91M
80 ac:
1615
87M
40 ac:
Line of Contact
Limestone
T. C. Lempriere
H. Pearce
Godkin S. M. C.o No Liability
1700
87M
32 ac:
Slourton and Hill
Silver Creek
RIVER
HYTE
1652
87M
40 T. C. Lempriere
12 chains long
5 cm
519

erection of smelters should be contingent upon the Godkin property being proven at depth, was rounded upon by Norman Godkin.[18]

The same tone of self-congratulation marked opening celebrations and banquets. In mid February 1891 Minister of Lands and Works, Alfred Pillinger, opened the three-mile-long first stage of the Godkin tramway to the bridge over the Whyte River. One horse could draw a truck containing 2 tons, with 4 trips possible in a day. The tramway rested on cross logs, on which were placed stringers, then four-inch slabs across those. The wooden rails were fixed on top of the slabs. Trestles were necessary in several places. No ballast was used.[19]

Now the mine could be tested. Ore could be sent out. Pumping and winding machinery could be brought to the Godkin, enabling sinking to prove whether the mine lived down. The arrival of machinery also warranted a celebratory banquet in Waratah and, more ambitiously, a christening ceremony on site on the southern section.[20] Two hundred tons of Godkin ore were reported to be ready for export.[21]

The September 1891 report, tabled when Browne was on sick leave, paints a more sobering picture. Twenty-seven tons of ore from the southern section had been despatched to the Dry Creek Works, South Australia and to Kennedy and Sons, Hobart, for a profit of £218. (The company would sell only 7 more tons of ore, to Kennedy and Sons and the Clyde Works in Sydney, in 1892. The results of these exports are summarised in the table below.) Directors were sounding edgy. One, PV Tuxen, wanted to amalgamate with the Godkin Amalgamated SM Co.[22] Notably, there was no banquet called to celebrate completion of the Godkin Tramway to the Arthur River, which was tipped to occur in October 1891. No announcement was even made.

GODKIN ORE SALES 1891-92	tons	cwts	qtrs	lbs	silver ozs	lead %
Good galena no.4 tunnel native silver lode 1891	14	2	2	18	156	27
Seconds galena 1891	2	6	1	0	67	9
Manganese gossan 1891	0	16	0	14	57	30
Galena from near surface 1891	8	17	3	17	70	12
Seconds galena 1891	0	1	0	22	55	6
Manganese gossan 1891	0	10	0	27	56	12
TOTAL	26	14	1	14		
Kennedy & Sons, Hobart 1892	3	18	3	25	41	
Clyde Works, Sydney, 1892	4	9	3	0	107	

[18] 'Godkin SM Co', *Mercury* 26 March 1891, p.3
[19] 'The Godkin Tramway: Opening Ceremony', *Wellington Times* 18 February 1891
[20] 'Starting the Godkin Machinery', *Wellington Times* 22 July 1891
[21] 'Waratah Notes', *Wellington Times* 27 May 1891, p.3
[22] 'Godkin Silver Mining Co', *Mercury* 29 September 1891, p.4

Browne appears to have never returned to the Godkin. His last hurrah, delivered vicariously by Chairman of Directors Smart at the February 1892 half yearly meeting, was to compare the Godkin with Broken Hill mines and to continue to press for a smelter. Smart kept up the rhetoric, declaring in September 1892 that no Broken Hill mine had produced such rich ore at such a shallow level.[23] Yet sums were mounting against these spruikers. Recapitalisation would be impossible in such bleak economic times. The Chairman of Directors revealed that the company had now spent about £26,000, and might absorb another £15,000 before it was a dividend payer. A four-mile water race still needed to be cut.[24] Calls on shares during 1892 reduced debt from £4,000 to £1,900, but it continued to hover around £1,800 for the rest of the company's active life.

The long tunnel: Montgomery's 1892 report on the Godkin
(As the only geologist to examine the Godkin's southern workings, Montgomery's description of them and the northern workings is repeated in full in Appendix 1.)

Montgomery delivered the stunning news that £26,000 had brought the company no closer to proving its property, with no payable ore yet in sight: 'the future of the mine is still entirely a matter of speculation, depending altogether on the results of further prospecting work'. Not all was lost, as

> the prospects must be regarded as fairly good. The gossan in the no.5 tunnel is of favourable appearance, and is now giving place to unoxidized ore carrying galena of good assay value…There is every inducement to go to the expense of further opening and testing the mine, and very reasonable hope of it turning out remunerative…In the southern section native silver has been found accompanying the veins of galena, and a little silver exists in all the gossany matter; the lode appears to be strong and permanent over a long distance.

Montgomery criticised expenditure on tramway extension from the Whyte River bridge to the Arthur River, money which could have been used in underground exploration. He also believed the company's work had been misdirected:

> The discovery of native silver naturally diverted all attention to the eastern lode [on the southern section], and postponed the attack upon the main lode. The great outcrop of gossan in the north section, however, ought not have gone neglected so long, and it is unfortunate that it was not opened up from the first instead of the southern section.

[23] 'Meetings: Godkin SM Co', *Mercury* 1 October 1892, Supplement p.1. Twelvetrees (1903) reported Godkin SM Co assays during 1890 and 1891 of 212, 218 300, 600, 100, 110, 116, 200, 107, 158, 85 and 41 ozs of silver per ton (p.22).
[24] 'Godkin SM Co', *Mercury* 4 February 1892, p.2

From between the crosscut at the 45-ft level (connecting the no.4 and another tunnel at the same level) and the engine shaft in the southern section, 27 tons of ore had been stoped out and sent to market. This ‘Native Silver Lode’, however, was not a true lode but a vein:

> it is…a part of the limestone that has been fractured and been impregnated with galena and silver in the cracks and joints; it has no regular walls, and the lodestuff does not differ sensibly from the enclosing country limestone except in being traversed by the strings and small veins of ore. I do not think that any reliance could be placed on its continuance either horizontally or vertically. The drives to northwest and south-east on its course, and following it as far as could be judged at the time, have not proved the rich ore to extend any considerable distance, and I do not think that this discovery will ever prove of much importance. It has even been detrimental to the mine, for it has diverted attention from the main lode. Its best point is that it proves that the country is favourable for the deposition of silver and galena, and therefore increases the probability that good ore will be obtained when the main lode is opened up.

Montgomery recognised the main lode lying on contact of dolerite and sandstone, in the no.4 tunnel. He described

> a tongue of sedimentary rock, mostly limestone, projecting out into the main mass of serpentinous dolerite, and that all round this, on its contact with the dolerite, there is a matter of more or less lode character; in parts it forms a true gossan, but generally it is very largely composed of clay, and only stained with oxides of iron and manganese. Though on the whole of a rather unfavourable appearance still there is a certain amount of likelihood that ore will be found in parts of it, and to the south-east along the main contact of the two formations there seems to be every reason to expect that there will be a body of lodestuff similar to that found in the north section in the corresponding position.

The geologist alluded to similar ‘lodestuff’ in Godkin Amalgamated tunnels south of the Whyte River, in which existed

> ferruginous stained masses of more or less lode nature at the contact of the dolerite and sandstone formations.

However, it was on the northern section that Montgomery saw the best chance of striking a payable lode, and here that he directed the Godkin Co’s attention:

> The workings from this [no.5] adit are under the largest and best-looking outcrop of gossan on the property, and in the tunnel, too, the lodestuff is of a very promising character. The appearance of carbonate of iron and galena in the winzes indicates that the level is not much above the bottom of the oxidised capping of the lode, and gives hope that at a short distance down the gossan will disappear and be replaced by unaltered lode-matter carrying valuable minerals. It is clearly necessary to sink deeper, and the Company have now to consider the best way of opening up the lode at a greater depth; the most obvious way would be to sink the north shaft deeper and open the lode from it; this involves putting a pumping engine on the shaft and enlarging and re-timbering it before sinking could be resumed.

Montgomery cautioned against moving the existing Worthington pump from the southern section to the northern shaft, where a horse whim was already failing to meet demand. He believed the Worthington would also fail the workload at that shaft. Since a Worthington pump now lies next to the northern shaft, it seems the geologist was ignored.

Montgomery also had a cheaper alternative proposal which, unlike deep sinking, could never be definitive. This was an ambitious, over-arching plan to put the company back on track: drive a 4,000-feet-long drainage tunnel from the Whyte River through both southern and northern leases to meet the engine shaft in the northern lease. While still working the oxidised zone, this would test the entire property at a deeper level as well as drain it. He estimated a cost of £2,500-£3,000. Should prospects then warrant deeper sinking, the point at which the new shaft should be sunk would depend on the position of the ore bodies found, which of course could not be determined at the moment.[25]

After self-congratulation came confession and absolution. ‘Previously we were working in the dark,’ Dr Smart, Godkin Chairman of Directors rejoiced, ‘but now we see some light.’ A distant light it was, because it took 19 years to reach the end of the long tunnel, a period which would see out Norman Godkin, other directors and the Godkin Co itself. With Browne the scapegoat for the company’s misdirection, Norman Godkin resumed work in the northern section, claiming to have discovered the main lode by March 1893. The lode in the winze was said to vary from 16 ft to 50 ft wide. Where it was 16 ft wide, it assayed 70 per cent lead and 60-70 ozs silver per ton. A bulk assay from the main lode returned 20 oz of silver per ton. Yet by now more than 28,000 shares had been forfeited.[26]

During the next six months, the men drove nearly 800 ft on the long tunnel from the northern shaft. Calls on shares were made to finance this work and reduce

[25] Alexander Montgomery, *Report on the Godkin Silver Mine*, Geological Surveyor’s Office, Launceston, 1892, p.3
[26] ‘Godkin SM Co’, *Mercury* 30 March 1893, p.4

the debt. It was also intended to place concentrating machinery on site — which does not appear to have happened. Proceeds of sales of forfeited shares helped pay wages. Mine manager Norman Godkin announced a bulk assay of 40 oz silver per ton from the face of the 110-ft level.[27] By March 1894, however, arduous duties had broken down his health.[28] In May the company inevitably succumbed, selling out to Launceston investor James Barclay.[29]

[27] 'Godkin SM Co', *Mercury* 30 September 1893, p.4
[28] 'Godkin SM Co', *Mercury* 31 March 1894, Supplement, p.1
[29] 'Mining', *Mercury* 21 May 1894, p.3

Section 3: smaller companies on the 13-Mile lode

Godkin Amalgamated Silver Mining Company

Summary: Seems to have been a speculation, the success of which depended on amalgamation with the Godkin SM Co. Eight sections to the north-east, east and south of the Godkin.

Geology: The Godkin's 'chloride lode' was claimed to have been traced into its ground.[30]

Workings: Three adits south of the Whyte River. More?

This seems to have been an offshoot of the Godkin SM Co formed by Norman Godkin and several other principals in that company. It was registered in Melbourne in November 1890, with Norman Godkin the only Tasmanian director. The others were F Allan, AC Madden, Frixon, De Little and Madden, while legal manager was an ex-Tasmanian, Thomas C Lempriere, of Collins Street.[31] Waratah's Harry Hill was mining manager. A house was built for him on one of the eight blocks in 1891.[32]

During 1892 there were negotiations about amalgamating some of its 8 sections with the Godkin SM Co, the Amalgamated having the advantage of owning a water race and 20 sluiceheads of water. A new company would be floated to work the remaining Amalgamated sections.[33] In the reigning economic climate, these were pipe dreams, as was talk of the Amalgamated being bought by an English syndicate in August 1892.[34] The company seems to have ceased operation after its fourth half-yearly meeting in November 1892.[35]

In 1893 Montgomery commented that its tunnels south of the Whyte River

> show the existence of wide ferruginous-stained masses of more or less lode nature at the contact of the dolerite and sandstone formation.[36]

Godkin Extended Silver Mining Association

Summary: 'A great deal of work has been done…with disappointing results', John Harcourt Smith noted in 1897. Undercapitilised company which appears to have collapsed in 1893, despite production of promising silver sulphide ore in previous year.

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[30] 'JWI', 'A Holiday Trip to the Godkin's', *Mercury* 3 January 1891, Supplement, p.1
[31] 'Meeting: Godkin Amalgamated SM Co', *Mercury* 6 November 1890, Supplement, p.1
[32] 'JWI', 'A Holiday Trip to the Godkin's', *Mercury* 3 January 1891, Supplement, p.1
[33] 'Godkin's Amlagamated Silver Mining Company', *Argus* 7 January 1892, p.7
[34] 'Mining', *Mercury* 12 August 1892, p.3
[35] 'Mining Meetings', *Argus* 8 November 1892, p.8
[36] Alexander Montgomery, *Report on the Godkin Silver Mine*, Geological Surveyor's Office, Launceston, 1892, p.6

Production: 32 tons fetching £241? (50 tons?)

Geology: Worked a western 'leg' of the main line of lode.

Workings: Main adit almost 800 ft long. Shaft 83 ft deep north of main adit. Adit driven 105 ft towards the shaft. Another adit driven 150 ft on western side of hill and connected by a winze to the main adit.

The claim was supposedly taken up in March 1888, which would make it the second (after the Bell's Reward) on this line of lode. Registered with 2,400 shares paid up to one shilling each in Waratah in March 1889. Most shareholders were Waratah shopkeepers and miners, 16 of whom gave their home as Heazlewood.[37] As such, it was never likely to produce the capital needed to develop its property. Poor access didn't help either.

Work centred on a main adit to cut the line of gossan at a depth of 250 ft. Eight hundred feet of driving were anticipated. When Montgomery reported in 1890, the main adit had been driven 445 ft through soft sandstone and slate, then hard sandstone. At 412 ft a lode of blende 14 ft thick was struck, carrying 11 per cent lead and 73.5 oz silver per ton.[38] Montgomery advised the company to drive on the blende lode, but it may have got distracted by the manganese and iron gossan cap of what Thorne believed was a very large lode — he was trenching along this in November 1890.[39]

Work on the blende lode resumed in January 1892, 32 tons of ore fetching a profit of £241 being sent to the Dry Creek Works and to Hobart. Assays from the lode: 451 oz silver and 42 per cent lead; 521 oz silver and 17 per cent lead. Also some black pug assaying 330 oz silver and 11 per cent lead per ton.[40] This was presumably the shipment Twelvetrees referred to when he recorded the company selling 'a considerable quantity of ore' averaging 114 ozs of silver per ton which was so highly zinciferous that with high transit charges it did not pay to continue exporting.[41] Nye (p.119) records a Government assay of the blende lode:

Constituent	Per cent	Dwts per ton
silver		13
lead	4.75	
zinc	30.16	

[37] 'Mining Notices', *Mercury* 5 March 1889, p.1
[38] Alexander Montgomery, 'Report on the State of the Mining Industry on the West Coast', *Report of the Secretary of Mines for 1889-90*, Parliamentary Paper 64/1890, p.25
[39] 'The Whyte River and Heazlewood Silver Fields: no.2', *Colonist* 15 November 1890, p.24
[40] 'Whyte River Mining Notes', *Mercury* 15 January 1892, p.3
[41] WH Twelvetrees, *Report on Mineral Fields Between Waratah and Long Plains*, Government Geologist's Office, Launceston, 1903, p.26

By the middle of 1892 work in the lower levels of the mine had been suspended due to foul air. The ventilator described about 18 months earlier, a 'huge furnace built of logs notched in together at the corners', might have failed.[42]

Other workings noted by Montgomery in 1890 were an 83-feet-deep shaft sunk north of the main adit through soft sandstone stained with manganese oxides giving a little silver; and a 105-feet-long adit drive towards the shaft in a south-westerly direction through clay stained with manganese oxide and hard sandstone.[43]

In 1897, Government Geologist John Harcourt Smith noted bunches of gossan assaying a few ounces of silver per ton in the Godkin Extended shaft. The main adit was then 827 ft long. Apart from the 105-ft tunnel, Smith examined a 150-ft-long tunnel driven on the western side of the hill through soft sandstone, and connected by a winze to the main adit 120 ft below.[44]

Whyte River Silver Mining Company 1890-1900

Summary: Lackadaisical prospecting by an undercapitalised company over a decade. Small, erratic shoots of ore were discovered but no payable lode, despite the presence of rich silver chlorides.

