ASX Release

7 June 2024

More Encouraging Assay Results from Sorowar – Pigiput Mineralised Zone

Highlights

- Assay results have been received for all four remaining Sorowar – Pigiput exploration drill holes from the FY24 drill program (since the last ASX release on 10 April 2024 titled *"New Sorowar – Pigiput Mineralised Zone"* that described the results of the Sorowar – Pigiput resource definition drilling program).
- Exploration drill holes SDH540, 541, 542 and 544 tested the interpreted northwest trending zone of mineralisation, located between the existing Sorowar and Pigiput ore bodies outside any current Inferred Resource area and outside the current conceptual sulphide pit design. Significant exploration drill hole intercepts include:
  - **SDH542: 44 m @ 2.5 g/t Au from 113 m, including 9 m @ 6.7 g/t Au from 119 m; and**
  - **SDH540: 24 m @ 2.0 g/t Au from 200 m, including 8 m @ 4.2 g/t Au from 212 m.**
- Exploration hole SDH542 intersected significant mineralisation outside any current Inferred Resource area, that extends approximately 80 m down dip to the southwest and 40 m vertically below the current conceptual sulphide pit design. Mineralisation is similar to that observed in holes SDH525, 533 and 534 that all returned significant intercepts (refer to ASX release on 4 March 2024 titled "*New Mineralisation Intersected at Simberi*").

St Barbara Limited ("**St Barbara**" or the "**Company**") (ASX: SBM) is pleased to announce that all remaining assay results have now been returned for the resource definition and exploration drilling of the Sorowar – Pigiput Trend portion of the 31 hole, 7,500-metre diamond drill program at the Simberi Operations in Papua New Guinea (PNG).

Managing Director and CEO Andrew Strelein said *"Hole SDH542 included 44 metres at 2.5 g/t Au from just 113 metres including 9 metres at 6.7 g/t Au and is another very encouraging broad intercept in the new mineralisation zone between Sorowar and Pigiput pits, but outside any current Mineral Resource. Hole SDH540 is on the same trend and included 24 metres at 2.0 g/t Au from 200 metres including 8 metres at 4.2 g/t Au."*

"Hole SDH544 has demonstrated a fault appears to have displaced the northern extent of the trend however the southern part of the trend remains open to the southeast and is a priority for testing in FY25."

"The results for resource definition and exploration holes in Pigibo are expected to be reported later this month."

"Whilst these drilling results won't be included in the Mineral Resource and Ore Reserve update currently underway, they will be included in subsequent updates."

The Simberi sulphide resource definition drilling program comprising of 23 holes for 4,587.6 m was completed in April. The program included 15 holes at Sorowar – Pigiput (reported previously) and eight new holes at Pigibo.

Separately, the Simberi sulphide exploration drilling program comprising eight holes for 2,900 m is 70% complete. The program includes four holes at Sorowar – Pigiput and four holes at Pigibo, testing for mineralisation down dip outside any current Inferred Resource area. To date, six holes have been completed for 2,043.1 m.

Explanatory Notes

Figure 1 below shows the location of the respective open pits on the main mining lease (ML 136). Figure 2 shows the locations of the FY24 completed and planned diamond drill holes including resource definition, exploration and metallurgical sample holes.

Exploration drill holes SDH540, 541, 542 and 544 tested the interpreted northwest trending zone of the new mineralisation zone located between the existing Sorowar and Pigiput ore bodies, but lie outside any current Inferred Resource area and outside the current conceptual sulphide pit design. Significant Sorowar – Pigiput exploration drill hole intercepts include:

- **SDH542: 8 m @ 2.0 g/t Au from 75 m, 9 m @ 1.6 g/t Au from 94 m, 44 m @ 2.5 g/t Au from 113 m, including 9 m @ 6.7 g/t Au from 119 m, 21 m @ 1.2 g/t Au from 178 m;**
- **SDH540: 13 m @ 1.4 g/t Au from 99 m, 24 m @ 2.0 g/t Au from 200 m, including 8 m @ 4.2 g/t Au from 212 m;**
- **SDH541: 17 m @ 1.0 g/t Au from 165 m, 4 m @ 2.0 g/t Au from 204 m, 11 m @ 0.9 g/t Au from 217 m; and**
- **SDH544: 5 m @ 1.1 g/t Au from 73 m, 11 m @ 0.6 g/t Au from 245 m, 3 m @ 1.5 g/t Au from 301 m.**

Figure 3 shows the location of significant assay results for the four Sorowar – Pigiput exploration drill holes. In addition, significant assay results are displayed for all fifteen recent Sorowar – Pigiput resource definition drill holes completed in the area.

Holes SDH540, 541 and 542 are interpreted to have intersected the down dip extensions of the northwest striking, moderate southwest dipping Sorowar – Pigiput mineralised trend based on the results returned from the exploration drilling.

It is interpreted that hole SDH544 failed to intersect the same mineralisation zone as those above, as a result of a northeast striking fault off-setting mineralisation further to the north and within the existing Sorowar Resource boundaries. Figure 3 shows the location of hole SDH544 and the interpreted displacement of this mineralisation zone to the north due to the interpreted fault. The newly defined southern portion of Sorowar – Pigiput mineralised trend remains open to the southeast and is to be targeted in the planned FY25 resource definition and exploration drilling program.

Figures 4 and 5 provides cross-sections showing the significant assay results returned from exploration drill holes SDH542 and SDH540 respectively. Figure 3 shows where these two cross-sections sit relative to the current and future planned pit outlines for Sorowar - Pigiput.

