



NORTHERN STAR RESOURCES LTD

ANNUAL REPORT

For the Period

1 June 2014 to 31 May 2015

PAULSENS

Annual Mineral Exploration Report for the Paulsens Group C8/2015.

PREPARED BY:	Alex MUKHERJI
AUTHOR:	Alex MUKHERJI
REPORT DATE:	8 September 2015
DISTRIBUTION:	Northern Star Resources Limited Department of Mines and Petroleum

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PAU_WASG4_SURF2015A.txt

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ATTACHMENTS SUBMITTED MANUALLY

- Geological Mapping
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Bibliographic Data Sheet

Project Name: Paulsens
Combined Reporting Number: C8/2015
Tenement Numbers: E 08/01166,E 08/01189,E 08/01649,E 08/01744,E 08/01745,E 08/01763,E 08/01842,E 08/01843,E 08/01844,E 08/01845,E 08/01878,E 08/01961,E 08/02000,E 08/02065,E 08/02067,E 08/02114,E 08/02251,E 08/02252,E 08/02364,E 08/02395,E 08/02499,E 08/02555,E 47/01134,E 47/01395,E 47/01535,E 47/01549,E 47/01553,E 47/01677,E 47/01773,E 47/01879,E 47/02035,E 47/02171,E 47/02292,E 47/02587,E 47/02636,M 08/00099,M 08/00196,M 08/00222,P 08/00516,P 08/00543,P 08/00546,P 08/00565,P 08/00653,P 47/01313,P 47/01637,E 08/01187
Tenement Operator: NORTHERN STAR RESOURCES LTD
Report Type: Annual
Report Title: Annual Mineral Exploration Report for the Paulsens Group C8/2015.
Report Period: 1 June 2014 to 31 May 2015
Author: Alex MUKHERJI
Submitted By: Alex MUKHERJI
Report Date: 8 September 2015
Map Sheets: *1:250,000 Map Sheet* *1:100,000 Map Sheet*
SF50-10 (WYLOO) 2252 (HARDEY)
SF50-10 (WYLOO) 2153 (MOUNT STUART)
SF50-10 (WYLOO) 2152 (WYLOO)
Target Commodity: GOLD
Prospects Drilled: Aries, Belvedere, Galileo, Paulsens, Paulsens East, Titan, Voyager 2
PoW Number:
Geophysical Survey Reg No:
Assays: Au, Ag, As, Bi, Cu, Mo, Pb, Pd, Pt, Sb, Ta, W, Zn

Abstract

Location: The centre of the Project area is located approximately 1,000km north of Perth, 160km west-northwest of Paraburdoo within the Ashburton Province of the Pilbara region of Western Australia. The project contains NST's currently operating Paulsens underground gold mine and the Belvedere deposit.

Geology: The Paulsens Project is located within the Wyloo Dome. Detailed geological descriptions of the area can be sourced from the Wyloo 1:250,000 geological sheets completed by the Geological Survey of Western Australia. The geomorphology of the Wyloo area is dominated by the Wyloo Dome which has formed flanking ridges and a central core of low rolling hills. The regional basement rocks are Archaean age (2.7Ga) basaltic greenstones with intercalated sandstones and argillites of the Fortescue Group at the base of the Hamersley Basin sedimentary and volcanic sequence. The Hamersley Basin rocks are overlain, above an angular unconformity, by the Lower Proterozoic age (1.8Ga). Wyloo Group cover rocks with shallow water conglomerate, sandstone and dolomite sequences at the base, below thick, flysch-type sandstones and siltstones. The sequence indicates prolonged subsidence and sediment accumulation within the Ashburton Trough.

Work Done: NST

- Exploration RC/DD and resource development DD drilling in and around the Paulsens deposit
- Regional and near mine soil, auger and stream sediment sampling
- Mineral Systems Analysis – Collaboration with Centre for Exploration Targeting (CET) at University of Western Australia
- A study on the geochemistry of the Wyloo Dome
- "SIEF" Capricorn Distal Footprint – Collaboration with other ASX listed companies and CSIRO
- Regolith mapping over the Mindle Shear
- Resource estimation at the Belvedere deposit
- Underground mine production at Paulsens

FMG

- No work was completed by FMG

Results: NST

Results from in-mine Paulsens resource development and exploration drilling in 2014-2015 were very positive and will continue to target high grade extensions to the underground Voyager 2 and Titan lodes as a priority.

Near-mine at Paulsens East, testing up-plunge of the Gallileo Lode, led to no significant intercepts being received.

At Belvedere, RC and DD resource development and geotechnical/metallurgical drilling assisted in an updated resource estimate and mine planning for potential extra mill feed for the Paulsens Mill.

Results from geochemical studies of the Wyloo Dome showed that dolerite and gabbro suites can be classified by geochemical characteristics using pXRF data.

Conclusion: NST

No further work is recommended at Paulsens East.

Mine planning is continuing at Belvedere for potential open pit operations.

The conclusion from the geochemical characterisation studies of the Wyloo Dome show that gold mineralisation at Paulsens is not related to a chemically unique suite of dykes/sills. As a result, no further work is required for this aspect of lithological control of gold mineralisation.

Drilling Summary:

Hole Type	No. of Holes	Total Drilled (m)
Diamond	127	36643
Reverse Circulation	9	1463

**Surface
Geochemistry
Summary:**

Sample Type	No. of Samples
Stream Sediment	20
Soil	2044
Auger	1730

1. Introduction

This report describes exploration activities for gold undertaken by Northern Star Resources Ltd (NST) over E08/1166, E08/1187-I, E08/1189-I, E08/1649, E08/1744, E08/1745, E08/1763-I, E08/1842, E08/1843-I, E08/1844, E08/1845, E08/1878-1, E08/1961-I, E08/2000-I, E08/2065-1, E08/2067-I, E08/2114-I, E08/2251, E08/2252, E08/2364-I, E08/2395, E47/1134, E47/1395-I, E47/1535-I, E47/1549-I, E47/1553, E47/1677-I, E08/1773-I, E47/1879-I, E47/2035-I, E47/2171-I, E47/2292-I, E47/2587-I, E47/2636-I, M08/99, M08/196, M08/222, P08/516, P08/543, P08/546, P08/565, P08/653, P47/1313, P47/1637 as part of the Paulsens Combined Reporting Group C8/2015 between the 1 June 2014 and 31 May 2015.

