



# **YILGARN EXPLORATION VENTURES PTY LTD**

## **CO-FUNDED DRILLING REPORT**

For the Period

1 August 2020 to 31 March 2021

Desdenona EIS (R21)

PREPARED BY:	James POTTER
AUTHOR:	James POTTER
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	Kin Mining NL

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# 1. Bibliographic Data Sheet

Project Name: Desdemona North  
Combined Reporting Number: C60/2016  
Tenement Numbers: E37/01326, E37/01201  
Tenement Operator(s): YILGARN EXPLORATION VENTURES PTY LTD  
Report Type: Co-Funded Drilling  
Report Title: Desdenona EIS (R21)

Report Period: 1 August 2020 to 31 March 2021  
Author: James POTTER  
Submitted By: James POTTER  
Report Date: 18 May 2021

Map Sheets: *1:250,000 Map Sheet* *1:100,000 Map Sheet*  
SH51-05 (MENZIES) 3139 (MELITA)

Target Commodity: GOLD  
Prospects Drilled: Paradise North  
PoW Number: ID 87939 and ID 86609  
Geophysical Survey Reg No: Assays:  
Selected 4m RC composites and 1m selected core for XRF100 (Bureau Veritas): Fe (100) SiO<sub>2</sub> (100) Al<sub>2</sub>O<sub>3</sub> (100) MnO (10) TiO<sub>2</sub> (10) CaO (100) MgO (100) K<sub>2</sub>O (10) P (10) S (10) Na<sub>2</sub>O (100) Cu (10) Ni (10) Co (10) Cr (10) Pb (10) Zn (10) As (10) Sn (10) Sr (10) Zr (10) Ba (10) V (10) Cl (10) LOI (0.01%) Laser Ablation/ICP-MS (LA101): Ag (0.1) As (0.2) Ba (0.5) Be (0.2) Bi (0.2) Cd (0.1) Ce (0.02) Co (0.1) Cr (1) Cs (0.01) Cu (2) Dy (0.01) Er (0.01) Eu (0.01) Ga (0.1) Gd (0.01) Ge (0.05) Hf (0.01) Ho (0.01) In (0.05) La (0.01) Lu (0.01) Mn (1) Mo (0.2) Nb (0.01) Nd (0.01) Ni (2) Pb (1) Pr (0.01) Rb (0.05) Re (0.01) Sb (0.1) Sc (0.1) Se\* (5) Sm (0.01) Sn (0.2) Sr (0.1) Ta (0.01) Tb (0.01) Te (0.2) Th (0.01) Ti (1) Tl (0.2) Tm (0.01) U (0.01) V (0.1) W (0.5) Y (0.02) Yb (0.01) Zn (5) Zr (0.5) and Fire assay for Au, Pt, Pd (FA003- 1ppb)

## Abstract

**Location:** The Desdemona North Project is located 230km north of Kalgoorlie and 10 km south of Leonora and the Gwalia gold mine in the Yilgarn Block of Western Australia. Access to the project is by a sealed road and via cleared tracks from the sealed Kalgoorlie to Leonora road.

**Geology:** The Paradise North prospect occurs in the Gindalbie Domain of the Kurnalpi Terrane separated in the west by the Mt George Shear Zone or Ockerburry Fault from the Kalgoorlie Terrane. Most of the area is covered by Cenozoic deposits including lake sediments, colluvial gravel and sands, overlying a stripped thin saprolite over Archaean bedrock. The bedrock in the drilling was dominated by siliceous felsic sediments, with minor mafics intruded by variable thicknesses of porphyries. Encouraging gold anomalies occur in two of the three diamond holes including 4m at 1.13 g/t Au and 15m at 0.51 g/t Au.

**Work Done:** The EIS programme at Desdemona North consisted of three diamond drill core holes for 1749.9m of core (20SDDD001, 20SDRC011D, 21DSDD003) and 11 RC holes, and one RC pre-collar totaling 1770.3m of RC drilling.

**Results:** The primary aim of the programme was to test and enhance the predicted mineral system targeting from Machine Learning and obtaining structural and lithological information. The drilling programme identified gold anomalies of 6m at 1 g/t Au, 1m at 0.31 g/t Au in the diamond drillholes and defined the geology under cover but failed to locate the predicted ore grade mineralisation in the first drilling programme.