Workings: 3 tunnels, two from the northern side of the hill, one from the southern. All connected by rises and winzes by 1900.

Production: 2 tons

Geology: According to Nye, decomposed and serpentinised Devonian pyroxenite. A decomposed diorite dyke exposed in the workings may represent an offshoot of syenite from a mass of syenite 4 or 5 chains to the east. Montgomery believed it same lode as was worked by the Bell's Reward. Harcourt Smith believed it was a parallel lode.

Registered in Launceston 14 February 1890 to work what was known as Stewart and Hart's claim (section 1083-87M, 34 acres) with 20,000 shares of 5 shillings each, none of them paid up.[45] Shareholders were a mixture of familiar Launceston investors like William Petterd and Frank Gee Duff, plus Waratah and 13-Mile miners like John Stanton and Jimmy Griffin. JH Thorne, mine manager of the Godkin Extended, was a major shareholder.

[42] 'The Whyte River and Heazlewood Silver Fields: no.2', *Colonist* 15 November 1890, p.24
[43] Alexander Montgomery, 'Report on the State of the Mining Industry on the West Coast', *Report of the Secretary of Mines for 1889-90*, Parliamentary Paper 64/1890, p.25
[44] J Harcourt Smith, 'Report on the Mineral District Between Corinna and Waratah 28 July 1897', *Secretary of Mines Annual Report 1997*, Parliamentary Paper 44/1897, pp. l-xlx
[45] Advert, *Mercury* 25 February 1890, p.1

The upper tunnel was driven on the north side of a hill to cut a quartz reef which it was hoped would carry gold. At about 80 feet it passed through a lode 5 to 6 feet wide — without the miners noticing it — and impregnated with chromate, carbonate of lead and oxide of antimony (Twelvetrees later called in 'ferro-manganiferous rock, carrying disseminated lead, carbonates and chromates).[46] It was reported to Montgomery in 1890 that it gave excellent assays for silver. He wrote: 'At greater depth the lode will probably contain more quartz and be better defined. It is similar in occurrence and appearance to the lodes in Bell's and Godkin's properties, and may be a portion of the same lode.' The adit was driven 70 or 80 feet further.[47]

By the time of John Harcourt Smith's inspection in 1897, when the same section was designated 109-93M, a winze sunk through this lode connected to the no.2 tunnel 60 feet below. In the no.2 adit the lode was struck 160 feet from the entrance, and a drive put in another 200 feet in a general south-easterly direction. The lode here had a very similar appearance as it did in the no.1 adit, 'having no defined walls, and showing in places crystals of chromate of lead'. A little beyond the rise to the no.1 level, a winze ('Jupp's winze') was sunk 30 feet in the no.2 tunnel and a little stoping was done, but these workings were full of water at the time of Harcourt Smith's visit. 'Good ore is said be going down under foot,' he wrote, 'and on the tip at the mouth of the tunnel is some nice-looking galena mixed with a good deal of blende.' The no.3 tunnel had been driven on the south side of the hill, about 110 feet below the no.2 tunnel. It was driven almost due north for 500 feet, where the lode was cut and driven on for 170 feet, its course being north-westerly. The lode was better defined here than in the upper levels, filled with 'broken country rock with occasional bunches of pyrites and galena, quartz, and a good deal of calcite. Native silver is also said to have been found in this level, but I did not see any.' While Montgomery believed this to be a continuation of the lode worked in the Bell's Reward mine, Harcourt Smith thought it was probably a parallel lode.[48]

A connection was established between the southern and northern drives while Twelvetrees was inspecting the mine in 1900. He was able to inspect the workings beneath Jupp's winze:

> Below the level the lode can be seen about 6 inches wide, lying on a smooth footwall. Most of the lode seems to be in

[46] WH Twelvetrees, *Report on the Mineral Fields Between Waratah and Corinna*, Government Geologist's Office, Launceston, 1900, p.38
[47] Alexander Montgomery, 'Report on the State of the Mining Industry on the West Coast', *Report of the Secretary of Mines for 1889-90*, Parliamentary Paper 64/1890, p.24. John Harcourt Smith reports that the lode was struck 100 feet into the adit, which extended for 200 feet in all (p.72).
[48] WH Twelvetrees, *Report on the Mineral Fields Between Waratah and Corinna*, Government Geologist's Office, Launceston, 1900, p.38

PLAN AND SECTION OF UNDERGROUND WORKINGS

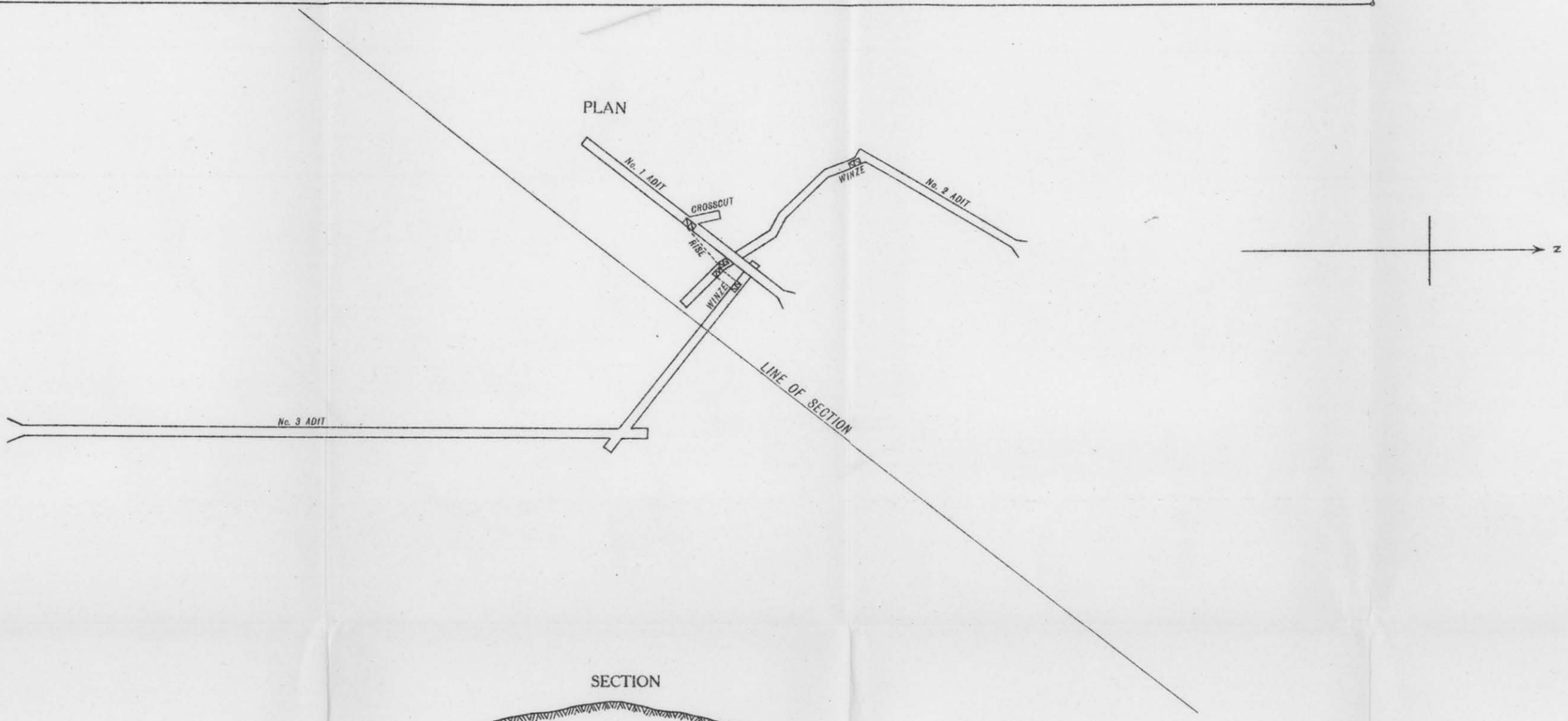
WHYTE RIVER SILVER MINE

5 cm

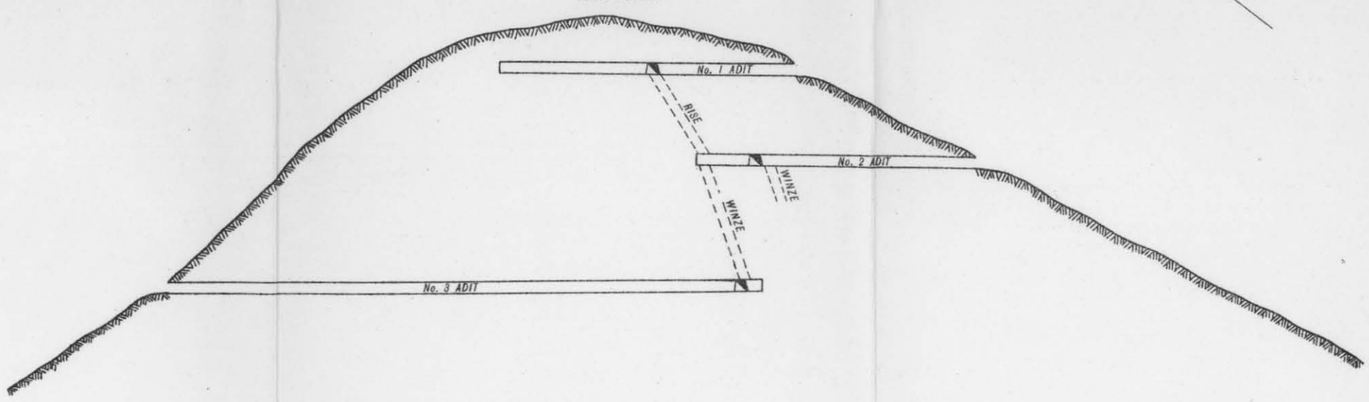
SCALE

50 0 50 100 150 200 FEET

PLAN



SECTION



P.B. Nye. M.Sc. B.M.E.
Government Geologist
16.3.23
16 GJE

Photo Algraphed by John Vail, Government Printer, Hobart, Tasmania.

> serpentinous rock. It is characterised by lead chromates, carbonates, and oxides of lead and antimony. The lead sulphide is strongly antimonial, and the ratio of silver to lead is 3 ozs of the former to the unit of lead.

Twelvetrees reported that no payable ore was found in the no.3 tunnel driven on the southern side of the hill. Thirty-two feet up the rise at the end of this tunnel a 6-inch-wide vein of galena was cut and driven on north, but was found to be of irregular width. Twelvetrees reported an assay of 22.7% lead, 63 ozs 1 dwts silver per ton. In conclusion he dismissed the Whyte River silver mine:

> Some rich silver chlorides have distinguished the secondary ores in this mine. Unfortunately, the workings have not disclosed a lode which can be described as payable. A few tons of ore-stuff have been broken, but the vein is too irregular to warrant much hope of a payable lode being found in the present levels. The deepest workings, however, are not more than 130 feet below the crown of the hill. The hopes raised by the secondary ores have not been justified by the subsequent prospecting, and I am afraid there is not any great chance of improvement at the depth attained.[49]

The company seems to have folded soon after making its 24th call on shares in 1900.

Casboult and Mace took up the property in 1904.[50] About 300 metres north of the Bell's Reward workings, two short adits were driven, a shaft sunk and surface trenching conducted. The trenching revealed a small amount of gossan but no metallic minerals. The lode, according to Nye, occurs where the pyroxenite meets the syenite and consists of narrow veins of galena, and small amounts of quartz, pyrite and blende, the whole being contained in decomposed pyroxenite. The upper adit connected with the shaft at the face. Stoping in this adit resulted in a parcel of galena ore being sent away. The lower adit was driven 70 or 80 feet through pyroxenite to test the lode at greater depth — but had not reached the lode when Nye reported. He declared the property of little if any value, only narrow veins of galena having been revealed. He advised continuation of the lower adit to meet the lode and prospecting along the lode. In 1923 'Mace's Show' was part of the Victorian Magnet consolidated holdings.[51]

The original Whyte River silver workings were abandoned when Nye inspected them in 1923. Like Twelvetrees, he dismissed the Whyte River mine, speculating

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[49] WH Twelvetrees, *Report on the Mineral Fields Between Waratah and Corinna*, Government Geologist's Office, Launceston, 1900, p.39
[50] 'Zeehan to Waratah', *Mercury* 30 March 1904, p.7
[51] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.125

that the lowest level was below the oxidised zone. The results from this level, then, suggested that there would be nothing of greater value at depth.[52]

[52] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.141

Section 4: initial development at Bell's Reward and Discoverer

Bell's Reward and the Discoverer 1889-1903

Summary: The Bell's Reward Silver Mining Co was an undercapitalised, privately subscribed Melbourne company which grew dispirited 1893 after two years of fruitless work when water burst into crosscut from main shaft. No meeting reports available. Sporadic work done on this mine after that. The Discoverer was only worked on a small scale in tandem with other mines.

Production: 37 to 47 tons (from the Bell's Reward) ? Nothing from the Discoverer.

Geology: Both mines on main line of lode. Nye believed there were two formations on the Bell's Reward property: gossan at the contact of the Silurian strata and the syenite, and which contained oxidised ores at one point. The other formation was impregnations of sandstone and limestones.[53]

Workings: Bell's Reward workings (main adit driven to cut Godkin Extended lode, main shaft cross cut into water, northern upper tunnel) all on 20-acre block 44-87M/3952-93M. Discoverer workings four adits plus one shaft.

From 1887 to 1891, work appears to have been carried out sporadically, funded by James Smith and mostly directed by WR Bell, who was manager of the Heazlewood mine until August 1888. By September 1889 trenching on Smith and Bell's section 44-87M had revealed 'three distinct bands of ore bearing rock':

> one between the sandstone and limestone well up on the side of the hill etc, the ore set in the limestone and the third in calcarious [sic] sandstone. These metal bearing rocks lie parallel and in the two lowest there are veins of galena more or less changed into carbonate of lead — these latter have all the appearance of being true lodes…[54]

'There is little doubt', Bell wrote, 'that we have a bigger show than the Godkins and probably as rich.' A shaft was being sunk to 'cut under the gossan' at a depth of 50 ft.[55] By February 1890 a mineral lode was exposed:

> …we have cut a considerable length of a deep ditch parallel with the large lode silicate of zinc etc and have again intersected the lode by the ditch. The lode where last cut through carries much

[53] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.125
[54] WR Bell to James Smith, 20 September 1889, no.312, NS234/3/17 (Archives Office of Tasmania)
[55] WR Bell to James Smith, 20 September 1889, no.312, NS234/3/17 (Archives Office of Tasmania)

> more galena than where first cut…the galena with sulphate of lead has a tendency to become massive…[56]

Montgomery believed that the gossan indicated 'the outcrop of an igneous dyke', which he compared in 'decomposed character' to the rock found in the Whyte River Company mine. Lodes, he wrote, were formed in the fissures of this dyke. On Bell's ground the dyke was

> clear, breaking through Silurian limestone, which is found on both sides of it. A surface trench and shallow drive cutting through the dyke stuff reveal brown and red clays, with numerous veins of oxides or iron and manganese. In parts there is so much of these that the clay becomes almost a gossan. In this trench a lode about four feet thick, consisting of quartz mainly, but much coloured with iron and manganese oxides, has been cut through. Chloride of silver is freely visible in many stones from this lode. On either side of the lode the dyke stuff is extremely decomposed, and much blackened by oxide of manganese. I was told that the dyke stuff contained a little silver. This lode strikes N 60° W in the trench and underlays SW about 1 in 6. All the surface immediately over the dyke is covered with gossan. Several other cuttings into the gossan formation have revealed the igneous clay lying beneath it…
>
> A lode of blende in quartz, striking N 45° W, and dipping to the NE is cut in a trench near the creek, and again a few yards away. This is from 6 to 8 feet wide, and looks like a strong lode. Its value as not yet been ascertained. The blende is reported to contain cadmium. The lode ought to be prospected, as it may contain galena. Thin veins of galena have been found in the limestone, which is a very congenial matrix for this ore and a strong lode traversing it might be rich in it.

