Normandy NFM Limited

NORTH FLINDERS EXPLORATION

final report

FINAL REPORT FOR EL8473 (FERAL), ARTHUR HILLS PROJECT

EXPLORATION LICENCES COVERERED BY THIS REPORT:

EL8473 FERAL

1:250,000 Sheet Reference:	MOUNT PEAKE	SF53-05
1:100,000 Sheet Reference:	GILES	5354

DISTRIBUTION:

- ❑ NT DEPARTMENT OF MINES AND ENERGY
- ❑ NORMANDY EXPLORATION

S HARRISON FEBRUARY 2001 NORMANDY RN: 27978

SUMMARY

The area covered by Feral, located approximately 300km north west of Alice Springs and 80km NNE of Yuendumu, is being explored for economic gold mineralisation.

This tenement is part of the Arthur Hills Project which is held by Normandy NFM Ltd in Joint Venture with Normandy Tennant Creek Ltd. Normandy NFM Ltd are tenement managers.

During 1998, Normandy NFM negotiated an agreement with the NT DME to provide a group reporting arrangement for the Arthur Hills Project exploration licences, which included Feral. It was also agreed that the report would cover a calender year (field season) rather than anniversary year. A submission date of the 28th of February each year was established.

Exploration activities proposed for completion during 1999 were completed during the 2000 field season. This included reconnaissance Aircore drilling.

