

NorthConnex Tunnelling Project Spoil to Fill the Old Hornsby Quarry

The New South Wales (NSW) Department of Planning in January approved the Hornsby Quarry Road Construction Spoil Management Project. The approval allows up to 1.5 million cubic meters of excavated natural material to partially fill an old quarry in Hornsby, NSW. Hornsby is located about 21km north of Sydney, Australia.

The fill material will come from the NorthConnex project, a planned 9km twin-tunnel motorway. The tunnel will connect the M1 Motorway at Wahroonga to the M2 Motorway at West Pennant Hills.

Transurban will operate the completed underground motorway. The new tunnel is expected to eliminate 5,000 trucks per day from Pennant Hills Road. By removing a painfully slow section of stop lights, the tunnel will create a 1000km non-stop travel way between Melbourne and Newcastle.

Lend Lease / Bouygues Construction joint venture is contracted to design and construct NorthConnex for a cost of about 2.9 billion.

Each hour up to 35 trucks loaded with sandstone and shale rock from the NorthConnex tunnelling will dump their load at the old quarry. The process will continue over about 30 months.

Trucks can begin transporting spoil once environmental management plans for the project are approved by the NSW Department of Planning. The plans govern how the project will address construction impacts to the community and environment. Potential impacts of concern include: stormwater runoff, noise and vibration, dust, traffic, and Aboriginal and European heritage.

Other locations considered for spoil disposal were considered. However, they were much farther away than the quarry. Using the nearby Hornsby quarry for the excavated rock and dirt reduces the overall transportation distance by around 3.7 million kilometres. That means less fuel burned. Therefore less CO2 will be emitted compared to using more distant locations.

Here's how the process will work: Conveyor shafts remove the rock from the NorthConnex tunnel. Loaded trucks transport the material through the suburb of Hornsby. Material is dumped into stockpiles near the edge of the quarry hole. Another conveyor system extends out above the quarry hole. A suspended conveyor drops the material to the quarry base. Dozers then spread and compact the loose rock over the quarry floor.

The sides of the quarry are considered unstable in several areas. Safety will be paramount during the work. In case of rockfalls along the sidewalls of the quarry, an exclusion zone will be set up along the quarry base perimeter. All construction equipment working within the quarry will be fitted with roll-over and falling-object protection systems. Stability inspections of the quarry walls will be made regularly and after significant rainfall.

Filling the quarry forms one of the first steps of a Master Plan developed by Hornsby Council. The plan encompasses 45 hectares of land including the old quarry as a planned recreation destination. Released in September 2015, the plan establishes goals, strategies and outcomes to guide future development. The plan includes: a natural amphitheater in the quarry, use of an old crusher plant as a community centre, a lake, sports grounds, picnic areas, walking trails and mountain biking tracks.

Historically a hard rock quarry from the early 1900's, Hornsby Council purchased the property in the early 2000's.

The old quarry was originally mined for "blue metal" which had its origins as a diatreme of volcanic pyroclastic breccia. The diatreme formed by molten lava pushing up into the Earth's crust and superheating groundwater in sandstone rock layers near the surface. A hot steam vent then blasted to the surface. As the groundwater depleted an eroded inverted funnel was left. That eventually collapsed into a concave layered formation. A cross section of the diatreme can be seen on the eastern side of the quarry and attracts geologists and educational classes.

Part of the diatreme will be buried when the quarry filling is complete.