

**Press Review:
Mining in the South Pacific**

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Abbreviations in common use:

BCL: Bougainville Copper Limited

LNG: Liquid Natural Gas

PIR: Pacific Islands Report

PNG: Papua New Guinea

Websites:

Radio New Zealand (RNZ): <http://www.radionz.co.nz/international>

PNG Post-Courier: <http://postcourier.com.pg/>

PNG National: <http://www.thenational.com.pg/>

Nautilus Announces Preliminary Economic Assessment for its Solwara 1 Project

By News Headlines, DSM Observer, February 28, 2018

Press Release: Toronto Ontario, February 27, 2018 – Nautilus Minerals Inc. (TSX:NUS, OTC:NUSMF Nasdaq Intl Designation) (the “Company” or “Nautilus”) is pleased to announce the results of a Preliminary Economic Assessment (“PEA”) prepared by AMC Consultants Pty Ltd (“AMC”), contained in an independent National Instrument 43-101 (“NI 43-101”) technical report, for the development of the Solwara 1 Project in the Bismarck Sea of Papua New Guinea (“PNG”). The PEA, entitled “Preliminary Economic Assessment of the Solwara Project, Bismarck Sea, PNG,” details the proposed production system and methodology, and provides estimates of operating costs, CAPEX to completion, metal production, and cash flows. Highlights include:

- Solwara 1 is fully permitted
- PNG Government is a 15% partner
- 15 month ramp up to “steady state” production (~3,200 t/d)
- Steady-state payable metal production per quarter ~ 2 0 kt Cu and 29 koz Au

- C1 costs*
 - US\$1.36/lb Cu for the entire deposit
 - US\$0.80/lb Cu when at projected “steady state” (3,200 t/d)
- Undiscounted post-tax net cash flow of US\$179 million
- Discounted net cash flow, discounting at 15% per annum, of US\$56 million
- IRR base case 28%*, rising to 40% using average forward curve metal prices for copper and gold during the production period (as at the PEA’s effective date)
- ~US\$243 million of CAPEX remaining to be raised (subject to financing) and spent until production commences
- Taxes and royalty payments from Solwara 1 are estimated to be more than USD\$100 million over the 3 year project life (including ramp-up)

The PEA models first production starting Q3 2019, and also shows that the Project has a high fixed cost component (~52%), largely vessel related, and is highly leveraged to metal grade, metal prices, equipment utilization and production rates. The maximum capacity of the production system is designed at ~6,000 tpd. AMC believes that if a steady-state production rate of 4,500 tpd is achieved, not an unreasonable target in their assessment, then C1 costs would be expected to be lowered to around USD\$0.63/lb Cu (net of by-products), well in the lower half of the first quartile of the world copper production curve. Mike Johnston, Nautilus’ CEO commented: “We are very excited by the results of the PEA. Expected C1 operating costs at US\$1.36/lb Cu for the entire project are in the lower half of the cost curve, and include the 15 month ramp up period. Expected “steady-state” C1 operating costs of US\$0.80/lb Cu sit comfortably in the lower half of the first quartile of the production curve, and highlight the potentially seriously disruptive nature of seafloor mining to the world’s mining industry. These are very competitive capital and operating costs, and have additional room to move.”

The production systems on which the PEA is based are currently under construction. The Nautilus business model is based on using the capital, IP, and know how that Nautilus has developed for the Solwara 1 Project, and applying it to future discoveries at minimal additional CAPEX cost, and with a much reduced “ramp up curve” for subsequent projects. The oceans have significant potential to provide the key minerals (copper, gold, silver, zinc, nickel, cobalt and manganese) needed by the world as it transitions to a low carbon future based on electric vehicles and batteries. Nautilus’ seafloor production system with its very small environmental footprint, lack of tailings, and industry leading OPEX and CAPEX costs, will allow the Company and its partner, Eda Kopa (Solwara) Limited to lead the world in this exciting new industry.

About AMC and the Technical Report

The Company’s subsidiary, Nautilus Minerals Niugini Ltd, engaged AMC to undertake the PEA for the Solwara 1 Project and compile a technical report compliant with NI 43-101. AMC is one of the world’s most trusted mining consulting companies and operates from eight offices in Australia, Canada, Singapore, Russia and the United Kingdom. It helps mining leaders find smarter ways to mine and unearth hidden business value. AMC provides specialist services in geology and mineral resource estimation, mining engineering, mineral processing, geometallurgy, and geotechnical engineering. Its global team of experts prepares mine feasibility studies, conducts studies to optimize and improve operating mines, and provides specialist technical reports for corporate and financial transactions. AMC has a long track record of producing high-quality results that provide confidence to explorers, miners and investors. The Company is today filing the technical report dated February 27, 2018, prepared by AMC entitled “Nautilus Solwara 1 PEA”. The authors of the technical report, all of whom are “qualified persons” under NI 43-101, are Ian Thomas Lipton, Edward Vincent Gleeson, and Peter Munro. The technical report will be available under the Company’s profile on the SEDAR website at www.sedar.com as well as on the Company’s website at www.nautilusminerals.com.

About Solwara 1

The Solwara 1 Project is a deep-sea mining project located in the Bismarck Sea of PNG. Construction of a commercial-scale mining operation to extract deep-sea metallic mineral resources is well advanced. Production has not yet occurred. The PEA is based on the existing mineral resource estimate at the Solwara 1 Project. The Company cautions that the PEA is preliminary in nature, that it includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA will be realized. A pre-feasibility study has not been undertaken. Mineral resources that are not mineral reserves do not have demonstrated economic viability. All dollar amounts in this release are presented in US dollars unless otherwise stated.

The results of the PEA represent forward-looking information that are subject to a number of risks, uncertainties and other factors that may cause results to differ materially from those presented herein. See “Forward-Looking Statements” below. Completion of the production system and initiation of mining operations at the Solwara 1 Project are also dependent on the Company raising the remaining capital required, and there can be no assurances that this can be achieved. All scientific and technical information contained in this news release has been reviewed and approved by Ian Lipton, Principal Geologist at AMC, who is a “qualified person” under NI 43-101.

*Notes:

The PEA is based on a first production date of Q3 2019. The Company is currently forecasting a Q2 2019 first production date (subject to financing), but this is also subject to finalizing the ship build contract delivery date between Mawei Shipyard and MAC, and finalizing the integration philosophy and methodology (due early Q2 2018). The PEA’s effective date is 1st January 2018. Metal prices used in the PEA’s base case were \$7,319/t

Cu, \$1,200/Oz Au, \$18.00/Oz Ag. The upside case used copper and gold prices averaged over the forward curve for the proposed production period (out to Q2 2022), on the effective date (1st January 2018), and were estimated by AMC using US\$7,981/tonne Cu, and US\$1,391/Oz Au prices. All other cost and production parameters are detailed in the PEA.

C1 cash costs per pound is a financial performance measure based on cost of sales and includes treatment and refinement charges and by-product credits, but excludes the impact of depreciation and royalties. C1 does not have any standardized meaning under Generally Accepted Accounting Principles (GAAP) or International Financial Reporting Standards, and may not be comparable to similar measures of performance presented by other companies.

Aopi says passing of bill will send wrong signal to investors

February 27, 2018, The National Business

The passing of the Mineral Resources Authority (MRA) Bill 2017 and the resulting changes will send a “very wrong signal to investors”, says the Papua New Guinea Chamber of Mines and Petroleum. President Gereia Aopi expressed concern at how the changes would also set back progress made by MRA. “The chamber and the mining industry believe that the performance of MRA over the last decade is a credit to the Government,” he said. “The excellent operating standards within the mining sector are an indicator of the good work of the regulator. “It would be a tragedy for all mining industry stakeholders if this progress is lost. “MRA has managed the regulatory environment for mining, as an arm of Government, in a firm, fair and responsible manner. “It has earned the respect and support of industry and other stakeholders, including landowners, and contributed to rising professional standards throughout the mining sector.” Aopi said mineral exploration and production companies had three major concerns about the legislative changes:

- Removal of direct industry representation on the MRA board;

- doubling of the production levy rate from 0.25 per cent to 0.5 per cent; and,
- Allocation and remittance of 35 per cent of annual production levies directly to the Department of Mineral Policy and Geohazards Management.

Aopi said for many years, successive governments had reaffirmed their confidence in the MRA “model”. “Why are we making these changes now to weaken a very important government body that has performed exceptionally well?” Aopi said. “The benefit of having an effective regulator over many years can clearly be seen in the professional way issues are managed in the mining sector. “It is a working model that is being discussed by the Government and the industry to be applied to the oil and gas sector to help manage the issues impacting their operations.”

Solwara licence renewal opposed

Post-Courier, February 27, 2018

Alliance of Solwara Warriors (ASW) has lodged is an objection to the exploration licence renewal to the Solwara 1 project. Twenty groups had signed the objection forms from local level government wards, churches and schools. They also claimed support from coastal communities in other maritime provinces. The alliance lodged its objection to the renewal of exploration licence EL1196 that covers the site set for mining by Nautilus Minerals. According to MRA officials, explorations licences have a lifespan of two years and are part of the renewal process prior to expiration where objections may be submitted by aggrieved parties. Spokesperson of the alliance and community leader in Namatanai LLG, Jonathan Mesulam said his group of representative had come from the New Ireland to represent the concerns of their communities in New Ireland and other impacted provinces.

He said the objection comes after years of what he described as a lack of proper consultation. “This project is the first and they are testing it with us in the ocean and for us living along the shoreline in New Ireland and East New Britain.” The company and the government said the villages and impacted communities are supporting the project, but this is not so,” Mr Mesulam said. He said after visits to communities, it was have found that there is opposition to this project supported by a different organisation in the country. Mr Mesulam said with impacted communities been educated and aware of what he claimed would be the side effect of such activities, he said many are opposing the project. “We are representing the voiceless to put a stop to the project,” he said.

Miners report some infrastructure damage after Papua quake

Melanie Burton and Sonali Paul, Reuters, February 27, 2018

Miners in northwest Papua New Guinea reported some damage to infrastructure following a powerful magnitude 7.5 earthquake that hit on Monday, as projects in the resource-rich region assess the impact on their operations. Barrick Gold Corp said a power station that supplies its Porgera gold mine had been damaged, while Ok Tedi Mining Ltd said a landslip had blocked a road and damaged pipelines to its copper and gold mine in the Star Mountains. The PNG government said it had sent disaster assessment teams to the rugged Southern Highlands about 560 km (350 miles) northwest of the capital, Port Moresby, following the quake early on Monday and a series of aftershocks. No casualties have been confirmed.

"It's premature to comment on what the impact to Porgera may be as those assessments remain underway. The mine does have limited back up power generation available on site," Barrick Gold spokesman Andy Lloyd said in emailed comments. Electricity from the power station is mainly used by the processing plant at Porgera. The mining fleet uses diesel. Porgera is co-owned by Chi-

na's Zijin Mining Group. State-owned Ok Tedi said that a landslip blocking roads would likely take several days to clear, but did not comment on any direct impact to operations. "Maintenance work on the damaged pipes will begin as soon as road access is restored and spare pipes are transported to the location," it said in a statement.



Landslide and damage to a road near the Ok Tedi mine. Jerome Kay/Handout via REUTERS

Early estimates are that it will take at least several days to clear the road to allow for normal traffic flow, with work due to start on Tuesday morning, it said. Earthquakes are common in Papua New Guinea, which sits on the Pacific's "Ring of Fire", a hotspot for seismic activity due to friction between tectonic plates. Part of PNG's northern coast was devastated in 1998 by a tsunami, generated by a 7.0 quake, which killed about 2,200 people. ExxonMobil said on Monday it had shut its Hides gas conditioning plant and that it believed administration buildings, living quarters and a mess hall had been damaged. Gas is processed at Hides and transported along a 700 km (435 miles) line that feeds a liquefied natural gas plant near Port Moresby for shipping. PNG oil and gas explorer Oil Search said in a statement on Monday it had also shut production in the quake-affected area.

Most mining operations halted as earth quake precautionary measure

Post-Courier, February 26, 2018

The 3:44 am (Feb 26), 7.5 magnitude earthquake that struck mainland PNG this morning has resulted in the prompt shutdown of Oil Search Limited operations as a precautionary measure. The oil giant also confirmed receiving a report from ExxonMobil that it is shutting down its operations in Hela province as a precautionary measure. In an online alert, Oil Search stated that its' primary concern is the safety of their employees and contractors. The Company is presently confirming that all personnel have been accounted for. No injuries have been reported so far. As a precautionary measure and in order to assess any damage to facilities, Oil Search's production operations in the PNG Highlands are in the process of being shut-down. ExxonMobil PNG Ltd has confirmed that the PNG LNG facility at Hides has also been safely shut down.

"We are also monitoring the impact on people in our local communities and will assist the relevant authorities, where possible," the oil company stated. Other reports have also confirmed the earthquake hit parts of Momase and the southern region as far as the Western Province. A source at Ok Tedi mine in the Western Province has also confirmed to have experienced "violent tremors" at about 3:30 am this morning. However, he stated in an email that they are all safe. "No one was hurt during the quake though we have not heard if anyone around town was hurt. It's the first time for

me to experience such a tremor in Western Province,” he said. Meantime, Oil Search stated that it will keep the market advised of any material updates.

Minister will not intervene in Ok Tedi mine sacking

Charmaine Poriambep, LOOP PNG, February 26, 2018



Despite calls from the North Fly MP to investigate the sacking of more than 100 Ok Tedi Mining Limited employees, Mining Minister Johnson Tuke says he will not intervene with administrative issues. He said the sacking of these workers is a management issue. “I understand that it is grievances displayed by employees. They have a channel to go through,” stated Tuke. Minister Tuke says Ok Tedi Mining Limited has set guidelines and regulations on how to deal with issues that arise and both parties have to be guided by those processes. Meanwhile, OTML says it will not make any comments or statements on the matter.

North Fly MP, James Donald, recently called on Tuke to immediately intervene and direct investigations into the sacking of a group of Ok Tedi Mine employees in Western Province. His call comes after the company management terminated more than 100 of its employees last Tuesday for staging a protest against the company. OTML said their industrial action was illegal as it did not follow the grievance process and was not supported by the union. They were served with termination letters on the evening of that same day (Tuesday) to leave. Donald said sacking of employees in that manner and in such big numbers was concerning as it was signalling something worse to come.

App brings alluvial miners, buyers closer

The National, February 26, 2018

ALLUVIAL miners throughout the country will now be able to trade directly with buyers all over the world through a mobile phone application. The Mintrad app was launched in Alotau, Milne Bay, on Thursday during the Alluvial and Small Scale Mining Convention 2018. It is an initiative of the Mineral Resources Authority (MRA) and is a platform for facilitating trading of alluvial gold. Miners will be able to communicate with buyers, negotiate prices based on world market prices and get the best maximum selling prices. It is about making trade easily accessible to simple rural miners in the comfort of their own villages. The app will be upgraded and improved as trading commences and feedback is received from users.

It was launched by Mining Minister Johnson Tuke and Esa'ala MP and Minister for Justice and Attorney-General Davis Steven. MRA managing director Philip Samar said the alluvial and small-scale mining sector was the mining sector's small-to-medium enterprise. He said launching of the app was consistent with one of MRA's main target this year, which was to develop the small-scale mining sector through awareness, funding assistance and appropriate technology. The staging of the convention was an initiative of the Esa'ala district development authority with the leadership and support of Steven. Samar commended Steven for his initiative and urged other MPs who represent mining districts to partner with MRA to develop the sector.

Sir Julius: Change in MRA Act will benefit state and the people

Post-Courier, February 26, 2018

New Ireland Governor Sir Julius Chan says the change to mining act is not about one selfish gain but it is for the benefit of the state and its people. Sir Julius was responding to a letter to Post-Courier by a Lomux of Port Moresby alleging that the change Sir Julius proposed was of personal gain and would cause more harm than good to the mining industry. "Lomux should get his facts right. First, yes PNG is part of the International mining and investment ecosystem. "What I 'am suggesting is that we be consistent with that system. "Almost everywhere in the world royalties are set at between eight percent and 20 percent. "In Canadian provinces, they are between 12 percent and 18 percent. In America, there are between eight percent and 16 percent. "Look at the equity across the world in most countries the state gets up to 50 percent equity 'carried interest' that means the company pays for the exploration and development cost and the state gets automatic half ownership of the mine," said Sir Julius.

He said PNG should do the same but Mr Lomux does not want PNG to do that in his letter. Sir Julius said with the current Act government is paying tax breaks to mining companies, among other things which are contrary to international practice. "Revising the Mining laws in PNG will lead to greater incomes for the state, landowners and for the provinces. "The companies will make good profits, but they will not make the obscene profits they have been making," said Sir Julius. He also stressed that changes he was suggesting in both Mining and the Gas and Oil Act will lead to an increase in revenue of K7.5 billion per year, over half of which will go to the state. "It will also reduce expenditure by the state of K2.5 billion per year as the provinces are able to take over aspects of service delivery and infrastructure development.

"This will eliminate our fiscal and budget deficits, allow us to pay all the Sovereign Debt we now have and get us out of the current fiscal dilemma in which we find ourselves. "And I have also recommended that 20 percent of any increase in revenues going to mining provinces as a result of these changes should be put into a trust fund to be used for projects and programs in non-mining provinces. "The non-mining provinces in the future will help the provinces with existing mines when their minerals ran out. "The intent of these changes is to maximize the returns from the mining and other non-renewable resources while they last. "So that we can increase revenues from those resources and use the large portion of the revenue to develop our renewable resources. "And this need committed people to make certain people of PNG benefit from the wealth coming out of their ground."

Alliance of Solwara Warriors to object exploration license

Loop PNG, February 25, 2018

The Alliance of Solwara Warriors* will submit their objections to Exploration License 1196 (EL 1196) to the Mineral Resources Authority (MRA) on February 26. EL 1196 is situated on tradition-

al shing and ceremonial waters of West Coast Namatanai in New Ireland Province and Duke of York Islands in East New Britain Province. In a statement, the Alliance of Solwara Warriors said: “As maritime communities whose wellbeing and quality of life depend on the health of the sea, we were not consulted before licenses and leases were awarded by the National Government for seabed mining project in the country. “We were not given the opportunity to exercise our rights as stated in the United Nation’s Declaration on the Rights of Indigenous people on Free Prior Informed Consent. “We also recognise through our local and traditional knowledge of tides and currents that many of our communities will face disastrous impacts if this experiment of seabed mining continues.



“Recent natural disasters such as the Kadovar eruption have highlighted the indecency of national authorities to respond to disasters.” The Alliance said carrying the voices of their communities, they call on the Mining Minister, Johnson Tuke, to recognise and acknowledge that they are not ‘external groups’. “We are the custodians of the sea!” Furthermore, the Alliance has thanked the Evangelical Lutheran Church of Papua New Guinea (ELC PNG), Catholic Bishops Conference (CBC), Caritas PNG, the PNG Council of Churches (PNGCC) and the Pacific Council of Churches (PCC) and His Eminence, Cardinal John Ribat, for recognising and acknowledging them as the custodians of the sea. * *The Alliance of Solwara Warriors is a growing group of communities and supporters from Madang, East New Britain, New Ireland, Manus and Milne Bay Provinces*

Nautilus appoints COO

Post-Courier, February 25, 2018

Nautilus Minerals has appointed Wayne Knott to the role of Chief Operating Officer (COO), commencing March 19, 2018. The appointment was announced last week as seafloor mining company moves towards starting its first seafloor mining operations in Papua New Guinea in 2019. Mr Knott is a metallurgist with over 30 years of mining industry experience, with particular expertise in dredging, operational start-ups, and reviews. Knott previously worked for Nautilus Minerals as Operations Manager during 2010 to 2012, where he was responsible for defining the Company’s original operational readiness plan, as well as providing significant input into the design and scope of the current production system.

His immediate past role was Operational Readiness Specialist for Hatch, with clients that included BHP, BMA, and Teck Resources. Mr Knott is MBA qualified with a bachelor's degree equivalent in Extraction Metallurgy. "We are delighted to have Wayne back leading our project team," Nautilus' CEO Mike Johnston said. "Wayne's expertise in operational start-ups, their design and implementation, combined with his intimate knowledge of our production system. He will be invaluable to us as we continue to advance towards completing the build and integration of our system, and launch the seafloor resource production industry."

Reserve alluvial mining for locals

Post-Courier, February 22, 2018

Alluvial mining is now reserved for Papua New Guineans according to the Minister for Mining Johnson Tuke. This will also see for regional alluvial (small scale) mining schools to be established in the country and the sector to be funded by the government. Mr Tuke made this announcement in Milne Bay province during the 2018 alluvial and small scale mining convention and Exposition. This exposition is a regional initiative of the Esa'ala district development administration in partnership with the Mineral Resources Authority (MRA), and supported by the Milne Bay Provincial Government. "Since taking office as the Mining Minister, I have been passionately attracted to the growth of the alluvial industry.

"My desire is to help Papua New Guineans to train professionally and acquire necessary skills and knowledge on how to mine the alluvial exceptionally well and build up the wealth capital to be able to engage productively in the exploration and mining stages of the industry," said Mr Tuke. He said mining was a sector that Papua New Guinea based its budget on and therefore imperative, under the O'Neill-Abel Government to help the people participate meaningfully in the alluvial sector and generate wealth for the country. "Enough of outside people mining in the alluvial sector, it's for our people we can't be spectators anymore in our own land. I will make a submission to the government to make alluvial mining a reserved activity only for Papua New Guineans," he said.

There will be four regional alluvial miners' training centres, to be located in Milne Bay Province (Southern), Wau-Bulolo in Morobe Province (Momase), Kainantu in Eastern Highlands Province (Highlands) and New Ireland Province (New Guinea Islands). He said the government would fund the alluvial mining sector starting next year to make it accessible for the people to assist them in their alluvial mining activities. Mr Tuke said the MRA and the Department of Mineral Policy & Geo-hazards Management would be tasked with the creation of a framework to establish the training centres and other necessary technical capacity to empower them.

Resource owners welcome industry removal from MRA Board

Post Courier, February 23, 2018



The Resource Owners Federation of Papua New Guinea, which has been campaigning for the removal of the industry representatives from the board of the Mineral Resources Authority (MRA), is pleased with the government for finally amending the Mineral Resources Authority Act 2005, to remove the mining industry representatives from the board of the authority. The presence of the mining industry representatives on the board of the MRA had caused the public to distrust the Authority and its decisions, even if those decisions were proper. MRA is the State's regulatory institution, whose function is to administer the mining laws of PNG. Federation President Jonathan Parai said it was utterly improper and unlawful for representatives of the industry, who are the subjects of the mining laws to have had a hand in the enforcement of the laws against themselves for the last seventeen years or so. He said their presence has been an impediment to the rule of law being applied impartially in the mining industry.

First platinum sponsor for APEC CEO's Summit

Freddy Mou, PNG Loop, February 22, 2018

Seven platinum sponsor spaces are yet to be filled, with nine months remaining for the Asia-Pacific Economic Cooperation (APEC) CEO's Summit in November this year. Newcrest Mining Ltd was the first company to sign an agreement with the APEC Authority in Port Moresby today for the platinum sponsor. Witnessed by APEC Authority chairman Sir Charles Lepani, ABAC chairman David Toa and APEC senior official Kelly Taureka, Newcrest's executive general manager, Ian Kemish, signed the agreement with Chairman of PNG ABAC Secretariat, Wayne Golding. Kemish said Newcrest is proud to sponsor the APEC CEO Summit and to tell the PNG story to the rest of the world.

