

PIT Design Area 206 Ha at PT Semen Padang Indarung

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ABSTRACT

PT. Semen Padang is a mining company engaged in quarry (limestone) mining. The company is located in Bukit Karang Putih – Indarung, Padang City. Mining in this company uses the Type Side Hill Quarry system. For production in the 206 Ha mining area using a combination of mechanical devices in the form of Excavators and Dump Trucks. With supporting tools in the form of a D9R Bulldozer and a GC-02 Motor Grader. The target of this activity is to optimize mining production in the 206 Ha pit area. Efforts were made to optimize mining production in the Exit Area and PIT Limit from 2014 – 2016 by combining Excavator and Dump Truck mechanical devices to the crusher loading area with a volume of 24,872,835 tons, 28,304,505 tons and 26,029,609 tons. Whereas in 2017 – 2020 only the PIT Limit area will carry out mining production, this is because the reserves in the Existing area have run out. PIT Limit production from 2017 – 2020 is 21,864,874 tons, 20,981,407 tons, 20,831,837 tons, and 20,662,775 tons.

Keywords: Produksi, PIT Limit, Eksisting, Indarung, PT Semen Padang.



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INTRODUCTION

Regional development in the era of regional autonomy has consequences for many aspects, including development and economic aspects. Infrastructure development which includes the construction of buildings, roads, bridges, and others, is one area of development that has received greater attention than several other fields. The mining sector is a type of resource that needs to be managed to improve people's welfare and strive to contribute to regional income (Irwandi, 2005). In the cement industry, limestone is an industrial mineral used as the main raw material.

PT. Semen Padang obtains its limestone raw materials for factory needs. The limestone was obtained from mining at the quarry mining site of PT. Semen Padang is located at Bukit Karang Putih – Indarung, Padang City. Limestone mining in quarry PT. Semen Padang is carried out by open pit mining with the Type Side Hill Quarry system. This system is an open pit mining system that is applied to mine industrial rock or mineral deposits located on hillsides or in the form of hills (Suwandhi, 2004). This method is applied when the entire hillside to be mined is carried out from the top down (Prodjosumarto, 1992). In general, every open pit mine carries out its mining using a benching system, namely a mining system in the form of tiers that divides the mining area into several fronts and working floors, where the stages of limestone mining activities include: pioneering, cleaning of the drilling area (dozing), drilling, blasting, loading, hauling, and crushing (Sumarya, 2010). The final stage of a mine planning design, in this

case, the production planning stage, is a stage to determine the order of mining after going through a previous planning process which involves several things including geometry, PIT Limits, and others. Therefore, to make it happen, careful planning is required by considering many important factors before mining is carried out.

METHODS

In researching this problem, the author combines theory with field data, so that from both of them a problem-solving approach is obtained. The research method used is a type of quantitative research. This research is more directed toward applied research, which is a type of research that aims to provide practical solutions to certain problems. Quantitative research methods can be interpreted as research methods based on the philosophy of positivism, then analyzed statistically. The interpretation of the results of the analysis is related to the data analysis that has been carried out so that the research conclusions are formulated as accepted or not.

RESULTS

The mining sequence plan is by the final mining pit design for the 206 Ha Area, as follows.

3.1 Mining Concept in 2014

1. Eksisting Area (206 Ha) : Mining production will be optimized in the Existing Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. With mining up to $\pm 280 - 270$ above sea level with a volume of 13,572,481 tons.
2. PIT Limit Area (206 Ha): Mining production will be optimized in the PIT Limit Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. Mining will be carried out up to the level of $\pm 485 - 480$ asl with a volume of 11,300,354 tons.

