DIAMONDS IN THE LAKE

How do you create an open pit mine in the middle of a lake? I came across this image of Diavik Diamond Mine while perusing the internet and couldn’t help but do some brief research to answer this question. My first thoughts were of earthen dikes and coffer dams, eventually building up the surfaces on which your operations will take place. A less artistic version of the Dubai islands, yet more fantastic in the sense that there exists a giant hole in the center which descends hundreds of meters below the surface of the water.

The location of the mine was chosen after the discovery of three kimberlite pipes in the Yukon Territory of Canada (a region well known for these formations).

Kimberlite is a type of rock thought to be formed at great depth as part of a volcanic “feeder pipe”, essentially a conduit for magma to reach the surface.
Only, in the case of kimberlite, the magma cooled at depth under intense pressures. Pressures high enough to create diamonds from the carbon within the system. In this case, the kimberlite pipes are approximately 55 million years old and have intruded 2.7 billion year old, precambrian granites and metamorphic rocks.

So how did mining begin? As it turns out, I did miss an obvious starting point: a pre-existing island. However, I wasn’t too far off! The kimberlite pipes were located mostly offshore. In order to get to them, special rockfill dikes were constructed in as much as 32 meters (105 feet) of water. Each dike was constructed in a sort of loop, enclosing the area above the kimberlite pipes which would eventually become the open-pit mine.
Grout curtains were installed along their base to prevent the flow of water beneath the dikes and into the enclosed area. The first and largest dike used approximately 6 million tons of rock and was 3.9 km (2.4 miles) long. Following construction, the enclosed areas were drained and surface mining could begin.

What makes this mine even more interesting, at least to me, is that it’s nearly inaccessible. Due to it’s remote location 300 km Northeast of Yellowknife, in the Yukon Territory of Canada, there aren’t too many roads. On top of that, there’s nothing between the island and shore but water, unless you count the ice during the winter season…which is, as it so happens, regularly used as the diamond mine’s bridge. Luckily, winter is not the only time product can be sent out, as the island is large enough to support an airport capable of supporting 747 jets.
Winter at Diavik Diamond Mine

Diavik’s surface mining days are now over, as it has transitioned to the even more complicated method of underground mining. However, the extraordinary manner in which they first developed the mine, and the sight of it today, leave it high on my list of awesome achievements.

Source: http://adventuresingeology.com/2012/02/24/diamonds-in-the-lake/