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Yactibo Permit Group, Nabanga Gold Deposit
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1 Summary

This Technical Report describes the Yactibo Permit Group, which contains the Nabanga gold deposit and associated Mineral Resource estimate. The Yactibo Permit Group comprises five contiguous Exploration Permits, namely Ouargaye, Nabanga, Kamsongo, Yacti and Napade, which together total 801 km² and are situated approximately 250 km southeast of Ouagadougou, the capital of Burkina Faso, West Africa. Access to the property is via sealed roads with the last 15 km being unsealed. The climate of the region is typical of sub-Saharan Africa.

The Yactibo Permit Group was previously owned by Orbis Gold Limited ("Orbis"). SEMAFO Inc. ("SEMAFO") initiated a takeover of Orbis on 30 November 2014. Compulsory acquisition of all remaining Orbis shares was initiated by SEMAFO on 11 March 2015 and Orbis was delisted from the Australian Securities Exchange ("ASX") on 16 March 2015.

1.1 Geology and mineralisation

The Yactibo Permit Group is located within the Birimian Gold Province in West Africa. The Birimian Gold Province is a world-class gold province and hosts most of the major gold deposits in West Africa, notably in Ghana, Ivory Coast, Mali, Senegal and Burkina Faso.

Gold mineralisation at Nabanga is predominantly hosted within a magnetic-rich granodiorite intrusive. The gold mineralisation is associated with quartz veining and a distinctive sheared alteration zone developed around the central quartz filled structure. The mineralised structure dips approximately 65° towards the northwest and has an average horizontal thickness of 4 m.

The granodiorite host has been variously altered with the alteration associated with the mineralised structure primarily comprising sericite-biotite-hematite-chlorite. Sulphide minerals, mostly pyrite with some trace chalcopyrite, are relatively uncommon. Electron microscope analyses show that the gold occurs as fine telluride inclusions within pyrite. However, rare visible gold has been observed in hand specimens sourced from artisanal workings along the mineralised structure.

1.2 Exploration

Exploration activities on the property have been ongoing since 2007. Initial exploration by Orbis on the property comprised mapping and field reconnaissance, which identified a number of artisanal mining trends. High resolution satellite imagery (Quickbird) was also obtained by Orbis. Regional soil sampling and rock chip sampling programs were commenced by Orbis in 2011. Artisanal mining activity, down to a maximum depth of approximately 70 m below surface, occurs across the Yactibo Permit Group and is often used to identify targets for further exploration. Rock chip samples within the Yactibo Permit Group, collected primarily from artisanal mining sites, show results of up to 101.3 g/t Au.

In 2010, a limited regional drilling program was undertaken which resulted in the discovery of the Nabanga gold deposit. A high resolution airborne geophysical survey (magnetics and radiometrics) was flown by New Resolution Geophysics ("NRG") in 2011.

A number of high order (+50 ppb Au) gold-in-soil anomalies have been identified across the Yactibo Permit Group. The soil anomaly at the Kamsongo target is defined within an area of 5 km along strike by 1 km across strike, with minimal exploration drilling conducted to date. The higher order soil anomalies present as priority areas for follow-up exploration.
1.3 Drilling, sampling and assaying

A total of 441 holes have been drilled on the Nabanga Permit as of June 2015, using reverse circulation ("RC") and diamond drilling techniques. Approximately 20 additional RC and/or rotary air blast ("RAB") drillholes were drilled outside the Nabanga Permit, with approximately 10 holes drilled at the Kamsongo target within the Kamsongo Permit; five holes drilled at the Yacti target and five holes drilled at the Pilogre target, both within the Yacti Permit. SEMAFO was unable to locate data for these drillholes and as such Snowden is unable to comment on the results.

All of the drillholes within the dataset provided by SEMAFO are within the Nabanga Permit and were drilled by Orbis between 2010 and 2013. Drilling at the Nabanga deposit was carried out on northwest to southeast drill sections on a nominal spacing of 40 m along strike by 20 m across strike.

The global recovery of RC chips is acceptable, with an average recovery of 80% to 90%. It is Snowden’s opinion that the recoveries are acceptable for representative sampling and subsequent Mineral Resource estimation.

RC cuttings are collected from the cyclone at 1 m intervals. Composite samples of 4 m are generated by riffle splitting a nominal 0.5 kg sample from each 1 m interval. Composite samples returning >0.25 g/t Au are resampled at 1 m intervals (2 kg to 3 kg riffle split from the original coarse reject), along with the immediately surrounding composite samples. Diamond core is half core sampled, with the core cut using a diamond saw. The majority of the diamond core is sampled based on the geological logging using a nominal sample length of 1 m.

Drill core and RC samples were submitted to three different laboratories – the BIGS laboratory, the ALS laboratory and the SGS laboratory, all located in Ouagadougou, Burkina Faso. ALS was used for samples from drillholes NARC001 to NARC091, with all subsequent RC samples submitted to the SGS Ouagadougou laboratory. Diamond drill core samples were submitted to the BIGS laboratory. Assaying for gold was by industry standard fire assaying with the gold grade determined by atomic absorption spectroscopy. Based on the results of the quality control ("QC") samples and multiple inspections conducted by Snowden, the SGS laboratory in Ouagadougou, which accounts for a significant proportion of the assaying, has achieved reasonable precision and analytical accuracy.

In the author’s opinion, the drillhole data for the Nabanga deposit is reasonable for use in resource estimation.

1.4 Quality assurance and quality control

Orbis implemented a quality assurance and quality control ("QAQC") protocol throughout the majority of the drilling programs at Nabanga, which includes the addition of standards, field duplicates and blank samples to the sample batches. A sample batch typically comprises one drillhole with a blank sample inserted at the start of each batch, a field duplicate (RC field split or quarter core) inserted within the mineralised intersection along with a blank inserted after the duplicate, and standard samples placed at the end of the visually mineralised intersection and at the end of the batch.
Analysis of the standards shows the majority of results within the accepted control limits, suggesting that reasonable analytical accuracy has been achieved. Moreover, assays of the blanks samples show no evidence of contamination during the laboratory sample preparation or assaying. For the field duplicates, overall the populations compare well, with some outliers at higher grades typical of gold deposits containing visible gold particles. Snowden considers there is no evidence to suggest that the primary sample varies significantly from the duplicate sample and that Orbis has achieved reasonable precision during the sampling and assaying process.

Twinning of four RC drillholes was undertaken by Orbis in 2012 with HQ diameter diamond core. The twinned holes are within 5 m of each other within the mineralised zone. The results show a moderate level of variability in both the mineralised intersection width (i.e. downhole length) and grade. Some of the variability is attributed to local geological variability (e.g. local steepening of the structure) along with the result of sampling the diamond drillholes to the geological boundaries, whereas the RC drillholes are sampled on a 1 m downhole interval. However, for one of the twins, there may be some contamination downhole in the RC hole contributing to the wider intersection. Snowden notes that at this stage, there is not enough twin drillhole data to enable a meaningful statistical comparison to be completed.

A random selection of 10 assay certificates (approximately 10% of all assay certificates) was checked by Snowden in 2012 against the data within the database. Some minor issues were identified, such as use of the repeat assay value rather than the original value and samples missing from the database. However, no material issues were identified from the assay certificate verification.

1.5 Metallurgical testwork

Preliminary metallurgical testwork was completed by ALS Metallurgy in November 2013 for Orbis. The testwork conducted at ALS was relatively broad and included chemical analyses, gravity separation, flotation and leaching.

The head grade of the composite sample tested was 10.9 g/t Au and 3 g/t Ag. Recoveries were not optimised, however gold recovery to a flotation concentrate was 80% at a grind size of $P_{80}$ of 75 µm. A laboratory scale Knelson concentrator recovered approximately 12.5% of the gold to a gravity concentrate. Subsequent high intensity leaching recovered about 25% of the gold with the balance reporting to the gravity tails.

Cyanidation tests were conducted on samples from the various mineralised zones, which included low, average and high grade oxidised material, as well as low, average and high grade sulphide material, all at a grind size of $P_{80}$ of 106 µm. Further leach tests were also conducted at finer grind sizes of 53 µm, 25 µm and 10 µm.

The initial leach tests were conducted to establish the free-milling nature of the mineralisation at Nabanga. The results showed that oxide material recoveries of 70% of Au and 83% of Ag could be achieved after 48 hours of leaching. The fresh samples only achieved 47% Au recovery and 51% silver recovery, giving an early indication that the Nabanga mineralisation may be refractory.

Although the initial leach tests performed relatively poorly, further fine grinding and higher cyanide additions did result in satisfactory gold recoveries (81% recovery for fresh material at a grind size $P_{80}$ of 53 µm with addition of 0.5% w/v NaCN). This indicates a more complex flowsheet requiring fine grinding of the feed prior to intensive leaching will be required.
Comminution tests undertaken included Bond Work index, Bond Abrasion Index and SMC tests. The comminution testwork results confirmed that the material was hard, with a Bond Work index of 22.9 kWh/t for the quartz rock type and 23.5 kWh/t for the granodiorite rock type. SMC testwork confirmed A x b values of 34.7 and 37.1, which supports the data that the material would be classed as hard for comminution design purposes.

Current metallurgical testwork for the Nabanga project is considered to be preliminary in nature and further testing is required to evaluate and optimise processing options, and to assess the variability of the mineralisation in terms of its metallurgical characteristics.

### 1.6 Mineral Resource estimate

Snowden Mining Industry Consultants (“Snowden”) has generated a resource block model for the Nabanga gold deposit. Ordinary kriging was used to estimate gold grades (Au) into a constrained block model reflecting the interpreted shear zone and veining.

Bulk density measurements were collected by Orbis from core using the Archimedes method. A total of 136 measurements have been collected. Given the low number of samples, Snowden elected to assign a default bulk density to the blocks within the model. Mineralised blocks were coded with a density value of 2.70 t/m³ based on the arithmetic average of density measurements for quartz vein material.

The Nabanga Mineral Resource estimate has been classified in its entirety as an Inferred Resource in accordance with CIM guidelines. The resource classification was based on a review of the underlying data quality along with an assessment of the level of confidence in the understanding of both the geological and grade continuity.

The Nabanga Mineral Resource, reported above a 5.0 g/t Au cut-off grade, comprises 1.84 million tonnes ("Mt") at 10.0 g/t Au of Inferred Resources, for 590,000 ounces of gold. The Mineral Resource statement is detailed in Table 1.1. A 5.0 g/t Au cut-off grade was used to report the resource based on the assumption that the resource would likely be mined by selective underground mining techniques.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Oxidation state</th>
<th>Tonnes (Mt)</th>
<th>Au (g/t)</th>
<th>Ounces (koz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inferred Oxide</td>
<td>0.08</td>
<td>8.9</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Fresh</td>
<td>1.76</td>
<td>10.1</td>
<td>570</td>
<td></td>
</tr>
<tr>
<td><strong>Inferred total</strong></td>
<td><strong>1.84</strong></td>
<td><strong>10.0</strong></td>
<td><strong>590</strong></td>
<td></td>
</tr>
</tbody>
</table>

* Small discrepancies may occur due to rounding

There are no Mineral Reserves on the property.
1.7 Conclusions and recommendations

The Yactibo Permit Group, including the Nabanga project, is located in a well-known gold province and the property has a history of artisanal mining. Results from the exploration rock chip and soil sampling programs conducted by Orbis between 2010 and 2014 across the Yactibo Permit Group, indicate that there are multiple targets which warrant further exploration to assess the potential of additional gold mineralisation in the area.

The Nabanga deposit represents a significant gold discovery in the area. The project has predominately been drilled using RC drilling techniques with some diamond core. The dominant drillhole spacing at Nabanga is 40 m along strike by 20 m across strike. The author is satisfied that the drill sample database and geological interpretations are sufficient to enable the estimation of Mineral Resources, and sample security procedures provide confidence in the integrity of the samples and assay results. The geological interpretation has considered all material items and represents an accurate reflection of the current geological understanding.

Accepted estimation methods have been used to generate a 3D block model of gold values. In Snowden’s opinion, the use of ordinary kriging estimation technique with top-cutting to control the influence of extreme grades on the block grade estimates, is appropriate for the highly skewed population distribution. Sub-domaining based on regions of similar orientation was used to account for slight changes to the dip and strike of the mineralised structure. The estimate has been classified with respect to CIM guidelines with the resources classified in their entirety at an Inferred status, according to the geological confidence and sample spacing that currently defines the deposit. Snowden believes that SEMAFO should be able to increase the confidence and potentially the size of the Nabanga Mineral Resource through additional drilling.

The following recommendations are made with respect to ongoing work at the Nabanga gold project:

- It is recommended that the accuracy of the downhole surveying be assessed using a method that is not impacted by magnetic interference, such as gyroscopic or optical techniques

- It is recommended that additional bulk density data be collected to assess the variability. Ideally, larger intervals of core should be used to measure the bulk density to provide a more representative measurement. Moreover, the equipment used (balance and cradle) should be upgraded to be in line with that used at the Natougou project. Wax coating of samples may be necessary to obtain reliable measurements in the oxidised zone (plastic wrapping is not recommended due to excess air being trapped which results in underestimating the bulk density)

- To date, only four twin diamond holes have been drilled to validate the RC drilling results. If further RC drilling is to be completed, it is recommended that SEMAFO increase the number of twin holes so that a meaningful statistical assessment of the two drilling methods can be conducted. Twin diamond holes should be drilled as close as possible to the original RC drillhole, ideally within 5 m

- A comprehensive topographic survey is recommended to ensure all mine planning and infrastructure requirements are planned for using reliable data

- Snowden recommends that SEMAFO complete a pattern of closer spaced drilling (down to a 10 m by 10 m spacing) in a portion of the resource to better define the short range grade and geological continuity.
2 Introduction

Snowden was engaged by SEMAFO in March 2015 to produce a NI 43-101 Technical Report on the Yactibo Permit Group, which includes the Mineral Resources at the Nabanga gold deposit, located approximately 250 km to the southeast of Ouagadougou, the capital of Burkina Faso in West Africa.

