ROPER PROJECT

EL's 22478, 22479 & 22480

GROUP ANNUAL REPORT FOR THIRD YEAR

10-08-2003 to 09-08-2004

Submitted to: NT Dept of Business, Industry & Resource Development

Submitted by: ERD Pty Ltd for Mr G Fanning

Author: HJ Roiko

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1. SUMMARY

Exploration Licences 22478, 22479 and 22480 were granted on 9th August 2001 to Mr G Fanning under an Agreement with Exploration & Resource Development Pty Ltd (ERD), a Darwin based resource sector company. ERD Pty Ltd is the designated Project Manager.

The tenements, covering approximately 4,325 sq km of Roper Group stratigraphy in the Bauhinia Shelf / Arnhem Shelf tectonic elements of the western McArthur Basin, envelope extensively mapped eroded ilmenite-bearing source rocks with considerable potential for large tonnage 'insitu', eluvial and colluvial heavy mineral accumulations.

Titaniferous dolerite sills intrude Adelaidean Roper Group sediments at a number of exposed stratigraphic horizons. The dolerites have been subject to prolonged weathering and erosion during the Tertiary and Recent epochs through to modern day wet season cycles.

Year one and two activities included: orientation soil and lag sampling of a number of these sills followed by a comprehensive auger drilling campaign testing the heavy mineral potential of three selected target areas; geological mapping; flora and fauna surveys; airborne and ground based topographic surveys; macro-sampling at BMC and Buka Prospects and commencement of channel sampling of shallow test pit walls on regolithic soils developed on regional dolerite sills.

Years 1 and 2 Summary:

- Regional sampling demonstrated two mineralisation regimes; a titanomagnetite dominated HM assemblage liberated from stratigraphically 'older' sills and an ilmenite-rich assemblage from 'younger' sills which have been exposed to longer weathering cycles and relatively mature regolith development.
- Favourable characteristics from chemical and physical property studies of the ilmenites include: insignificant highly susceptibles (titanomagnetite) and trash HM's; angular to euhedral ilmenite grains free from silicate inclusions; consistent TiO_2 content of 50-50.6%; negligible chromium content; low alkalis; acceptable CaO, ZrO_2 and SiO_2; low U+Th and high FeO; bulk of the size ranges are within >100 to 250 microns.
- The auger drilling campaign comprised 2,998 predominantly 100m spaced holes drilled for a cumulative 8,372 metres at three selected prospects; BMC, BBan and Buka.
- Drill indicated resources of approximately 1Mt and 1.5Mt of ilmenite-dominant heavy minerals have been outlined with internal high grade (>5%) ore zones contained within regolithic and pisolitic soils at BMC and Buka South Prospects respectively.
- Processing of representative macro-samples from Buka and BMC reports that the pisolitic samples are easily treatable, contain higher insitu grades, lower slimes and minimal oversize.

- The concentrates produced provide a quality ilmenite product with expected recoveries in excess of 95% and outstanding unit efficiencies due to the limited mineral species present and favourable size relationships between ilmenite and gangue minerals.
- At the Buka South Prospect empirical observations coupled with geology and macro-sample data show an excellent correlation between high grades (>7.5%HM) and remobilised pisolite-abundant soils, moderate grades (>5%HM) with regolithic soils and lower grades corresponding to immaturely transported and deposited gravel/sediment regimes and black soil pondage areas.
- No rare and endangered plant or animal species of conservation significance were encountered within the project area.
- Regional sill investigations commenced on EL 22478 with collection of 77 channel samples from small backhoe excavations from seven selected target areas.

Year 3 activities incorporated infill 25 metre spaced auger drilling at the Buka South Prospect in EL 22478 (3,207 holes for 3,893 metres); continuation of backhoe excavation and channel sampling (77 samples) of a further 4 regional sill targets on EL 22479; excavation and sampling of three shallow trenches at Buka South to collaborate auger intercepts and provide ore body characteristics; an independent resource calculation exercise at Buka South.

Buka South Infill Auger Drilling

In view of the easily treatable and high grade nature of the pisolitic soils at Buka South, a campaign of infill auger drilling on 25 metre drill hole spacing was undertaken internal to the 5%HM contour to test thickness and grade of pisolite ore and determine a measured resource for an initial two to three years proposed production. A total of 3,207 holes were drilled for a cumulative 3,893 metres with an average pisolite thickness of 1.21 metres. Coupled with the existing 100m spaced holes internal to the infill grid a combined 5,430,000 tonnes of mineralised soils was calculated. Average grade reported approximately 6.9% HM yielding 6.76% ilmenite for 367,000 tonnes ilmenite. The drilling indicated partially channelised coarse pisolitic sheet wash soil regimes overlying clay-rich regolith (insitu) soils with variable boulder content developed 'down slope' from shallow bedrock highs (undulating bedrock topography).

Regional Sill Investigations

Following on from year 2, regional sill investigations were completed on EL 22479. Four dolerite regolith targets were sampled with a series of 200m spaced small backhoe excavations to one metre depths with collection of a representative 15kg channel sample from the pit walls. Sampling was designed to provide, where possible, long axis and cross-sectional data for use in resource inference. Additionally, eight shallow test pits were excavated and sampled on an opportunistic basis where access tracks intercepted previously unsampled regional sill exposures. A total of 77 shallow pits were sampled and were immediately infilled following the sample collection.

