

Moving beyond compliance:

Coral Bay Nickel Corporation's Rehabilitation of Tailings Storage Facility 1

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When Coral Bay Nickel Mining Corporation (CBNC) decommissioned its 80-hectare Tailings Storage Facility 1 (TSF 1) in June 2010, there was not a slight idea on how the company would reclaim the barren, rocky dam slope filled with reddish-brown tailings appearing as a total eyesore on satellite images.

CBNC operates a Hydrometallurgical Processing Plant (HPP) in Rio Tuba, Bataraza, Palawan to produce nickel and cobalt sulfide from low grade nickel ores from Rio Tuba Nickel Mining Corporation through the application of high pressure acid-leach technology.



Tailings Storage Facility #1 (TSF1) built on a mined-out area in 2004.



2008: Embankment has been raised to the 68 MASL level and 3.7M DMT of tailings stored.

The embankment was raised to 68 meters above sea level and 3.7M dry metric tons (DMT) of tailings stored after five years of operation. Its slurry characteristic was suggestive of an unproductive substance incapable of growing any life-form.

In the heat of the anti-mining campaign in Palawan, the rehabilitation of the TSF 1 posed a huge

challenge for CBNC especially when the Mines and Geosciences Bureau (MGB) of the Department of Environment and Natural Resources (DENR), directly exercising control and supervision over all large scale mines, intensifies its implementation of the provisions

of the Mining Act and enhances its advocacy for responsible mining. The MGB Regional Office of MIMAROPA, in particular, as the agency having jurisdiction over mining in Palawan urged that rehabilitation of the area immediately commence.

CBNC's Environmental Manager Briccio Abela eventually came up with a design, yet with the area's physical condition, a year was devoted for land preparation.

Strategizing for an unviable to successful rehabilitation

In the rehabilitation design, Engr. Abela set four major objectives in undertaking the desired transformation of the decommissioned TSF1 - - **Physical Stability** or ensuring that the rehabilitated area will not cause siltation during wet season and dust propagation during dry season ; **Visual Acceptability** which aims at ultimately greening the whole area to eliminate the negative aesthetic impact; achieve **Productivity** through farm inputs and other technology that will develop the tailings soil into a productive agricultural land; and **Self-Sustainability** as the end-goal of the project recreating a functional ecosystem.

Despite their optimism, several challenges confronted the company during actual implementation and these were much about covering the whole area with nutrient-rich top soil so plants may grow. The task was almost impossible considering the soft and weak surface that could not hold heavy equipment and burrowing, yet in employing the following strategies, CBNC was ready to spread the green.



The barren and cracked dam surface

Reddish Brown Tailings to Green Productive and Functional Ecosystem

The rehabilitation process involved at least three stages namely, (1) covering of the tailings surface; (2) providing nutrients into the top soil; and (3) trial planting.

Besides laying of soil in the tailings surface, the first stage also included ascertaining the dam's physical stability by installing an effective decant system that will eliminate

potential overtopping; conduct of regular monitoring, soil drilling and testing until the surface became denser and ready for the next planting activities.

Much intervention was required in providing nourishment to the top soil. The surface was even fed with organic matter which decomposed in due time and served as available nutrients for plants. Waste rice hull was hauled and disposed into tailings surface cracks that were formed during tailings soil moisture evaporation, although only a small area was filled because of the huge volume required and the difficulty of hauling it to the middle portion of the tailings pond due to soft soil and surface cracks.

Possible formation of rain gullies within the dam was also eliminated through installation of coco-coir net and planting of grasses to totally cover the whole embankment slope surface.

Fertile and nutrient-rich soil planting media containing a mixture of top soil, vermicompost and carbonized rice hull was used. This soil media was placed in small (6-inch by 8-inch) plastic pots where the vines and grasses were grown for 3-4 weeks in sturdy condition prior to transplanting.



Carbonized rice hull was introduced to nourish plants

Species of vines, grasses and herbs such as *Brachiaria Humidicola*, *Stylosanthes seabrana*, *Centroema pubescens*, wild sugar cane (*Saccharum spontaneum*), napier grass (*Pennisetum purpurium*), banana and elephant ear (*Xanthosoma robustum*) were found after trial planting. Diverse other grasses and vines whose seeds or roots were naturally present in the soil used also sprouted and are growing naturally and now cover the tailings soil.



October 2012: TSF# 1 After 20 months of rehabilitation activities at the surface and slopes

The successful rehabilitation of TSF1 speaks beyond mere compliance of CBNC's commitment to protect and enhance their environment as evidenced by the 2014 Presidential Mineral Industry

Environmental Award for Mineral Processing category bagged by the company during the 61st Annual National Mine Safety and Environment Week held in November last year.

The PMIEA is the highest award given to deserving companies in various categories in mining in recognition to their outstanding levels of dedication, initiative and innovation in the pursuit of excellence in environmental mineral utilization. PMIEA awardees, thus, reflect a pro-people and pro-environment characteristics of the mining industry in sustaining wealth creation and improving the quality of life.

The transformation of TSF1 into a beautiful, productive, sustainable and functional ecosystem now leads Palawan mine's showcase of best practices that reflects not only mining businesses done responsibly, but even beyond what these companies are required to give back to the environment and the people.