The tenements of the Paulsens Group are either wholly owned by NST or are part of two joint ventures. In addition, some tenements have been endorsed for iron. The principal commodity of interest by NST is gold while JV partner FMG is exploring for iron.

2. Location and Access Details

The centre of the Project area is located approximately 1,000km north of Perth, 160km west-northwest of Paraburdoo and contains NST's currently operating Paulsens underground gold mine, within the Ashburton Province of the Pilbara region of Western Australia (Figure 1). The tenements are accessed by the sealed Nanutarra-Paraburdoo Road and various mining, pastoral and exploration tracks.

Large drainage channels, steep topography and heritage sites can make access challenging and in some cases inaccessible. The climate is arid to semi-arid with very hot summers and mild winters. The average rainfall is typically low, between 200 and 250mm, although occasional local flooding occurs in the summer months associated with tropical lows.

3. Tenement Details

Tenement Information

Tenement	Grant Date	Expiry Date	Holder	Expenditure (\$)	Area Size (KM2)	Area Size (BLK)
E 08/1166	11/08/2003	10/08/2015	CULLEN EXPLORATION PTY LIMITED,NORTHERN STAR RESOURCES LTD	70000	47.6	17
E 08/1189-I	11/08/2003	10/08/2015	INTREPID MINES LTD ,CULLEN EXPLORATION PTY LIMITED,NORTHERN STAR RESOURCES LTD	70000	16.8	6
E 08/1649	30/03/2007	29/03/2017	NORTHERN STAR RESOURCES LTD	70000	39.2	14
E 08/1744	05/09/2007	04/09/2017	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	70000	16.8	6
E 08/1745	08/08/2007	07/08/2017	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	70000	39.2	14
E 08/1763-I	30/01/2008	29/01/2018	INTREPID MINES LTD ,CULLEN EXPLORATION PTY LIMITED,NORTHERN STAR RESOURCES LTD	50000	14	5
E 08/1842	09/12/2008	08/12/2018	NORTHERN STAR RESOURCES LTD	50000	28	10
E 08/1843-I	16/12/2008	15/12/2018	NORTHERN STAR RESOURCES LTD	30000	14	5
E 08/1844	09/12/2008	08/12/2018	NORTHERN STAR RESOURCES LTD	15000	2.8	1
E 08/1845	09/12/2008	08/12/2018	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	30000	5.6	2
E 08/1878-I	19/04/2013	18/04/2018	FMG PILBARA PTY LTD	68000	190.4	68
E 08/1961-I	15/06/2010	14/06/2015	FMG PILBARA PTY LTD	50000	16.8	6
E 08/2000-I	16/12/2011	15/12/2016	FMG PILBARA PTY LTD	30000	53.2	19
E 08/2065-I	29/06/2011	28/06/2016	FMG PILBARA PTY LTD	30000	28	10
E 08/2067-I	29/05/2012	28/05/2017	FMG PILBARA PTY LTD	30000	22.4	8
E 08/2114-I	07/01/2011	06/01/2016	FMG PILBARA PTY LTD	20000	8.4	3
E 08/2251	11/06/2012	10/06/2017	NORTHERN STAR RESOURCES LTD	10000	2.8	1
E 08/2252	11/06/2012	10/06/2017	NORTHERN STAR RESOURCES LTD	10000	2.8	1
E 08/2364-I	05/07/2013	04/07/2018	FMG PILBARA PTY LTD	10000	2.8	1
E 08/2395	07/05/2013	06/05/2018	NORTHERN STAR RESOURCES LTD	10000	2.8	1
E 08/2499	12/11/2014	11/11/2019	NORTHERN STAR RESOURCES LTD	20000	19.6	7
E 08/2555	22/01/2015	21/01/2020	NORTHERN STAR RESOURCES LTD	10000	2.8	1
E 47/1134	06/01/2003	05/01/2016	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	70000	16.8	6
E 47/1395-I	05/06/2008	04/06/2017	FMG PILBARA PTY LTD	50000	5.6	2
E 47/1535-I	07/06/2012	06/06/2017	FMG PILBARA PTY LTD	20000	14	5
E 47/1549-I	07/06/2012	06/06/2017	FMG PILBARA PTY LTD	30000	16.8	6
E 47/1553	06/10/2006	05/10/2015	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	70000	28	10
E 47/1677-I	06/06/2012	05/06/2017	FMG PILBARA PTY LTD	30000	16.8	6
E 47/1773-I	08/06/2012	07/06/2017	FMG PILBARA PTY LTD	43500	81.2	29
E 47/1879-I	07/06/2012	06/06/2017	FMG PILBARA PTY LTD	10000	2.8	1
E 47/2035-I	08/06/2010	07/06/2015	FMG PILBARA PTY LTD	50000	22.4	8
E 47/2171-I	06/10/2010	05/10/2015	FMG PILBARA PTY LTD	30000	22.4	8
E 47/2292-I	08/12/2010	07/12/2015	FMG PILBARA PTY LTD	20000	11.2	4
E 47/2587-I	06/12/2012	05/12/2017	FMG PILBARA PTY LTD	20000	28	10
E 47/2636-I	30/05/2013	29/05/2018	FMG PILBARA PTY LTD	15000	8.4	3
M 08/99	11/02/1990	13/02/2032	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	18400	1.84	0
M 08/196	02/03/1999	02/03/2020	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	80000	7.99	0