The combined 154 samples collected during years 2 and 3 were dispatched to Tristate Research Laboratories in Mildura Victoria for heavy mineral processing. Eight of the tested targets represent stratigraphically 'lower' sills with relatively immature regolith development (insitu boulders) with variably abundant heavy minerals veneers overlying red residual soils. Variably pisolitic red to red-brown regolithic soils with visible magnetic and non-magnetic heavy minerals were encountered to one metre thickness in most of the areas. Two sampled bodies (Buka NE & Buka NNE) represent the prospective 'upper' level sills and reported ilmenite dominant HM assemblages.

The following table summarises the exploration results with a geological resource inference calculated.

Regional Sill	Potential Tonnage	Av HM%	Av Mag %	Av Ilmenite %	Slimes %	HM tonnes	Mag tonnes	Ilmenite tonnes
MV1	1,564,000	1.6	1.1	0.5	88	25,024	17,204	7,820
MV2A	4,080,000	2.55	0.25	2.3	74	104,040	10,200	93,840
MV2B	510,000	3.2	2.1	1.1	85	16,320	10,710	5,610
CON 1N	6,446,400	2.4	1.8	0.6	83	154,714	116,035	38,678
CON 1S	3,570,000	8.6	7.1	1.5	88	307,020	253,470	53,550
CON 2	267,750	4.3	3.3	1	77	11,513	8,836	2,678
GOON 1	663,000	0.6	0.3	0.3	90	3,978	1,989	1,989
GOON 2	2,346,000	0.6	0.3	0.3	85	14,076	7,038	7,038
Buka NE	1,602,000	4.45	0.12	4.33	82	71,289	1,922	69,367
Buka NNE	2,787,480	3.6	0.3	3.3	78	100,349	8,362	91,987
BBAN	11,980,000	3.99	2.87	1.13	73	478,002	343,826	135,374
BBAN SW	1,887,000	0.51	0.02	0.49	78	9,624	377	9,246
Mt Caroline	994,500	1.06	0.48	0.58	75	10,542	4,774	5,768
Dooley's E	765,000	3.15	2.5	0.65	65	24,098	19,125	4,973

Buka South Trenching

Shallow trenching incorporating three E-W costeans across a western sheetwash channel at Buka South was undertaken to verify drill indicated pisolite thicknesses by direct measurement and check for concealed roots and boulders which may affect mining. Each of the trenches captured 25m spaced infill drillholes with channel samples collected adjacent to the holes. Additionally 12.5m spaced channel samples were collected to further augment grade variation and increase confidence levels for proven resource calculations. The pisolite thicknesses encountered by the drilling were largely collaborated by the trench exposures. Tree roots are predominantly confined to the upper 40cm of soil profile. Dolerite boulders up to 35cm in diameter manifest proximal to or within the clayey underlying regolith soils with only minor cobbles and boulders within the sheetwash pisolitic regimes (generally on margins).

The three trenches provide an average of 7.5% HM in the upper metre and 5.1% HM in the lower interval. While the trench results correlate well with the

drill indicated measured resource, direct comparison with auger holes adjacent to trench channel samples indicate a 20% increase in auger grades overall.

Independent Resource Estimation

All Buka South auger drilling data was forwarded to Tennent & Isokangas Pty Ltd, Consulting Mining Engineers in Brisbane, for an independent resource estimate using computer assisted Surpac software. An uncut Indicated Resource of 39Mt @ 4.1%HM (3.3%HM adjusted) was calculated for the entire drilled out area and includes 10Mt @ 5.8%HM (adjusted 4.7%HM) in the identified pisolite zone.

The resource estimate largely collaborated ERD's internal estimate of 36Mt @ 3.9%HM (adjusted 3.12%HM).

Pre-feasibility Studies

The scoping study covering conception and costing for mining plant, Project infrastructure, water supply and tailings disposal through to transport mode and corridors linked to bulk storage and loading facilities in Darwin is continuing together with value-add studies including potential for beneficiating ilmenite product to synthetic rutile.

1.1 Environment

All field activities adhered to the environmental and safety principles and practices outlined in detail in the Small Mining Management Plan which was accepted by the Department prior to commencement of exploration. All regional sill shallow test pits and Buka South trenches were immediately infilled and re-contoured to existing conditions. Auger holes were similarly either infilled or plugged with anthills. Temporary camp sites comprising caravan and tents were cleared of all rubbish with negligible evidence of occupation upon departure.

2. Conclusions and Recommendations

25m spaced infill drilling over a shallow pisolitic horizon at Buka South Prospect provided for a resource estimate of 5.4Mt tonnes @ 6.9% HM (6.76% ilmenite) for 367,000 tonnes ilmenite in a measured category. Analyses of auger sample volumes, weights and HM grades with theoretical data and trench/macro-sample data suggest an over-reporting of auger grades in the order of 20%. Independent resource estimation studies confirm earlier ERD grade/tonnage estimates for Buka South. Investigation of regional regolith soil targets report potential for supplementary ore for identified resources.

Recommendations arising include continued product marketing and value-add studies, pursuit of JV opportunities and securing of appropriate 'mining' tenure to progress positive project development opportunities.

