

# TECHNICAL MEMORANDUM



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**TO:** Craig Riley  
Nautilus Minerals

**JOB NO:** 06631025 – 038

**DATE:** 18 December 2007

**COPY:** Nick Davies  
Nautilus Minerals

**FROM:** Ian Lipton

**EMAIL:** [ilipton@golder.com.au](mailto:ilipton@golder.com.au)

**RE:** **Resource Statement for the Solwara 1 Seafloor Massive Sulphide Deposit**

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Craig,

The following statement is suitable for public reporting of the Solwara 1 resource estimate.

Golder Associates Pty Ltd (Golder Associates) has estimated resources for the Solwara 1 Seafloor Massive Sulphide Deposit based on the results of 111 core drill holes drilled from the seafloor in 2007, with additional supporting information from 35 core holes drilled in 2006, surface chimney sampling and an electromagnetic survey.

The Mineral Resources estimated by Golder Associates at a 4% copper cut-off grade, quoted to the appropriate level of precision, are:

**Indicated Mineral Resource: 870 kt @ 6.8% Cu, 4.8 g/t Au, 23 g/t Ag, 0.4% Zn.**

**Inferred Mineral Resource: 1,300 kt @ 7.5% Cu, 7.2 g/t Au, 37 g/t Ag, 0.8 % Zn.**

Key features of the resource estimate are:

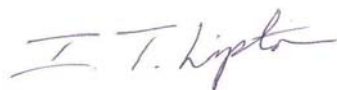
- The Solwara 1 deposit is located on a volcanic sea mount. It consists of a zone of massive sulphides partially overlain by a thin zone of barren or weakly mineralised sediments. Base metal rich chimneys occur above much of the massive sulphide deposit. The massive sulphide zone exhibits strong geological continuity and correlates well with a distinct electromagnetic anomaly on the sea floor.
- Drilling and sampling was observed during three separate site visits to the operations vessel by Ian Lipton, the nominated Qualified Person.

- Core recovery averaged 73% in the massive sulphide zone, which forms the Indicated Resource and the majority of the Inferred Resource. Core recovery in the units above and below the massive sulphide zone was lower and highly variable, hence these zones are classified as Inferred Resource.
- The core, all of 52 mm diameter, was sawn in half and sampled over intervals of approximately 1 m with breaks at lithological boundaries.
- Samples were analysed by multi-acid digestion and ICP-AES. Examination of quality control data, including blanks, certified reference materials and duplicate samples indicates that the Cu, Au, Ag and Zn analytical data are satisfactory.
- All drill holes were vertical and were registered to the bathymetry, which has a 20 cm by 20 cm horizontal resolution over the majority of the resource area, and 1 m by 1 m horizontal resolution in some peripheral parts.
- A wireframed model of the sub-chimney mineralisation was constructed using the main lithological boundaries observed in the core: base of unconsolidated sediments, base of lithified sediments and base of the massive sulphide zone.
- The chimney material volume was estimated from the 20 cm by 20 cm bathymetry data. The grade of the chimney fields was estimated from 133 samples of *in situ* chimneys.
- A computer block model was constructed by filling between the wireframe surfaces to the base of the chimneys with 10 m by 10 m by 0.5 m blocks. Sub-blocking was not employed, with whole blocks assigned to geological domains on a maximum proportion basis. Blocks representing the chimney volume were superimposed at the top of the model.
- Grades of Cu, Au, Ag, and Zn were estimated into the blocks by ordinary kriging using unfolding techniques and correlograms to define the spatial continuity. Search distances for the first estimation pass were 50 m laterally and 3 m vertically, with a minimum of 7 and a maximum of 12 samples used to estimate each block. Search distances for the second estimation pass were 500 m laterally and 5 m vertically, with a minimum of 1 and a maximum of 12 samples used to estimate each block. No more than 3 samples were selected from a single hole. Hard boundaries were used between all lithological zones. The chimney zone blocks were estimated effectively in two-dimensions (with no variation in grade in the vertical direction).
- Appropriate high-grade capping to outlier values was applied on a zone by zone basis.
- Measurements of dry bulk density were determined on over 300 samples of drill core using two water displacement methods. The average dry bulk density for the massive sulphide mineralization was 3.4 t/m<sup>3</sup> and for the semi-massive mineralization was 3.1 t/m<sup>3</sup>. The average dry bulk density of the chimneys (86 measurements) was 2.2 t/m<sup>3</sup>. Average dry bulk density values were assigned to each logged lithology prior to block grade estimation by ordinary kriging.

- All resources lie within the area of massive sulphide accumulation indicated by chimneys and an electromagnetic anomaly. Resources have been classified as Indicated or Inferred based on the drill hole spacing and core recovery. In many locations the base of the massive sulphide zone was not intersected by drilling and the resource remains open at depth.
- The zone of mineralisation classified as Indicated Mineral Resource was tested by drill holes spaced from less than 10 m to a maximum of approximately 50 m. Within this zone, most of the blocks were estimated in the first pass and the core recovery in the intercepts used to estimate the blocks was generally greater than 70%. In the area classified as Inferred Mineral Resource the drill hole spacing ranges up to 200 m, but is generally less than 100 m, and the core recovery was more variable. All of the chimney mineralisation was classified as Inferred Mineral Resource.
- Nautilus Minerals advised Golder Associates that the 4% Cu cut-off grade is comfortably above those indicated by previous preliminary scoping studies reported in 2006, and that metallurgical test work on recovered material from Solwara 1 has indicated that economic recoveries are likely to be achieved.

These mineral resource estimates are based upon and accurately reflect data compiled by Mr Ian Lipton, Principal Geologist, who is a Fellow of the Australasian Institute of Mining and Metallurgy and a full time employee of Golder Associates Pty Ltd. The Ontario Securities Commission has advised that Mr Lipton has sufficient experience that is relevant to the style of mineralisation and the type of deposit under consideration and to the activity which he has undertaken to qualify as a Qualified Person as defined in NI43-101. Mr. Lipton consents to the inclusion of this information in the form and context in which it appears in this report.

Yours faithfully,  
**GOLDER ASSOCIATES PTY LTD**



Ian Lipton  
Principal Geologist