

Statement by J. Rutherford on New Zealand Iron Sources and Opportunities

There is an interesting example of iron fertilisation of the ocean in New Zealand that does not appear to have received attention from scientists carrying out short term ocean fertilisations, which understandably leave much uncertainty as to the results of long term depositions of iron into the ocean and thence to the seabed.

On the continental shelf of the west coast of the North Island of New Zealand there is major deposition of volcanic plio-pleistocene iron sands and according to recent aero-magnetic, drilling and vibracoring surveys, they cover thousands of square kilometres of the seabed, with that closer to shore, extending to up to 100 metres below the seabed. Hundreds of billions of tonnes of iron ore, enough to keep Chinese steel mills operational for a century and believed to be the easiest upliftable iron ore in the southern hemisphere. The world's largest miner, BHP-Billiton, has been making a very good living over the past 20 years of mining iron sands on the adjoining beach (originally a government initiative that would never be permitted by our Conservation Department today) on 8 square kilometres, providing the feedstock for the Glenbrook Steel Mill in south Auckland, the largest industrial complex in the country which employs thousands. The company allocated the largest metallurgical resource ever issued by the NZ government (1270 square kilometres of iron sands on the coastal seabed between the cities of New Plymouth and Auckland) has been joined in partnership by Rio Tinto, the world's second largest miner.

We New Zealanders watch the scientific progress on the prospects of southern ocean iron fertilisation with great interest, as we can produce liquid iron derivatives from the iron sands and if appropriate, provide this in stainless steel ISO shipping tankers, that could be placed on the stern of ships participating in southern ocean fertilisations.

New Zealand's Nobel Laureate Alan MacDiarmid (until recently Professor of Chemistry at the University of Pennsylvania) and associated researchers sourced 72 "ships of opportunity" that sail in Antarctic waters for fishing, research, and supply to bases in Antarctica which in some cases can accommodate up to 100 scientists in addition to the crew and which should present a cost effective fertilising and monitoring capability with the co-operation of ship owners such as the US Navy Deep Freeze operation based in Christchurch NZ, and extending to other governmental agencies in the many countries having bases or other interests in Antarctica. In Alan's view this is the best method of moving from pilot trials to progressively greater fertilizations, if initial efforts produce a perpetuation of indicative plankton increases as demonstrated by earlier expeditions over the past 20 years that have incurred substantial cost but not led to ongoing work due to limited government funding, especially in a small country like New Zealand with only 4,000,000 people where the government is constantly being harassed by voters' calls for more money for health, education, police, etc. On the other hand, there is growing political support for an offshore collaboration with parties interested in working to reduce the potential of New Zealand's sovereign territory in Antarctica, the Ross Ice Shelf, collapsing and raising sea levels.

New Zealand, despite its miniscule population, has provided innovation with significant international consequences. First country to give women the vote for example. More recently, our Economic Zone Act was enacted in 1977, and such provided an extension of the NZ 12 mile territorial sea, extending 200 miles out not only from the conventional territorial sea of the main two islands of New Zealand but also extending 200 miles out from its smaller islands well removed from the "mainland". Much to the surprise of international lawyers this move was endorsed by the UN at the Third Conference on the Law of the Sea in Montego Bay Jamaica, five years later. The UN felt that because of NZ's isolated position, encompassing its outer islands in such a manner would not adversely affect other nations and such a move was preferable to piracy on the high seas. Other nations were encouraged to make similar moves and Australia passed its economic zone legislation in 1994. Accordingly the NZ economic zone extends northwards from its sovereign territory in Antarctica, the Ross Shelf, toward its southern islands, (Auckland Islands etc., which also have a 200 mile zone around them) and extending out to the Chatham and other NZ islands, so we have a good potential to spearhead ocean fertilization in vast economic zones on the ocean, contiguous with Antarctica, approved by the UN, utilising a local natural resource at low cost, and hopefully with the help of other nations.

NZ is a debtor nation in Kyoto Protocol terms due to half of its greenhouse gas emissions being methane from farm animals. When this bad news was discovered, government realised that it had mistakenly joined the Kyoto Protocol in anticipation that NZ, as a small population country with copious forests, would be a Kyoto creditor but when the animal methane emissions are taken account of, we are a debtor to the extent of approximately a billion dollars. The governing political party initially decided to impose a "fart tax" on farmers' animals but had to withdraw this in the interest of staying in government by not alienating the farmers who provide a major aspect of our economy.

Accordingly there is much political interest in supporting iron fertilisation and making our ports and iron derivatives available to those countries or companies that wish to participate in such endeavours, as a major contribution toward our greenhouse gas obligations.

The Kyoto Protocol Articles are so structured as to provide credits for member countries' greenhouse gas improvements on their land rather than beyond their coastlines in economic zones or territorial waters, but "joint implementations" between two or more countries can be approved and such would include efforts on the oceans. The sequestration of CO₂ can be assessed as being effective on average over a period of years and this is the philosophy applied to trees, some of which get blown over in early life, some milled at 20-30 years and others live on for centuries. On a similar basis we have applied to SGS one of the main Kyoto certifiers (Mark Trexler of Ecoscurities is aware of them) to make a submission to the Supervisory Committee, once further pilot trials have added more data to ocean sequestration, that such should also be credited based on a period of years in that some plankton will carry carbon down to the deep ocean on their demise and it will remain there for centuries, others will be eaten by fish, etc., and a time frame could be established on average which could also be a subject for discussion at the Symposium. Clearly the potential to get carbon credits in due course will be an incentive for financial participation by venture capitalists, government agencies, shipping companies etc., to participate in the early work in anticipation of downstream financial benefits. The "joint implementation" aspects fit nicely into the use of a range of equipment, resources, scientists and vessels from multiple countries already sailing in Antarctic waters.