3. Introduction

Contiguous Exploration Licences 22478 (Roper 1), 22479 (Roper 2) and 22480 (Roper 3) cover an area of approximately 4,472km^2 on the Urapunga 1:250000 mapsheet SD 53-10 and extend a short way into the southern Mount Marumba (SD5306) sheet. Tenement applications were lodged on 17 March 2000, by ERD Pty Ltd Director Mr G Fanning. The tenements were granted for a period of six years on 10 August 2001 and are scheduled to be transferred in total to Exploration & Resource Development Pty Ltd in the near future. A 12 month waiver of the 50% relinquishment due at completion of tenure year 2 (9th August 2003) on EL's 22478, 22479 and 22480 was requested and accepted by the NT Department of Business, Industry & Development (DBIRD). Following rationalisation of tenure holding, a 50% sub-block relinquishment for all three EL's was forwarded to DBIRD in early July 2004.

The EL's are considered prospective for heavy mineral accumulations (principally ilmenite) in regolithic soils developed on numerously exposed and variably eroded dolerite sills intruding into Proterozoic Roper Group stratigraphy.

The tenements, collectively forming the Roper Project, are centred approximately 80 kilometres east of the township of Mataranka and are dissected in the north and south by the unsealed Central Arnhem and sealed Roper Highways respectively (Figure 1). A station-maintained road is central to the Project Area linking the two highways. All EL's are interspersed with station tracks leading to the main arterial roads. Due to the monsoonal nature of the area the station tracks are well graded every year but are virtually impassable at the height of the monsoon.

The Project Area lies principally within the physiographic province of the Gulf Fall, a dissected terrane from which almost all of the old Tertiary land surfaces have been eroded. Topography is characterised by broad alluvial valleys between low rubbly hills and prominent strike ridges of resistant Roper Group strata, locally still capped by remnant Tertiary laterite. The flat-floored valleys form part of the vast Roper River floodplain and its associated tributaries (Wilton, Maiwok, Flying Fox, Mainoru) and are largely developed on incompetent shales, fine-grained sediments, volcanics and carbonate rocks. The target dolerite sills are prominent in their deep red soil colour and rounded boulder outcrops. Quite a few of the rivers and creeks are perennial or contain large year round billabongs. The northeastern part of EL 22480 covers a portion of the Wilton River Plateau, a flat-lying Proterozoic sandstone highland.

The principal vegetation regime is open Eucalyptus woodland ranging from sparsely wooded open grassland alluvial and blacksoil plains to densely vegetated lancewood on high ground and steeply sloping areas. The major watercourses are lined with paperbarks and larger Eucalypts. Spinifex grows predominantly on the sandy soils close to outcrop while a peculiar relationship between SE Asian Capoc trees and rubbly dolerite outcrops is evident.

Completed year one and two activities included: orientation soil and lag sampling of a number of these sills followed by a comprehensive auger drilling campaign testing the heavy mineral potential of three selected target areas; geological mapping; flora and fauna surveys; airborne and ground based topographic surveys; macro-sampling at BMC and Buka Prospects and commencement of channel sampling of shallow test pit walls on regolithic soils developed on regional dolerite sills.

This report outlines exploration activities conducted during tenure year 3 ending 9th August 2004 for EL's 22478, 22479 and 22480.

4. Geology

4.1 Regional Geology

The Project lies in the central-western shelves (Arnhem Shelf and Bauhinia Shelf) of the McArthur Basin. The basin can be viewed as several northerly trending rifts separated by northwest-trending faults and transverse ridges and was subject to repeated cycles of clastic and marine carbonate sedimentation interspersed with volcanic extrusion and sill emplacement (*Tawallah, McArthur and Nathan Groups*) in response to reactivation of older basement structures.

A later, more passive series of sedimentation cycles in response to western basin subsidence occurred with the deposition of suites of blanket quartz sandstones, micaceous siltstones, black shales and glauconitic sandstones (*Roper Group*). Ironstones are prominent on a local stratigraphic level (Roper and Hodgson Iron Deposits). 'A variety of marginal, shallow and deeper marine shelf environments reflect alternating basin-wide sea level rises and falls. Tholeiitic dolerite and gabbro sills were emplaced throughout the Roper group soon after deposition ceased and before regional deformation.'[1]

4.2 Project Geology

The Roper Heavy Minerals Project is confined to the Roper Group specifically targeting the ilmenite-bearing dolerite sill horizons and their erosional transport trails. The strata are generally flat lying to undulating although secondary folding and reactivation of older faults result in steepening of dips and stratigraphic dislocation in places (WNW trending Urapunga Tectonic Ridge in the central area and N-S trending Strangeways Fault in the southwest).

The absence of Cambrian flood basalts and only remnant outliers of Cretaceous sandstones, both of which are extensive to the south, west and north of the Project, suggest a significant exposure to uplift and erosion within the area permitting exposure of the underlying Proterozoic sediments and dolerite sills. Extensive deposits of Quaternary to Recent sediments comprising alluvium, colluvium, unconsolidated gravel and sand overlain by mud-rich soils are mapped in the project area and reflect material derived from prolonged weathering and erosion during the Tertiary.

Sills of the Derim Derim Dolerite were emplaced at various stratigraphic horizons (Table 1) from a primary magma source at depth. Extensive lateritised outcrops, subcrops and regolithic soils of the dolerite have been mapped over approximately 1,300km^2 within the tenements. The dolerite outcrops as low-relief medium to coarse grained, variably altered and weathered ('onion-skin' weathering) rounded boulders. Composition is dominated by plagioclase (40%), clinopyroxene (40%), amphibole (7%), opaques (ilmenite & magnetite 5%) and clay (7%). The associated regolith soils are deep red-purple-brown, clay-rich and contain abundant liberated ilmenite and locally with accessory titanomagnetite, magnetite and haematite

grains. In some areas these dolerite sills have only been recently exhumed (higher elevations) and in other instances, larger areas of dolerite sills have been exposed for a longer geological time resulting in pisolitic laterite formation and attendant erosion (lower elevations). These latter areas are considered to have the best potential for higher insitu ilmenite grades in both eluvial and alluvial terrain.