This Technical Report has been prepared by Snowden for SEMAFO, in compliance with the disclosure requirements of the Canadian National Instrument 43-101 ("NI 43-101") and in accordance with the requirements of Form 43-101F1. The Yactibo Permit Group was previously owned by Orbis. SEMAFO initiated a takeover of Orbis on 30 November 2014. Compulsory acquisition of all remaining Orbis shares was initiated by SEMAFO on 11 March 2015 and Orbis was delisted from the ASX on 16 March 2015. Exploration soil and chip sampling, drilling and surface mapping work on the Nabanga deposit and surrounding Exploration Permits have been completed by Orbis since 2010.

This Technical Report has been compiled by Mr John Graindorge (Principal Consultant – Applied Geosciences) and Mr Harald Muller (Senior Principal Consultant and Divisional Manager – Metallurgy), who are full-time employees of Snowden. Both John and Harald are considered Qualified Persons ("QPs") for the purposes of NI 43-101. The responsibilities of each author are provided in Table 2.1.

Table 2.1 Responsibilities of each co-author

<table>
<thead>
<tr>
<th>Author</th>
<th>Responsible for sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Graindorge</td>
<td>All sections except for Section 1.5 and Section 13</td>
</tr>
<tr>
<td>Harald Muller</td>
<td>Section 1.5, Section 13 and contribution to Section 18</td>
</tr>
</tbody>
</table>

John Graindorge visited the Nabanga project site between 13 March 2015 and 17 March 2015, where he observed the general site geology from outcrop and drill core/chips, the core storage areas, along with the extents of artisanal mining activity in the area.

Unless otherwise stated, information and data contained in this report or used in its preparation have been provided by Orbis and SEMAFO.

All measurement units used in this document are metric and all currencies are expressed in US dollars ("US$"), unless otherwise stated. Contained gold metal is expressed as Troy ounces ("oz"), where 1 oz = 31.1035 g. Gold grades are expressed as grams per metric tonne ("g/t Au") or as parts per billion ("ppb").
3 Reliance on other experts

The author has not reviewed the land tenure situation and has not independently verified the legal status or ownership of the properties or any agreements that pertain to the Yactibo Permit Group. Snowden has relied on information provided by Orbis and SEMAFO relating to the legal status and ownership of the permits which comprise the Yactibo Permit Group.

Otherwise no reliance on other experts who are not QPs was made in the preparation of this report.
4 Property description and location

The Nabanga gold deposit is part of the Yactibo Permit Group located in Burkina Faso, West Africa. The project lies approximately 250 km southeast of Ouagadougou, the capital of Burkina Faso (Figure 4.1). It is approximately centred on UTM coordinates 225,000 mE and 1,250,000 mN (WGS84 Zone 31N).

Figure 4.1 Nabanga location map

4.1 Type of mineral tenure

The Mining Act of Burkina Faso (number 031-2003/AN of 8 May 2003) provides the legal framework for exploration and mining activities within Burkina Faso. Exploration Permits up to 250 km² are granted for an initial period of three years, which may be renewed twice for periods of three years. At the second renewal, the permit area must be reduced by 25%, although an exemption from this requirement can be applied for at the time of the second renewal. Exploration activities are required to be reported annually to the Director General of Mines and Geology, along with the provisional program of work and budget expenses for the subsequent year.

Exploitation (Mining) Permits, which are required for mining to commence, are granted for a term of 20 years (with unlimited five-year renewals) and the government carries the right for a 10% free carried interest (via a 10% equity interest in the local holding company). The application for an Exploitation Permit requires an Environmental and Social Impact Assessment ("ESIA") and an environmental monitoring and management plan. The current Mining Act includes a sliding scale royalty to the government which is dependent on the gold price (3% to US$1,000, 4% to US$1,300 and 5% >US$1,300).

SEMAFO holds five contiguous Exploration Permits – Ouargaye, Nabanga, Kamsongo, Yacti and Napade, collectively known as the Yactibo Permit Group (Figure 4.2), covering approximately 801 km² of southeast Burkina Faso.
Table 4.1 shows details for SEMAFO mineral tenements in Burkina Faso for the Yactibo Permit Group.

**Table 4.1 Yactibo Permit Group exploration permits**

<table>
<thead>
<tr>
<th>Permit name</th>
<th>Grant date</th>
<th>First renewal date (Decree no.)</th>
<th>Second renewal date (Decree no.)</th>
<th>Final permit expiry date</th>
<th>Net profit royalty rate</th>
<th>Area (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ouargaye</td>
<td>16/01/2007</td>
<td>16/01/2010 (10-085)</td>
<td>16/01/2013 (00-016)</td>
<td>16/01/2016</td>
<td>1.5%</td>
<td>200</td>
</tr>
<tr>
<td>Nabanga*</td>
<td>01/04/2008</td>
<td>01/04/2011 (11-040)</td>
<td>01/04/2014 (00-199)</td>
<td>01/04/2017</td>
<td>1%</td>
<td>179</td>
</tr>
<tr>
<td>Kamsongo</td>
<td>24/09/2008</td>
<td>24/09/2011 (11-339)</td>
<td>24/09/2014 (00-298)</td>
<td>24/09/2017</td>
<td>1%</td>
<td>184</td>
</tr>
<tr>
<td>Yacti</td>
<td>17/10/2008</td>
<td>17/10/2011 (11-371)</td>
<td>17/10/2014 (00-071)</td>
<td>17/10/2017</td>
<td>1%</td>
<td>165</td>
</tr>
</tbody>
</table>

* Includes Nabanga deposit

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1. 10 km UTM grid; last three digits (000) of Easting and Northing coordinates truncated
4.1.1 Nabanga Exploration Permit

The Nabanga Exploration Permit, which hosts the Nabanga deposit, covers an area of 179 km² and was granted on 1 April 2008 by Burkina Faso Decree No. 08-059 to Birimian Resources SARL (“Birimian Resources”), a 100% owned subsidiary of SEMAFO. The original vendor of the permit (Mr Sawadogo Sayouba) retains a 1% Net Profit Royalty (“NPR”), payable upon any future gold sales.

The permit was initially renewed for a further three years from 1 April 2011 by Decree No. 11-040, and was renewed for a second time on 1 April 2014 by Decree No. 00-199. On the second renewal, the area was reduced by 25% to the current total area of 179 km².

The outline of the Nabanga permit boundary is detailed in Table 4.2 and depicted in Figure 4.3.

Table 4.2 Nabanga permit boundary (UTM, WGS 84, Zone 31 North)

<table>
<thead>
<tr>
<th>Point (see Figure 4.3)</th>
<th>Easting (mE)</th>
<th>Northing (mN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>220,795.6</td>
<td>1,255,312.6</td>
</tr>
<tr>
<td>B</td>
<td>234,795.7</td>
<td>1,255,312.6</td>
</tr>
<tr>
<td>C</td>
<td>234,795.7</td>
<td>1,247,989.6</td>
</tr>
<tr>
<td>D</td>
<td>229,925.6</td>
<td>1,247,989.6</td>
</tr>
<tr>
<td>E</td>
<td>229,925.6</td>
<td>1,242,726.6</td>
</tr>
<tr>
<td>F</td>
<td>227,125.6</td>
<td>1,242,726.6</td>
</tr>
<tr>
<td>G</td>
<td>227,125.6</td>
<td>1,238,312.6</td>
</tr>
<tr>
<td>H</td>
<td>220,795.6</td>
<td>1,238,312.6</td>
</tr>
</tbody>
</table>
**Figure 4.3 Nabanga permit boundary**

1 km UTM grid; last three digits (000) of Easting and Northing coordinates truncated.
5 Accessibility, climate, local resources, infrastructure and physiography

5.1 Access and physiography

Access to Nabanga is by means of Route Nationale RN04, an all-weather bitumen road from Ouagadougou, the capital of Burkina Faso, through Fada n’Gourma. From there, travel is via Route Nationale RN18, an all-weather bitumen road to within approximately 15 km of the Nabanga project. An unsealed dirt road, which crosses the Kompienga River, is then used to access the Nabanga property approximately 15 km to the west of RN18, although other similar dirt access roads can be used to access other parts of the property.

Numerous unsealed dirt tracks allow for access to most places throughout the Yactibo Permit Group. The main dirt access road to Nabanga is in reasonable condition, however where the road crosses the Kompienga River the road condition is relatively poor (Figure 5.1). During the wet season (August to October), heavy rains may temporarily restrict vehicle movement within the property and access to the property.

Fada n’Gourma is the nearest town with basic hospital, hotel and limited resupply facilities. Any significant supplies must be sourced from Ouagadougou.

The Nabanga area is relatively flat and sits at an elevation of approximately 200 m above sea level. The mineralisation typically forms minor elevated ridges which may rise some 5 m to 10 m above the surrounding plains.

Figure 5.1 Nabanga dirt access road – Kompienga River crossing during dry season (March 2015)
5.2 Climate

The climate of Burkina Faso is semi-arid, with a rainy season from May to September and a hot dry season from February to April. Average temperatures range between 16°C (Centigrade (°C)) overnight in the cool season to over 40°C during the day in the hot season. Average annual rainfall is approximately 900 mm, although large inter-year variability is common (Figure 5.2). During October to April, the climate is heavily influenced by the dry, dust-laden northwest trade wind known as Harmattan, which blows down from the Sahara Desert.

Figure 5.2 Climate information for Ouagadougou

Monthly historic rainfall data has been obtained from the National Climatic Data Centre website for the Fada n’Gourma weather station. Data covers the years 1920 to 2010. The average monthly rainfall data from this station is given in Table 5.1. August is on average the wettest month of the year with an average rainfall of 244.6 mm, while December, January and February are the driest months with average rainfall close to 0 mm.
Table 5.1  Average monthly rainfall for Fada n’Gourma

<table>
<thead>
<tr>
<th>Month</th>
<th>Average monthly rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0.1</td>
</tr>
<tr>
<td>February</td>
<td>0.5</td>
</tr>
<tr>
<td>March</td>
<td>6.7</td>
</tr>
<tr>
<td>April</td>
<td>26.0</td>
</tr>
<tr>
<td>May</td>
<td>75.3</td>
</tr>
<tr>
<td>June</td>
<td>121.4</td>
</tr>
<tr>
<td>July</td>
<td>182.0</td>
</tr>
<tr>
<td>August</td>
<td>244.6</td>
</tr>
<tr>
<td>September</td>
<td>154.9</td>
</tr>
<tr>
<td>October</td>
<td>29.8</td>
</tr>
<tr>
<td>November</td>
<td>1.6</td>
</tr>
<tr>
<td>December</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Annual total</strong></td>
<td><strong>843.8</strong></td>
</tr>
</tbody>
</table>

Vegetation in the region is a mosaic of cultivated land and tropical acacia savannah.

5.3  Infrastructure

To date no infrastructure studies have been completed due to the early stage of the project. Development of the Nabanga project will require investment in a range of infrastructure items such as upgrades to road access, installation of water supply and storage facilities, tailings storage facilities, power generation facilities and camp/accommodation facilities.

5.3.1  Power supply

Several options were identified by Orbis with respect to power supply for the Nabanga project. The potential options are:

- Onsite generation by diesel or heavy fuel oil (“HFO”) generators
- Hydro power from the nearby Kompienga Dam power station
- Regional electricity grid between Ouagadougou, Tenkodogo and Kompienga.

The power options are illustrated in Figure 5.3. Snowden notes that other options may exist and further studies are required to determine an appropriate power supply option for the Nabanga project. Moreover, the condition of the existing power infrastructure, such as the Kompienga Dam power station, is unknown.
5.3.2 Mining personnel

Mining personnel will likely be sourced from a combination of local personnel along with expatriate personnel.

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3 Permit boundaries in Figure 5.3 are not current and should be treated as approximate only. They do not take into account permit reductions at 2nd renewal. The current permits are discussed in Section 4.1.
6 History

Four of the Yactibo permits (Ouargaye, Nabanga, Kamsongo and Yacti) were acquired by Orbis in 2007 and 2008, through Birimian (at the time Birimian was a 100% owned subsidiary of Orbis). The Napade permit was later added to the Yactibo Permit Group in 2011 to fill the gap between the Nabanga and Kamsongo permits. The Yactibo Permit Group was acquired by SEMAFO in March of 2015 when SEMAFO completed a takeover of Orbis.

No exploration is known to have occurred on the Yactibo permits prior to Orbis’ acquisition of the permits in 2007 and 2008. Other than the Nabanga deposit within the Nabanga Permit, all other areas within the Yactibo Permit Group are considered to be at an early exploration stage.

Initial exploration by Orbis on the property comprised mapping and field reconnaissance, which identified a number of artisanal mining trends. High resolution satellite imagery (Quickbird) was also obtained by Orbis, which was used primarily for regional reconnaissance and to identify artisanal mining sites, which are utilised to identify/define targets for follow-up exploration. Rock chip samples within the Yactibo Permit Group, collected primarily from artisanal mining sites (artisanal samples are typically either grab samples from the spoil heaps or from “ore” mined from underground), show results of up to 101.3 g/t Au (sample of quartz vein collected from spoil heap at Pilogre artisanal site). The results are shown in Figure 6.1.

Regional soil sampling was conducted across the Yactibo Permit Group over a number of programs since 2010. The soil sampling was primarily conducted on a nominal 800 m line spacing with samples collected at 100 m intervals along the lines. Infill soil sampling was conducted within the Kamsongo and Nabanga Permits based on a 200 m line spacing with samples collected at 50 m along each line. The results of the soil sampling are shown in Figure 6.2 and correlate well with the rock chip sampling.
Figure 6.1  Rock chip sampling results >0.1 g/t Au within the Yactibo Permit Group

![Image of map showing artisanal sites and Nabanga project with rock chip sampling results](image-url)
Figure 6.3 shows the detail of the Kamsongo target, which is defined by an approximate 5 km long 50 ppb Au soil anomaly. Some limited follow-up drilling (combination of RC and RAB) of the Kamsongo target intersected mineralisation over 4 m to 8 m downhole widths with between 0.44 g/t Au and 1.46 g/t Au.

Footnote 4: Soil sample results outside the Yacli Permit boundary (i.e. to the south of the permit) were completed prior to the second renewal. This area was relinquished by Orbis at the second renewal.
In 2010, a limited regional drilling program was undertaken which resulted in the discovery of the Nabanga gold deposit. A high resolution airborne geophysical survey (magnetics and radiometrics) was flown by NRG in 2011.