**Conclusion:** Further review of the data will be completed to determine if any vectors to economic gold mineralisation are present and continue to improve the Discriminant Predictive Targeting (DPT) system for exploration in the Yilgarn and elsewhere.

Drilling Summary:	Hole Type	No. of Holes	Total Drilled (m)
	Reverse Circulation	12	1770
	Diamond	3	1750

## 2. Introduction

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SensOre Ltd, through its subsidiary Yilgarn Exploration Ventures Pty Ltd, applied its Machine Learning and Artificial Intelligence workflow, Discriminant Predictive Targeting® (DPT®) system, to gold exploration targeting in the Yilgarn Craton. In 2019 the Desdemona North target was identified by DPT and an interest is being acquired through a joint venture with the tenement owner Kin West Pty Ltd (a subsidiary of Kin Mining NL).

An application to the CO-FUNDED GOVERNMENT – INDUSTRY DRILLING PROGRAM for the drill test component of the program was made in March 2020. In May 2020 Yilgarn Exploration Ventures was informed the application was successful and drilling could commence in July 2020. This final report on the drilling was compiled by Rick Berg Geological Consultants with a contribution on the geochemistry from Sophie Hancock and drilling details provided by James Potter from SensOre Ltd.

### 3. Location and Access Details

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The Desdemona North Project is located 230km north of Kalgoorlie and 10 km south of the regional town of Leonora. Access to the project is via the sealed Kalgoorlie to Leonora road and Leonora is serviced by regular weekly flights to Perth.

## 4. Tenement Details

### Tenement Information

Tenement	Grant Date	Expiry Date	Holder	Expenditure (\$)	Area Size (KM2)	Area Size (BLK)
E 37/1326	14/11/2018	13/11/2023	KIN WEST WA PTY LTD		92.4	33
E 37/1201	29/05/2015	28/05/2025	KIN WEST WA PTY LTD		11.2	4

The Desdemona North project consists of five granted Exploration Licences granted to Kin West WA Pty Ltd. The JV tenement area covers 60 square km. This Co-Funded drilling programme was completed on E37/1201 and E37/1326. Tenement details are listed in Table 1 below and the location is shown on Figure 1.

Table 1 Desdemona North- Tenement Details

Project	Holder	Tenement	Details	EL Block s	Ar ea Km 2	Tenement Grant Date	Tenement Expiry Date	Expenditure Commitment: (Annual)
Desdemona North	Kin West WA Pty Ltd	E 37/115 2		5	15	12/12/2013	11/12/2023	\$30,000.00
Desdemona North	Kin West WA Pty Ltd	E 37/115 6		2	6	30/01/2014	29/01/2024	\$30,000.00
Desdemona North	Kin West WA Pty Ltd	E 37/120 1		4	12	29/05/2015	28/05/2025	\$20,000.00
Desdemona North	Kin West WA Pty Ltd	E 37/132 6	6 of 33 blocks	6	18	14/11/2018	13/11/2023	\$33,000.00
Desdemona North	Kin West WA Pty Ltd	E 40/283	3 of 20 blocks	3	9	23/03/2011	22/03/2021	\$70,000.00
<b>Totals</b>				<b>20</b>	<b>60</b>			<b>\$183,000.00</b>

## 5. Geology

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### 5.1 Regional Geology

The Desdemona North project is located in the Gindalbie Domain of the Kurnalpi Terrane, separated by the Mount George shear zone and/or Ockerburry Fault from the Kalgoorlie Terrane (GA Record 2006/5).

The north trending Mount George shear zone separates the Raeside Granite Dome in the west from the younger greenstones of the Gindalbie domain in the eastern part of the project. The older Jasper and overlying Gwalia mafic-ultramafic sequence with Mt George chert, sediments of the Leonora greenstone belt in the Kalgoorlie Terrane appeared not developed or not yet identified in the project area (Figure 2). The area is mostly covered by salt lakes in the northern part and alluvial, colluvial gravel and sand in the remaining part of the area. Only some Archaean outcrops exist on the eastern side of the area.