"The PNG Government has placed a top priority on hosting a successful APEC year. "Newcrest is standing alongside the Government as a platinum sponsor." He added that Newcrest injects considerable economic and social value into PNG, including employment, contract for local goods and supplies and community contributions, and such sponsorship is timely. He said with the Government's priority to host the APEC Summit, Newcrest is committed in supporting the government in hosting such big events. Meantime, Chairman of PNG ABAC Secretariat, Golding, thanked Newcrest for its sponsor and is looking forward to welcome other sponsors as well.

"This hosting of the 2018 APEC Year is an honour and will require all PNG's skills and capabilities, supported by friends of PNG, to host the Asia Pacific's largest economic grouping," he stated. "We thank Newcrest and other sponsors for their generosity." There are two categories for the sponsors: Platinum and Gold, with about eight sponsor placings in each category. Gold sponsors cost about US\$150,000 (K459,000) while Platinum is US\$275,000 (K841,000). All the sponsors will be for the main APEC CEO Summit in November which will be steered by APEC Business Advisory Council (ABAC) working in close consultation with PNG's business and industry community.

Nautilus Minerals hails progress of support ship

February 22, 2018, The National Business

NAUTILUS Minerals chief executive Mike Johnston says Mawei Shipyard continues to make "excellent progress" on the building of its support vessel. Johnston, in a statement, gave an update on the progress in the building of its production support vessel and associated equipment. They will be used by Nautilus and its partner, Eda Kopa (Solwara) Limited, at the Solwara 1 project site in New Ireland. "Mawei Shipyard continues to make excellent progress on the production of the support vessel," Johnston said. "Highlights for this period include the installation of the in-hold material

handling system allowing the closing of the vessel's deck, the installation of the derrick substructures and the advancement of the derrick structure.”



Mawei Shipyard in China had reported that the support vessel was more than 75 per cent complete. The in-hold cargo handling systems have all been fabricated, assembled and installed in the four holds of the vessel. This has allowed for the installation of deck blocks and close out of the deck of the vessel in preparation for the derrick installation. The Sichuan Honghua Petroleum Equipment Co has made progress with fabrication of the derrick and associated substructure. The equipment is required for the deployment of the subsea slurry lift pump and riser.

Mining Policies Need To Be Reviewed: Minister

Matthew Vari | Post Courier, February 22, 2018

Minister for Mining Johnson Tuke says the policies governing the mining sector in Papua New Guinea need to be revisited. He said much of the legislations governing the sector are still from the colonial era. Mr Tuke said with the strong support from Prime Minister O'Neill and government caucus he is determined to take stock of benefits to landowners that make changes for the country to have a greater share in its own wealth. "I think all our mining policies are more or less colonial. Are we still in the colonial times? We are moving forward," Mr Tuke said. "Leaders like Sir Julius Chan have all learnt their mistakes, and are telling me to move forward. The decisions conducted then were suitable for that time. This time has different underpinning. We have take heed of it and move ahead." Mr Tuke said he plans for all new mines to provide community obligation concessions.

"We have been for far too long reaped. This is high time; there will never be another time. It needs courage and determination. This government is determined." Mr Tuke commended Prime Minister Peter O'Neill for his leadership in ensuring changes do take place for the country's mining sector. "There has never been a time any consecutive government has thought so much of its people. I have started off with MRA and I will pursue with mining policy and acts." "I am adamant and I will fight vigorously until I pass the mining policy (review). I think 40 years is enough and we are overqualified to develop new policies." "I have got to do one or two things, I have to make abnormal decisions that will stimulate many others but affect a few." He said with the mining industry a huge contributor to the national purse much of its activities have been done behind the curtain. Something Tuke says he wants to change. "I want everybody to know the system, the guidelines, the pol-

icy and the process, because once it (minerals) is gone, it is gone. You can't renew that so our people have to know what they (developers) are doing.”

Ok Tedi: Mine group sacked

By SHIRLEY MAULUDU, February 22, 2018, The National Main Stories



THE Ok Tedi Mining Ltd has sacked a group of employees who were staging a protest at the mine site on Tuesday, telling them in a letter that their action was “illegal”. Some of employees, who arrived on a charter flight yesterday in Port Moresby, claimed there were 191 of them who were issued termination letters on Tuesday. They were told to leave the site on a charter flight yesterday. Henry Kuso, a spokesman for those who arrived at Jackson Airport, in Port Moresby, yesterday, said the company arranged three charter flights yesterday out of Tabubil in Western. Mining Minister Johnson Tuke was unable to comment when contacted yesterday. Ok Tedi managing director Peter Graham could not be reached for comment yesterday. But he had confirmed with The National on Tuesday that the protest had not affected the company operations. “The industrial action was illegal since it did not follow the grievance process and was not supported by the union,” he said. “Management is addressing the matter in accordance with company policy and the employee terms and conditions.”

Department of Labour and Industrial Relations Secretary Mary Morola told The National yesterday that the department was yet to be informed of what happened at Ok Tedi. “All I can advise is that the Department of Labour and Industrial Relations has not been officially informed of the Ok Tedi matter on staff terminations,” she said. Kuso told The National when the group of sacked workers arrived at Jackson Airport that their sacking was because of the protest on Tuesday. The protest was to follow up on their demand to:

- Change to current the 2/1 (two weeks on, one week off) roster for shift workers;
- Change their current contract; and
- Renegotiate the industrial agreement.

Kuso said the company had promised when it resumed operation in March 2016 following the drought in 2015 that it would review some of their work conditions and benefits. “The protest (on Tuesday) was to raise our grievances to the management,” Kuso said. “It has been two years since the resumption following the drought. Some of the things the company promised to do, it failed to

honour. “We had just a peaceful sit-in protest to get the company to come and have a face-to-face discussion with us.” He said they had talks on Tuesday with the acting general manager who “never got back to us, not even the human resources division”. “We sat from 6am to 4pm. We were surprised in the evening when a team from the Asset Protection Department delivered our termination letters. “Some of us were given the termination at night while they were asleep. “Their termination letters were shoved under their doors. “They were advised to leave in the morning (yesterday).”

How Australia is being cheated over its gas

Australia is "swimming in gas" but ordinary citizens are not benefiting from this precious resource.
Post-Courier, February 21, 2018

Australia is “swimming in gas” but ordinary citizens are not benefiting from this precious resource. As energy analyst Bruce Robertson told news.com.au last week, Australia has been “uniquely stupid” in allowing companies to dig up resources that belong to the Australian people and sell it overseas, without even ensuring there would be enough gas to cover our own use. Instead big gas companies are selling the resource overseas for a profit, and even other countries are making more money than Australia is from its own gas. Here’s why the system is broken:

AUSTRALIA HAS PLENTY OF GAS

The Australian Energy Market Operator has warned that Australia is about to run out of gas but that’s not actually true. BHP Petroleum chief Mike Yeager told journalists in 2014 that there was plenty of gas available in the Bass Strait, and it could supply people in Victoria and NSW, and possibly even Queensland, “indefinitely”. At the moment Australia is the world’s second-largest LNG exporter, providing about 12 per cent of the world’s gas, and it is expected to become the world’s largest exporter by 2020. Yet the Australian Energy Market Operator warned last week that Australians may soon be left to swelter or freeze because they can’t get enough gas for their own use. It predicted that NSW, Victoria and South Australia could feel the impact of gas shortages by the summer of 2018-19.

GAS PRICES IN AUSTRALIA HAVE SHOT UP

The development of LNG plants to ship gas overseas means Australians are now competing with overseas markets for supply of their own gas. Part of the reason there is a shortage is because Queensland coal seam fields are not delivering as much gas as companies originally thought they would. It has also cost more to get out of the ground than expected. On top of this, an unexpected global glut of gas means companies are not making as much money as they thought they would. This puts pressure on them to sell more gas and the Australian Competition and Consumer Commission has noted that companies are choosing to sell gas on the overseas “spot market”, on top of fulfilling their contracts. In order to get more gas to send overseas, LNG operators have turned to conventional gas supplies, mainly from South Australia and Victoria.

This means that cheap gas extracted from the Bass Strait, which was mainly used by Victorians for their heating and cooking, is now being pumped all the way up to Queensland to be sold overseas. ACCC chairman Rod Sims told a conference this week that demand for gas on the east coast had “tripled virtually overnight”. This has pushed prices up and it doesn’t help that there is little competition in Australia so companies can charge higher prices locally. Mr Sims said there were now reports of Victorian manufacturers being offered one and two-year contracts for gas at a wholesale price of \$20 per gigajoule or more, much higher than the historical average of \$3-\$4. The problem has become so bad some manufacturers are warning they may have to close “purely as a result of the current gas crisis”, he said.

THE GAS CARTEL

Gas on the east coast of Australia is controlled by a handful of companies and the lack of competition means they can charge higher prices locally. At the moment, supply is controlled by six companies: Santos, Exxon, BHP, Origin, Arrow Energy and Shell. Some of these companies also control pipelines used to transport gas around the country, also adding to inflated prices. Mr Robertson said companies were sitting on gas reserves and not releasing enough of their product. “Companies are sitting on permits, not developing them and restricting supply so they can make a lot of money,” he said. He said the global glut of gas, which is predicted to continue until 2030, has also put more pressure on companies to make money domestically. The more they restrict supply locally, the more money they make. It’s created the bizarre situation that sees Australian gas being sold in Japan for a wholesale price that is cheaper than the price it’s available for in Australia. Santos, Shell and Origin Energy have to stick to long-term contracts they signed with Japan amid a global glut, but the lack of competition in Australia means they can restrict supply locally and drive up prices. Australians are now paying a price higher than the international price for gas. There’s even talk about Australia importing its own gas back because this would be cheaper.

OTHERS MAKE MORE MONEY FROM AUSSIE GAS

Australia is also not profiting as much as we could from selling our gas overseas. Japan reportedly puts a tax on the gas it imports from Australia, which will deliver it \$2.9 billion over the next four years. In comparison, Australia will not receive any money from its petroleum resource rent tax from gas projects over the same period. We get \$0 in tax from selling our gas overseas. Most of the \$800 million we do get from the tax every year comes from established oil operations in the Bass Strait, rather than from LNG producers. Qatar, which is the world’s biggest exporter with 32 per cent of the market, also reportedly raises three times as much in royalties as Australia for selling the same amount of gas.

BUT MALCOLM’S FIXED IT RIGHT?

The even sadder reality is the government has little power to force gas companies to give us more gas to keep the country’s power supply stable. The government can’t even find out how much gas the companies have got in their reserves. After talking tough about forcing companies to provide us with more gas, Prime Minister Malcolm Turnbull emerged from a meeting on Wednesday, saying he had a guarantee Australians would get more gas. He said gas producers committed to ensuring there was enough gas to meet peaks in demand and bring more supply into the market as quickly as possible. There’s no way for Mr Turnbull to force companies to do this, except by threatening to block their exports. Whether this threat is enough to get the gas companies to play ball remains to be seen, but the Australian Financial Review noted last Friday gas producers were only giving “vague assurances”. Citigroup analyst Dale Koenders told the AFR local prices would still need to be high enough to make it pay. But the Prime Minister also agreed to speed up reforms to provide greater transparency about how much companies are charging for the use of pipelines that carry the gas across Australia. The ACCC found pipeline operators were able to charge higher prices because of the lack of competition, and this has also added to the cost of gas. It hopes to bring down prices by exposing details about costs so that companies can tell whether the prices are really reflective of the costs of delivering the service, or if they are being over-charged.

THEY WANT MORE

The gas companies are complaining they do not have access to enough gas and blame state governments for banning things like coal seam gas exploration. The Victorian government has banned all onshore gas exploration and production, and there has also been delays over projects in NSW and the NT. Shell Australia chairman Andrew Smith said developing additional local supply, particularly in Victoria, was a key component of ensuring competitive prices. The Prime Minister has agreed to continue pressuring these governments to reconsider the bans. But it might be worth remembering that current arrangements do not guarantee any of this extra gas will be pumped into the domes-

tic market. Based on recent experience, it's likely to go overseas. And that's worked out so well for us so far.

East Sepik governor dispatches police to arrest rogue miners

Radio New Zealand, 21 February 2018



The Governor of Papua New Guinea's East Sepik province has dispatched police to detain a company looking to mine without landowner approval. Allan Bird, who was elected six months ago, said he was trying to improve the governance around resource extractive projects in his province. He said his administration was ready to support landowners in any action they would like to take in protecting their traditional tribal land. "Two days ago we had a ship go up the Sepik river with all kinds of equipment to go and mine a gold mine somewhere up in Angoram, in a place called Keram LLG (Local Level Government area). The landowners came and complained. "Today I dispatched 15 police officers to actually go there and arrest these people and bring them to Wewak and we can figure out what's what." Mr Bird said he checked with PNG's Mining Minister about the Keram mining concern who didn't know anything about it.

Cooks' new marine bill open to public submissions

A select committee in the Cook Islands will now consider the Marine Resources Bill which the government says will make the country a world leader in the protection and management of its waters.
Radio New Zealand, 20 February 2018

The *Cook Islands News* reported the bill passed its second reading in parliament last week supported by MPs on both sides of the house. Its one of three new pieces of maritime legislation that the government says signal the Cooks is serious about fisheries management and conserving the Marae Moana ocean sanctuary. The bill would replace a 13-year-old act adding six features to the existing law including marine reserves, a fishing quota management system and penalties. Consultation on the bill began in 2012 and the public will now be able to make submissions to the select committee which is due to report back to parliament at the end of May.

Government nets next to nothing from Tolukuma mine sale

PNG Mine Watch, 19 February 2018



The government sold the Tolukuma gold mine to a Singapore company, Asidokona, in 2015, for a reported price of K81.35 million. However, Mine Watch can reveal, the government has only ever received K700,000. Despite Petromin's claims Asidokona would invest heavily in the mine infrastructure, a new road and restart production, the whole deal looked dodgy from the very start. Then Mining Minister, Byron Chan, described Asidokona as "reputable, committed" but Asidokona is not a mining company, it is a front for Singaporean speculator, Philip Soh Sai Kiang. In 2016 Mine Watch revealed that Asidokona was trying to offload the mine for US\$ 212 million to a Singapore nightclub company, LifeBrandz. That deal fell through. All the while the government has been trying to convince landowners that mining will soon recommence and they will benefit handsomely from a new royalties deal as well as the 10% shareholding agreed as part of the 2015 sale. This was tantamount to bare faced lying by the government, as officials must have known all along that Asidokona had no intention of restarting mining and, indeed, has only ever paid a tiny proportion of the sale price. According to an audited financial report for Kumul Minerals Holdings Limited, the successor to Petromin, the sale of Tolukuma was completed on 30 November 2015, not for the reported price of K81.35 million, but K26 million.

Sale of Tolukuma Gold Mine Limited on 30 November 2015

The group disposed of its interest in Tolukuma Gold Mine ("TGM"), a fully owned subsidiary on 30 November 2015. The subsidiary was disposed for K26 million. As part of this disposal, the company assumed liabilities amounting to K37.1 million. Out of the total consideration an amount of K0.7 million was collected and the balance K25.3 million was included as receivable in note 17. An amount of K16 million of the consideration was expected to be settled on or before 31 December 2016. An amount of K 2 million and K1.4 million are due to be settled before 31 December 2017 and 31 December 2018 respectively.

As the recovery of the outstanding sales proceeds is considered doubtful, this has been fully provided for in these financial statements.

Even worse, only K700,000 has ever been received and the balance of K25.3 million is still outstanding. Apparently the buyer, Asidokona, was due to pay a further K16 million on before 31 December, 2016, but never paid. A further K2 million was to be settled by 31 December 2017 and K1.4 million by 31 December 2018. According to the directors of Kumul Minerals "recovery of the outstanding sales proceeds is considered doubtful" and the debt has been written off. To cap the sorry saga, Tolukuma Gold Mines has now been liquidated for non payment of its debts. The Tolukuma landowners have every right to feel they have been betrayed and deceived by government authorities.

ExxonMobil: Over K820mil invested in development

By Lemach Lavari, February 19, 2018 The National Business

EXXONMOBIL PNG has invested more than K820 million in community and infrastructure development programmes in the country since 2014, according to managing director Andrew Barry. The programmes focused on education, health, women's empowerment, environment and agriculture. Barry said the firm's approach was to build partnerships to identify programmes that would deliver results and meet the demands of the people. The company last Thursday held its fourth "Thank You" event at the Stanley Hotel and Suites in Port Moresby to thank its community development partners. More than 100 organisations attended. Barry said the firm's principle was to improve the lives of the people. "Through a range of innovative strategic community programmes, we are using our combined talents to improve access to education and health care, elevate women's initiatives, and protect the country's biodiversity," he said.

Ensie Sinapa, a leadership consultant, said it was a unique opportunity to partner with ExxonMobil to help improve living standards through community development. Sinape is carrying out an innovative leadership and governance training programme for school board managers in Central under a public-private partnership arrangement between ExxonMobil, the provincial government and Esmie Sinapa Development Consultants. "The journey is rewarding and one of growth for many of us," she said. Nipa Kutubu District women president Anne Hewago said she and other women leaders undertook training in leadership and management skills at a Global Woman Management Training Programme in America funded by Exxon.

Mining exploration licences issued

Post-Courier, February 18, 2018

Secretary for Bougainville Mineral and Energy Resources Shadrach Himata says a total of four mining explorations licences have been issued to date. Mr Himata said companies from Australia, Canada, and the Philippines have taken up interest in the exploration of various areas in Bougainville upon the request of landowner groups. "We have a company from Australia, Canadians interested, and the Filipinos who are interested in exploration," Mr Himata said. "Right now we have issued four exploration licences in the Tore area in North Bougainville and the Central Bougainville is the Isina area. "The Filipino company, SR Metals, are interested in doing exploration in the eastern part of Isina area in Central Bougainville." He said on the northern part of the Tore area, Australian company, Kalia Resources, is carrying out exploration.

"I guess Bougainville is open to any investor who want to come and do business with us," he said. "Potentially Bougainville is a highly mineralised region, but what we are doing at the moment is we are looking at areas that the people themselves want exploration to take place, then we open up those areas. "Basically the entire Bougainville region is under what we call a moratorium. Only areas where people are willing to give up their land for exploration, then the government will facilitate." He said for Panguna, the government gave the first right of refusal to Bougainville Copper Limited, but through the process the people and the government felt it was risky to allow BCL to develop the mine or pursue exploration. "They have decided not to renew the exploration licence and put the area on reservation.

"Apart from Panguna we have also opened up other economic areas on Bougainville with mineral exploration, with the hope that we will find a major resource to process to development. "We are betting on current exploration companies on the ground right now. Again you never know how long exploration takes. It may take five years or even 10," he said. "If we find something earlier the better, but we still see Panguna as an actual mine and it is easier to develop Panguna than other areas."

He said although Panguna has been put on reserve, it is still on the radar in terms of an economic impact project for Bougainville. "The key is unity of the people, that is why we are putting the brakes a bit. When they are ready they can come back to the government with one voice and we can decide what is the best method going forward."

Frieda River upside options explored

PNG Industry News, 16 February 2018

THE Frieda River copper-gold project in Papua New Guinea's Sandaun Province represents PanAust's long-term strategic growth opportunity. This was said by PanAust managing director Fred Hess when he presented the company's quarterly report for December 2017 this week. [*PanAust is wholly owned by Chinese State company, Guangdong Rising Assets Management Co. Ltd (GRAM)*] "In 2017, we made strides towards making the project a reality through identifying opportunities to increase the value of the project, decrease capital expenditure, and reduce its overall risk profile. "We will continue to evaluate these opportunities in 2018," Hess said. The company says it continues to liaise with PNG authorities on Frieda River following lodgement of a special mining lease (SML) application and environmental impact statement (EIS) with the Mineral Resources Authority (MRA) of Papua New Guinea and Conservation and Environment Protection Authority (CEPA) of PNG, respectively in 2016.

"The overall approval and permitting process for the SML application and other permits and approvals is now being coordinated by a government appointed state negotiating team, chaired by the Department of Mineral Policy and Geohazards Management. PanAust says it is investigating opportunities to increase the value of the project and access alternative development pathways to decrease capital expenditure and reduce the overall Project risk profile. Study work to investigate these opportunities continued throughout the quarter, and indicate several potential pathways for value enhancement. The outcomes of this work will inform a decision as to whether an update to the project's SML application will be made. Hess added: "Looking to the year ahead, PanAust will look to further strengthen the relationships that have become integral to the company's success, and are synonymous with how it conducts itself where ever it operates. "The common currency of PanAust's success is the strength of its relationships; relationships with our employees, communities, host governments, suppliers, peers, and partners. These relationships depend on trust and consistent transparent communication. This is what pushes PanAust way ahead and will continue to do so throughout 2018," Hess said.

Solwara 1 needs more funding

February 16, 2018 The National Business

By SHIRLEY MAULUDU

NAUTILUS Minerals needs about US\$250 million (K790 million) more to continue with the development of the Solwara 1 project in New Ireland, chief executive Mike Johnston says. Johnston said yesterday that the company was working with its financial advisers to find the additional financing. "Nautilus continues to work with M.Horn & Co Ltd who has been appointed as the company's exclusive financial adviser in respect of the remaining project financing up to US\$250 million (K790 million) required to complete the development of the Solwara 1 project," he said. "The project continues to receive ongoing financial support from our two largest shareholders." During a recent meeting with the Mining Minister Johnson Tuke, Johnston said: "For the project, the final capital we need to raise an additional roughly about US\$250 million.

And then there is working capital and exploration that we intend to do which brings it up to about US\$300 million (K948.02 million). That's the final capital," Johnston said. Meanwhile, the company is confident that the Solwara 1 project will go ahead as planned. Johnston said the project is set for production next year. He gave the assurance during a presentation he made about the project to Tuke in Port Moresby on Monday. "The timeline is driven by the delivery of the vessel. The delivery of the vessel at this stage is schedule for the end of this year, or possibly early next year," Johnston said. "It's about three months from the delivery of the vessel to arrive in Papua New Guinea. "The end of the first quarter or first half 2019 is the current schedule for the startup of the production."

BCL takes Bougainville Govt to court over licence non-renewal

Mining company Bougainville Copper Ltd is taking an arm of the Bougainville government to court. Radio New Zealand, 16 February 2018



Panguna mine. Photo: Wellington Chocolate Factory

This came after the autonomous government in the Papua New Guinea region announced late last year a moratorium on mining at Panguna, which had been abandoned in 1989 after the civil war started. Two companies are vying to re-open Panguna but Bougainville President John Momis said to get the nod, the successful company must first win the trust of the people and BCL is yet to do this. Meanwhile a mining wardens meeting in central Bougainville in December turned down BCL's request for its exploration licence to be extended. But the company is not giving up and secretary Mark Hitchcock says they want the licence restored, hence their application for a judicial review.

