

Case Study

Project Title

Study of Pit Lakes and Post Mining Concept – PT Kideco Jaya Agung.

Project Snapshot

Client: PT Kideco Jaya Agung | **Location:** Paser Regency, East Kalimantan

Sector: Coal Mining | **Period / status:** 2024

Ganeca Services: Environmental Study to Provide an Overview of Post-Mining Conditions within the WUP Area.

Project Overview

A pit lake is one of the important elements in post-mining planning, particularly in coal mining operations with large and deep mine pits. The presence of a pit lake needs to be planned from an early stage to ensure that the final mining condition can be managed safely, sustainably, and with potential benefits for the surrounding area. Ganeca Environmental Services, together with PT Kideco Jaya Agung, conducted a study covering 10 pit lake areas and their surrounding areas to understand their hydrological characteristics, physical and geotechnical conditions, and utilization potential as part of the post-mining concept. The study was subsequently developed into several alternative programs that considered environmental, technical, socio-economic, and cultural aspects in an integrated manner.

The Challenge

Large and deep pit lakes have filling dynamics and final conditions that need to be properly understood before determining their potential uses. The time required for a pit lake to reach full capacity may also vary depending on the water sources and filling scenarios applied. In addition to hydrological aspects, changes in topography and slope resulting from mining activities also influence the final form and condition of the post-mining area. Therefore, the development of utilization concepts cannot be based solely on the presence of a water body, but must also consider morphology, geotechnical conditions, potential hazards, accessibility, as well as the socio-economic and cultural characteristics of the surrounding communities.

Our Solution

Ganeca developed the study by integrating hydrological analysis, physical site conditions, geotechnical aspects, and socio-economic and cultural considerations to develop a post-mining program concept that could be tailored to the characteristics of each area. From a hydrological perspective, hydrological system mapping and water balance analysis were conducted to understand the water balance and pit lake filling dynamics. Several filling scenarios were assessed, including the utilization of rainfall, river diversion, and water transfer between pit lakes. Each scenario was then analyzed to estimate the filling duration until the pit lake reached the planned condition for utilization. The study also included the identification of risks and potential hazards, changes in topography and slope, as well as an evaluation of morphological and geotechnical characteristics as a basis for determining potential post-mining uses. Socio-economic and cultural aspects were also considered to ensure that the developed concepts were not only technically and environmentally feasible, but also relevant to the needs of the area and surrounding communities. Based

on the overall analysis, Ganeca developed a post-mining program concept that directed the potential utilization of the area into three main focuses: nature conservation, agriculture, and tourism.

Results & Value

The study resulted in a mapping of post-mining utilization potential across 10 pit lake areas and their surrounding areas, with utilization alternatives tailored to the characteristics and extent of each area that could be accommodated. The hydrological and water balance analyses also provided a basis for understanding the filling scenarios and estimated duration required for the pit lakes to reach their planned conditions. The study findings provided a conceptual basis for PT Kideco Jaya Agung in developing a post-mining program that considers changes in topography and slope, environmental characteristics, risks, as well as socio-economic and cultural aspects. The resulting concept focused on three utilization areas nature conservation, agriculture, and tourism as an effort to develop a post-mining plan that is not only oriented toward land rehabilitation, but also toward long-term sustainability and increasing benefits for the surrounding area.

Project Photos



Related Services: [Research on Mine Environmental](#)