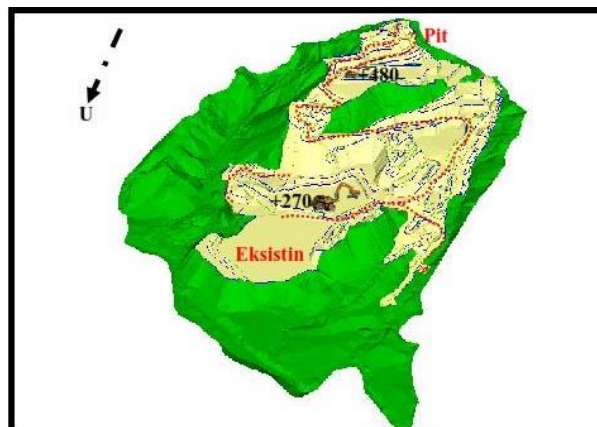


Figure 1. PIT Design in 2014

3.2 Mining Concept in 2015

1. Eksisting Area (206 Ha): Mining production will be optimized in the Existing Area to move material by a combination of Excavator and Dumptruck mechanical devices to the crusher loading area. Mining up to $\pm 270 - 260$ above sea level with a volume of 5,969,821 tons.
2. PIT LIMIT Area (206 Ha): Mining production will be optimized in the PIT Limit Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. Mining up to $\pm 480 - 470$ above sea level with a volume of 22,334,684 tons.



Figure 2. PIT Design in 2014

3.3 Mining Concept in 2016

1. Eksisting Area (206 Ha): Mining production will be optimized in the Existing Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. Existing production will be optimized up to an elevation of ± 250 asl with reserves until exhausted with a volume of 3,812,892 tons.
2. PIT Limit Area (206 Ha): Mining production will be optimized in the PIT Limit Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. Production from PIT Limit up to $\pm 470 - 460$ dpl with a volume of 22,216,717 tons.

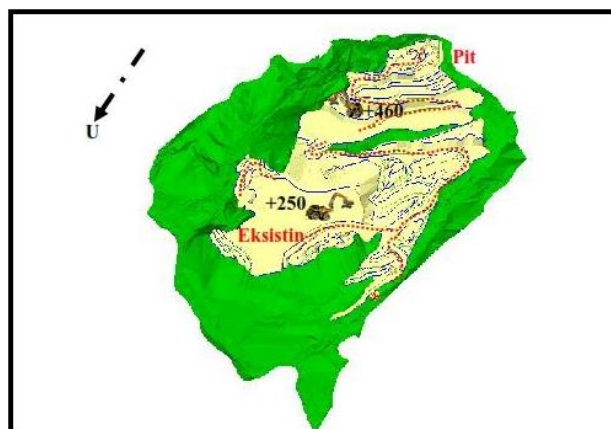


Figure 3. PIT Design in 2014

3.4 Mining Concept in 2017

Existing Area is no longer mined (Depleted Reserves). Mining production will be optimized in the PIT Limit Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. Production from PIT Limit upto $\pm 460 - 450$ above sea level with a volume of 21,864,874 tons.

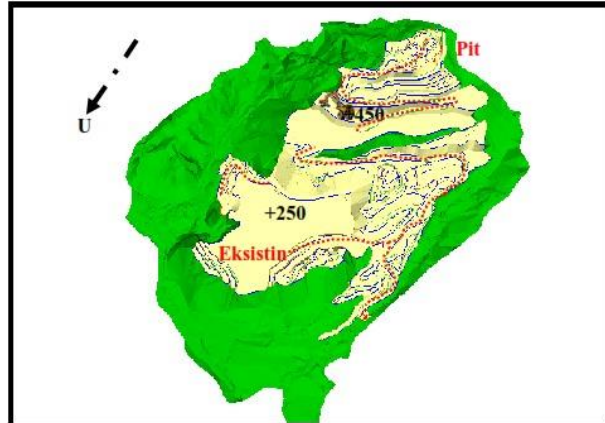


Figure 4. PIT Design in 2017

3.5 Mining Concept in 2018

Existing Area is no longer mined (Depleted Reserves). Mining production will be optimized in the PIT Limit Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. Production from PIT Limit up to $\pm 450 - 440$ asl with a volume of 20,981,407 tons.

