

Major miners and technology companies come together on the seabed

2007-07-14 13:29:32 by Rons_ROV_Links

Vancouver-based Nautilus Minerals and London-based Neptune Minerals are two leading protagonists in the search for high-grade seafloor massive sulphide deposits, capturing the imagination of the international mining industry. Seafloor Massive Sulphide (SMS) deposits are considered to be modern day analogues of Volcanogenic Massive Sulphide (VMS) deposits, - a major source of the world's copper, zinc, gold and silver. Vancouver-based Nautilus Minerals and London-based Neptune Minerals are the two leading protagonists in this area and have captured the imagination of the industry.

Nautilus Minerals boasts Teck Cominco Limited, Anglo American and Barrick Gold as significant shareholders, while more recently, Newmont has invested heavily in Neptune.

High grades are certainly one of the attractions. SMS are high-grade hydrothermal deposits rich in copper, zinc and lead with a high gold and silver content. SMS samples recovered to date generally have significantly higher metal content than those mined onshore around the world.

SMS have been identified worldwide from extensive international research as current ore-forming processes associated with submerged tectonic margins and mid-ocean spreading margins. Hydrothermal plumes (Black Smokers) occur where metal-rich high-temperature fluids discharge from seafloor vents. Before the fluids enter the ocean, they are commonly between 300oC and 500oC and under high pressure. Under these conditions the superheated waters dissolve minerals from the surrounding rocks. As the fluid enters the near-freezing ocean water, the metals in solution precipitate out as sulphide particles and typically build chimneys packed with minerals. Fine particles from the chimney plumes fall to the ocean floor and build up as concentrated metalliferous deposits (SMS).

Nautilus is exploring high grade gold copper +/- zinc mineralization on the seafloor off Papua New Guinea (PNG) where it has 15,000 km² of tenements. It is progressing its innovative exploration and environmental base line studies under the banner of New Vision. New World. New Resources. in collaboration with members of the international scientific community. Nautilus is the first company to commercially explore the ocean floor for gold-copper-zinc-silver SMS deposits. Environmental permitting is underway and one of the world's leading dredging companies is planning a +\$120 million specialized mining ship to contract mine for Nautilus its PNG high-grade gold-copper deposit.

Nautilus engaged Worley Parsons Engineering to advise on mining techniques, capex and operating costs for mining and raising 2 Mt/y (mining 400 t/h) and processing 270 t/h at a land-based facility. Worley concluded that much of the remote subsea technology required for this project may already be available courtesy of those currently servicing and supporting the offshore oil/gas and telecommunications industries. Based on the recommendations of the Worley Parsons' study, Nautilus put together an alliance of key players from the offshore equipment, services and engineering industries to lower the risk of development of the project. Engineering studies, tests and design are being conducted by several alliance members using their extensive research and development facilities. Importantly Worley Parsons expertise

covers minerals and metals and the offshore oil & gas sectors, the two industry sectors fundamental to the mining of SMS.

Perry Slingsby Systems (based in UK and USA) is the world leader in manufacture of deep ocean remote operated vehicles (ROVs) for the oil/gas and telecommunications industries. Vehicles are manufactured for applications such as deep sea trenching for pipe and cable laying and for sub sea construction activities to 3,000 m. Canyon Offshore is an international operator of deep ocean ROVs for the oil/gas and telecommunications industries. It owns equipment for sub sea construction as well as trenching for pipe and cable laying at depths to 3,000 m. Part of the Houston based Caldiv Group, Canyon Offshore is the largest operator of ROVs in the Gulf of Mexico supporting the ultra deep development of oil and gas to 3,000 m. They also service the North Sea from facilities in Aberdeen and operate extensively in the Asia Pacific region.

Voest Alpine is a subsidiary of Sandvik. A world leader in the manufacture of roadheaders for hard rock drifting and of bolter miners, Sandvik is providing cutting head technology to the project and has at its Austrian test facility, conducted tests of the engineering properties of SMS samples supplied by Nautilus.

Seacore, based in Cornwall UK, but operating worldwide, is a specialist in marine drilling and coring in open ocean waters to depths of 2,500 m. Seacore has provided a great deal of specialist undersea exploration technology, and continues to do so.

Hayward Tyler, a UK and USA-based company, has provided specialist advice and designs to the engineering alliance for 350 and 750 kW electric motors rated to 2,500 m as part of a study of a potential sub sea mining operation. With experience of sub sea motors to 2.5 MW, Hayward Tyler is recognised as a world leader. Meanwhile, Cortland Fibron brings to the Technical Alliance a capability in power cables and umbilicals to support deep ocean operations.

Neptune Minerals has 100% interest in three prospecting licenses for SMS deposits in New Zealand-controlled waters, totalling over 236,000 km².

The company targeted New Zealand for its initial operations because of:

- Its stable political environment
- Government legislation and support for offshore mineral exploration
- The country's well established offshore oil and gas marine industry
- An active marine contracting sector which includes ships, platforms and ROVs
- Seamount sites at depths of 120 to 1,800 m under water at well within the operating range for existing technologies

In May 2007, together with Geo Subsea, Neptune undertook the Kermadec 07 exploration program, involving high resolution seafloor mapping and sampling of SMS targets offshore New Zealand. Preliminary results are expected to be released in August 2007.

Neptune has exploration applications covering 37,000 km² pending in the territorial waters of Japan, PNG, Vanuatu, Italy and the Marianas.

© 2007 *Mineweb*

<http://www.rovworld.com/modules.php?name=News&file=article&sid=1506>