Submission No 471

INQUIRY INTO IMPACT OF THE WESTERN HARBOUR TUNNEL AND BEACHES LINK

Organisation: Willoughby Environmental Protection Association (WEPA)

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WEPA SUBMISSION TO THE NSW LEGISLATIVE COUNCIL INQUIRY
INTO THE IMPACT OF THE WESTERN HARBOUR TUNNEL AND BEACHES LINK TUNNEL PROJECTS
17 June 2021

1 INTRODUCTION

The following submission is made on behalf of the members of the Willoughby Environmental Protection Association Inc. (WEPA) to the NSW Legislative Council Public Works Committee Inquiry into the impact of the Western Harbour Tunnel (WHT) and Beaches Link Tunnel (BLT) Projects.

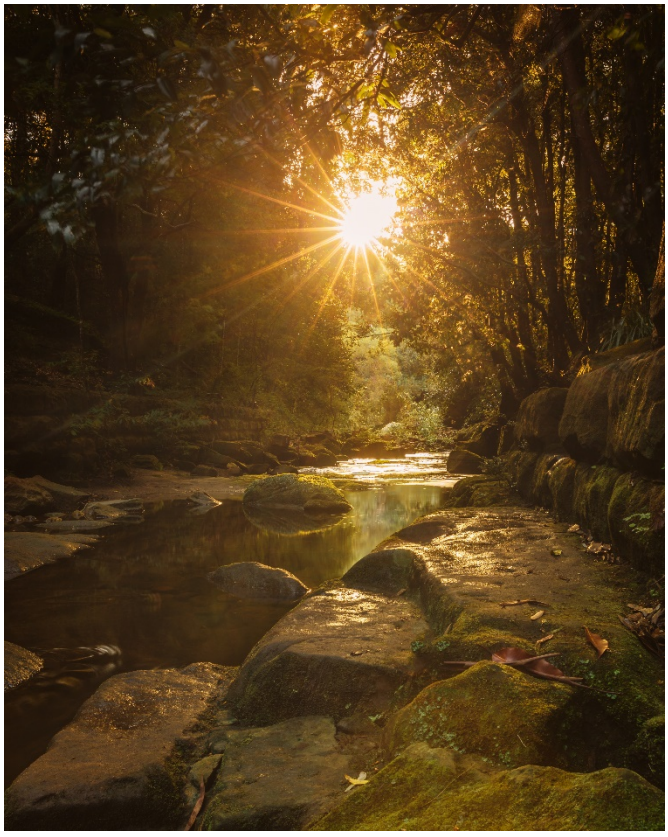


Figure 1 Flat Rock Gully Creek, Image: Andy Farries

WEPA

WEPA was formed in 1981 and for close to forty years has been fighting to protect and regenerate Flat Rock Gully, which lies between Northbridge and Naremburn and is a bushland area of significance for local wildlife and our community. Our inaugural President, Eric Wilksch, was devoted to the restoration of the Flat Rock Gully bushland and creation of public walks on the eastern side of Flat Rock Gully and this has remained an important WEPA priority.

Executive Summary

The Beaches Link Tunnel Project proposes to clear over 6 acres of bushland habitat at the top of the Flat Rock Gully catchment, with flow on effects to the rest of Flat Rock Gully, Tunks Park, Middle Harbour, the Sailors Bay foreshores, and local and regional north-south and east-west wildlife corridors. The impacts on the environment will be long-term and

potentially irreversible. There will also be long-term, negative impacts on the community living in and around these areas.

The EISs fail to properly assess risks including in relation to biodiversity, contamination and local traffic, and Conditions of Approval (COA) for the WHT are inadequate in significant respects. The Secretary's Environmental Assessment Requirements (SEARS) have not been met in significant respects including in relation to the consideration of alternatives and the assessment of contamination.

Costing for the projects is incomplete as it fails to take significant factors into account and pre-dates assessments of matters such as contamination which impact on it. There is a real risk that proceeding with the BLT will stifle the development of public transport solutions on the Northern Beaches. There has been a total lack of transparency in relation to costing with the failure to release the business case.