The tunnel then being driven through hard limestone to reach the dyke would give a good idea of how much of it is payable, Montgomery predicted.[57] Mine manager George Bottriell resigned at the Bell's Reward in December 1890, when it seemed to him that the gossan in the lower level tunnel was turning to clay and sinking would be necessary, thereby requiring pumps and other equipment.[58]

Bell's Reward Silver Mining Co 1891-93

On 3 February 1891 Bell and Smith sold the two Bell's Reward leases to the promoters of the Bell's Reward Silver Mining Company for £2,000 each.[59] ('Glen

[56] WR Bell to James Smith 20 January 1890, NS234/3/18 (Archives Office of Tasmania)
[57] Alexander Montgomery, 'Report on the State of the Mining Industry on the West Coast', *Report of the Secretary of Mines for 1889-90*, Parliamentary Paper 64/1890, pp.24-25
[58] George Bottriell to James Smith 23 December 1890, NS234/3/18 (Archives Office of Tasmania)
[59] Agreement dated 3 February 1891 in James Smith inward correspondence file, NS234/319 (Archives Office of Tasmania)

Osborne' house in Burnie appears to have been built in 1892 with Bell's share of the money.) The Bell's Reward Silver Mining Company was registered in Melbourne and subscribed privately with £9,000 capital and R Trivess Moore of Melbourne its legal manager.[60] A mining manager was needed. Lane, manager of the Block 14 Company mine at Broken Hill, demanded £2,000 per year.[61] Another Broken Hill man, Edgar L Rosman, former manager for the Broken Hill Proprietary Company itself, must have come cheaper.[62] He started driving the main shaft at the Bell's Reward in May 1891, before the company was even registered.[63]

On 15 June 1891, Bell and Smith sold the two Discoverer sections (45-87M and 916-87M) to promoters of that company for £1,000 each.[64] The prospectus of the Discoverer Silver Mines Company NL appeared in July 1891.[65] It was never floated.

By April 1892 the main Bell's Reward adit was in 351 ft and the company was sinking the engine shaft. In the following month pumping and winding machinery was installed, and in August 1892 this was said to be removing 5,000 gallons of water per day.[66] By February 1893 the engine shaft was down 150 ft, and a crosscut being driven westward to cut the lode. Then the miners hit a pocket of water in the limestone, flooding them out.[67]

After two years of fruitless work, this water burst seems to have dispirited an already pessimistic mine manager and directorship. The board believed its money was better invested elsewhere than in the Bell's Reward or the Discoverer — choosing an untried gold property at Ballarat.[68]

In February 1895, Smith, Bell and William Gibson took out an agreement over two sections at Heazlewood.[69] Shortly after this, while prospecting with his son Leslie, Smith discovered a 4-ft-wide or 10-ft-wide lode (reports vary) at Bell's Reward which reportedly assayed 826 oz of silver to the ton. Forty-six bags of ore (Harcourt Smith believed it was 7 tons of ore, assaying 65 ozs per ton of

[60] 'Mining Intelligence and Stock and Share Market', *Argus* 25 May 1891, p.9
[61] WR Bell to James Smith, 3 March 1891, NS234/3/19 (Archives Office of Tasmania)
[62] WR Bell to James Smith, 4 May 1891, NS234/3/19 (Archives Office of Tasmania)
[63] 'Mining', *Mercury* 29 May 1891, p.3
[64] Agreement dated 15 June 1891 in James Smith inward correspondence file, NS234/3/19 (Archives Office of Tasmania)
[65] Advert, *Wellington Times* 8 July 1891, p.3
[66] 'Manager's Reports', *Mercury* 30 April 1892, Supplement, p.1; 23 May 1892, p.3; 19 August 1892, p.3
[67] J Harcourt Smith, 'Report on the Mineral District Between Corinna and Waratah 28 July 1897', *Secretary of Mines Annual Report 1997*, Parliamentary Paper 44/1897, pp. l-xlx
[68] WR Bell to James Smith 5 April, 1893, no.78; R Trivess Moore to James Smith, 10 June 1893, no.176, NS234/3/21(Archives Office of Tasmania).
[69] The agreement is in James Smith's inward correspondence 9 February 1895, no.16 NS234/3/24 (Archives Office of Tasmania).

silver) were shipped to Melbourne — the first shipment of Bell's Reward ore.[70] As a result, a director, William Jones, is reported to have sailed to Melbourne and arranged to have a concentrating plant installed on the site as early as possible.[71] There is no evidence that this was done, and the Bell's Reward was abandoned again in 1896 for lack of funds.

Hopes were pinned on John McCall securing funding. In May 1896 McCall entered into an agreement with Bell, Smith and Gibson to provide £2,500 for prospecting Bell's Reward section 887-87M and Discoverer section 916-87M.[72] However, he found it impossible to raise money in Melbourne.[73]

Montgomery cautions the Discoverer Syndicate 1896

In a private report, Montgomery warned the Discoverer syndicate not to make the mistake of adjoining companies which had already come to grief by spending their money tunnelling in the upper parts of their lode. He supported the syndicate's proposal to 'sink a good shaft at once and to open the lode in depth below the oxydised zone…' He stated that the properties of the Bell's Reward, Godkin and Godkin Extended had lodes 'of promising character and there was much hope if the work had been persevered with good results would have been obtained'.[74]

AT Brown dismisses the Bell's Reward and Discoverer 1897

John McCall subsequently tried unsuccessfully to float the Discoverer in England.[75] Hopes were dampened in 1897 by the private report of another 'eminent expert', AT Brown, who dismissed the Bell's Reward and Discoverer sections:

> It will be seen that a very considerable amount of prospecting work has been done without proving anything that can be considered to be of commercial value. Where the ore occurs it is finely disseminated through the gangue, and in much too small a quantity to give satisfactory results by any system of working. The general features of the deposits, in my opinion, do not indicate the probably improvement in depth, or the existence of large bodies of payable ore. Considering all the data collected of

[70] 'New Find on Bell's Reward', *Mercury* 20 February 1895, p.3; 'An Outlet for Waratah', *Mercury* 3 June 1896, p.4
[71] 'Mining', *Mercury* 18 March 1895, p.3
[72] The agreement dated 25 May 1896 is in James Smith's inward correspondence, NS234/3/24 (Archives Office of Tasmania).
[73] John McCall to James Smith, 13 June 1896, no.100, NS234/3/24 (Archives Office of Tasmania)
[74] Montgomery's report in contained in James Smith's inward correspondence, no.112, 24 June 1896, NS234/3/24 (Archives Office of Tasmania).
[75] John McCall to James Smith, 27 March 1897, no.298, NS234/3/25 (Archives Office of Tasmania)

> the general prospects, conditions, and values, my opinion is that they are not good enough to warrant further development…[76]

John Harcourt Smith 1897

Government Geologist John Harcourt Smith could not enter the 500-ft-long main adit and the 156-ft-long main shaft of the Bell's Reward in 1897, and could therefore gain no idea of the value of the property. He thought it a great pity that the crosscut was not continued after the water burst, believing that the lode had been cut. In an open cut close to the engine-house he

> noticed little chloride of silver in broken sandstone impregnated with oxides of iron and manganese, and all the gossan is said to carry a little silver.

He traced a 'strong gossan outcrop on the surface' through to the Discoverer, Godkin Extended and Godkin sections, the general strike being NW and SE:

> On the western side of the lode limestone, sandstone, quartzite, and slates occur, the country to the east being chiefly decomposed igneous rock though occasional patches of sedimentary origin are also seen.

On the Discoverer section 916-87M two tunnels had been driven over 200 ft, and there was one shorter adit. No.1 tunnel was partially blocked, but seemed to be similar to no.2, which was 110 ft below it. No.2 passed through

> clayey decomposed igneous rock for about 100 ft, when a belt of sandstone was cut, and beyond this there is a very strong manganese gossan formation, the western wall of which was not reached…The gossan is said to carry a little silver but not in payable quantities and sinking will have to be resorted to prove the value of the lode. From what is seen in the Godkin mine, it is evident that the zone of oxidation extends to a considerable depth but should good "pay-ore" be met with in that mine, this section should be well worth developing.

Twelvetrees' report 1900

In 1898 Bell believed McCall's failed London flotation had left the 13-Mile mines in a worse state than before. Bell hoped to amalgamate the Discoverer and Godkin Extended, the key investor being Jameson, a director of the Mount Lyell Co.[77] James Smith's son Leslie reported in 1900: 'At the Discoverer we appear to be just touching the lode but can form no idea as to value etc just yet.'[78]

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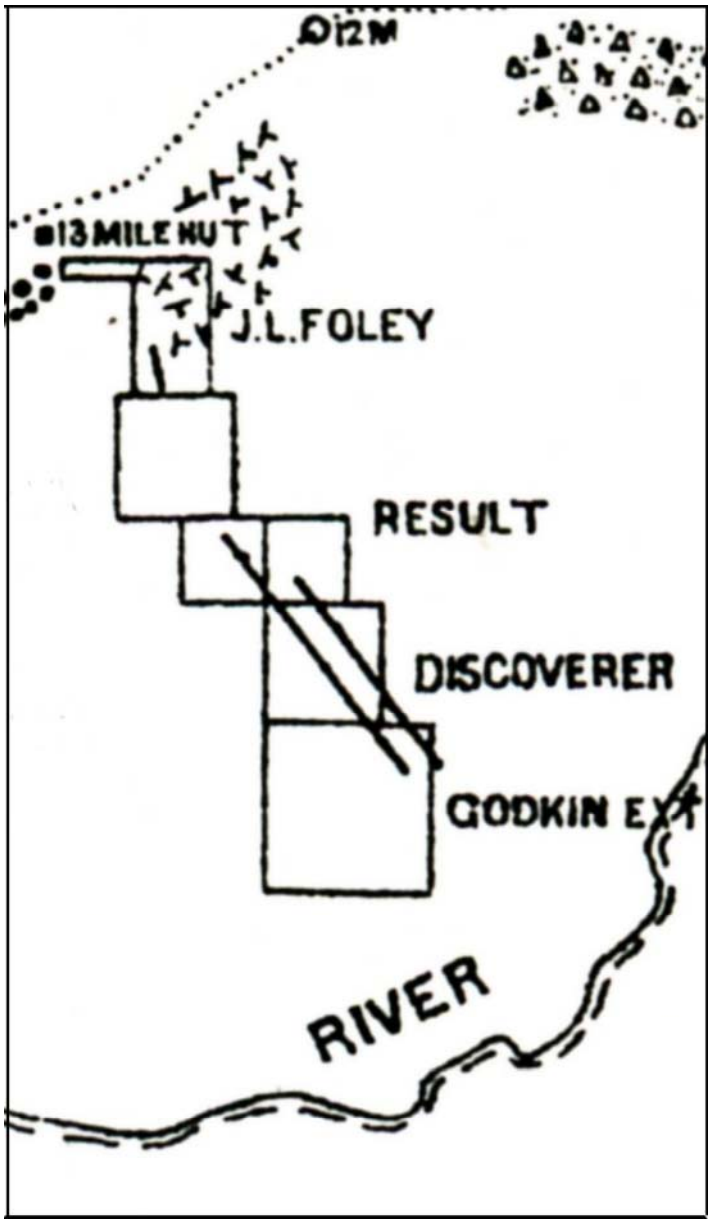
[76] 'Our Letter Home', *Mercury* 27 November 1897, Supplement, p.2

[77] WR Bell to Mary Jane Smith 6 January 1898, no.778, NS234/2/5 (Archives Office of Tasmania)

[78] Leslie Smith to Mary Jane Smith 30 October 1900, no.1367, NS234/5/4 (Archives Office of Tasmania)



Map 7: detail from Twelvetrees' map (1900)

The **Bell's Reward** had been renamed the **Result** when Government Geologist WH Twelvetrees inspected it in 1900. It now consisted of a 40-acre section, 3925-93M (the old 887-87M) and the 20-acre 3952-93M (the old 44-87M). As before, all the workings were on the smaller block. The main adit had been driven 500 ft to cut the Godkin Extended lode line, but its roof had fallen in. Bell stated that the first 130 ft were through barren limestone, then followed 25 ft soft slate, 15 ft sandstone with chloride of silver, 7 ft sandstone, 24 ft ferro-manganese gossan, 130 ft limestone charged with galena and blende, 169 ft quartzite and hornblendic rock. The northern upper tunnel had been driven 80 ft. through

‘rotten, puggy limestone, then decomposed slate, then a band of sandstone, with chloride of silver, then 7 ft of sandstone, carrying galena, then 24 ft of gossan, with a couple of strings of galena, and finally into bluish-grey limestone.’ A main shaft had been sunk 154 ft through 70ft decomposed rock, then solid limestone.

> The decomposed rock is cavernous, and driving from the bottom was suspended owing to a sudden burst of water when the reservoir was tapped. Future work will probably include driving alone the course of the gossan cut in the main adit. What I am rather afraid of is that the backs gained in the main drive will not give sufficient depth for the sulphide ore to be met with, as we know that in the district the gossanous zone extends to considerable depths. If, however the water level is reached, some enrichment may be looked for.

The **Discoverer** contained two tunnels, both of which cut a band of gossan. This band, said to be the Godkin lode, also passed through the Result lease. In the Discoverer tunnels it was 100 ft wide, reduced to 25 ft in the creek opposite the main adit of the Result. (It was not cut by the Result main adit.) The bottom Discoverer tunnel, no.2, had been driven 379 ft, through 150 ft of decomposed clayey, eruptive rock. It then crossed the band of ferro-manganese gossan containing soft, putty-like clay or kaolin, suggesting that the gossan band was originally a dyke of eruptive rock. On the footwall of the gossan was a band of black pug derived from clay-slate.

> This is succeeded by limestone, apparently conformable with the gossan. There is a foot of pug just behind the end, which is now in hard limestone. It is intended to drive this tunnel to intersect the Bell’s Reward (Godkin Extended) lode cut in the Result. When this is reached, the tunnel will have 200 to 300 feet of backs. No.1 tunnel is 120 feet above the preceding, and has been driven through 100 feet of the gossan, through the slate, and is in the limestone, in all, about 170 feet. It is blocked by a fall of ground…
>
> No work was being done on these sections when I was there, but in view of the persistence of the gossan outcrop along a great length of line, I am told that resumption of operations is contemplated. The gossan itself seems very poor, but I think it likely that when the limit of the oxidation zone is reached, there will be the usual enrichment by leaching from above. If, as I surmise from the gossan and the aluminous patches contained in it, it is an igneous dyke, it may, in depth, carry more than one ore vein.

The creek up the valley has been worked, off an on, for gold, with some success. At one time the whole ground was pegged out for gold, with quite unreasonable expectations. What gold has been obtained was, most likely, derived from the little bunches and veins of quartz in the diorite and other hornblendic rocks of the range along the eastern side of the creek. These rocks also contain veinlets of copper ore.[79]

[79] WH Twelvetrees, *Report on the Mineral Fields Between Waratah and Corinna*, Government Geologist's Office, Launceston, 1900, pp.35-38

Section 5: Later development and exploration

Twelvetrees' report 1903

In 1902 the late James Smith's sons Leslie and Garn, plus his son-in-law, Julius Rohr, lived and worked with Bell at the Bell's Reward mine, their diet enriched by growing potatoes, turnips, cabbages, peas, parsnips, carrots, raspberries and strawberries.[80] Bell was now 72 years old and busy with the nearby Magnet mine.