"We have taken the regulator, which is the Bougainville Government, as the Department of Mineral and Energy Resources, to court. We are seeking leave to apply for a judicial review of that decision, to not renew the exploration licence." The Bougainville government is the main shareholder in Bougainville Copper Ltd, with 36%, after it was given the lion's share of equity by Rio Tinto when that company walked away from involvement in BCL two years ago. Mr Hitchcock say the ABG leadership has told him that the company has to do what it has to do to protect the interests of all of its shareholders.

Nautilus submerged trials get a pass mark

February 14, 2018, The National Business

NAUTILUS Minerals says that it has successfully completed the submerged trials for its seafloor production tools in the country. Chief executive Mike Johnston said the overarching objective of the trials was to ensure that all three machines met the requirements of their respective functional design specifications in submerged conditions. “Results to date indicate that they do,” he said. “Analysis is ongoing with a view to complete a full report on the submerged trials by the end of Q1, 2018.” Completing the trials in PNG allowed Nautilus to work closely with partner Kumul Minerals Holdings Ltd, government officers from the various government regulatory agencies, as well as representatives from provincial governments of New Ireland and East New Britain. “It also gave community leaders from coastal villages geographically closest to the Solwara 1 site the opportunity to witness the trials of the equipment, and allowed the Company to accrue the economic benefits of the testing activity within PNG,” Johnston said. “The equipment is currently being prepared for shipment to China where it will be integrated onto the vessel.”

Meanwhile, the company said the Government has granted a new two-year exploration licence to the company which included new targets. That would allow the company to conduct exploration activities within the southeast Bismarck Sea, Nautilus in a market release said. The exploration licence EL2537 covers 2558sq km, including the same prospective geology that hosts Nautilus’ Solwara 1 deposit. The area was selected based on reconnaissance sampling and surveys completed in 2017. Nautilus acknowledged assistance in this area by the PNG Geological Survey. Johnston said granting of this exploration licence was “excellent news”. “Work done in the area by the company has identified numerous exploration targets, with similar geology to our seafloor massive sulfide deposits found at Solwara 1,” he said. “The work completed last year reconfirms the significant exploration potential for deep sea minerals over expansive yet unexplored metallogenic provinces.”

Tolukuma Mine liquidated

Post-Courier, February 13, 2018

One of Papua New Guinea’s gold mines, Tolukuma, was liquidated last week after a service provider took them to court for non-payment of bills totaling US\$233,844 last year. The National Court ordered on February 08, 2018, that:

- Tolukuma Gold Mines Limited is placed into liquidation by this Court under the provisions of the Companies Act on the ground that it just and equitable that the company be placed into liquidation.
- Andrew Pini of Pini Accountants and Advisors is appointed to act as liquidator of Tolukuma Gold Mines Limited.
- Tolukuma Gold Mines Limited is to pay Hevi Lift Limited and IPI Catering Limited’s costs of and incidental to the proceeding.
- The time of the entry of these orders is abridged to the date of settlement by the Registrar which shall take place forthwith.

Liquidator Andrew Pini confirmed yesterday that the National Court last Thursday appointed his accounting firm to take on the liquidation process effective immediately. Hevi Lift took the matter to court in October 2017 for their outstanding of US\$233,844 owing since June last year. Two other companies, IPI Catering and Pacific Development Contractors submitted in support their statements to the court, as they were also owed K1.6 million and K1.8 million respectively by Tolukuma Gold Mines. “I don’t know exactly how much they owe the creditors or service providers, what I intend to do immediately is make an assessment of the real debt figure and then will put out a report,” Mr Pini said yesterday.

“I will visit the mine to start our process of liquidation, but for now I have come up with directions on how we can immediately start. I have put out public statements to all creditors of the company to come and lodge their claims using the prescribed claim Form 43 of Schedule 1 of the Companies Regulations 1998. “In accordance with Regulations 21 and 22 creditors of the company are required to lodge their claims by 5pm Wednesday March 14, 2018. After this, then I will ascertain the real debt figure for the mine.” A Singapore-based Asidokona Mining Resources, a private company, bought the Tolukuma gold mine in Central Province for K81.35 million to recapitalise and eventually restart it. They took over from Petromin in 2015.

Court reinstates case of mine spill

By CHRISTOPHER YOWAT, February 13, 2018, The National National

THE Supreme Court has reinstated a case filed against the Tolukuma Gold Mine Limited over the alleged spillage of sodium cyanide into rivers in Golilala district, Central, 18 years ago. The case was filed by James Gabe and others in 2006. It claims that more than K1 million in damages from the mining company was dismissed by the National Court in April, 2014. Gabe then applied to the Supreme Court to review the decision by Justice Sir Bernard Sakora. The three-man Supreme Court bench of judges David Cannings, Ere Kariko and Jeffery Shepherd, granted the orders sought by Gabe – that the dismissal of the case by the National Court on April 9, 2014, be quashed and that the matter be reinstated.

Justice Sir Bernard had dismissed the proceedings after he had been satisfied that Gabe and the other plaintiffs were guilty of an inordinate delay in prosecuting the case and that there had been no proper explanation for it. Gabe argued that the decision to dismiss the case was made on an “erroneous factual basis”. Justice Cannings, on behalf of the Supreme Court panel, said: “We consider, with respect, that if his honour had closely analysed the events that took place in the six-month period between the failed mediation (in April 2013) and the filing of the respondent’s motion for dismissal (in October 2013), his honour would have formed a different view as to the satisfactoriness of the applicant’s explanation for the delay.”

Seabed minerals [mining] company to visit Cook Islands

Jonathan Harwood, Cooks Island News, February 12, 2018



Seabed Minerals Authority mining operations commissioner Paul Lynch says 'exploration' is very different from the 'exploitation' the EU Parliament wants to stop.

Representatives from United States-based company Ocean Minerals LLC (OML), which has an option on exploring the possibility of seabed mining in Cook Islands waters, are to visit Rarotonga next month. Last year, the company signed a deal worth \$100,000 to reserve an area of around 23,000 square kilometres containing high-value polymetallic (manganese) nodules for up to 18 months. They have until April next year to make an application to begin exploration work within the Cook Islands EEZ. The visit comes soon after the [European Parliament called for a moratorium on seabed mining](#). In January it passed a resolution that “calls on the (European) Commission and (European Union) member states to support an international moratorium on commercial deep-sea mining exploitation licenses until such time as the effects of deep-sea mining on the marine environment, biodiversity and human activities at sea have been studied and researched sufficiently and all possible risks are understood.”

Paul Lynch, commissioner of the Seabed Minerals Authority in the Cook Islands said any mining operations in local waters remained a long way off. And he explained that “exploitation”, which is what European legislators want to halt, was very different to “exploration”, which is what is currently being considered for the Cook Islands. Exploration involves short term scientific research to understand the viability of any mining proposal, and also involves assessing what impact it might have on the seabed and environment. Exploitation is the final stage and involves the actual removal of minerals from the seabed and could last for many decades. Indeed, a desire to understand the effects of deep-sea mining or exploitation could be interpreted as a call for more knowledge to be gained from exploration projects.

Lynch said he was confident that the Cook Islands was approaching the issue in a responsible way, having passed the Seabed Minerals Act in 2009 – the world’s first national legislation dedicated to regulating seabed minerals activities. “We have a world class regulatory framework to deal with the potential risks. And that is why we want to first seek exploration applications, over the next three to five years, so we can see if it is viable for the country, in terms of benefits and sustainability. The contractor also needs to determine its own costs and benefits perspective.” He added that any subsequent mining operations were still five to eight years away and would adhere to “best international practice and high environmental principles in collaboration with Marae Moana”.

New Caledonian union concerned at nickel job losses

Radio New Zealand, 12 February 2018

A New Caledonian union is concerned at the potential for 70 job losses at the Vale nickel company. The SOENC union said plans to alter the Vale operation were presented at the end of last year, reportedly outlining planned cuts to about 1300 people employed in a range of support roles.



Vale's nickel plant in New Caledonia Photo: AFP

According to the Nouvelles Caledoniennes newspaper, Vale has declined to comment about the re-structure. The union said in the face of the crisis in the nickel sector, there had been no pay rises to help sustain the operation. Vale has been tight-lipped about its plans but has said it won't invest any more into its New Caledonia plant, which has over the years been hit by a number of setbacks. Last year, there were fears the plant in Goro would be mothballed but since then there has been speculation that Chinese interests might buy into the business to salvage the plant.

Moratorium on Panguna stays

PNG Industry News, 12 February 2018



Bougainville President John Momis

IT seems that nothing will happen at the Panguna copper-gold mine until after the referendum on independence is held for the island upon which it is situated in Papua New Guinea – Bougainville. The doors to Bougainville Copper Mines (BCL) and RTG Mining - both anxious to redevelop the mine which has been closed since 1989 - have now been firmly shut by President John Momis. Momis has told media that the mine would remain closed until after the vote, which is expected to take place on June 15, 2019. This follows up on a statement issued by Vice President Raymond Masono, who is also Mines Minister, in which he said that the Autonomous Bougainville Government (ABG) had completed the legal process under the Bougainville Mining Act 2015 in relation to BCL's application to renew its exploration licence over the Panguna mine area "and conclude that it is untenable under current circumstances for the Panguna project to proceed, resulting in a decision not to grant an extension to BCL's exploration licence.

"Effectively BCL does not have any more tenement (sic) in Bougainville or any legal right over Panguna mineral resources and the legal ownership of the Panguna resources reverts back to the customary landowners of Panguna and the ABG. "In making that decision to not grant an extension of terms to BCL's tenement, the ABG has also made a decision to impose a mining reservation (moratorium) over the Panguna mine area for an indefinite period," Masono said. Masono added that the public was invited to comment on the Panguna moratorium and this should be submitted to the Department of Mineral and Energy Resources by close of business on March 26, 2018.

"It is in Bougainville's best interest that the Panguna resources owners be left alone and be dealt with by the ABG alone regarding any future plans for the Panguna project moving forward when the circumstances are conducive and the moratorium is lifted. "For BCL or RTG or any other investor to directly deal with the landowners regarding the development of the Panguna project will only

result in more division and problems among the people and may affect ABG's drive for peace and unity leading towards the referendum. "The ABG will not accept nor be influenced by any speculations regarding its decision on the moratorium and redevelopment of the Panguna project," Masono concluded.

Miner responds to questions raised in Parl

Barrick (Niugini) Limited, operator of the Porgera Mine in Enga Province, said like all other mines in the country, it operates under strict conditions pursuant to PNG laws.

Post-Courier, February 12, 2018

Barrick (Niugini) Limited, operator of the Porgera Mine in Enga Province, said like all other mines in the country, it operates under strict conditions pursuant to PNG laws. Barrick was responding to Questions in Parliament concerning the validity of the PJV Environment Permit raised by the Member for Lagaip-Porgera, Tomait Natassi Kapili, last Wednesday. Kapili, in a series of questions, asked Minister for Environment and Conservation John Pundari to confirm or deny whether Barrick now holds a 50 year environment permit Environment Permit Number WD-L3(121) that will expire on December 31, 2053.

He said the terms of the Environment Act 2000 and Environment (Amendment) Act 2002, especially Environment (Permits) Regulation 2002, provide for less than 25 years and not more than that. Mr Pundari said he would look into the issues raised by the MP. But Barrick in a response said these conditions are set out in the mine's current Waste Discharge Permit, which was issued following the enactment of the PNG Environment Act (2000), and which consolidates a number of previous permits that had been issued prior to the introduction of the new Act. The company said this expiry date was carried over from the previously issued environmental permits, which were issued in 1988 for a period of 50 years.

Govt grants Nautilus new licence

February 12, 2018, The National Business

NAUTILUS Minerals says the Government has granted a new two-year exploration licence to the company which include new targets. Nautilus in a market release said this would allow the company to conduct exploration activities in the southeast Bismarck Sea. The exploration licence EL2537 covers 2558sq km, including the same prospective geology that hosts Nautilus' Solwara 1 deposit. The area was selected based on reconnaissance sampling and surveys in 2017. Nautilus acknowledged assistance in this area by the PNG Geological Survey. Nautilus Minerals chief executive Mike Johnston said granting of this exploration license was "great news". "Work done in the area by the company has identified numerous exploration targets, with similar geology to our seafloor massive sulfide deposits found at Solwara 1," he said. "The work completed last year reconfirms the significant exploration potential for deep sea minerals over expansive yet unexplored metallogenic provinces.

"Our team has worked very hard to improve exploration efficiency: Covering larger areas at lower costs, and the results at hand show that this approach is bearing fruit." Meanwhile, subject to receiving additional funding under the company's previously-announced bridge loans and potential credit facility transaction, Nautilus aims to test and progress these targets as soon as practicable. This is to advance the company's plans of increasing its current resource portfolio to support future seafloor mining operations. According to the company, PNG is renowned for hosting large mineral deposits and the same tectonics that drove mineralisation at the nearby Bougainville and Lihir deposits, is also believed to drive seafloor mineralisation at Solwara 1 and 12. This places this exploration li-

cense in a favourable location. The company said it looked forward to sharing the results once exploration commenced.

PNG holds patents with Nautilus Minerals

Post-Courier, February 11, 2018

Being the first undersea mine in the world will present additional benefits for the country as it holds its 30 per cent stake in the Solwara 1 project. The additional benefit will come in the form of intellectual property concepts and systems developed in the project, which Nautilus Minerals CEO Mike Johnston said will attract royalties. “Nautilus Minerals and the State of PNG, through their ownership in the Solwara 1 Joint Venture, hold a number of patents (exclusive rights) covering various aspects of our seafloor mining system. “Some of these patents are owned in partnership with other major companies (such as SMD from the UK, and Technip from France). The patents protect the partners intellectual property or ideas that have been developed over many years. “They act as serious barriers to competitors or groups that might be sitting on the sidelines, or moving slowly behind us waiting to see what deep sea mining will be like,” he said.

Mr Johnston said the patents define their mining machines and systems, registered initially throughout the world, and then “approved and granted” in specific countries like the United States, United Kingdom, China, Japan, and others. “At each stage of the “filing” and approval process, there are modest fees that the Solwara 1 joint venture has had to pay. “To date, we have paid around equivalent to K4 million to register and protect our intellectual property. This cost does not include the cost of developing and testing the ideas. “Any other group wishing to do sea floor mining must either develop a new system, or strike some sort of deal (usually a royalty arrangement) with the patent holders if they wish to use a similar system,” he said.

Mr Johnston said valuing intellectual property remains difficult, however, there are numerous instances where the holders of a patent or a simple “registered idea” has resulted in the creation of significant value. “The oceans contain the largest known resources of copper, nickel, cobalt, and manganese, on the entire planet, as well as significant quantities of gold, silver and zinc. All of these minerals are critical for the renewable energy and electric vehicle future that many people see the world rapidly heading towards. “By 2030 the copper market alone is expected to have a value greater than USD\$210 billion (K640 billion). If seafloor mining is able to provide 30 per cent of this copper, as offshore oil and gas does to the world’s oil and gas markets, that’s a market of USD\$60 billion (K183 billion), roughly four times PNG’s entire 2017 GDP,” he said.

Landowners and companies in new battle for Panguna mine, which triggered Bougainville Crisis Eric Tlozek, ABC News, 10 February 2018

The race to reopen one of the world's biggest copper mines, Panguna, is dividing landowners and the wider community in Bougainville.

Key points:

- Local leader Philip Miriori says activity at the Panguna mine would bring "prosperity" and "better infrastructure" to the community
- Bougainville's President says the Government is keen to restart the mine to boost its case for independence
- Not all landowners around the mine are happy with the stalemate, or with RTG's push to leapfrog former operator BCL

Panguna was abandoned in 1989, after landowner dissatisfaction with the mine led to the Bougainville Crisis, an armed uprising against the Papua New Guinea Government in which 20,000 people died. Now mining companies are trying to come back, right as Bougainville prepares to vote on whether it should become an independent nation. Philip Miriori is a local leader who wants mining to resume. "The Panguna mine must reopen," he said. "That is going to bring prosperity. We need to see our kids go to school. We need better hospitals, better infrastructure." Mr Miriori leads a group called the Me'ekamui and has been battling through the courts and mediation to become chairman of the landowner association of the mine pit, the SMLOLA (Special Mining Lease Osikaiyang Landowners Association). "I think unity for the resource owners is important, before anything else," he said. "Without the unity, I don't think we can achieve anything." Mr Miriori's Me'ekamui group has entered into a joint venture with Perth company RTG Mining, which is making a bold bid to reopen Panguna.



PHOTO: Philip Miriori's Me'ekamui group has entered into a joint venture with RTG mining. (ABC News: Eric Tlozek)

"What I was interested in with RTG is a social licence [to mine]," Mr Miriori said. "I don't want to get anything for myself, I want to see my people benefit." But Mr Miriori and other supporters are being paid by RTG, an arrangement the Bougainville Government has criticised. Mr Miriori said the payments were legitimate salaries, not inducements for people's support. "That is always a normal part of anything, nothing is free," he said. "The world has changed. People are educated. So there's no bribery there." RTG's bid and Philip Miriori's push for leadership of the landowner association has disrupted a sustained effort by the mine's former operator, Bougainville Copper Limited, or BCL, to return to Panguna. BCL is part-owned by the Bougainville Government and had an exploration licence and first right of refusal over the site. But the Bougainville Government has now rejected BCL's application to extend that licence, and put an indefinite moratorium on any mining at Panguna.



PHOTO: The Panguna mine is one of the world's biggest copper mines. (AAP Image: Ilya Gridneff)

Bougainville's President, John Momis, said the issue of mining had become too sensitive. "A lot of people are against mining, any mining at all, and mostly against BCL, because of its past," he said.

Landowners at loggerheads as referendum looms

Mr Momis said the Government does not want conflict at the mine to distract from a scheduled referendum next year on whether Bougainville should secede from Papua New Guinea.

He said the Government may have been overly keen to restart the mine, because it wanted the revenue to boost its case for independence. "Panguna is a very, very difficult issue for all the things that happened in the past," Mr Momis said. "So maybe we were pushing things too hard because of our desire to meet our fiscal self-reliance target." Not all the landowners around the mine are happy with the stalemate, or with RTG's push to leapfrog BCL. Jeffrey Clason's mother is one of the mine landowners, and he said many people want BCL to resume mining. "I think the majority of the landowners are still with BCL and I think as the Mining Act says, they're the last people to say yes or no, it's their land," he said. "So, for the landowners, BCL is still welcome."



PHOTO: Bougainvillean Bernadine Kama says she does not want mining to restart at Panguna at all. (ABC News: Eric Tlozek)

Some Bougainvilleans, like Bernadine Kama — who comes from a village near the mine, don't want mining to restart at Panguna at all. "We've already seen the damage and destruction done to our land," she said. The Bougainville Government said it will come up with a new strategy for Panguna, and will continue consultation with landowners about whether it should be mined, and who should mine it. But in the meantime, Bougainville Copper Limited is pursuing court action against the Government, which is not only a major shareholder, but also the mining regulator. So the battle for Panguna is getting more complicated, right as the region prepares for a contentious referendum on its political future.

Delay in Woodlark mine causing anxiety: MP

Cedric Patjole, Loop PNG, February 9, 2018

The delay in the Woodlark Island Gold Project is causing a lot of anxiety and undesired expectation from landowners. Samarai-Murua MP, Isi Leonard, said this in Parliament when asking Mining Minister Johnson Tuke on the status of the Woodlark Island Gold Project. Leonard said the project has been on development status for well over a decade following numerous delays and a changing

of ownership twice. “The people of Woodlark and Samarai-Murua regard the project as a major catalyst for development. But the delay in its development is causing much anxiety and undesired expectation,” he said. The member asked Minister Tuke the status of the project, whether the low commodity process hindered project development financing and if the government could step in.



Leonard asked about a previous agreement for a joint venture partnership to develop gold projects on Woodlark and Misima islands. He also said if the current explorer is moving ahead, can a previous project agreement signed be approved by the Government. “Geo-pacific Resources is moving the project forward, can the MOA agreed to by stakeholders in December 2015 be approved by the NEC. This will give more confidence to the landowners and the developers of the project,” he said. Meanwhile, Minister Tuke asked the MP to send his office his series of questions which he will respond in detail as he did not have the information with him.

K92 Mining begins production in EHP

February 9, 2018, The National Business

THE K92 Mining Incorporated company has commenced commercial production at its Kainantu gold mine in Eastern Highlands, effective of Feb 1. The company in a market release said production for last month exceeded 2700 ozs gold equivalent (2500 ozs gold). K92 chief executive officer and director John Lewins said: “We are extremely pleased to have reached this very significant milestone.” Lewins defined their commercial production as having commenced stope production underground; achieving a minimum of 60 per cent of designed gold production; and a minimum of 90 per cent of designed metal recovery from the process plant over a 30-day period. “These metrics were achieved last month and the company expects that to be maintained going forward,” Lewins said. Production levels from Kora North are anticipated to continue building up in the coming months from development and tonnage from the cut and fill stopes.

Design levels are expected to be achieved during the June quarter, when the first long-hole stope production commences. “That we have achieved mining the Kora North lode, eight months after drilling the first discovery hole and just four months after commencing grade control drilling and the treatment of the initial bulk sample, is a testament to the professionalism, enthusiasm and ability of the entire team at our Kainantu operation.” Lewin said K92 has not “based its production decisions on ongoing mine production or mineral reserve estimates or feasibility studies.” Historically, he said, such projects have increased uncertainty and risk of failure. “Mineral resources that are not mineral reserves do not have demonstrated economic viability.” K92 Mining has also commenced

gold production from the Irumafimpa gold deposit, which together with the Kora gold deposit, is part of the company's Kainantu gold project.

O'Neill caught out telling lies over Ok Tedi Mine

Bryan Kramer MP, PNG Blogs, February 09, 2018

Prime Minister Peter O'Neill was caught lying and misleading Parliament during question time when it resumed its first session in 2018 on Tuesday. O'Neill was responding to a question raised by the Governor of Western Province, Toboi Yoto asking when his people would benefit from Oktedi Mine and when they would receive the share certificates. Western Governor explained that since the O'Neill Government took over the mine in September 2013 it had failed to transfer the share certificates representing 33% interest in the mine to the Western Province people. Further, still, they had yet to receive their dividends. In response, O'Neill claimed when his Government took over the mine from BHP, who at the time wanted to shut down the mine for not being profitable. He said the Government inherited a loss-making machine.

He confirmed his Government has yet to transfer 33% interest to the landowners, claiming it was because of stamp duties issue. Member for Moresby North-West Sir Mekere Mortaua interjected with a point of order. Mekere a former PNG Sustainable Chairman told O'Neill to stop his incurable lies [about the mine]. There was never any plans to shut down the mine it was not making any loss but investing in further explorations, Sir Mereke said. O'Neil responded telling Mekere that he was only trying to protect his legacy of providing immunity (protection) to BHP, the mines former developer who destroyed the lives and livelihood of the people through environmental damage.