A second phase of drilling was completed at Nabanga in mid-2011 and based on the results, further resource definition drilling was completed in the 2011 to 2012 field season, culminating with an initial Mineral Resource estimate being completed by Snowden in September 2012 (Snowden, 2012), which was classified and reported in accordance with the 2004 edition of the Australasian Code for Reporting Exploration Results, Mineral Resources and Ore Reserves (the “2004 JORC Code”).

Follow-up diamond drilling below the initial resource was completed in 2013 with mixed results. According to Orbis (2013), the deep diamond drilling indicates a significant weakening of the Nabanga structure below 200 m vertical depth (Figure 6.4). An additional five RC drillholes were completed by Orbis in 2013 along strike to the northeast, with no significant mineralisation intersected, effectively closing off the resource to the northeast.
The initial resource focused on a 2.3 km length of the Nabanga structure, which is interpreted from magnetic geophysical surveys to have a total strike length of approximately 9 km. Soil sampling and induced polarisation ("IP") geophysical surveys conducted in 2013 identified linear anomalies that may represent strike extensions or additional “Nabanga-style” mineralisation at depth (Orbis, 2013). Trench sampling was conducted across many of the anomalies in 2013. The trenching results are shown in Figure 6.5, indicating potential strike extensions to the main Nabanga mineralised structure.
6.1 Artisanal mining

No modern production of gold has occurred within the Yactibo Permit Group. Extraction of gold by the local community from shallow artisanal workings has occurred for an unknown period of time. Ore is mined by hand (pick and shovel), with minor utilisation of semi-mechanised machinery (small scale crushers). Free gold is recovered by simple gravity methods, using water from adjacent watercourses or from the bottom of deeper shafts in the dry season. As the gold is only partially recovered, the tailings are often placed in sacks and sold for further processing, or alternatively, the raw unprocessed ore may be sold on for processing.

Within the Nabanga Permit, artisanal activity occurs along the northeast to southwest trending Nabanga mineralisation. The vertical extent of the workings is unknown, however they are thought to reach a maximum depth of approximately 40 m below surface, although the majority of the workings are thought to be less than 10 m deep. It is thought that the artisanal miners have predominately targeted the higher-grade vein within the core of the Nabanga mineralisation, possibly leaving a “skin” of lower grade material in the hangingwall and footwall. The total tonnage and grade of material extracted from artisanal workings at the Nabanga deposit is unknown, however it is not considered to be material to the current Mineral Resource estimate (which has been depleted down to a depth of 10 m below surface to account for artisanal mining). Visible gold was observed in a hand specimen from the Nabanga workings (Figure 6.6).

Figure 6.6 Visible gold in hand specimen from Nabanga artisanal workings

Within the Ouargaye Permit, extensive artisanal mining has been noted at the Biou project in the north of the permit. The artisanal workings at Biou are reported to reach a maximum depth of up to 70 m below surface and occur along a steeply dipping shear zone.

Artisanal workings have also been observed by Birimian within the Yacti Permit, some of which may be along strike from the Biou workings.

Figure 6.7 shows examples of artisanal mining at the Nabanga and Biou projects.
Figure 6.7  Examples of artisanal mining at Nabanga (top) and Biou (bottom) in March 2015

Nabanga project (Nabanga Permit)

Biou project (Ouargaye Permit)
7 Geological setting and mineralisation

7.1 Regional geology

The geology of Burkina Faso is dominated by Palaeoproterozoic rocks that underlie most of the country. Younger rocks outcrop only in the far west and southeast of the country, respectively as part of the Taoudenni and Volta sedimentary basins.

The majority of the Palaeoproterozoic terrane consists of granitoids, with subordinate migmatitic gneisses, cut by a large number of predominantly northeast to north-northeast trending greenstone belts hosting the volcanosedimentary rock sequences of the Birimian Supergroup.

The Yactibo Permit Group is located within the Birimian Gold Province in West Africa (Figure 7.1). The Birimian Gold Province is a world-class gold province and hosts most of the major gold deposits in West Africa, notably in Ghana, Ivory Coast, Mali, Senegal and Burkina Faso.

Figure 7.1 Overview of regional geology of Birimian Province

The Birimian is a Paleoproterozoic granite-greenstone province that developed during the Eburnean Orogeny (2195 million years ago (“Ma”) to 2067 Ma; Pohl, 1988).

The rocks of the Birimian are distinguished into two main groups (Lower Series and Upper Series), which despite the nomenclature, are regarded as being time equivalents (Appiah et al., 1991).
The Lower Series consists of predominantly sediments, comprising black and grey phyllites, schists and meta-greywackes with subordinate volcanics, all of which have been metamorphosed to greenschist facies (Appiah et al., 1991; Dzigbodi-Adjimah, 1993). Phyllites and argillites are the most widespread lithology.

The Upper Series consist of predominantly volcanic rocks, including andesitic tuffs and tholeiitic basaltic volcanics, with associated basic intrusives, and interbedded graphitic phyllites containing 1% to 2% pyrite. These volcanic dominated belts are generally sub-parallel to the Nabanga deposit and trend in a northeasterly direction. Individual belts are 15 km to 40 km in width and are spaced approximately 90 km apart.

7.1.1 Eburnian metamorphics and intrusives

These rocks comprise much of the Lower to Middle Proterozoic of the Man Shield which is composed of granitoid rocks and high grade metamorphic equivalents (gneisses). These rocks yield Eburnian age datings between 2081±25 Ma and 1968±49 Ma, within a thermal event that started at 2127±65 Ma. The granitoids include quartz-diorite, tonalite, trondhjemite, adamellite, granodiorite and granite. The quartz-diorites are largely found cutting the greenstone accumulations, while the granites are developed within the sedimentary basins. The granitoids are divided into two types, namely, synorogenic foliated batholiths within the basin centres, and late orogenic, unfoliated intrusions within the Upper Series volcanic belts (Leube et al., 1990).

7.1.2 Tarkwaian sequence

The Tarkwaian sequence is up to 2,600 m thick in the Tarkwa district. These sediments are present in all of the volcanic belts, being developed in the centres of each, with the exception of the Sefwi Belt where they occur on its eastern margin. No Tarkwaian rocks have been found within the main Birimian basins of the Lower Series. The Tarkwaian sediments overlie and truncate granitoids dated at 1890 Ma to 2061 Ma which cut the Birimian (Leube et al., 1990), but are older than a series of 1650 Ma mafic intrusives (Leube et al., 1990). The main Tarkwaian development over the Ashanti Belt is some 250 km long and averages about 16 km in width (Leube et al., 1990).

7.2 Property geology

The Yactibo Permit Group straddles a major northeast trending shear separating the Youga Belt in the northwest from the Diapaga Belt in the southeast. The Nabanga deposit is located to the southeast of the shear, within the Diapaga Belt.

The Diapaga Belt is dominantly comprised of metamorphosed intermediate volcanics, sediments, and foliated or migmatitic granites and gneisses, with less common mafic volcanics and basic-ultrabasic intrusive complexes. Conglomeritic sediments are present, and are mapped as Tarkwaian equivalents. Early banded and/or foliated granitoids, which many workers ascribe to a Tonalitic-Trondhjemitic-Granodioritic (“TTG”) group associated with subduction, are also very common and probably correlate with the Belt Granitoids as defined in Ghana.

The overall strike orientation of the mineralised structures within the Yactibo Permit Group is northeast-southwest, with a moderate to steep dip towards the northwest.
7.3 Nabanga geology

7.3.1 Mineralisation

Gold mineralisation at Nabanga is predominantly hosted within a magnetic-rich granodiorite intrusive. The gold mineralisation is associated with quartz veining and a distinctive alteration zone developed around the central quartz filled structure. The mineralised structure dips approximately 65° towards the northwest and has an average horizontal thickness of 4 m (Figure 7.2).

Figure 7.2 Cross-section through Nabanga deposit

At a broader scale the Nabanga structure can be traced in high resolution magnetic data over an additional 5 km strike length to the southwest beyond the limit of surface gold workings (Figure 7.3).
Figure 7.3  Geophysical survey (magnetic) of the Nabanga project area

The intrusive includes rafts or xenoliths of chlorite-sericite-biotite schist preserving relict phryic plagioclase and is interpreted to represent low grade greenschist facies metamorphosed basalt to basaltic andesite. Trace pyrite occurs within the mafic schist that appears to be largely unmineralised.

Scanning electron microscope ("SEM") analyses of specimens collected from RC drillhole NARC040 show that the gold occurs as fine (<10 µm) gold ±silver telluride inclusions within pyrite grains (Rugless, 2012). A backscattered SEM image showing calaverite (gold telluride; calaverite = AuTe₂) inclusions within a pyrite grain is provided in Figure 7.4.
7.3.2 Lithology

The mineralised quartz vein is hosted within granodiorite rocks of Birimian volcanic greenstone belts (Figure 7.5). Gold mineralisation associated with the Birimian greenstone belts occur as either structurally controlled lodes at the transition between the volcanic belts and adjoining sedimentary basins, entirely within Birimian rocks, or as stratabound deposits within the overlying Tarkwaian conglomerates which are developed over the volcanic belts.

The four main lithologies at Nabanga consist of granodiorite, amphibolites, diorite and the quartz vein.

---

Figure 7.4 SEM backscattered image showing fine gold telluride (cv) inclusions within pyrite (py) grain

Source: Rugless, 2012 (Plate 8)
Granodiorite

The granodiorite is medium to coarse grained, with a granular plutonic texture. It comprises 10% to 20% (by volume) anhedral quartz interstitially, 40% to 60% plagioclase, approximately 15% k-feldspar, with the remainder comprising the ferromagnesian phases of amphibole, biotite and associated magnetite (Rugless, 2011).

The granodiorite often shows a very weak to weak foliation, which commonly becomes stronger in the immediate vicinity of gold-hosting quartz veining.

Within the area drilled so far, granodiorite that is apparently unaffected by alteration proximal to mineralisation shows weak chlorite ± epidote ± sericite alteration.

In the immediate area of the Nabanga mineralisation, the granodiorite is interpreted to intrude a sequence of mafic amphibolites, interpreted from petrographic studies to be metamorphosed porphyritic basalt to andesite (Rugless, 2011). These amphibolites appear as remnant lenses within the granodiorite. From aeromagnetic and radiometric characterisation, the granodiorite appears in some areas to be semi-concordant with meta-volcanic and/or meta-sedimentary layering.
Amphibolite

Within the granodiorite are multiple lenses of amphibolite, most of which the granodiorite appears to have intruded. Thin section investigation shows that these amphibolites comprise chlorite and actinolite, with minor relict feldspar phenocrysts and rare sulphides, probably with a porphyritic basaltic or andesitic precursor (Rugless, 2011). This amphibolite usually shows a weak to moderate pervasive foliation.

Individual lenses of amphibolite do not appear to show continuity between sections or between drillholes within a single section. The amphibolite shows no positive relationship with the mineralisation or associated alteration and quartz veining, and mineralisation is often lower grade and/or narrower where the main zone occurs within an amphibolite.

Diorite

A fine to medium grained diorite was identified by Orbis during drilling. Originally thought to be a different phase of the granodiorite by logging geologists, this appears unlikely as the diorite has very low magnetic susceptibility. The diorite is not believed to have any significant impacts on the mineralisation.

Quartz vein

A massive white quartz vein hosts the majority of the gold mineralisation and has been recorded up to 5 m (downhole length) but more typically is 1 m to 2 m wide (downhole length). The massive white quartz vein is classified as a rock type in the drilling database so that the mineralised zone position can be easily recognised.

7.3.3 Structure

The Nabanga mineralised zone is cross-cut by three (currently known) structures that strike oblique to the Nabanga structure. The Nabanga mineralised structure tends to ‘rotate’ east and become shallower as it approaches these oblique structures. The cross-cutting structures are highlighted in the geophysical surveys; however they not as obvious in percussion drilling chips.

7.3.4 Alteration

The granodiorite host has been variously altered with the alteration associated with the mineralised structure primarily comprising sericite-biotite-hematite-chlorite. Sulphide minerals, mostly pyrite with some trace chalcopyrite, are relatively uncommon.

A petrographic analysis by Pathfinder Exploration Pty Ltd (Rugless, 2011) shows the medium to coarse grained granodiorite host has been variously altered. Figure 7.6 to Figure 7.9 depict petrographic images with associated descriptions of the various alterations types.
Figure 7.6 Petrography – sample NARC015 61 m to 63 m

The plutonic host comprises sericitised (ser) plagioclase (pl) associated with anhedral quartz (Q) and platy Fe/Mg to Mg/Fe chlorite (chl) aggregates that have replaced original amphibole.

Crossed polars
Field of view: 3 mm

Source: Rugless, 2011

Figure 7.7 Petrography – sample NARC002 44 m to 47 m

The feldspathic component – probably plagioclase, has been pervasively altered to scaly sericite (ser) and dusted by hematite in the plutonic host. Interstitial quartz (Q) represents a primary phase. Mg/Fe chlorite (chl), preserving relict crystallographic axes has replaced original amphibole in the matrix.

Crossed polars
Field of view: 3 mm

Source: Rugless, 2011
Figure 7.8 Petrography – sample NARC040 70 m to 71 m

Evidence of crushing within the cataclasised felsic plutonic host. Quartz (Q) has been recrystallised and is associated with syn-tectonic clay alteration. Trace subhedral pyrite (py).

Crossed polars

Field of view: 3 mm

Source: Rugless, 2011

Figure 7.9 Petrography – sample NARC070 70 m to 71 m

The felsic plutonic host has been deformed in a mylonitic shear. The quartz (Q) component has been recrystallised and attenuated while the feldspathic component has been pervasively sericitised (ser). Foliated chlorite (chl) parallels an anastomosing schistosity.