The 2.68-2.69 Ga old volcanic centre of the Melita complex occupies the north eastern part of the domain consisting of intensely folded pillow basalts, layered gabbro's and minor rhyodacite sills, overlain by coarse felsic volcanics and rhyolitic lava flows (Figure 2). Some outcrop of sediments occurs west of the Melita Complex and consist of mica schists from sandstone, siltstones with chloritoid and minor black shale, chert bands. This zone is interpreted to continue intermittently north towards the Keith Kilkenny Shear zone.

The western part of the domain, east of the Raeside granite, has mainly been interpreted from aeromagnetic imagery and generally shallow drilling where available. Interpretation varies from NS trending felsic volcanic and volcanoclastic rocks shown on the 500k GSWA geology map to the continuation of basalt of the Melita Formation, adjacent to a narrow sheared mafic and felsic unit, separating it from the Raeside granite on the digital 100K interpreted bedrock geology (100k\_IBG).

### 5.2 Local Geology

Most of the Desdemona North JV area is under lake sediments and colluvial gravel, sand cover, that may vary from at least 10-60m thickness above the Archaean bedrock. Although the joint venture area is interpreted to be underlain by commonly deeply weathered felsic volcanics and volcanoclastic sediments (GSWA, 500k), some mafic, andesitic component is found to be present at the eastern edge of the project. A lighter gravity signature in the central part of the project area may reflect the presence of felsic intrusions and this area was targeted by the Co-funded RC drilling programme as shown in Figure 3. The sequence is intensely deformed and folded, dipping shallowly to the east based on the recent diamond drilling.



## 6. Previous Exploration

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Previous exploration over the area was completed by Sons of Gwalia/Dalrymple, Esso, Amoco, Horizon and more recently Kin Mining highlighted several anomalous prospects, including (see their website):

- Annapurna/Gwalia South which returned 4m @ 15.13g/t Au (170-174m) from aircore and RC drill results.
- Paradise and Paradise North returned resp. 6m @ 1.34g/t Au and 12m @ 3.57g/t Au within sub-parallel trends to the Gwalia Shear Zone.
- The Hotspot prospect which revealed a rock chip sample grading 16.6g/t Au.

These anomalous results were associated with the Paradise North- Charcoal shear trends, the Paradise, Hotspot trend and Mt George-Annapurna-Charcoal West trend. The modelled target system from Yilgarn Exploration Ventures is expected to be part of the Paradise N-Charcoal mineral system (Figure 4). The modelled Desdemona Target zone is located in the Paradise North mineralised corridor (Figure 4).

## 7. Current Exploration

The work completed under the current Co-Funded drilling programme consisted of 11 RC drillholes and three diamond core holes. The RC drilling was completed in July 2020 by Topdrill Pty Ltd and the diamond drilling by West Core Drilling Pty Ltd in both 2020 and 2021. Details of the drill hole locations and depths are listed in Table 2 below.

A total of 1749.9m of diamond core was drilled in two holes and 1770.3m RC in 12 holes including 149.3m as pre-collar to diamond hole 20DRRC011D. The first two RC holes were abandoned due to difficult drilling conditions with puggy channel clays.

The RC drilling was initially sampled on a 4m composite basis and submitted to Bureau Veritas for Au, Pt, Pd by fire assay (FA003- 1ppb DL) with selected lithologies of interest for whole rock elements by XRF after Lithium Borate fusion for 24 elements (XRF100) and multi-elements by fused bead Laser Ablation ICP/MS (LA101). Any anomalous gold samples (over 100ppb) are re-analysed on a 1m basis by fire assay for Au, Pt, Pd.

The diamond core was half cored and generally sampled on at least a one metre basis for the same suite of elements as the 4m composite RC samples. The core was marked, orientated and photographed before logging and sampling. The half core has been submitted to the DMIRS core library.

All sampling, logging files and SensOre geology codes are given in Attachment 1.

A detailed 200m spaced gravity survey was completed over the project area prior to the drilling period to allow for final siting of the drill holes. The RC drillholes were primarily sited to test the predicted Desdemona mineral system target in a gravity low, derived from nominal 400 x 200m ground gravity stations and inferred to be a possible felsic intrusive into a mafic- sedimentary sequence (Figure 3).