In 1903 Twelvetrees was thus able to access the Bell's Reward workings again. The main adit was now 600 or 700 feet long. Twelvetrees noted that

> about 170 feet behind the end of the tunnel, a few feet have been driven north and south on a hanging wall of quartzite, with adherent puggy matter, and soft slate charged with galena. This has been believed to be a lode fracture, as the wall is remarkably smooth, but I am inclined to think it is merely a plane of bedding, along which mineral has been deposited. No water was struck in the tunnel until a little further on where it is depositing oxide of iron. The tunnel end is in limestone and bears south-west, but has been bent a little too much to the east to be at right angle to the lode-line. It is below the flat top of the hill, and should be driven further in to prove the ground ahead. Between 30 and 40 tons of ore were sold last year, but some of if it did not realise expenses incurred, as this portion of the produce only contained 25 to 30 ozs of silver, and as much as 4 and 8 per cent zinc.

He was interested in a zinc ore carbonate formation south of the tip, which assayed 1.5 oz silver per ton and 25 per cent zinc, suggesting that it would become a zinc-blende deposit at depth. The 60-ft-long collapsed tunnel south of the Bell's Reward huts did not reveal a lode. Bell had recently driven 60 ft into the hill with the idea of intersecting the silver chloride bearing sandstone, but Twelvetrees believed this was not a lode. Lower down, another tunnel 60 or 70 feet long

> Intersected the same black formation, containing bright galena and vughs of crystalline ore. This tunnel is in soft clay, and has also fallen in. The formation could be cut lower down, but at any depth accessible to adits it will probably be of the same character. The gossan on this mine seems to occur as irregular patches rather than persistent lodes, and I am disposed to think this is due partly to the irregular fracturing of the country-rock and partly to the formation of cavities in a soluble rock such as

[80] Garn Smith to Mary Jane Smith, 30 December 1902, no.1713, NS234/5/6 (Archives Office of Tasmania)

> limestone. The fractures have created channels through which solutions could circulate, and the porous shattered rock has been permeated with mineral. All this porous country, being well within the zone of surface waters, it would seem probable that a zone of enrichment exists at water-level. To reach this, shaft-sinking is necessary; any sound plan for developing the property must include this feature. It may be that these gossan patches are not constant at depth; that they are in fact not lode cappings at all, but irregular concentrations. If they were heavily charged with mineral, they have parted with the most of it, and it cannot be recovered, except by going down after it. The main line of gossan, however, probably descends along the contact-line to the zone of the primary ores.

Four tunnels had now been driven at the Discoverer. The lowest tunnel was the old no.1, still the longest on the property. Two more adits had been driven above this and below the old no.2 tunnel. In the higher of these, large blocks of gossan occurred, lying on the limestone. Twelvetrees saw yellow fossiliferous sandstone at the face of the 170-ft no.2 tunnel, the fossils being casts of the remains of brachiopods of Silurian age. Fifty or 60 feet above that tunnel a shaft had been sunk 50 feet in hilldrift and clay:

> The surface of the hill all the way down is strewn with lumps of gossan. If the gossan outcrops denote separate lodes, there must be several of these, but form the appearances generally, I believe they represent irregular channels or cavities in the either broken or soluble rock. Still there is no reason why they should not carry concentrations of valuable ore, and they all doubtless have some connection with the main lode-line, which will be found to follow the irregular contour of the granitic rock. The granitic-looking rock is to be seen most favourably at the Godkin Mine, on the Whyte River, and there it is found to be syenite (quartzless granite, the constituents of which are orthoclase, oligoclase, chloritic pseodomorphs after hornblende, and a little quartz). The limestone appears to be the rock in which, or between which and the syenite, the strongest gossan bodies are developed. This is natural, as it is a soluble rock, and lime appears to have been a very general precipitant of minerals from solution.[81]

New Godwin Extended Company 1903-05

Summary: Same old problem of undercapitalisation and working superficially.

[81] WH Twelvetrees, *Report on Mineral Fields Between Waratah and Long Plains*, Government Geologist's Office, Launceston, 1903, pp.20-25

Production: unknown

Workings: drove a lower level adit on the Godkin Extended

The New Godkin Extended was registered in Devonport in 1903 to work the Bell's Reward, Discoverer and Godkin Extended with 24,000 shares of 1 shilling each, 12,000 paid up in full. Leslie Smith was the major shareholder, holding 10,000 of the 24,000, with Devonport merchant John Henry holding 6,000.[82] The company appears to have done most of its work on the Godkin Extended. When Twelvetrees inspected that property in 1903, it was driving a lower level adit. In the existing main adit, according to Twelvetrees,

> loose boulders of rich banded ore were met with, as well as slugs of sulphide of silver. The sandstone contained secondary blende, and fossil casts of univalves (Silurian) were detected in it. The main gossan line is still some distance ahead of the end.

Nye in 1923 agreed that the adit had stopped short of the 80 ft required to test the downward continuation of the lode found earlier in the no.1 adit.[83] An extraordinary meeting called in October 1905 to increase the shareholding capital (to 48,000 of 2 shillings each) was followed by a sixth call of 2d on shares in the following month.[84] Nevertheless, the company appears to have ceased operation in 1905.

(Victorian) Magnet Silver-Mining Company 1895-1923?

Summary: Working in the same undercapitalised mode as its predecessor, in 1912 this Melbourne company finally fulfilled Montgomery's 1893 plan of testing both southern and northern Godkin blocks by completing a 4,000-ft drainage tunnel from the Whyte River to the northern shaft. This revealed no valuable lodes. The existence of lodes beneath the oxidised zone remained unexplored.

Production: 19.2 tons?

In January 1895 Norman Godkin reported that a company had been floated in Melbourne to work the Godkin mine with a capital of £6,000.[85] Little seems to have been done by the time John Harcourt Smith inspected the two 40-acre sections in 1897. All workings were then full of water, except for the north shaft which was being worked. A small pumping plant has been erected here. The shaft was now 80 ft below the no.5 tunnel, its bottom in gossan, with a cross-cut

[82] 'Mining', *Mercury* 25 August 1903, p.3
[83] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.109
[84] 'Mining', *Mercury* 7 October 1905, p.7; 'Mining', *Mercury* 1 November 1905, p.7
[85] 'Mining', *Mercury* 3 January 1895, p.3

driven from this 30 ft to the south-west, and from the end of that another drive 30 ft to the south-east.

> The gossan which contains a great deal of black oxide of manganese, is full of vughs making it very bad for shooting, and progress is consequently slow. Mr Scaddon, the mine manager, informed me that the gossan contained a little silver, but not in payable quantities. From the fact that galena was obtained from two winzes sunk between 30 and 40 ft below no.5 tunnel, it was hoped that the oxidized zone would have been passed through so the result is very disappointing. The first of these winzes is about 100 ft south-east from the shaft, and from the open character of the lode-matter it is probable that the winze will soon be drained, and galena may be met with in the drive, but it is evident that the shaft will have to be sunk deeper to reach the main unoxidized portions of the lode.[86]

In 1903, when Norman Godkin breathed his last, Twelvetrees reported the company's continuation of the long adit suggested by Montgomery to drain the works:

> The manager stated the intention was to drive and overhaul the old workings. Once the drainage is effected, the old works can be thoroughly examined and the old main shaft put in working condition. Sinking at the north shaft can also be restarted, and the lode-belt thoroughly explored at depths considerably greater than previously worked.

Twelvetrees believed that, since the deposition of ore on the Godkin, Godkin Extended, Discoverer and Bell's Reward, had taken place under identical conditions, successful deep work in one would justify undertaking it in the others:

> The rich returns obtained from the lode at the Godkin certainly justify further endeavour. It would be folly, in the face of such yields, to supinely resign work because of the irregularity and patchiness of the ore at shallow levels and in the oxidised zone. Although the lode-line through three properties is geologically and essentially one and the same, the indications are that it has split in the northern Godkin section, going north. The main Godkin lode further north is represented by the large gossan belt in the low tunnel of the Discoverer, and keeps all along close to the contact line: the western leg, or Godkin Extended lode, probably feathers out into the irregular gossan patches to the

[86] J Harcourt Smith, 'Report on the Mineral District Between Corinna and Waratah 28 July 1897', *Secretary of Mines Annual Report 1997*, Parliamentary Paper 44/1897, pp. l-xlx

> west, on the Discoverer and Bell's Reward. The remarks as to deep mining apply with equal force to that end of the lode.[87]
>
> Gossan is seen all along the track to the Godkin Extended and at the North Godkin shaft a large outcrop occurs, about 50 feet wide, consisting of iron oxide, with a good deal of black oxide of manganese, mixed with aluminous country-rock. In a trench, above the engine-house at this shaft, the gossan has been again exposed, and is associated with quartz. There is a slight curve here in the gossan line which, going north, either branches, or bends somewhat to the west. Standing at the engine-house and looking easterly, the hill country is granite (syenite); westerly it is sandstone, more or less indurated or metamorphosed; between the two sets of rocks is the gossanous zone, consisting of oxidised iron and manganese, intermixed with country-rock (aluminous or siliceous according as the granite or sandstone material predominates). It is moreover very possible that the gossan occupies a space which was once a strip of limestone, but since dissolved away. The Godkin North shaft was sunk to a depth of 150 to 180 feet, and a communication exists between it and no.5 tunnel by a drive north from the latter, along the gossan line. Some shallow winzes were sunk from the drive yielding payable ore (reported by the manager at 45 per cent lead and 85 ozs silver), and cross-cutting from the drive showed the limonite and manganiferous gossan, with quartz leaders, to be silver-bearing up to 12 ozs, and 20 to 50 feet wide.

The Victorian Magnet company was working from the Whyte River end of the proposed drainage tunnel, rather than continuing the 800 feet driven from the north shaft end by the Godkin SM Co in 1893. The latter was now inaccessible. 'For nearly half the distance', Twelvetrees wrote,

> it passed through sandstone, and before intersecting the gossan line a bed of ore-bearing pebbly sandstone or conglomerate was met with. Boulders of banded ore are seen outside on the tip, showing the country to be, in places, loose and porous. The rocks have evidently been disturbed by intrusion, and water channels have formed. Information is to the effect that these ore boulders were embedded in a black puggy matter in the conglomerate. The tunnel-level is about 100 feet below the collar of the north shaft. The orestuff on the tip consists of conglomerate and carbonate of iron, with a little galena and zinc-blende, too poor, I consider, to be treated as it is. The tunnel has

[87] 'A Pre-eminent Mineral Bearing Area', *Mercury* 22 October 1903, p.3

> been driven right across the gossan line, and, from its length, it must have passed into the granite country.[88]

Painstakingly slow and fruitless exploration work continued for the next two decades. By 1903, TH Jones, presumably the former manager of the (Tasmanian) Magnet mine, had taken over operations for the Victorian company, and in 1904 there were said to be 40 to 50 tons of ore at grass, with fair silver content and some gold.[89] A 'good width of milling ore' was reported to have been cut in 1905, although no production is recorded, and the company was said to have struck another large body of ore in 1906.[90]

In 1912 the Victorian Magnet consolidated the old Godkin and Godkin Extended leases as 4007M (183 acres) and 5760M (278 acres). The company spent £1195 putting the property in order, completing the drainage tunnel, erecting a horse whim and a new poppet head at the north shaft.[91] Recapitalisation was called for in 1913, but subsequent reports in the Secretary of Mines Annual Reports refer mostly to prospecting.[92] No attempt appears to have been made to test the property beneath the oxidised zone.

PB Nye's report 1923

In 1923, when Nye reported on the silver fields, the (Victorian) Magnet Silver Mining Company NL maintained its consolidated leases while working the old Godkin and Godkin Extended mines, the access being a three-mile-long sledge track which mostly followed the old Godkin Tramway from the Whyte River bridge. The Bell's Reward and southern Godkin workings were inaccessible. Nye had this to say about the 'Native Silver Lode':

> The drive from the shaft to the crosscut, and further to the south-east, was driven on the course of a supposed lode. The best ore was found between the shaft and the crosscut, and a quantity of it has been stoped out. The ore consisted of veins of galena and blende in limestone, with which native silver was also associated. A parcel of 27 tons of "firsts" were shipped and gave an assay of 103 oz. of silver per ton but the lead content was low, being reported as 27 per cent. A smaller parcel gave 107 oz. of silver per ton. This formation was termed "The Native Silver Lode," but has been proved to have no lateral extension, and the association of minerals suggests that it is rather a secondary impregnation of limestone than an original lode. In the

[88] WH Twelvetrees, *Report on Mineral Fields Between Waratah and Long Plains*, Government Geologist's Office, Launceston, 1903, pp.25-27
[89] 'Zeehan Mining', *Mercury* 13 April 1904, p.6; *Secretary of Mines Annual Report for 1904*, 1905, p.82
[90] 'Bischoff and Magnet Mines', *Mercury* 4 July 1905; p.7 'Waratah Mining', *Mercury* 10 May 1906, p.7
[91] *Secretary of Mines Annual report for 1912*, 1913, p.37
[92] 'Mining Notices', *Argus* 17 December 1913, p.1

GSB 33

PLATE XII

PLAN OF UNDERGROUND WORKINGS

GODKIN MINE

SCALE

50 0 50 100 150 200 FEET

5 cm

N

ORIGINAL GODKIN EXTENDED LEASE 1076-87-M 80 ACRES

CONSOLIDATED LEASE No. 5760-M

278 acres

ORIGINAL GODKIN LEASE 1599-87-M 40 ACRES

CONSOLIDATED LEASE No. 4007-M

183 acres

CONSOLIDATED LEASE No. 5760-M

278 acres

CONSOLIDATED LEASE No. 4007-M

183 acres

ORIGINAL GODKIN LEASE 1615-87-M 40 ACRES

No. 1 ADIT
No. 2 LEVEL
SHAFT
AIR SHAFT
SHAFT
No. 2 ADIT
No. 1 LEVEL
WINZE
No. 1 DRIVE
No. 2 DRIVE
No. 3 LEVEL
110-FEET LEVEL
NORTH SHAFT
No. 1 WINZE
No. 2 WINZE
110-FEET LEVEL
DRIVE TO NORTH SHAFT
No. 1 ADIT
No. 2 LEVEL
LINE OF SECTION
CROSSCUT
CROSSCUT
No. 5 ADIT
AIR SHAFT
No. 2 ADIT
WINZE
No. 5 ADIT
LINE OF SECTION ALONG No. 5 ADIT
110-FEET LEVEL
LINE OF SECTION
110-FEET LEVEL
NORTH DRIVE
110-FEET LEVEL
45-FEET LEVEL
MAIN SHAFT
90-FEET LEVEL
110-FEET LEVEL
No. 1 ADIT
No. 3 ADIT
110-FEET LEVEL
WINZE
RISE
AIR SHAFT
AIR SHAFT
45-FEET LEVEL
LINE OF SECTION
110-FEET LEVEL
45-FEET LEVEL
RISE
No. 4 ADIT
110-FEET LEVEL
AIR SHAFT
SHAFT
DRAINAGE TUNNEL
LINE OF SECTION

A B C D E F G H

R.B. Kyle. M.Sc. B.M.E.
Government Geologist
3. 23
16. G.J.E

Photo Algraphed by John Vail Government Printer Hobart Tasmania

> continuation of the crosscut from the No.4 adit this “lode” has been cut, but it consists of practically barren limestone.