Feral was recommended for relinquishment as a result of the exploration undertaken, that revealed the tenement to be covered by overburden in excess of 60 metres thick.

Work completed includes:

- Ground Magnetics Survey 29 line km
- Aircore Drilling 6 holes for 408m, 140 samples

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1. INTRODUCTION

This document describes the exploration undertaken during the life of EL8473 (Feral). As a result of work undertaken on the tenement, the decision was made to surrender the tenement on 02/02/2001

2. TENEMENT DETAILS

Feral is one tenement within the Arthur Hills Project that comprises three tenements with a total area of 908 graticular blocks for 2923 sq km. A summary of tenement details for the exploration licences is listed in Table 1 and displayed in Figure 1. The present breakdown between the JV partners is as follows:

Normandy NFM Limited	50%
Normandy Tennant Creek Limited	50%

Table 1: Tenement Summary for Feral (EL8473)

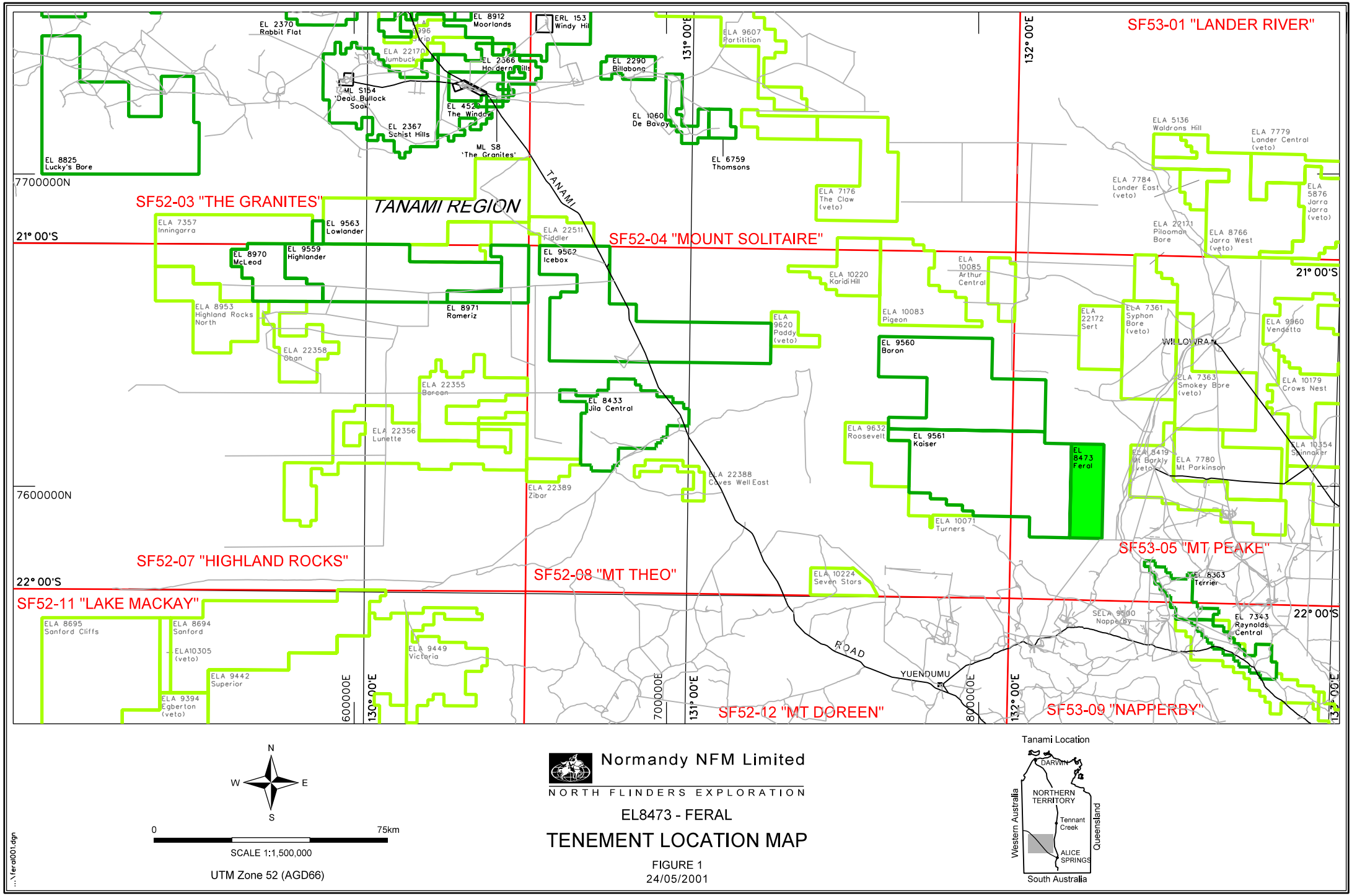
Licence	Detail	Date	Blocks	Km^2	Expiry	Surrender
EL8473	Grant:	29/04/99	102	328	28/04/05	09/04/01

