Persatuan Pengguna Pulau Pinang
Consumers Association of Penang
槟城消费人协会 பினாங்கு பயனீட்டாளர் சங்கம்

Websites:
www.consumer.org.my

10 Jalan Masjid Negeri, 11600 Pulau Pinang, Malaysia
Tel: 604-8299511 Fax: 604-8298109
email: consumerofpenang@gmail.com

Letter to Editor **31 May 2019**

Lynas must remove its radioactive wastes from Malaysia

The Consumers' Association of Penang (CAP) and Sahabat Alam Malaysia (SAM) refer to Lynas's announcement in the press (the Sun, May 29, 2019) by Professor Dr. Ismail Bahari, the General Manager of Lynas in charge of radiation safety and compliance that its wastes can be used as a fertiliser or soil conditioner (Condisoil). He said that the Water Leach Purification (WLP) 'residue' contains a very low level of radioactive material, equivalent to natural occurring levels. Hence, the waste produced need not go to waste and can provide the agriculture sector an alternative supply of nutrients essential for plants.

In February 2015, the Department of Environment approved Lynas's proposal to construct a landfill within its premises to store its Neutralisation Underflow (NUF) waste which had been classified as scheduled waste. This approval required Lynas to submit an EIA to the DOE which it did on 15 February 2019.

NUF is historically categorised as radioactive waste materials under AELB. However, the Atomic Energy Licensing (Radioactive Waste Management) Regulations 2011 on P.U. (A) 274 gazetted on 16 August 2011 conveniently created new provisions which allowed the reuse and recycling of radioactive materials.

This in effect gave a licensee carte blanche to manage radioactive wastes upon approval from the AELB. The P. U. (A) 274 regulations do not clearly set limits or standards for exemption of radioactive wastes based on radiation exposure that is allowed for individuals unlike the International Atomic Energy Agency's General Safety Guide (IAEA-GSG).

AELB has arbitrarily set its own safety standards for radiation exposure which are not according to the international standard. The AELB standards have been used to exempt and clear Lynas's radioactive wastes for reuse and recycling. This would endanger public health.

Lynas' Radioactive Waste Management Plan (RWMP) labels its radioactive wastes as 'residues' as it was planning to commercialise them and conveniently cites the P.U. (A) 274 of 2011. Since P. U. (A) 274 regulations allowed radioactive wastes to be used and recycled, Lynas had taken advantage of this clause to declare that its radioactive wastes are harmless and safe. This had enabled Lynas to submit its RWMP and claim to have fulfilled the AELB's conditions.

The controversial regulations were used to render radioactive wastes as non-radioactive. It legitimised what Lynas is doing and the AELB is a party to this.

The RWMP (Dec 2011) had foreseen the possibility that the Flue Gas Desulphurisation (FGD) and NUF radioactive wastes will be exempted from AELB regulation and be treated as classified scheduled wastes under the purview of the Environmental Quality Act 1974 which will be enforced by the DOE. This came to fruition when an application by Lynas in July 2013 resulted in AELB releasing the NUF from its control as Lynas was said to have duly complied with the requirements of the AELB and DOE.

However, the DOE Scheduled Wastes list has no category for the kind of wastes that Lynas is producing i.e. radioactive wastes containing uranium and thorium. **Due to the omission of radioactive contaminants in the DOE regulations, the operating licence does not require any monitoring or discharge limits for them. This**

is a major loophole used by Lynas and could lead to serious pollution and health hazards without any legal responsibility to be borne by the company.

As stated earlier, Lynas suggested its LAMP site as a Prescribed Premise. The DOE's approval of this was a monumental blunder.

Since 2015, Lynas has been funding research to recycle its wastes, which involves both the WLP (Water Leach Purification) and NUF. Lynas had diluted and dispersed NUF and WLP wastes as Condisoil. So far Condisoil has been experimentally used in soils for planting padi, in corn, kenaf, coconut and oil palm among others.

No studies have been done on the long-term effects of Condisoil fertilisers or conditioners on the soil and its impact on rice toxicity (plants can accumulate toxicity in its roots, leaves and seeds). No experiments have been carried out to the stage where the padi plants produce rice, on yields, and on toxicity of the rice produced. Neither have studies been conducted on the effects on animals or people who consume the rice, even though more than 7000 ha of padi lands are involved.

