SILVER FALLS (The Pinnacles) EL 23/2000

ANNUAL AND FINAL REPORT

FOR THE PERIOD ENDING 8th NOVEMBER 2005

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1. SUMMARY

Exploration activities in the fifth and final year of tenure of EL 23/2000 have focussed on assessing the potential of the Shale Basin area and the North Pinnacles prospect to host a deep (>150m) Rosebery – Hercules style VHMS deposit. Work undertaken included:

- 3.3 km of gridding over the southern part of the Shale Basin Prospect. Surveying with GPS and geological mapping of this grid.
- Collection and analysis of 138 soil samples (including duplicates) from the Shale Basin area.
- A review of the potential of the North Pinnacles prospect.

The results of this work have not provided encouragement for further work.

2. INTRODUCTION

This report documents work undertaken on Exploration Licence 23/2000 Silver Falls (Pinnacles) for the period November 2004 to November 2005, the fifth and final year of the licence.

The EL covers 43.75 km^2 and is located 10-15km north of Rosebery (Figure 1). The principal target of exploration on the licence is a volcanic hosted base metal massive sulphide (VHMS), similar to mineralisation at the Rosebery and Hercules mines in western Tasmania. Zinifex has been systematically exploring the EL using a combination of geological mapping, partial leach soil geochemistry and infill ground time-domain EM, where there is no existing coverage, or the work that has been done is considered to have been ineffective.

Access to the tenement is via the formed gravel surface 'Boco Road' extending west from the Murchison Highway (A10). The Silver Falls prospect is accessible from an existing 4WD vehicle access track which trends north from the Boco Road, following the ridge of Burns Pinnacles. Access to the northeast part of the tenement is via the Sawmill Creek track, a 4WD track which branches north from the Boco Road near Boco Siding.

Work completed during the reporting period focussed on exploring the Shale Basin area and reviewing of data from the North Pinnacles prospect.

2.1 Attribution

The following personnel were responsible for the work carried out within the Silver Falls Exploration Licence area during the reporting period:

Contract Geologist	Mick Skirka – Skirka Geological Services
Consultant Geologist:	Keith Corbett – CorbettTas Enterprises

3. LAND TENURE

EL 23/2000 Silver Falls (Figure 1) was granted to Pasminco Limited for a five-year term on 8th December 2000 and covered an area of 18 km^2. The adjacent EL 5/2001 (Pinnacles) was granted for a period of 5 years on the 14th May 2001, and was subsequently amalgamated with EL 23/2000, to give a total licence area of 43.75 km^2.

On April 5th 2004 the name of Pasminco Australia Limited was changed to Zinifex Australia Limited as part of a float of some Pasminco assets.

The EL is subject to a number of land classifications. The current land tenure includes the John Lynch Forest Reserve, in the North Western portion, and the Sawmill Creek Forest reserve in upper North Eastern portion of the licence. The remaining area within the EL comprises State/multiple use Forest and MDC informal reserves. All these land classifications are available for mineral exploration.

4. REGIONAL GEOLOGY

EL23/2000 is located in the Dundas Trough in western Tasmania. The VHMS prospective sequence forms part of the mid- to late-Cambrian Mt Read Volcanics (Figure 2; after Corbett and McNeill [1986]).

Basement in western Tasmania is Precambrian in age, comprising predominantly greenschist facies metasediments with minor basalts and dolerites, although higher grade amphibolite and eclogite facies rocks are also present (Burrett and Martin, 1989). Basement is exposed west of the EL in the Huskisson River valley.

Cambrian volcanism and sedimentation development on the margin and within the rift can be subdivided into the Eo-Cambrian tholeiitic Crimson Creek Formation (CCF) and the mid to late Cambrian Dundas Group and predominantly calc-alkaline Mt Read Volcanics (MRV).

The CCF was deposited in shallow but rapidly subsiding basins (Brown, 1986) and consists of basaltic lavas and volcaniclastics, haematite facies turbidites, carbonates, chert and minor evaporites. The formation is exposed in the south-west corner and to the west of the EL.

The oldest MRV outcropping on EL 23/2000 Silver Falls is the Pinnacles Rhyolite, which forms a topographic high along the Pinnacles Ridge. This unit, a possible lateral equivalent of the Que-Hellyer Volcanics represents the top of the host sequence to the Browns Tunnel mineralisation to the south of the licence (Kirsner, 1992). Overlying the Pinnacles Rhyolite is a volcano-sedimentary sequence, derived from a felsic volcanic source, that is a correlate of the Southwell Subgroup or White Spur Formation and which underlies a large part of the EL.