3. LOCATION AND ACCESS

Feral is the eastern-most tenement of the Arthur Hills project, located approximately 300km north west of Alice Springs and 80km NNE of Yuendumu (Figure 1). Access from Alice Springs is via the Stuart Highway to the north, and then utilising the Tanami Road to the northwest. Old station tracks of variable quality are then used to gain access to the licences. Alternatively, access can be gained via the Stuart Highway to Aileron and thereafter utilising station tracks through the Pine Hill, Coniston and Mt Denison stations. The tenements are entirely within Aboriginal freehold land.

4. PREVIOUS EXPLORATION

Other exploration companies in and around the Feral have conducted limited exploration. Sons of Gwalia explored for Granites, Callie and Tanami Mine-style gold mineralisation within areas to the north. This included lag sampling, regolith mapping, RAB, vacuum and aircore drilling. Gold results to 68ppb were returned from a mafic intrusive complex within the former EL7632 while a 30ppb gold result was obtained from the former EL7633. Also of note, was an 18ppb gold result from RAB drilling in metasediments within the former EL7632.


SF53-01 "LANDER RIVER"
SF52-03 "THE GRANITES"
TANAMI REGION
SF52-04 "MOUNT SOLITAIRE"
SF52-07 "HIGHLAND ROCKS"
SF52-08 "MT THEO"
SF52-11 "LAKE MACKAY"
SF52-12 "MT DOREEN"
SF53-05 "MT PEAKE"
SF53-09 "NAPPERBY"
TANAMI
ROAD
YUENDUMU
WILLOWRA
EL 8825 Lucky's Bore
EL 2370 Rabbit Flat
EL 8912 Moorlands
ERL 153 Windy Hil
ML S154 'Dead Bullock Soak'
EL 2367 Schist Hills
ML S8 'The Granites'
EL 2290 Billabong
EL 1060 De Bavay
EL 6759 Thomsons
ELA 9607 Partitition
ELA 7176 The Claw (veto)
ELA 5136 Waldrons Hill
ELA 7779 Lander Central (veto)
ELA 7784 Lander East (veto)
ELA 5876 Jarra Jarra (veto)
ELA 22171 Piloomah Bore
ELA 8766 Jarra West (veto)
ELA 7357 Inningarra
EL 9563 Lowlander
EL 8970 McLeod
EL 9559 Highlander
EL 8971 Rameriz
ELA 8953 Highland Rocks North
ELA 22358 Ohan
ELA 22511 Fiddler
EL 9562 Icebox
ELA 9620 Paddy (veto)
ELA 10220 Karidi Hill
ELA 10085 Arthur Central
ELA 10083 Pigeon
ELA 22172 Sert
ELA 7361 Syphon Bore (veto)
ELA 9860 Vendetta
EL 9560 Boron
ELA 7363 Smokey Bore (veto)
ELA 10179 Crows Nest
ELA 22355 Berean
EL 8433 Jila Central
ELA 22356 Lunette
ELA 9632 Roosevelt
EL 9561 Kaiser
EL 8473 Feral
ELA 8419 Mt Barkly (veto)
ELA 7780 Mt Parkinson
ELA 10354 Spinnaker
ELA 22388 Caves Well East
ELA 22389 Zibar
ELA 10071 Turners
ELA 10224 Seven Stars
EL 6363 Terrier
ELA 9500 Napperby
EL 7343 Raynolds Central
ELA 8695 Sanford Cliffs
ELA 8694 Sanford
ELA10305 (veto)
ELA 9442 Superior
ELA 9394 Egberton (veto)
ELA 9449 Victoria
7700000N
7600000N
21° 00'S
22° 00'S
600000E
700000E
800000E
130° 00'E
131° 00'E
132° 00'E
133° 00'E
N
S
E
W
0
75km
SCALE 1:1,500,000
UTM Zone 52 (AGD66)
Normandy NFM Limited
NORTH FLINDERS EXPLORATION
EL8473 - FERAL
TENEMENT LOCATION MAP
FIGURE 1
24/05/2001
Tanami Location
DARWIN
NORTHERN TERRITORY
Tennant Creek
ALICE SPRINGS
Western Australia
Queensland
South Australia
...\feral001.dgn

24/05/2001

5. GEOLOGY

5.1 Regional Geology

The Arunta Inlier is one of the largest Proterozoic Inliers in Australia. Mapping by the BMR during the 1960s and 1970s resulted in the subdivision of the Arunta Inlier into three major tectonic provinces: northern, central and southern (Shaw et al. 1984). Palaeo-Proterozoic stratigraphy was grouped into three major divisions: Division 1, Division 2 and Division 3, based on facies assemblages and lithological correlations, (Stewart et al. 1984). Division 1 rocks were inferred to be the oldest, comprising mafic and felsic granulites. Division 2 rocks are mainly represented by turbiditic metasediments. Division 3 rocks comprise platform-style quartzite, shale and carbonate sequences unconformably overlying Division 1 and 2 rocks. All three Palaeo-Proterozoic divisions are intruded by K-feldspar megacrystic granitoids. The three Proterozoic divisions, as well as the granitoids, are unconformably overlain by Neo-Proterozoic cover sequences.

A more recent review of the tectonostratigraphic relations of the Arunta Inlier by Collins and Shaw (1995) has suggested that the Arunta Inlier should be sub-divided into only northern (older) and southern (younger) tectonic provinces, separated by the Redbank Thrust Zone. Furthermore, they consider that in the northern tectonic province boundaries between Division 1 and Division 2 rocks are gradational and that both are part of the same tectonostratigraphic unit. They have therefore proposed a revision of the tectonostratigraphic nomenclature, abandoning the Divisions in favour of lithological assemblages. In the northwestern Arunta Inlier, Divisions 1 and 2 are replaced by the "Lander Assemblage". Several deformations are recognised in the Lander Assemblage prior to deposition of the "Reynolds Assemblage" (formerly Division 3). These deformations are collectively termed the "First Tectonic Cycle". Further deformations occurred following deposition of the Reynolds Assemblage which collectively are termed the "Second Tectonic Cycle". Metamorphism associated with the first tectonic cycle is prograde, whereas metamorphism associated with the second tectonic cycle is retrograde.

A summary of geological history and nomenclature for the northwestern Arunta Inlier is presented in Table 2.