The northern pre-collared diamond hole 20DSRC011D was sited to test the depth extent of the Paradise N gold mineralisation in possibly deeper east dipping mafic sequence. The southern diamond hole, 20DSDD001, planned to test deeper mafic units associated with an extensive multi-element geochemical gold target. The final deeper diamond hole 21DSDD003 was designed to test the deeper DPT target with the Leonora (Gwalia) stratigraphy predicted to be intersected below 700m.

Table 2 Desdemona North Project- 2020 Co-Funded Drillhole Locations

Hole ID	Hole Type	Pre collar	Max Depth	Grid	East	North	Dip	Azi
depth								
20DSRC001	RC		48	MGA94_51	338402	6788395	-60	270
20DSRC002	RC		12	MGA94_51	337599	6788399	-60	270
20DSRC003	RC		144	MGA94_51	337603	6788397	-60	270
20DSRC004	RC		198	MGA94_51	338199	6788400	-60	270
20DSRC005	RC		198	MGA94_51	337600	6788000	-60	270
20DSRC006	RC		171	MGA94_51	337804	6788002	-60	270
20DSRC007	RC		166	MGA94_51	337801	6787600	-60	270
20DSRC008	RC		174	MGA94_51	337399	6787599	-60	270
20DSRC009	RC		156	MGA94_51	337999	6787597	-60	270
20DSRC010	RC		132	MGA94_51	337795	6788398	-60	270
20DSRC011D	DD	149.3	468.7	MGA94_51	338657	6789270	-55	270
20DSRC012	RC		222	MGA94_51	338398	6788403	-60	270
20DSDD001	DD	0	451.9	MGA94_51	339020	6788290	-60	270
20DSDD003	DD	0	978.6	MGA94_51	337912	6789805	-60	310

## 8. Current Exploration Summary

### 8.1 Drilling

The locations of the EIS drillholes on the interpreted geology is given in Figure 4 and a summary of the drill lithologies is given in Table 3.

The main rock types intersected were:

- Felsic to intermediate, siliceous meta sediments with sulphidic black shales, folded, and deformed with extensively boudinaged quartz veins as illustrated in Figure 5.
- Mafic schist, basalts, particularly well developed in lower part of the mineralised hole 20DSRC011D as shown in Figure 6.
- Thin felsic to intermediate porphyries, and possible lamprophyre that could be significant for presence of gold mineralisation. An example is shown in Figure 7.

The cumulative distribution of the main rock types by drillhole are shown in Table 3 and Figure 4.

The best gold values were intersected in the pre-collared diamond drillhole 20DSRC011D with a best intercept of 6m at 1.0 g/t Au from 31m and in diamond hole 20DSDD001 with 1.06m at 0.31 g/t Au from 74.94m at the contact of graphitic shales and siliceous sediments. Both anomalous intersections have high As. values of 200-2000ppm.

Some of the initial logging may need to be adjusted incorporating the detailed whole rock and trace element geochemistry. Further details of the geochemistry are given below.

Table 3 Cumulative distribution of the main rock types by drillhole

HoleID	Black shale	Lamprophyre	Mafic schist	N S	Porphyry	Sediment	Transported	Felsics and Intermediate	Veins	Grand Total
20DSDD001		0.4	30.35		6.5	411.4	2.6		0.65	451.9
20DSRC001							48			48
20DSRC002							12			12
20DSRC003			42	26			76			144
20DSRC004	80		46		6		66			198
20DSRC005	146						51		1	198
20DSRC006	129						42			171
20DSRC007	121						45			166
20DSRC008	100						74			174
20DSRC009	127						29			156
20DSRC010	44						88			132
20DSRC011D	138.3		269.3		20.67	29.44	11			468.7
20DSRC012	163						59			222
21DSDD003		1.5	535.1				20.7	418.39	2.95	978.6
Grand Total	1048.3	0.4	387.6	26	33.17	440.84	603.6		1.65	2541.6

### 8.2 Lithogeochemistry Review

Drilling geochemical data was used for applied lithogeochemistry to evaluate and interpret rock types, alteration, and pathfinder patterns. At each project stage rock classifications commonly change. Importantly, each stage has different limitations and purposes for rock description and classification. Geological logging identified 18 rock types: 4 felsic, 2 intermediate, 2 mafic, 1 ultramafic, 3 metamorphic, 3 sedimentary, 2 transported cover/regolith and 1 vein. This was used to aid exploratory data analysis and interpretation. Silica content varies 42-81% and was used to classify broad felsic, intermediate, and mafic groups.