A poorly understood but stratigraphically important transition to the Tyndall Group correlates is marked by a magnetic correlate to the “Lynchford Tuff” on the eastern limb of the Silver Falls Syncline (McNeill & Richardson, 1997). Time equivalents of the Owen Conglomerate occupy the core of the Silver Falls Syncline in the central northern part of the EL but much of this area has a partial cover of Pleistocene glacials that masks the underlying geology.

A package of Dundas Group sediments which possibly post-date the MRV occur in the western sector of the EL in the footwall to the Rosebery Fault. These sediments include dolomitic siltstones, conglomerates and quartz muscovite sandstone lithologies which are correlated with the Stitt Quartzite at Rosebery.

At least two phases of regional compression were associated with the mid Devonian Tabberabberan Orogeny (Keele, 1991). The development of folding, cleavage and regional thrusts in lower Palaeozoic rocks were associated with this event. Fold trends in the licence are N to NNE. The Silver Falls syncline and the Pinnacles Anticline are large fold sets within the EL, with the Silver Falls syncline the dominant structure as the Pinnacles Anticline dies out to the north. The dominant regional fault structure in the EL is the Rosebery Fault, a regionally significant east dipping thrust that extends some 28km from near Mt Dundas, in the south, into the Silver Falls area. The location of this major structure north of the Silver Falls prospect area is unclear.

Deformation was followed by the extensive intrusion of Devonian to Carboniferous granitoids. The Meredith Granite and its hornfels aureole outcrop to the west of the EL (Brown, 1986). After substantial erosion of this terrane extensive Tertiary flood basalts and sub-volcanic sediments were deposited. Remnants of the basalt flows are preserved between the Ramsay and Coldstream Rivers northeast of the licence.

5. PREVIOUS EXPLORATION

The Silver Falls area has been the focus of intermittent exploration activity since the discovery of outcropping Pb-Ag mineralisation by Jack Lynch in 1890. Modern exploration commenced in the area in the 1940's and is summarised in McNeill and Poltock (2003). Work completed by previous explorers in the Shale Basin area is summarised in Table 1; work completed by Pasminco/Zinifex since the granting of EL 23/2000 is summarised in Table 2.

Table 1. Previous Exploration completed in the Shale Basin Prospect area

Year/Tenement	Work Completed
1966-1967, EL5/63 (Anon, 1967)	Soil sampling identified anomalous Zn (up to 8.2% Zn on line 25N).
1968-1969, EL5/63 (Fitch, 1968)	Costeaning, channel sampling, mapping and auger sampling of the Shale Basin area.
1983-1984 (Shaw, 1984)	Limited geochemical sampling across the Shale Basin area. Comstaff concluded that previously reported Zn anomalism was due to hydromorphic dispersion of base metals into limonite and manganese wad.
1986-1988, EL5/63 (Anon, 1988)	UTEM, Sirotem and limited rock chip and stream sediment sampling. A 'lesser' conductor was identified by the UTEM survey (Anomaly A) which was followed up with a Sirotem survey and rockchip and stream sediment samples (4 samples, no anomalous values returned). Interpretation of the Sirotem data was hampered by 'loop effects'.
1989-1990, EL44/88 (Lorrigan, 1990)	Geological mapping of roads and costeans and rock chip sampling. Rock chip results failed to confirm the Zn anomalies located by Comstaff and the lack of alteration downgrades the prospect.
1992-1993, EL44/88 (Poltock et al., 1993)	Review of BHP UTEM data – Anomaly A recommended for follow-up. Limited geological mapping and rock-chip sampling.
1993-1994, EL44/88 (Poltock and Saxon, 1994)	Re-cutting of the Comstaff EAF grid; geological mapping, compilation of Comstaff soil data; ground magnetics; MMI soil geochemistry.
1994-1995, EL44/88 (Saxon, 1995)	Interpretation of MMI and total digest soil geochemistry. Conclude that drilling to the south has downgraded the prospectivity of the Shale Basin area.