Moreover, the Executive Committee Report (ECR) to the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) revealed that the DOE had rejected Lynas' application to conduct large-scale studies for kenaf and grain corn with NUF and Condisoil as the application of the latter in the study showed among others an increase: in heavy metals after the use of Condisoil; chromium concentration exceeds limits; and the concentration of heavy metals during growth increased after Condisoil use (page 87, ECR).

The ECR noted that LAMP had been actually 'diluting and dispersing' WLP as its waste management plan (page 32 (66)). Please note that WLP wastes contain 5.91 Bq/g of Thorium (Th-232) and 0.23 Bq/g of Uranium (U-238). Th-232 has a half-life of 14 billion years. These are ultra-hazardous radioactive wastes which need to be regulated. The manner in which Lynas has managed its wastes would be illegal and unacceptable in any other country.

In the Executive Summary of the EIA, Lynas states that it has 'proven by water and groundwater records from Lynas where no non-compliance or significant exceedances were experienced within 6 years'. This is misleading as demonstrated below.

In fact the ECR noted that 'the main cause of sediment pollution in Sg. Balok was from the LAMP operation which included the process of transporting lanthanide concentrate from Kuantan Port to the operational site, the storage of the raw materials at the site and from the NUF and WLP storage sites within the boundary of the operating site' (page 78(a)).

Citing the RIA Report (2016), the ECR states 'there is a statistically significant increase in U238 radioactivity from the stream sediments at the location of LAMP effluent dumps as compared to the downstream location' (pg 68 to 69).

The Executive Committee also found that 'non-compliance with some heavy metals (nickel, lead, chromium and mercury) in groundwater was particularly alarming for the parameters of nickel and chromium (page 80).

Heavy metals which are carcinogens have been found in groundwater and river sediments. In light of this, and of the increase in heavy metals after the use of Condisoil mentioned earlier, Lynas's assertion that there were no cases of non-compliance or significant exceedances in operations is absolutely misleading.

The NUF wastes as at February 2018 were 1.2 million tonnes. In the Lynas Executive Summary of the EIA, Lynas states that it 'has sufficient space to store up to 10 years-worth of the NUF produced … the storage of NUF in a secure landfill is only a temporary measure pending commercialisation'. The Thorium and Uranium will be more concentrated in the wastes after the rare earths have been removed. There are two isotopes of Thorium: Thorium 232 which decays through Radium 228 to Ac228 (actinium) to Thorium 228 (half life of 3.66 days) to radium, radon gas and radioactive forms of lead bismuth and polonium until it finally becomes stable lead. All of these decay products are toxic to humans and all are in the waste – not just the Thorium because parts of the thorium waste are at different stages of decay. Lynas's EIA is reporting the part that is thorium 232 or 239 at the time it arrives in Gebeng, Kuantan and *not the part of the ore that is radioactive*. (Personal communication, Dr. Rosalie Bertell, 5 May 2011).

Considering that the concentration of rare earths is unknown in the lanthanide ores, before it is processed, the amount of thorium in the waste is unclear or unknown. The amount of thorium in the waste, plus all of the decay

products of that thorium, plus their decay products will depend on how long it has been around in the mine-site in Mt. Weld, Western Australia and further, is then sitting around in the environment in Gebeng, Kuantan.

Any ore containing thorium and uranium will also have 36 daughter elements. All of them, except lead are radioactive. The most dangerous ones are the radium elements. In an undisturbed ore, the entire elements in the decay chain stick together, as in a family. The family gets broken during milling and processing. At the end of the process, they will be located in two different waste streams – one predominantly thorium-uranium and the other predominantly radium and lead isotopes. The radium elements need stronger containment and will have to be kept in isolation from the environment for a minimum of 200 years.

There are three streams of wastes in LAMP. The bulk waste contains gypsum, magnesium hydroxide and silica which should be disposed in the normal way with regard to the pH and concentration of non-radioactive heavy metals. The second stream is thorium-uranium and the third stream is radium-mesothorium. The AELB has lumped all the three streams together. These different streams are created in different processes and have to be seen as different entities. If this is done, radioactivity of the cakes (solid wastes) will be far above the regulatory limit anywhere in the world according to Dr. V. T. Padmanabhan in his submission in CAP-SAM Written Submission on Lynas to MOSTI-AELB on 29 October 2012.

Hence, Lynas is not dealing with pure thorium but with radioactive material with a long list of radioactive decay products some of which are very radioactive.