Nye says little about the 4,000-ft Godkin drainage tunnel. He repeats much of Montgomery’s description of the northern Godkin workings, adding that the shaft had been sunk to 210 ft. Nye concluded that while the workings were extensive,

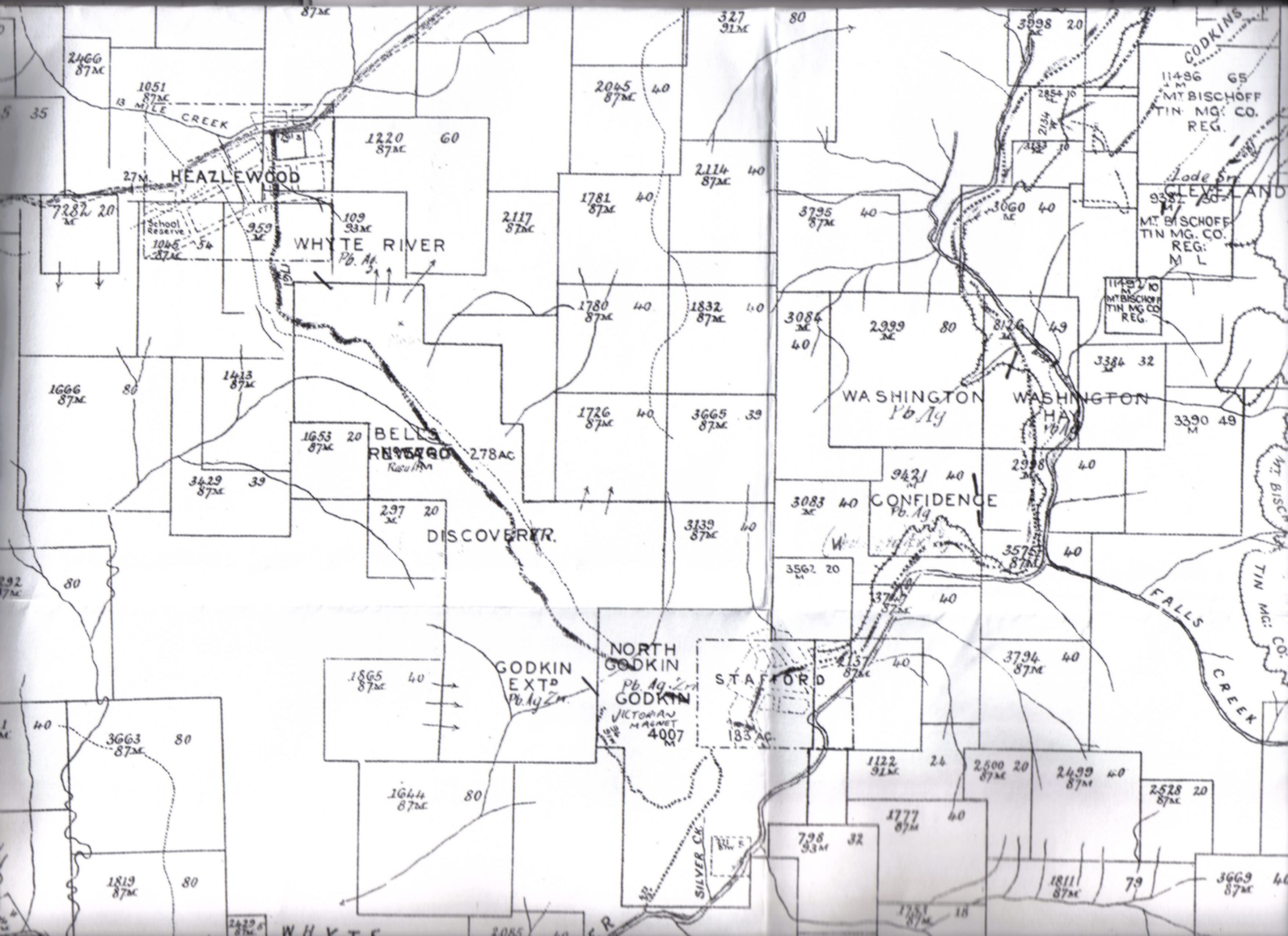
> they have revealed no lode of any value. The winzes from the north drive from the no.5 adit exposed a little galena and oxidised ores, but this ore must have been of small dimensions, and no lateral extension has been proved in the other workings at the no.3 level. The only other metallic contents were a very small amount of galena in the drive connecting the main and the north shafts, while the gossan contains a small amount of silver minerals. Apart from these all that the workings have revealed is practically barren gossan and the more or less stained mud. The mud is the product of complete decomposition of the pyroxenite, shales, and possibly limestones, which occur at the junction of the pyroxenite and the Silurian strata. This mud is often mixed with oxides of iron and manganese, and resembles gossan, and it is this formation that underlies the massive gossan (oxides of iron and manganese) which outcrops at the surface.[93]

Nye noted an assay of 1.5 ozs silver and 24 percent of zince obtained from a sample collected from the zinc carbonate formation exposed south of the Bell’s Reward tip. This led Nye to believe there were two formations on the property: gossan at the contact of the Silurian strata with the syenite, and which contained oxidised zinc ores at one point. The other formation was impregnations of sandstones and limestones ‘probably of no economic importance’.[94]

Likewise, Nye stated that no further work was justified on the Godkin Extended, where the short shoot of secondary galena, blende and silver minerals at the no.2 level had failed to continue at depth. He described the workings on the blende lode in the main adit:

> This lode was driven on to the north-west, but it was cut out over the back at 40 feet, and the drive was continued to 160 feet without revealing anything further. The lode was stoped over the back of the drive, and a small parcel of ore (reported to be 40 tons) was sent away. A winze was sunk of the east side of the adit, and has since been connected with a rise from No.3 level. The lode is reported to have contained slugs of silver sulphite

[93] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.118
[94] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.125


HEAZLEWOOD
WHYTE RIVER
Pb. Ag.
BELLS
DISCOVERER
278 AC.
GODKIN EXT.D
Pb Ag Zn
NORTH GODKIN
Pb. Ag. Zn
GODKIN
VICTORIAN MAGNET
4007
183 AC.
STAFFORD
WASHINGTON
Pb Ag
WASHINGTON HAY
Pb Ag
CONFIDENCE
Pb. Ag
CLEVELAND
MT. BISCHOFF TIN MG. CO. REG.
CODKINS
FALLS CREEK
SILVER CK.
13 MILE CREEK
School Reserve
Lode Str.

> and to have given very high assay values, the parcel sent away, however, bulking only 120 ozs. silver per ton. The portion of the lode still visible consists of a very cellular mass of light-coloured zinc blende with a small amount of galena.

Nye then examined the 'black formation' reported by previous geologists at the Godkin Extended, describing it in great detail.[95]

Nye concluded that, before this field be abandoned, sinking should be conducted at depth at the old Godkin north shaft. 'If no evidence of a primary lode is obtained when the one of oxidation of any such lode must have been passed through, then no further work should be undertaken.'[96]

EZ drilling 1949

The south Godkin lease has still not been tested at depth. In 1949 the Electrolytic Zinc Company diamond drilled six holes at the Bell's Reward (3 holes), Godkin (1 hole), Godkin Amalgamated (1 hole) and the Discoverer (1 hole), 3,157 feet of drilling altogether. The deepest hole was 230 metres near the north Godkin shaft. Groves summarised that

> A few feet of ferruginous material were found in each hole, but no sulphide mineralization was discovered. It appears that the strong gossans at the surface generally give way to a soft, ferruginous and manganiferous lode with little or no galena at depth, with development of fairly rich, although small pockets of galena and sphalerite in places.[97]

Allegiance Mining reported that the EZ drilling revealed three important facts:

- The Ordovician-Silurian sediments on the east side of the Huskisson Syncline dip east (not west).
- "dolerite" (Cambrian basalts or syenite?) have been thrust over the sediments at a relatively shallow angle.
- Minor trace mineralisation was developed on the two major historically mined lines of lode (calcareous conglomerate and sediment-mafic contact).[98]

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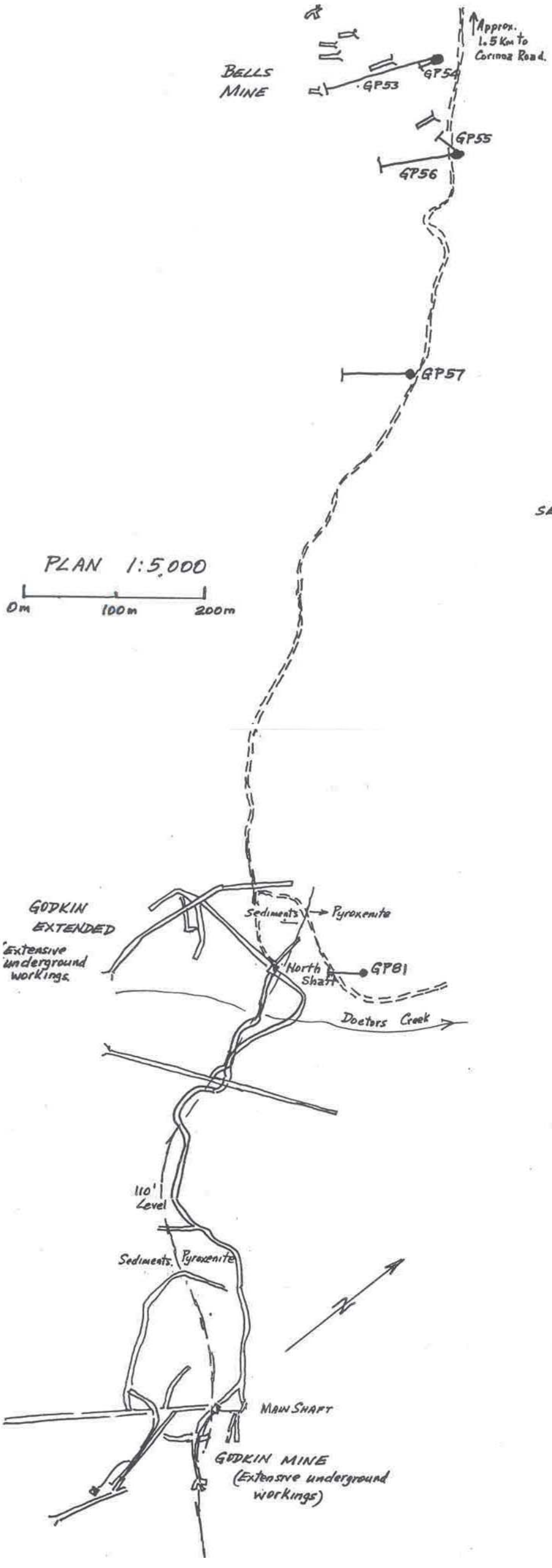
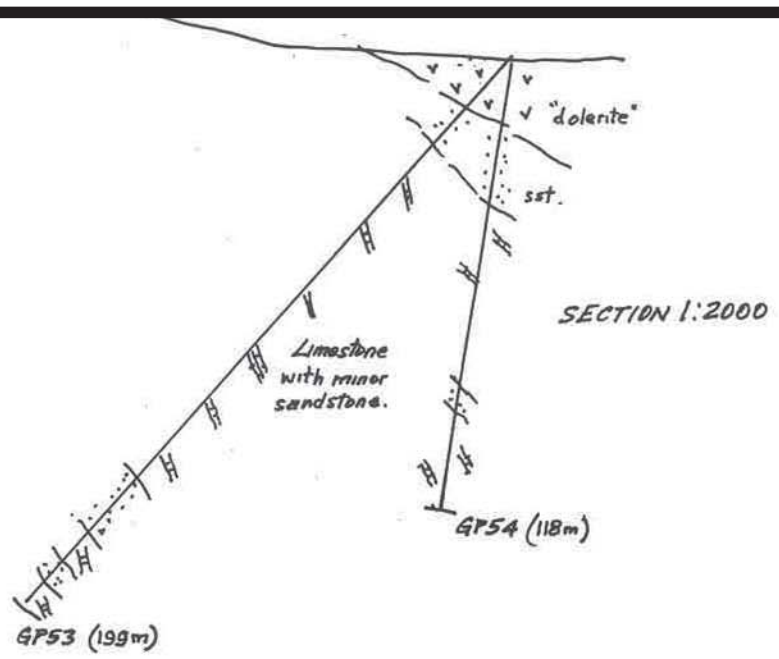
[95] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, pp.119-22

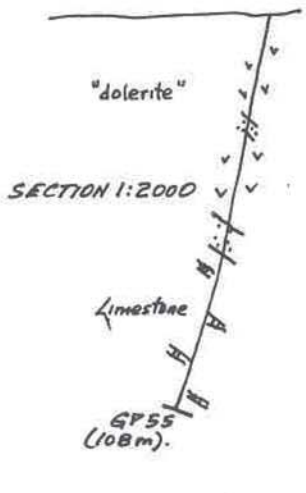
[96] PB Nye, *The Silver-Lead Deposits of the Waratah District*, Geological Survey Bulletin 33, Department of Mines, Hobart, 1923, p.126

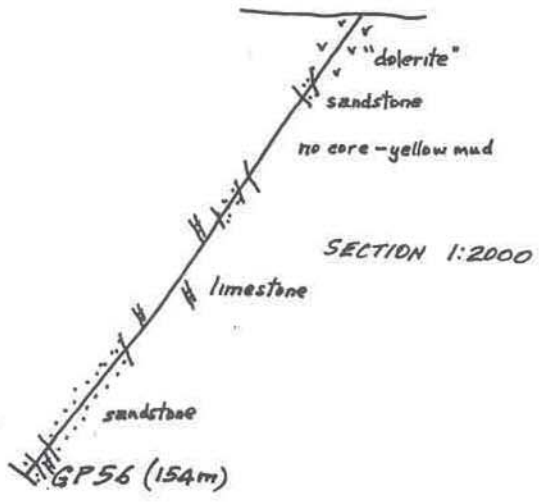
[97] DI Groves, *The Geology of the Heazlewood-Godkin Area*, Department of Mines, Hobart, 1965, p.37

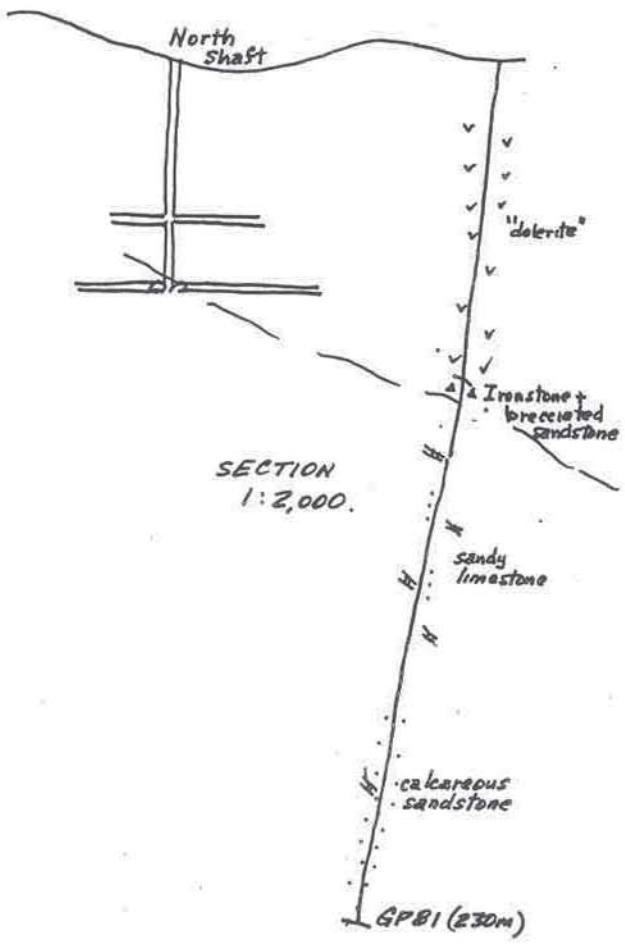
[98] Allegiance Mining, *EL 14/2001 Heazlewood Area, Tasmania: Partial Relinquishment Report*, 2002, p.20

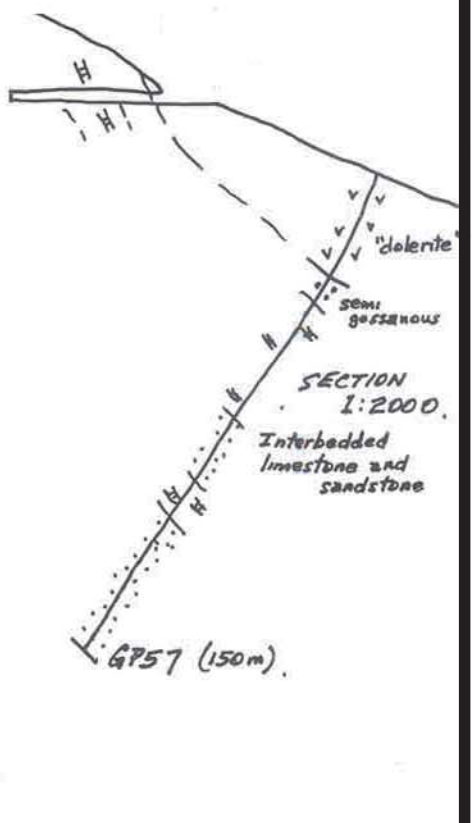












Note: The Godkin Workings are extensive and detail is available on smaller scale plans; the locations of the 6 EZ holes are approx only; the locations as shown on this plan were derived from an

Allegiance Mining N.L.