Figure 4 is a cross-section that shows where the exploration drill hole SDH542 intersected significant mineralisation between 113 m and 157 m down hole. This intercept is located outside the current Inferred Resource area and extends approximately 80 m down dip to the southwest and 40 m vertically below the current conceptual sulphide pit design.

Figure 6 shows photographs of selected diamond drill core from Pigiput - Sorowar drill holes SDH525, SDH534, SDH533 and SDH542 with the gold grade (g/t Au) for individual metre intervals superimposed. Mineralisation in these holes is dominantly associated with a monomict andesite shatter breccia which displays angular clast support in a matrix of quartz ± carbonate. Visual pyrite is estimated between 5 to 10% and is disseminated in the altered clasts and locally within the quartz matrix. Assay results for SDH525, SDH534 and SDH533 were announced previously (refer to ASX releases on 4 March 2024 titled "*New Mineralisation Intersected at Simberi*" and on 10 April 2024 titled "*New Sorowar – Pigiput Mineralised Zone*"). Assay results for the recent exploration hole SDH542 are announced in this release.

Figure 1. Simberi Island Site Layout within Mining Lease

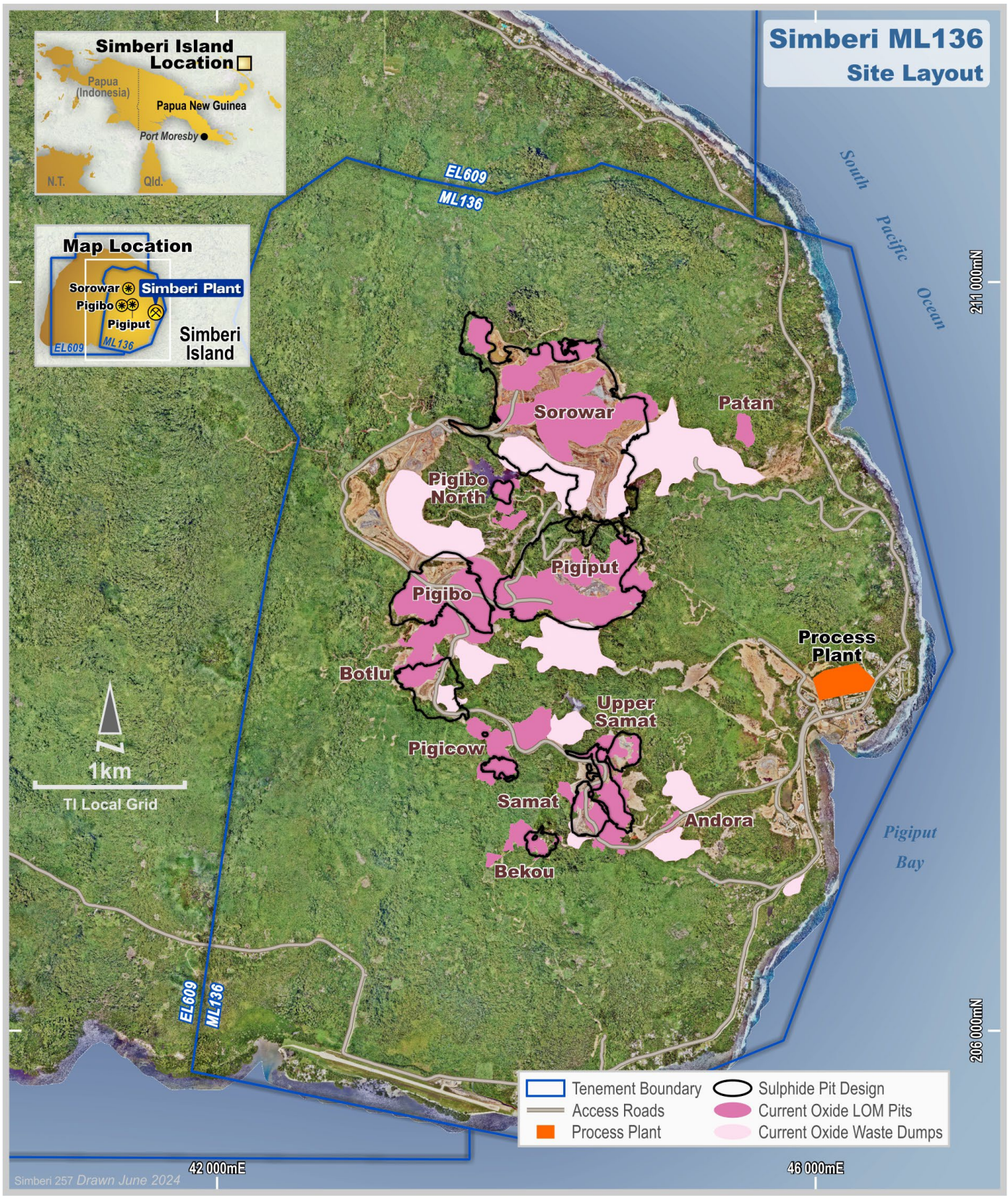


Figure 2. FY24 Completed and Planned Diamond Drilling, Simberi Island, Papua New Guinea