Moreover, the HIA report 2016 cited by the ECR (p69 (xix)) has revealed that the WLP wastes currently has a radiation exposure of 14.4 mSv/year when the WLP radioactive wastes is uncovered and an exposure level of 14.1 mSv/year when the WLP is covered with the HDPE layer. The HDPE layer has been found to be highly ineffective. Apart from 'leaking radiation' it will be leaking contaminated radioactive leachate into the ground water. The potential for the radioactive dust particles to be airborne and inhaled and ingested by workers and the public is of great concern. **This is most alarming and scandalous and Lynas has not even identified let alone prepared a plan for the Permanent Disposal Facility (PDF). Its 'worst case scenario' may result in the radioactive wastes being stuck at the LAMP site which will become the de facto PDF, presenting the Government of Malaysia and the people of Kuantan with a *fait accompli*.**

Instead, what we have seen is that these highly radioactive and toxic wastes have been diluted and dispersed on prime agriculture land and Lynas has mixed WLP radioactive wastes in Condisoil which one study has shown to have a natural radionuclide concentration as high as 7.584 Bq/g , compared to Malaysia soil's natural background (page 88, ECR).

Unfortunately, the NUF and the WLP radioactive wastes have become 'interchangable' with Condisoil and used on thousands of hectares of padi land. Where these rice crops end up to be consumed is unknown. Both the NUF and the WLP wastes are highly hazardous to the environment and human health. Lynas's non-compliance in its operations has seen heavy metal contamination in ground water and river sediments and Condisoil. The dangerous and blatant manner in which the WLP radioactive wastes have been managed as revealed in the HIA Report 2016, is cause for utmost disquiet. Despite these serious infringements, Lynas has not been penalised or taken to task. It has been treated with kid gloves.

From the time Lynas began its operations in Gebeng, Kuantan in 2012 it had no intention of sending its radioactive wastes anywhere or building a Permanent Disposal Facility. This was despite having twice made the commitment to the Government of Malaysia to remove the wastes from Malaysia.

Every state has the right to protect its national sovereignty. The lands, natural resources, groundwater, lakes, rivers, fisheries, forests, and territorial seas within its territorial domain is part and parcel of its national integrity and sovereignty. Thus, every country can make its own national rules. This concept is universally recognised in international law.

We have seen how Lynas by not sticking to the original conditions agreed upon with the Malaysian government, fails to honour its promises. It has been wriggling its way out of stated obligations. Despite shifting the goal posts to suit its interests, and meanwhile Malaysia has been very generous and taken into consideration the numerous requests from Lynas and tried its best to allow Lynas to operate its LAMP.

In 2012, when LAMP started, Lynas had given an undertaking to remove its wastes out of Malaysia as a condition to start operations. Then it refused to do that and wanted a Prescribed Premise created on its LAMP site. The DOE bent over backwards to accommodate Lynas and approved their request. Lynas was given the go ahead

to prepare the EIA for its own Prescribed facility to store the scheduled wastes. It did not want to get rid of its scheduled wastes in Malaysia in Government Prescribed Premises. It got its way again.

However, when it was given the green light, Lynas took its time and was very late by several years in submitting the EIA for LAMP as a Prescribed Premise. It was hoping to create time pressure on the government to approve the EIA. The EIA of LAMP Prescribed Premise has a capacity to hold wastes for only a maximum of ten years or less. This is based on Lynas's flawed assumption that Condisoil will be approved.

Therefore,

> CAP-SAM calls on MESTECC and the Government to not approve Condisoil, especially in the absence of long-term studies.

> CAP-SAM calls on MESTECC and the Government to ensure that all current and future radioactive wastes are taken out from Malaysia, to the country of origin.

Lynas does not want to get rid of the radioactive wastes (which were generously and conveniently downgraded by the AELB from low radiation to Cleared Wastes category, which then falls under the DOE Scheduled Wastes list, which does not regulate radioactive wastes) in the government-approved external Prescribed Premises. Instead, Lynas wants to even gain more money by selling its wastes to Malaysian farmers as Condisoil and fertilisers, with unknown future health and environmental repercussions. These are not acceptable and must be stopped immediately.

The government has sovereign right to enact laws, standards, rules and conditions to protect her citizens, the environment, and the economy, now and in the future against environmental terrorism.

Mohideen Abdul Kader
Acting President
Consumers Association of Penang and

Meenakshi Raman
President
Sahabat Alam Malaysia