Crossed polars

Field of view: 3 mm

Source: Rugless, 2011
8 Deposit type

The Nabanga mineralisation is considered to belong to the ‘intrusion related’ class of gold deposits which include a number of significant global deposits including Fort Knox and Pogo (Alaska), Vasilkovskoe (Russia) and Chirano (Ghana). Intrusion-related gold deposits can extend to significant depths. Gold mineralisation within the Chirano gold deposit (located some 500 km south of Nabanga) is known to extend to at least 1 km vertical depth.
9 Exploration

SEMAFO has not conducted any exploration within the Yactibo Permit Group. All exploration to date was conducted by Orbis and is discussed in Section 6. Snowden understands that SEMAFO is in the process of reviewing the exploration data acquired from Orbis to identify targets within the Yactibo Permit Group for further exploration.
10 Drilling

Drilling at Yactibo was performed by a combination of RC and diamond drilling. The diamond drillholes were generally pre-collared using RC drilling down to maximum depth of 200 m below surface. Diamond tails (NQ diameter) were used to complete the holes. A limited number of diamond holes were cored from the surface. A number of trial RAB holes were drilled within the Kamsongo Permit, however the drilling technique was deemed unsuitable and often could not reach the planned target. No further RAB drilling has been completed.

The drilling dataset contains 441 drillholes, of which 390 were used for the resource estimate. The 51 drillholes which were not included in the Nabanga resource estimate either do not intersect mineralisation or are too sparse to allow resources to be modelled. All of the drillholes within the dataset provided by SEMAFO are within the Nabanga Permit. Table 10.1 summarises the drillhole details for the Nabanga Permit. All drillholes were drilled by Orbis between 2010 and 2013.

Table 10.1 Nabanga Permit drillhole details

<table>
<thead>
<tr>
<th>Drill type</th>
<th>Number of holes</th>
<th>Pre-collar total length (m)</th>
<th>Average total depth (m)</th>
<th>Total length (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diamond</td>
<td>75</td>
<td>11,937</td>
<td>260</td>
<td>19,470</td>
</tr>
<tr>
<td>RC</td>
<td>366</td>
<td>-</td>
<td>101</td>
<td>37,021</td>
</tr>
<tr>
<td>Total</td>
<td>441</td>
<td>11,937</td>
<td>128</td>
<td>56,491</td>
</tr>
</tbody>
</table>

A collar location plan, coloured by the year in which the hole was drilled, is presented in Figure 10.1. Drilling at the Nabanga deposit was carried out on northeast to southwest drill sections on a nominal spacing of 40 m along strike by 20 m across strike. Drill spacing tightens to approximately 30 m along strike between 1249850 mN and 1250300 mN.

The vast majority of the drilling within the Nabanga Permit is focused on the Nabanga deposit, which is split into the North Zone, Central Zone and Southern Extension Zone. Drilling to the northwest targets a sub-parallel structure known as the Nabanga North Lode. The best result at Nabanga North Lode is 2 m at 8.32 g/t Au from 25 m downhole (NARC019; downhole length), although the majority of results suggest that the mineralisation is narrow, discontinuous and generally of low grade (less than 0.3 g/t Au).

Orbis indicated that approximately 20 additional RC and/or RAB drillholes were drilled outside the Nabanga Permit, with approximately 10 holes drilled at the Kamsongo target within the Kamsongo Permit; five holes drilled at the Yacti target and five holes drilled at the Pilogre target, both within the Yacti Permit. SEMAFO was unable to locate data for these drillholes and as such Snowden is unable to comment on the results.
Figure 10.1  Drillhole collar location plan (coloured by year) for Nabanga Permit
10.1 Sampling techniques

10.1.1 RC sampling

Material from the RC drilling is collected (every 1 m) into a poly bag (plastic bag) directly from the cyclone on the drill rig. The bags are pre-labelled with the hole ID, “metre from” and “metre to”. A small sample of chips from each 1 m drilling run is removed with a sieve, washed and placed in appropriately labelled chip trays for future reference.

The geologist identifies possible mineralised intersections which are sampled on a 1 m interval. The metre bags are split using a three-tiered riffle splitter, followed by a single tier riffle splitter to produce a nominal 2 kg sample. Outside the mineralised interval, RC samples are composited to 4 m samples. A three-tiered riffle splitter and/or single tier riffle splitter is used to split the metre bags to an approximate weight of 500 g resulting in an approximate 2 kg sample representing a 4 m interval of drilling. Sample tickets are placed into a poly bag and the hole ID and sample depth recorded on the remaining ticket stub. The riffle splitter is cleaned after each sample with a brush. QC samples are also submitted with these samples.

For wet samples, holes are poked in the plastic metre bags and the water allowed to drain. The samples are then placed on black plastic sheets, under the supervision of the geologist on site, to dry. Once dried, the samples are homogenised by hand and then split using the same process as the dry samples.

The split 2 kg samples are placed in a poly bag and transported to camp to await shipment to the SGS laboratory in Ouagadougou. The original 1 m drill bags from each hole are transported directly after splitting and arranged in order by depth drilled at the bag farm. With the exception of initial RC drillholes, Orbis routinely collect a 2 kg to 3 kg split of the 1 m samples for storage in an enclosed shed on site.

The assay results from the 4 m composites are used to select 1 m intervals for resampling. A grade of 0.25 g/t Au is used to flag 4 m composite samples for the second phase of assaying. The 4 m composite samples either side of the identified mineralised section are also split to bracket potential mineralisation. A riffle splitter is used to split the 1 m sample to an approximate 2 kg to 3 kg sample. This is placed in a pre-labelled polythene bag. A corresponding sample ticket is placed in each bag and the hole ID and depth recorded on the stub remaining in the ticket book. The riffle splitter is cleaned after each sample. QC samples are submitted with these samples and details of this process are explained further in Section 11.3.

Records of sampling show that RC samples were collected dry 77% of the time, moist 9% of the time and wet 13% of the time.

10.1.2 Diamond drillhole sampling

Diamond core samples are collected based on 1 m intervals or to the lithological/alteration/mineralisation boundaries. The core is cut in half lengthwise using a diamond saw and the sampled half core (right-hand side) is placed in a plastic bag and labelled with the hole ID and depth. A sample ticket labelled with the hole ID and depth is also placed in the bag. QC samples are also submitted with these samples and details of this process are explained further in Section 11.3.
10.2 Drill sample recovery

The drilling recoveries for both diamond core and RC drilling were reviewed to ensure appropriate material weight or core length was recovered during drilling. The global recovery of RC chips is acceptable, with an average recovery of 80% to 90% (Figure 10.2). The estimated recovery of the RC drilling is based on a 5¼ inch (133.35 mm) diameter drillhole with a global average bulk density of 2.8 t/m³.

It is Snowden’s opinion that the recoveries are acceptable for representative sampling and subsequent Mineral Resource estimation.

Figure 10.2 Histogram of RC drilling recoveries

10.3 Logging

Drill core and RC chips are logged according to lithology, alteration, sulphide percentage, vein composition and percentage, and structures. Prior to 2013, logging was hand written on a template and manually entered into the database, however from 2013 all logging was entered directly into Micromine Geobank Mobile using portable tablets. The logging geologist uses a library of geology codes to log in order to minimise subjectivity. RC chips are logged on site, whilst the diamond core is transported to the shed in camp for detailed logging. Upon completion of each hole, the responsible geologist will perform a ‘quick log’ on site prior to moving the core. This entails writing a brief description identifying the major rock units and the intervals containing mineralisation. A set of field photographs are also taken at this time. The ‘quick log’ and the field photographs were transferred to Orbis’ Brisbane office for review on a daily basis.
10.4 Location data and survey methods

10.4.1 Data spacing and distribution

The dominant drillhole spacing at Nabanga is 40 m along strike (045°) by 20 m across strike (315°). The drill spacing in some areas is down to approximately 30 m along strike.

10.4.2 Location of data points

All drillhole collars were surveyed using a Trimble Geoexplorer 6000 differential global position system ("DGPS"). The stated accuracy of the instrument is 1.0 cm to 2.5 cm in the X-Y directions and 1.5 cm to 4.0 cm in the Z direction (minimum/maximum values relate to using/not using the external antenna). The coordinate system basis used is WGS84 Zone 31N.

It is Snowden’s opinion that the collar coordinates have been accurately surveyed and are appropriate for use in Mineral Resource estimation.

10.4.3 Downhole surveys

All drillholes used for the Nabanga Mineral Resource estimate have been surveyed using digital single and multi-shot cameras. The cameras used for the downhole surveys are the Campteq multi-shot camera and the Reflex EZ-trac multi-shot camera; both have a reported accuracy of ±0.5° for azimuth measurements and ±0.2° for dip measurements. Snowden notes that the downhole surveying methodology used can be influenced by magnetic interference from the surrounding host rocks, however, given the low magnetic susceptibility of the Nabanga deposit (average of approximately 24,600 nT), this interference is unlikely to be material to the Mineral Resource estimate. It is recommended that the accuracy of the downhole surveying be assessed using a method that is not impacted by magnetic interference, such as gyroscopic or optical techniques.

The downhole surveys were checked by Snowden by flagging surveys with azimuth and/or dip deviations of greater than 1°m. A total of 83 intervals were flagged during this process however 80 of these were a result of discrepancies between the collar survey (0 m) and the initial survey measurement taken at a downhole depth of 6 m. The remaining three issues were a result of poor survey readings due to battery failure of the instrument. The collar survey has been used for these drillholes and a straight drillhole path has been used. Snowden also viewed the drillhole traces in both section and plan to assess for unexpected deviations – no issues were identified from this visual validation.

10.4.4 Orientation of data in relation to geological structure

All drillholes are angled between approximately 50° and 70° toward the southeast (approximate UTM bearing of 140°) and intersect the mineralisation at about 45° to normal.

10.4.5 Topography

No topographic survey has been conducted on the Nabanga property to date.

Snowden elected to use the drillhole collars to create a topographic surface for constraining the resource block model. The topographic surface was generated by extracting the collar points in Maptek Vulcan software and gridding a surface using the triangulation method with a 10 m grid cell size. Whilst not optimal, Snowden believes that given the relatively flat topography, the topographic surface based on the drillhole collar locations is reasonable given the early project status.
11 Sample preparation, analyses, and security

11.1 Sample preparation

Drill core and RC samples were submitted to three different laboratories – the BIGS laboratory, the ALS laboratory and the SGS laboratory, all located in Ouagadougou, Burkina Faso. ALS was used for samples from drillholes NARC001 to NARC091, with all subsequent RC samples submitted to the SGS Ouagadougou laboratory. Diamond drill core samples were submitted to the BIGS laboratory.

Snowden visited the SGS Ouagadougou laboratory in March 2015, as discussed in Section 11.3.2.

The SGS Ouagadougou laboratory (herein referred to as “SGS”) is not currently certified to ISO17025 standards, however Snowden understands that the certification process is currently underway but the process was delayed due to the Ebola outbreak in West Africa. It is anticipated by the laboratory that they will achieve certification in mid-2015. Samples received in a pulp form (i.e. standards and/or blanks) are prepared by SGS as follows:

- One in 30 samples screened to ensure 85% passing 75 µm
- If the screen test fails the required particle size then all samples are screened
- Any samples failing the screen test are milled to attain the required particle size.

If the samples are received as rocks, drill core or RC drill cuttings, SGS prepare the samples as follows:

- The samples are dried at 105°C for a minimum of six hours
- Samples are weighed
- Crushed to 80% passing 2 mm
- 1.5 kg split by rotary splitter or riffle splitter
- The entire 1.5 kg split of the 2 mm material is then pulverised to 85% passing 75 µm in a bowl and puck pulveriser.

A 200 g sub-sample is then collected (by scooping) from the 1.5 kg split. The remaining material is returned to the original bag (or a plastic bag if the original is not suitable). All preparation equipment is flushed with barren material prior to the commencement of the job. Cleaning of equipment (e.g. crushers and pulverisers) is by compressed air which is done between each sample.

11.2 Analytical technique

All samples were analysed for gold using industry standard fire assaying with the gold grade determined by atomic absorption spectroscopy ("AAS"). This technique has a detection limit of 0.01 ppm Au for both the ALS and SGS laboratories. The detection limit at the BIGS laboratory (diamond core only) is reportedly 0.001 ppm Au.

Samples analysed at SGS are assayed by fusing a 50 g sample with a litharge (lead oxide) based flux followed by cupellation, dissolving the gold-bearing prill in aqua regia and determining the gold content by AAS.

It is Snowden’s opinion that the analytical technique used for the Nabanga samples is appropriate.
11.3 Quality of assay data and laboratory tests

11.3.1 Internal laboratory quality assurance and quality control

SGS undertake an internal QAQC process involving standards, blanks and duplicates. Each analysis batch consists of 84 samples, of which 10 are QC samples, comprising four reference materials, two duplicates (taken before crushing), two pulp duplicates, one blank (pulp) and one coarse blank. SGS also participate in regular round robin programs to monitor for bias. A minimum of 5% additional check assays are performed on all batches (depending on the number of anomalies present within a given batch).

SGS provided Orbis with a monthly report of results from the internal QAQC program. Snowden has reviewed four of these reports and consider the results and the material within the reports informative and beneficial.

The internal QAQC procedures used at the ALS and BIGS laboratories in Ouagadougou are not known.

11.3.2 Laboratory inspections

A brief laboratory inspection of the SGS facilities in Ouagadougou was completed by Mr John Graindorge (Principal Consultant – Snowden) and Ms Ann Ledwidge (Exploration Manager Africa – Orbis) on 16 March 2015 with supervision by the SGS Laboratory Manager, Helena Bouda. The sample preparation areas were organised and clean of excessive dust and many of the crushers included automated rotary splitting devices. The areas were clean and well maintained. Balances in the fire assay section were clean and calibration records kept. All machines supported data capture directly into the Laboratory Information Management System (“LIMS”). The fire assay flux addition area used a semi-automated multi-pot system with mixing of the sample+flux in a tumbler. The fire assay process (fusion and cupellation) was well organised and maintenance records are kept. Acid digestion rooms had clearly set out equipment locations and suitable safety systems. Spectra atomic absorption machines are utilised for analysis and have clear maintenance and calibration records kept. In the majority of cases, laboratory procedures were visible and easily available to staff.

Snowden considers SGS Ouagadougou to be a suitable laboratory to be the primary analysis facility for Nabanga samples.

