



# PT. NEWMONT MINAHASA RAYA

MENARA RAJAWALI 26<sup>TH</sup> FLOOR  
JL. MEGA KUNINGAN LOT # 5.1, KAWASAN MEGA  
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## The Gold Extraction Process

Mining gold has been done for thousands of years, in spite of the tough work conditions associated with traditional-style mining. Modern technology has created safer working conditions, safer and more efficient processes for extracting gold from ore, and has made possible land rehabilitation and reclamation.

Newmont employs the best practices in the industry and continues to develop ever-better methods of surveying and developing gold resources. This paper introduces the basic steps of the gold extraction process that was used at PT Newmont Minahasa Raya.

1. Large rocks are extracted from the ground. This is usually done through drilling, blasting, and loading the rock into trucks. The natural composition of these rocks consists of several minerals, including small amounts of cinnabar and arsenic sulfides. These minerals contain mercury and arsenic respectively, in naturally occurring and stable forms.
2. Rock containing economically recoverable quantities of gold (called ore) is brought to the plant, crushed, and ground until it is fine sand. Rock removed to access the ore that does not contain economically viable content of gold is placed in piles around the mine site and subsequently covered with soil for revegetation.
3. The ore is then roasted and put into a leach circuit, where it mixes with small quantities of cyanide and hydrated lime. This solution extracts the gold from the fine rock. The gold is recovered from the solution using activated carbon. This method of extraction does not use mercury.
4. The tailings, or residual waste, consists of two parts:
  - A solid part that is crushed fine rock.
  - A liquid part that contains traces of cyanide, arsenic and mercury, all elements that can be harmful to human at high concentrations, if discharged untreated.
5. The liquid part of the tailings is treated in three stages:
  - Cyanide destruction – Sulphur dioxide and air is passed through the liquid, converting the cyanide to harmless carbon dioxide and ammonia.
  - Arsenic precipitation – Iron sulfate is mixed into the solution and reacts to form stable ferrous arsenate, the same that occurs naturally in the environment.
  - Mercury – Precipitation of trace levels of dissolved mercury is treated by the addition of sodium sulfide to form the stable mineral mercury sulfide.
6. The tailings are pumped through a pipe that runs from the Minahasa plant across Buyat Bay to the ocean. The discharge takes place 82 meters under the sea level. The location was selected based upon a number of undersea geographical conditions that ensure tailings are contained in a small area at the entrance to Buyat Bay.

For further information, kindly contact us:  
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