"It was loss-making machine when we took it over but we had to restructure the mine during the drought and paid off all the employees making a profit," he said (source post courier article - <https://postcourier.com.pg/ok-tedi-issue-heats/>) It was at this point I then interjected asking the Speaker to advise the Prime Minister to stop lying and misleading parliament. As I had in front of me 2012 OkTedi Financial Report confirming the mine was, in fact, making a profit. O'Neill responded I was a busybody from Madang on social media. So was O'Neill lying when he claimed the Oktedi Mine was a loss-making machine before he took over it? O'Neill took over the mine in 2013, so let's review the mine's profits four years before and four years after from when he took over it.

- In 2009 net profit K1.5 Billion
- In 2010 net profit 2.03 Billion
- In 2011 net profit K1.2 Billion
- In 2012 net profit of K913 million
- In 2013 net profit of K181 million
- In 2014 net profit of K360 million
- In 2015 net loss of -K347 million
- In 2016 net profit of K384 million

This confirms O'Neill was lying and misleading parliament. What O'Neill failed to disclose that soon after taking over the mine [companies he held a direct and indirect interest in](#) where awarded substantial contracts to service the mine. So perhaps he was referring to his own companies being a loss making machines until he took over the Mine and thereafter they started turning over million Kina profits. It is not the first time O'Neill has unashamedly lied both on the floor of Parliament and in the public arena. In the height of 2017 General Elections O'Neill made an announcement while on the campaign trail in Tari that his Government had made the decision to transfer the 4.27% Kroton shares to the PNG LNG landowners. "Today I am announcing that the national government will transfer 25 per cent of Kroton shares, which is 4.2 percent indirect interest in the PNG LNG

project,” he said. “The shares to be transferred to landowners and provincial governments in Hela, Southern Highlands, Gulf, Western and Central province are valued at K3.5 billion,

“Our Government is providing 25 per cent of Kroton shares to landowners and beneficiary groups that should rightfully be receiving benefits from the PNG LNG project. “These shares will enable the landowners and communities and the provinces to secure a better future and to be more self-sufficient. “This Government has made it our business to correct bad decisions from the past, particularly when this relates to land ownership. “I was not a signatory to the initial Umbrella Benefits Sharing Agreement in 2009, but I have made sure that our government does the right thing by our people today. “This in the same spirit as the transfer of 17.4 percent of BCL shares to the landowners and people of Bougainville by the national government.” “It is the same as the transfer of 33 per cent ownership in Ok Tedi” O’Neill said. (source <https://www.thenational.com.pg/clans-promised-shares/>)

So did O’Neill transfer the 4.27% of Kroton shares in the PNG LNG Project to the landowners? Did he transfer the 33 per cent ownership in the Oktedi mine to Western landowners?

The answer is NO. Such statements maybe construed as undue influence (criminal offence under Section 102) When a person makes a false statement to induce a voter to vote in a particular way knowing the statement to be false. This explains why O’Neill is commonly referred to as a Pathological Liar - defined as habitual or compulsive lying. It is certainly embarrassing knowing such a person occupies the office of Prime Minister where his shrewd conduct and poor character reflects on our Nation of 8 million people. Following the formation of the Government in August 2017 I asked members of the Opposition who previously served under O’Neill why they abandoned his Government - they responded because he was forever lying, making commitments or promises he would never honor. "We got tired of his lies and left" they said.

Chan wants government to return resource ownership to people

February 9, 2018, The National National

Government needs to immediately revise the Mining Act of 1992 and the Oil and Gas Act of 1998 to return ownership of the resources to the people, New Ireland Governor Sir Julius Chan says. Sir Julius said the people had owned those resources for thousands of years and they should continue to own them. “We have no right to take it away from the people. We need to introduce the principal of derivation to mining, oil and gas development,” he said. “Every province in which such projects are implemented, should receive an annual derivation grant of five per cent of the value of the resources originating in that province. “We also fully implement the Alotau Accord II commitments to increase autonomy for provinces. Those areas that demonstrate the capacity to manage their own affairs should be given the powers to do so. “Provinces should be given administration and financial autonomy. Where provinces show capacity, they should be given authority over development of both non-renewable and renewable resources,” Sir Julius said.

Ramu NiCo records high production

Post-Courier, February 9, 2018

Ramu NiCo is looking forward to positive production in 2018 following its high records in 2017. The company produced a total of 35,100 tons of nickel last year using improved management standard and production stabilisation including careful safety management and operational compliances. “This is an average of 107.7 per cent and yearly plan completion rate of 106.4per cent, which is a 57 per cent year on year increase. “Ramu NiCo has now become an industrial benchmark for reaching production capacity and reducing production cost,” President Gao Yongxue announced

during the company's 2018 annual working conference. He said economical and technical standards have been met with nickel recovery rate at more than 90 per cent on average, 2.3 per cent higher than the 2017 and cobalt recovery rate at more than 80 per cent, 2.0 per cent higher than last year contributing to increase of 903.9 ton of nickel and 75.3 ton of cobalt.

“Unit cost has also been reduced significantly due to breakthroughs made in cost control measures. “Nickel and cobalt grade in mix hydroxide product improved, moisture content is further lowered, contributing to cost reduction,” he said. He said other factors that contributed towards the production success and cost reduction includes equipment management, production stabilisation, improved scientific and technical innovation, risk control management, markets security and management optimisation and cost reduction. Mr Yongxue urged employees to work together to ensure the project reaches a much improved production output and low costs operation.

This Deep-Sea Creature Lays Its Eggs on Hydrothermal Vents—A First

Yet another scientific discovery lays bare the myth that 'nothing lives down there' and further reinforces that we just don't know what could be lost if Nautilus Minerals is allowed to carry out its proposed open cut strip mining operation on the sea floor

Jason Bittel, National Geographic, February 8, 2018



The Pacific white skate lay its eggs on superheated hydrothermal vents, and then may wait more than four years for the eggs to hatch. PHOTOGRAPH BY JULYE NEWLIN, OCEAN EXPLORATION TRUST

The world's most patient mom may be a deep-sea octopus that tends her eggs for nearly 4.5 years. But now, there may be a new contender for her throne. Scientists have caught a rare glimpse of another deep-sea dweller that may also spend four or more years nursing its eggs, and it does it in an even more unusual place: on hydrothermal vents, where hot water spews from the ocean floor. It's called the Pacific white skate (*Bathyraja spinosissima*), a bone-white, bug-eyed relative of sharks that can live almost two miles (2,900 meters) underwater. Deep-sea skates, which are shark relatives that resemble rays, lay large eggs that can take years to hatch in cold water. In June of 2015, scientists piloting a remotely operated vehicle through the depths of the Galapagos Marine Reserve discovered mounds upon mounds of Pacific white skate egg-casings littered atop a hydrothermal vent.

Using the submarine's robotic arm, the scientists plucked four of the yellow-green egg-cases—each about the size of a deflated football—and brought them back to the surface for DNA analysis. This

the first time skates have been found to use hydrothermal vents as nurseries, and the scientists suspect the animals are laying their eggs here for a reason. It takes longer for eggs to incubate in cold water, so the skates may be warming them up on the vents, says Dr. Pelayo Salinas-de-León, a National Geographic Society Explorer who led the study, described in the journal *Scientific Reports*. The team estimates that, like the deep-sea octopus, Pacific white ray egg cases may require more than four years to hatch, judging by the incubation time of a closely related skate in the Berendt Sea and the depth and temperature of the water surrounding the vent. And that's a "very conservative" estimate, adds Salinas-de-León, who is also a marine scientist with the Charles Darwin Foundation and National Geographic's Pristine Seas initiative.

A Whole New World

Since hydrothermal vents were first discovered in 1977, scientists have found crabs, anemones, mollusks, and shrimp inhabiting these seemingly inhospitable environments. But until now, no one would have included skates on that list, says Dr. Lisa Levin, a professor of biological oceanography at the University of California, San Diego.

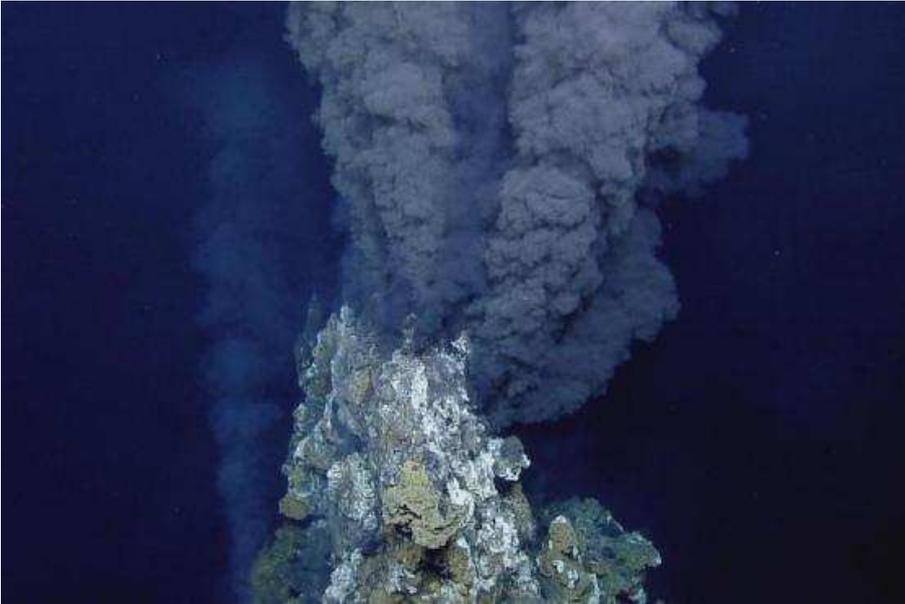


The Pacific white skate is the first animal found to be laying its eggs on a hydrothermal vent. PHOTOGRAPH BY JULYE NEWLIN, OCEAN EXPLORATION TRUST

"We know so little about the functions of these systems that finding a new function, like being a nursery habitat, is very important," says Levin. Interestingly, Levin says there have been a handful of sightings of skate eggs near cold seeps, which are similar to hydrothermal vents but lack heat and emit methane. The water shooting out of a hydrothermal vent can exceed 750 degrees Fahrenheit (400°C), Salinas-de-León says, but as soon as it hits the near-freezing water of the deep sea, that plummets to just 36°F. But even just a few degrees of warmth around the mouth of the vents could be enough to reduce the skate eggs' incubation time by months or even years, says Salinas-de-León. The only other animals known to use Earth's warmth for egg incubation are the mound-building megapode birds of Southeast Asia and Australia and a group of nest-building neosauropod dinosaurs from the Cretaceous Period, he says.

Plumes In Peril

You might think that a bubbling cauldron at the bottom of the ocean would be relatively safe from humans and our impacts, but even these remote areas are threatened. Hydrothermal vents are being targeted for deep seabed mining, and the oil and gas industry drills on the margins of methane cold seeps.



The water shooting out of a hydrothermal vent can exceed 750 degrees Fahrenheit, or 400°C. PHOTOGRAPH BY JULYE NEWLIN, OCEAN EXPLORATION TRUST

The new findings suggest that skates may be more at risk for overfishing than previously thought, since exceptionally long incubation times mean the animals' populations can't bounce back quickly. "The idea of skates using heat to incubate their young, much like some dinosaurs, is likely to invoke fascination and maybe even a little sympathy," says Sonja Fordham, president and founder of the conservation organization Shark Advocates International. "We hope that exciting new findings like those in this paper can help to spark greater interest in skates and, in turn, a greater constituency for conserving them," says Fordham. Salinas-de-León, too, sees the discovery as a mandate to protect these unique and relatively unexplored ecosystems. "We hardly know anything about the deep sea, and we are fishing, and mining, before we even get a chance to even document what species live down there and what unique behaviors [they] could reveal [to] us," he says.

Window closing on Solomons' environment - Pikacha

Time is running out to save the natural habitat of Solomon Islands wildlife, a scientist who spent the last 13 years documenting it says.

Radio New Zealand, 8 February 2018



Photo: 123RF

Patrick Pikacha has just finished a new book *Shore to Shore Wildlife and Landscapes of Solomon Islands* which he hopes will convey the importance of protecting the country's endemic species. The government's pursuit of economic gain through extractive industries like logging and mining had been severely mismanaged resulting in widespread damage to much of the country's natural environment, Dr Pikacha said. But there was still hope of saving some of it if action was taken now, he said. "We sit on the equatorial belt and so rain forests are able to regenerate really, really quickly compared to other parts of the world but the opportunity is getting really, really slim," Dr Pikacha said. "And we need to act now in terms of managing these last native, untouched areas and hopefully allow logged over forests to regenerate. "Otherwise it will be even more disastrous."

Bougainville Government grants second mining license

BY FRANKLIN KOLMA, Post-Courier, February 8, 2018

The Autonomous Bougainville Government on Monday granted its second mining exploration license to a Philippines company in a low key event at Tunania, the seaside home of Bougainville crisis commander of rebel forces, Sam Kauona. The event was set against the sombre double backdrop of the bloody crisis which had begun as a protest against mining giant Bougainville Copper in 1989 and a desperate race against time to get some serious investment on the ground before the referendum next June to decide the question of Independence for the Autonomous Region of Bougainville. Bougainville Exploration License no. 5 covering a 183 square kilometre area was launched by Bougainville President Dr John Momis with a plea to stand "united" and "strong". The echoes of the crisis were palpable here and brought a sombre note to an occasion that speaker, after speaker suggested, was "the turning point", "a special milestone", "a breakthrough", and a fresh start". The silence and the people's reactions spoke more forcefully than the speeches.

The people gathered in small silent groups under the shade of trees and coconut palms, more observers than participants, while the representatives of Philippines company, SR Metals Inc. battled it out in the clearing under the blazing sun, appearing to all like a graduating class of foreigners in some Bougainville initiation ceremony. The chiefs of nine affected clans were first called out and they gave their blessing and permission for the forests to be disturbed in the interest of all during the exploration period. Then each speaker coaxed the people to leave their fears behind and take a leap of faith. Sam Kauona said: "I fought for this 28 years ago. After going through many years of sacrifice and pain, we deserve to see the benefit of what we fought for. I as your general assure you. Do not be afraid. Let us move forward." Bougainville President Dr John Momis said: "Bougainville now stands at the threshold of a new social, economic, political, and moral order. "Independence is imminent, just round the corner. But Independence will not just happen.

We dream dreams and we want to be free. We want to be free agents of development. We want to break away from the syndrome of dependency and economic exploitation and manipulation by those who have money because we treasure our people and their resources. But we need resources ourselves to do this. That is why Mr Gutierrez (manager of SR Metals), we are so grateful that you could have listened to my plea to have come to Bougainville." Bougainville South MP and Deputy Opposition Leader Timothy Masiu said: "This is a breakthrough. This is the day that our former leaders and our people have dreamt of and fought for. The wheels of change are starting now." Mr Masiu called on the people to trust in the leadership of the ABG and be responsible partners in all undertakings if there was to be real meaningful development.

"These people (mining company) have the expertise. They have the experience. They have the money. They will teach us how to do mining but only if we respect them and look after them." The SR Metals Inc Managing Director Eric Gutierrez said his people were ready but would mobilize only if the company was invited by the Government and the people. Mrs Kauona, representing wom-

en, said: “We mothers bore the burden of the mining industry here in Bougainville. 20,000 people have died because of this industry, because of Panguna mine. Our children have bathed this island with their blood. Today we celebrate because this new deal has been forged out of the expensive and fresh blood of our children. “Papua New Guinea was sustained by Bougainville. We are doing the same thing. History has come around again. We are going to sustain the independence and livelihood of Bougainville.”

Gold Ridge slams cyanide claims

Solomon Star, 7 February 2018



The Gold ridge tailings dam.

GOLD Ridge Mining Limited (GRML) has dismissed findings of a research that claims high levels of cyanide were found in sediments downstream of its central Guadalcanal mine. Researcher Dickson Boboria, a Solomon Islander studying for his doctoral degree, claims the situation has put the livelihoods of the Metapona communities at risk. But Gold Ridge last night refuted Mr Boboria’s findings. The company said the findings are in direct contradiction to the cyanide sampling results obtained from Gold Ridge Mine and accredited independent environmental consultants. “Gold Ridge Mine in collaboration with an Independent Environmental Auditor and community monitors has in place a robust environmental monitoring protocol to monitor cyanide levels in the Tailings Storage Facility (TSF) and downstream,” the company said in a statement. “TSF monitoring has been in place from the inception of the mine in 1996,” it added. “The results of monitoring from December 2017 show that cyanide is not present in the top five metres of the surface water of the TSF.

“Gold Ridge Mining Limited (GRML) took sediment samples prior to and during the 2016 spill over event including locations downstream of the dewatering discharge pipe into the Tinahulu River and downstream of the spill over into the Kuara stream. “All samples taken from rivers and stream were below detection levels of cyanide – less than 1 milligram per kilogram. “GRML undertakes sampling of the TSF and downstream to robust good practice standards with the results analysed at an internationally accredited laboratory, Australian Laboratory Services. “GRML is transparent in its approach.” The statement said relevant ministries and government officers receive a weekly report on the TSF, which includes results of sampling as soon as they are received. “In addition, two independent sampling regimes complement the company’s approach. “The National Public Health Laboratory carries out a sampling regime and The University of Queensland (UQ) on behalf of the

Solomon Islands Government (SIG) have collected samples since 2014 and analysed them at internationally accredited laboratories.

“Sediment samples taken by UQ and SIG in 2016, started from the Chovohio River, all the way down to Metapono including Kwara and the Tinahulu rivers. “The UQ/SIG research sampled sediment at a total of 19 sites, with the majority around or downstream of the TSF. “ sampling included four sites along the Matepono River including one at the river mouth. “At all sites, no cyanide was detected within the sediments sampled meaning that cyanide levels were below detection level (less than 1 milligram per kilogram (<1mg/kg)). “Cyanide has only been found in sediment taken from deep core sediment samples at an approximate depth of half a metre into the sediment layer of the dam.” The company said in January 2018, UQ and SIG undertook another program of comprehensive TSF and downstream sampling commissioned by the United Nations Development Program with the results to soon be released.

“I am surprised that the institution where Dickson Boboria studies allowed him to publicly report data that is factually incorrect and misleading especially on a matter that has the potential to create uncertainty and emotion for downstream communities,” Walton Naezon, Director of GRML, said yesterday. Henry Tobani, the Independent Environmental Auditor for the tailings dam and downstream communities, expressed concern that Mr Boboria may not have potentially exercised his duty of care as a researcher in the manner in which he has presented his findings. “We understand that the media can sensationalise reports, especially when presented verbally, but there is no excuse for what could possibly be blatant misinformation,” Mr Tobani said. “It is usual for researchers to have a research method and protocol and to request permission to access and use data,” he added.

Dr Fiona Martin, Gold Ridge Mine’s General Manager Community and Government Relations, said: “It is my understanding that Mr Boboria did not obtain informed consent from the designated Gold Ridge Mine representative to access site, so we are unsure where and how he got his data.” Dr Martin said she believed that this situation could possibly mean that Mr Boboria may have breached his university data collation protocols. She expressed concern that the usual ethical and research methodological standards expected from a doctoral research student from a university of standing may not be in place for this project, which calls into question the research. Dr Martin requested Mr Boboria to contact the Gold Ridge Mine environmental team to share and discuss his results. “We are transparent in how we share our data and are happy to provide Mr Boboria access to our data to assist with his research. “We expect researchers to extend the same courtesy and to discuss their research methods and preliminary findings from Gold Ridge Mine data with us prior to public release.”

PM: State still holding 33pc shares in Ok Tedi

February 7, 2018, The National National

PRIME Minister Peter O’Neill says the Government is still holding onto the 33 per cent share equity in Ok Tedi for the people of Western, plus their dividends. Western Governor Toboi Awi Yoto had queried in Parliament the non-issuance of the share certificate after the Government had announced in 2016 the transfer of the 33 per cent share equity in Ok Tedi to the people of Western. Yoto said the people and their leaders had supported the Government in September 2013 in taking over the ownership of Ok Tedi from the PNG Sustainable Development Programme in good faith. “They have done this hoping that they will receive better benefits from the Government,” he said. “When will the share certificate be given to the people of Western, and when will we be given our dividends from the 33 per cent share equity? We are aware that OTML declared three dividends payments to shareholders last year.”

O'Neill said the Government took over the ownership of OTML in 2013 and in 2016 transferred 33 per cent of the ownership to the people of Western. "The transfer was done at no cost through their company Mineral Resource Ok Tedi No 2 Limited and Mineral Resource Star Mountain Limited." He said the two companies were to pay their taxation of stamp duty. "One-third of the dividends declared by OTML is in a trust kept by the Mineral Resource Development Company for the benefit of Western," he said. "As soon as the shares are stamped and handed over to the governor, it will come together with the cheque payment for the dividends."

Solwara project set for 2019

BY MELISHA YAFOI, Post-Courier, February 6, 2018

SOLWARA 1 the world's first under sea mine in Papua New Guinea is eyeing production in 2019. This K969million (US\$300m) under sea mining project will have a mine life of three years according to Nautilus chief executive officer Michael Johnston. Mr Johnston gave the update on Monday during a briefing with the Mining Minister Johnson Tuke and the media in Port Moresby. He said all three trials for the first Seafloor Production Tools (SPT)- the collecting machine have been completed at the trial facility and was used to train local experts at Motukea Island outside Port Moresby. Mr Johnston said they are now in the process of packing of packing those SPTs and will be shipping them to China to have them installed on the vessel at the Mawei shipyard however will take a few months to have them packed up.

"The vessel itself is 75 per cent completed; it is about 233 meters long and about 40 metres wide and is currently being built in China at the Mawei shipyard. "The production system, production tools and the launching recovery system are all completed and are being tested and installed on the vessel, the pump and the riser systems are all completed now and are waiting to be transported to China to put onto the Vessel. We're also going to do some testing on the Subsea Slurry Lift Pump and riser as well and we're talking to a Chinese group to help us with the testing of the pump at Honghua's fabrication facility in Chengdu," Mr Johnston said.

Mining legislation praised

BY MELISHA YAFOI, Post-Courier, February 6, 2018

The country's mining legislations has been described as one of the best in the world. Nautilus Minerals chief executive officer Michael Johnston made this remark on Monday evening during a briefing with the Mining Minister Johnson Tuke in Port Moresby. Mr Johnston said the mining legislations governing this industry have covered all aspects compared to other third world countries. He said since his career with the industry and in countries that he has worked with prior to appointment to PNG, he has dealt with legislations that are inferior to PNG's. "PNG is better and has many aspects, you have an independent authority the Mineral Resources Authority and you have policy and legislation separate which not many countries do that and they don't do it as well.

"The Government wants to see mineral resources developed responsibly and that's keen for these things to happen. The state is a very good partner for mineral project development so those are some of the main reasons why we're chosen to mine in PNG," Mr Johnston said. He said apart from the legislations the country has one of the best processes for permits to be issued such as the environmental permitting process. Mr Johnston said the key difference identified in this process is the concept of inception record, which is not applicable in many countries. "To me it is one of the best permitting process in the country. What it allows you to do is to get all the stakeholders together, and work out what needs to be covered in the environmental impacts side.