In the same way as litigation lawyers love court cases and pre-paid fees, scientists are enamoured of ongoing research and funding. At a recent Forum at the MacDiarmid Institute of Renewable Energy at the China Three Gorges University, a popular expression amongst the attending scientists from many countries was "Innovation without funding is hallucination". The Chinese government has funded that Institute generously and certainly an autocratic government can get things done in the grand manner including building the world's tallest dam at Three Gorges and resettling hundreds of thousands of farmers, with a further 4 million (the whole population of NZ) to be resettled as further dams are built down the Yangtze. That government's US\$ reserves in 4 years have grown from US\$125 billion to US\$956 billion, and it is well capable through the State Ocean Administration of funding increasing scientific activity in ships such as the Xue Long (the largest vessel regularly sailing in Antarctic waters) which supply China's three bases in Antarctica. The Chinese government is a much better bet for financing further development work on iron fertilization in the southern ocean, than the NZ government and fortunately we have a very good working relationship with China including the pending free trade agreement reputed to be the first between China and an OECD country. We would be delighted to have Chinese ships calling at our ports and exporting iron derivatives. Accordingly, as a confrontational lawyer and not a cautious scientist, I throw down the gauntlet to the members of the scientific community participating in the Symposium and invite them to agree with the MacDiarmid view, that if iron fertilisation is such an unknown potential problem (despite previous voyages confirming plankton growth, and being somewhat supportive of the Dr Michael Markels' philosophy relating to CO₂ sequestration, massive increases in fish stocks and 800,000 new fish related jobs on the west coast of the US) in the southern ocean, why are the multiple thousands of square kilometres of the continental shelf off the west coast of the North Island of New Zealand which abound with plankton, fish, and other marine flora and fauna, over a seabed that is up to 48% Fe₂O₃, not suffering toxic blooms, oxygen depletion, suffocation, nutrient depletion, acidification and other gloom and despondency as postulated in some of the literature (including the IMO statement of 13 July 2007) on the subject of adding iron to the ocean?

In the NZ context, adding iron to the ocean in massive quantities is old art, proven as being OK over the centuries, and not recently introduced to the sea by avaricious businessmen thoughtless of "downstream" consequences, in amounts that would be fractional to that already existing. Further, there is copious bottom trawling in the fish rich Taranaki seas by fishing fleets that stir up the ironsand on the seabed which would likely create turbidity in the water similar to particulate iron fertilisation

I can assure the IMO that the team of scientists investigating the extent of the iron sands deposits whilst at sea and obtaining hundreds of grab and vibracoring samples, utilising drop video cameras, trawls on the seabed, collecting biota etc, carried out in the past year, did not report on "negative impacts on the marine environment and human health" (IMO report 13 July 2007) from an iron infested seabed off the coast of the province of Taranaki in New Zealand, and from frequent contact with those scientists since that expedition I can confirm they remain in perfect health, as do the ship's crew and the freighting and analysing personnel who handle the iron sands frequently.

Further, I have heard no complaints from environmentalists or BHP personnel handling ironsands below sea level in a marine estuary where that company has been dredging iron sands for more than 2 decades.

There are those coarse commercialists who say the reason some scientists perpetuate uncertainty is that having already enjoyed multiple millions of dollars of funding from governments, foundations and similar agencies over the past 20 years, they have a selfish interest in wanting more funds for personal or institutional support rather than looking at the most economical method of building more data by using extended voyages of "ships of convenience" such as those listed in the attachment with support from many countries, onboard scientists, subsequent monitoring on return journeys from servicing Antarctic bases, and in the longer term by remote surveillance via satellite imaging, Argo floats and similar remote submersible devices, which are becoming progressively more sophisticated, and capable of satellite connectivity.

As Rio Tinto and Iron Ore New Zealand Ltd are keen to be eco friendly, they have assisted independent scientists to carry out marine flora and fauna surveys to hopefully demonstrate that the removal of the iron sands by strip dredging will not adversely affect the marine environment and a page from the report prepared by an independent scientific agency for the Taranaki Regional Council that is charged with the duty of protecting the coastal marine environment, not from iron addition, but from the reverse - iron removal - is attached. The marine consulting and research scientific team that carried out the environmental survey are available for further work if required. Certainly there are those environmental agencies in this case that are concerned about potential damage to the marine environment by iron removal so they must surely be supportive of the reverse phenomenon - iron fertilisation of the southern ocean!!

Alan MacDiarmid suggested that a good move, with a view to attracting the support of governments, foundations, other agencies, shipping companies, and experts that could contribute in varying ways would be to form a non-profit foundation or institute. Accordingly the International Co-operative Environmental Society (ICE) has been formed as a non-profit entity. There are no initial or ongoing costs to those participating and they have no liability either as individuals, institutions or corporates. An application form can be requested for those interested to print out, sign and return. We will arrange existing members to propose such new members in accordance with the Rules which are available at any time. We invite any interested members of the Symposium to apply for positions on the managing Committee.

We formed a similar non profit entity 20 years ago, the Communications Institute, which became approved by the most prestigious scientific entity in the British Commonwealth, The Royal Society, as a tax exempt Institute, and this has played a prominent part in our worldwide satellite services mainly uplinked from the largest teleport in Southern California, the PacAmTel Teleport which distributed data (particularly distance learning and satellite surveillance) voice and video to many countries before being sold to Intelsat. Currently we operate a worldwide Voice Over Internet Protocol service (VoIP) so can keep in touch with our overseas scientific and other associates at little or no cost.

I would welcome any feedback on the above topics from those participating in the Symposium so that something I have not seen taken into account to date, namely the presence of massive areas of iron sands on the seabed of one of the most productive fishing areas of New Zealand without adverse results, can be considered in depth, both before and at the upcoming meeting.

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