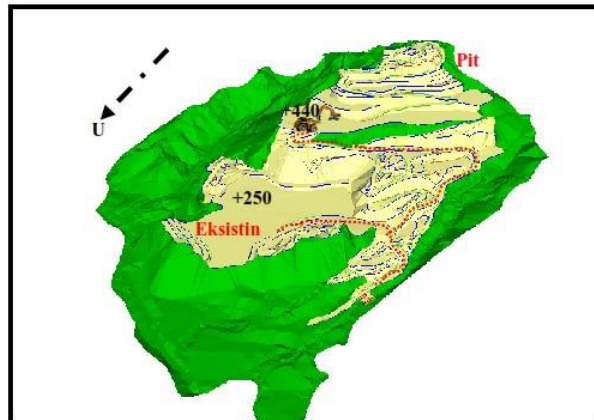


Figure 5. PIT Design in 2018

3.6 Mining Concept in 2019

Existing Area is no longer mined (Depleted Reserves). Mining production will be optimized in the PIT Limit Area to move material by a combination of Excavator and Dump truck mechanical devices to the crusher loading area. Production from PIT Limit up to $\pm 440 - 430$ asl with a volume of 20,831,837 tons.

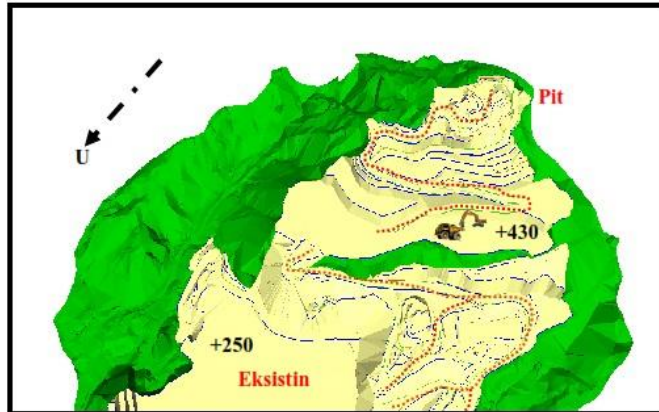


Figure 6. PIT Design in 2019

3.7 Mining Concept in 2020

Existing area is no longer mined (Exhausted Reserves) Mining production will be optimized in the PIT Limit Area to move material by a combination of *Excavator* and *Dump truck* mechanical devices to *the crusher loading area*. Production from PIT Limit up to $\pm 430 - 420$ asl with a volume of 20,662,775 tons.

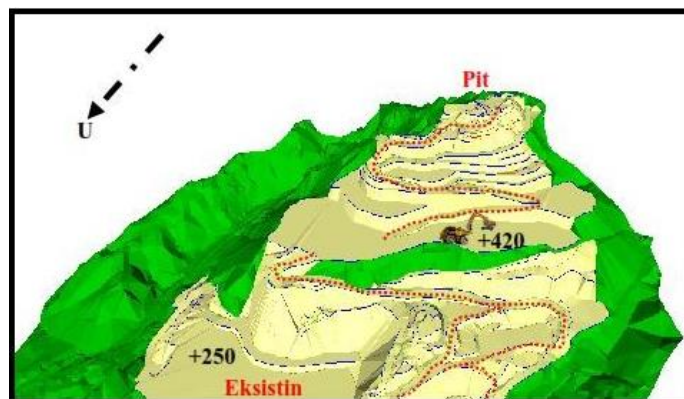


Figure 7. PIT Design in 2020

CONCLUSION

Following the Final Design PIT area of 206 ha, a term of 7 years with the condition of the Existing area from 2014 to 2016 reserves are exhausted, and the PIT Limit area from 2014 to 2020 reserves are exhausted. Using Excavators and Dump Trucks that have been calculated so that the expected production is achieved, the management of PT. Semen Padang takes this into account. Based on the discussion above, it can be suggested: 1) further monitoring is needed to determine the accuracy of the results of simulation calculations with the actual implementation in the field during and after mining operations are carried out annually by the management of PT. Semen Padang; 2) there is a need for intensive maintenance of mechanical devices so that the cause of the damage can be identified from the start, this is to anticipate more serious damage; and 3) it is necessary to carry out a more thorough hydrological research on the mining area to obtain accurate and thorough data as a basis for developing a good drainage system.

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