EL 14/2001 - HEAZLEWOOD

GODKIN WORKINGS

PLAN AND DRILL SECTIONS

Compiled :	L. Newnham
Date :	Nov. 2000
Drawn :	L. Newnham
Scale :	As Shown
File :	

Newnhan Exploration and Mining Services

Figure No. 12

Diagrams of the six drill holes are in Appendix 2.

Groves' 1965 report on the 13-Mile line of lode has already been discussed in detail. In his conclusion he reported that the line of lode had been thoroughly prospected and drilled, with little success. This he qualified with:

> However, small pockets of rich ore which occur in the Godkin section itself have not been investigated by drilling. The occurrence of several lodes, produced by cross faulting, provides a reasonable drilling target. The ore may be found to concentrate at the intersection of such lodes at depth, as in other silver-lead-zinc mines in western Tasmania.[99]

Allegiance Mining in 2001 described two lines of lode at the 13-Mile:

- contact zone between Ordovician-Silurian sediments on the west and pyroxenite on the east
- stratabound conglomeratic-zone within sandstone, shales and limestone

In the main Godkin mine, the lode occurred on the boundary between sediments and pyroxenite. The sediments were recorded as striking 330° and dipping 40-50° to the SW, which is opposite to all the other mines in the line of working to the north (typo error?). There was also a small wedge of pyroxenite within the sediments suggestive of substantial tectonism along this margin.

In the Godkin Extended and Discoverer mines, the lode was in stratabound black carbonaceous material within a conglomerate at the boundary between sandstone and limestone formations.

In the Bell's Reward, the lode was developed in a stratabound clayey zone similar to the Godkin Extended.

At Mace's mine, 300m north of Bell's Reward, two adits were driven on small galena-sphalerite-quartz pyrite veins developed on the contact between pyroxenite to the west and syenite to the east.

Production from these extensive workings was small, possibly only 300-500 tonnes of high-grade Ag-Pb concentrates. Significant secondary enrichment of Ag was reported…

[99] DI Groves, *The Geology of the Heazlewood-Godkin Area*, Department of Mines, Hobart, 1965, p.39

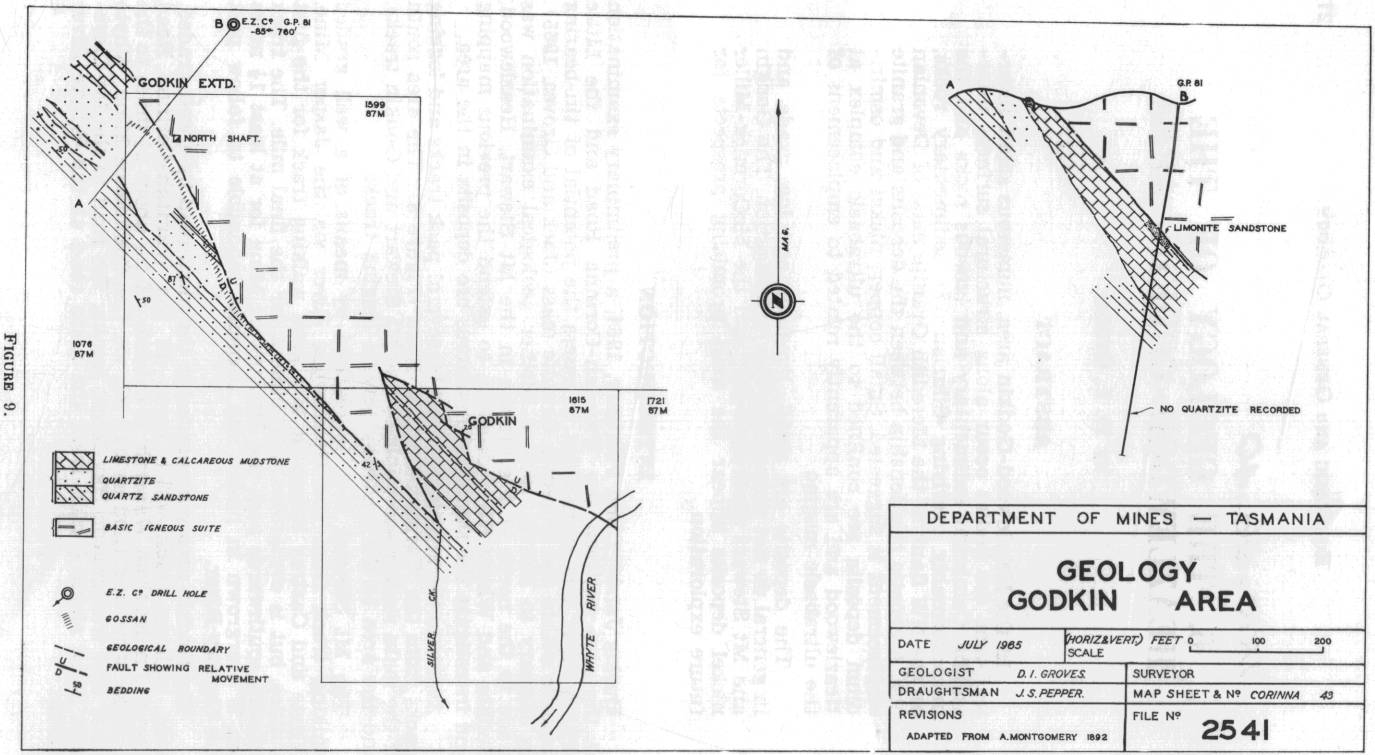

5 cm
B
E.Z. Co G.P. 81
-85° 760'
GODKIN EXTD.
1599
87M
NORTH SHAFT.
A
87
50
1076
87M
1615
87M
1721
87M
GODKIN
42
SILVER CK.
WHITE RIVER
MAG.
N
A
G.P. 81
B
LIMONITE SANDSTONE
NO QUARTZITE RECORDED
LIMESTONE & CALCAREOUS MUDSTONE
QUARTZITE
QUARTZ SANDSTONE
BASIC IGNEOUS SUITE
E.Z. Co DRILL HOLE
GOSSAN
GEOLOGICAL BOUNDARY
FAULT SHOWING RELATIVE MOVEMENT
BEDDING
DEPARTMENT OF MINES — TASMANIA
GEOLOGY
GODKIN AREA
DATE JULY 1965
(HORIZ&VERT) FEET SCALE 0 100 200
GEOLOGIST D.I. GROVES.
SURVEYOR
DRAUGHTSMAN J.S. PEPPER.
MAP SHEET & Nº CORINNA 43
REVISIONS
ADAPTED FROM A. MONTGOMERY 1892
FILE Nº 2541

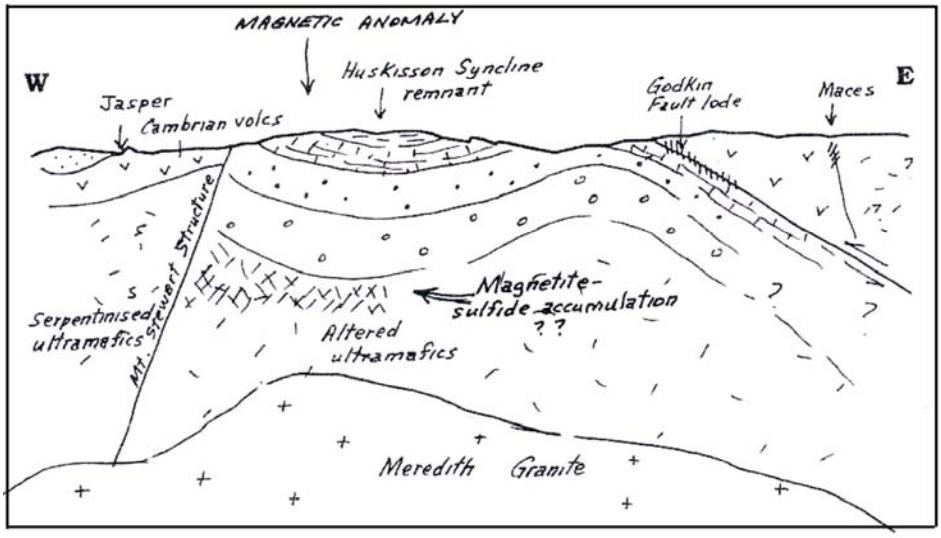
FIGURE 9.

In summary, the Godkin Workings were developed on two NW trending lines of "lode". One was stratabound in highly decomposed calcareous conglomerate in a limestone sandstone sequence. Most of the mineralisation in this zone was probably secondary and deposited by circulating acid waters attacking the limestone and becoming neutralised (of) Mt Lyell copper clays, Grieves, Merton Hill, Coupon. The other lode was developed at the faulted contact between syenite/pyroxenite and sediments. A possible third style was developed at Mace's on the contact between syenite and pyroxenite.

The sediments and faulted contacts generally appear to strike NW and dip NE.

This interpretation is confirmed by EZ drilling in the area, which indicated possible low angle thrusting of the Cambrian ultramafics/mafics over the Ordovician sediments. The east dip of the sediments is contrary to that expected on the eastern side of the Huskisson Syncline remnant and suggests strong folding along a major thrust structure on this margin of the syncline.

Whilst the Godkin Workings had insignificant production, they are valuable in demonstrating a zone of major tectonism along the eastern margin of the Huskisson syncline, possibly involving low angled thrusting.[100]



Map 12: Allegiance Mining (2001) cross-section through Huskisson Syncline remnant

[100] Allegiance Mining, *EL 14/2001 Heazlewood Area, Tasmania: Partial Relinquishment Report*, 2002, pp.16-18

In 2004 Fugro Airborne Services conducted an aeromagnetic survey of the Heazlewood area, including the 13-Mile line of lode, on behalf of Allegiance Metals Pty Ltd. The aim was to establish prospective 'Avebury-style' nickel deposits. Interpreting the survey data, Steve Webster Pty Ltd concluded that

> outcropping and buried zones of the ultramific complex are analysed in a preliminary interpretation that showed structural elements which equate to known mineralisation trends and previously unidentified parallel features of similar character. Some of these features are associated with strong magnetic anomalies that may indicate new targets that fit the Avebury model and have high priority for exploration.

Webster then compared the 13-Mile line of lode specifically with the Avebury model identifying

> a NW-SE trending weak magnetic low [which] marks the contact between the Siluro-Devonian sediments and mafic units that is also the locus of mineral occurrence between Godkin and Whyte River mines. There does not appear to be ultramifics associated with this zone and thus it is not prospective for Avebury-style Ni deposits.[101]

[101] Steve Webster Pty Ltd, *Allegiance Metals Pty Ltd Helimag Survey in Western Tasmania by Fugro Airborne Surveys. Quality Control Report and Preliminary Interpretation*, 2004

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Appendix 1:

Alexander Montgomery, geology of the Godkin mine, 1892

No.1 Tunnel.-This was put in immediately under a mass of gossan cropping out on surface, in which there was a veil of pyromorphite two or three inches wide, giving good assay returns. Several cuttings that have been made into this mass since mining work began have proved it to be superficial and flat-lying, the gossan not extending downwards more than a few feet. From the shape of the surface of the ground it seems probable that this lodestuff has been brought into its present position by a landslip, and that therefore we should look for the parent mass higher up the hill. Unfortunately for the development of the mine, the slipped gossan, instead of coming to rest upon solid country when its superficial character would have been at once apparent, came right upon some clayey matter which might well belong to a lode, but which subsequent work has shown to be one of the broken clayey masses formed at the contact of the sedimentary and igneous rocks. There appears to be a good deal of this clay in the vicinity of this contact, formed by mechanical disruption of the older rock at the time of the dolerite intrusion, together with chemical action subsequently: under favourable circumstances true lode-matter might be formed in such situations, and the clay is much stained with oxides of iron and manganese, and in places has much the character of a true gossan. It has therefore taken a great deal of work to show its real nature, and has prevented the recognition of what appears to be the fact, that the patch of gossan on surface is not in its original position. In the No.1 tunnel the gossany matter is found for 50 feet in from the mouth: much of it is stained black with oxide of manganese, and good assay returns were said to have been obtained from this black portion. As it has not been mined out, however, the presumption is that in bulk it was not rich enough to pay for removal. From 50 to 80 feet from the entrance there is a layer of ferruginous stuff to the top of the drive, but under it appears to be broken and stained country rock. At 80 feet there shows in the floor a piece of weathered shaly matter, probably the cap of the limestone found below this tunnel at the next level, which often contains a good deal of slaty substance in bands through it. Between 80 and 140 feet the tunnel passes through much decomposed clayey dolerite, and then to 230 feet it encounters brown clay with occasional curious wavy markings; this is similar to the clay lying under the gossan at the entrance to the tunnel and to the stuff passed through in the first 200 feet of the No.4 adit. After passing through it the drive goes through 84 feet of clayey dolerite. In the face there is a good deal of sandstone mixed with clay and traversed by ferruginous vein: there is also a little quartz. This was taken to be the side of the sandstone country coming in, but from what has been seen in the west end of the No.4 tunnel it is more probably the eastern side of the true contact lode, which is exactly similar to this at the lower level. Another twenty feet of driving would probably have found the lode, and gone through it into the true sandstone footwall.

No.3 Tunnel.-This is almost immediately above the end of the No.4 tunnel. For about 12 feet in the mouth there is dolerite clay, and then the drive passes into hard sandstone. This tunnel seems to be altogether on the west side of the lode, and to have gone in just above it.

No.4 Tunnel.-This is also known as the 45-feet level, as it is connected with the main engine shaft. The workings at this level consist of two main crooked drives running

more or less northwesterly, connected by a cross-cut: there are also several small branch drives from these. The mouth of the tunnel is under a superficial lump of gossan, and all round it there is a good deal of ironstone. For about 180 feet from the entrance the stuff passed through is yellowish clay, much stained in places with black oxide of manganese: it is not country rock, and it is not true vein stuff, but appears to be a contact mass at the junction of the intrusive and sedimentary formations: similar masses of clay are, however, sometimes found in lodes, especially large ones, and at the time the tunnel was driven it was natural to suppose that the lode was being penetrated. After passing through this limestone was encountered in broken blocks, often with clay between them, for some 42 feet. In this limestone the crosscut to the north east to connect with the eastern part of the 45-feet level begins. Leaving it till later, and continuing on the western branch, the clay is again met with about 12 feet past the crosscut and continues for 148 feet. The weathered dolerite then appears, and is seen also in a small crosscut to the south that has been made close to where it first comes in. This continues to within 14 feet of the face. On the last day of my visit there was about four feet in width of a mixture of oxide of iron, clay, quartz, and fragments of sandstone in the face, and then for about another 10 feet back along the drive the country seemed broken, containing angular pieces of sandstone and weathered dolerite, and was a good deal stained with oxide of iron. Since then I have heard from Mr. Godkin, the acting mining manager, that the lodestuff *proved* to be about 20 feet wide, and after passing through it sandstone was cut on the western side. A good deal of water was also reported to be coming from the lode. Though the stuff contains a good deal of clay and country rock I have no doubt that this is the main lode, as it is lying on the contact of the dolerite and the sandstone. While I was at the mine a small drive was put in close to the mouth of No. 4 tunnel on the contact with the sandstone, and the material passed through was very similar to that found in the face, so that it would seem that this tunnel began just on the edge of the lode and *went* gradually away from it: the mouth of the adit seems, however, to be just at the point of a tongue of dolerite coming in from the northward, and the lode is small and would probably soon die out if followed into the sandstone country to the south east. No trace of it appears to have been found in this direction, and it seems most likely that in order to find lodestuff again we must go a little further east to the contact of the sandstone and dolerite once more.