Diamond drillhole intercepts of the dolerite sills show a thickness in the order of 60-70 metres with upper and basal fine-grained chilled margins of 6-10m. Thin section work commissioned by Pacific Oil & Gas in the late 1980's showed the rock to be representative of a small, high-level intrusion of doleritic basic rocks. Ilmenite and magnetite are observed to be primary constituents of the dolerite. A chemical analysis (Cochrane & Edwards, 1960) of fresh dolerite within the Moroak Formation (Prk) near the Sherwin Iron Deposits reported 1.52% TiO_2.

Table 1 - Roper Group Stratigraphy

Stratigraphy ***(youngest to oldest)***	**Symbol**	**Lithology**	**Comments**
Chambers River Formation	Prc	Siltstone, mudstone, fine sandstone	Dolerite sill
Bukalorkmi Sandstone	Prl	Quartz sandstone	Dolerite sill
Kyalla Formation	Pry	Siltstone, mudstone, fine sandstone	Dolerite sill
Moroak Formation	Prk	Quartz sandstone	Dolerite sill
Sherwin Member	Prkz	Sand-silt-mudstone & ironstone	Iron ore horizon
Velkerri Formation	Prv	Mudstone, siltstone (organic in part)	Dolerite sill
Bessie Sandstone	Pre	Quartz sandstone	Dolerite sill
Corcoran Formation	Pro	Siltstone lower; with sandstone upper	Dolerite sill
Munyi Member	Prom	Ferruginous sandstone & siltstone	Dolerite sill
Hodgson Sandstone	Prh	Quartz sandstone	Dolerite sill
Jalboi Formation	Prj	Fine sandstone, siltstone	Dolerite sill
Arnold Sandstone	Prx	Quartz sandstone	
Crawford Formation	Prr	Fine sandstone, siltstone	Dolerite sill
Mainoru Formation	Pru	Undifferentiated	Dolerite sill
Showell Member	Prus	Calcareous mudstone, limestone	Dolerite sill
Wooden Duck Member	Pruw	Mudstone-siltstone-sandstone	
Mountain Valley Limestone	Prut	Mudstone, limestone	
Nullawun Member	Prun	Mudstone	
Limmen Sandstone	Pri	Quartz sandstone	
Mantungula Formation	Pm	Mudstone, fine sandstone, dolostone	
Phelp Sandstone	Prp	Quartz sandstone	

5.0 Previous Exploration

Summaries of previous exploration were documented and can be referenced in ERD's First Annual Report (September 2002).

6. Exploration Activities

Year 3 activities incorporated infill 25 metre spaced auger drilling at the Buka South Prospect in EL 22478 (3,207 holes for 3,893 metres); receipt and interpretation of HM results from the year 2 regional sill investigations on EL 22478; continuation of backhoe excavation and channel sampling (76 samples) of a further 4 regional sill targets on EL 22479; excavation and sampling of three shallow trenches at Buka South to collaborate auger intercepts and provide ore body characteristics; an independent resource calculation exercise at Buka South.

6.1 Regional Sill Channel Sampling

6.1.1 EL 22478

Eight mapped dolerite regolith areas were sampled with a series of 200m spaced small backhoe excavations to one metre depths with collection of a representative channel sample from the pit walls during year 2.

Summaries of the targets follow:

MV1: 17 trench samples (03TR001-03TR016 & 03TR023) tested one sq km of regolithic soils developed on a dolerite sill intruding basal Crawford Formation sandstones immediately north of the Central Arnhem Highway approximately 10km SE of Mountain Valley homestead.

MV2: 6 trench samples (03TR017-03TR022) were collected along a fence line approximately 4km south of MV1 testing HM potential of regolithic soils forming an 'apron' on the eastern side of bouldery dolerite outcrop (Crawford Fm stratigraphic horizon as for MV1).

CON1: 11 trench samples were collected (03TR024-03TR034) along 5 km of fence lines and cross-terrain approximately 9 km SE of Conways Outstation. The sampling tested regolithic soils developed on dolerite intruding the base of Munji Member (Corcoran Fm) comprising ferruginous siltstones and fine grained sandstones.

CON2: 2 reconnaissance trench samples (03TR036-03TR037) were collected testing moderate to poorly developed regolithic soils developed on dolerite intruding Kyalla Formation (Pry) siltstones and mudstones approximately 10.5 km SW of Conways. Black soil pondage regime soils dominate the sill exposure.

GOON2: 18 trench samples (03TR038-03TR054 & GOON1 - IKJ1) were collected alongside the gazetted Central Arnhem Highway to Goondooloo

road and fence lines approximately 13 km south of Conways. The sampling tested variably developed regolithic and pisolitic soils with scattered boulders developed on dolerite intruding mudstones and siltstones of the Velkerri Formation over a 1.5 km NS and 1.2 km EW section.

Buka NE: 8 trench samples (03TR055-03TR062) were collected along an old Pacific Oil & Gas seismic line and cross-terrain approximately 6 km NE of Buka South Prospect. Good regolithic soils with moderate to abundant pisolites are developed on weathered dolerite intruding at the base of the Bukalorkmi Sandstone (Prl) stratigraphic horizon (as for Buka South).