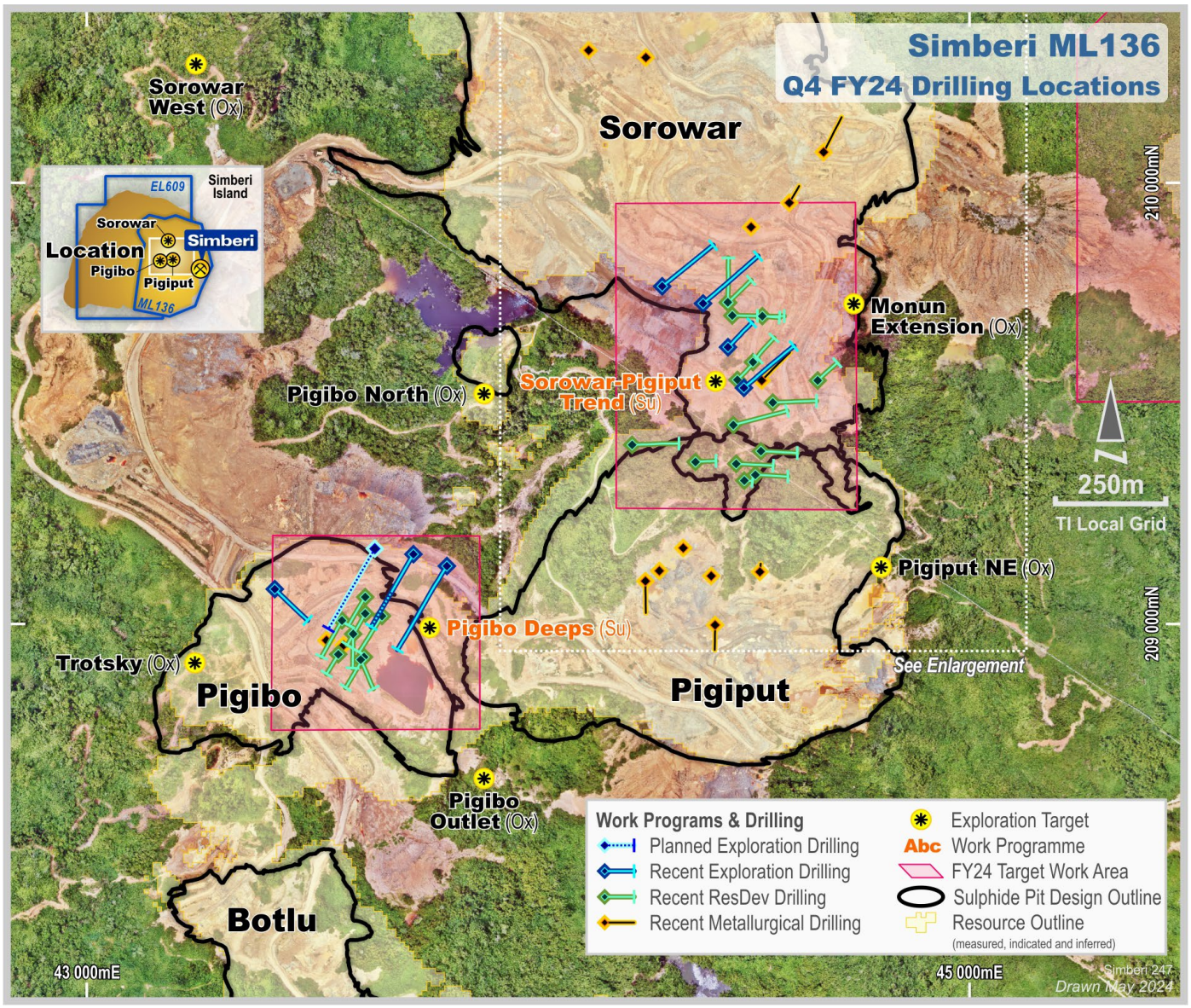


Figure 3. FY24 Completed Diamond Drilling, Sorowar – Pigiput Trend, Simberi Island