Community consultation has been rendered substantially meaningless by the failure to consider alternatives; the failure to provide comprehensible information in relation to costs and supposed benefits including the basis on which relevant conclusions have been reached; and the failure to provide comprehensive risk assessments.

WEPA is strongly opposed to the Western Harbour Tunnel and Beaches Link Tunnel Projects as currently constituted.

Recommendation 1

That the Inquiry recommend that the NSW Government place a moratorium on the projects' development process until it can establish the superiority of the projects via a transparent process, consideration of other options for transport, and the business case / cost-benefit analysis for the projects. Such an analysis should take into account the environmental costs of the proposals including the need for more robust mitigation measures to ensure that it does not negatively impact the environment that our communities and local wildlife share and be exhibited for public comment. We would particularly like to see a re-examination of the need for the project in light of changed work habits due to COVID-19, declining population growth rates, and the relative merits of public transport solutions in dealing with traffic congestion/transport issues on the North Shore and Northern Beaches.

2 INQUIRY RESPONSE

In keeping with our location and capacities as a local volunteer group in the Willoughby LGA, in response to the Inquiry we have focused on the impacts on suburbs in our LGA and on **Flat Rock Gully, Clive Park and Middle Harbour**. We are aware of similar impacts relating to Seaforth, Manly Dam and the bushland along Warringah Expressway but would note that the communities in these areas will be submitting in detail on these concerns.

Reference is made in this submission to the Secretary's Environmental Assessment Requirements (SEARs). These are a set of requirements, issued by the Secretary of the Department of Planning, Industry and Environment, that must be responded to in the preparation of an EIS for projects and infrastructure of this nature.

WEPA would like to submit the following information in response to the Terms of Reference provided by the Inquiry:

ToR (a) the adequacy of the business case for the project, including the cost benefits ratio

It is not possible to judge the adequacy of the **business case** as it has not been publicly released.

Although Infrastructure Australia (IA) has recently assessed the business case for the WHT, no business case for the BLT has been provided to IA. Therefore, BLT continues to be classified by IA as an initiative rather than a project.[1]

As regards Infrastructure NSW, although a *Final Business Case Summary (FBCS) – Western Harbour Tunnel* was released in May 2020, that summary states:

> *The Western Harbour Tunnel and Beaches Link Program (the Program) Business Case prepared by Roads and Maritime Services (now Transport for NSW) includes the Beaches Link project. The Beaches Link project is subject to a final investment decision by the NSW Government and will be evaluated in a separate summary at the appropriate time.*[2]

There is nothing in the BLT EIS to suggest that 'the appropriate time' has arrived.

[1] Infrastructure Australia Priority List
[2] Infrastructure NSW, Final Business Case Summary Western Harbour Tunnel (FBCS)

The Western Harbour Tunnel and Beaches Link Tunnel are separate projects and the merits of each should be assessed separately.

As mentioned earlier, until recently no business case had been submitted to Infrastructure Australia (IA). The WHT has now been evaluated by IA with the *Project Business Case Evaluation Summary*, published in April 2021, showing a benefit to cost ratio of between 1.2 and 1.3. While this evaluation takes into account the costs of some "dis-benefits" mentioned in the IA summary, the question of whether the benefits have been properly costed or whether an alternative solution to the problem would produce a higher benefit to cost ratio, is left unanswered. The IA summary also notes that "... *cost estimates presented in the business case submitted by the proponent to Infrastructure Australia are from 2017*".

The cost estimates do not take into account additional costs such as those which may arise from required remediation measures once comprehensive environmental and contamination assessments are completed. As discussed below, the Phase 1 contamination assessments conducted for the purpose of preparing the EIS are only aimed at identifying potential contamination; the Phase 2 assessments which are supposed to assess contamination in more detail and propose remediation measures, are conducted after planning approval is granted. Given that contamination can significantly affect construction costs [3] it is inappropriate to be proceeding with a project without taking those costs into account.

