

**Hon. Phillip Paulwell**  
**Minister of Science, Technology, Energy and Mining**  
**Statement to Parliament on Rare Earth Elements**

Mr. Speaker, we have been presented with an opportunity in our mining sector, and today I would like to share with the Parliament and the Jamaican people some details of that opportunity.

Background

Mr. Speaker, red mud has always been both a major challenge and area of interest in the bauxite/alumina industry in Jamaica. The first area of interest is in the alumina refinery itself, where the efficient recovery of alumina from the bauxite is paramount, but an efficient system for red mud disposal is also very important for the success of the refinery, as well as to ensure the integrity of the environment. To this end, Jamaica can proudly boast that we led the way in developing the now famous dry stack mud disposal system, which was developed at the Ewarton plant in St. Catherine. This system is now used all over the world.

Much attention is still given to the engineering designs and management of the red mud disposal facilities, and we boast state-of-the-art systems, such as at Jamalco and at Ewarton, which are safe and efficient.

The next area of interest for a long time has been the extraction of the elements or minerals which are found in the red mud, and in the past, efforts in this regard have focussed on the iron content, titanium and the silicates.

Many may be aware of the very early attempts led by the late Robert Lightbourne to have the iron content extracted, but unfortunately a commercial venture was not achieved.

During the 1980s and '90s the Jamaica Bauxite Institute, in conjunction with the University of the West Indies and UNIDO, worked on several projects to utilize red mud. One project looked into the use of red mud as a building material, and this reached the stage of constructing pilot buildings. However, the commercial aspect was difficult when competing with abundant limestones in Jamaica.

Serious work was also done in characterizing and attempting to extract rare earth minerals from our red mud. We faced major challenges in having the type of equipment which would be ideal, but still did meaningful scientific work.

Mr. Speaker, we continued to work with parties who tried to extract titanium for the high-priced metal, with companies looking at producing pig iron from red mud for the steel industry, as well as the use of red mud to make products for waste water treatment. There was limited success in the use of dried red mud as a pozzolonic additive for the production of cement, which was used by Carib Cement Company for a short time.

In January 2012, a Japanese company with the technology to extract rare earth elements approached the GOJ with a research request. Today Mr. Speaker, I am pleased to announce that that research has confirmed high concentrations of rare earth elements in Jamaica's red mud.

### About Rare Earth Elements

Rare earth elements or lanthanides, Mr. Speaker, are extremely valuable elements which require advanced technology for their extraction so as to realise their commercial value. There are 17 elements which make up these rare earth elements, including Scandium, Cerium and Dysprosium, to name a few.

History has shown that traditionally, rare earth elements were not in high demand, and that the rare earth elements that were supplied to the international market emanated from China at a very low cost. In recent times, the demand for rare earth elements has grown exponentially, owing predominantly to advances in modern technology and the rare earth elements becoming a key component of those advances.

Today, several industries are critically dependent on the supply and availability of rare earth elements, chief among them the electronics and ICT industries. Typically, rare earth elements are key components of: computers; Liquid Crystal Displays (LCDs) and Cathode Ray Tube (CRT) monitors; hybrid automobiles; wind power turbines; magnets; television sets; energy efficient light bulbs; sensors; GPS technologies; CD and DVD drives; digital cameras; most optic lenses; most communication devices, as well as satellites.

Interestingly, the energy efficient rechargeable batteries that are utilised in cellular phones, portable computers, hybrid cars and every other electronic device that does not remain plugged into the wall to be operational, are entirely dependent on the sustained availability of rare earth elements.

Mr. Speaker, advanced technology is required for the extraction of rare earth elements from bauxite residue. Therefore when Nippon Light Metal Company, Ltd. approached the JBI to assess the viability of using their patented advanced proprietary technology to realise rare earth elements from bauxite residues, the Government of Jamaica (GOJ) became acutely aware of the potential opportunity that this prospect presented.