11.3.3 Assay reports

All assay reports from the primary assay laboratory (SGS) are submitted to Orbis as digital data files and as PDF certificates.

11.3.4 Standards

Standard samples were submitted by Orbis with primary samples to the laboratory. A standard was inserted into the drillhole sample batch at the end of the visually mineralised intersection along with at the end of the hole.

From the supplied QAQC dataset, Orbis utilised 22 standards since 2010. Of these 22 standards, certificates for four standards have been supplied. Snowden did not review the remaining 18 standards due to lack of available results. The certified standards have been sourced from Ore Research and Exploration Pty Ltd (“ORE”) (Table 11.1). The standards represent 2% of all samples submitted to the laboratory (502 out of a total of 17,968 samples).
Snowden regards the ORE standards as representative of the style of mineralisation exhibited at Nabanga. The ORE standards are derived from the Magdala Lode at the Stawell Gold Mine in Victoria and a high grade lode from the Cracow Gold Mine in Queensland. In Snowden’s opinion the selection of standards based on grade is appropriate and reflects the likely grades at Nabanga (Figure 11.1).

### Table 11.1 Standard information

<table>
<thead>
<tr>
<th>Orbis standard ID</th>
<th>OREAS standard ID</th>
<th>Expected Au (ppm)</th>
<th>Expected standard deviation</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>STD12</td>
<td>OREAS 12a</td>
<td>11.79</td>
<td>0.24</td>
<td>Magdala Lode (Stawell Gold Mine, VIC Australia)</td>
</tr>
<tr>
<td>STD16</td>
<td>OREAS 16a</td>
<td>1.81</td>
<td>0.06</td>
<td>Magdala Lode (Stawell Gold Mine, VIC Australia)</td>
</tr>
<tr>
<td>STD18</td>
<td>OREAS 18c</td>
<td>3.52</td>
<td>0.11</td>
<td>Magdala Lode (Stawell Gold Mine, VIC Australia)</td>
</tr>
<tr>
<td>STD62</td>
<td>OREAS 62c</td>
<td>8.79</td>
<td>0.21</td>
<td>Cracow epithermal gold mine, QLD Australia</td>
</tr>
</tbody>
</table>

### Figure 11.1 Standards used for Nabanga drilling QAQC program

Expected values as reported by ORE along with statistics for the submitted standards are shown in Table 11.2. Of the 502 standard sample results, 25 lay outside the control limits, as defined by three standard deviations from the expected grade, as specified by ORE (Table 11.2).
### Table 11.2  Gold standard statistics

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Reference ID</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STD12</td>
</tr>
<tr>
<td>Expected value (g/t Au)</td>
<td>11.79</td>
</tr>
<tr>
<td>Expected standard deviation</td>
<td>0.24</td>
</tr>
<tr>
<td>Assay statistics</td>
<td></td>
</tr>
<tr>
<td>Number of results</td>
<td>70</td>
</tr>
<tr>
<td>Mean (g/t Au)</td>
<td>11.64</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.14</td>
</tr>
<tr>
<td>&lt;=3SD from certified mean</td>
<td>100.0%</td>
</tr>
<tr>
<td>&lt;=2SD from certified mean</td>
<td>95.7%</td>
</tr>
<tr>
<td>&lt;=1SD from certified mean</td>
<td>84.3%</td>
</tr>
</tbody>
</table>

#### 11.3.5 Blanks

Orbis submitted a blank sample at the start of each drillhole sample sequence, along with one blank within the mineralised intersection. The blank material is sourced from the Bobu quarry in Burkina Faso and comprises a sedimentary rock, which Orbis ascertained does not contain gold mineralisation (background value of approximately 0.01 g/t Au). This material is used by other exploration companies in Burkina Faso and whilst the blanks are not certified, they provide an indication of contamination when inserted directly after a suspected mineralised intercept.

Results from the blanks for gold are considered reasonable with the average grade of the blank samples being 0.014 g/t Au, however Snowden notes that the grades range from below the detection limit up to 1.82 g/t Au (Figure 11.2).

The average of the blank material is well below the mineralisation cut-off (0.20 g/t Au) used for geological modelling. Snowden considers the results acceptable for Mineral Resource estimation and attributes some of the higher than expected gold grades to elevated background levels inherent in the material. Consequently, Snowden recommend that certified blank materials should be used by SEMAFO as part of the QAQC procedures, in preference to locally obtained, uncertified material.
11.3.6 Field duplicates

Orbis riffle split 418 field duplicate samples and submitted them within the sample batches for analysis. Summary statistics for the original and duplicate assays are presented in Table 11.3. The duplicate sample pairs have a Pearson correlation coefficient of 0.98, which Snowden considers an excellent correlation for a gold deposit.

The mean gold grade of the original and duplicate samples is 3.84 g/t Au and 3.90 g/t Au respectively. The coefficient of variation (“CV”) for the original and duplicate datasets is 2.70 and 2.62 respectively, indicating that the variability is similar in both datasets, as would be expected.

A scatterplot and ranked half absolute relative difference (“HARD”) plot are provided in Figure 11.3 and Figure 11.4 respectively.

Overall the populations compare well, with some outliers at higher grades typical of gold deposits containing visible gold particles. Snowden considers there is no evidence to suggest that the primary sample varies significantly from the duplicate sample and that reasonable precision during the sampling and assaying process has been achieved.
Table 11.3 Summary statistics for field duplicates

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Original g/t Au</th>
<th>Duplicate g/t Au</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of samples</td>
<td>418</td>
<td>418</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Maximum</td>
<td>104</td>
<td>99.7</td>
</tr>
<tr>
<td>Mean</td>
<td>3.84</td>
<td>3.90</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>10.37</td>
<td>10.24</td>
</tr>
<tr>
<td>CV</td>
<td>2.70</td>
<td>2.62</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Correlation coefficient</th>
<th>Original</th>
<th>Duplicate</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.0%</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>50.0%</td>
<td>0.20</td>
<td>0.22</td>
</tr>
<tr>
<td>75.0%</td>
<td>2.20</td>
<td>2.49</td>
</tr>
<tr>
<td>80.0%</td>
<td>3.52</td>
<td>3.66</td>
</tr>
<tr>
<td>90.0%</td>
<td>10.16</td>
<td>10.93</td>
</tr>
<tr>
<td>97.5%</td>
<td>30.88</td>
<td>31.34</td>
</tr>
<tr>
<td>99.9%</td>
<td>98.70</td>
<td>94.40</td>
</tr>
</tbody>
</table>

Figure 11.3 Scatterplot between original samples and field duplicate samples
11.4 Sampling security

Samples are stored securely on site at Nabanga, with the transportation of samples during the drilling campaigns overseen by security guards. Personnel releasing the samples for shipment to the laboratory assume responsibility for the sample security and paperwork, with recorded sample numbers accounted for prior to shipment to the laboratory. The SGS laboratory in Ouagadougou checks the received samples against the paperwork and signs-off on the receipt.

11.5 Bulk density

Bulk density measurements were collected on site by Orbis from samples of diamond drill core. A total of 139 bulk density measurements were completed, including five duplicated measurements. The measurements were completed primarily on fresh, non-porous core and include the following lithologies:

- Granodiorite (84 measurements)
- Amphibolite (30 measurements)
- Quartz vein (20 measurements).

Two methods were employed by Orbis to determine the bulk density. The initial 46 bulk density measurements were taken using a displacement calculation as Orbis were not in possession of an appropriate set of scales. This method was discontinued due to the inaccuracy surrounding the method.
A further 83 measurements were obtained by using the Archimedes immersion technique (weight in air divided by the difference between the weight in air and the weight in water). The methodology is as follows:

- Set scale to zero and place the sample directly on the scale and record the reading (weight in air)
- Put cradle in place and set the scale to zero with empty cradle submerged in water
- Put the sample on the cradle and ensure sample is fully immersed in the water (the cradle should not touch the bottom or the sides of the water bucket)
- Wait until reading is stable and then record the reading (weight in water)
- Calculate the bulk density (weight of sample in air divided by weight of sample in air minus weight of sample in water).

Figure 11.5 Photo showing bulk density weighing station with water cradle

Source: Birimian

It is Snowden’s opinion that the procedure for measuring bulk density using the Archimedes water immersion technique is reasonable for an Inferred Resource, however there is scope for improvement. Ideally, larger intervals of core should be used to measure the bulk density to provide a more representative measurement. Moreover, the equipment used (balance and cradle) should be upgraded to be in line with that used at the Natougou project. Wax coating of samples may be necessary to obtain reliable measurements in the oxidised zone (plastic wrapping is not recommended due to excess air being trapped which results in underestimating the bulk density).

A histogram of the bulk density data is provided in Figure 11.6. There are nine measurements ranging from 1.88 t/m$^3$ to 1.96 t/m$^3$ which are not associated with mineralisation. These anomalously low measurements are derived from pitted, weathered granodiorite.
11.6 Qualified Person’s opinion on adequacy of sampling

The sampling practices and assaying practices used for the trench, rock chip and soil sampling programs are, in the author’s opinion, adequate for the purposes of early exploration (i.e. to define areas of anomalous gold concentration for exploration targeting). While some minor errors are likely to be present in the geochemical assay data, the author believes these are minimal and not material to the assay data for the purposes of early exploration.

The RC and diamond core drilling completed at Nabanga by Orbis between 2010 and 2012 included independent QC samples with the sample batches, the results of which show reasonable precision and accuracy have been achieved. Additionally, the diamond core drilling, is achieving excellent core recovery.

Assaying for gold has primarily been completed at the SGS laboratory in Ouagadougou, which, based on the results of the QC samples and multiple inspections, has achieved reasonable precision and analytical accuracy.

In the author’s opinion, the drillhole assay data for the Nabanga deposit is reasonable for use in resource estimation.
12 Data verification

12.1 Drillhole twinning

Twinning of four RC drillholes was undertaken by Orbis in 2012 with HQ diameter diamond core (HQ has a similar hole diameter to RC). A comparison between the mineralised intersections from the twinned drillholes is provided in Table 12.1 and cross-sections for each drillhole pair are presented in Figure 12.1 to Figure 12.4. The twinned holes are within 5 m of each other within the mineralised zone. The results show a moderate level of variability in both the mineralised intersection width (i.e. downhole length) and grade.

Comparisons between the twinned drillholes are as follows:

- The comparison between NARC154 and NADD012 (Figure 12.1) shows a narrower intersection at higher grade in the diamond drilling, which is likely a result of sampling the diamond drillhole to the geological boundaries, whereas the RC drillhole is sampled on a 1 m downhole interval. However, there may be some contamination downhole in NARC154 contributing to the wider intersection.
- NARC134 and NADD013 compare reasonably well (Figure 12.2), with the grade difference attributed to local geological variability.
- NARC184 shows a significantly narrower intersection than the corresponding twinned diamond core drillhole, NADD002, likely caused by a local steepening of the structure (Figure 12.3).
- The modelled mineralised intersection for NARC033 is significantly narrower than the diamond twin (Figure 12.4). However, including lower grade mineralisation in the footwall of the modelled RC Intersection shows a good comparison to the diamond core twin, with similar width and grade.

Snowden notes that at this stage there is not enough twin drillhole data to enable a meaningful statistical comparison to be completed.

Table 12.1 Twinned drillhole mineralised intersection comparison

<table>
<thead>
<tr>
<th>Twinned drillholes</th>
<th>RC intersection</th>
<th>Diamond core intersection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Downhole length</td>
<td>Grade</td>
</tr>
<tr>
<td>NARC154 vs NADD012</td>
<td>10 m</td>
<td>1.56 g/t Au</td>
</tr>
<tr>
<td>NARC134 vs NADD013</td>
<td>5 m</td>
<td>4.32 g/t Au</td>
</tr>
<tr>
<td>NARC184 vs NADD002</td>
<td>4 m</td>
<td>5.68 g/t Au</td>
</tr>
<tr>
<td>NARC033 vs NADD023</td>
<td>5 m (12 m)</td>
<td>6.03 g/t Au (2.82 g/t Au)</td>
</tr>
</tbody>
</table>
Figure 12.1  Cross-section (looking northeast) showing twinned RC (NARC154) and diamond core drillhole (NADD012; 3 m separation)

NARC154
10 m @ 1.56 g/t Au

NADD012
7 m @ 3.82 g/t Au
Figure 12.2 Cross-section (looking northeast) showing twinned RC (NARC134) and diamond core drillhole (NADD013; 1 m separation)

Figure 12.3 Cross-section (looking northeast) showing twinned RC (NARC184) and diamond core drillhole (NADD002; 2 m separation)
Assay data validation has been completed by Orbis through the insertion of certified standards and field duplicate samples in the sample batches. Snowden has also inspected the primary laboratory (SGS).

Additionally, a random selection of 10 assay certificates (approximately 10% of all assay certificates) was checked by Snowden in 2012 against the data within the database. Some minor issues were identified (Table 12.2), such as use of the repeat assay value rather than the original value and samples missing from the database. However, no material issues were identified from the assay certificate verification.
Table 12.2  Identified issues with supplied assay certificates

<table>
<thead>
<tr>
<th>Batch/certificate number</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>OU11149424</td>
<td>None</td>
</tr>
<tr>
<td>OU11159174</td>
<td>Sample 77937 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 778026 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td>OU11159178</td>
<td>None</td>
</tr>
<tr>
<td>OU11162179</td>
<td>None</td>
</tr>
<tr>
<td>BF010606</td>
<td>None</td>
</tr>
<tr>
<td>BF011427</td>
<td>Sample 82288 – used repeat (0.07 g/t Au) instead of original (0.05 g/t Au)</td>
</tr>
<tr>
<td></td>
<td>Sample 82334 – used repeat (0.04 g/t Au) instead of original (0.03 g/t Au)</td>
</tr>
<tr>
<td></td>
<td>Sample 82383 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 82395 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 92040 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 92047 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 92047 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 92048 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 92052 – used repeat (below detection) instead of original (0.04 g/t Au)</td>
</tr>
<tr>
<td></td>
<td>Sample 92144 – used repeat (0.04 g/t Au) instead of original (0.03 g/t Au)</td>
</tr>
<tr>
<td>BF0011592</td>
<td>Sample 90316 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 90464 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 90465 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 90466 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 90719 does not exist on certificates or QAQC but is in DB</td>
</tr>
<tr>
<td></td>
<td>Sample 90743 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 90744 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td></td>
<td>Sample 92288 does not exist in DB or QAQC data</td>
</tr>
<tr>
<td>BF013501</td>
<td>Sample 86556 – used repeat (0.31 g/t Au) instead of original (0.32 g/t Au)</td>
</tr>
</tbody>
</table>

Snowden believes the assay data within the database is robust. Snowden has not conducted any independent sampling or assaying to verify the gold tenor of the samples. Given the results of the assay certificate checks and QAQC results, Snowden does not believe that independent sampling is required at this stage.