Table 2: Exploration on EL 23/2000

Reporting Period	Work Completed
2000-2001 (Briggs, 2001)	Review of previous exploration; gridding (10.3 line km); geological mapping; B horizon soil sampling (447 samples); minor rock-chip sampling, petrography and Pb isotope analysis of samples from the Silver Falls Prospect. Re-logging of DDH HRD1. This work supported stratigraphic similarities to Rosebery and located three significant partial leach soil anomalies. Drill testing was recommended.
2001-2002 (McNeill, 2002)	Work was restricted to some compilation of previous exploration data and drill testing the Silver Falls prospect with a single199.8m diamond drill hole. Results were not encouraging and it is not planned to complete any further work at the Silver Falls prospect, apart from a DHEM survey in DDH HRD1. It was recommended that follow-up mapping should be undertaken south of the Silver Falls grid to locate strike extensions of the "host sequence" between the existing grid and the Shale Basin prospect, an area of very poorly known geology.
2002-2003 (McNeill and Poltock, 2003)	Work during the reporting period focussed on completing a DHEM survey in DDH HRD1 in the Silver Falls area, and the cutting, geological mapping and soil sampling of a 5.6 line km grid over the area between the Silver Falls grid and the Shale Basin prospect. There was no encouragement for further follow-up in the results of this work. It was therefore recommended that exploration work in the coming year be focussed on the Shale Basin area.
2003-2004 (McNeill and Skirka, 2005)	Work completed in the reporting period focussed on the Shale Basin area and comprised gridding (8.85 line km), soil sampling (337 samples), geological mapping and a review of the previous ground EM coverage. No significant coherent anomalies were identified. An additional two lines of gridding/sampling were recommended at the southern end of the Shale basin area to complete the geochemical coverage and a review of the North Pinnacles prospect area was also recommended.

6. WORK COMPLETED 2004-2005 REPORTING PERIOD

Work completed in the reporting period comprised limited gridding, soil sampling, and geological mapping at the Shale Basin area and a review of the North Pinnacles Prospect.

6.1 Geology

A small amount of geological mapping was completed over the southern part of the Shale Basin prospect, located in the southern part of the license area.

The mapped area comprised two AMG east-west lines within 376300 – 378000mE, 5385500 – 5385700mN (AGD66) which, together with the five gridlines from the previous year, completed the coverage over the Shale Basin area.

Outcrop on the grid lines is limited and the western part of both lines is covered with fluvioglacials. Fact geology was plotted at 1:5000 scale and previous mapping data by Skirka (2004) and Lorrigan (1990) has been incorporated (Plan 2).

The additional data has not changed the geological interpretation of the Shale Basin area from the previous year (Plan 3).

Stratigraphy

The eastern end of each line and the main Pinnacles Ridge Track is underlain by fine grained to weakly quartz phyric, rhyolitic lavas of the Pinnacles Rhyolite. In the south eastern part of the mapped area (on the Shale Basin access track) these lavas have a distinct breccia texture.

Overlying the Pinnacles Rhyolite to the west is a sequence of interbedded medium to coarse grained crystal rich volcaniclastic sandstone, arkosic sandstone and laminated siltstone. The relationship between this sedimentary sequence and the underlying Pinnacles Rhyolite is unclear. Close to the contact the sediments have a subvertical to steep northwestly dip (locally overturned on the Silver falls Track). No evidence of significant shearing was observed close to the contact and the sedimentary sequence is presumed to be conformable.

The sedimentary sequence comprises interbedded medium to coarse grained, feldspar-quartz phyric, crystal rich volcaniclastic sandstone and medium grained arkosic sandstone with minor laminated siltstone. In the northwestern part of the mapped area a unit of dark grey laminated siltstone/shale is correlated to a similar unit mapped by Poltock (2003).

The sediments have a shallow to moderate northwesterly dip (away from the contact with the Pinnacles Rhyolite) and the sedimentary sequence is folded into a gently NNE plunging syncline. The western limb of the syncline is largely obscured by fluvioglacial cover that continues to the western end of the mapped area.

6.2 Geochemistry

Soil sampling was completed on the 3.3 line km of new grid cut over the Shale Basin prospect.

Randomised sample numbers were used in partial leach sampling to reduce the effect of analytical variations. The partial leach soil samples were generally collected at 25m intervals, at or near a grid peg, and involved digging a hole with a pick, removing the organic rich A-horizon and collecting approximately 500g of sample from the nominal

B horizon. The samples were then placed in ziplock plastic bags and, once returned to the field office, the bags were stored open to prevent anaerobic reactions. When a batch of 200 or 300 samples was collected, the sample bags were sealed and the samples despatched to Amdel in South Australia for analysis by partial leach technique DL42. Elements determined were Ag, As, Au, Ba, Bi, Cd, Cu, Co, Mo, Pb, Ni, Y, Zn and the rare earth elements Ce, Eu, Gd, La and Sm. The pH of the leachate, after digestion, was also determined. Results are included as Appendices 1 and 2 and sample locations are shown on Plan 1.