“I’ve worked in a lot of countries where you have to come up with a best practice, sustainable outcome which everyone is in agreement with before you do the work,” he said. Mr Johnston said it is a robust system, which gives the regulator a clear path going forward. It’s not always about making changes,” he said. “Community consultations are another area where PNG leads for countries like Australia and New Zealand. “Community consultations have always been an element which is strongly required in the permitting process and even half of the permits are granted, you still have ongoing meetings which are needed.”

Global licenses set for seafloor mining

Matthew Vari, Post-Courier, February 6, 2018

Currently in the world around 27 licences are either granted or set to be granted for seafloor mining around the world. That was the update presented by Nautilus Mineral’s CEO Mike Johnston when asked on global progress in seafloor mining around the world, in response to PNG taking on actual mining as a first for the globe. “Some people say there aren’t others doing it but they are. There is something like 1.4 million square kilometers of granted licenses at the moment on the sea floor. That is a significant amount on land. “There is more copper on the sea floor in the Central Pacific Ocean than all the reserves known on land and the grade is almost twice the reserves on land,” he said. Mr Johnston said it is because of this known fact that a number of countries are looking at sea floor mining, with majority of companies have their licences granted in international waters.

“The Chinese government has two licences granted, the Japanese Government has licenses in international waters and testing looking to grant licence in its own exclusive economic zone. “Japan haven’t granted any licenses there over 10 years while the government has been doing its own research,” he said. He said South Korea has its own licence, along with India and Germany. The list also includes, French, British and the Singapore government also. “There is a consortium of east European nations that have a licence, that includes Poland and Czechoslovakia. “Twenty licenses granted in international waters so it has been growing significantly,” he said.

Minister Tuke Firm On Seafloor Mining Decision

Matthew Vari, Post Courier, February 6, 2018



Minister Johnson Tuke is demanding Nautilus provide a firm timeline for mining to start

Minister for Mining Johnson Tuke is firmly committed to the National Government’s decision to go ahead with the Solwara One project. Mr Tuke maintained the government has done its due diligence to the latter and Nautilus Minerals has complied per government regulations. He said this in re-

sponse to what he termed were external groups that continue to undermine the decision made by the country. “I stand firm that this is the government’s decision and no other parties can undermine the government.” “Papua New Guinea is a sovereign nation and as such we go by our own polices and manage our own affairs in so far as this ministry is concerned.” Minister Tuke made the comments during an update presentation made by Nautilus CEO Mike Johnston on Monday evening in Port Moresby. The presentation has is part of Minster Tuke’s recent planned visits to existing Mine projects in the country.

Minister Tuke said the government has been determined to ensure new prospects get off the ground, thus he has met with developers for other proposed mine projects in the country. “I have been adamant about this not only you (Nautilus), but few other mining prospectus we have got Wafi (Golpu) and Frieda river to deal with, I am concerned with the timeline. You have give some us certainty,” Minister Tuke told Mr Johnston. “For the last few years or so we haven’t experienced any new mine. This government is concerned that we should at least come up with a new mine that is the reason why I have demanded to know the timeline.” He, however, maintained that all requirements for the first of its kind seafloor operation to stick to the policies and environmental provisions.

Indonesia police kill Papua woman, clash claim disputed

NinieK Karmini, Associated Press, 5 February 2018



Police claim arrested youth was stealing ore concentrate from the Grasberg mine cargo dock

Indonesian paramilitary police fatally shot a woman in what they said was a clash with stone-throwing villagers in the troubled Papua region, but a relative of the victim disputed their account of events. Police said in a statement Monday that the 61-year-old woman was among villagers who intervened to help an 18-year-old man who jumped out of a boat to escape custody after being detained on suspicion of theft. The statement said police fired warning shots during the clash with villagers on Saturday. The woman died from a gunshot to the head, police said. A cousin of the dead woman said that there was no clash and that she was shot as an innocent bystander when police fired on the escaping suspect. In a separate statement, Papua police spokesman Ahmad Kamal said seven officers were being questioned by the police internal affairs unit in connection with the incident. Conflicts between indigenous Papuans and Indonesian security forces are common in the impoverished region, which Indonesia annexed more than half a century ago.

Police said the 18-year-old was one of three people suspected of stealing ore concentrate in Mimika district from the cargo dock of U.S. mining company Freeport-McMoRan, which operates the giant Grasberg gold and copper mine in Papua, and was captured after a hunt by police, security guards and navy officers. The handcuffed man jumped out of the speedboat he was being transported in on Saturday evening and villagers from a nearby island came to his aid and prevented him from being apprehended again, according to police. Cornelia Emakefaro, the cousin of the victim, said the woman and her husband were in a small boat on an errand to fetch fresh water when the woman was hit by police gunfire after the theft suspect jumped into the water. "Based on information from my cousin's husband as the only witness and the village head, there was no attack from villagers to the officers," Emakefaro said. "We understand they are carrying out the task of catching suspects who may have been involved in the theft, but they are not entitled to shoot people like chasing game animals." In September, Indonesian police demoted two officers who fired at a crowd of protesting Papuan villagers, killing one man, in a decision that rights groups said was too lenient and showed a chronic lack of accountability for abuses in Papua.

Seabed mining project off PNG hits choppy waters

Fatima Arkin, SciDevNet, 5 February 2018



Speed read

- World's first sea mining project hits funds crunch, legal roadblocks
- But developer plans to go ahead despite setbacks and questions on its viability
- Local communities in PNG fear the project will destroy their livelihood

Despite a funds crunch and legal challenges mounted by coastal communities in Papua New Guinea (PNG), the world's first deep-sea mining industry will go ahead, assures a spokesperson for Nautilus Minerals, the project developer. Noreen Dillane, corporate communications manager at the Canada-registered Nautilus, tells *SciDev.Net* that the company views the 'Solwara 1' project as "ultimately lucrative" because of the rising demand for metals due to the development of electric vehicles and storage batteries. "Commodity prices are very strong at present, with gold and copper prices currently at four-year highs, cobalt at an all-time high, and zinc at a ten-year high," says Dillane. Solwara 1 aims to extract gold and copper deposits beneath the Bismark Sea under permits given by the PNG government, which also owns 15 per cent equity in the project.

Nautilus fell short of the target to raise US\$41 million by the end of 2017, as well as an additional US\$270 million to build and deploy the seafloor production system for the project. In December, the company warned the Toronto Stock Exchange that "there can be no assurances that the company will be successful in securing the necessary additional financing transactions within the required time or at all". In January, Arnold Amet, former PNG attorney-general and justice minister, asked the government to end its partnership with Nautilus, saying that the mining project was financially risky and posed an environmental threat. "By the company's own admission, the project is an experiment with unknown environmental and social consequences and uncertain profits. The past few months have really shown the extent to which financiers and our own communities in PNG reject this project," he said in a statement.

"The local communities of Namatanai district in the New Ireland Province and the Duke of York Islanders in the Gazelle district of the East New Britain Province (all in PNG) are still very concerned about environmental impacts of mining activities to their traditional fishing waters," Amet tells SciDev.Net. "There are uncertainties about the tides carrying the sediments onto their shallow waters, affecting fishing, as well as marine life and marine environments." On 6 December, local communities launched legal proceedings against the PNG government demanding production of documents relating to the licensing of Nautilus and potential environmental, health and economic impacts from the Solwara 1 deep-sea project. Two key officials recently left Nautilus: director Mark P.M. Horn resigned in October, followed by vice-president for PNG operations Adam Wright in January.

European Parliament Calls for a Moratorium on Deep-Sea Mining

European legislators have voted overwhelmingly for a resolution that advocates halting efforts to mine the seabed for minerals – until the environmental consequences of industrializing the high seas can be determined. (European Parliament "calls on the Commission and the member states to support an international moratorium on commercial deep-sea mining exploitation licenses until such time as the effects of deep-sea mining on the marine environment, biodiversity and human activities at sea have been studied and researched sufficiently and all possible risks are understood.")

Written by Todd Woody, NewsDeeply, Feb. 1, 2018



A seabed mining machine built for Nautilus Minerals. *YouTube/Nautilus Minerals*

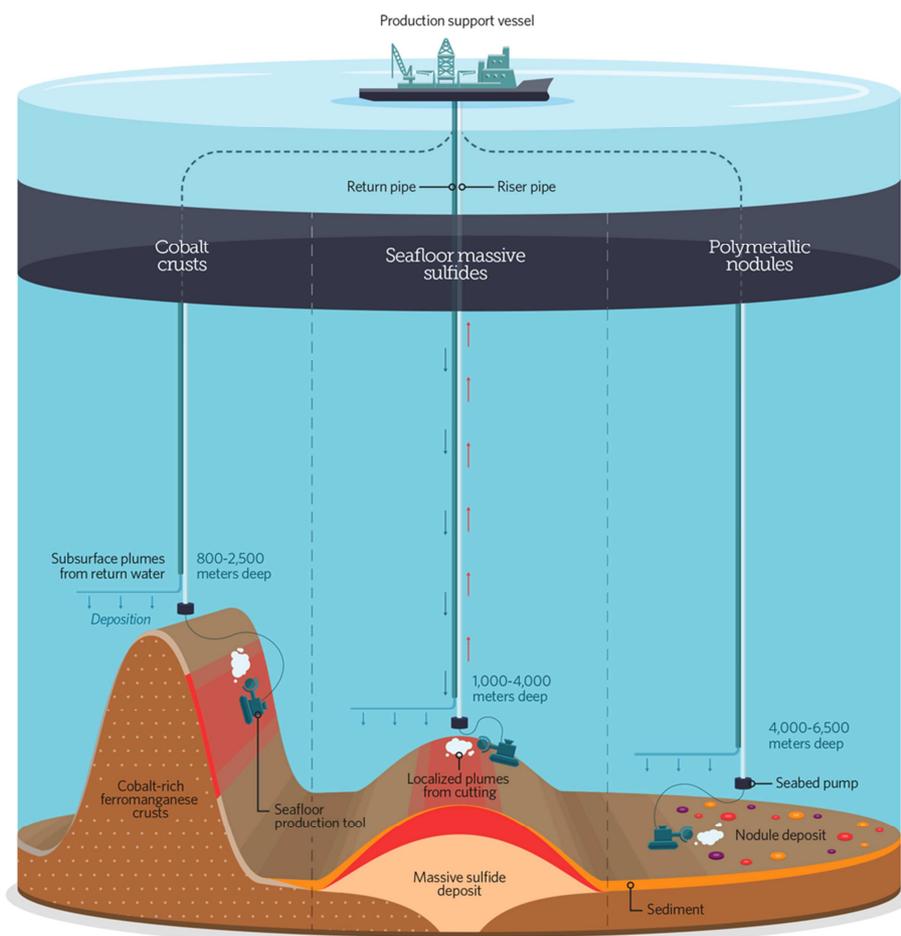
As the International Seabed Authority (ISA) drafts regulations to govern the mining of the ocean for valuable minerals, the European Parliament has called for a ban on seabed mining until the environmental impacts and risks of disturbing unique deep-sea ecosystems are understood. In a [resolution](#), the European Parliament also urged the European Commission to persuade member states to stop sponsoring and subsidizing licenses to explore and exploit the seabed in international waters as

well as within their own territories. The seabed mining provisions were part of a larger measure on international ocean governance that addressed plastic pollution, climate change, fisheries, coral reefs and other marine issues.

According to the resolution, the European Parliament “calls on the Commission and the member states to support an international moratorium on commercial deep-sea mining exploitation licenses until such time as the effects of deep-sea mining on the marine environment, biodiversity and human activities at sea have been studied and researched sufficiently and all possible risks are understood.” While the resolution that passed on January 16 is nonbinding and the European Parliament has no legal say in international deep-sea mining, it marks the highest-profile opposition to date to the nascent industrialization of the seabed, a process that is [proceeding largely out of public sight](#) under the jurisdiction of the [International Seabed Authority](#).

The United Nations-chartered body headquartered in Kingston, Jamaica, consists of 168 member states that issue licenses to corporations and state-owned companies for the exploration and eventual mining of the seabed. The ISA is currently developing regulations that would permit the extraction from the deep sea of mineral deposits rich in manganese, nickel, iron, cobalt and rare elements crucial in the manufacture of smartphones, solar panels, batteries and other products essential to the global economy.

Figure 1
Types of Deep Sea Mining



Source: New Zealand Environment Guide

© 2017 The Pew Charitable Trusts

(Courtesy of the Pew Charitable Trusts)

“The resolution has no formal legal authority, but because a large majority of the European Parliament voted in support of it, I think it will have some real political weight,” Matthew Gianni, the co-founder of the nonprofit [Deep Sea Conservation Coalition](#), said of the measure, which received 558 votes out of 666 cast. “Certainly there is a growing debate within the E.U. over whether or not seabed mining needs to be done or should be done.” The secretary-general of the International Seabed Authority, Michael Lodge, told Oceans Deeply in an email that, “This seems to be something internal to the European Parliament. It is not something that the ISA would have any comment about.”

Like Gianni, Conn Nugent, director of the Pew Charitable Trusts’ [Seabed Mining Project](#), is a close observer of the ISA. He was more skeptical of the European Parliament’s influence. “There is no evidence (so far, at least) that any national government is prepared to endorse what [they] said in this regard,” Nugent said in an email. On the other hand, he noted, “I would also say that the ... resolution reflects a modest but noticeable upsurge in the interest level about deep-sea mining among West European environmentalists. If that modest upsurge were to grow into a strong movement, and if that movement were to influence the votes of E.U. member-state delegations in the ISA, well, that would be worth watching.”

The ISA to date has issued exploration licenses to 28 contractors that cover more than 520,000 square miles (1.3 million square km) of the seabed in the Atlantic, Indian and Pacific oceans. Contractors – ranging from Lockheed Martin subsidiary UK Seabed Resources to the China Ocean Mineral Resources Research and Development Association – are targeting millions of potato-sized polymetallic nodules that cover the Pacific Ocean floor between Hawaii and Mexico; hydrothermal vent fields that contain polymetallic sulfides; and underwater mountains called seamounts rich in cobalt and other metals.

Once thought to be a vast wasteland where few organisms could survive crushing pressures, perpetual darkness and freezing temperatures, the seafloor remains barely explored, but marine scientists now know it’s home to a diversity of distinctive life forms whose fragile habitats are among the areas targeted for mining. Little is also known about the impact of mining the seabed on those ecosystems and whether such activities could lead to the extinction of marine life found only in particular habitats at depths that can reach 4 miles (6km) below the ocean surface. That has prompted researchers, conservation groups and some government officials to urge the ISA to put large swathes of the seabed off-limits to mining and to impose strict environmental rules on contractors.



An artist’s rendering of a deep-sea vehicle designed by Dutch company Royal IHC to harvest polymetallic nodules from the seabed. (Royal IHC)

The 1982 United Nations [Convention on the Law of the Sea](#), which regulates marine activities beyond national jurisdiction, declared the seafloor to be “the common heritage of mankind, the explo-

ration and exploitation of which shall be carried out for the benefit of mankind as a whole.” It also mandated “effective protection for the marine environment from harmful effects which may arise from such activities” and the “prevention of damage to the flora and fauna of the marine environment.”

The seabed authority tried to balance those seemingly conflicting obligations in [draft “exploitation” regulations](#) released by its Legal and Technical Commission at the ISA’s annual meeting in Kingston last August, with the aim of adopting a mining code by 2020 to allow mining to proceed. But [comments on the draft regulations](#) submitted by member states, mining contractors, scientists and conservation groups that the ISA released earlier this month indicate that significant differences remain. China, Japan and South Korea – nations that hold mining exploration licenses and plan to mine the seabed – cautioned against burdening mining contractors with excessive environmental regulations. Japan, for instance, stated that the seabed authority should not require regular inspections of mining operations to ensure compliance with environmental regulations.

“To minimize the burdens of states, contractors and the Secretariat of the ISA including financial burdens, Japan is of the view that it is appropriate not to have inspections by inspectors on a regular basis but to have them only when deemed necessary,” Japan’s representatives [wrote](#). Australia, New Zealand, South Africa and other countries that do not hold exploration licenses advocated for strong environmental standards, enforcement and monitoring. They said the seabed authority should implement the precautionary principle approach, which would deny licenses for mining projects when insufficient scientific evidence exists about the potential impact on deep-sea ecosystems.



Giant tubeworms of the genus *Riftia* live on dark volcanic rock typical of the deep-sea Alarcon Rise hydrothermal vent field off the Mexican coast. (Courtesy of MBARI)

“South Africa stresses the importance of conservation of the marine environment and that any exploration or exploitation of the international seabed should be sustainable,” wrote the representatives from South Africa. “The code is currently particularly weak on environmental aspects,” they added. “A transparent and credible environmental impact assessment process is needed, but there is currently no transparency on information on contracts outside the Legal and Technical [Commission] due to confidentiality issues,” the delegates said.

Other countries and the European Parliament in its resolution echoed concerns over a lack of transparency at the ISA. Under current rules, the ISA considers mining contracts to be confidential, as are the environmental data and compliance reports contractors regularly submit to the seabed au-

thority's [Legal and Technical Commission](#), a group of 30 delegates who review and approve mining concessions. The Commission withholds that information from the ISA Council, the organization's 36-member policymaking body as well as the full assembly of member states. The ISA member states will meet in March and July in Jamaica to negotiate the regulations in light of the comments received.

The European Parliament is just one of a growing number of observers taking an interest in the seabed authority and the mining regulations. For instance, the [Benioff Ocean Initiative](#), a nonprofit affiliated with the University of California, Santa Barbara, and funded by Salesforce founder Marc Benioff, submitted comments recommending that the ISA require all seabed mining vessels to be equipped with tracking devices called Automatic Identified Systems so their activities could be monitored in real time.

PNGEITI welcomes decision on tax credit scheme

The Papua New Guinea Extractive Industries Transparency Initiative (PNGEITI) has welcomed the government's decision to put on hold Tax Credit Scheme (TCS).

Post-Courier, February 1, 2018

The Papua New Guinea Extractive Industries Transparency Initiative (PNGEITI) has welcomed the government's decision to put on hold Tax Credit Scheme (TCS). Prime Minister Peter O'Neill told business leaders some companies failed to execute TCS properly. Mr O'Neill said the government decided to put a stop to it, because there is a transparency issue with the process. Head of PNGEITI National Secretariat Lucas Alkan when concurring with the idea that the TCS is a best public private partnership (PPP), said the opaque nature of the scheme had to be addressed by reviewing the processes involved in awarding tax credit to companies. Mr Alkan said successive EITI reports have found discrepancies in the reporting of the tax value foregone and it was timely that the government looks into it to take remedial actions. "We welcome the decision of the Government to put on hold TCS projects as EITI reports affirm the observation that there is lack of transparency and accountability in this scheme.

"The process needs to be more transparent -particularly the guidelines and the criteria involved in the approval process. The ITC expenditure should be included in the annual national budget books and the Department of National Planning and Monitoring (DNPM), should be able to show this information," he said. Mr Alkan said the PNGEITI Report for 2016 fiscal year published recently included the ITC as one of the recommendations for the government to increase transparency and accountability regarding the approval process by DNPM, expended on projects by companies and resulting tax payments offset by the IRC. "We trust the national government will address the opaque nature of this scheme so that original intent of TCS is maintained. "We applaud the Prime Minister for the insight and look forward to a review of the TCS," he said.

NZ Minister says Nauru mine site needs topsoil

Radio New Zealand, 31 January 2018

Aupito is in Nauru representing New Zealand at the island's 50th anniversary of independence. He said he had received a strong welcome from President Baron Waqa as New Zealand endeavours to rebuild its relationship with the island, after suspending aid over concerns about the independence of the judiciary three years ago. Aupito said he was taken on a tour of the area mined for phosphate over the past 100 years and he says it looked like a grave site. "The land it needs topsoil. You have got these pinnacles of hard rock that can't be crushed and that's all that's left after 100 years of consistent and indiscriminate mining." Much of the phosphate mined on Nauru ended on pastures in

New Zealand. Nauru's Government has been seeking international assistance to rehabilitate the area, including having soil brought in from overseas.



The Nauru phosphate cantilever. Photo: Supplied/ Nauru Government Information Department

Nickel, cobalt price lifts company performance

January 30, 2018, The National Business

HIGHLANDS Pacific recorded a strong result during the final quarter of last year, attributing it to the record production at the Ramu nickel/cobalt mine in Madang. It said the rapidly rising cobalt and nickel prices also contributed to the strong result. Highlands Pacific noted that Ramu produced 9160 tonnes of nickel and 877 tonnes of cobalt in the December quarter. It took the annual production of nickel in concentrate to a record 34,666 tonnes, which was up 56 per cent on the previous year, and exceeded nameplate production capacity of 32,600 tonnes. Annual cobalt production was 3308 tonnes, up more than 51 per cent compared to the prior year. The company in a statement said the excellent production performance was achieved as nickel and cobalt prices were rising strongly, fuelled by increasing demand from emerging battery technologies. Highlands Pacific holds an 8.56 per cent interest in the Ramu project. It generated net cash inflows of US\$49 million (K154.89mil) for the December quarter, after capital expenditure of US\$7 million (K22.12mil).

For the full year, net cash inflow was a strong US\$170 million (K537.37mil), after capital expenditure of US\$17 million (K53.73mil). Highlands Pacific managing director Craig Lennon said he was delighted. "Ramu is now performing exceptionally well, confirming that it is one of the true success stories of PNG's mining industry," Lennon said. "We have been involved with the development of the project for many years, and our commitment and perseverance are now delivering results. "The operation is achieving consistent production records just as cobalt prices surge to record levels, and as nickel continues to show a solid upward trend, buoyed by demand for battery metals. "We continue to see a very strong future for the project, and we hold an entitlement to increase our interest in the project to 20.55 per cent, which gives our shareholders a great option on the future for nickel and cobalt."

Nautilus sets date for final trial of seafloor tools

January 29, 2018, The National Business

NAUTILUS Minerals says submerged trials of the collecting machine and auxiliary cutter were completed late last year. The company highlighted this in a statement when it provided an update on

submerged trials for the company's seafloor production tools with the final machine – the bulk cutter – due to finish trials next month. Nautilus said that to date, the bulk cutter had completed commissioning of the power and control system, onshore functions testing, submerged function testing and submerged endurance trials. The rest of the trials will focus on overall cutting performance, a key criteria for this piece of machinery. Ongoing analysis of the results to date indicates that the seafloor production tools can perform to design specifications, with the machine components functioning as designed in submerged conditions.

The cutting performance of the auxiliary cutter has been particularly positive. Approximately 770 tonnes of material was cut during trials, with the Nautilus site team commenting that the material appeared at least three times harder than the mineralised material at Solwara 1, (even allowing for the hyperbaric effect on material located at seafloor depths of the Solwara 1 Project which are far greater than the depths at which the trials were conducted). The company will provide a comprehensive analysis once all test work and data analysis is complete.

Nautilus' chief executive Mike Johnston said: "We are extremely pleased with the progress that continues to be made on the trialing of the seafloor production tools. The results of the trials to date indicate that the machines have been meeting and/or exceeding their key design specifications. "These results have been achieved through the dedicated work of our staff, key contractors (SMD and KDI), support staff (Curtain Brothers PNG) and within a tight budget. "The performance of these machines is critical to our seafloor production system, and the results to date significantly de-risk the project. "We look forward to providing future updates once the bulk cutter trialing is completed."