### Nippon Light Metals MOU and pilot project

Nippon Light Metal Company, Ltd. is a publicly traded aluminium supplier headquartered in Tokyo, Japan, with annual revenues of over \$7 billion US dollars and over 10,000 employees.

Since approaching the GOJ, Nippon Light Metal has done basic chemical research analysis including the extraction of some rare earth elements. Having done that analysis, the company has established that Jamaica's red mud has significant concentrations of rare earth elements, particularly in comparison to other areas, and that those elements can be extracted efficiently.

In September, 2012, Nippon Light Metal entered into a Memorandum of Understanding (MOU) with the JBI for the establishment of a pilot project to determine the scope of the commercial project. Nippon Light Metal's ultimate objective is to extract some 1,500 metric tons per annum.

### Value of the opportunity

The concentration of rare earth elements in minable quantities around the world is unusual, and the concentration of rare earth elements found in Jamaica red mud deposits are significantly greater than what is known about other red mud sites around the world.

**Rare earth oxides, the commodity that will be extracted, are currently being traded at rates up to \$3,500 US dollars per kilogram. Mr Speaker, when we compare that to alumina, which is now being traded at \$330 US dollars per tonne, it is clear that this resource presents an opportunity Jamaica must pursue, and which must be managed in such a way that Jamaica and Jamaicans benefit significantly.**

At this juncture, Mr. Speaker, I would like to remind members of this Honourable House that the Crown Property (Vesting) Act stipulates that any minerals found in Jamaica are owned by the Crown, and to note that licenses granted to bauxite/alumina companies are specifically to the extraction of bauxite ore only.

### Environmental Impact

Mr. Speaker, I'd like to point out here, that more than any income to be earned, the true value of this opportunity is the chance to preserve and protect that which is priceless, and that is Jamaica's natural heritage.

As I mentioned earlier, the disposal of red mud residue from bauxite / alumina production has always posed an environmental challenge, but this project offers us a unique opportunity to utilise that waste in a productive manner.

We are aware that like many important technologies, rare earth elements resource development may have environmental implications that must be identified and managed. The pilot plant study will seek to specifically map the potential impact on land, water and air and the effect of neutralizing the by-products of rare earth elements extraction. I have today been advised that the pilot project has been approved by the National Environment and Planning Agency (NEPA), and is awaiting final approvals from other regulatory agencies.

At this embryonic stage, the MOU ensures that Nippon Light Metal will assume full responsibility for the management and disposal of any waste from the pilot project.

#### Commercial arrangements

The total amount to be invested in buildings and equipment for the pilot project plant is \$3 million US dollars, to be funded completely by Nippon Light Metal, who will also be responsible for the operating costs. A number of Jamaican engineers and other workers will be employed on this project, and Jamaica will benefit from the transfer of knowledge.

Most significantly, the results of the pilot project shall be beneficially owned in equal parts by the JBI and Nippon Light Metal. Further, any rare earth elements produced at the pilot plant will be jointly owned by the GOJ and Nippon Light Metal. During this phase of the pilot, we will commence negotiations for the full commercialization of this project.

This development has had the active involvement of the Government of Japan through its Embassy in Jamaica and its Ministry of Economy, Trade and Industry. Both the Government of Jamaica and the Government of Japan are fully behind this project. Mr. Speaker, I would like to say a special word of thanks to the representatives of the Government of Japan present in Gordon House today, and also to their colleagues in Japan, with whom I met in September last year when I travelled to meetings with the then Minister of Economy, Trade and Industry.

## Conclusion

Mr. Speaker, we are at the starting line of an opportunity that has the potential to redefine Jamaica's economic prospects in a positive way. We anticipate that as technology emerges and develops the number of applications that will require inputs of rare earth elements will increase significantly. Already, internationally, demand for rare earth elements exceeds the supply. Therefore, the Government of Jamaica perceives the extraction of the rare earth elements that are present in Jamaica, to be an exciting new opportunity to earn much needed foreign exchange and create jobs.