M 08/222	22/08/2000	23/08/2021	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	22100	2.21	0
P 08/516	30/03/2007	29/03/2015	NORTHERN STAR RESOURCES LTD		0.52	0
P 08/543	02/08/2007	01/08/2015	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	2880	0.72	0
P 08/546	30/01/2008	29/01/2016	INTREPID MINES LTD ,CULLEN EXPLORATION PTY LIMITED,NORTHERN STAR RESOURCES LTD	4000	0.99	0
P 08/565	18/11/2009	17/11/2017	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	2920	0.72	0
P 08/653	17/05/2013	16/05/2017	NORTHERN STAR RESOURCES LTD	3040	0.76	0
P 47/1313	30/01/2008	29/01/2016	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	2000	0.23	0
P 47/1637	28/09/2012	27/09/2016	NORTHERN STAR RESOURCES LTD	3000	0.74	0
E 08/1187-I	22/02/2007	21/02/2016	INTREPID MINES LTD ,NORTHERN STAR RESOURCES LTD	70000	36.4	13

The tenements of the Paulsens Group are either wholly owned by NST or are part of two joint ventures. In addition, some tenements have been endorsed for iron.

The Cullen JV is a joint venture between NST and Cullen Exploration Pty Ltd (Cullen). The joint venture commenced in April 2005 initially between Intrepid Mines (formerly NuStar Mining) and Cullen. NST purchased the Paulsens gold mine and associated exploration tenement package from Intrepid in July 2010. Cullen's interest in the joint venture has now been reduced to 20% free-carried until decision to mine.

The FMG JV is a farm-in and joint venture between NST and Fortescue Metals Group (FMG). The agreement commenced in March 2013 whereby NST purchased an initial interest of 25%. Over the next two years, NST is obliged to spend \$4,000,000 on non-iron ore minerals to gain an additional 60% interest when the joint venture commences. On the 30 January 2015, NST gave notice to FMG that it had successfully earned in its 60% non-iron ore interest in the tenements.

4. Geology

4.1 Regional Geology

The Paulsens Project is located within the Wyloo Dome (Figure 1). Detailed geological descriptions of the area can be sourced from the Wyloo 1:250,000 geological sheets completed by the Geological Survey of Western Australia. The geomorphology of the Wyloo area is dominated by the Wyloo Dome which has formed flanking ridges and a central core of low rolling hills

The regional basement rocks are Archaean age (2.7Ga) basaltic greenstones with intercalated sandstones and argillites of the Fortescue Group at the base of the Hamersley Basin sedimentary and volcanic sequence. The Hamersley Basin rocks are overlain, above an angular unconformity, by the Lower Proterozoic age (1.8Ga). Wyloo Group cover rocks with shallow water conglomerate, sandstone and dolomite sequences at the base, below thick, flysch-type sandstones and siltstones. The sequence indicates prolonged subsidence and sediment accumulation within the Ashburton Trough.

The Paulsens project area is located in the north-western part of the Wyloo Dome, a northwest trending, regional doubly-plunging anticlinorium fold (Tyler & Thorne 1990). The Wyloo Dome covers an area of 60 by 25 kilometres.

In the centre of the dome, twelve kilometres east of Paulsens, a large granite body of uncertain age (the Metawandy Granite) intrudes the mafic lavas and tuffs of the Fortescue Group. Minor amounts of interbedded sediments can be identified within this older sequence, occurring around the Tombstone Prospect. The sediments grade upwards and along strike into tuffs. The Melrose Argillite within the Fortescue Group is the immediate host of the Paulsens gold mineralisation localised in an antidual axial zone. The dome was formed during the Early Proterozoic (1.6Ga to 2.4Ga) Capricorn Orogen, which produced the Ophthalmia and Ashburton Fold Belts. Post-depositional folding and uplift deformed the dome.

Marking the edge of this older core sequence in the north-western portion of the dome and to the southeast and is an upward fining sedimentary sequence with a basal sandstone unit that also hosts the Paulsens gold deposit. This unit is overlain by massive basalt flows which contain intercalated sandstones and siltstones. This volcanic sequence is capped by the Mt McGrath sediments consisting of interbedded grits, sandstones and siltstones deposited on a basin margin.

The Mt McGrath sediments are overlain by the Duck Creek Dolomites which originated as fringing reefs around the emerging dome. The grits, sandstones and siltstones of the Ashburton Formation were deposited in deeper water beyond the fringing reefs.

At least two suites of early Proterozoic 1.6Ga to 2.6Ga dolerite dykes cut basement rocks of the Wyloo Dome. The Billeroo dykes are the oldest and most numerous and are up to 50 meters thick with irregular trends, generally sub-parallel to and affected by the axial plane cleavage of the second deformation. These dykes post-date the Melrose Fault and the mineralisation. The Black Hill dolerite dykes are unweathered and strongly magnetic with steep dips and a northeast trend.

Two phases of deformation are recognised, the second of which was the most intensive. Regional metamorphism to greenschist facies was coincident with regional folding and has caused propylitic alteration of mafic rocks to chlorite-epidote-carbonate assemblages with andalusite porphyroblasts in pelitic rocks.

4.2 Local Geology

Geology of the Paulsens Project area is made up of Fortescue Group rocks and minor Wyloo Group rocks that occur in the northern

tenements. The Wyloo Group unconformably overlies the Fortescue Group. The contact between the two Groups is believed to be tectonic or partially tectonic. Most of the area is dominated by a sequence of metasediments. These are conformably overlain by a sequence of mafic volcanics.