Buka NNE: 15 trench samples (03TR063-03TR077) were collected cross-terrain approximately 8 km NNE of Buka South testing variably pisolitic regolithic soils developed on a Prl stratigraphic horizon sill over 2.8 km NS and 1 km EW.

Six of the tested targets represent stratigraphically 'lower' sills with relatively immature regolith development (insitu boulders) with variably abundant heavy minerals veneers overlying red residual soils. Variably pisolitic red to red-brown regolithic soils with visible magnetic and non-magnetic heavy minerals were encountered to one metre thickness in most of the areas. Two sampled bodies represent the prospective 'upper' level sills.

The samples were dispatched to Tristate's Mildura Laboratory and processed as for previous auger and soil samples. Laboratory results are tabled in Appendix 1.

The following table summarises the resource inferences based on exploration results for the sampled sills. Figure 2 displays the sample and sill locations.

Table 2 EL 22478 Regional Sill Resource Inferences

Regional Sill	Tonnage	Av HM%	Av Mag %	Av Ilmenite %	Slimes %	HM tonnes	Mag tonnes	Ilmenite tonnes
MV1	1,564,000	1.6	1.1	0.5	88	25,024	17,204	7,820
MV2A	4,080,000	2.55	0.25	2.3	74	104,040	10,200	93,840
MV2B	510,000	3.2	2.1	1.1	85	16,320	10,710	5,610
CON 1N	6,446,400	2.4	1.8	0.6	83	154,714	116,035	38,678
CON 1S	3,570,000	8.6	7.1	1.5	88	307,020	253,470	53,550
CON 2	267,750	4.3	3.3	1	77	11,513	8,836	2,678
GOON 1	663,000	0.6	0.3	0.3	90	3,978	1,989	1,989
GOON 2	2,346,000	0.6	0.3	0.3	85	14,076	7,038	7,038
Buka NE	1,602,000	4.45	0.12	4.33	82	71,289	1,922	69,367
Buka NNE	2,787,480	3.6	0.3	3.3	78	100,349	8,362	91,987

MV1: 1m thick titanomag dominant regolith soil developed on weathered dolerite bedrock rimming outcropping dolerite boulders in central-western sector; tonnage reflects a 60% reduction in area/volume due to outcrop; visible HM veneer not reflected in underlying soils (1.6%HM); NB very high slimes (88%).

MV2A: The 2 regolith soil inliers sampled lie within a 3sqkm area bounded by mapped dolerite but largely concealed beneath thin Quaternary cover. Adjacent sampling shows dominance of mag over ilmenite while MV2A reverses this association suggesting longer term chemical attritioning and removal of the mag component. An inference of ilmenite mineralisation continuity beneath cover is made with a 20% reduction as contingency (boulders, etc); high slimes (74%)

MV2B: 1km (NS) and 300m (EW) 'apron' to dolerite boulder outcrop to west; titanomagnetite dominant sill (2:1); very high slimes (85%)

CON 1N: Large 12 sqkm mapped body of dolerite with sandstone scree components and ~ 30% regolith soils (visible); mag dom HM's (3:1); very high slimes (83%).

CON 1S: Large 7sqkm mapped dolerite with patchy regolith soil development amidst black soils and sst scree; single trench internal to reg soils reports high grade (8%) mag dominant (~5:1) HM's; inference of 30% reg soils; very high slimes (88%); warrants follow-up.

CON 2: Very patchy regolith soils adjacent to drainage with dolerite boulder outcrop either side to N & S; in consequence small inferred tonnage; mag dominant HM (~3:1); high slimes (77%).

GOON 1: 0.8sqkm mapped dolerite; 50% area reduction due to black soils; abundant visible HM but not manifesting in underlying soils (very low 0.6% lab recovery); excessive slimes (90%); suggest very fine unrecoverable HM.

GOON 2: Abundance of boulders & black soils in N & W dilutes area/volume by ~70%; abundant surficial HM again fails to manifest in soil profile (0.6%HM average); very high slimes (85%); impressive regolith soils but very low HM.

Buka NE: Buka-equivalent mapped dolerite sill over 1.5sqkm; central dolerite outcrop hillock with 'apron' regolithic soils (60% of overall area); ilmenite dominant HM; 4km to Buka South deposit; potential to compliment Buka resource.

Buka NNE: Buka-equivalent mapped dolerite sill over ~3sqkm; regolithic soils (estimate 60% of overall area); ilmenite dominant HM; 7km to Buka South; potential to compliment Buka resource.

6.1.2 EL 22479

As for EL 22478, regional sill investigations were completed on EL 22479. Four dolerite regolith targets were sampled with a series of 200m spaced small backhoe excavations to one metre depths with collection of a representative channel sample from the pit walls. The channel samples were designed to emulate a large auger intercept and comprised approximately 15-20 kilograms. Sampling was designed to provide, where possible, long axis and cross-

sectional data for use in resource inference. Additionally, eight shallow test pits were excavated and sampled on an opportunistic basis where access tracks intercepted previously unsampled regional sill exposures. A total of 77 shallow pits were sampled and were immediately infilled following the sample collection.