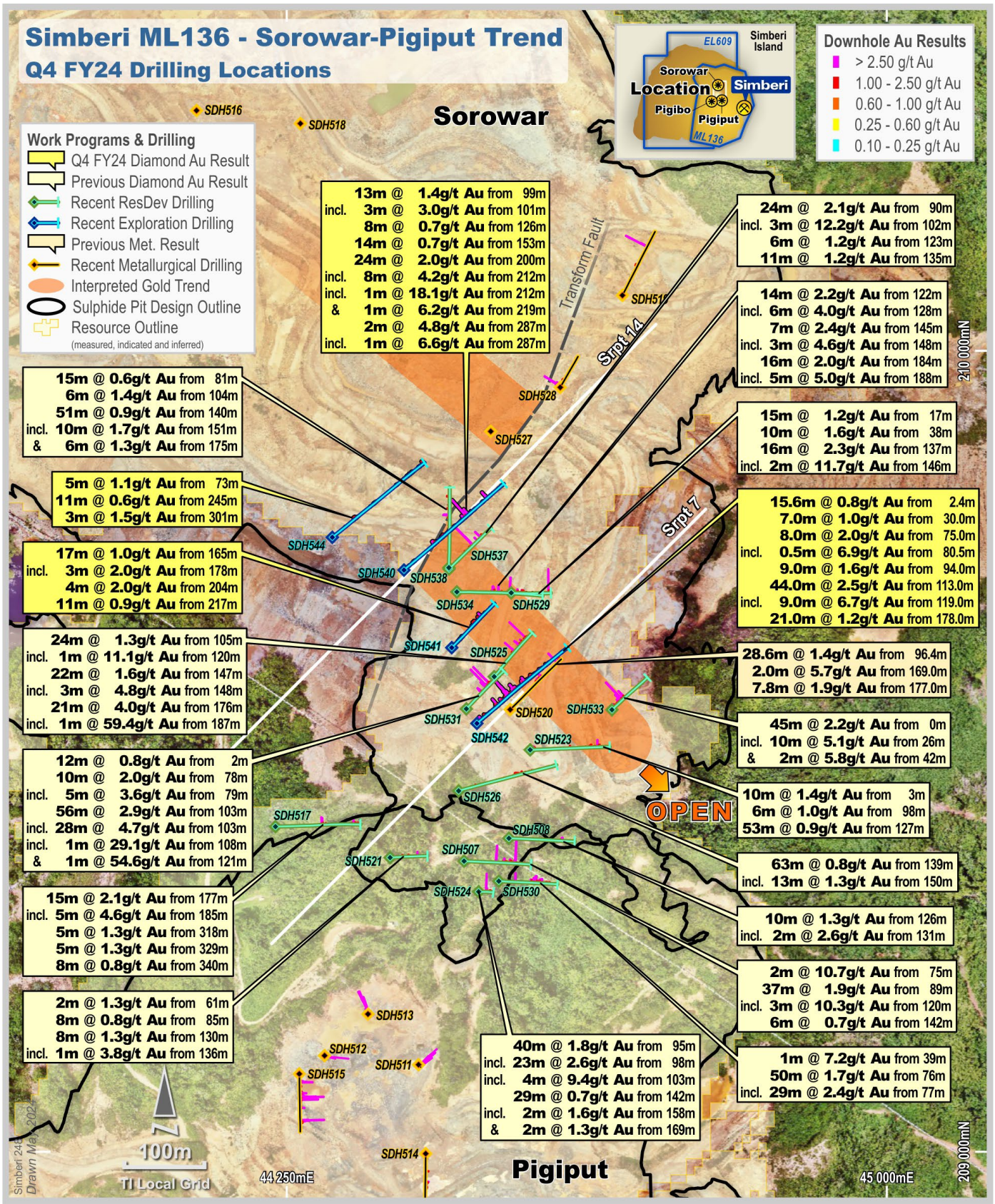


Figure 4. Drill Cross Section Srpt 7 (View Looking Northwest), Sorowar, Simberi Island

