



Open Pit Kimberlite Mining

Excavation of the pit into the kimberlite pipe using hydraulic shovels, ore trucks and explosives.

Tailings Deposit ▲

Tailings are residual material from the plant. Reprocessing the tailings material will recover further diamonds.

Open Pit Mining

Step open pit mining, used at the Williamson mine in Tanzania and the Ebenhaezer satellite pipe at Koffiefontein.



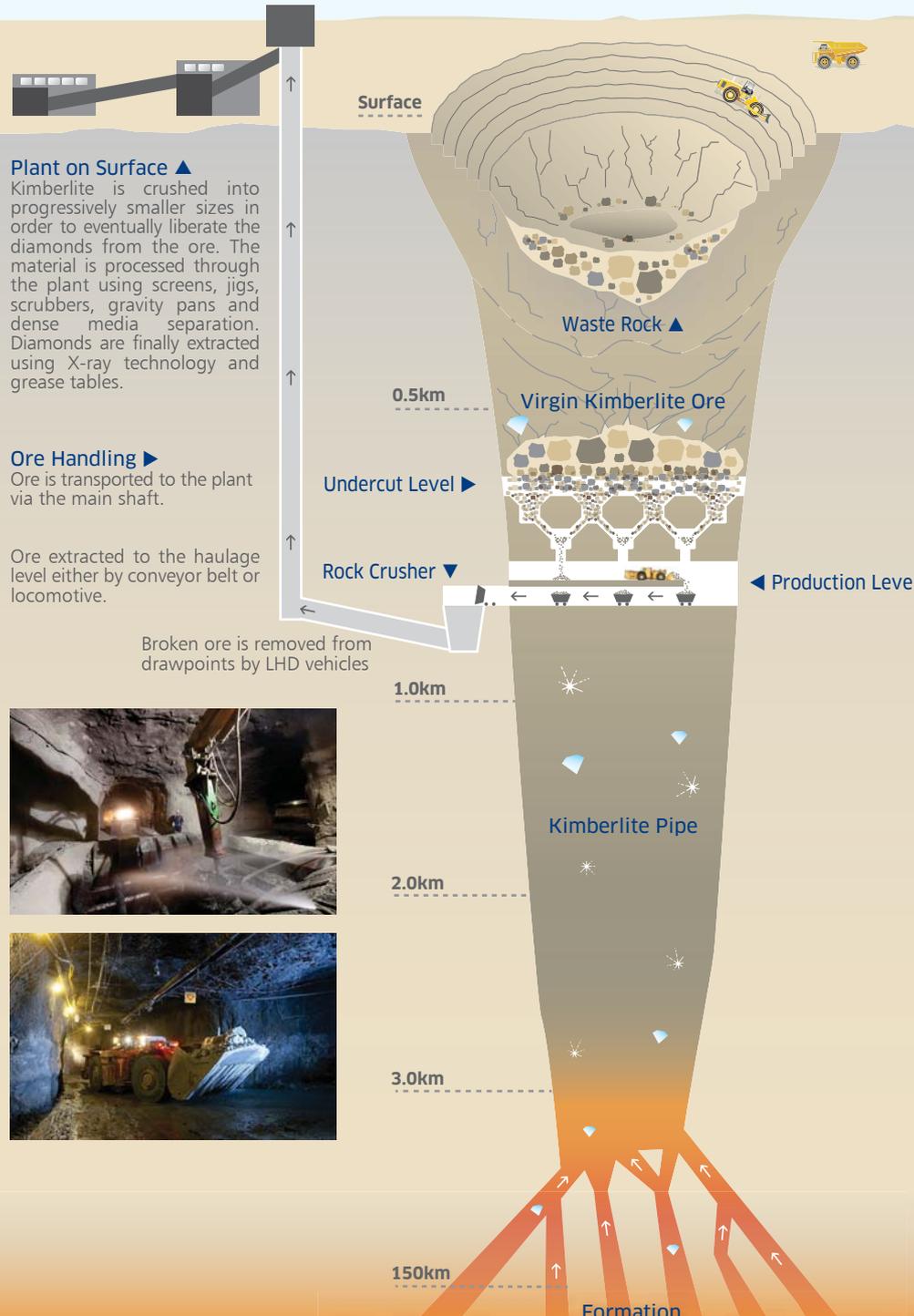
Underground Block Caving

This mining method is used at Petra's South African mines.