12.1 Qualified Person’s opinion

The Snowden Nabanga/Yactibo site visit included a review of the site, drilling, interpretation, sampling and analysis. All aspects of on-site data collection and management were reviewed, however Snowden notes that no drilling or sampling was taking place at the time of the site visit and as such, opinions are based on a review of the documented procedures and discussions with site personnel. The primary analysis laboratory (SGS) in Ouagadougou was inspected. The Qualified Person considers that all protocols and procedures for Nabanga data are reasonable and are suitable for use in Mineral Resource estimation.
13 Mineral processing and metallurgical testing

The following section is taken from an Independent Technical Report ("ITRR") and Valuation of the mineral assets of Orbis Gold Ltd (Snowden, 2014a), which was prepared by Snowden at the request of Orbis in December 2014.

13.1 Metallurgical testwork

Snowden has reviewed the metallurgical testwork reports for the Nabanga project, which included:

- ALS Metallurgy; Metallurgical testwork conducted upon samples from Nabanga Gold Project for Orbis Gold Limited; November 2013
- Lycopodium; Nabanga Project Metallurgical Testwork Review; October 2012
- Pathfinder Exploration Pty Ltd; Petrographic and Mineragraphic Descriptions, 2011
- Knight Piesold Consulting; Memorandum to Mt Isa Metals; re: Preliminary Waste Rock Geochemical Characterisation; 22 October 2012
- Pathfinder Exploration Pty Ltd; SEM Analyses of Samples NARC040 66 m to 67 m and 69 m to 70 for Mt Isa Metals Ltd; 6 June 2012
- JK Tech; SMC Test Report; Mt Isa Metals; July 2012.

The testwork conducted at ALS in 2013 was relatively broad and included:

- Chemical analyses
- Gravity separation
- Flotation
- Leaching.

The head grade of the composite sample tested was 10.9 g/t Au and 3 g/t Ag. Recoveries were not optimised, however gold recovery to a flotation concentrate was 80% at a grind size of P<sub>80</sub> of 75 µm. A laboratory scale Knelson concentrator recovered approximately 12.5% of the gold to a gravity concentrate. Subsequent high intensity leaching recovered about 25% of the gold with the balance reporting to the gravity tails.

Cyanidation tests were conducted on samples from the various mineralised zones, which included low, average and high grade oxidised material, as well as low, average and high grade sulphide material, all at a grind size P<sub>80</sub> of 106 µm. Further leach tests were also conducted at finer grind sizes of 53 µm, 25 µm and 10 µm.

The initial leach tests were conducted to establish the free-milling nature of the mineralisation at Nabanga. The results showed that oxide material recoveries of 70% of Au and 83% of Ag could be achieved after 48 hours of leaching. The fresh samples only achieved 47% Au recovery and 51% silver recovery, giving an early indication that the Nabanga mineralisation may be refractory.

As the initial leach tests at a grind size P<sub>80</sub> of 106 µm returned unsatisfactory results, further tests were conducted at finer grinds and then also at higher cyanide concentration. Table 13.1 provides a summary of the leach test results.
Table 13.1  Summary of cyanide leach test results

<table>
<thead>
<tr>
<th>P&lt;sub&gt;80&lt;/sub&gt; Grind size (µm)</th>
<th>Cyanide (% w/v NaCN)</th>
<th>Oxide material Au recovery (%)</th>
<th>Sulphide material Au recovery (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>0.035</td>
<td>70</td>
<td>47</td>
</tr>
<tr>
<td>53</td>
<td>0.035</td>
<td>78</td>
<td>56</td>
</tr>
<tr>
<td>25</td>
<td>0.035</td>
<td>81</td>
<td>60</td>
</tr>
<tr>
<td>Revised conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>0.5</td>
<td>90</td>
<td>81</td>
</tr>
<tr>
<td>25</td>
<td>0.5</td>
<td>95</td>
<td>86</td>
</tr>
<tr>
<td>10</td>
<td>0.5</td>
<td>99</td>
<td>95</td>
</tr>
</tbody>
</table>

Although the initial leach tests performed relatively poorly, further fine grinding and higher cyanide additions did result in satisfactory gold recoveries. This indicates a more complex flowsheet requiring fine grinding of the feed prior to intensive leaching will be required.

Further testwork will be required to determine if the recovery of gold in a gravity circuit will enhance overall recoveries and also if the inclusion of a flotation circuit to produce a high grade concentrate will improve overall processing efficiencies and recoveries.

The following comminution tests were undertaken:

- Bond Work Index
- Bond Abrasion Index
- SMC tests.

Testwork results confirmed that the material was hard, with a Bond Work index of 22.9 kWh/t for the quartz rock type and 23.5 kWh/t for the granodiorite rock type. SMC testwork confirmed A x b values of 34.7 and 37.1, which supports the data that the material would be classed as hard for comminution design purposes.

Knight Piesold investigated the potential for acid and metalliferous drainage from waste rock for the Nabanga project. Based on results from acid-base accounting, the net acid generation tests show the waste rock appears to present low risks of generating acid drainage. Similarly the waste rock samples were found to have a low level of enrichment and therefore the risk of leaching metal from the waste dumps was considered to be low. However further confirmatory tests were recommended during subsequent project design phases.

Current metallurgical testwork for the Nabanga project is considered to be preliminary in nature and further testing is required to evaluate and optimise processing options, and to assess the variability of the mineralisation in terms of its metallurgical characteristics.
14 Mineral Resource estimates

The Mineral Resources for the Nabanga deposit were estimated by Snowden in September 2012 (Snowden, 2012) for Orbis. Snowden is independent of SEMAFO.

Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Snowden is unaware of any issues that could materially affect the Mineral Resources in a detrimental sense. These conclusions are based on the following:

- SEMAFO has an Exploration Permit (Nabanga Permit) covering the Nabanga deposit in good standing. The third renewal for the Nabanga Permit is due in April 2017
- Snowden is not aware of any outstanding legal issues relating to the project
- There are no known marketing, political or taxation issues
- There are no known infrastructure issues
- SEMAFO is currently operating the Mana Mine in Burkina Faso.

Some drilling below the resource was conducted by Orbis in 2012 which is not considered material to the current Mineral Resource estimate. This drilling is further discussed in Section 14.2.2 below.

14.1 Geological interpretation

14.1.1 Mineralisation

Orbis, in 2012, supplied Snowden with DXF format sectional interpretations of the Nabanga mineralisation, based on a 40 m section spacing. The interpretations were based on logged lithology, quartz percentage, magnetic susceptibility and gold assay data. The sections were imported into Surpac software and the points were snapped to the drillholes (the original sections were created in MapInfo, which does not allow strings to be snapped to drillholes). Based on a review of the raw assay data and section strings, Snowden believes a lower threshold of 0.20 g/t Au is appropriate for defining mineralisation domains at the Nabanga deposit (Figure 14.1).
A higher grade core, associated with quartz veining, was identified which is (predominantly) located on the hangingwall of the structure (Figure 14.2). Based on sectional observations and the log probability plot for all domained data, a threshold for this domain was interpreted to be a nominal 1.00 g/t Au.

As a result, two domains were created; a lower grade domain (≥ 0.20 g/t Au < 1.0 g/t Au) and a higher grade domain (≥ 1.0 g/t Au). Whilst there is evidence for the mineralised structure to continue at depth, the wireframes were interpreted to 0 mRL, which is approximately 200 m below surface. There is a portion of the wireframe interpretation that extends deeper to approximately -50 mRL to honour deeper diamond drilling. The deeper portions were extended no further than 25 m past the lowest drillhole.

The high grade core (Domain 1) is comprised primarily of quartz vein whereas the lower grade zone (Domain 2) is comprised primarily of altered and sheared granodiorite (Figure 7.5). Snowden’s observations of the diamond drill core and RC chips shows that the quartz veining associated with the higher grade core of the mineralisation, is consistent across sections and between drillholes.

The general strike of the mineralised structure is towards 50° (UTM) however, towards the cross-cutting structures, the strike trends towards 60° and the dip starts to shallow from 65° to closer to 60°.
14.1.2 Oxidation

An oxidation surface (i.e. base of oxidation) was generated by creating a point at the first interval logged as ‘FRS’ (fresh material) and gridding these points in Vulcan. The gridding method used an inverse distance weighting technique with a 10 m grid cell size.
14.1.3 Artisanal workings

The Nabanga mineralisation has been subject to artisanal workings which, based on anecdotal evidence, extend to an average depth of approximately 10 m below the surface, although workings are thought to extend locally up to 40 m deep (Figure 6.7). Due to the inherent dangerous nature of these workings, it is not possible to accurately quantify the depth and extent of the workings. As such, Snowden created a surface to represent the estimated average depth of the workings by copying the topographic surface down 10 m. This surface was used to deplete the resource, with material above this surface assumed to be totally mined out.

A schematic cross-section of the Nabanga geological interpretation is presented in Figure 14.3.

**Figure 14.3** Schematic cross-section (looking northwest) of Nabanga geological domains

14.2 Data analysis

14.2.1 Assays below detection limit

Assays below the detection limit were coded as -5559 in the database provided by Orbis in 2012. A total of seven samples are coded as below the detection limit, which Snowden reset to a value of 0.001 g/t Au for the resource estimate.
14.2.2 Drillhole data

A collar location plan of drillholes used for the Nabanga Mineral Resource estimate (i.e. up to September 2012) is presented in Figure 14.5. Whilst some mineralised intersections are noted in the drilling to the southwest of the current resource limits (as depicted in Figure 14.5), the intersections are relatively low grade and have poor continuity between sections and as such this area was excluded from the resource estimate.

As discussed in Section 6, Orbis completed follow-up diamond drilling below the resource in 2013. A total of 36 additional drillholes were completed by Orbis after the Mineral Resource was completed. The results of the deep drilling were mixed with overall a significant weakening of the Nabanga mineralised structure below 200 m vertical depth (refer to Figure 6.4). The continuity of both the grades and the mineralised structure was significantly less at depth. An example cross section is shown in Figure 14.4 illustrating the weak mineralisation at depth below the modelled resource. Given that the majority of the deep drillholes either do not intersect mineralisation or only intersect very weak mineralisation (typically less than 1 g/t Au), Snowden does not believe that the additional drilling is material to the Mineral Resource estimate at the current classification.

Figure 14.4 Example cross-section showing deep drilling below resource

![Diagram](image-url)
14.2.3 Sample compositing

The drillhole data was composited downhole prior to running the estimation process using a 1 m sample interval to minimise any bias due to sample length. The compositing was run within the attribute fields to ensure that no composite intervals crossed any lithological or grade boundaries.

The downhole compositing function in Surpac was used to generate the drillhole composites. This process employed a ‘fixed length’ technique, and includes composite intervals where sample lengths are 1.0 m ±0.25 m. Composite intervals which fall outside these criteria are considered residual samples and were not included in the remainder of the resource estimation process. There were 15 residual samples for Domain 1 which constitutes 2% of all composite samples. Table 14.1 outlines the residual samples which were removed to ensure no bias due to sample length. Snowden does not believe that the removal of the residuals is material to the resource estimate.

Table 14.1 Residual composites removed from resource estimate

<table>
<thead>
<tr>
<th>Hole ID</th>
<th>Drillhole interval</th>
<th>Residual length</th>
<th>Au (g/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From (m)</td>
<td>To (m)</td>
<td></td>
</tr>
<tr>
<td>NADD012</td>
<td>59</td>
<td>60</td>
<td>0.4</td>
</tr>
<tr>
<td>NADD014</td>
<td>52.89</td>
<td>53.89</td>
<td>0.11</td>
</tr>
<tr>
<td>NADD015</td>
<td>219.3</td>
<td>220.3</td>
<td>0.7</td>
</tr>
<tr>
<td>NADD024</td>
<td>244.88</td>
<td>245.88</td>
<td>0.25</td>
</tr>
<tr>
<td>NADD025</td>
<td>219</td>
<td>220</td>
<td>0.3</td>
</tr>
<tr>
<td>NARC035</td>
<td>77.07</td>
<td>78.07</td>
<td>0.55</td>
</tr>
<tr>
<td>NARC047</td>
<td>53.21</td>
<td>54.21</td>
<td>0.26</td>
</tr>
<tr>
<td>NARC087</td>
<td>30</td>
<td>31</td>
<td>0.67</td>
</tr>
<tr>
<td>NARC131</td>
<td>24.14</td>
<td>25.14</td>
<td>0.57</td>
</tr>
<tr>
<td>NARC159</td>
<td>22.98</td>
<td>23.98</td>
<td>0.02</td>
</tr>
<tr>
<td>NARC160</td>
<td>58.9</td>
<td>59.9</td>
<td>0.1</td>
</tr>
<tr>
<td>NARC172</td>
<td>53</td>
<td>54</td>
<td>0.61</td>
</tr>
<tr>
<td>NARC178</td>
<td>96.7</td>
<td>97.7</td>
<td>0.3</td>
</tr>
<tr>
<td>NARC203</td>
<td>107.95</td>
<td>108.95</td>
<td>0.02</td>
</tr>
<tr>
<td>NARC215</td>
<td>28.32</td>
<td>29.32</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Figure 14.5  Collar location plan for drilling at Nabanga up to September 2012 (WGS84 Zone31N)
14.2.4 Declustering

Snowden carried out a cell-weighted declustering analysis to determine whether a bias existed in the mean grade due to clustering of the drilling data. To determine the optimal cell size for declustering the data, the declustering was carried out on the gold assay data for Domain 1 using cell sizes ranging from 5 mE by 5 mN by 5 mRL up to 25 mE by 25 mN by 25 mRL.