Table 2: Geological History of the Northern Arunta Inlier (after Collins et al, 1995)

Age	Regional Event	Tectonic Cycle
400-300 Ma	Alice Springs Orogeny	Third Tectonic Cycle
850 Ma	Deposition of Vaughan Springs Quartzite	
≥ 1635 Ma 1780 - 1760 Ma	Warbudali Tectonic Event (Mt Doreen- Yuendumu) (equivalent to Chewings Orogeny ?) Weldon Tectonic Event (Anmatjira - Reynolds Range) Hardy Tectonic Event (Mt Doreen - Yuendumu) (equivalent to Strangways Orogeny ?)	Second Tectonic Cycle (retrograde metamorphism)
1820 - 1780 Ma	Deposition of Reynolds Assemblage	
1860 - 1820 Ma 1880 Ma	Stafford Tectonic Event Yuendumu Tectonic Event (equivalent to Barramundi Orogeny ?)	First Tectonic Cycle (prograde metamorphism)
≥ 1880 Ma	Deposition of the Lander Assemblage	

5.2 Local Geology

BMR mapping in the Arthur Hills Project area is dominated by Quaternary cover sequences, principally aeolian sand, calcrete and red soil. In some areas sandstone, conglomerate grit and arenite are present. The BMR interpreted the majority of the recent cover within the Arthur Hills Project area to be underlain by Lander Rock Beds. West northwest-orientated, strike-extensive quartz veins traverse the northern reaches of the area including the ‘Arthur Hills’.

6. WORK UNDERTAKEN

6.1 Ground Magnetics Survey

Approximately 29 line-kilometres of ground magnetics data were acquired along the proposed drilling traverse prior to the reconnaissance/regolith drilling program. The purpose of this was to use magnetics to assist in targeting of magnetic features. Profiles for all are contained in Appendix 2 and the locality is displayed on Figure 2.

6.2 Aircore Drilling

Six aircore holes were drilled within Feral for 408 metres. Holes were drilled to test targets defined using ground magnetic data and also to test the nature of the regolith profile. Hole spacings varied between 400 metres and 3 kilometres, depending on the target being tested.

Samples were taken as 3 metre composites and were sent to Genalysis for low-level determination of Au and multi-elements. Refer Appendix 1 for logs and assays.

Drilling intersected a sequence of transported overburden material, comprising sandstone, grit, arenites and conglomerates that are in excess of 60 metres thick within the tenure. Half of the holes drilled did not penetrate this cover sequence. The holes that did reach bedrock intersected hydrothermal quartz, granitoid and possible potassic micro-aplite. The majority of these holes were located adjacent to the Silver Fox prospect, as displayed in Figure 2.

Assays returned for the drillholes were negative for gold, with a maximum As value of 18ppm and 3ppm Bismuth.

A total of 5 samples were submitted to Pontifex and Associates for thin section preparation and analysis to confirm the transported nature of the samples and bedrock. The report for these descriptions is contained in Appendix 4, with drill hole descriptions and assay data for all holes drilled.

Table 4. Aircore Sampling at Feral (EL8473)

Drillholes	Metres	Sample no.	Total	Amdel	Elements
AHAC0013-0018	408	5308306-309, 5308311-342, 5308344-382, 5308384-436, 5308438-449	140	ARM1	Au Ag, As, Bi, Cd, Co, Cu, Mo, Ni, Pb, Sb, Se, Te, Zn
					6 drillholes for 408m, 140 samples

200000E 210000E 220000E

7610000N 7600000N 7590000N

EL 9561
KAISER

EL 8473
FERAL

AHAC0018
AHAC0017
AHAC0016
AHAC0015
AHAC0014
AHAC0013

Numerous small depressions

LANDER

N
W E
S

0 2000m
SCALE 1:100,000

UTM Zone 53 (AGD66)

Normandy NFM Limited
NORMANDY EXPLORATION PTY LTD

EL8473 - FERAL

AIRCORE DRILLHOLE & GROUND MAGNETICS TRAVERSE
LOCALITY PLAN

07/06/2001

FIGURE 2

t:\MSDATA\diagram\arthur\feravv001.dgn

7. EXPENDITURE INCURRED FOR THE REPORTING PERIOD

A summary of exploration expenditure for the third year of reporting is tabled below.

Table 3. Details of Exploration Expenditure for the reporting period 01/01/01 to 09/04/01

COST CENTRE	Expenditure ($)
Exploration Employee Costs	5 600
Exploration Overheads and Allocations	2 409
Exploration Operating Costs	1 602
TOTAL	**$9 611**

8. REFERENCE LIST / ANNUAL REPORT BIBLIOGRAPHY

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Smith, M.E.H., 2000. Report for the Arthur Hills Project covering the 1999 Field Season. Normandy RN: CR25988

APPENDIX 1 – DIGITAL DATA, ASSAYS AND LOGS

feral_Assay.DAT	feral_Collar.DAT
feral_CodeGeol.DAT	feral_Survey.DAT

APPENDIX 2 – GEOPHYSICAL SURVEY DATA

Feral_groundmag.xls

APPENDIX 3 – SAMPLE & SURVEY METHODOLOGY

AIRCORE DRILLING SAMPLES

Composite samples are taken of all RAB/Aircore drill spoil. Samples are taken as 3 metre composite (i.e. 1 drill rod) intervals. Drill spoil is collected in a bucket beneath the cyclone and at the end of each drill rod, the sample is spear sampled to gain a representative sample. This sample is placed into a calico bag (approximately 8"x12" in size, weighing 2kg) and sent to the laboratory for analysis.