From southwest to northeast (older to younger) the basement lithostratigraphy at Paulsens comprises laminated to thick bedded graphitic argillites and quartz arenites assigned to the Hardy Sandstone, gradationally overlain by volcanogenic sandstones and granule conglomerates of the Mt Jope Volcanics, and finally pillow basalts of the Mt Jope Volcanics. The Hardy and Mt Jope formations are assigned to the Fortescue Group. A north-northwest striking gabbro dyke, termed the Paulsens gabbro, intrudes the Hardy Sandstone and Mt Jope Volcanics.

A shallow east-northeast dipping north-northwest plunging kink up to approximately 350m across in the Paulsens gabbro separates it into two west-southwest dipping limbs exposed along the west-south-western and east-north-eastern sides of Paulsens. The kink is occupied by a massive quartz-carbonate sulphide vein array and the kink is at least to some degree the result of faulting. Several west-southwest to southwest dipping dolerite dykes intrude both the Fortescue rocks and the Paulsens gabbro. Multiple chill margins within some of the dolerites indicate up to four intrusive pulses. The dolerite dykes appear to broaden and sill along the contact between the Mt Jope sediments and overlying pillow basalts.

The Wyloo Group is subdivided by the Geological Survey (Bulletin 139, "Geology of the Ashburton Basin, Western Australia") into the basal Beasley River Quartzite, the Cheela Springs Basalt, the Mount McGrath Formation, the Duck Creek Dolomite, the June Hill Volcanics and, stratigraphically highest, the Ashburton Formation. All of these units are represented in the north western part of the tenement group.

Exploration Models and Mineralisation

Paulsens Mineralisation

The Paulsens Project is named after the historic Paulsen Mine (also known as Melrose Mine; Finucane 1939), located at the foot of a prominent quartz hill in the centre of M08/99, which was active during the period 1935 to 1940. According to Seymour, Thorne, and Blight (1988) reported mine production was 2,955t for 28.549kg gold (average recovered grade 9.55g/t). The ore body at the old workings comprised a partially oxidised quartz-carbonate-sulphide vein generally less than 2m thick and dipping roughly 30° to the northeast. The quartz-carbonate-sulphide vein was worked over a strike length of roughly 50m (140 feet), stoping extended to ~ 17m (57 feet) below surface, and the deepest shaft to 32m (106 feet). It is now recognised that the reef at the old mine represents a small splay at the western edge of a much larger mineralised vein system.

The Paulsens resource is a structurally controlled vein-hosted Au-sulphide deposit. Quartz-carbonate veins are the main host to Au-sulphide mineralisation and thickest where the Melrose Fault Zone intersects the steeply west-southwest dipping gabbroic Paulsens Dyke. The intersection of these two features defines the orientation of the mineralised vein array (~35/340°). The upper and middle part of the vein array is broadly open folded about an axis 25/310° (F2) and appears thickest in the hinges suggesting thickening of veins during folding.

Pyrite is the principal sulphide phase, occurring mainly as irregular coarse-grained veins and pyrite-cemented quartz-wallrock breccias at the margins of the quartz-carbonate veins. Incipient brecciation and cementation of the Au-pyrite veins with quartz-carbonate-pyrrhotite (latter locally forming massive veins) indicates a second phase of mineralisation.

Following a decision to exploit the Paulsens mineralisation as an underground deposit, initial resource work was undertaken in March 2004. Development of the decline commenced in July 2004 and ore was first intersected in January 2005. First gold was poured in June 2005.

Belvedere Mineralisation

The Belvedere resource is located 6.5 kilometres from the Paulsens Mine. Previous exploration has defined a non-JORC resource of 31,000 tonnes @ 4.29 g/t Au (4,334oz). NST recently upgraded this to a JORC compliant resource for a total of 251,055 tonnes @ 3.2g/t of Au (25,869 oz).

The Belvedere prospect is located immediately west of a north-northeast-trending fault with apparent sinistral strike slip displacement of about one kilometre. The Belvedere quartz veins and stopes are within splays off this crosscutting fault. The main historical workings at Belvedere occur where this fault passes along the eastern margin of a north-south trending dolerite dyke where the latter bends onto a northeast trend. This bend in the dyke may be a result of the dyke intruding along a portion of the fault early in its development. Subsequent sinistral shear movement generated across the dolerite has produced two north trending Riedel shears which are pervasively carbonate altered and contain a network of quartz veins. These veins appear to be barren.

Maximum quartz vein development occurs where these shears bend or split, producing dilatational zones plunging west at around 60°. The quartz-sulphide veins (with pyrite, arsenopyrite, galena) are up to six metres wide and extend along strike for 60m. The veins appear to pinch out to the north against a NW-trending conglomerate unit. The two veins are 30m apart and are gently folded and dip moderately to the west. Extensive areas of dolerite occur immediately adjacent to these quartz veins and may stope out parts of the mineralised vein system.

Mineralisation in the Wyloo Group

Wyloo Group rocks are considered prospective for gold (and base metals) and have been explored in the past by various companies including BP Minerals, MIM, Pasminco and Poseidon Exploration. Reactive carbonate and carbonate rich sediments and brittle rocks such as quartzites in the Wyloo Group provide suitable sites for Au mineralisation in the area.