Summaries of the inspected targets follow:

BBAN SW: 6 trench samples (03TR78-03TR83) were collected cross-terrain approximately 10km NNE of the abandoned Goondooloo Homestead. The samples tested thin (<0.7m) immature regolithic soils amidst boulders, scree and black soils developed on dolerite intruding mudstones, siltstones and fine grained sandstones of the Kyalla Formation (Pry).

BBAN: 50 trench samples (03TR84-03TR133) were collected adjacent to a station track and cross-terrain perpendicular to the track over a 27km strike length. An abundance of boulders and outcrop form a central "spine" to the large dolerite body with lateritised regolithic soils developed on the flanks amidst scattered boulder and black soil regimes. The dolerite sill intrudes at the Bessie Sandstone (Pre) stratigraphic horizon and lies approximately midway between Buka and BMC Prospects.

Mt Caroline: 2 trench samples (03TR134-03TR135) were collected immediately south of the principal Moroak to Goondooloo road testing poorly developed regolithic soils amidst boulders and scree developed on dolerite intruding Bessie Creek Sandstone (Pre).

Dooley's East: 11 trench samples (03TR136-03TR146) were collected adjacent to a station track and cross-terrain between the Maiwok and Flying Fox Creeks approximately 25km SE of Conways. The samples test a 2km long and 250m wide regolithic apron to outcropping dolerite intruding fine sediments of the basal Kyalla Formation (Pry).

Eight small test pits (Fence 1 and Hill1 to Hill 7) were excavated on an opportunistic basis along existing station tracks between the mid-lower reaches of Maiwok and Flying Fox Creeks on Moroak Station wherever regolithic soils were encountered. The soils were largely immature and are not considered entirely representative of the target sills. Trenches Fence 1, Hill 1, Hill 5 and Hill 7 targeted Pry horizon dolerites and trenches Hill 2-4 and Hill 6 tested Prv/Prk stratigraphic level sills.

Results of Reconnaissance Sills Investigation

The samples were dispatched to Tristate's Mildura Laboratory and processed as for previous auger and soil samples. Laboratory results and channel sample ledgers are tabled in Appendix 2.

The following table summarises the resource inferences for sampled sills. Figure 3 displays the sample and sill locations.

Table 3 Regional Sills Resource Inferences

Regional Sill	Tonnage	Av HM%	Av Mag %	Av Ilmenite %	Slimes %	HM tonnes	Mag tonnes	Ilmenite tonnes
BBAN	11,980,000	3.99	2.87	1.13	73	478,002	343,826	135,374
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Dooley's E	765,000	3.15	2.5	0.65	65	24,098	19,125	4,973

BBAN: An extensive 26.1sqkm mapped dolerite body with a large (~70%) component of outcrop, boulders, scree and black soils with approximately 30% regolthic soil development and an abundant titanomagnetite dominant HM (60:40 timag:ilmenite) veneer; average 4%HM to maximum of 12%; located midway to Buka & BMC.

BBAN SW: Approx 8sqkm of mapped dolerite dominated by boulders & outcrop with approx 25% shallow regolithic soil development and low (0.5%) HM content.

Mt Caroline: A 3.5sqkm dolerite body 12km S of BBAN adjacent to a principal station road; again large proportions (~80%) of boulders and scree occur throughout with thin regolithic soil development in the remainder; low tenor results (1%HM).

Dooleys East: A large 17sqkm mapped dolerite body was inspected and found to comprise dominantly boulders and outcrop with patchy regolithic soil development; a 250m wide flanking apron in the north portion (approx 0.5sqkm) was sampled with 11 trenches; the regolith rapidly grades into black soils; 11 test pits average 3.15%HM (max 11%) with 60% titanomagnetite content.

The large BBAN dolerite outcrop and regolith is variably mineralised with a number of trenches which report up to 10%HM highlighting higher grade regimes which warrant further follow-up if technology to treat the dominant titanomagnetite is available.

Opportunistic test pits excavated on accessible portions of regional sills in the central project area (Hill 1 to Hill 7 samples) generally disappoint with reported low tenor HM results ranging 0.1-2% in soils and 3.4% in a potential alluvial play near Flying Fox Creek. They are not entirely representative of the larger surrounding bodies and should be investigated further for resource potential.

6.1.3 EL 22480

Field inspections of two large mapped dolerite bodies near the confluence of the Roper River and Maiwok Creek and the Roper River and Jalboi River in the southern portion of EL 22480 failed to reveal any significant residual

regolith soil development. The large sills, intruding at the Kyalla Fm (Pry) and Corcoran Fm (Pro) stratigraphic horizons, manifest as dolerite boulder strewn subcrop and expansive black soil regimes. Minimal surficial HM is evidenced and prospectivity for significant heavy mineral accumulations is considered low. Tenement rationalisation has consequently resulted in relinquishment of these areas within EL 22480.

6.2 Buka South Prospect - Infill Auger Drilling

Following indicated ore resource calculations from the 100 metre spaced auger drilling at Buka South and in view of the easily treatable and high grade nature of the identified pisolitic soils, a campaign of infill 89mm diameter auger drilling on 25 x 25 metre drill hole spacing was undertaken internal to a portion of a 5% HM contour across the Buka resource to determine a measured resource for an initial three years production.

A total of 3,207 holes were drilled for a cumulative 3,893 metres with an average pisolite ore thickness of 1.21 metres (range 0.2m – 3.0m) from surface. The infill drilling, coupled with an existing 297 100-metre spaced holes, covered approximately 220 hectares. Sampling was undertaken at an initial 1 metre depth interval followed by smaller increments to the base of the pisolite horizon. The drilling indicated partially channelised coarse pisolitic sheet wash containing high insitu HM grades (up to 34%HM) overlying clay-rich regolith ore with variable boulder content and containing HM contents ranging from 5 to 8%. Shallow bedrock with scattered surficial boulders were identified in the central western sector.