GROUND MAGNETICS SURVEY

All ground magnetic surveys were effected by Normandy NFM personnel.

Total Magnetic Intensity (TMI) readings were taken at 10m intervals (unless otherwise stated) using a G856 proton precession magnetometer and a pole height of 1.8m. Diurnal measurements were taken using a second magnetometer as a base station, with readings taken every 30 seconds. On completion of the survey, diurnal variations were removed from the data using the MAGPAC program.

Data was collected over the surveyed lines which were pegged every 100m and clearly annotated with the line number and location coordinates. The placement of these traverses was achieved by using a Trimble Global Positioning system combined with a Racal differential GPS attachment.

APPENDIX 4 – PETROLOGICAL SAMPLE DESCRIPTIONS

Report #	Author	Date	Work	Geo	Prospect				Notes
Petrology #	Count	ID		Type	NFMSample #	From	To	Easting Northing	Description
Arthur Hills									
P8042	**PO**	**30/10/2000**		**SH**	**Arthur Hills**				
P06671	1	AHAC16		DC		78	81		Not transported overburden as defined but consists of 3 chips of coarse to very coarse hydrothermal quartz with minute fluid inclusions, also rare small inclusions of tourmaline and muscovite.
P06672	2	AHAC16		DC		42	45		25% limonitic cement, Grains - average size 0.5mm (range 0.1-3mm), 30% quartz, 30% K-spar, 5% plagioclase, 7% detrital muscovite, 10% composite feldspar-quartz.
P06890	21	AHAC15		DC		27	30		Two chips - Massive, apparent primary igneous fine (0.3mm) to medium grained (1-2mm) mosaic. Dominant quartz (50%) subordinate and generally finer K-spar (30%), minor plagioclase (5-10%) and numerous scattered extremely fine (0.1mm) accessory grains of biotite, tourmaline, opaque oxide, apatite. Tentatively classified as (potassic) mciro-aplite. Unique in this suite. One chip - of transported overburden, loose packed aggregate of fine to coarse quartz grains (rare feldspar), ubiquitous intergranular limonite permeation but not distinctly kaolinitic as in other chips of typically transported overburden. Somewhat unique (sic) within the whole suite.
P06891	22	AHAC17		DC		54	57		Two chips composed entirely of massive recrystallised quartz. One apparent hydrothermal vein quartz, very coarse has protomylonitic stress fabric, subparallel fissures healed by stringers of very fine recrystal;ised quartz. The other chip possibly a former quartzite, equigranular, relict very stressed grains as residuals within intergranular, extremely fien recrystallised quartz. Alternatively may be an ex-quartz rich gneiss, with any other former minerals obliterated (some similarities with mylonitic P06898).
P06892	23	AHAC18		DC		48	51		Two chips - 50-60% cement. Grains av 0.25mm (range 0.1-1.5mm), 10-20% quartz, 5% K-spar, 5-30% fine detrital muscovite in matrix. Compares with P06883. Four chips - 20-35% limonitic cement 30% quartz, 15% K-spar, 5% plagioclase, 5% detrital muscovite, 10-15% sericitic fragments. Finer and better sorted equivalent of P06884 and others.

BIBLIOGRAPHIC DATA SHEET

REPORT NUMBER	27978	
REPORT TITLE	FINAL REPORT FOR EL8473 (FERAL), ARTHUR HILLS PROJECT	
PROSPECT NAME	-	
LICENCE NUMBERS	EL8473	
OWNER/JV PARTNERS	Normandy NFM Ltd. 50% (managers), Normandy Tennant Creek Ltd. 50%	
COMMODITIES	Gold	
TECTONIC UNITS	Arunta Province	
STRATIGRAPHIC NAMES	Lander Rock Beds	
1:250 000 MAPSHEET	Mount Peake	SF53-05
1:100 000 MAPSHEET	Giles	5354
KEYWORDS	Aircore Drilling, Petrography, Ground Magnetics Survey	