

Ground Impact Objections

I am writing to formally object to the Northern Beaches Tunnel plans and intent. My reasons for objecting are outlined below.

I object for the future of this city (why build road tunnels when we should be building public transport infrastructure? Why remove much needed and rapidly diminishing green space), however most importantly I object for the future of our children. What legacy are we leaving them?

1. I object to

Spoil

- Over 3 Million Tonnes of ground-based spoil will be removed as part of the Beaches Link Project, trucked through our area and dumped at an unknown location.
- 153, 000 cubic meters of sediment from Middle Harbour will be dumped at sea
- 10,000 cubic meters of contaminated sediment will be barged out under the Spit Bridge, past beaches and dried out at an unknown location
- 900 additional vehicle movements per day will service the Flat Rock Drive site and 590 at Cammeray
- 500m3 of spoil is permitted under the EIS to be stored outside of sheds at Flat Rock and 4500m3 at Cammeray - this presents a significant dust risk to the area

Drawdown of groundwater, quality of groundwater

- The EIS estimates that the drawdown in Northbridge as a result of the project will be 28m, in Flat Rock reserve 21m and at Willoughby Leisure Centre 22m, resulting in water stress/death for plants and trees and potential settlement issues
- Groundwater dependent ecosystems are located at the upper reaches of Flat Rock Creek & Quarry Creek such as the rare turpentine scrub and these will be impacted.
- The EIS states that “tunnelling works could potentially lower the groundwater table within poorly consolidated fill .. FRG - at this location, the tunnelling works could drain the groundwater, currently ‘ponded’ within landfill in the former creek” (23.2.3 p 23-14)
- Pfautsch’s (2015) study notes the implications of changing groundwater levels owing to mining can potentially extend beyond the boundaries of mine - “Where the water table had fallen to 19 metres below the surface, water use of trees was much lower compared to trees where the water table remained unchanged at around six metres below ground level. The tight connection between water use and the growth of trees implies that a reduction in water use will lead to a reduction in growth. In extreme cases trees can die of thirst”
- The changes in the groundwater level, because there is a tunnel underneath, has the potential to spread contamination around and downstream from the site. (Appendix N page 88 lists potential for further contamination as works can create contaminated plumes etc)

- 39% reduction in creek flow in Flat Rock Gully - impacts identified for fauna and flora ecosystems
- 117,000 kL from the tunneling will be flushed down Flat Rock Creek each day during construction. Each year this is equivalent to 200 Olympic sized swimming pools (500 megalitres). It is not clear if the water will be adequately treated for the full range of chemicals detected in the area.
- Water drawdown is estimated to flow into tunnel at a rate of 1.39L/s/km – during construction

Settlement and Subsidence Risk

- Naremburn is described as medium to high density in Chapter 20 “Land use and property”. This fails to recognise the large conservation area of Naremburn which has many examples of the earliest built history on the North Shore, homes that are generally more sensitive to land movement and slippage. The homes are also built on clay which presents further risk related to subsidence. The tunnels pass directly under this area and the EIS confirms a high level of drawdown is to be expected.
- Potential cracks in property due to settlement - definition of slight is 50mm (building and structure settlement classification chapter 16 page 29). This definition in the EIS needs to change
- Settlement induced by groundwater drawdown (table 50-75mm is moderate, greater than 75cm is severe). Settlement at Flat Rock Reserve is considered category 5 and up to 85cm which is categorised as severe settlement (p29-32 Chpt 16). see table 16-9 page 30, lists all max total settlement predictions for identified sites
- fig 16-1 (Chapter 16) shows the Luna Park fault zone going through Northbridge and Middle Harbour. More definition on this fault zone required. The EIS admits that geological uncertainty may have an impact on the project’s final design.
- Disturbance of the water table can lead to instability because of the fault zone, which may alter the tunnel route and depth. When there is a change proposed that change is analysed and stakeholders consulted before the change proceeds

Property Impacts/ Vibration (See Health for noise impacts)

- Risks to heritage sites have been identified at Clive Park (incl. Aboriginal), Flat Rock Gully (1 Aboriginal), Cammeray (1 Built) and Artarmon due to vibration
- Residents around the Northbridge peninsular (around Clive Park) will experience vibration above screening levels as a result of the Middle Harbour crossing works
- Widespread substratum acquisition is intended according to the EIS, 50mtr’s either side of the twin tunnel route and ramps. The route can however change after approval due to the uncertain geology of the area.