Returning now to the crosscut connecting the two main drives of the 45-feet *level*, we find it to be all through limestone, broken at first, but more solid towards the north-east end for the whole distance, except for a band of sandstone in the middle close to the air-shaft. Along the western edge of this sandstone a short drive has been put in to the north-west along a seam of clay, which appears to break somewhat obliquely across the strata, and is probably a branch from the clayey contact mass lying between the dolerite and the limestone. The sandstone is only a small band some 8 or 10 feet thick, in the limestone. The air-shaft is one which was sunk early in the history of the mine: near the surface there was in it a vein of rich galena, which was lost lower down. The crosscut was driven to prospect for this vein, and was successful in finding galena and native silver about 70 feet north-east of the shaft. The eastern drive at this, level was made for the purpose of following this ore, but has not been very successful. The best ore was found between the crosscut and the main shaft, and a large quantity was stoped out of it, from which some 30 tons of picked ore was shipped to the smelting works. This returned about £17 a ton gross value, the bulk assay giving about 150 ozs. of silver and 27 per cent. of

lead. Mr. Godkin could not give me the exact figures, but these are pretty nearly correct. An examination of the heap of seconds showed them to consist of limestone with veins running through it of galena with a good deal of blende. Some very fine specimens of native silver were obtained during the progress of stoping. The galena when dressed clean assays very well, but the assay value of the whole heap of seconds I should judge to be very low, the percentage of galena in it being evidently very small. So far as I could learn no proper sample of the bulk has been taken, so the exact value is not known. This ore would be valuable in future for fluxing purposes on account of the large quantity of lime contained in it, and the silver in it would then help to pay expenses of smelting richer ore, but I am much mistaken if it could be profitably dealt with in any other way, even by concentration. The vein seen in the stopes from which the stuff at grass was taken does not appear to me to be a true lode at all; it is rather a part of the limestone that has been fractured and been impregnated with galena and silver in the cracks and joints; it has no regular walls, and the lodestuff does not differ sensibly from the enclosing country limestone except in being traversed by the strings and small veins of ore. I do not think that any reliance could be placed on its continuance either horizontally or vertically. The drives to northwest and south-east on its course, and following it as far as could be judged at the time, have not proved the rich ore to extend any considerable distance, and I do not think that this discovery will ever prove of much importance. It has even been detrimental to the mine, for it has diverted attention from the main lode. Its best point is that it proves that the country is favourable for the deposition of silver and galena, and therefore increases the probability that good ore will be obtained when the main lode is opened up.

The crosscut has been driven from 20 to 30 feet past the drive on the supposed course of the lode. In the face serpentinous dolerite makes its appearance, indicating the edge of the main mass of this rock seen on surface extending eastward for a long distance. Between the main drive and this face has been all called the "The Native Silver Lode," but I could see no reason for regarding it as lodematter at all, though there may be a few minute veins of ore through the limestone. The main drive, south-east from the crosscut, goes through limestone for about 75 feet and then strikes a formation of brown and grey clay, stained with oxides of iron and manganese, and containing some chloride of silver in parts. The clay shows wavy lines and markings similar to that in the mouth of No.4 tunnel. Where the drive strikes the side of this a crosscut has been driven to the north-east through it a distance of about 30 feet. In the face we again meet with the weathered dolerite. From the mouth of this little crosscut the drive is continued on a more easter1y course than at first and passes through the formation which is known as the "Chloride Lode" into weathered dolerite once more. Near the end another small crosscut has been driven south-west almost along the edge of the dolerite, but is not yet through the lodematter, if it may be called such. Connection has here been made with the surface by means of what is called an underlay shaft, but which seems to me to be inclined in a direction opposite to the underlay of the lode. This shaft is through weathered stained dolerite, and I cou1d not distinguish any lode on which it had been sunk; it is very straight and even, and appears to have been started as an inclined rise, and continued on the same angle of slope without any reference to the lode.

Between the two crosscuts the lode matter is more ferruginous, and contains more manganese oxide and also some quartz, and thus has more the character of true lodestuff. As this is evidently another contact between the limestone and dolerite formations, it

seems probable that here again a contact lode has formed, and it is probable that if followed to the south-east the lode-stuff would be found to continue along the junction.

The drive to the north-west from the engine shaft was partly blocked up in the end at the time of my visit, and I could not see all the north-west end of it. For about 140 feet from the shaft it passed through limestone, a good deal shattered, and with a lot of soft clayey matter (pug) between the blocks. From 140 to 200 feet was all black "pug," containing fragments and lumps of limestone. From 200 feet to 233 feet from the shaft, which was as far in as I could get, there was a great deal of gossan; where first met with this was lying rather flat, resting on whitish clay, and this again on the black "pug." The gossan is largely composed of oxides of iron and manganese, but also contains a good deal of clayey matter and some quartz; it is, on the whole, similar to the gossany lode-matter found in the main lode on the North section. I was unable to ascertain if the dolerite was met with after passing through the gossan, but, judging from the shattered condition of the limestone and the position of the dolerite on surface, it is extremely likely to be close at hand.

90ft. Level.-This was not examined by me, having been shut up by the new centering which was being put in the shaft. It passed through limestone, and then struck hard green serpentinous dolerite. Some lode-matter, 4 or 5 feet wide, taken to be the Native Silver lode, was cut at 130 feet from the shaft, but my informant could not tell me if it was at or near the contact of the limestone and dolerite or not.

110-ft. Level.-A crosscut has been driven to the south-west a distance of 189 feet from the centre of the engine shaft. For 116 feet it passes through hard solid limestone, then goes through fossiliferous sandstone for about 55 feet, and the remaining 18 feet was through soft sandy “pug". The end of the drive was filled up and could not be seen, but was said to have struck hard country again, either sandstone or limestone. A drive from the crosscut was put in to the north-west a distance of about 100 feet, following the soft "pug" formation; I could not get far into this, as the soft stuff had run very much into the drive and dammed the water back in it. A strong stream of water keeps flowing from this drive.

It seems probable that the soft clayey formation met with in the 110-ft. level is identical with that passed through in the crosscut at the 45-ft., just before reaching the old main shaft, and that both are connected with the clayey contact mass seen in the first 180 feet of the No.4 adit, and again past its junction with the crosscut; the gossan found in 'the north-west end of the eastern drive at the 45-feet level may also be connected with these.

The work that has been done, therefore, reveals that there is a tongue of sedimentary rock, mostly limestone, projecting out into the main mass of serpentinous dolerite, and that all round this, on its contact with the dolerite, there is matter of a more or less lode character; in parts it forms a true gossan, but generally it is very largely composed of clay, and only stained with oxides of iron and manganese. Though on the whole of a rather unfavourable appearance, still there is a certain amount of likelihood that ore will be found in parts of it, and to the south-east along the main contact of the two formations there seems every reason to expect that there will be a body of lodestuff similar to that found in the north section in the corresponding position. It may here be remarked that in the Godkin Amalgamated Company's sections on the south side of the Whyte River the tunnels that have been driven show the existence of wide ferruginous-

stained masses of more or less lode nature at the contact of the dolerite and sandstone formations.

North Section, No.5 Tunnel.-This is driven to the north-east across the line of the lode. For the first two hundred feet it passes through sandstone, the strata striking N. 40° W. and dipping as a rule to the north-east at pretty high angles. Between 152 and 162 feet from the entrance there is a band of broken iron-stained country where a good deal of water was struck when driving the adit. This has been taken to be the place where the Godkin Extended lode passes through the drive, but I hardly think it has anything to do with it: it is the axis of a small synclinal fold in the strata, for after passing through it we see them dipping to the south-west for some distance. At 145 feet there is another broken band of country much stained with oxides of iron and manganese, and which has evidently served as a channel for the passage of water through the rock. At 207 feet a distinct fault is met with; strike *N.* 400 W., dip 850 to N.E., showing slickensided surfaces. Immediately past this the strata stand vertical; so it may prove to be a fault of some magnitude, though I did not notice any sign of it in the adjacent Godkin Extended tunnel. Just past the fault the drive went through first three feet of sandstone, then struck beds of quartzite and flinty sandstone, dipping vertically. At 330 feet the beds begin to dip again a little to the N.E. and there is what may *prove* to be another fault, probably a small one. An occasional bed of hard siliceous limestone or calcareous quartzite is hereabouts met with, corresponding to the beds lying between the quartzite and the limestone in the Godkin Extended tunnel. At 338 feet there is a bed of clayey slate, and then sandstone comes in again, similar to that passed through in the first part of the tunnel. At 348 feet this begins to be much broken and iron-stained, and at 355 feet it is so much impregnated with oxides of iron and manganese as closely to resemble lode-matter. At 396 feet the lode is reached and passed through at 424 feet: it consists of iron and manganese oxides, some clay, and a good deal of fragmentary wall rock. The lode appears here to be underlaying to the N.E. about 1 in 1. After going through the lode the tunnel has been continued for about 350 feet, in decomposed dolerite, which becomes harder and less altered as we proceed. A small iron-stained vein carrying a little silver was cut through, and followed a short distance to the north by a small drive, but was too small to be of any consequence.

From the tunnel a drive has been made along the lode to the north shaft: it is rather crooked, having been diverted from time to time from one course to another as the walls of the lode seemed to be at hand. In the first part of this drive, though there is much nice-looking gossan, there is also a great deal of clay and country rock, but towards the north-eastern end the appearance is much more favourable, the gossan being spongy and nearly all made up of iron and manganese oxides. Two winzes have been sunk, the first 34 feet deep, the second nearly 40 feet. In the first one a little galena and cerussite were obtained, and in the second ore came in at a depth of about 10 feet, continued to be got for about 8 feet, and then dipped to the north-east out of the winze, but was cut again by a small crosscut from the bottom of the winze. Just beside this winze a crosscut has been put in to the south-west, but not far enough to reach the footwall of the lode.

Some very nice cellular gossan is seen in the mouth of this, probably corresponding to the ore vein cut in the winze. The north shaft is down 45 feet below the level, and would have been sunk deeper only that the water became too heavy for the

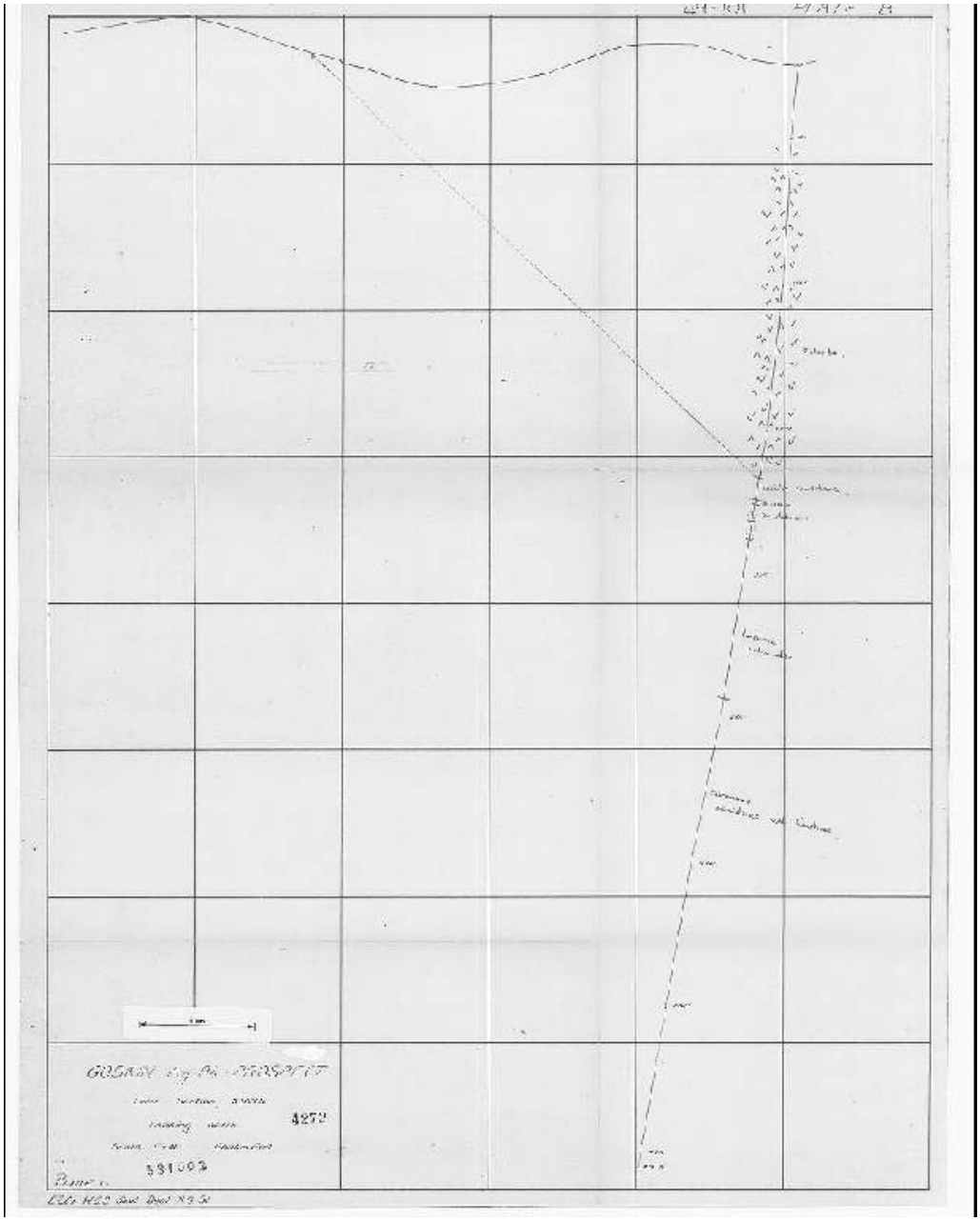
horse-whim to deal with; it was raising from 1000 to 1200 gallons an hour, but could not cope with the flow. The chamber at the tunnel level is in very nice-looking gossan, and the shaft appears to be at the east edge of this: it is also at the east side of the huge outcrop of gossan on the surface, and this would indicate that the lode has very little underlay; however, 30 feet above the level a seam of galena was passed through underlaying to the north-east, and again sandstone has been found for ten feet in the bottom of the shaft, underlaying N .E. about 1 in 4, so that there seems to be really a certain amount of underlay to the north-east. As before remarked, from the nature of a contact lode it is likely that there will be sudden and considerable variations in the underlay. As the shaft below the level and the winzes had water in them at the time of my visit, I could not examine them to see the ore *in situ.* I, however, looked closely at the pile of it that was stacked at the mouth of the tunnel. It consists mostly of carbonate of iron, with veins and spots of galena and blende, very similar to the lode seen close to the creek at the mouth of Bell's Reward tunnel. A bulk assay is said to have yielded 12 per cent. of lead and 11½ ounces of silver per ton; and Mr. Godkin says that the average of his assays of picked pieces of the galena is 48 to 50 per cent. lead and about 37 ounces of silver to the ton. The stuff is too poor to be worth smelting as it stands, but would be worth concentrating; about 20 tons of it have been raised from the shaft and winzes. There is also a pile of from 15 to 20 tons of gossany stuff carrying galena and cerussite which has been saved, but which I should not consider to be of much value.