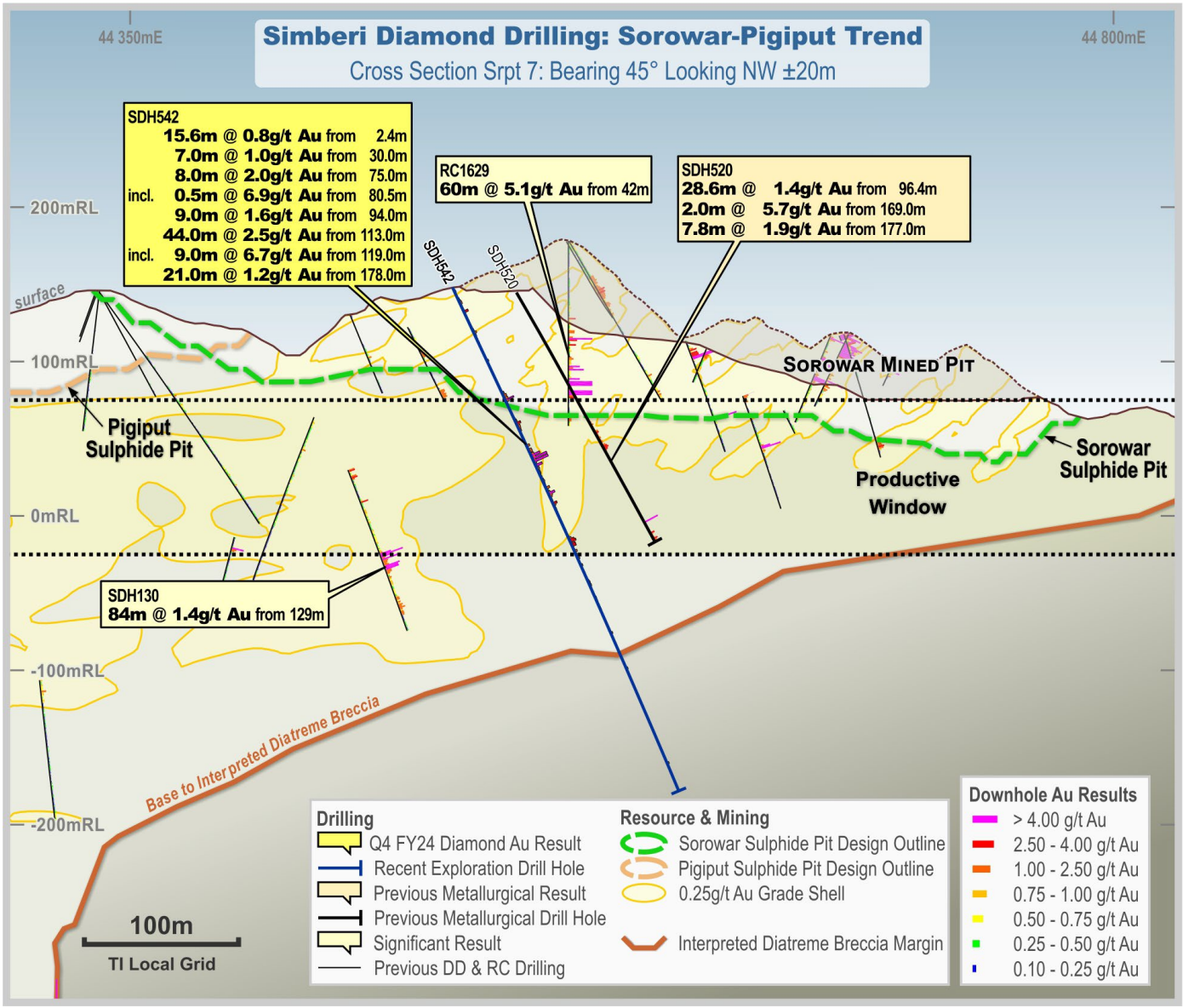
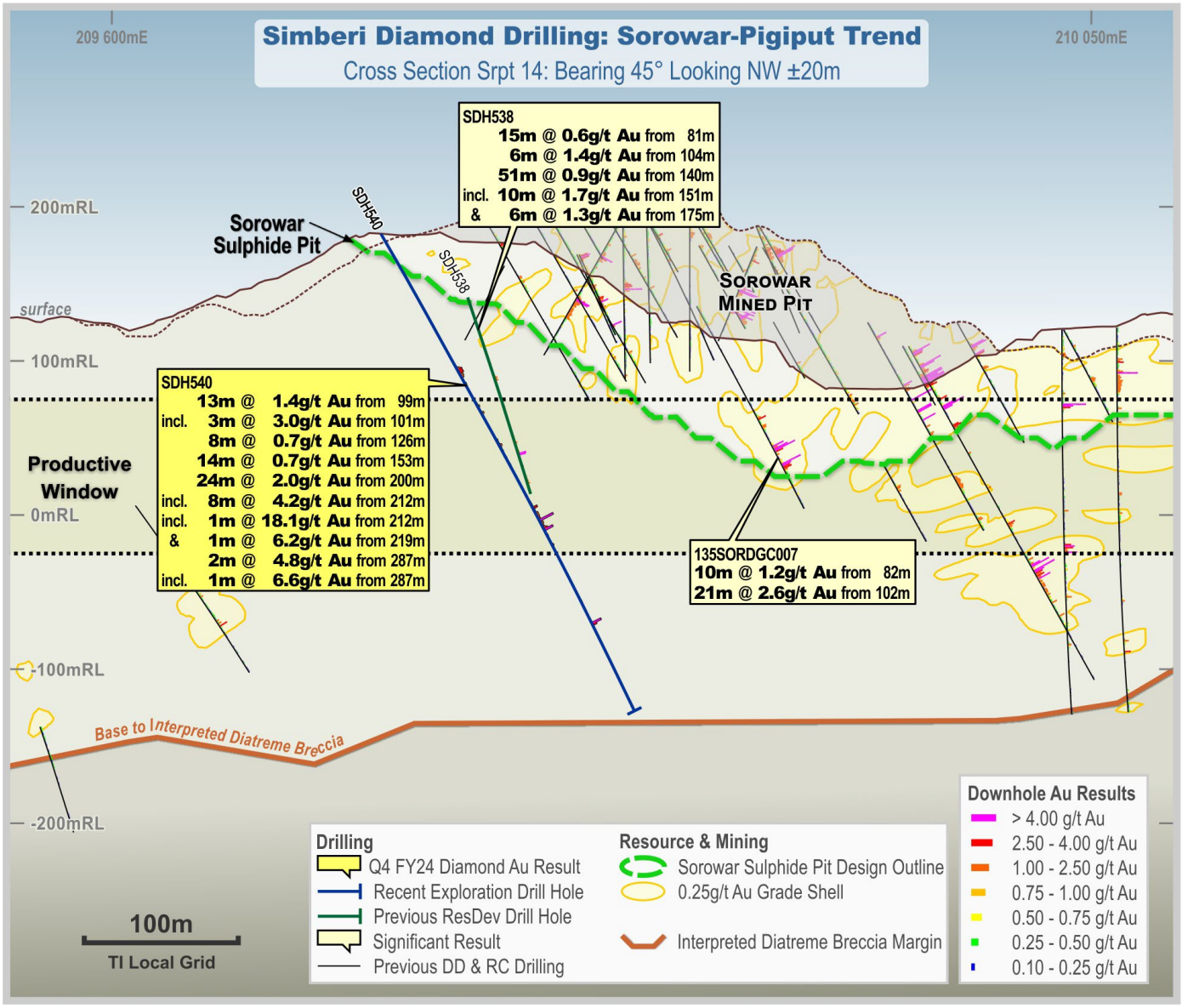


Figure 5. Drill Cross Section Srpt 14 (View Looking Northwest), Sorowar, Simberi Island