All samples were dispatched to Tristate laboratory in Mildura and processed as for earlier drill samples. The infill auger drillhole location plan is presented in Figure 4. Auger sample ledgers and laboratory results are included in Appendix 3.

The following data was derived from the combined 25m & 100m database:

0-1m Interval:

The composite 3,504 holes covered an area of 2,250,000 square meters (polygonal) with an average down-hole intercept of 0.94m (range 0.2-1.0m); bulk density of 1.78t/BCM (derived from 2002 macro sampling) and a calculated average HM grade of 7.6% (no lower grade cut-off).

A drill indicated measured resource for 0-1m calculates at 3,765,000 tonnes grading 7.6% HM (7.5% ilmenite) for 286,000 tonnes HM (containing 282,400 tonnes ilmenite).

1-2m Interval:

1,946 holes reported in the second metre over an area of 1,216,250 square meters (using 625sqm area of hole influence) with an average downhole intercept of 0.77m (range 0.2-1.0m); bulk density of 1.78t/BCM (derived from

2002 macro sampling) and a calculated average HM grade of 5.2%. (100m spaced holes averaged 4.97% HM in this interval).

A drill indicated measured resource for 1-2m calculates at 1,667,000 tonnes grading 5.2% HM (5.03% ilmenite) for 86,700 tonnes HM (containing 83,350 tonnes ilmenite).

The combined measured tonnage for the 0-2m sampled interval is 5,432,000 tonnes of pisolite ore grading 6.9% HM and 6.76% ilmenite for a contained 372,700 tonnes HM including 366,000 tonnes of ilmenite.

6.3 Buka South Prospect – Trench Channel Sampling

Shallow trenching incorporating three east-west orientated costeans across a suspected pisolitic sheetwash channel in the western sector was undertaken using a small backhoe to check for boulders or other hidden features that would affect insitu grade determination by the auger drill or affect mining operations and to check on the drill measured thickness of the pisolite. The 250-300m long trenches were designed to capture 25 metre spaced auger holes with walls accurately channel sampled at 12.5 metre intervals at set dimensions of 18x12cms and corresponding auger sample downhole intervals to basal depth of pisolite.

The pisolite thicknesses encountered by the drilling were largely collaborated by the trench exposures. Small tree and vegetation roots were predominantly confined to the upper 40cm of soil profile. Dolerite boulders up to 35cm diameter manifest proximal to or within the underlying clayey regolith soils with only minor cobbles and boulders encountered in the pisolite sheetwash material. Boulders became more prolific in the northern (Trench 3) costean close to subcrop further north. Results and ledgers are included in Appendix 4**.** Trench locations are presented in Figure 5.

Earthmoving contractors visiting the site saw no impediments to simple Front End Loader (FEL) mining techniques.

The trenches largely confirm subtle subsurface sheetwash regimes with abundant pisolite ranging 30-60% of sample. Typically a 15cm depth moderately indurated, HM-mineralised (8-23%) clayey topsoil is developed on moderately pisolitic (1-2mm diameter), poor to moderately indurated lateritic soils (av to 50cm depth) further underlain by friable to poorly indurated soils with coarse (3mm diameter) and abundant pisolite. The pisolite horizon grades into clay-rich, more indurated regolithic soils with minor residual pisolite and weathered dolerite boulders at 1.2 to 1.5m depths. Trench wall channel samples averaging 20kgs were collected at 12.5m measured intervals immediately adjacent to captured 25m spaced auger holes.

The samples were dispatched to Tristate Laboratory in Mildura with adopted procedures as per auger samples. Results include the following:

Trench 1: 0-1m Average 8.80%HM (range 4.25% - 16.57%);

Trench 1: 1-2m Average 5.53%HM (range 2.22% - 10.95%); Average depth 1.45m;

Trench 2 0-1m Average 6.26% HM (range 3.15 – 10.82%;
Trench 2 1-2m Average 4.07%HM (range 2.11% - 7.43%); Average depth 1.45m;

Trench 3: 0-1m Average 7.3%HM (range 4.5% - 9.1%);
Trench 3: 1-2m Average 6.4%HM (range 3.6% - 10.7%); Average depth 1.37m.

The three trenches provide an average of 7.5% HM in the upper metre and 5.1% HM in the lower interval. While the trench results correlate well with the drill indicated measured resource, direct comparison with auger holes adjacent to trench channel samples indicate a 20% increase in auger grades overall. In comparing the two data sets it is apparent that the auger sample weights are lower than theoretical calculated weights suggesting an incomplete retrieval of entire drilled material which in turn affects the reporting of HM grade. Studies are continuing into the possible source of the variation.

6.4 Buka South Prospect – Independent Resource Estimate

A Resource estimate for the Buka South heavy minerals resource was produced by Tennent Isokangas Pty Ltd (TIP), Consulting Mining Engineers of Brisbane, Queensland, for internal comparison purposes for Exploration and Resource Development Pty Ltd (ERD).