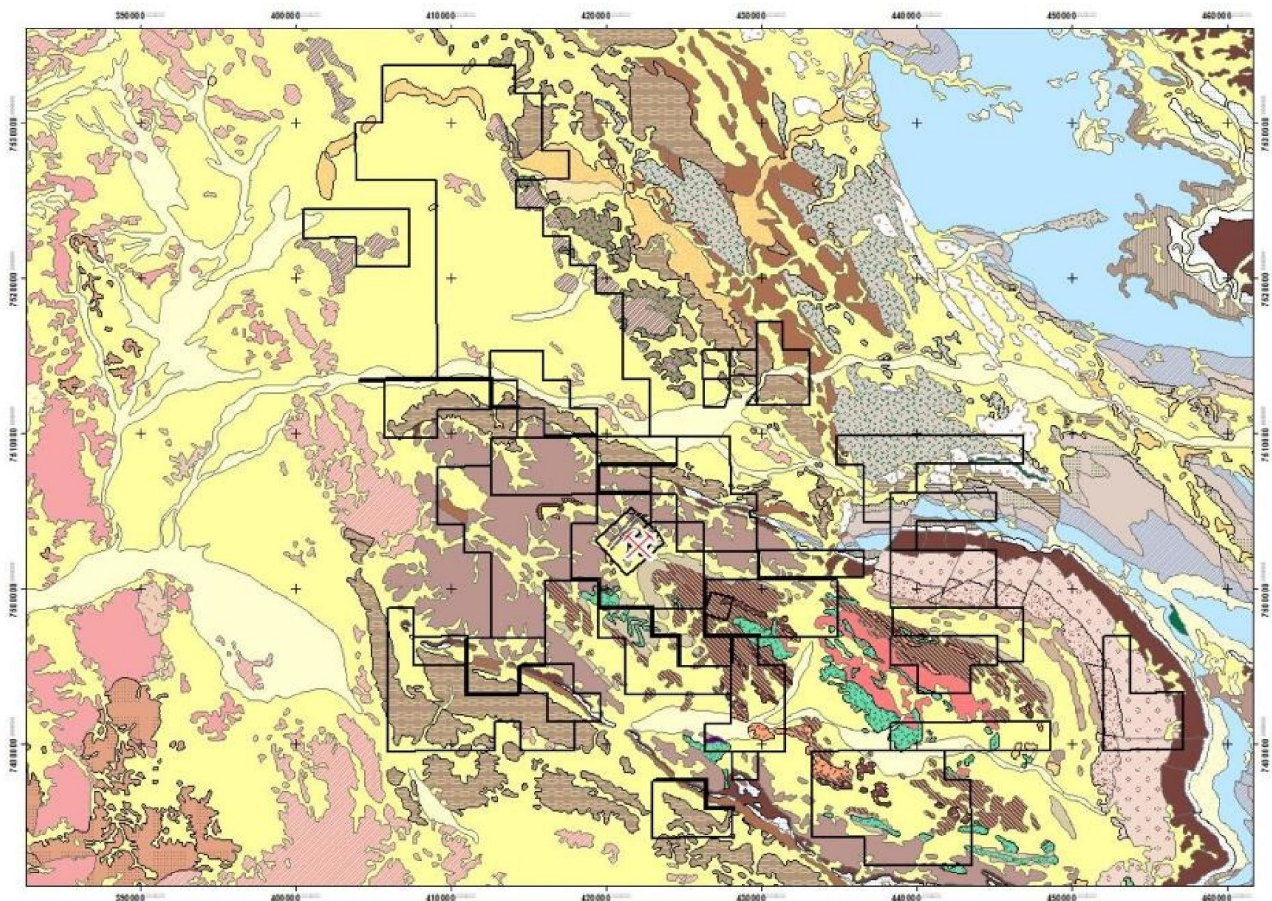


Figure 1 Regional Geology Wyloo Dome

5. Previous Exploration

This can be gleaned from previous annual reports.

6. Current Exploration

- Exploration RC/DD and resource development DD drilling in and around the Paulsens deposit
- Regional and near mine soil, auger and stream sediment sampling
- Mineral Systems Analysis – Collaboration with Centre for Exploration Targeting (CET) at University of Western Australia
- A study on the geochemistry of the Wyloo Dome
- "SIEF" Capricorn Distal Footprint – Collaboration with other ASX listed companies and CSIRO
- Regolith mapping over the Mindle Shear
- Updated resource estimation at the Belvedere deposit. As at December 2014, a Total Indicated and Inferred Resource of 251,00t @ 3.20g/t Au for 25,869oz.
- Underground mine production at Paulsens totalled 455,655 tonnes @ 5.2g/t Au for 75,607oz mined.

Tenement	Drill Type	No. of Holes	No. of Metres	Soils	Streams	Auger
M08/99	DD RC	14 9	7,016 1,463			
M08/196	DD	104	29,297			
M08/222	RC DD	6 12	911 1,872			
E08/2000				876	2	352
E08/1745				27		3
E08/2067				184		498
E47/1773				353		267
E47/1879				50		9
E47/1773						598
E08/1649				3	8	
E08/2251				111		
E08/2499				136		
E08/2252				159		
E08/1744				161		
E08/1878					8	

7. Current Exploration Summary

7.1 Geological Mapping

In early 2015, regolith mapping was completed to extend the existing map to cover the wider area of the Mindle Shear Zone, from the Red Dingo prospect area southeast through the Paulsens mine and past the Belvedere resource. The map is attached to this report as an Arc GIS map package.

7.2 Surface Sampling

Mindle Shear

The Mindle Shear Zone (MSZ) is a complex high-strain zone that ranges from 800m to 4km wide and is characterised by anastomosing shear zones, plastic deformation features and pervasive sericite-carbonate alteration. The kinematics of the zone are complex, as indicated by contrasting kinematic indicators and general stratigraphic offsets compatible with reverse, normal, and dextral strike-slip motion. The MSZ separates the southern highly deformed part of the Wyloo Dome from the generally lower strain northern part and is a splay of the Nanjilgardy Fault, which cuts across the northeastern corner of the Paulsens project area.

The Nanjilgardy Fault and the MSZ are closely associated with many of the known occurrences of gold mineralisation in the Ashburton Basin and Wyloo Dome. The Nanjilgardy Fault/MSZ represent a major long lived, structure which acted as the primary conduit for fluids. The recent Capricorn Seismic line and field mapping support this interpretation.