Meet to re-open mine successfully

Post-Courier, January 28, 2018, BY SEBASTIAN HAKALITS

A recent meeting between the chairman of the Special Mining Lease Osikaiyang Landowners Association (SMLOLA) Philip Miriori and the President of ABG Dr John Momis in Buka in January was described as a success. It was jointly agreed that the technical team of the SMLOLA would re-engage with the ABG Mining Department to develop a plan. Mr Miriori said following the recent rejection of Bougainville Copper Limited's plans to redevelop Panguna by the Bougainville Executive Council, and president Momis's press release of December 22, 2017 that he wants to work more closely with the landowners to find an acceptable redevelopment proposal for Panguna that will be widely supported by Bougainvilleans and unite the landowners. "We were very appreciative of President Momis's offer to meet to start this process," Miriori said.

Mining Minister and vice president of Bougainville, Raymond Masono was also present at the meeting along with Finance Minister Robin Wilson and ABG Police Minister William Masiu. Mr Miriori said they had a successful meeting with President Momis and "the other ministers and I confirm it is my intention as the chairman of the SMLOLA to engage meaningfully with the ABG and National Government in finding a way forward for the future prosperity of all Bougainvilleans." "Mr Momis was very respectful of my position and was appreciative of the reconciliation we have been able to achieve on the leadership issues. He said we all understand that the redevelopment of Panguna, if done with the support of the community, could enable Bougainville to thrive and enhance the Independence Referendum plans, which the ABG committed to in the recent joint supervisory body meeting in Port Moresby.

Mr Miriori said this week he and his brother Lawrence Daveona, the former Chairman will commence their awareness campaign throughout the Panguna area to update their members on their meeting with President and will report back to Momis before the end of the month with their find-

ings. He said meanwhile, their technical team will be meeting with the ABG Department of Minerals and Energy this week. “We believe this could be the turning point for our Bougainville and look forward to working with the ABG as one team to progress the redevelopment plans at Panguna,” said Miriori.

Human Rights Advocates Unite for Porgera Women

Ramcy Wama, Post Courier, January 26, 2018

Four human rights groups have complied with Canadian gold miner Barrick Gold’s request to unite to seek redress for atrocities committed against women in the past 20 years at Porgera gold mine in Enga Province. Akali Tanga Association, Human Rights Inter Pacific Association, Porgera Red Wara Women Association and 118 Indigenous Women Association announced their unity in Porgera last Friday. The four had been separately fighting against the negative human rights impacts caused by the Porgera Gold Mine since the mine started its operation in 1989. They claim to represent victims who were allegedly poisoned from the chemical waste, women and girls who were raped and sexually assaulted by mine workers and related social problems affecting the landowners as a result of the mining operation. The Barrick Gold Corporation, the joint owner company of Barrick Niugini Limited (BNL) that currently operates Porgera Gold Mine, asked for the four advocates to unite and claim for the remedy for the victims because of duplicity in separate claims.

Barrick Gold chief sustainable officer Peter Sinclair, in an email on October 29, 2016, had asked the advocates, Akali Tanga Association and Human Rights Inter Pacific to make one claim for all the victims for the company to evaluate and approve. “Given the serious nature of these allegations, and the volume and nature of the claims presented, significant time will be required to complete an evaluation of each claim, which may include consultations with external stakeholders. “Be assured that we will use our influence as an equal shareholder of BNL to emphasise the critical importance of BNL management adhering to its own human rights policy, including a commitment to investigate and respond to allegations of negative human rights impacts that BNL may have caused or contributed to in a fair and effective manner,” Mr Sinclair said.

Human Rights Inter Pacific chairman Karath Mal Mawa said yesterday that the human rights groups had agreed to make a united submission on abuses at the mine. “We have fixed each claim of the individuals and are ready to launch for remedy payment,” Mr Mawa said. Some of the victims presented about 30 pigs in appreciating the four human rights uniting to press for redress. In April 2015 Barrick Gold settled 11 claims of atrocities committed against women at Porgera. The settlement in Canada was reached with EarthRights International, a non-governmental organisation, that was representing the women, bringing to a close all of the outstanding claims made by women, who were allegedly beaten, raped, and threatened by the miner’s security personnel and employees. Some incidents dated back to even before Barrick bought the mine via its takeover of Placer Dome in 2006.

New Irelanders satisfied with seabed mining campaign

Loop PNG, January 25, 2018

Landowners from New Ireland Province are pleased with the result of the campaign against experimental seabed mining. They noted the overwhelming support from the national, regional and international organisations, including from prominent leaders. Following the recent resignation of Nautilus chairman Russel Debney and Nautilus vice president PNG Adam Wright, Jonathan Mesulam of the Alliance of Solwara Warriors said: “We are pleased with the recent turn of events and would

like to acknowledge the support given by the European Union Parliament, United Nations and reputable leaders who have come out publicly and called to ban experimental seabed mining.”



Nautilus the Protector - Solwara Em Laif

Mesulam also acknowledges the support by prominent leaders such as Sir Arnold Amet, Cardinal Sir John Ribat and international naturalist Sir David Attenborough, who have come out strongly against experimental seabed mining. Whilst acknowledging the support by different organisations at their levels, Mesulam challenges the three local MPs; Sir Julius Chan (Governor), Ian Ling-Stuckey (Kavieng Open) and Walter Schnaubelt (Namatanai), to come out publicly and make their stance clear. He further said the locals will continue to advocate on experimental seabed mining and will make sure “Nautilus leaves our shores”.

Sea Bed Mining is an invasion of indigenous livelihoods

Caritas PNG, ACT NOW!, 24 January 2018

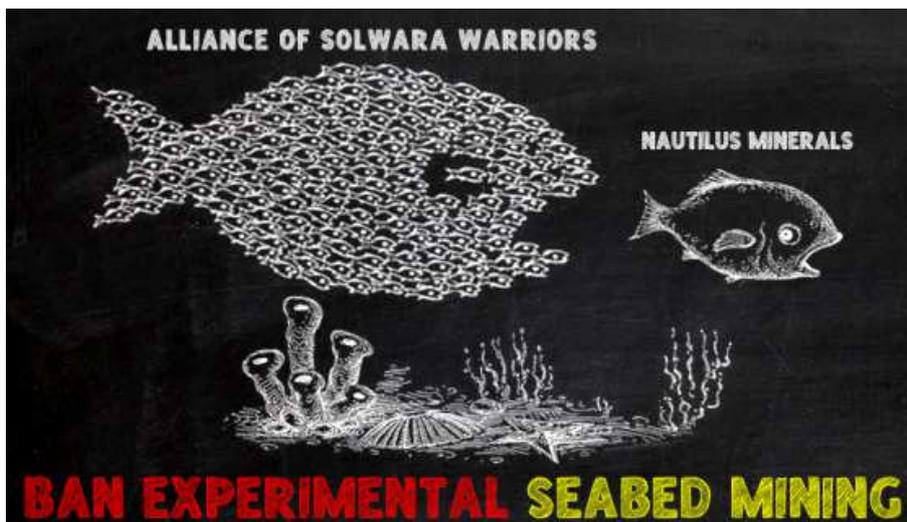


Image: Alliance of Solwara Warriors

Deep sea bed mining is the extraction of metals such as iron, manganese, copper, zinc, lead nickel, cadmium, silver, platinum gold and rare earths from the sea floor. The Parliament decision for granting license to Nautilus (Under Sea Bed Mining) in Papua New Guinea waters is a disgraceful act of genocide on all levels of life in PNG history. According to Caritas Co-ordinator, Chairman of the Indigenous priest association, Kokopo, Fr Mathias Lopa, the awarding license to Nautilus Sea Bed Mining is a preferential choice for more money over the indigenous livelihood. He said that in

a diagnostic view, we should say that, it is political preferential choice for ecological destruction of natural environment and sustainability of livelihood. He stated that it is a shame for the authorities not listening to the people's voice and no considerable attention given to the result of the independent scientific research study on the fragility and venerability of life under the sea. The scientific study proves the imminent destructive impact on human life and the natural coexistence as an eventual consequence of such an economic venture.

He said that should there be any rational thinking Papua New Guinean could explain to all citizens of this nation, why Papua New Guinea has many major mining operations by foreign investors as well as reaping of the virgin forest and grabbing land to make millions of kina as revenue over night and yet our rural population still lack basic services. Fr Lopa added that concurrently signing of agreement between Papua New Guinea (NEC) and Nautilus, Sea Bed mining company is ethically questionable. He said that the people of the NGI region considered the parliamentary decision on sea bed mining as pre mature, short-sighted and imprudent decision. He stated that it is a common knowledge that PNG as a nation has no skill and knowledge on how to restore and rebuild the lives of the sea living organism when imposing of an unimaginable and pre-mediative act of crime against nature by an affluent nation. He said that the short sighted and non-evaluative decision by Parliamentary Bureaucracy is an outcome of being blind folded by foreign economic creed.

He also said that using the robot to destabilize the eco-system of life under the sea that sustains life on the land is a scary scenario. He said that such an invasion on non-renewable resources is an act of economic terrorism against the basic foundation of life under, within and above the sea. Therefore, our life is at the mercy of the capitalist economic imperialism. Fr Lopa stated that the arrogant of authorities for not listening to the people's plea is a sign of psychological fear of offending the international relationship based on agreement. He said that as thinking citizens, we need to rationally speculate and conceptualize the possible terrifying scenario if revoking of international agreement that would cost our nation a significantly amount of penalty payment. He also said that the ethical question that ought not to be avoided is, what is important, the agreement with the company or the future generation and their natural resources.

He questioned as to why harvest all non-renewable resources with no due consideration of the future generation. Consuming all resource for the future generation to pay the debt of the present incurring nation's economic debt is morally unacceptable. Fr Lopa urged all fellow citizens that we have a social obligation and constitutional responsibility to speak up as openly guaranty by our constitution to air your views on this matter. He said that the citizens of New Guinea Islands region are concern about our lives and the lives of our children and their children. Of course we need money and we do have various means of making money. He questioned as to why resort to sea bed mining at this time. The politicians of the New Guinea islands have the political obligation and ethical responsibility to protect the lives of their voters and make our islands a safer place to live and enjoy life.

Discussions for further LNG expansion underway

January 24, 2018, The National Business

THERE has been an increase in discussions on LNG expansion held between Oil Search, ExxonMobil and Total SA during final quarter of last year, according to Oil Search. The company, in its 2017 fourth-quarter report, highlighted that results of engineering studies on potential downstream development options for processing Elk-Antelope in Gulf and P'nyang gas in Western, were provided to the joint venture participants in late December. Oil Search, in its report that was released yesterday, noted that these studies were primarily focused on the evaluation and comparison of the

downstream configuration and capacity for potential PNG LNG expansion and the development of Papua LNG.

Managing director Peter Botten said the joint venture would use these findings to determine its preferred development option, which it intends to present to the PNG Government early this year. “This will lead to the negotiation of a final gas agreement, prior to FEED (front end engineering design) entry in the second half of this year, with FID (final investment decision) targeted for next year,” he said. “LNG expansion will be underpinned by the more than 10tcf (trillion cubic feet) of discovered undeveloped gas resource in the Elk-Antelope and P’nyang fields, and potentially gas from the foundation project fields, which provides an option to front-end part of the new capacity with low-cost gas. “The joint venture remains aligned on pursuing an integrated development that will benefit all stakeholders through material construction and operational synergies.”

Oil Search repays LNG project debts

Post-Courier, January 23, 2018

Oil Search has repaid K1 billion (US\$314 million) of PNG LNG project financial debt, with net debt at the end of 2017 of K8.4 billion (US\$2.61 bn), compared to K9.9 billion (US\$3.08 bn) at the beginning of the year. This includes K 2.7 billion (US\$850 million) of undrawn corporate credit facilities, Oil Search had total liquidity of nearly K6.1 billion (US\$1.9 bn) at the end of 2017. Managing director, Peter Botten said the results of engineering studies on the various integrated downstream development options for processing gas from the Elk-Antelope fields in PRL 15 and P’nyang in PRL 3 were provided to the joint venture participants in December. He said discussions between Oil Search, Total and ExxonMobil progressed on project financing and marketing arrangements, with key project definition expected in early 2018, prior to presenting a preferred development option to the Government.

Mr Botten said the P’nyang south 2 ST1 encountered good-quality, gas-bearing Toro and Digimu sands, confirming the presence of gas in the south-eastern part of the field. “Recertification of the field’s gas resources will be completed in the second quarter of 2018 and is expected to result in the addition of 1C contingent resources that can be used to underpin marketing and financing discussions for LNG expansion,” he said. Site preparation for the Muruk 2 appraisal well continued during the quarter and, subject to weather conditions, drilling is expected to start in the second quarter of 2018. Muruk 2 will help define the potential volumes in the field.”

Oil Search records revenue increase

Post-Courier, January 23, 2018

Oil Search Limited has seen a 17 per cent increase (K4.6 billion) higher than in 2017 for its total revenue. This resulted from the oil and condensate price in the fourth quarter of 2017, which was at K204 (US\$63.05) per barrel, up 20 per cent on the third quarter, reflecting the strength in global oil prices. Managing director, Peter Botten said “this, together with a 5 per cent increase in our realised LNG and gas price, helped lift fourth quarter revenue to K 1.2 billion (US\$389 million), driving total revenue for the year to US\$1.45 billion K4.6 billion, 17 per cent higher than in 2017.” The company also recorded a total of 7.59 million barrels of oil equivalent (mmboe) in the final quarter of 2017. This as enable the full production for the year to 30.31 mmboe, a record for the company says managing director Peter Botten.

Mr Botten said Oil Search has finished strongly in 2017 with exceptional results which were at the upper end of its guidance range and an all time record. He said the PNG LNG project also delivered

another solid quarterly performance with the project operating at an annualised rate of approximately 8.3 MTPA, despite a short rate reduction in October related to the second phase of LNG plant compressor upgrades. In November, Oil Search announced the proposed acquisition of a 25.5 per cent interest in the Pikka unit and adjacent acreage and 37.5 per cent in the horseshoe block, on the Alaska North Slope, for K1.3 billion (US \$400 million), with the option to double its interests by mid-2019 for an additional K 1.5 billion (US\$ 450 million).

The acquisition was made on the basis that the Pikka unit contains a discovered resource of 500 million barrels, compared to an estimate of 1.2 billion barrels by the existing JV partners. Oil Search will take over operatorship in the first quarter of 2018 and plans to undertake an active appraisal ahead of a planned FID in late 2019. "The acquisition, which is expected to be completed within the next month, represents an entry into tier 1 assets that have potential to generate material growth with high returns and complements the company's existing high quality gas assets in PNG," Mr Botten said.

Seabed mining could destroy ecosystems

University of Exeter, PHYS.ORG, January 22, 2018



Relatively little is known about deep-sea ecosystems

Mining on the ocean floor could do irreversible damage to deep-sea ecosystems, says a new study of seabed mining proposals around the world. The deep sea (depths below 200m) covers about half of the Earth's surface and is home to a vast range of species. Little is known about these environments, and researchers from the University of Exeter and Greenpeace say mining could have "long-lasting and unforeseen consequences"—not just at mining sites but also across much larger areas. The study is the first to give a global overview of all current plans to mine the seabed, in both national and international waters, and looks at the potential impacts including physical destruction of seabed habitats, creation of large underwater plumes of sediment and the effects of chemical, noise and light pollution arising from mining operations.

"Our knowledge of these ecosystems is still limited, but we know they're very sensitive," said Dr. David Santillo, a marine biologist and senior Greenpeace scientist based at the University of Exeter. "Recovery from man-made disturbance could take decades, centuries or even millennia, if these ecosystems recover at all." "As we learn more about deep sea ecosystems and the role of oceans in mitigating climate change, it seems wise to take precautions to avoid damage that could have long-lasting and unforeseen consequences." Despite the term "mining", much seabed mining would involve extraction of minerals over very wide areas of the sea floor rather than digging down to any

great depth, potentially leaving a vast 'footprint' on the deep-sea habitats in which these mineral deposits occur.

Rising demand for minerals and metals, including for use in new technology, has sparked renewed interest in seabed mining. Some operations are already taking place, generally at relatively shallow depths near national coastlines. The first commercial enterprise in deeper waters, expected to target mineral-rich sulphides at depths of 1.5-2km off Papua New Guinea, is scheduled to begin early in 2019. Speaking about these plans last year, Sir David Attenborough said it was "tragic that humanity should just plough on with no regard for the consequences". The Exeter and Greenpeace research team say there are "many questions and uncertainties" around seabed mining, including legal issues and the difficulties of predicting the scale and extent of impacts in advance, and of monitoring and regulating mining activity once it takes place in the deep sea. The paper says that alternatives to seabed mining have already been proposed, including substituting metals in short supply for more abundant minerals with similar properties, as well as more effective collection and recycling of components from disused products and wastes.

However, Dr. Santillo said demand for seabed mining would also diminish if humanity could cut overproduction and overconsumption of consumer goods. "Rather than using human ingenuity to invent more and more consumer products that we don't actually need, we could deploy it instead to build goods that last longer, are easier to repair and make better use of the limited natural resources we have," he said. "With the right approaches, we can avoid the need for seabed mining altogether and stop the 'race to the bottom'. "As governments prepare to set the rules and the first companies gear up to mine, now is the time to ask whether we just have to accept seabed mining, or should instead decide that the potential damage is just so great that we really need to find less destructive alternatives." The paper, published in the journal *Frontiers in Marine Science*, is titled "An overview of seabed mining including the current state of development, environmental impacts, and knowledge gaps." It is an open-access publication accessible to readers anywhere in the world.

Wright resigns from Nautilus

Cedric Patjole, Loop PNG, January 18, 2018

Nautilus Minerals vice president of PNG Operations, Adam Wright, has resigned. The Company announced last night that Wright's resignation is effective as February 26th 2018. CEO Mike Johnston said Wright played a significant role over the last three and a half years in the areas of project management, stakeholder and government engagement and corporate social responsibility. "We would like to thank him for the valuable contributions he has made to Nautilus' progress to date and wish him well in his future endeavours," said Johnston. Wright's resignation comes at a time when the company is struggling to secure financing to fund its capital working requirements and the completion of its sea floor production system for the Solwara 1 project in PNG waters.

Wright's resignation from Nautilus is the second to be announced in the last three weeks. On December 27, 2017, Russel Debney resigned as chairman after a long stint with the company where he joined the Nautilus board in 2006. The recent events surrounding the company have further raised domestic and international pressure by concerned groups and individuals, calling for the project to be stopped. Former attorney-general, minister for justice and Madang governor, Sir Arnold Amet, has called on the government to terminate its partnership with Nautilus given the recent events. The PNG Government owns a 15 percent stake in the Solwara 1 Project.

Exxon discovers new oil and gas reserves in PNG

Radio New Zealand, 18 January 2018

The energy giant Exxon Mobil has discovered new natural gas and oil reserves in Papua New Guinea's Western Province and has begun evaluating the find. Exxon says it drilled almost 9000 feet into the earth at the P'nyang field, discovering "high-quality, hydrocarbon-bearing sandstone reservoirs. The find adds to the American company's "rapidly growing inventory of low cost natural gas" in PNG where it operates the Liquefied Natural Gas Project. This includes reserves acquired in Exxon's recent purchase of InterOil Corporation, as well as various other gas resources it has rights to around PNG's Highlands and Southern regions. The president of ExxonMobil Development Company Liam Mallon said the company and its co-venture partners were evaluating the well results and assessing how to develop the resource. He said that Exxon would work with the PNG government to undertake the work.

Police Officers shot at Porgera

PNG Industry News, 17 January 2018

TWO reservists from the police unit at Porgera in Enga Province are in hospital after they were ambushed and shot by gunmen on Sunday, police said. The National newspaper reported that Enga's acting police commander chief superintendent George Kakas said one of the reservists was shot in the leg while the other suffered a stroke when they were attacked near Wali Creek, a few kilometres from the Porgera gold mine's township. The reservists in five patrol cars were going to investigate the aftermath of a violent confrontation between two tribes when they were attacked with automatic weapons, but no major injuries or fatalities were reported, Kakas said. He said a bullet presumably fired from a high-powered rifle penetrated a patrol car and injured the officer's leg. The other reservist suffered a stroke during the incident. The men were flown to Wabag hospital and are now recovering, The National reported. Kakas said the incident had culminated from a stand-off between two tribes who were claiming ownership of the Mount Kare land where the Pogera mine is situated.

The Porgera joint venture is an open pit and underground gold mine about 130km west of Mount Hagen. Barrick Niugini is the 95% owner of the Porgera joint venture, and is the manager of the operation. Barrick Gold Corporation and Zijin Mining Group each own 50% of Barrick Niugini. The remaining 5% interest in the Porgera joint venture is held by Mineral Resources Enga and is divided between the Enga provincial government (2.5%) and local landowners (2.5%). A tribe embroiled in this feud allegedly attacked villagers from a neighbouring tribe, setting fire to some houses at Wali Creek. Kakas said the reserve police officers and mine security personnel were dispatched to check on the safety of power pylons and water supply facilities when they were ambushed by gunmen from the surrounding mountains. A peace and good order meeting was convened on Monday involving the provincial government, police and representatives of the Porgera mine. Barrick Niugini was approached for comment yesterday but had not responded before this publication's deadline.

MEDIA RELEASE

Former Attorney General of Papua New Guinea:

The writing is on the wall for Solwara 1 - PNG should withdraw its investment before it's too late. Deep Sea Mining Campaign, 17 January 2018

PAPUA NEW GUINEA | Amid financial strife and looming litigation, Sir Arnold Amet, for-

mer Papua New Guinean Attorney General and Minister for Justice advises the PNG Government to terminate its joint partnership agreement with Nautilus, recoup its 15% stake in the Solwara 1 deep sea mining project and decline to renew the licences for Solwara 1. For Nautilus Minerals a miserable Christmas has just flowed into an unhappy new year. A series of gloomy end of year investor updates confirmed Nautilus is unable to raise the funds necessary to complete equipment for its Solwara 1 deep sea mining project [1]. Then came the final blow for 2017 - affected communities launched legal proceedings in a bid to obtain key documents that will reveal to them and all Papua New Guineans whether Solwara 1 was approved lawfully and what the true environmental, health and economic impacts of the project will be [2].

Shortly after, Company Chair Russell Debney resigned [3]. This is in spite of his long association as a board member since the company listed on the stock exchange in 2006 and the chair of the company's predecessors, Nautilus Minerals Niugini Limited and Nautilus Minerals Oceania Limited. Due to the high-risk nature of the project, financiers have declined to bail the company out [4], suggesting the efforts of Nautilus's two largest shareholders have been in vain [5]. The best they have been able to come up with are bridging loans of USD 7 million to meet immediate needs whilst desperately hunting for another USD 350 million [6].

Sir Amet stated, "Investors, financial institutions and even the former chair of Nautilus can see the writing on the wall for Solwara 1. By the company's own admission the project is an experiment with unknown environmental and social consequences and uncertain profits. The past few months have really shown the extent to which financiers and our own communities in PNG reject this project." "This high-risk project is a foolhardy investment when our country has so many pressing needs. In order to acquire our 15% equity, the National Government obtained a loan in 2014 from the Bank of the South Pacific of almost PNG K400 million. It's also likely that the Government has provided Nautilus with generous incentives, which would further limit the potential to raise revenue from this project."