Based on results of statistics and variography, an ordinary kriged grade estimate was applied to the pisolite and non-pisolite resource areas within a block model. Material losses as well as some material gains have occurred in many of the 89 mm auger holes. Volume recovery was calculated as a percentage based on measured sample weights against theoretical volume of each sample interval. The results show that 61% of 100 m x 100 m drill hole sample intervals and 29% of 25 m x 25 m drill hole sample intervals are potentially outside acceptable parameters for proper sampling. This signals that a large proportion of holes could potentially have significant sampling errors. This may affect the resource estimate significantly by upgrading or downgrading grade results and/or affecting bulk density estimates. When the volume recovery is averaged down each hole, 22.9% of all averaged drill holes are still potentially outside acceptable parameters.

The base of the resource is at the top of weathered dolerite which is gradational with and beneath the largely insitu regolith soil. The 100 m spaced holes terminated upon encountering this degraded dolerite or fresh dolerite. Interpretation by ERD suggests that the grade figures may be approximately 20% lower than the raw prediction in this Resource, as determination of heavy mineral percentage (HM%) results are affected by significant volume recovery issues. ERD reconciled this grade discount on comparisons between auger intercepts and trench and macro sample data. This Indicated Mineral Resource

therefore applies to the tonnage figure and adjusted HM% figure in the attached table

The following table showing the Indicated Mineral Resource could be reported as a JORC compliant Indicated Mineral Resource for tonnage and adjusted HM percent figures.

BUKA SOUTH MINERAL SANDS DEPOSIT								
INDICATED MINERAL RESOURCE JULY 2004								
In-situ geological resource, containing:								
0.0 HM% cutoff	Block Flag	Geology	Volume	Bulk Density	Tonnes	Mt	Raw HM%	Adjusted HM%
0.0-999.0	1	Pisolite Area	5,650,505	1.80	10,170,909	10.2	5.8	4.7
	2	Black Soil Area	2,880,704	1.75	5,041,233	5.0	3.3	2.6
	10	Non-pisolite, non-black soil	14,047,036	1.67	23,458,550	23.5	3.5	2.8
		Sub Total	**22,578,246**		**38,670,692**	**38.7**	4.1	**3.3**
2.5 HM% cutoff	**Block Flag**		**Volume**	**Bulk Density**	**Tonnes**		**Raw HM%**	
2.5-999.0	1	Pisolite Area	5,476,263	1.80	9,857,274	9.9	6.0	4.8
	2	Black Soil Area	1,743,510	1.75	3,051,142	3.1	4.3	3.4
	10	Non-pisolite, non-black soil	8,969,568	1.67	14,979,178	15.0	4.6	3.7
		Sub Total	**16,189,341**		**27,887,594**	**27.9**	**5.1**	**4.0**
4.0 HM% cutoff	**Block Flag**		**Volume**	**Bulk Density**	**Tonnes**		**Raw HM%**	
4.0-999.0	1	Pisolite Area	4,599,990	1.80	8,279,982	8.3	6.5	5.2
	2	Black Soil Area	721,991	1.75	1,263,484	1.3	5.7	4.6
	10	Non-pisolite, non-black soil	5,415,049	1.67	9,043,131	9.0	5.5	4.4
		Sub Total	**10,737,030**		**18,586,598**	**18.6**	**6.0**	**4.8**
5.0 HM% cutoff	**Block Flag**		**Volume**	**Bulk Density**	**Tonnes**		**Raw HM%**	
5.0-999.0	1	Pisolite Area	3,589,919	1.80	6,461,855	6.5	7.0	5.6
	2	Black Soil Area	435,520	1.75	762,160	0.8	6.6	5.3
	10	Non-pisolite, non-black soil	3,191,600	1.67	5,329,972	5.3	6.3	5.0
		Sub Total	**7,217,040**		**12,553,987**	**12.6**	**6.7**	**5.3**

The independent resource estimates tabled above are slightly above ERD's internal estimates for combined soil types at Buka as summarised below.

: No cut – 36Mt @ 3.9%HM (raw); 36Mt @ 3.12%HM (adjusted);
: 2.5% cut – 24Mt @ 5.16%HM (raw); 24Mt @ 4.13% (adjusted);
: 5% cut – 9.7Mt @ 7.41%HM (raw); 9.7Mt @ 5.9%HM (adjusted).

A number of recommendations were made by TIP regarding the issue of lower volume recoveries reporting from the auger sampling prior to upgrading to measured Resource or Reserve status. The full resource estimation report is presented in Appendix 5.

6.5 Concurrent Pre-feasibility Studies

Investigations are continuing on potential mining, processing and project infrastructure costing together with assessment of ilmenite product for value-add beneficiation to synthetic rutile. Data is still awaited and will be incorporated into a Year 4 pre-feasibility study report.

7. Environment

All field activities adhered to the environmental and safety principles and practices outlined in detail in the Small Mining Management Plan which was accepted by the Department prior to commencement of exploration. Auger drilling at Buka South was undertaken cross-terrain with no new access tracks required. As for previous years, auger holes were plugged immediately upon hole completion. The shallow backhoe regional sill test pits and Buka South trenches were similarly immediately infilled after sampling and contoured to original state. Selected photographs of field activities are included in Appendix 6.

9. References

Abbott ST, Sweet IP, Plumb KA, Young DN, Cutovinos A, Ferenzi PA, Brakel A & Pietsch BA, 2001. Roper Region: Urapunga and Roper River Special, Northern Territory (Second Edition), 1:250 000 Geological Map Series Expanatory Notes, SD 53-10 & SD 53-11. Northern Territory Geological Survey

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