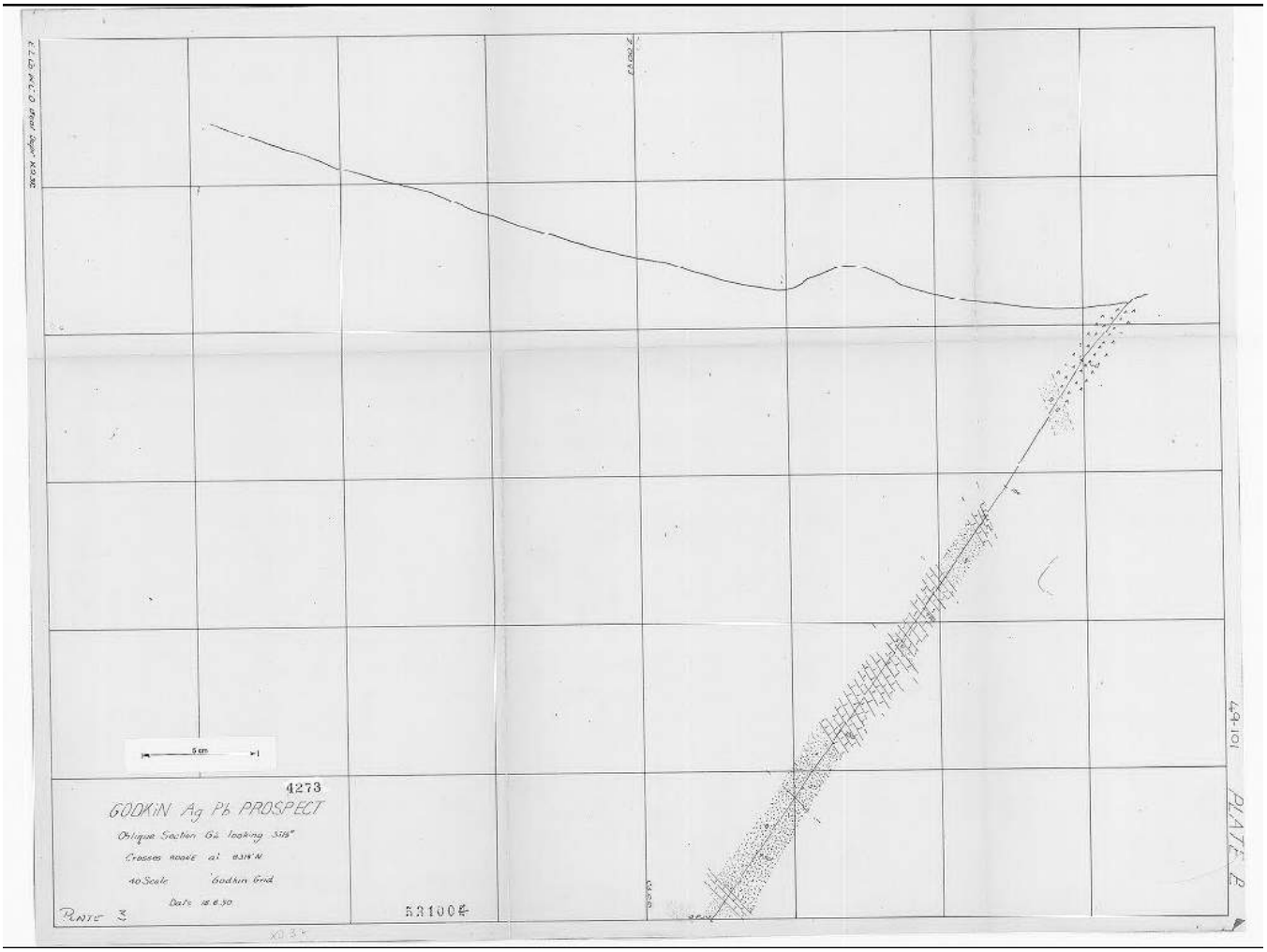
The workings from this adit are under the largest and best-looking outcrop of gossan on the property, and in the tunnel, too, the lodestuff is of a very promising character, The appearance of carbonate of iron and galena in the winzes indicates that the level is not much above the bottom of the oxidised capping of the lode, and gives hope that at a short distance down the gossan will disappear and be replaced by unaltered lode-matter carrying valuable minerals. It is clearly necessary to sink deeper, and the Company have now to consider the best way of opening up the lode at a greater depth; the most obvious way would be to sink the north shaft deeper and open the lode from it; this involves putting a pumping engine on the shaft and enlarging and re-timbering it before sinking could be resumed. It has been proposed to remove the Worthington pump from the main engine shaft on the south section to the north shaft, but I cannot see that this would be a really effective solution of the difficulty, for the experience now gained as to the quantity of water in the country renders it highly probable that the present plant will not be able to cope with it. If the Company were in a position to put an 18 or 20-inch lift on the north shaft or on a new shaft more to the south east of it, so as to be more in the centre of the body of ore to be worked, I should recommend them to do so, and eventually, if the mine comes up to the hopes entertained by its owners, it is likely that such a shaft will have to be sunk. I do not think it would be worth while moving the present engine, however, but would rather see the new shaft at once equipped with one able to deal with any water likely to be met with.[102]

[102] Alexander Montgomery, *Report on the Godkin Silver Mine*, Geological Surveyor's Office, Launceston, 1892, pp.3-6

Appendix 2:

EZ drilling charts 1949

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GODKIN Ag Pb PROSPECT
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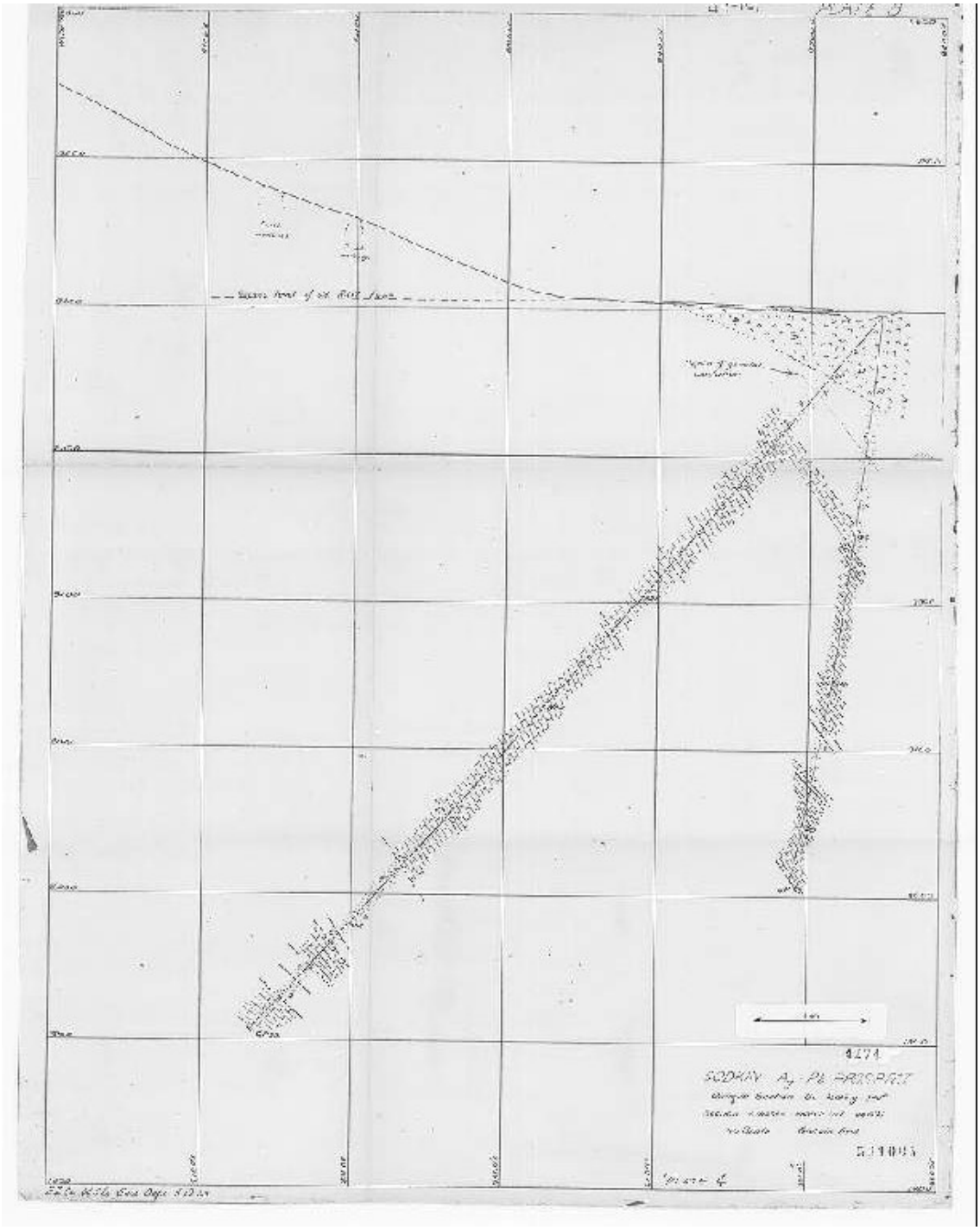
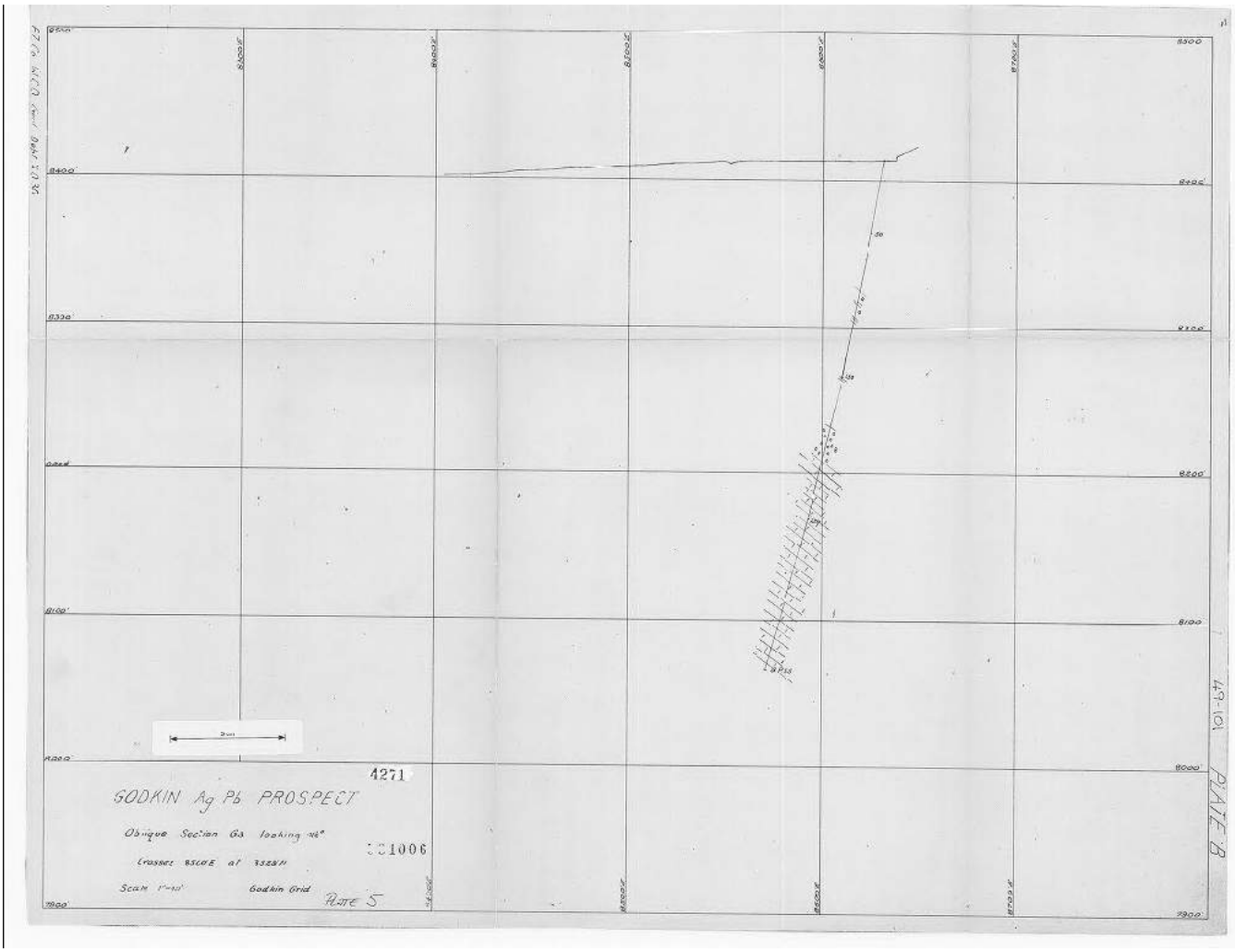
49-101
PLATE 2




4271
GODKIN Ag Pb PROSPECT
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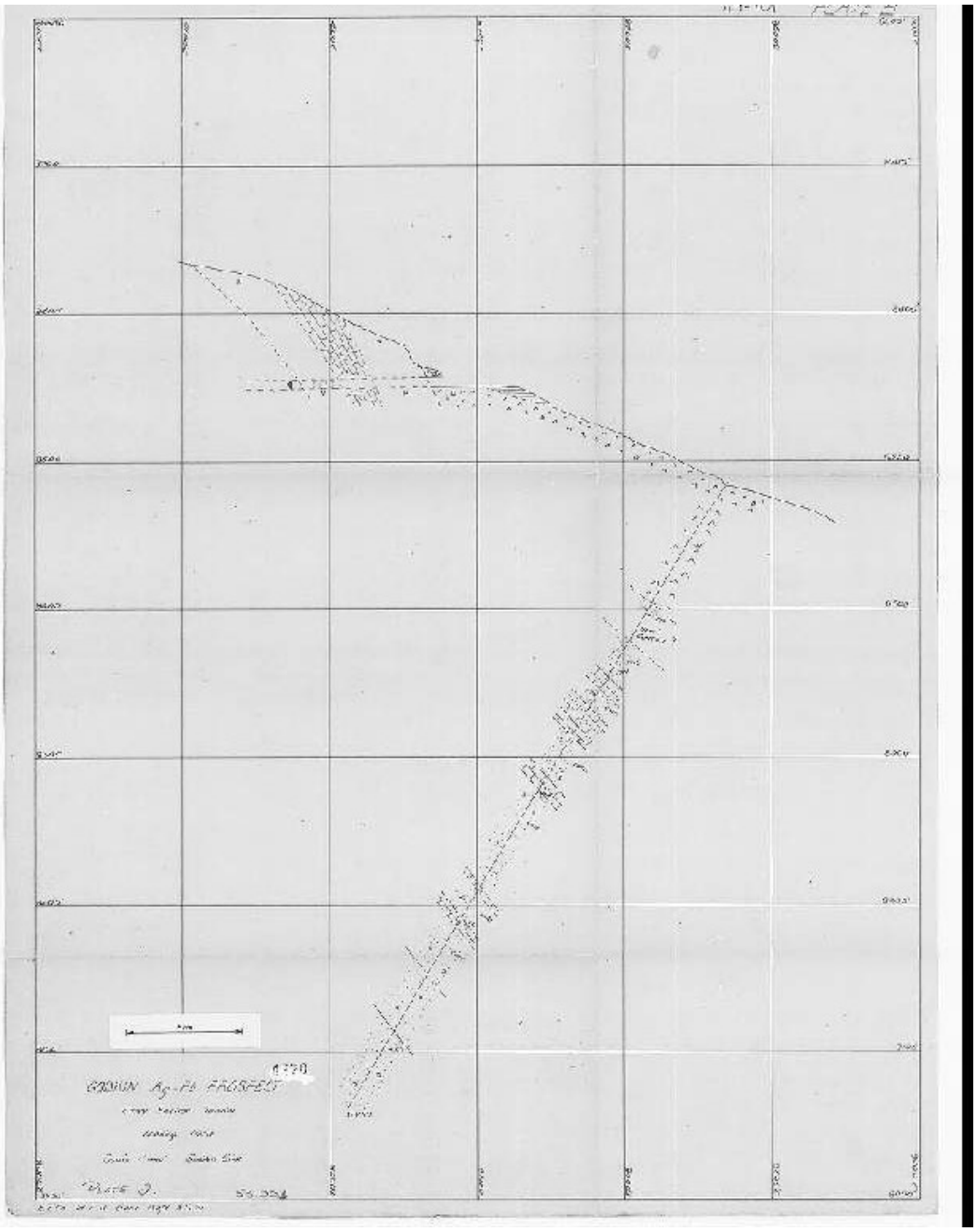
Scale 1"=10'
Godkin Grid
PLATE 5
49-101
PLATE B


GROUP Ag-Pb PROSPECT
PLATE 9.