Flooding

- The flood study fails to recognise that water and sediment may be from a contaminated source.

- “The Flat Rock Creek catchment drains in an easterly direction from the Pacific Highway in Artarmon and has a total catchment area of about 3.9 square kilometres (390 hectares) at Willoughby Road”. The proposed dive site is within the Creek area where flooding occurs which then continues to downstream habitats. There appears to be little assessment of flooding impact on the Flat Rock dive site and downstream habitats, parks and waterways. The flood study limits the Flat Rock Creek assessment to the upper reaches around Gore Freeway. Given the size of the catchment, the location of the dive site in and around the diverted creek and in a flood zone it would be appropriate to continue the flood study around Flat Rock Gully and down into Tunks. This information should inform the health risk and waterways assessment.

2. I ask you for:

Flat Rock Gully not to be used as the primary dive for the Beaches Link due to changes in groundwater levels and water quality impacting on ecosystems in the short and long term both at FRG and Middle Harbour, known contaminants in former tip site that will be disturbed, predicted severe settlement at site (see other chapters for further reasons)

A. Spoil removal

- Contaminated spoil not to be stored onsite in Flat Rock Gully or Cammeray. The spoil should be immediately be sealed and carried away from residential areas or stored underground
- Improve the site, remediate better than before, to compensate for pain and suffering during the 5 years of construction and restore ecosystems. This was done at Bangaroo. No contaminated soil to remain onsite, site rehabilitated back to bushland in FRG, improved walking tracks and bicycle paths and ecosystems restored
- Silica dust created by tunnelling sandstone more adequately dealt with than just a water cart and covering the load.
- Real time monitoring and alerts around air quality at The Baseball Diamond and Netball courts at Flat Rock Gully as they do in the Hunter Valley near mine sites for recreational users of adjoining ovals, recreation fields, towns etc

B. Groundwater drawdown, quality of groundwater

- Groundwater Dependent Ecosystem –provide an additional study to confirm the importance of the ecosystem to local community in the EIS. Argument that it is in an area that is contaminated therefore not worth keeping has lots of examples where residents have managed to show importance of ecosystems in disturbed areas
- Groundwater contamination as confirmed in the EIS, including Flat Rock Gully, Quarry Creek, Tunks Park - ask for ongoing ground water quality monitoring and not just during the early operation of the tunnel.
- Contaminants from Flat Rock Reserve, Willoughby Leisure Centre etc may be mobilised with change in groundwater (through drawdown or surface water). The EIS assumes a shallower depth of fill than the historic record shows and leachate/ landfill can permeate fissures underground.

- Water monitoring station results to be made publicly available and placed downstream of the dive site, around the Baseball Diamond and in Long Bay to assess run off. Run off modelling should be completed once an expanded flood study is done.
- 16-63 - In the EIS Chapter 16 it is stated further investigations are required to determine the potential for impact to gw 02 3150 and to identify appropriate mitigation and rectification for implementation as required. Complete and publish mitigation and rectification.
- Groundwater improvement strategies over the long term implemented. Suggested in EIS Chapter 16 - modelling of tunnel lining for a 300m section under FRG reduces the drawdown by 8m, this lining could extend along the route of the tunnel and especially around Flat Rock Gully and under the Conservation Area of naremburn where properties are at greater risk of subsidence.
- Request a resident review/consultation ongoing review forum – e.g. regular meetings, with key stakeholders, including residents to discuss results from monitoring and mitigation. There should be a portal where information can be accessed in real time
- The method of wastewater treatment needs clarification - where will they be placed, how long will they be there, what level will they treat the water to.

C. Settlement

- Tunneling induced movement - compensation for house cracking and settlement even if slight - currently up to 50mm which means a 5cm crack in houses not repaired. This criteria is unacceptable for the majority of homeowners in the area
- all properties above the tunnel route to be offered a free and **independent** pre-construction property condition survey providing a clear record of a property's condition before work starts. If any damage is found to be directly related to the project, the damage will be addressed at no cost to the property owner.
- Further investigation needed on the definition of the Luna Park fault zone required and instability toward Clive Park.

I implore you to not go ahead with building of this tunnel.

Kind regards
Willoughby resident