The area is prospective and largely untested. Previous work included small, tight spaced soil grids with limited analysis suites. A combination of soil and auger sampling will ensure that an insitu sample is collected. Multi-element analysis will be used to assess the area for multi-element anomalies.

A total of 3,774 Auger and soil samples were collected on a 800m x 50m, infilled to 200m x 50m, oblique grid using a 2mm mesh and retaining a 500g sample of the fine fraction (Figure 3). Auger drilling was undertaken over areas covered by recently transported alluvium while soil samples were taken over areas of outcrop, sub-crop, in-situ weathering and colluvium.

All the samples were submitted to BV Ultratrace Laboratory and analysed for Au (BLEG and aqua regia with ICP-MS determination), Pd and Pt (fire assay with ICP-OES determination). The rest of the multi-element suite was variously analysed by aqua regia digest with ICP-EOS/MS determination and 4 acid digest with ICP-MS determination.

Results from both the auger and soil sampling programmes were disappointing though there were some anomalous gold results northwest of Paulsens mine. These were questionable as they did not support the first pass results or did not have elevations in any other elements. These check samples were re-analysed at BV-Ultratrace and the results returned <10ppb Au. The relevant pulps were also re-analysed to ensure there were no issues at the laboratory itself.

Regional

An extensive helicopter-borne stream sediment survey was completed towards the end of the reporting period in November 2014 which

covered a large part of the Ashburton Basin, of which 20 samples were collected within the Paulsens Group. These samples were also submitted to BV-Ultratrace Laboratory for multi-element analyses.

Full interpretation is still pending at the time of writing this report but preliminary analysis shows no gold anomalism encountered within the Paulsens Group however pathfinder element results immediately northwest of Paulsens mine require follow up with infill sampling.

The Red Dingo Prospect lies 10km northwest of Paulsens and 5km west of Merlin. Gold mineralisation at Merlin was discovered when BP Minerals conducted BLEG stream sampling. Subsequent soil sampling defined targets which were tested with RAB drilling that returned a number of >1 g/t intersections. Follow-up RC and diamond drilling returned positive results including 27m @ 1.4 g/t from 4m and 23m @ 1.6 g/t from 92m (including 8m @ 4.3 g/t from 97m). The resource calculation at Merlin defined 523,000t at 1.4g/t for a total of 24,000oz of gold.

Historically the prospect was covered by 6 tenements, each with different holders. This may have been the reason why minimal work has been carried out. Re-interpretation of regional stream sediment data has identified an anomaly over the area, which requires follow up work. Red Dingo shares many geological similarities with Merlin. 558 soil samples were collected.

Soil samples identified weak anomalism that appear to be oriented parallel to the fold axis of the Paulsens Anticline. These samples require field investigation and infill sampling.

7.3 Drilling

Resource Development - Paulsens In Mine/Near Mine Paulsens In Mine

Underground resource development drill holes comprised the drilling of 92 holes for 20,464m to assess the Paulsens, Titan and Voyager 2 lodes. In-mine exploration comprised 26 RC and DD holes for 14,859m at Galileo, Paulsens East and Southern Gabbro lodes. Figure 3 shows the spatial relationship of the Paulsens mine lodes.

½ core samples were submitted to BV-Ultratrace Laboratory where they were analysed for gold only by fire assay followed by ICP-OES determination.

The Voyager 1 and 2 lodes currently supply all the gold being produced at Paulsens. From early 2014, drilling programmes targeted gold mineralisation within the quartz host-rock and results have been significant as they show that the Titan lode shares many characteristics with the Voyager lodes. In last quarter of FY2015, the Voyager lodes increased to 278,000oz at 10.4g/t Au with ore development in this area leading to a 20% increase in mill grade from the previous quarter.

Voyager 2 produced a best intercept of 0.3m @ 2,146g/t Au from 77m in PDU3308 with the Southern Gabbro also exhibiting high grade along multiple widths. Examples from the Southern Gabbro include: 0.32m @ 188g/t Au from 191.68m and 0.53m @ 458g/t Au from 214.5m in PDU3283; 0.98m @ 16.9g/t Au from 119m and 0.37m @ 24.8g/t Au from 307.39m in PDU3070.

Resource development and in-mine exploration drilling in 2015 will continue to target high grade extensions to the Voyager 2 and Titan lodes as a priority.

Paulsens Near Mine

The Aries Prospect is located on M08/196 within the greater Paulsens Mine footprint. In 2009, Intrepid Mines completed a directional drilling programme to define down plunge extensions of the Paulsens Mine "Voyager 1" mineralisation. A drill intercept of 13.1m @ 30.15g/t Au (from 100.4m in PLDD015) was unexpectedly intersected high in the stratigraphy within the Tin Hut Basalt. Here, mineralisation is characterised by a quartz-ankerite vein ± pyrite, galena and sphalerite. On approach to the vein, the basalt is mylonitized, exhibiting predominately dextral strike-slip kinematics.

In June 2013, NST tasked geological consultants Jigsaw Geosciences to complete a geological and structural review of the Paulsens Mine which resulted in a new interpretation that mineralisation and its host rocks are strongly influenced by large-scale shear systems most likely associated within the Nanjilgardy Fault. These shears are believed to have introduced gold-bearing fluids into the mineral system. Previous geological models for Paulsens very rarely discussed the impact of shear systems on the local mine geology. Deformation was largely interpreted to be the result of flexural slip and/or brittle failure. Shearing had been interpreted to have occurred after the main gold event.