Three duplicate and two standard samples were collected per 100 samples. The field duplicates were also analysed in duplicate to allow assessment of both the sample and laboratory variance. Additionally at each sample site a small amount of soil was collected and stored in a chip tray for reference and to allow soil colour to be recorded. Soil colour was assigned from a Munsell Colour chart with 19 colours and was then assigned to one of six colour groups.

The 138 samples (including duplicates) collected were analysed as a single batch (SDS 4551).

No samples are obviously contaminated, however, 19 samples, 14% of the data set, have a low (pH<8.0) post-digest pH. At these 'low' pHs the speciation of reagents in DL42 may change and the resulting assays may be unreliable. Test work at Amdel indicated that decreasing the sample:liquid from 10:1 (method DL42) to 5:1 (method DL43) could buffer the solution to a higher, acceptable, final pH and not significantly affect the precision of the analysis. Accordingly all 19 samples, with low post-digest pH, were re-assayed with the new protocol with the result that all of the samples had post-digest pHs of >8.0. In the interpretation discussed below the low (pH <7.95) samples from the original dataset have had their assay results replaced by the re-assayed data and the results have been combined with the results from the 2003-2004 sampling program.

Images of the gridded raw data are presented as Figures 3-11. Several coincident Pb-Zn+/-Cu anomalies are apparent, particularly on line 6445900N near the Marionoak River and near the eastern end of each line. However the anomalies are not coherent and are typically single point or spiky.

The anomalous results on line 6445900N are proximal to previously identified anomalous conventional soil samples collected by Comstaff in 1969-1970 which were later attributed to hydromorphic dispersion into manganese wad. This anomaly has been closed off by the recent sampling and no further work is proposed.

6.3 North Pinnacles Prospect Review

A review of the geology, mineralisation and VHMS exploration potential of the North Pinnacles prospect was completed by consultant Keith Corbett. The aim of the study was to summarise previous exploration, prepare fact and interpretive geological maps, and review the VHMS potential of the area. A review of the Burns Peak – Browns Tunnel area, just to the south on EL 48/2004, was undertaken concurrently.

The review concluded that whilst there remained questions related to the style and nature of mineralisation and the nature of the western margin of the Pinnacles Rhyolite, the drilling and surface work done to date appears to have delimited the scope of the alteration/mineralisation at North Pinnacles, and no new VHMS-related targets can be suggested.

A report detailing the review of the North Pinnacles prospect is contained in Appendix 3.

7. ENVIRONMENTAL DISTURBANCE AND REHABILITATION

No environmental disturbance or rehabilitation activities were undertaken during the reporting period. The DDH SFD1 drill site (drilled in April-May 2002) and access track were visited during 2003 and 2004 and rehabilitation progress was reported in McNeill and Poltock (2003) and McNeill and Skirka (2005).

8. CONCLUSIONS AND RECOMMENDATIONS

Work during the reporting period focussed on the cutting, geological mapping and partial leach soil sampling of a 3.3 line km grid over the southern part of the Shale Basin area and a review of the North Pinnacles prospect.

At the Shale Basin area, an additional 138 partial leach soil samples have not identified a significant coherent anomaly and no additional exploration is proposed.

A review of the North Pinnacles prospect concluded that previous exploration had delineated the scope and extent of the mineralisation/alteration and no additional VHMS targets were identified.

The exploration strategy used by Zinifex has been completed for EL23/2000 and there are no obvious target areas remaining to be tested.

9. EXPENDITURE

The total expenditure for all work undertaken by Zinifex Rosebery Mine on Silver Falls EL 23/2000 for the twelve month period to the end of October 2005 was $31,984. A detailed expenditure statement is given below.