"This is irresponsible in the context of our country's ever-increasing debt bill", continued Sir Amet. There is little likelihood of a positive return from this project to the balance sheet of the economy. The recent bridging loans for the project are a drop in the ocean - only 1/50th of the total funds required. With an interest rate of at least 8% and a lucrative 5% cash commission going to a previous director of Nautilus, this loan represents yet another expensive debt burden for PNG - especially as the loan is secured against PNG's equity." "These bridging loans are from existing Board directors through a new private investment company incorporated in the British Virgin Islands. Such financial structures are commonly known as ways for minimising tax. And because the loan is from a related party, there was no need to even consult the PNG Government as the minority equity holder. If we stay in this deal, it will be the people of PNG who will have to pay."

"The best course of action now is for the PNG Government to terminate its joint venture agreement with Nautilus before our investment ends up sinking to the bottom of the ocean along with the company. In addition, Nautilus's licences are renewed every 2 years. The environmental uncertainties surrounding this project call for the Government to decline renewal. Indeed, given the poor financial record of the company, the government should consider suing Nautilus for the recovery of the full K400 million investment as its 15% equity stake is now virtually worthless."

NOTES

[1] If it proceeds the Solwara 1 mine will be located in the Bismarck Sea of Papua New Guin-

ea, approximately 25 km from the coastline of New Ireland Province, about 35 km from Duke of York Islands and 60 km from Kokopo township in East New Britain.

[2] Legal action launched over the Nautilus Solwara 1 Experimental Seabed Mine, Centre for Environmental Law and Community Rights (CElCoR) and Alliance of Solwara Warriors media release, 8 December 2017, <http://www.deepseaminingoutofourdepth.org/legal-action-launched-over-nautilus-solwara-1/>

[3] See: http://www.nautilusminerals.com/irm/PDF/1946_0/NautilusChairmanResigns

[4] In their [Annual information forms](#) lodged with Canadian Securities for financial years 2015 and 2016, Nautilus describes Solwara 1 as an experiment - both the environmental impacts and profits are completely unknown. See sections on Risk factors, For example: "Our operations are speculative due to the high-risk nature of business related to the exploration and acquisition of rights to potential mineable deposits of metals. These risk factors could materially affect the Company's future results and could cause actual events to differ materially from those described in forward-looking statements relating to our Company." (FY 2016, p 52)

"... Performance, availability, reliability, maintenance, wear and life (FY 2015, p54)of equipment are unknown. There can be no guarantee that sub-sea engineering and recovery systems can be developed or if developed, will be employable in a commercially-viable manner."

"... while Company studies have indicated a low likelihood of risk to the aquatic environment from mining activities, the actual impact of any SMS [seafloor massive (FY 2015, p61)sulphide] mining operations on the environment has yet to be determined."

"Nautilus has not completed and does not intend to complete a preliminary economic assessment, pre-feasibility study or feasibility study before completing the construction and first deployment of the Seafloor Production System at the Solwara 1 Project." "No independent Qualified Person has confirmed the amount of these costs or recommended that these costs be incurred. There is significant risk with this approach and no assurance can be given that the Seafloor Production System, if fully funded and completed for deployment at the Solwara 1 Project, will successfully demonstrate that seafloor resource development is commercially viable."

(FY 15, p52)

[5] Nautilus announced on 11 October the formation of Deep Sea Mining Finance Ltd. ("DSMF") which will seek to leverage the international expertise and financial relationships of Nautilus' two major shareholders to assist in advancing the development of the Company's Solwara 1 Project.

[6] http://www.nautilusminerals.com/irm/PDF/1950_0/Nautilusarrangesbridgeloansandsignsewfundingmandate

Nautilus in process of securing K22.6mil for Solwara 1 project

January 17, 2018, The National Business

NAUTILUS Minerals is in the process of securing short-term loans to progress immediate works on the Solwara 1 project in New Ireland. The company, in an announcement to the Toronto Stock Exchange last week, also noted the company entering into a funding mandate agreement. "The bridge loans, which the company expects to be in the amount of up to US\$7 million (K22.6 million), will assist the company's immediate working capital requirements and facilitate payments required to continue the development of the company's seafloor production system to be first utilised at the company's Solwara 1 project," Nautilus said. "The loans bear interest at 8 per cent per annum, payable bi-annually in arrears with a one-year maturity date." The bridge loans are expected to form part of a larger secured structured credit facility of up to US\$34 million (K109.8 million) on terms currently being negotiated.

“The company requires significant additional funding in order to complete the build and deployment of the seafloor production system to be utilised at the Solwara 1 project by the company and its joint venture partner, the Independent State of Papua New Guinea’s nominee,” Nautilus said. “There can be no assurances that the company will be successful in securing the necessary additional financing transactions within the required time or at all, including in connection with the funding mandate. “Failure to secure the necessary financing may result in the company undergoing various transactions including, without limitation, asset sales, joint ventures and capital restructurings. “The company will provide further updates as circumstances warrant.” Nautilus Minerals has arranged to receive bridge loans from Deep Sea Mining Finance Ltd and has also entered into a funding mandate agreement with M. Horn & Co Ltd.

Chatham has plans for new seabed mining consent

Simon Hartley, Otago Daily Times, 16 January 2018



Waitangi, the main town on the Chatham Islands.

Would-be seabed miner Chatham Rock Phosphate says it is "on track" to resubmit a marine consent application to the Environmental Protection Authority, by the end of the year. Since November, Chatham Rock has sought to recapitalise. A rights issue to existing shareholders raised \$549,000 and it is in the process of seeking a private placement, in stages, for up to a further \$C1.2million (\$NZ1.33million), chief executive Chris Castle said in a recent NZX update. Chatham has held a mining licence since since December 2012, but the EPA turned down its first application in February 2015, after Chatham had spent about \$33million on research, development and application costs. Chatham wants to suction up 1.5million tonnes of phosphate nodules annually from the seafloor, at depths of up to 450m, on the Chatham Rise about 250km west of the Chatham Islands. It had recently confirmed it will also look at whether it was feasible to separate out any rare earth minerals brought to the surface with the phosphate, as a potentially lucrative byproduct.

Mr Castle said in his market update, which was included in addresses to the Underwater Mining Conference in Berlin last September, the company wanted to move away from being a "one-trick pony". Chatham had made "significant progress" in securing marine phosphate opportunities overseas, to secure "alliances" linked to offshore phosphate assets, but structured in such a way so as not to divert funding from its proposed New Zealand operations. It was about to commission a research project looking at separating byproducts, he said. "Successful recovery of even a small proportion of these [unnamed rare earth] byproducts could add significantly to our future revenue and profitability and also establish a strategic ocean-floor based asset for New Zealand," he said.

The private placement, which closes on Friday, was undertaken in stages to partially reduce shareholder dilution of value, given the placement involved 4million shares, Mr Castle said. "We still anticipate completing the [EPA] reapplication process and hearing by early 2020, he said. The country's other seabed mining project, separate to Chatham, is Trans-Tasman Resources' development to mine ironsands from the seafloor off the southern coast of Taranaki, which gained EPA approval last year. Two High Court appeals have since been lodged against the EPA decision, by Kiwis Against Seabed Mining and Forest and Bird. They are yet to be heard. Trans-Tasman wants to take 50million tonnes of seabed material annually, to extract 5million tonnes of ironsands, for 35 years. Its first application was turned down by the EPA in 2014.

Mining exploration in Bougainville led by landowners

Cedric Patjole, Loop PNG, January 15, 2018



Landowners in the Autonomous Region of Bougainville are partnering with investors to conduct mineral exploration in areas sanctioned by the Autonomous Bougainville Government. Prospecting has started since the introduction of legislation allowing landowners complete ownership of customary land, and the lifting of the moratorium on specific localities for mineral exploration. However, the ABG is making sure the exploration is done in the best interest of the people. ABG Treasury and Finance Minister, Robin Wilson, said currently there is a moratorium on Panguna Mine due to its history and sensitive nature, which is being carefully addressed. However, exploration has been allowed in other parts of the island. "So far we have lifted the moratorium on three areas in Bougainville. That's Mt Ore, Isina in Central Bougainville and the Arawa-Panguna area," said the Minister. "So this are the areas where mining activities are going on, and it is driven by the landowners themselves. It's not government-driven. "It's the landowners and the investors they found and have brought them over.

"We are just making sure the investors are genuine investors. We're making sure that they are not coming up with contracts or agreements that will make the landowner suffer." The Minister said the lead taken by landowners follows legislation giving LOs complete authority and ownership over clearly defined customary land. He said by giving the power back to landowners, they can either accept or reject the prospects on their land. "The landowner now owns everything. In terms of alienated land the government still owns the resources. But where it's clearly customary land, it is landowner-owned. "So we believe that by giving the power back to the landowners, the landowners now have a say in whether exploration happens or mining happens," Wilson said. "In that way we are not forcing the issue on them. The landowners have to accept the development prospects that happen on their land." Wilson revealed that currently the island has been tagged as a high risk area by many international observers. However, he said with any successful explorations and discovery, this could trigger more investment in future, as the ABG aims to rebuild the island's local economy.

Study finds safer way to deal with mercury from mines

January 15, 2018, The National Business

THE use of mercury in small-scale alluvial gold mining is now better understood because of a study in Morobe by the Mineral Resources Authority, Japan's University of Kyoto and University of Technology's mining engineering department. The study involved assessing a machine for the recovery of mercury used in alluvial mining, said the authority in a statement. It was done at the authority's small-scale mining branch in Wau and involved the trial of an amalgam retorting machine brought in from Kyoto University. "The objective was to test-run the Japanese mercury recovery kit, a prototype amalgam retorting machine for the recovery of mercury and critically assess the overall performance, its efficiency and ease of operation of the device," the statement said.

"From the results obtained, the research team concluded, after careful assessment of the overall performance and efficiency of the mercury recovery kit, that it was an appropriate technology and should be used in Papua New Guinea's artisanal and small-scale gold-mining industry for mercury and recycling recovery." Authority managing director Philip Samar said the study looked at ways to reduce and mitigate the increased use and disposal of mercury into the environment. It also looked at how to increase alluvial gold production while ensuring the protection of the environment and the wellbeing of alluvial miners in the country.

Appeal for safety in New Caledonia mines

RNZ, 12 January 2018



Three nickel mines hit by strike in New Caledonia. Photo: AFP PHOTO MARC LECHELARD

The Union of Mining Industries issued a statement in response to a recent spate of vandalism at the mining sites of three different companies along the main island's east coast, which caused extensive damage to vehicles and buildings. It said employees and shareholders were traumatised by the breadth of the recent destruction and violence, and wanted a climate allowing for work to be done without fear of becoming a victim of theft or violence. The Union said it was intolerable to attack the workplace of thousands of people and to destroy millions of dollars worth of equipment in the context of a volatile nickel market in which the industry was struggling to survive. It said as incidents now occur on an almost daily basis, the group was appealing to the state and the mayors for help.

Failing seabed miner Nautilus Minerals continues on life support

Press Release, GlobeNewswire, Business Insider, January 11, 2018

Nautilus Minerals Inc. announces that it continues to arrange bridge loans from Deep Sea Mining Finance Ltd, which are expected to form part of a larger secured structured credit facility of up to US\$34 million to be provided by the Lender to the Company. In conjunction with initial advances under the bridge loans, the Company has issued to the Lender an additional 8,591,065 warrants of the Company, for a total of 11,812,714 share purchase warrants issued to the Lender to date. Each Warrant entitles the Lender to purchase one common share of the Company at a price of C\$0.17 for a period of five years from the date of issuance of the Warrant. The bridge loans, which the Company expects to be in the amount of up to US\$7 million, will assist the Company's immediate working capital requirements and facilitate payments required to continue the development of the Company's seafloor production system to be first utilized at the Company's Solwara 1 Project. The loans bear interest at 8% per annum, payable bi-annually in arrears with a one year maturity date.

The Company will be entitled to pre-pay each loan prior to maturity, by paying 108% of the outstanding principal of the loan plus accrued and unpaid interest. Each loan will be represented by a promissory note and will initially be secured against the assets of the Company through a general security agreement. The Lender may subsequently require the loan to be guaranteed by the Company's material operating subsidiaries and secured against the assets of such subsidiaries. There can be no assurance that the Company will be successful in concluding the larger credit facility transaction or that any further funding will be secured by the Company. As previously disclosed, the Lender is a private company owned 50% by each of: (i) USM Finance Ltd, a wholly owned subsidiary of USM Holdings Ltd, an affiliate of Metalloinvest Holding (Cyprus) Limited; and (ii) Mawarid Offshore Mining Ltd., a wholly-owned subsidiary of MB Holding Company LLC. As the Lender is controlled by two insiders of the Company, the Lender is a "related party" of the Company and the loan transaction constitutes a "related party transaction" of the Company under MI 61-101 *Protection of Minority Security Holders in Special Transactions*. The transactions comprising the bridge loans and the Warrants will be exempt from the formal valuation and minority shareholder approval requirements of MI 61-101.

The Company did not file a material change report more than 21 days before the expected closing of this transaction, as the details of the transaction were not finalized until immediately prior to the closing and the Company wished to close the transaction as soon as practicable for sound business reasons. The Company requires significant additional funding in order to complete the build and deployment of the seafloor production system to be utilized at the Solwara 1 Project by the Company and its joint venture partner (as to 15%), the Independent State of Papua New Guinea's nominee. There can be no assurances that the Company will be successful in securing the necessary additional financing transactions within the required time or at all. Failure to secure the necessary financing may result in the Company undergoing various transactions including, without limitation, asset sales, joint ventures and capital restructurings. The Company will provide further updates as circumstances warrant.

Bougainville imposes moratorium on Panguna mine over fears of civil unrest

Helen Davidson, The Guardian, 10 January 2018

In dramatic policy turnaround, government determines people feel Bougainville Copper Limited doesn't deserve a social licence to run the controversial mine. The Bougainville government has enacted an indefinite moratorium on renewing the licence of a controversial mining company over fears it could reignite violent civil conflict. In December Bougainville landowner groups were called to vote on allowing Bougainville Copper Limited (BCL) to renew their mining licence and

potentially reopen the Panguna mine, but the vote was split. “If we went ahead now, you could be causing a total explosion of the situation again,” the Bougainville Autonomous Government (ABG) president, John Momis, told the ABC on Monday. The Panguna copper mine was central to the civil war and blockade in the 1990s that killed tens of thousands of people. Conflict escalated after landowners protested environmental damage by the mine and the lack of economic benefit for local people.

The Rio Tinto-owned BCL was forced to close the mine, and discussion in recent years about reopening it has sparked hostilities in the nearby communities. In June protesters blocked Momis and other political leaders from accessing Panguna to sign an agreement with landowners, which the ABC reported would have opened the way for BCL to work towards returning. Legislation passed in 2015 [gave traditional landowners greater ownership over resources as well as powers](#) over the establishment or reopening of mines, but confusion and division remains. At the time of the BCL vote local journalist Aloysius Laukai reported Momis said mining by any company would be “untenable” under the circumstances. However on Monday Momis told the ABC the moratorium only strictly applied to BCL, not other potential operators. The moratorium is a dramatic turnaround in policy from the ABG, which determined people felt BCL didn’t deserve a social licence to run the mine.



The Panguna mine, located in the east of Papua New Guinea in the Autonomous Region of Bougainville, was at the centre of Bougainville’s decade-long civil war.

The ABG owns a 36.4% share in BCL, and has consistently said reopening Panguna was essential for the island’s economic self-sufficiency if it is to become independent. Luke Fletcher, the executive director of an Australian-based NGO, Jubilee, said it wasn’t clear if the turnaround was “a temporary retreat or a permanent change of direction”. “It could be they’re just biding their time for another couple of years, or they’re considering opening Panguna with other operators,” Fletcher said. “It does seem the intention is still to reopen the mine.” The Papua New Guinea government is the only other major shareholder after Rio Tinto left in 2016. It has said it will give its 17% share to Bougainville, making the ABG majority shareholders of a company that has just one project – a mine over which the ABG has now placed a moratorium. BCL is yet to be officially informed of the moratorium, but learned of it through media reports.

The company’s Port Moresby general manager, Mark Hitchcock, said it had sought further clarity, as it still “firmly believed” it had strong support among landowners. “Hitchcock said previously held community forums led by the ABG had also demonstrated strong majority support and this reflected the company’s own experiences on the ground,” a spokesman told Guardian Australia. “He stressed that BCL was a local company majority owned by the people of PNG, including Bougainville and had always acted in good faith after being invited to enter a new process for the redevel-

opment of Panguna by the ABG and landowners.” BCL claimed it had support from eight of the nine landholder groups, as well as the Special Mining Lease Osikaiyang Landowners Association. It said minority elements – and competing mining interests – were disrupting consensus.

There were disputes with the association’s chair, Philip Miriori, BCL said, citing a letter from 367 authorised customary heads who disputed Momis’s characterisation of the vote as a “narrow divide”. The customary heads told PNG’s Post Courier the meeting was given a submission signed by 320 of the heads giving their support to BCL. As the resource-rich country moves on from civil war and towards independence, it is increasingly looking to mining for its economic future. West Australian company Kalia Ltd recently announced it had signed a land access agreement with north Bougainville landowners, allowing the start of a “full-scale exploration program”.

Cars burned in attack on New Caledonia mine

There has been a fresh spate of vandalism at a New Caledonian mine site on the east coast of the main island. Radio New Zealand 10 January 2018



Nickel mine in New Caledonia Photo: AFP

Five cars have been burned at the base of the Ballande mine in Nakety, triggering a shutdown of operations. The perpetrators also damaged mining trucks and ransacked a building late on Sunday night. The mine, belonging to the Ballande group, was targeted three years ago when light vehicles were found crushed by huge mining trucks, which in turn were dumped in ditches. In 2014, diggers were used to wreck technical installations, some of which were set on fire. That incident caused an estimated \$US 5 million in damages.

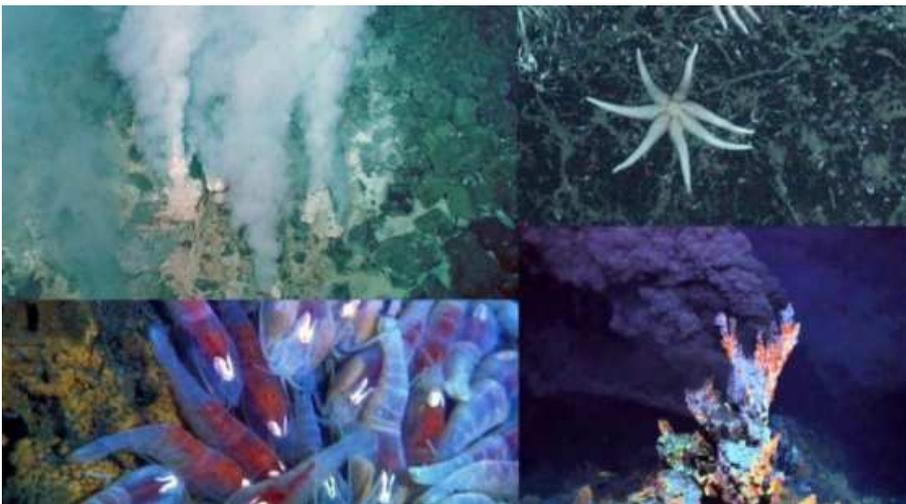
Solwara 1 Hydrothermal Vents: Sources of Riches from the Deep Blue Sea

Joanita Nonwo, EMTV, 8 January 2018

The interests in mining the deep seas for its riches date as far as the 1960’s with research vessels discovering hydrothermal vents that spew out rich minerals from the earth’s crust. These vents are very rare, being found only where there are active volcanic and tectonic movements under the sea. Hydrothermal vents in simple, are openings in the earths’ crust of the ocean floor where extremely high temperatures exits, spewing out chemical water rich with minerals. Scientists first discovered hydrothermal vents in 1977 while exploring an oceanic spreading ridge near the Galapagos Islands, and to their surprise, found the area to be teeming with very rare marine biodiversity – large num-

bers of organisms that had never been seen before. Flourishing with life in total darkness, toxic chemicals, and extreme water pressure where no life thought to exist.

It was in the 1980's that the ocean floors of Papua New Guinea was included as a potential under-water mining site – off the north-eastern waters of PNG, contained highly graded minerals of copper and gold. The project site, 'Solwara 1' sits on the sea floor at a water depth of about 1600 meters, containing very high grades of copper and gold – those that are much higher than those from the land. Although there were high costs and engineering challenges that faced the possibility of having the first world under-water mine here in PNG then, there were also questions and concerns raised over the terms of operation and the safety of the ocean against pollution and destruction. Nautilus, the company who will mine the PNG sea floor was granted the Environmental Permit in 2009 with its first mining lease in January 2011.



In a recent radio interview with PNG's Mining Minister, Johnson Tuke, the Minister stated that PNG Government has been open about the project and that Nautilus has released a thorough environmental impact statement. "This government is responsible. The environment context of it has to be taken on board, and proper due diligence has been conducted already, I suppose... I'm really not a marine biologist who has got a preview for you but to the layman understanding, and from what I learnt over the years with Nautilus, Nautilus has given us a feasibility study. That is the reason why the license was granted. And from what I know, there is a certain dark area (in the seabed to be mined) where it is out of photosynthesis. They say there is no life beyond that point." And while the Minister's last sentence contradicts the scientific discovery back in 1977, there are also calls from local communities to abort the project including one from Sir David Attenborough, a world renowned BBC broadcaster and Naturalist who described the project as "heartbreaking."

"That is where life began, and that we should be destroying these things (hydrothermal vents) is so deeply tragic." Chief Executive of Nautilus Minerals, Mike Johnston, has stated that is has taken a long time for the project to eventuate and there has always been a lot of support for the project. Nautilus has helped in developments on New Ireland, building toilets and running water to 25 schools, and working with health organisations running vaccination programs. However, the idea of using PNG waters as a lab for testing new technology at this point seem to be an unknown territory that many environmentalists are calling it 'risky'. A marine geochemist, Andrea Koschinsky, stated; "We will not know for sure the complete effects on the deep sea ecosystem, should we decide to do deep sea mining," "There are too many unknowns and challenges with this operation in our oceans... our marine environment are already stressed by pollution, over fishing and rising sea levels." stated Johnathan Mesula of Alliance of Solwara Warriors.

Mining Panguna requires 'social license'

The president of the Autonomous Bougainville Government (ABG) says mining companies must win the trust of landowners if they want to operate the Panguna mine.

RNZ, 5 January 2018



President of the autonomous Bougainville government, John Momis. Photo: RNZI

Last month, President John Momis placed an indefinite moratorium on mining at Panguna after landowners opposed the return of miner Bougainville Copper Limited, or BCL. The landowners said BCL would not take responsibility for the environmental and social impacts of its previous operation. BCL ran Panguna until the outbreak of civil war in 1989 in which grievances caused by the mine were central to the 10 year conflict that cost over 20,000 lives. Mr Momis said to avoid further conflict, Panguna could only be opened with the landowners' consent. "Because of our concern that it might ignite another war, we decided, on the recommendation of the Bougainville Mining Council, to impose an indefinite moratorium on mining on Panguna," he said. "The mine can recommence, but we have to ensure that whichever company gets the license must be acceptable to the people. In other words it must win the social license."