The declustering analysis indicates a significant range in the mean gold grade for Domain 1 due to clustered samples, from 7.78 g/t Au to 9.14 g/t Au. An optimal declustering cell size of 5 mE by 25 mN by 5 mRL was selected, which results in a declustered mean grade of 8.20 g/t Au for Domain 1.

14.2.5 Statistical analysis

Summary statistics (declustered) for the composited samples for Domain 1 and 2 are presented in Table 14.2. Histograms and log probability plots are provided in Figure 14.6.

The log probability plot for Domain 1 has a broad inflection around the lower threshold (1.00 g/t Au) but follows a straight line essentially to the 99th percentile (approximately 90.0 g/t Au) where it becomes more erratic due to outliers.

Domain 2 shows two populations: a population between 0.20 g/t Au and 1.0 g/t Au, and another above 1.0 g/t Au. This is mainly a result of the domaining approach of Domain 1; grades higher than 1.0 g/t that were located away from the main core of Domain 1 were excluded from Domain 1 to minimise internal dilution.
Table 14.2  Summary statistics for composites (declustered)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Domain 1 (g/t Au)</th>
<th>Domain 2 (g/t Au)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples</td>
<td>625</td>
<td>804</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.32</td>
<td>0.10</td>
</tr>
<tr>
<td>Maximum</td>
<td>154.00</td>
<td>20.30</td>
</tr>
<tr>
<td>Mean</td>
<td>8.20</td>
<td>0.55</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>14.76</td>
<td>1.02</td>
</tr>
<tr>
<td>CV5</td>
<td>1.80</td>
<td>1.89</td>
</tr>
<tr>
<td>Variance</td>
<td>217.80</td>
<td>1.03</td>
</tr>
<tr>
<td>Geometric mean</td>
<td>3.82</td>
<td>0.40</td>
</tr>
<tr>
<td>Percentiles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td>1.04</td>
<td>0.20</td>
</tr>
<tr>
<td>20%</td>
<td>1.37</td>
<td>0.23</td>
</tr>
<tr>
<td>30%</td>
<td>1.81</td>
<td>0.28</td>
</tr>
<tr>
<td>40%</td>
<td>2.41</td>
<td>0.33</td>
</tr>
<tr>
<td>50%</td>
<td>3.13</td>
<td>0.38</td>
</tr>
<tr>
<td>60%</td>
<td>4.11</td>
<td>0.45</td>
</tr>
<tr>
<td>70%</td>
<td>6.65</td>
<td>0.52</td>
</tr>
<tr>
<td>80%</td>
<td>10.10</td>
<td>0.66</td>
</tr>
<tr>
<td>90%</td>
<td>18.80</td>
<td>0.85</td>
</tr>
<tr>
<td>95%</td>
<td>34.20</td>
<td>1.00</td>
</tr>
<tr>
<td>97.50%</td>
<td>48.60</td>
<td>1.61</td>
</tr>
<tr>
<td>99%</td>
<td>71.40</td>
<td>3.77</td>
</tr>
<tr>
<td>Top cut</td>
<td>70.00</td>
<td>-</td>
</tr>
<tr>
<td>Number cut</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Top cut mean</td>
<td>7.76</td>
<td>-</td>
</tr>
<tr>
<td>Top cut CV</td>
<td>1.43</td>
<td>-</td>
</tr>
</tbody>
</table>

CV = coefficient of variation (standard deviation divided by the mean)
14.2.6 Top cut analysis

Top cutting data is a sensitive topic when estimating any material as the use of top cuts directly impacts the amount of contained metal estimated in a deposit. An aggressive top cut may result in underestimating the apparent contained metal in a deposit, whereas a lenient top cut may cause an overestimation of metal.

The CV for Domain 1, along with the log probability plot and histogram, indicates the presence of outliers. From the log probability plot (Figure 14.6) it can be seen that the general trend of the population starts to disintegrate at approximately 70.0 g/t Au. Based on analysis of the statistics and the log probability plot, Snowden selected a top cut of 70 g/t Au for Domain 1. No top cut was applied to Domain 2 as the high grade samples are interpreted to be splays off the main structure and are below the Domain 1 top cut. The impact of the top cut on the mean grade and CV is shown in Table 14.2.
14.2.7 Contact analysis

When using grade thresholds for interpretation of mineralisation, it is necessary to determine the nature of the mineralisation profile across the domain contacts. Assuming a hard contact when the contact is gradational for grade estimation can introduce an error in the estimated grades. This becomes more critical when the grade thresholds are close to economic cut-offs.

Snowden examined the nature of the contacts between Domains 1 and 2 to provide an indication of boundary criteria for the grade estimation. The analysis shows a strong distinction of gold grades between Domain 1 and Domain 2 (Figure 14.7). Based on the contact analysis along with observations during the modelling, Snowden applied a hard boundary for the grade estimation between Domain 1 and Domain 2.

*Figure 14.7 Contact analysis between Domain 1 and Domain 2*

14.2.8 Variography

Continuity analyses were conducted for Domain 1 using Snowden Supervisor software. Snowden was not able to generate reliable variograms for Domain 2 and as such the variogram parameters from Domain 1 were applied to Domain 2. Due to the skewed nature of the gold grades, a normal scores transformation was applied which provides a clearer representation of the directions of continuity, with the modelled sill values back-transformed for the grade estimation. Variograms were modelled using two nested spherical structures.
Domain 1 was interpreted to plunge shallowly to the southwest and exhibits long ranges consistent with observations during modelling; however, the current drill spacing of approximately 40 m along strike is not adequate to confidently define the short range continuity. The maximum range of continuity for the major direction (down plunge) was interpreted to be 206 m, while the maximum range of continuity for the intermediate direction (almost down dip) was interpreted to be 95 m. The maximum range of continuity for the minor direction was interpreted to be 4 m, which corresponds to the width of the mineralising structure.

The back-transformed variogram model parameters are presented in Table 14.3, with the variogram fans and models shown in Figure 14.8.

**Table 14.3  Back-transformed variogram model parameters**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Element</th>
<th>Direction</th>
<th>Orientation</th>
<th>Nugget</th>
<th>Structure 1 Sill</th>
<th>Structure 1 Range</th>
<th>Structure 2 Sill</th>
<th>Structure 2 Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Au</td>
<td>1-14→055</td>
<td>14→055</td>
<td>0.35</td>
<td>2</td>
<td>0.59</td>
<td>4</td>
<td>0.06</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>2-20→315</td>
<td>315</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 14.8 Normal scores variogram fans and variogram models for Domain 1
14.3 Block modelling and grade estimation

14.3.1 Kriging neighbourhood analysis

A kriging neighbourhood analysis (“KNA”) was performed using Snowden Supervisor software to optimise various kriging parameters, based on the Domain 1 variogram for gold. The KNA assesses the impact of the parameters on the kriging efficiency and slope of regression statistics. The main aim of a KNA is to assess the level of conditional bias (i.e. degree of oversmoothing) induced by various kriging parameters such as the parent block size, number of informing samples and search ellipse radii. Snowden used the results of the KNA to verify the choice of parent block size, number of informing samples and the search ellipse radii.

Based on the KNA results, along with consideration of the drillhole spacing and geometry of the mineralisation, the following parameters were selected:

- Parent block size of 1 mE by 20 mN by 10 mRL
- A minimum of 12 samples and maximum of 32 samples for the initial search pass
- Search ellipse radii for the initial search pass of 100 m in the plunge direction by 50 m in the intermediate direction (close to down dip) by 10 m in the direction orthogonal to the dip plane.

14.3.2 Volume model construction

The block model extents, along with parent and sub-cell sizes are listed in Table 14.4.

<table>
<thead>
<tr>
<th>Model setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum easting</td>
<td>225,510 mE</td>
</tr>
<tr>
<td>Minimum northing</td>
<td>1,249,550 mN</td>
</tr>
<tr>
<td>Minimum elevation (RL)</td>
<td>-100 mRL</td>
</tr>
<tr>
<td>Maximum easting</td>
<td>226,200 mE</td>
</tr>
<tr>
<td>Maximum northing</td>
<td>1,252,250 mN</td>
</tr>
<tr>
<td>Maximum elevation (RL)</td>
<td>250 mRL</td>
</tr>
<tr>
<td>Parent cell size – X</td>
<td>1 m</td>
</tr>
<tr>
<td>Parent cell size – Y</td>
<td>20 m</td>
</tr>
<tr>
<td>Parent cell size – Z</td>
<td>10 m</td>
</tr>
<tr>
<td>Minimum cell size – X</td>
<td>0.25 m</td>
</tr>
<tr>
<td>Minimum cell size – Y</td>
<td>2.5 m</td>
</tr>
<tr>
<td>Minimum cell size – Z</td>
<td>2.5 m</td>
</tr>
<tr>
<td>Rotation about Z axis</td>
<td>55°</td>
</tr>
</tbody>
</table>

A comparison between the volume of the wireframe interpretations (clipped to the surface topography) and the volume defined by the block model for each domain is presented in Table 14.5, which shows that the block volumes are within 5% of the wireframe volume.
Table 14.5  Wireframe to block model volume comparison

<table>
<thead>
<tr>
<th>Wireframe volume (m³)</th>
<th>Block model volume (m³)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dom 1</td>
<td>Dom 2</td>
</tr>
<tr>
<td>964,645</td>
<td>967,585</td>
<td>1,932,230</td>
</tr>
</tbody>
</table>

Block model coding

The block model was coded based on the wireframe surfaces/solids of the gold mineralisation and oxidation zones, along with the topographic surface and surface defining the extent of artisanal mining.

Mineralisation

The gold mineralisation was coded using a field called DOMAIN. Field codes are summarised in Table 14.6. An example cross-section showing the DOMAIN field coding is presented in Figure 14.9.

Table 14.6  DOMAIN field coding

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOMAIN</td>
<td>-99</td>
<td>Unmineralised</td>
</tr>
<tr>
<td>DOMAIN</td>
<td>1</td>
<td>High grade mineralised core</td>
</tr>
<tr>
<td>DOMAIN</td>
<td>2</td>
<td>Lower grade mineralisation (alteration zone)</td>
</tr>
</tbody>
</table>
Additionally, to account for changes in the strike and dip of the mineralisation, the block model was coded according to two geometry types, which was recorded in a field called GEOMETRY. Blocks within the portions of the structure that strike approximately 50° and dip approximately 69° were coded 0 and blocks within the portion of the structure striking approximately 60° and dipping 60° were coded 1. Gold grade estimation was carried out for the two geometries using identical search criteria with the exception of search ellipse strike and dip, which was altered to suit the local strike and dip.

**Oxidation**

The oxidation zone was coded using a field called WEATHERING. Field codes are summarised in Table 14.7. Within the mineralisation, the oxide zone extends down to between 10 m and 30 m below surface, averaging approximately 20 m in depth.
Table 14.7  WEATHERING field coding

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEATHERING</td>
<td>-99</td>
<td>Not coded</td>
</tr>
<tr>
<td>WEATHERING</td>
<td>1</td>
<td>Oxidised zone</td>
</tr>
<tr>
<td>WEATHERING</td>
<td>0</td>
<td>Fresh zone</td>
</tr>
</tbody>
</table>

14.3.3  In situ bulk density

As discussed in Section 11.5, Orbis collect bulk density measurements from core primarily using the Archimedes method. A total of 136 measurements have been collected. Given the low number of samples, Snowden elected to assign a default bulk density to the blocks within the model.

Blocks were coded with a value of 2.70 t/m³ based on the arithmetic average of density measurements for quartz vein material. Blocks outside Domains 1 and 2 (i.e. unmineralised domain) received a default bulk density of 2.82 t/m³, based on the average density value for the surrounding granodiorite.

14.3.4  Search neighbourhood parameters

A three-pass search strategy was utilised for all estimates with the same search neighbourhood parameters applied to all domains. The search parameters are shown in Table 14.8.

The primary search distance of 100 m in the plunge direction by 50 m in the intermediate direction by 10 m across strike, represents approximately half the distance of the maximum range of the variogram for Domain 1. The initial search radius is sufficient to select at least two drill lines for the majority of the deposit. A radius of 10 m across strike was selected to allow for minor local variability in the dip and strike of the mineralisation. No limit on the number of samples per drillhole was applied as the minimum required samples ensure that samples from more than one drillhole are utilised for an estimate. Based on the results of the KNA, a minimum of 12 samples was used for the initial search which equates to approximately four drillholes used per estimate.

The second search was increased by approximately one to two drill lines along strike and down dip (i.e. 50 m in both directions) and the minimum number of samples reduced to six. The third search uses a search range of 280 m along strike, 100 m down dip and 10 m across strike. This is to allow for estimation at the extremities of the deposit where the drill spacing is approximately 80 m. A minimum of six samples ensured the estimation pass had to select at least two drillholes.
### Table 14.8  Search ellipse parameters

<table>
<thead>
<tr>
<th>Search pass</th>
<th>Geometry code</th>
<th>Orientation</th>
<th>Number of samples</th>
<th>Search radius (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Strike</td>
<td>Plunge</td>
<td>Dip</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>50.2</td>
<td>14.1</td>
<td>69</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>60</td>
<td>14.1</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>50.2</td>
<td>14.1</td>
<td>69</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>60</td>
<td>14.1</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>50.2</td>
<td>14.1</td>
<td>69</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>60</td>
<td>14.1</td>
<td>60</td>
</tr>
</tbody>
</table>

### 14.3.5  Grade estimation methodology

The gold grade was estimated using ordinary kriging for Domain 1 and Domain 2. Due to the skewed nature of the gold grade distribution, a top cut of 70 g/t Au was applied to the composites for Domain 1, however an uncut gold grade estimate was also generated for comparative reasons. Ordinary kriging was carried out using the semi-variogram parameters specified in Table 14.3 and the search neighbourhood parameters specified in Table 14.8. Estimation was into parent cells using a discretisation of 3 by 3 by 3 in the X, Y and Z directions.