Five RC holes (PAVRC0012-0016) were consequently drilled for a total of 684m to test for strike extensions and orientation of gold mineralisation identified in historic drill hole PLDD015. The area is known for excessive deviation in azimuth and dip with slow drill rates. PAVRC012 was abandoned at 87m and redrilled as PAVRC016 with the latter having deliberately altered dip and azimuth to compensate. The samples were submitted to BV-Ultratrace and analysed for Au, Pd and Pt (fire assay with ICP-OES determination). The rest of the multi-element suite was assayed by 4 acid digest with ICP-OES/MS determination.

Lithology is dominated by fine to medium grained, moderate to strongly foliated, calcite-altered basalts. Quartz-chlorite-calcite amygdaloids tend to elongate along the foliation and exist predominantly in the finer grained portions of the drill holes. A narrow unaltered, medium grained, equigranular and massive dolerite dyke intrudes into the basalt in PAVRC0012 at 68–70m, PAVRC0015 at 24–33m and PAVRC0016 from 78–90m. Narrow zones of pervasive sericite - calcite ± ankerite alteration with increased strain, veining and sulphides (py - po ± gl ± cp ± sph) were observed in all the drill holes. PAVRC0016 intersected a quartz ± ankerite vein with up to 15% sulphides (py-po-gl) between 146–149m, this interval returned 3m @ 6.11ppm Au and 21166.6ppm As. The following metre consisted of a sericite-fuchsite-ankerite schist with 10% quartz ankerite veins and 5% sulphides and anomalous gold grades (0.21ppm). Significant intercepts are summarised in the table below.

Table 2 Aries Prospect – Significant Intercepts

Site ID	From	To	Sample ID	Au ppm	Ag ppm	As ppm	Bi ppm	Cu ppm	Mo ppm	Pb ppm	Pd ppm	Pt ppm	Sb ppm	Ta ppm	W ppm	Zn ppm
PAVRC0013	67	68	NPGED0012560	2.86	13	556	1.4	156	2	8910	0.01	0.01	12.4	0.1	0.5	758
PAVRC0013	68	69	NPGED0012699	0.43	1.5	221	0.1	70	1	848	0.015	0.01	1.4	0.2	0.5	284
PAVRC0016	146	147	NPGED009968	11.8	1.5	2110	0.9	980	5	538	0.005	0.005	12.6	-0.1	3	82
PAVRC0016	147	148	NPGED009970	4.53	1	2840	0.2	960	6	91	0.005	0.005	13.5	-0.1	3	34
PAVRC0016	148	149	NPGED009971	2.01	1	1400	0.2	316	6	69	0.005	0.005	10	-0.1	3	102
PAVRC0016	149	150	NPGED009972	0.21	-0.05	1220	-0.5	108	2.5	64	0.01	0.01	30.3	-0.1	1	

At the Paulsens mine itself, mineralisation outside the quartz host is observed parallel to the regional southwest dipping foliation and parallel to the sub-vertical shear foliations. At this stage, the relationship between the gold grades returned in PLDD015 and PAVRC0016 are unclear. Recommendations of a single diamond hole from the surface will test whether the mineralisation can be correlated. In addition, structural data collect will help define the orientation of the vein and assist in future drill planning.

Paulsens East

Paulsens East is located ~1km northeast of the Paulsens mine box cut and a programme of 9 RC holes with DD tails (PAVRCD0001-0002, 0017-0020, 022-023) was completed for 1,508.2m. This 2nd phase of the programme was initiated in October 2014 and is on-going into the 2015 reporting period. Drilling was designed to test Paulsens-style gold mineralisation north of the Hardey Fault, up-plunge of the Gallileo vein and a narrow shear-bound vein in the Tin Hut Basalt.

No significant results were returned and no further work is recommended.

Belvedere

The Belvedere Prospect is located on M08/222, ~5km southwest of the Paulsens gold mine, within a sequence of mafic volcanic and sedimentary rocks of the Mt Roe Formation. In the 1930's, the area was mined for gold through a series of shallow shafts.

In 1998, Taipan Resources drilled 32 RC holes for 2,453m. Significant intercepts included 5m @ 8.8g/t Au from 12m depth. NST completed two more drilling campaigns, in 2011 and 2012, including 33 RC, 1 RCD and 1 diamond hole for a total of 5,200 metres. The best result to date is 9m @ 12.7g/t Au from 73m (PBERC0021).

Previous mapping, structural interpretations and 3D modelling completed by consulting geologists have improved the understanding of the area which has led to the generation of the current exploration targets.

Consequently, 12 RC holes with 2 diamond tails were completed for a total of 1,650.5m to test down plunge extensions to known gold mineralisation, increase the data on the poorly constrained Belvedere Fault mineralisation and test conceptual targets generated through structural mapping, drill interpretation and 3D modelling (Figure 5).

The samples were submitted to BV-Ultratrace and analysed for Au, Pd and Pt (fire assay with ICP-OES determination). The rest of the multi-element suite was assayed by 4 acid digest with ICP-OES/MS determination.

A cross-section through the mineralisation allowed new and improved geological interpretations (Figure 6). Remodelling of the mineralisation has defined four zones of mineralisation: the main lode; footwall lode; hanging wall lode and Belvedere Fault mineralisation.

Mineralisation is located within quartz ± ankerite/calcite veins with associated patchy to massive galena - pyrite ± arsenopyrite that form within the Belvedere Dolerite Dyke. A strong sericite - ankerite ± silica ± albite alteration halo surrounds the veins overprinting all primary doleritic textures and bleaches the rock. Table 3 summarises significant gold intercepts. Following completion of this drilling, the resource was re-estimated and is discussed in the following section.