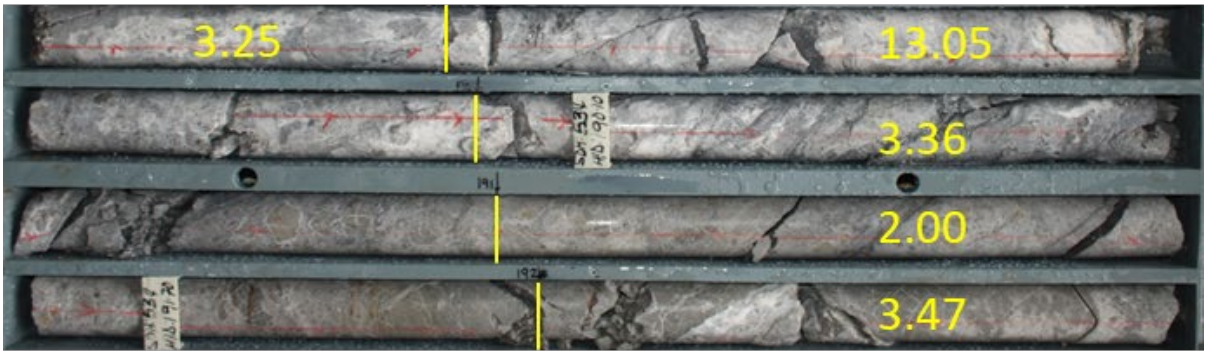


Mineralisation displayed below in Figure 6 for diamond drill holes SDH525, SDH534, SDH533 and SDH542 is dominantly associated with a clast supported shatter breccia comprised of monomict angular andesite clasts in a matrix of quartz ± carbonate. Visual pyrite is estimated between 5 to 10% and is disseminated in the altered clasts and locally within the quartz matrix. Gold grades (in g/t Au) are displayed in yellow text for each metre interval in the photographs showing core from SDH525, SDH534, SDH533 and SDH542. A one metre high-grade intercept of 59.4 g/t Au from 187 m depth is associated with a quartz vein displaying subtle colloform banded textures. A similar style quartz vein is observed in SDH534 returning a one metre intercept of 13.1 g/t Au from 189 m depth. Figure 6 was displayed previously (refer to ASX Release on 10 April 2024 titled "*New Sorowar – Pigiput Mineralised Zone*") without the assay results for SDH542.

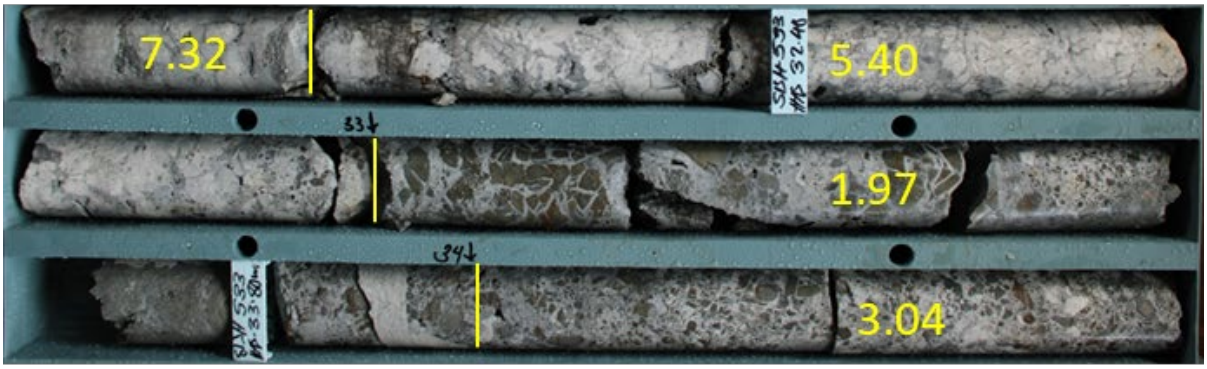
Note: The presence of monomict andesite breccia with 5% to 10% pyrite is a geological observation of non-economic minerals that are possibly associated with gold. It must be cautioned that visual observations and estimates are uncertain in nature and should not be taken as a substitute for appropriate laboratory analysis. Laboratory assay results will be reported when they are received and interpreted.

Figure 6. Diamond Drill Core from four Simberi drill holes SDH525, SDH533, SDH534 and SDH542.

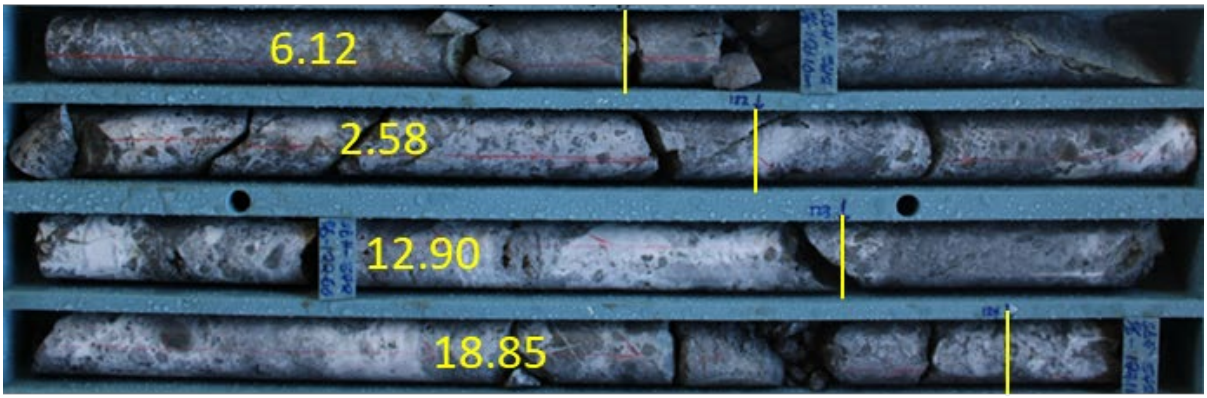
SDH525: 186.7m - 190.3m



SDH534: 188.6m - 192.5m



SDH533: 31.8m – 34.5m



SDH542: 120.6m – 124.1m

Note: Individual metre interval gold assay grades shown in g/t Au.