Several small areas at depth did not receive an estimate due to the sparse drillhole data in these areas. The unestimated regions of mineralisation were assigned a background gold grade of 0.001 g/t Au and are not included in the classified resource. The gold grade of blocks outside the mineralised zone was not estimated, with a default value of 0.001 g/t Au assigned.

The kriging efficiency and slope of regression statistics were also calculated in the final block model.

Figure 14.10, Figure 14.11 and Figure 14.12 illustrate long sections of the gold grade estimate within the entire mineralised zone (i.e. Domains 1 and 2), horizontal thickness and metal accumulation (m g/t Au = grade x horizontal thickness) respectively.
Figure 14.10  Long section showing estimated gold grade (top cut to 70 g/t Au)
Figure 14.11 Long section showing horizontal thickness
Figure 14.12  Long section showing gram metres (based on horizontal thickness)
14.3.6 Model validation

The grade estimates were validated using:

- A visual comparison of the block grade estimates and the drillhole composite data
- A global comparison of the average input composite (naïve and declustered) and estimated block grades
- Generation of east-west, north-south and horizontal section plots of the estimates, declustered and naïve composite grades, along with the number of composite samples available.

Plots of the average naïve and declustered composite and block model gold grades are presented in Figure 14.13 and Figure 14.14 respectively for Domain 1 and Domain 2. A summary of the grade comparison statistics from the estimation domains is presented in Table 14.9. An example cross-section is shown in Figure 14.15.

The conclusions from the model validation work are:

- Visual comparison of the model grades and the corresponding drillhole grades shows a good correlation
- A comparison of the global drillhole and model domain grades for the gold estimate within the main mineralised domain shows that the estimates are within 5% which is considered a good outcome
- With the exception of poorly sampled regions the grade trend plots show a good correlation between the patterns in the model cell grades compared with the drillhole grades.
Figure 14.13 Grade trend plots – Au, Domain 1

Validation Trend Plot
domain = 1, 40m X

Validation Trend Plot
domain = 1, 20m Y
Figure 14.14 Grade trend plots – Au, Domain 2
Table 14.9  Statistical validation comparing input sample data against block
model estimates

<table>
<thead>
<tr>
<th>Statistic (g/t Au)</th>
<th>Composite data</th>
<th>Block model</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Naïve</td>
<td>Declustered</td>
<td>Block Naïve</td>
</tr>
<tr>
<td>Domain 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>629</td>
<td>629</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>9.11</td>
<td>8.98</td>
<td>8.58</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.06</td>
<td>0.06</td>
<td>1.67</td>
</tr>
<tr>
<td>Maximum</td>
<td>154</td>
<td>154</td>
<td>38.64</td>
</tr>
<tr>
<td>Domain 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>881</td>
<td>881</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.55</td>
<td>0.54</td>
<td>0.53</td>
</tr>
<tr>
<td>Minimum</td>
<td>20.3</td>
<td>20.3</td>
<td>5.73</td>
</tr>
<tr>
<td>Maximum</td>
<td>0.001</td>
<td>0.001</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Figure 14.15  Example oblique section (looking northeast) showing block gold
grade estimates
14.4 Mineral Resource classification

14.4.1 Nabanga Mineral Resource classification scheme

The Nabanga Mineral Resource estimate has been classified in its entirety as an Inferred Resource in accordance with CIM guidelines. Blocks above the base of the interpreted artisanal working (see Section 6.1 and Section 14.1.3) remain unclassified and do not form part of the stated Mineral Resource.

The classification was developed based on an assessment of the following criteria:

- Nature and quality of the drilling and sampling methods
- Drill spacing
- Confidence in bulk density measurements
- Confidence in the understanding of the underlying geological and grade continuity
- Analysis of the QAQC data
- A review of the drillhole database and the sampling and logging protocols
- Confidence in the estimate of the mineralised volume
- The results of the model validation.

The classification was recorded in the model using a field called RESCAT, which is described in Table 14.10.

Table 14.10 Resource classification model field values

<table>
<thead>
<tr>
<th>RESCAT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not classified (includes material outside the mineralised domains and/or above base of artisanal workings)</td>
</tr>
<tr>
<td>3</td>
<td>Inferred</td>
</tr>
</tbody>
</table>

14.5 Mineral Resource reporting

14.5.1 Cut-off grade

The Nabanga Mineral Resource has been reported above a 5 g/t Au cut-off grade. The cut-off grade is based on the assumption that the resource would likely be mined using selective underground mining techniques.

Snowden notes that the Mineral Resource is relatively insensitive, in terms of contained metal, to the reporting cut-off grade at cut-offs between 1.0 g/t Au and 5.0 g/t Au. There are approximately 10% less gold ounces contained in the material above the higher cut-off grade of 5.0 g/t Au compared to a cut-off grade of 1.0 g/t Au.

14.5.2 Moisture

All Mineral Resources have been reported on a dry mass basis.
14.5.3 Nabanga Mineral Resource statement

The Nabanga Mineral Resource, reported above a 5.0 g/t Au cut-off grade, comprises 1.84 Mt at 10.0 g/t Au of Inferred Resources, for 590,000 ounces of gold. The Mineral Resource statement is detailed in Table 14.11.

Table 14.11 Nabanga Mineral Resource as at June 2015, reported above a 5.0 g/t Au cut-off grade

<table>
<thead>
<tr>
<th>Classification</th>
<th>Oxidation state</th>
<th>Tonnes (Mt)</th>
<th>Au (g/t)</th>
<th>Ounces (koz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inferred Oxide</td>
<td></td>
<td>0.08</td>
<td>8.9</td>
<td>20</td>
</tr>
<tr>
<td>Fresh</td>
<td></td>
<td>1.76</td>
<td>10.1</td>
<td>570</td>
</tr>
<tr>
<td><strong>Inferred total</strong></td>
<td></td>
<td><strong>1.84</strong></td>
<td><strong>10.0</strong></td>
<td><strong>590</strong></td>
</tr>
</tbody>
</table>

* Small discrepancies may occur due to rounding

14.5.4 Deep drilling below resource limits

Drilling conducted below the current Mineral Resource estimate is discussed in Section 14.2.2.
15 Mineral Reserve estimates

No Mineral Reserves have been defined on the property.
16 Adjacent properties

There is no information from adjacent properties applicable to the Yactibo Permit Group for disclosure in this report.
17 Other relevant data and information

As far as Snowden is aware, there is no other relevant data or information to disclose that makes the Technical Report not misleading.
18 Interpretation and conclusions

The Yactibo Permit Group, including the Nabanga project, is located in a well-known gold province and the property has a history of artisanal mining. Results from the exploration rock chip and soil sampling programs conducted by Orbis between 2010 and 2014 across the Yactibo Permit Group, indicate that there are multiple targets which warrant further exploration to assess the potential of additional gold mineralisation in the area.

The Nabanga deposit was first drilled by Orbis in 2010 and has been drilled using diamond core and RC drilling techniques down to a nominal spacing of 40 m by 20 m in a significant portion of the deposit area. The author is satisfied that the drill sample database and geological interpretations are sufficient to enable the estimation of Mineral Resources and sample security procedures provide confidence in the integrity of the samples and assay results. The geological interpretation carried out by Snowden has considered all material items and represents an accurate reflection of the current geological understanding.

Accepted estimation methods have been used to generate a 3D block model of gold values. In Snowden’s opinion, the use of ordinary kriging estimation technique with top-cutting to control the influence of extreme grades on the block grade estimates, is appropriate for the highly skewed population distribution. Sub-domaining based on regions of similar orientation was used to account for slight changes to the dip and strike of the mineralised structure. The estimate has been classified with respect to CIM guidelines with the resources classified in their entirety at an Inferred status, according to the geological confidence and sample spacing that currently defines the deposit. Snowden believes that SEMAFO should be able to increase the confidence and potentially the size of the Nabanga Mineral Resource through additional drilling.

The Mineral Resource estimate was compiled by Snowden in 2012. A total of 36 additional deep drillholes were completed by Orbis after the Mineral Resource was completed. The results of the deep drilling were mixed with overall a significant weakening of the Nabanga mineralised structure below the current resource. The continuity of both the grades and the mineralised structure was significantly less at depth. Given that the majority of the deep drillholes either do not intersect mineralisation or only intersect very weak mineralisation (typically less than 1 g/t Au), Snowden does not believe that the additional drilling is material to the Mineral Resource estimate at the current classification.

Based on the early stage metallurgical testwork results, Snowden considers that high recovery of gold from the Nabanga mineralisation should be possible, however further work will be required to ensure ore characteristics and variability are fully understood and that selected processing options have sufficient flexibility to maintain recovery as the mineralisation varies within the orebody. Samples for the metallurgical testwork were selected from oxide and fresh material. Comminution tests show that the Nabanga mineralisation is hard and competent. Cyanidation tests, at a grind size P_80 of 106 µm, were conducted on samples of oxidised material and sulphide material. The leach test results showed that oxide material recoveries of 70% of Au could be achieved after 48 hours of leaching. However, the fresh samples only achieved 47% Au recovery, giving an early indication that the Nabanga mineralisation may be refractory. As the initial leach tests at a grind size P_80 of 106 µm returned unsatisfactory results, further tests were conducted at finer grinds and then also at higher cyanide concentration. Although the initial leach tests performed relatively poorly, further fine grinding and higher cyanide additions did result in satisfactory gold recoveries, with a 95% recovery for fresh material at a grind size P_80 of 10 µm and with 0.5% w/v NaCN. This indicates a more complex flowsheet requiring fine grinding of the feed prior to intensive leaching will be required.
19 Recommendations

The following recommendations are made with respect to ongoing work at the Nabanga gold project:

- It is recommended that the accuracy of the downhole surveying be assessed using a method that is not impacted by magnetic interference, such as gyroscopic or optical techniques.

- It is recommended that additional bulk density data be collected to assess the variability. Ideally, larger intervals of core should be used to measure the bulk density to provide a more representative measurement. Moreover, the equipment used (balance and cradle) should be upgraded to be in line with that used at the Natougou project. Wax coating of samples may be necessary to obtain reliable measurements in the oxidised zone (plastic wrapping is not recommended due to excess air being trapped which results in underestimating the bulk density).

- To date, only four twin diamond holes have been drilled to validate the RC drilling results. If further RC drilling is to be completed, it is recommended that SEMAFO increase the number of twin holes so that a meaningful statistical assessment of the two drilling methods can be conducted. Twin diamond holes should be drilled as close as possible to the original RC drillhole, ideally within 5 m.

- A comprehensive topographic survey is recommended to ensure all mine planning and infrastructure requirements are planned for using reliable data.

- Snowden recommends that SEMAFO complete a pattern of closer spaced drilling (down to a 10 m by 10 m spacing) in a portion of the resource to better define the short range grade and geological continuity.
20 References


Rugless, C.S. 2011. NARC Series – Brief Petrographic Descriptions, unpublished internal report prepared by Pathfinder Exploration Pty Ltd for Mt Isa Metals Ltd.

Rugless, C.S. 2012. SEM Analyses of Samples NARC040 66 m to 67 m and 69 m to 70 m, unpublished internal report prepared by Pathfinder Exploration Pty Ltd for Mt Isa Metals Ltd, 6 June 2012.


21 Certificates

CERTIFICATE OF QUALIFIED PERSON

I, John Graindorge, Principal Consultant of Snowden Mining Industry Consultants Pty Ltd, 181 Adelaide Terrace, East Perth, Western Australia, do hereby certify that:


(b) I graduated with a Bachelor’s degree in Geology from the University of Western Australia. I also completed a Post-Graduate Certificate in Geostatistics in 2007 at Edith Cowan University. I am a Member of the Australasian Institute of Mining and Metallurgy and a Chartered Professional Geologist. I have worked as a Geologist continuously for a total of 15 years since my graduation from university. I joined Snowden in 2005 and have been involved in resource estimation and evaluation for 10 years.

(c) I have read the definition of ‘qualified person’ set out in National Instrument 43-101 (“the Instrument”) and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements of a ‘qualified person’ for the purposes of the Instrument. I have been involved in resource evaluation consulting practice for 10 years, including gold projects for at least five years.

(d) I have made a current visit to the Yactibo Permit Group property in Burkina Faso from 13 March 2015 to 17 March 2015.

(e) I am responsible for the preparation of all sections of the Technical Report except Section 13 and Section 1.5.

(f) I am independent of the issuer as defined in section 1.4 of the Instrument.

(g) I have not had prior involvement with the property that is the subject of the Technical Report.

(h) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

(i) As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 23rd day of June of 2015 at Perth, Western Australia.

(signed) John Graindorge
John Graindorge, BSc (Hons), MAusIMM(CP)
CERTIFICATE of QUALIFIED PERSON

I, Harald Muller, Senior Principal Consultant and Divisional Manager – Metallurgy of Snowden Mining Industry Consultants Pty Ltd, 104 Melbourne Street, South Brisbane, Queensland, Australia, do hereby certify that:


(b) I graduated with a Bachelor’s degree in Chemical Engineering from Pretoria University and a Master’s degree in Business Leadership from the University of South Africa. I am a Fellow of AusIMM, a Fellow of IChemE, a Chartered Engineer and a registered Professional Engineer, as well as a Fellow of SAiChE. I have worked as a metallurgist continuously for a total of 30 years since my graduation from university. I have worked in the process and project development of precious metals for at least five years.

(c) I have read the definition of ‘qualified person’ set out in National Instrument 43-101 (“the Instrument”) and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements of a ‘qualified person’ for the purposes of the Instrument. I have been involved in mining and metallurgy related consulting practice for 5 years, including development and review of several gold projects in Australia and internationally.

(d) I have not made a current visit to the Yactibo Permit Group property in Burkina Faso.

(e) I am responsible for the preparation of Section 1.5 and Section 13 of the Technical Report and contributed to the preparation of Section 18 of the Technical Report.

(f) I am independent of the issuer as defined in section 1.4 of the Instrument.

(g) I have not had prior involvement with the property that is the subject of the Technical Report.

(h) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

(i) As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and dated this 23rd day of June of 2015 at Brisbane, Queensland.

(signed) Harald Muller
Harald Muller, B Eng (Chem), MBL, FAusIMM, FIChemE, FSAlChE, C Eng, Pr Eng