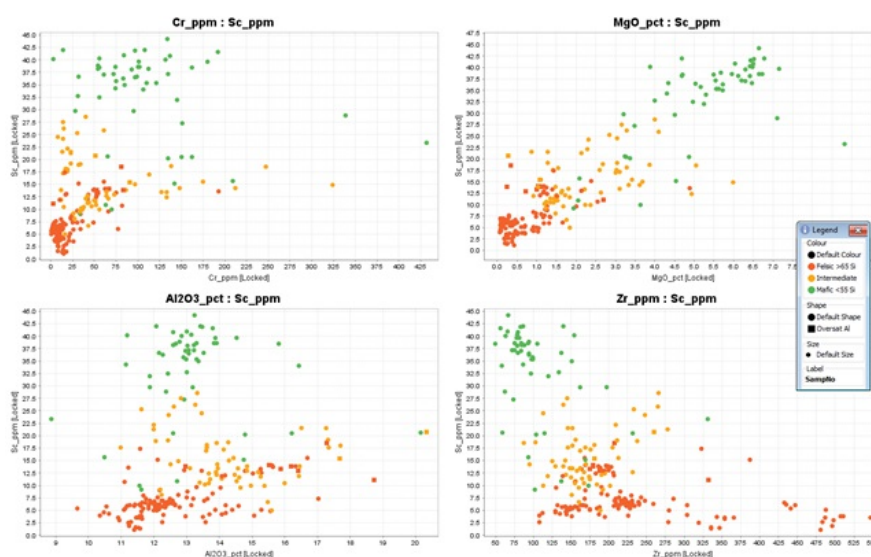
Volcaniclastics commonly have a much wider scatter than igneous rocks. Much of the data here looks like volcaniclastics, although with a small dataset there are not many coherent clusters. Ideally, each sample would be assigned a rock type category based on its multivariate chemistry, but this would be overly time-consuming given the chemical variability within the dataset.

The rocks plot in the metaluminous (most common, lack of Al-rich modal minerals) to peraluminous range (likely modal mineral abundance of Al rich minerals e.g. muscovite), with some samples extremely enriched in Al. Differing workflows were applied to the meta-volcanic and meta-sedimentary samples, using the logged lithology and the geochemistry data to explore on standard diagrams how the samples plotted. Whole rock classification for igneous rocks for meta-volcanic and unknown protolith samples the total alkali-silica (TAS) schema based on major elements is used.

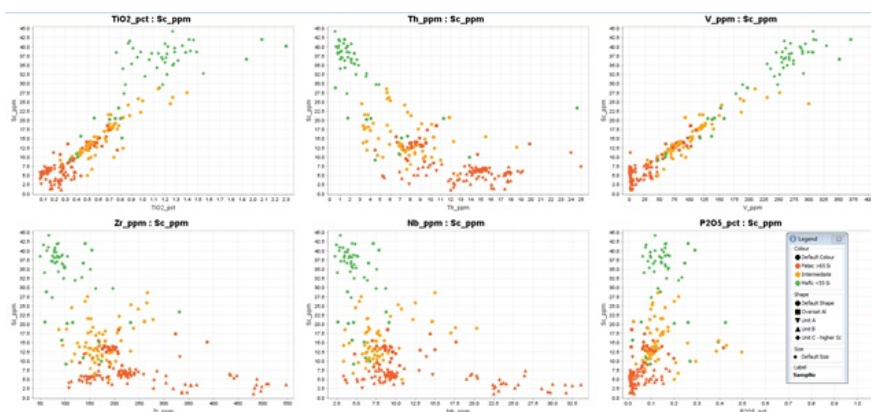
For sedimentary and metasedimentary rocks, the provenance signatures are plotted using major elements (Al, Ti, Fe, Mg, Ca, Na, K) to separate the rocks into felsic, quartzitic, mafic and intermediate provenances. The Desdemona sedimentary prospect samples dominantly plot in the quartzitic field with some mafic protoliths indicated. For volcanic rock identification in deeply weathered terrane such as the Yilgarn, the protolith of the transported cover and regolith samples as logged in this project can be classified using Ti and Zr (Hallberg, 1984).