A 'block' of ore is undercut to initiate caving, whereby gravity is used to make ore 'cave' under its own weight. The undercut zone is drilled and blasted progressively and broken ore is drawn down to create a void into which initial caving of the overlying ore can take place.

As more broken ore is drawn progressively, the cave propagates upwards through the block until the overlying rock also caves and surface subsidence occurs. New levels of block caving can be constructed deeper into the pipe once an existing block of ore has been exhausted.



Plant on Surface ▲

Kimberlite is crushed into progressively smaller sizes in order to eventually liberate the diamonds from the ore. The material is processed through the plant using screens, jigs, scrubbers, gravity pans and dense media separation. Diamonds are finally extracted using X-ray technology and grease tables.

Ore Handling ►

Ore is transported to the plant via the main shaft.

Ore extracted to the haulage level either by conveyor belt or locomotive.

Broken ore is removed from drawpoints by LHD vehicles



Formation
Diamond formation occurred deep within the Earth's mantle billions of years ago. High temperature and pressure conditions resulted in the crystallisation of carbon into diamond. The diamonds were then carried to Earth's surface during rare volcanic eruptions of molten rock, which then cooled to form carrot shaped 'pipes' known as kimberlites.





PetraDiamonds

Diamond Value Chain

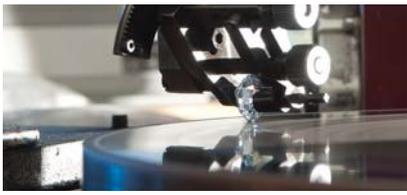


PetraDiamonds



Sorting and distribution

Once mined, rough diamonds are sorted by experts who assign them to parcels according to their shape, size, clarity and colour. Petra sells its rough diamond parcels by method of open tender, essentially an auction process which uses free competition to achieve the best price. Tenders last between four to six working days, during which participants view the assortments and place a confidential electronic bid on the parcel of their choice.



Cutting and polishing

The art of cutting and polishing of rough diamonds produces polished stones. This process always results in a dramatic loss of weight; rarely is it less than 50% of the original rough stone. After a diamond has been cut and polished it is classified again according to the 4Cs: Colour, Carat, Clarity and Cut. A diamond's value depends significantly upon the many variances of the 4Cs. The vast majority of diamond cutting and polishing takes place in India and increasingly in China.



Jewellery manufacturing and retail

For hundreds of years, diamonds have been given to celebrate important moments in people's lives such as engagements, weddings, anniversaries and births. Demand for diamonds continues to rise in both established and new markets. The fastest growing new consumer markets are China and India, both of which are recording double digit growth year on year. There is a positive long term outlook for the rough diamond market due to inherent production constraints which suggest that supply will struggle to keep pace with demand.

Petra's Diamonds

The mines within Petra's portfolio produce the full spectrum of diamonds, including fancy coloured diamonds, the rarest and often the most valuable. Cullinan is renowned as the world's only reliable source of blue diamonds, Williamson is known for its 'bubblegum pink' diamonds and Finsch and Kimberley Underground are known for fancy yellow diamonds.

Petra's mines have the capacity to produce world-class gems and Cullinan in particular is renowned as the source of large Type II diamonds. Petra has mined and sold several exceptional diamonds including the following:

The Cullinan Heritage



This 507 carat diamond was recovered on South Africa's 'Heritage Day' in 2009 at Cullinan and was quickly ascertained to be the nineteenth largest high quality gem diamond ever discovered. Petra sold this historic stone in February 2010 for US\$35.3 million, being the highest price on record for a rough diamond.

Blue Moon



This exceptional 29.6 carat blue diamond was discovered at Cullinan in January 2014 and was noted as an outstanding blue with extraordinary saturation, tone and clarity. It subsequently sold in February 2014 for US\$25.6 million (US\$862,780 per carat – possibly a world record per carat for a rough diamond) to Cora International NY through the South African company Golden Yellow Diamonds.

After cutting and polishing, the stone was unveiled as the 'Blue Moon', a 12 carat cushion-cut diamond of the highest quality – being 'fancy vivid' blue in colour and 'internally flawless' in clarity.