Inside the pit of abandoned Panguna mine in Bougainville Photo: supplied

The vast Panguna copper and gold mine once generated nearly half of Papua New Guinea's annual export revenue. In 2016, mining giant Rio Tinto transferred its controlling stake in BCL to both the PNG government and the ABG, winning support from Mr Momis for BCL to return to Panguna. But opposition to BCL from the Special Mining Lease Osikaiyang Landowners Association was reiterated this week by its chair Philip Miriori, who said it was time for Bougainville to attract a mining partner that would respect the people and make sure they all benefit. Australian mining company RTG claimed to have the landowners' backing last month when its chairman Michael Carrick told RNZ Pacific his company was a better option than BCL. Mr Momis said it was not clear if an Australian company could provide landowners the same benefits as one partly owned by the ABG. "That may be so but that is not the view of the people of Bougainville. We have a referendum coming up which is important for the ultimate determination of our future and we can't allow BCL's involvement in Panguna that may lead to bloodshed," he said. "We can't open the mine in the face of such huge opposition from the people. According to our law, the landowners own the resource, not the government. Until companies win the social license from the landowners they are barking up the wrong tree."

Report reveals failure to provide K72.9mil oil and gas receipts

The National, January 3, 2018



Bank of PNG has failed to produce receipts for oil and gas development levy and royalty payments totalling K72.9 million, according to a report. Those receipts were for payments made by ExxonMobil PNG Limited to the government in 2016, said a 2017 report produced by the PNG Extractive Industries Transparency Initiative (PNGEITI). The payments were K62.2 million for development levy and K10.7 million for royalty payments. At the time the report was published, Bank of PNG had not provided the independent administrator of the report with confirmation of the receipt. The report includes payments done by Oil Search Ltd and ExxonMobil PNG LNG. Oil Search pays development levy and royalties to the Department of Petroleum and Energy (DPE) by cheque while ExxonMobil pays the levy and royalties to Bank of PNG via electronic transfer and sends remittances advices to DPE, said the report.

ExxonMobil PNG said they have been directed by the Government to this payment method. The DPE only provided receipts for Oil Search payments of K7.4 million in development levy and K26.3 million in royalty. These payments have been 95 per cent reconciled. The 2016 report by the PNG EITI is the fourth under the department of Treasury. It was endorsed by Treasurer Charles Abel. "The 2016 financial year report is the culmination of continued commitment, collaboration and efforts by the Government, extractive industries and civil society organisations to provide a

comprehensive picture of the sector, its impact on the economy and our management of the revenues and benefits derived,” Abel said. EITI is a global standard for the good governance of oil, gas and mineral resources. It seeks to address the key governance issues in the extractive sectors. PNG became a candidate of the EITI in 2014 and is looking to deal with transparency issues to improve its image for foreign investment.

Landowners believe they were ‘robbed’

Post-Courier, January 5, 2018

There is nothing to show for in the PNG LNG impacted areas with the Government continuously misleading the people and promising better benefits as captured in the PNG LNG agreement of 2009. Since the agreements were signed in Kokopo in 2009, and the first shipment of the prophetic Gigira Laitapo gas left the shore of PNG in 2014, more than 300 shipments have been made, generating millions of kina for the developers, its partners and the Government, yet the upstream landowners have yet to benefit. Hiwa landowner chief Max Ekeya said the upstream landowners have been misled by the state and several landowner leaders. He said landowners continue to become spectators on their own land while their resources continue to be exploited. Mr Ekeya said the situation continues and it is sad and sickening, a daylight robbery to (them) the landowners, when they cannot see any cash follow in their communities and within the impacted project areas. “We at the corridors of Hides PDL1, contributing about 37 per cent of the gas and where most of the Well Heads are located have nothing to show for in terms of development.

“The Nogoli police station is run down, tribal fights everywhere within the vicinity of the project area, killings happening regularly. We need to upgrade the police station,” Mr Ekeya said. He said the Yuni Community School was supposed to be upgraded to high school level but didn’t eventuate. “The fulfillment of promissory notes by MRDC and KPHL to convert Yuni training centre to technical college by 2017 with the first intakes but is yet to come in place. Mr Ekeya raised concerns on the bad road conditions, along the Komo-Margarima Koroba-Kopiago and Tari Pori electorates. “Why isn’t this happening while the country and the world is feeding on Hela gas? “We see PNG Power and some local contractors trying to erect power lines out of Hides and supply power to Hela people, support should be given,” Mr Ekeya said. He said the main problem we have with the landowners was with too many chiefs and leader. “The Hides landowners have a common problem of not having a solid group to address concerns in unity to achieve a result.

“We have a situation where we have differences among ourselves, when we are divided the government and the developer are not interested to hear our concerns.” He said the landowners were faced with tough economic conditions and our people are pressured over school fees and other daily necessities. The concerned leader has called for the government to give priority on clan vetting and ILG to be completed, so landowners can benefit through the payment of royalties to sustain their livelihood. Mr Ekeya called on the landowner leaders to prioritise government expenditure of K35 million as project security to address law and order, pay compensation-related killings in the project areas and empower the local leaders and policemen to provide peace among the people. “All Hiwas should unite with the Hides Hiwa Block Landowners Association to raise our concerns. “I appeal to our leaders to provide good leadership to make way for clan vetting to be done,” Mr Ekeya said.

Nautilus chairman resigns

PNG Industry News, 03 January 2018

NAUTILUS Minerals' chairman Russell Debney has resigned as months-long talks to find funding for its controversial Solwara 1 project in Papua New Guinea have taken longer than expected. Deb-

ney stood down on December 27, seven days after the most recent funding deadline passed. He had been chairman since June 1, 2016. Nautilus announced it was actively seeking the appointment of an independent director to replace him. The company initially reported in September that it required significant additional funding to complete the build and deployment of the seafloor production system that is to be used at its pending Solwara 1 project, located in the Bismarck Sea off the coast of New Ireland Province. The most [recent] December funding deadline was the third since September the company had announced but failed to meet. Concerns over the financing situation have affected investor confidence, with the company's shares falling 38% since March 7. Nautilus was granted its first mining lease at Solwara 1 in 2011. The deposit sits on the seafloor under about 1600m of water and contains a copper grade of about 7%.



Russell Debney

Papua mine permit extended again

RNZ, 3 January 2018



Photo: wikicommons

The Jakarta Post reported the permit had been extended again until June 30, indicating that both parties were unable to settle their dispute before the January 10 deadline. The government had al-

lowed the miner to resume exporting copper concentrate by issuing a temporary special mining permit until October last year which was extended until this month. The Finance Minister Sri Muliyani Indrawati told the Post the new deadline would provide certainty for the company's operations while talks continue. Last year, the American company Freeport-McMoran agreed to divest 51 per cent of shares in its Indonesian subsidiary.

Report reveals failure to provide K72.9mil oil and gas receipts

January 3, 2018 The National Business

Bank of PNG has failed to produce receipts for oil and gas development levy and royalty payments totaling K72.9 million, according to a report. Those receipts were for payments made by ExxonMobil PNG Limited to the government in 2016, said a 2017 report produced by the PNG Extractive Industries Transparency Initiative (PNGEITI). The payments were K62.2 million for development levy and K10.7 million for royalty payments. At the time the report was published, Bank of PNG had not provided the independent administrator of the report with confirmation of the receipt. The report includes payments done by Oil Search Ltd and ExxonMobil PNG LNG. Oil Search pays development levy and royalties to the Department of Petroleum and Energy (DPE) by cheque while ExxonMobil pays the levy and royalties to Bank of PNG via electronic transfer and sends remittances advices to DPE, said the report.

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BCL Panguna extension denied

PNG Industry News, 03 January 2018

THE Bougainville Executive Council has confirmed that Bougainville Copper Ltd's application for extension of the term of its expired mining licence at the Panguna copper mine has not received necessary landowners' consent. Autonomous Bougainville Government President John Momis said his government would consult with the Panguna landowners on an appropriate arrangement or the best alternative model for the development of the mine. Until the consultation process is complete, the ABG will impose a moratorium over the grant of new licences for Panguna. Under the Bougainville Mining Act, a moratorium can only be implemented if there is no existing exploration licence. Special Mining Lease Osikaiyang Landowners Association chairman Philip Miriori thanked Momis and the ABG for respecting the association's opposition to BCL. "The Panguna community broadly wants the mine to reopen," he said. "We welcome very much the statement of the president that the ABG will consult with the Panguna landowners to determine the best alternative model for the development of Panguna." RTG Mining Inc, the Australian mining company proposing a restart for the abandoned mine, also thanked the ABG for supporting Panguna landowners.

Pressemitteilung

Forscher von BGR und SAMS veröffentlichen Studie in Nature-Zeitschrift: Starke Winde vor Mexiko haben Einfluss auf möglichen Tiefseebergbau im Pazifik

Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, 05.12.2017

Ein möglicher Tiefseebergbau im zentralen tropischen Pazifik muss auch Wettereinflüsse berücksichtigen. So herrschen im Gebirge Mexikos vor allem in Mai bis November starke Stürme. Sie sorgen für die Entstehung großflächiger ozeanischer Wirbel, die in 2500 Kilometern Entfernung von der Küste Auswirkungen auf den Meeresboden in vier Kilometer Tiefe und damit auf den geplanten Abbau von Manganknollen haben. Das fanden Wissenschaftler der Bundesanstalt für Geowissenschaften und Rohstoffe (BGR) und der Scottish Association for Marine Science (SAMS) heraus. Ihre Untersuchungen veröffentlichten sie jetzt in der aktuellen Ausgabe der Nature-Zeitschrift „Scientific Reports“.

Im deutschen Lizenzgebiet im Zentralpazifik zwischen Hawaii und Mexiko erkundet die BGR im Auftrag der Bundesregierung Vorkommen von Manganknollen. Die Knollen liegen hier in großer Dichte auf dem Meeresboden. Sie gelten als eine mögliche zukünftige Quelle für Nickel, Kupfer, Kobalt und verschiedene Hochtechnologiemetalle zur Deckung des weltweiten Rohstoffbedarfs. Bei einem Abbau der Knollen durch Großgeräte würden feine Sedimentpartikel aufgewirbelt, die als Trübewolke in Bodennähe verdriften und sowohl die Lebensfunktionen der dort lebenden Tiere als auch generell die Nahrungskette beeinträchtigen.

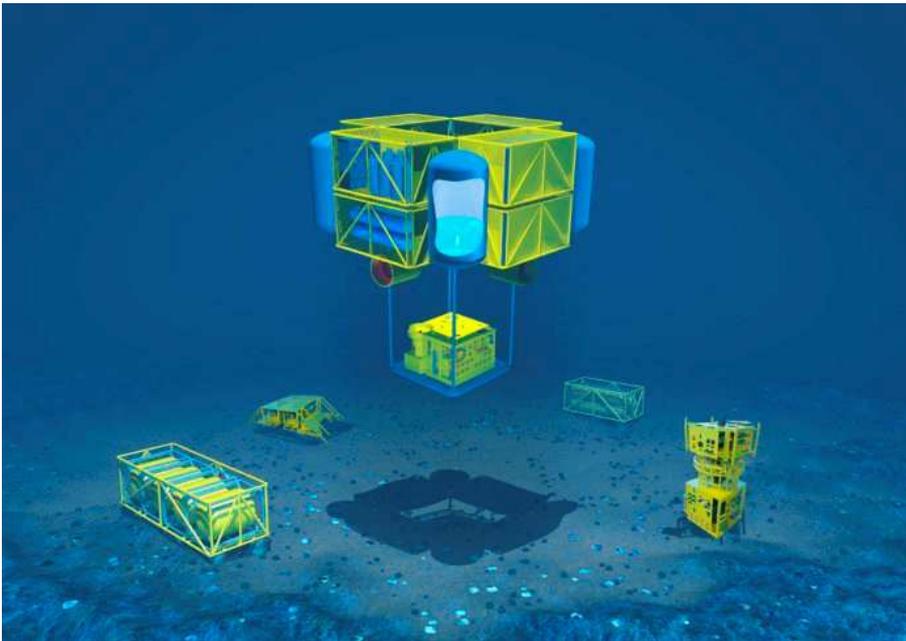
Zusammen mit ihren schottischen Kollegen untersuchte die BGR-Wissenschaftlerin Dr. Annemiek Vink das Verdriften derartiger Trübewolken, deren räumliche Ausdehnung noch weitgehend unbekannt ist. Die stündliche Vermessung von Strömungsgeschwindigkeiten am Meeresboden des deutschen Lizenzgebietes über drei Jahre hinweg in 4100 Metern Tiefe lieferte die Daten dafür. Die Beobachtungen zeigen, dass die energiearme Tiefsee regelmäßig für eine Zeitdauer von mehreren Wochen deutlich energiereicher wird, wenn riesige ozeanische Wirbel ähnlich wie Tornados in der Atmosphäre über das Gebiet ziehen.

Landungen im Gebirge von Mexiko – der Tehuantepec und der Papagayo – verursachen stürmische Winde, die diese großen ozeanischen Wirbel mit Durchmessern von 100 Kilometern an der Oberfläche erzeugen. Drei- bis achtmal jährlich lösen sie sich von der Küste und wandern langsam Richtung Westen. Einige dieser Wirbel erreichen das Lizenzgebiet und haben einen starken Einfluss auf die Strömung am Boden der Tiefsee. Sie sorgen dafür, dass sich die Strömungsgeschwindigkeit in einem Zeitfenster von einigen Wochen von 4 auf 13 Zentimetern pro Sekunde erhöht. Eine Computersimulation des SAMS zeigt nun erstmalig, dass Trübewolken, die bei einem Abbau im industriellen Maßstab entstehen würden, unter dem Einfluss dieser Wirbel über Entfernungen von mehreren Zehner Kilometern am Meeresboden transportiert werden. Weiterhin konnte gezeigt werden, dass die Anzahl ozeanischer Wirbel in El Niño-Jahren deutlich zunimmt.

„Mit diesen neuen Erkenntnissen lässt sich das Verdriften solcher Trübewolken durch einen möglichen zukünftigen Tiefseebergbau nun mehrere Monate im Voraus vorhersagen. So könnten Bergbauunternehmen rechtzeitig vor dem Eintreffen der ozeanischen Wirbel Maßnahmen ergreifen, um die Auswirkungen solcher Trübewolken so weit wie möglich zu reduzieren“, erklärt Annemiek Vink. Das internationale Forschungsprojekt MIDAS (Managing Impacts of Deep-Sea Resource Exploitation), in dessen Rahmen diese Studie 2013 bis 2016 unter Beteiligung der BGR durchgeführt wurde, hatte die Europäische Kommission gefördert. „Die Forschungsergebnisse helfen, optimierte Lösungskonzepte für einen umweltschonenden Abbau zu entwickeln, um die Entstehung und Ausbreitung einer Trübewolke schon im Ansatz so weit wie möglich zu reduzieren“, erläutert Frau Dr. Vink. Link: <https://www.nature.com/articles/s41598-017-16912-2>

German Developers Promote New Underwater Vehicle Technology

The Large Modifiable Underwater Mothership (MUM) offers potential applications for deep sea mining By Arlo Hemphill, DSM Observer, November 27, 2017



The Large Modifiable Underwater Mothership (MUM)

A new German technology is being promoted as the next generation in autonomous underwater vehicles. The [Large Modifiable Underwater Mothership \(MUM\)](#) is a modular, unmanned underwater vehicle capable of being customized cost-efficiently for a variety of missions. Individual base modules can be freely combined with specific mission modules to form large systems, enabling even unusual and highly specialized tasks to be performed quickly and easily. Possible activities range from payload transportation and operations to research missions and stationary deep sea tasks, making it potentially useful for various stages of deep sea mining from scientific monitoring to extractive activities.

The floating, wireless underwater vehicle will be equipped with an emissions-free, air-independent fuel cell propulsion system. The goal of the engineers is to develop a vehicle with diving depths of up to 5,000m that can continuously operate for several weeks. With a payload capacity of several tonnes, MUM will be capable of handling even heavy-duty tasks. The individual modules can be reused, permitting a significant reduction in costs compared with conventional vehicle concepts and much quicker development cycles. Newly developed mission modules are also easy to integrate. The technology is being led by a team of engineers from [ThyssenKrupp](#), [Berlin Technical University](#), the [University of Rostock](#), [ATLAS ELEKTRONIK](#) and [EvoLogics](#). The team has secured funding for development from the German Federal Ministry for Economic Affairs and Energy over three years.

Deep-Seabed Mining May Come Soon, Says Head of Governing Group

New regulations could open the door for sustainable mining, says the head of the International Seabed Authority. However, he and others pointed to environmental, financial, and technical challenges. By Randy Showstack, Staff Writer, 22 November 2017

The spotlights of a remotely operated vehicle illuminate carbonate rock spires of the Lost City hydrothermal vent field in the Atlantic Ocean during a 2005 scientific research expedition to the site. Recent approval by the International Seabed Authority for mining exploration in deep-ocean areas

worldwide, including Lost City, has prompted some ocean scientists to raise concerns about possible harm to the vents and the ecosystems they support. [Credit](#): IFE, URI-IAO, UW, Lost City Science Party; NOAA/OAR/OER; The Lost City 2005 Expedition, [CC BY 2.0](#)

“All the indications are that we are at a decisive point in the long history of attempts to mine the deep seabed,” said Michael Lodge, secretary-general of the International Seabed Authority. The world is “on the threshold of a new industry,” the head of an international body that governs deep-seabed mining said last week. At a 14 November forum in Washington, D. C., Michael Lodge, secretary-general of the [International Seabed Authority](#) (ISA), laid out environmental and other challenges to deep-sea mining while maintaining that a new regulatory system could allow the seabed operations to proceed in a sustainable manner. “All the indications are that we are at a decisive point in the long history of attempts to mine the deep seabed,” he said.

Although commercial exploitation of seafloor materials has not yet begun and could be years off, [Lodge](#) told the joint [meeting](#) of several boards of the National Academies of Sciences, Engineering, and Medicine (NASEM) that ISA has approved 29 exploration contracts covering more than 1.3 million square kilometers of the seabed in the Pacific, Indian, and Atlantic oceans. He distinguished deep-seabed mining from shallow-water mining for gold, sand, and other materials, which has gone on for centuries. Also, ISA distinguishes between [exploration](#) and exploitation activities. Technology for underwater mining, including remotely operated vehicles and other tools, has advanced enormously during the past few years, Lodge noted. Still to be developed, however, are a regulatory regime for mineral exploitation and reliable ways of knowing if a region of the seabed contains sufficient resources—such as manganese nodules, ferromanganese crusts, massive sulfides, or metal-rich muds—to support major capital investments, he said.

Developing New Regulations

ISA currently is crafting regulations, open for comment until 20 December, on the exploitation of deep-sea mineral resources. Established under the 1982 United Nations (UN) [Convention on the Law of the Sea](#), ISA oversees mining in the deep sea beyond the exclusive economic zone jurisdictions of individual countries. The organization currently is crafting [regulations](#), open for [comment](#) until 20 December, on the exploitation of deep-sea mineral resources. Lodge said that ISA “must develop environmental regulations that ensure that [exploration](#) and exploitation take place in a manner that recognizes the need to protect the environment, both on the ocean floor and in the water column.”

Among those submitting comments, the Deep-Sea Minerals Working Group of the [Deep-Ocean Stewardship Initiative](#) (DOSI) called the consultative approach to developing ISA’s mining code “commendable” but urged more openness. “Exploitation of the Seabed will affect all nations in perpetuity. A clear, open process to develop these Regulations is necessary,” reads the 16 November [comments](#) from DOSI, a network of more than 700 experts from about 40 countries. DOSI’s letter, provided to *Eos*, also recommends that the regulation preamble reflect language from the UN convention about the need to “ensure effective protection for the marine environment from harmful effects which may arise from such activities.” At the forum, [Conn Nugent](#), director of the seabed mining [project](#) for Pew Charitable Trusts in Washington, D. C., said his group’s goal is to help ensure passage of a mining code that reserves large no-mining areas and adopts a precautionary code to govern activities where mining is allowed.

Environmental Issues

Other speakers in a panel discussion also addressed environmental concerns. “All mining has an impact,” said [Mark Hannington](#), head of the marine mineral resources group at the GEOMAR Helmholtz Centre for Ocean Research. “You’re either impacting society or land-based ecosystems

or water quality or you're affecting ecosystems on the bottom of the ocean." He said some mineral deposits should be off limits. "Obviously, the hydrothermal vents that are still active are unique ecosystems, and nobody intends to mine those," Hannington noted. He said inactive [hydrothermal vents](#) might be attractive for mining but are harder to locate, and "we don't know what kind of ecosystems might be associated with inactive vents."

Dozens of scientists, however, last month expressed concern about a recent ISA decision to grant a contract for massive sulfide mineral exploration in a region of the Mid-Atlantic Ridge with active vents. "These unique hydrothermal vent sites"—known as Lost City, TAG, and Broken Spur—"are irreplaceable, and their vulnerability to nearby exploration, let alone seabed mining, is entirely unknown," reads a 27 October [letter](#), provided to *Eos*, which was signed by [Beth Orcutt](#), senior research scientist with the Bigelow Laboratory for Ocean Sciences in East Boothbay, Maine, and co-signed by nearly 50 other scientists.

"A critical thing is to understand what our environmental goals are. Clearly, there is going to be habitat destruction, so what is it we are trying to protect?" [Cindy Van Dover](#), professor of biological oceanography at Duke University's Nicholas School of the Environment in Durham, N.C., and a panelist at the forum, said that it's "upside down" for exploration contracts to be awarded "before we understand what our regional environmental management plans are." Van Dover, who said she is neither pro- nor anti-mining, noted that mining degradation won't just include "what you scrape up." She said a sediment plume could affect the benthic and pelagic environment, and sound and light disturbances and toxic heavy metals also could disturb the marine environment. "A critical thing is to understand what our environmental goals are. Clearly, there is going to be habitat destruction, so what is it we are trying to protect?" she said.

Moving Forward

Hannington cautioned that although the number of areas with evidence of some valuable minerals is "astounding," there is a big difference between a potential mineral resource and just a mineral occurrence. Global mining companies, he observed, currently are on the sidelines and don't necessarily view deep-seabed mining as something of immediate interest. Once new regulations governing exploitation are approved, possibly within a few years, mining likely would start slowly at relatively small scales, according to Lodge and others. "I think it will start off with a few operators who are willing to take the risk and invest that capital," said Lodge. However, at least one expert attending the seafloor mining forum disagreed with that forecast. [Larry Meinert](#), deputy associate director for energy and mineral resources at the U.S. Geological Survey, told *Eos* that he doesn't see "a viable way to develop deep-sea mining as an industry." "No company could afford to put in a billion dollars of assessment to figure out whether this could be done," said Meinert, who spoke about minerals at an earlier session of the NASEM meeting. "There's no economic model that could pay for that."