Interpreted Rock type	Number of samples
Unit A – Mafic volcanics	22
Unit B – Felsic volcanics	54
Unit C – Intermediate volcanics	16
Unit D – Quartzitic metasediments	102
Unit E – Mafic metasediments	36
Unit F – Intermediate metasediments	5
Total	235
Total samples unclassified & without multielement chemistry	973

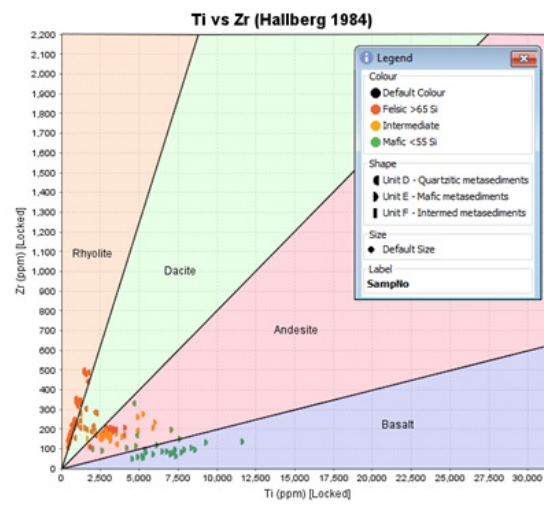
It is difficult to consistently log lithology, especially in very altered rocks. Immobile trace element chemistry provides quantitative data that can improve the accuracy and consistency of logging i.e. an aid to logging but not a replacement. Consistent logging will lead to better geological interpretations and better classification of rocks type. This assessment did improve the overall confidence in the classification of rock types into major geochemical groupings which describe their felsic, intermediate, or mafic character and sedimentary or volcanic origins. Further work to establish more definitive rock type categories is not justified given the prospect assay results.



Immobile Elements 1



Immobile Elements 2



Tr vs Zr Plot

## 9. Conclusion and Recommendations

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The twelve hole RC and diamond drilling programme intersected mainly siliceous and sulphidic graphitic sediments in the RC drilling associated with a gravity low, without any gold mineralisation. The northern pre-collared diamond hole, 20DSRC011D, intersected a sequence of siliceous felsic sediments followed by a thick mafic volcanic package and contains the best gold intercept of 6m at 1 g/t along strike from the Paradise North mineralised trend. Further testing of this trend may be warranted.

The second diamond hole 20DSDD001 intersected a thick sedimentary package with minor mafic volcanics towards the end of the hole and a weak shallow intercept of 1.01m at 0.31 g/t Au at a graphitic shale/sediment contact. Further shallow RC drilling to determine the extent and trend of the anomaly can be recommended. Further review of the data is recommended to determine if any vectors to economic gold mineralisation are present and continue to improve the Discriminant Predictive Targeting (DPT) system for exploration in the Yilgarn and elsewhere.

The final diamond hole 21DSDD003 had hoped to intersect the a mafic sequence similar to that observed at Gwalia. Due to the complex structure in the hole its likely the main mafic sequence is deeper or it has been downthrust due to a large number of felsic intrusives and volcanics. Geochronology is recommended to better understand how the units fit into the regional stratigraphy.

## 10. References

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- Witt, WK 1994, The Geology of the Melita 1:100,000 sheet, Western Australia: Western Australia Geological Survey, Explanatory Notes, 63pp Perth 1994.
- Witt, WK, Ford, A, Hanrahan, B and Mamuse, A 2013, Regional scale targeting for gold in the Yilgarn Craton: Part 1 of the Yilgarn Gold Exploration Targeting Atlas: Geological Survey of Western Australia, Report 125, 131p.
- Witt, WK, Ford, A and Hanrahan, B 2015a, District-scale targeting for gold in the Yilgarn Craton: Part 2 of the Yilgarn Gold Exploration Targeting Atlas: Geological Survey of Western Australia, Report 132, 277p.
- Wyche, S 2012, Yilgarn Craton: geological setting of gold and nickel deposits: Geological Survey of Western Australia, Record 2012/11, 38p.

# 11. Appendices

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No Appendices as text are available



# 12. Expenditure Summary

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Detailed expenditure reported in the Form 5's.