Table 3 Belvedere Significant Gold Intercepts

Hole ID	From (m)	To (m)	Width (m)	Au (ppm)
PBERC0038	0	4	1	23.6
PBERC0040	154	155	1	0.51
PBERC0044	38	39	1	3.33
PBERC0044	45	49	4	4.09
PBERC0044	113	114	1	10.3
PBERCD0045	68.8	69.4	0.6	6.85
PBERCD0045	71.5	72.3	0.8	1.82
PBERCD0045	77.05	79.65	2.6	2.46
PBERCD0045	173.8	174.25	0.45	10.9
PBERCD0046	65.15	66.95	1.8	1.4
PBERCD0046	72.8	73.6	0.8	5.58

7.4 Resource Estimations/Revisions

As at 30 June 2015, the mineral resource estimate for Paulsens is for a total of 2.262Mt @ 2.4g/t Au for 441,000oz.

An updated resource estimate was completed at the nearby Belvedere deposit which has resulted in a total resource of 251,055t @ 3.2g/t Au for 25,869oz. Additional expenditure is warranted and it is proposed that geotechnical and geometallurgical drilling is required to further assess the economic viability of the deposit as potential extra mill feed for the Paulsens Mine. In addition, an assessment on the deep extensions is also warranted due to the fact that the deposit is cut off by an east-west fault.

7.5 Mining

YTD production as at 30 June 2015 is 455,655 tonnes @ 5.5g/t Au for 75,607 oz mined.

7.6 Other Activities

Mineral Systems Analysis

During the reporting period, the CET at UWA was engaged to provide a new structural analysis of the Ashburton Basin and to identify potential exploration targets. The targeting approach taken in this study builds on mineral system analysis, which has been developed over the last 15 years and synthesised in recent publications by Cam McCuaig et al at CET.

Mineral systems analysis relies on identifying different stages of mineralisation that leave signatures in geological, geophysical, geochemical and remote sensing datasets which can be mapped. An innovation developed during the course of McCuaig's work was to separately identify both a confidence in the quality of the geological interpretation and a ranking that measures the likelihood that any given geological feature contributed to mineralisation. The final report prepared by the CET with key recommendations can be found in Appendix 2. A summary of the 20 top-ranked targets is shown in Figure 7. GIS files and the final GIS map are contained in an ArcGIS Layer Package "Mineral Systems Analysis_Final".

Research - "SIEF" Capricorn Distal Footprint Studies (CSIRO)

In early 2013, NST was approached by CSIRO about a collaborative research project that involves the study of the distal footprints of giant ore deposits in the Capricorn Orogen however, the outcomes can be applied elsewhere in areas under cover. This 4 year project up to 2017 involves CSIRO-CET/UWA, Curtin and GSWA with funding secured from government ("SIEF" – Science and Industry Endowment Fund), research institutions and private industry. NST is one of the successful industry participants and meets regularly with other participants for workshops and seminars and contributes to the funding on an annual basis. As this work is on-going until 2017, there are no current reports per se, to refer to, however the Capricorn Case Study Summary and Work Programme are included in Appendix 3.

Geochemical Chemical Studies - Paulsens Mine and Wyloo Dome

An extended programme of XRF sampling in mid 2014 was conducted in order to investigate if there are any geochemical similarities between the gold mineralised Paulsens Mine Gabbro and the north-trending dolerite or folded gabbro suites. If the results are positive then this can be used for exploration targeting throughout the Wyloo Dome. As at the time of writing this report, interpretation was still in progress.

The studies involved the collection of dolerite and gabbro samples to determine if different suites of intrusive can be classified by geochemical characteristics using immobile element ratios with data collected from a portable (p)XRF. Other important questions which may be answered include:

- Are the Mine Gabbro and kinked north-trending dolerites a part of the same suite?
- How does the mine gabbro compare to the Belvedere and Tombstone dolerites? If they are from the same suite how will this effect target generation in the area?
- Does the mine gabbro compare to the gabbro with plagioclase xenocrysts (cat rock) logged in the PLDD series of holes? How do they compare to the Tin Hut Basalt?

Sample locations were selected prior to completing field work using aerial imagery, magnetic data and existing geology maps. The following suites were separated out:

1. North trending dolerite (often folded)
2. Northeast trending dolerite
3. Northwest trending dolerite
4. Gabbro, samples of the mine gabbro will be treated separately.

Notes were made on how the intrusive was interpreted along with any comments which may be important at a later date such as; if the dykes are folded, any named dykes or those where its suite was not obvious.

Multi-element data were sampled by pXRF. Three readings were taken on different surfaces on each of the samples. In addition, samples were pulverised and an extra sample taken. Analysis of the results will determine if multiple readings on the same sample gives comparable results to a pulverised sample. 90-second beams were used to test the samples using soils and geochemistry modes to achieve a spread of elements.

Preliminary interpretation of data using ioGAS shows that the dolerites and gabbro can be characterised using geochemistry. The north trending folded and unfolded dolerites were grouped together as they showed no chemical variation. Results showed that the Mine Gabbro, north and northwest trending dolerites have similar chemistries, however, they can be differentiated using elements such as Zr, Ti and Cr as shown below. Northeast trending dolerites have vastly different chemistry compared to the other dykes and have been left out of some of the analysis.

Figure 10 graphs

As mentioned earlier in this section, complete interpretation with recommendations is still pending.

8. Conclusion and Recommendations

Results from in-mine Paulsens resource development and exploration drilling in 2015 were very positive and will continue to target high grade extensions to the Voyager 2 and Titan lodes as a priority.

Near- mine, at the Aries Prospect, recommendations for a single diamond hole from surface will test whether historic high grade mineralisation can be correlated with lower grade results from current drilling. In addition, structural data collect will help define the orientation of the vein and assist in future drill planning.

Near-mine at Paulsens East, testing up-plunge of the Gallileo Lode, led to no significant intercepts being received and no further work is recommended.

Results from drilling at the Belvedere Prospect were not as promising as anticipated however it is recommended to re-log adjacent historic holes to reduce logging inconsistencies in order to provide a better interpretation and geological model.

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Appendices

No Appendices as text are available