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Competent Persons Statement

The information in this report that relates to Exploration Results is based on information compiled by Dr Roger Mustard, who is a Member of The Australasian Institute of Mining and Metallurgy. Dr Mustard is a full-time employee of St Barbara and has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Dr Mustard consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Table 1: Simberi Diamond Drilling Significant Intercepts – Simberi Island, Papua New Guinea

Hole Id	North	East	RL	Dip/ Azimuth	Total Depth	Lode	Down-hole Mineralised Intersection			
	m	m	m	degrees	m		From	To	Interval	Gold grade
							m	m	m	g/t Au
SDH540	209,726	44,397	182.4	-60 / 050	350.8	SU	99.0	112.0	13.0	1.4
including						SU	101.0	104.0	3.0	3.0
						SU	126.0	134.0	8.0	0.7
						SU	153.0	167.0	14.0	0.7
						SU	200.0	224.0	24.0	2.0
including						SU	203.0	204.0	1.0	3.1
and						SU	212.0	220.0	8.0	4.2
including						SU	212.0	213.0	1.0	18.1
and						SU	219.0	220.0	1.0	6.2
						SU	287.0	289.0	2.0	4.8
including						SU	287.0	288.0	1.0	6.6
SDH541	209,629	44,456	173.7	-75 / 045	327.0	OX,TR	13.0	18.0	5.0	0.7
						SU	152.0	155.0	3.0	0.9
						SU	165.0	182.0	17.0	1.0
including						SU	178.0	181.0	3.0	2.0
						SU	204.0	208.0	4.0	2.0
						SU	217.0	228.0	11.0	0.9
including						SU	223.0	224.0	1.0	3.8
SDH542	209,535	44,488	147.9	-65 / 050	358.0	TR,SU	2.4	18.0	15.6	0.8
including						SU	9.0	12.0	3.0	1.4
and						TR	17.0	18.0	1.0	2.9
						SU	30.0	37.0	7.0	1.0
including						SU	32.0	35.0	3.0	1.4
						SU	75.0	83.0	8.0	2.0
including						SU	80.5	81.0	0.5	6.9
						SU	94.0	103.0	9.0	1.6
including						SU	97.0	98.0	1.0	3.2
						SU	113.0	157.0	44.0	2.5
including						SU	119.0	128.0	9.0	6.7
including						SU	122.0	125.0	3.0	14.1
and						SU	147.0	148.0	1.0	6.7
						SU	178.0	199.0	21.0	1.2
including						SU	181.0	182.0	1.0	3.1
and						SU	183.0	184.0	1.0	2.5
and						SU	188.0	189.0	1.0	4.7
						SU	209.0	215.0	6.0	1.2
SDH544	209,766	44,308	199.5	-61 / 051	305.7	SU	73.0	78.0	5.0	1.1
						SU	245.0	256.0	11.0	0.6
						SU	301.0	304.0	3.0	1.5

NOTES:
OX: oxide, SU: sulphide, TR: transitional material

JORC Table 1 Checklist of Assessment and Reporting Criteria
Section 1 Sampling Techniques and Data – Simberi ML136 (Sorowar and Pigiput)

Criteria	Commentary
Sampling techniques	• Diamond Drilling comprised PQ3 (83 mm) and HQ3 (61.1 mm) sized core collected using standard triple tubes. Half core was sampled on nominal 1 metre intervals with the lower or left half (looking downhole) of the core submitted for sample preparation and analysis. Competent core is half cored by an Almonte automated coresaw whereas broken or highly weathered core is manually half cored with a masonry chisel. • Half core samples were fully prepared at the company's on-site sample preparation facility on Simberi Island with 150 g to 200 g pulps sent to ALS Laboratory in Townsville for further analysis. Pulp residues are stored in Townsville for six months following assay before disposal.
Drilling techniques	• Diamond drilling comprised PQ3 (83 mm) and HQ3 (61.1 mm) core recovered using a 1.5 m barrel. Drilling was completed by Quest Exploration Drilling (QED). When ground conditions permit, an ACT Digital Core Orientation Instrument was used by the contractor to orientate the HQ3 core.
Drill sample recovery	• Diamond drilling recovery percentages were measured by comparing actual metres recovered per drill run versus metres recorded on the core blocks. Recoveries averaged >98 % with increased core loss present in fault zones and zones of strong weathering/alteration.
Logging	• Diamond holes are qualitatively geologically logged for lithology, structure and alteration and qualitatively and quantitatively logged for veining and sulphide mineralogy. Diamond holes are geotechnically logged with the following attributes qualitatively recorded - strength, infill material, weathering, and shape. Whole core and half core photography is completed on wet core. • All holes are logged in their entirety and data recorded in templated excel workbook prior to being uploaded to the company's secure SQL database.
Sub-sampling techniques and sample preparation	• All diamond drill core was half cored with the lower or left half (looking downhole) submitted for sample preparation and analysis. • All drill samples are prepared at the company's on-site sample preparation facility. After oven drying for 12 hours, sample material undergoes initial crushing in a Terminator Jaw Crusher to achieve particle size <2mm. For samples weighing in excess of 1kg, a 0.8kg to 1.2kg sample split is taken using a riffle splitter. Crushed samples of ~ 1kg standardized weight are then completely pulverized in an Essa LM2 Pulveriser (90% passing 75 microns). Approximately 200g of pulverised material is retained for assaying using a metal scoop to transfer material into analytical envelopes (pulp packets) before being sent to the ALS lab in Townsville. All reported results are from analysis conducted by ALS. • For internal reference, a second pulverized sub- sample (~ 100 grams) is analysed at the site lab using same QAQC reference materials as those sent to ALS lab. • Quality control of sample material prepared on site consists of insertion of two (non-certified) blank control samples at the start of each hole, and between each sample, any pulverised residue in the LM2 is discarded and the bowl vacuumed and wiped clean. • 150 g to 200 g pulp samples are then sent to ALS Laboratory in Townsville for assay via air freight. Pulp residues are stored in Townsville for six months following assay for re-assay if required.
Quality of assay data and laboratory tests	• Pulps are analysed for Au via 50 g Fire Assay Atomic Absorption Spectroscopy (AAS) finish (Au-AA26 method) and multi-element (Ag, As, S, Fe, Cu, Pb, Zn, Mo and Sb) by Aqua Regia digest followed by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) instrument read (ME-ICP41S method). • QC included insertion of certified reference material (1:20); insertion of in-house blank control material (2 at the start of each job); and the insertion of lab duplicates (1:20 split from the initial jaw crushed material prepared by the site lab. QAQC results were assessed as each laboratory batch was received and again at resource estimation cycles. Results indicate that pulveriser bowls were adequately cleaned between samples. • ALS Townsville insert certified standards, replicates, lab repeats and complete sizing checks (1:40) or higher as part of their internal QAQC protocols.
Verification of sampling and assaying	• Sampling data is recorded electronically which ensures only valid non-overlapping data can be recorded. Assay and downhole survey data are subsequently merged electronically. All drill data is stored in a SQL database on secure company server.
Location of data points	• All drill collars were surveyed by company appointed surveyors using a DGPS in Tabar Island Grid (TIG) which is based on WGS84 ellipsoid and is GPS compatible. • All diamond drill holes were downhole surveyed using a Reflex EZ track single shot camera with the first reading at 9, 12 or 18 m and one at 30 m and then approximately every 30 m increments to the bottom-of-the hole where an end of hole survey is also taken.
Data spacing and distribution	• Resource definition drilling to define Indicated Mineral Resources is completed on a nominal 30m * 40m pattern. This spacing is adequate to establish both geological and grade continuity for the Mineral Resource and Ore Reserve procedures. • Sampling is typically based on one-metre intervals with no compositing applied.
Orientation of data in relation to geological structure	• Drilling is orientated perpendicular to the major structures controlling the distribution of gold mineralisation. The orientation of the drilling ensures unbiased sampling of structures.
Sample security	• Only company personnel or approved contractors are allowed on drill sites; drill core is only removed from drill site to secure core logging/processing facility within the gated exploration core yard; core is promptly logged, cut, and prepped on site. The samples sent to ALS are stored in locked and guarded storage facilities until receipted at the Laboratory.
Audits or reviews	• No audits or reviews of sampling protocols have been completed.