Personnel	$2,444
Travel and Accommodation	$405
Geological Consultants	$10,072
Geochemical Consultants & Assays	$3,075
Geophysical Surveys & Contractors	$543
Other Contractors	$8,513
Drilling Contractors	$0
Stores & Supplies	$147
Vehicles Plant & Equipment	$0
Land	$889
Computing	$2,728
Office	$261
Administration Fee 10%	$2,907
Total Tenement Expenditure	**$31,984**

10. KEYWORDS AND LOCALITY

Keywords

Silver Falls, Pinnacles, Shale Basin, geology, Mt Read Volcanics, White Spur Formation, Tyndall Group, Central Volcanic Complex, North Pinnacles, VHMS, Rosebery Fault, soil geochemistry, partial leach.

Locality

1:250,000	BURNIE SK 55-3
1:100,000	SOPHIA 8014
1:25,000	PARSONS (3638), RAMSAY (3639), BLOCK (3838) & CHARTER (3839)

11. REFERENCES

Anon, 1967. Untitled. Unpublished internal Mines Exploration Pty Ltd documents. Zinifex Rosebery archive file BP12.

Anon, 1988. Exploration Licence 5/63, Final Report on the Relinquished Area : Results of Exploration for 1987-1988 and A Summary of Activities for the Period 1963-1988. BHP unpublished report. (**TCR88-2815**)

Briggs, T.J., 2001. The Pinnacles (Silver Falls) EL 23/2000 Annual Report for the period ending 8th November 2001. Unpubl. Pasminco Exploration Report No. SF1.

Brown, A.V., 1986. Geology of the Dundas-Mount Lindsay-Mount Youngbuck Region. Geology Survey Tasmania Bull. 62.

Burrett, C.F., & Martin, E.L., 1989. Geology & Mineral Resources of Tasmania. Special publication 15. Geological Society of Australia Inc.

Corbett, K.D., McNeill, A.W., 1986. Mt Read Volcanics Project. Map 2. Geology of the Rosebery- Mt Black area. 1:25 000 Dept of Mines, Tasmania

Fitch, R.G., 1968. Resume of the work carried within EL 5/63 During the 1968-69 Field Season. Unpubl. Internal Report. Comstaff Pty Ltd.

Keele, R.A., 1991 The Zeehan - Red Hills - Lake Selina Traverse - A Domain Approach to the Analysis of Structural Data. CODES: AMIRA Project P291-Structure and Mineralisation of western Tasmania. November 1991.

Kirsner, L.W., 1992. EL 2/90 Boco, EL 8/90 North Pinnacles Exploration Report for the period 11 October 1990 – 29 February 1992. Unpubl. Pasminco Exploration Report T92-3 (**TCR92-3343**).

Lorrigan, A.N., 1990. Annual Report for EL 44/88- Burns Peak, 1990. Unpubl. Pasminco Exploration Report T90-1 (**TCR90-3203**).

McNeill, A.W., 2002. The Pinnacles (Silver Falls) EL 23/2000 Annual Report for the period ending 8th November 2002. Unpub. Pasminco Exploration Report No. SF3.

McNeill, A.W., and Poltock, R.A., 2003. The Pinnacles (Silver Falls) EL 23/2000 Annual Report for the period ending 8th November 2003. Unpub. Pasminco Exploration Report No. SF4.

McNeill, A.W. & Richardson, S, 1997. EL 24/95 Bulgobac, Tasmania: Progress Report for the Period March 1996 to March 1997. Unpubl. Report Aberfoyle Resources Ltd. (**TCR97-3998**)

McNeill, A.W., and Skirka, M, 2005. The Pinnacles (Silver Falls) EL 23/2000 Annual Report for the period ending 8th November 2004. Unpub. Pasminco Exploration Report No. SF5.

Poltock, R.A., Kirsner, L.W. and Saxon, M.S., 1993. Pasminco-Noranda-Plutonic Joint Venture, Burns Peak EL 44/88, Annual Report, November 1992-October 1993. Unpub. Pasminco Exploration Report No. T93-16 (**TCR94-3523**).

Poltock, R.A., and Saxon, M.S., 1994. Burns peak EL 44/88 Annual Report for the period November 1993-November 1994. Unpub. Pasminco Exploration Report No. T94-13 (**TCR94-3654**).

Saxon, M.S., 1995. Burns Peak EL 44/88 Joint Venture, Annual Report for the period November 1994-October 1995. Unpubl. Pasminco Exploration Report No. T95-19 (**TCR95-3803**).

Shaw, R.W.L., 1984. Annual Report to the Department of Mines, Tasmania for the Period 1.7.83 to 30.6.84, Exploration Licence 5/63. Unpublished Report. Comstaff. (**TCR84-2133**)