Section 2 Reporting of Exploration Results – Simberi ML136 (Sorowar and Pigiput)

Criteria	Commentary
Mineral tenement and land tenure status	• SBM has 100 % ownership of the three tenements over the Simberi Islands; ML136 on Simberi Island, EL609 which covers the remaining area of Simberi Island, as well as Tatau Island and Big Tabar Island and 4 sub-block EL2462 which covers part of Tatau and Mapua Islands.
Exploration done by other parties	• CRA, BHP, Tabar JV (Kennecott, Nord Australex and Niugini Mining), Nord Pacific, Barrick and Allied Gold have all previously worked in this area. Nord Pacific followed by Allied Gold was instrumental in the discovery and delineation of the 5 main oxide and sulphide deposits at Simberi.
Geology	• The Simberi gold deposits are low sulphidation, intrusion related adularia-sericite epithermal gold deposits. The dominant host rocks for mineralisation are andesites, volcaniclastics and lesser porphyries. Gold mineralisation is generally associated with sulphides or iron oxides occurring within a variety of fractures, such as simple fracture in-fills, single vein coatings and crackle brecciation in the more competent andesite units, along andesite/polymict breccia contact margins as well as sulphide disseminations. Deeper holes in the area between Pigiput and Sorowar intersected up to 100m of semi continuous carbonate +/- quartz base metal / Au veining, similar in style to mineralization occurring on Tatau and Big Tabar islands to the south, which are also prospective for Porphyry Cu/Au deposits.
Drill hole Information	• Drill hole information is included in intercept table outlining collar position obtained by DGPS pickup, hole dip and azimuth acquired from a downhole surveying camera as discussed in section 1, composited mineralised intercepts lengths and depth as well as hole depth.
Data aggregation methods	• For gold only epithermal mineralisation, broad down hole intercepts are reported as length weighted averages using a cut-off of 0.6 g/t Au, minimum width of 2 m, and a minimum grade*length of 2.5 gmpt (gram metre per tonne). Such intercepts may include material below cut-off but no more than 5 sequential metres of such material and except where the average drops below the cut-off. Supplementary cut-offs, of 1.0 g/t, 2.5 g/t, 5.0 g/t and 10.0 g/t Au may be used to highlight higher grade zones and spikes within the broader aggregated interval. Single assays intervals are reported only where ≥2.5 g/t Au and ≥1 m down hole. • Core loss is assigned the same grade as the sample grade; no high-grade cut is applied; grades are reported to one decimal figure and no metal equivalent values are used for reporting exploration results.
Relationship between mineralisation widths and intercept lengths	• Down hole length was reported for all holes. • Simberi lodes display high variability in orientation and complex geometries because of the interplay of veining, brecciation intensity, host lithology and oxidation fronts.
Diagrams	• Included in the body of the report.
Balanced reporting	• Details of all holes material to Exploration Results are reported in intercept tables. This report covers four holes of an eight hole exploration drilling program. Assay results from the first fifteen FY24 resource definition diamond drill holes are reported in Table 1 of the ASX release dated 10 April 2024 titled “New Mineralisation Intersected at Simberi”.
Other substantive exploration data	• Included in the body of the report.
Further work	• Included in the body of the report.