It should be noted that Glen Searle, town planner, researcher and educator, who is also an Honorary Associate Professor at The University of Queensland and the University of Sydney, gave evidence to the West Connex Parliamentary Inquiry in relation to costs that should have been included in the West Connex business. This list included the costs of:

- upgrading connecting roads which has been estimated as being in excess of $1billion for the St Peter's interchange alone (the Wakehurst Parkway needs to be rebuilt as a four-lane roadway as a feeder for the BLT)
- negative health outcomes to residents from construction-related stress and ongoing noise and pollution stack emissions which will lead to lower property values of houses next to surface sections of the motorway
- lost heritage value (Naremburn is a heritage-listed suburb)
- increased congestion costs during construction

[3] Timna Jacks, 'Worst of PFAS contamination revealed on West Gate Tunnel', The Age, March 6 2020

- losses of revenue to businesses adjacent to the project construction or businesses affected by traffic diversions required for construction.

ToR (b) the adequacy of the consideration of alternative options

It is a SEAR that alternatives to the WHT and BLT be considered.

The only alternatives considered in the WHT and BLT EISs were motorway tunnels in different alignments, and a cursory reference to public transport alternatives. Congestion pricing was not considered at all.

Despite the environmental impacts, the contamination risks and the construction impacts, the EISs give no serious consideration to alternatives.

Public Transport Alternative

The WHT EIS fails to assess the impact of the B-line buses on congestion on the Harbour Bridge and Military Road. On 31 January 2020, the TfNSW responded to a GIPA request by WEPA for this information (Attachment A), states that TfNSW had not had such an assessment done but this was to be done. Moreover, neither EIS takes account of the possible impact of a rapid and frequent public transport link, between the identified growth area around Frenchs Forest and Chatswood, when combined with the metro to the city to be completed in 2024.

Recommendation 2

That the Inquiry ask Transport for NSW (TfNSW) whether the assessment in relation to the B-line buses has now been done and what the result is.

The BLT EIS mentions the planned rapid bus service from Dee Why to Chatswood operating in conjunction with the new metro but blithely dismisses its potential impact:

> *While these projects would contribute to reducing congestion… they would not be sufficient to resolve the existing road network capacity constraints between the lower North Shore and the Northern Beaches. This is due to the complexity of journey patterns and trip purposes within Greater Sydney and the dispersed nature of origin and destination points for an individual journey.*

For the following reasons it appears likely that fast and frequent public transport between Chatswood and Dee Why along the Warringah Road corridor, could make a significant

contribution to reducing traffic. And this reduction would be both along the Spit Road/Military Road corridor and along the Warringah Road corridor:

1. The BLT EIS states that the metro from Chatswood to the Sydney CBD will provide a capacity increase of 100,000 passengers an hour.[4] The Metro website gives an estimated journey time of nine minutes from Chatswood to Barangaroo and 11 minutes to Martin Place, and a frequency of a train every four minutes at peak.[5]
2. Census journey to work data shows that 52.1% of Northern Beaches residents work in their own LGA and 65% of the remainder work in either the City of Sydney LGA, North Sydney LGA, Willoughby LGA or Ryde LGA – all areas which will be serviced by the planned rapid bus service from Dee Why to Chatswood, the Metro from Chatswood to the city and beyond to be completed in 2024, or the existing metro from Chatswood. Given that the reference in the EIS is to Military Road/Spit Road and Warringah Road/Eastern Valley Way Road corridors generally operating over capacity during peak periods but not at other times, journey to work data becomes particularly relevant.[6]
3. The EIS shows that the Warringah Road corridor is both busier and more congested than the Spit Road/Military Road corridor.
4. The EIS shows that public transport utilisation of the Warringah Road corridor is much lower than public transport utilisation of the Spit Road/Military Road corridor.
5. There is currently no priority given to public transport along the Warringah Road corridor by way of measures such as bus lanes or transit lanes.
6. The projected growth in traffic is primarily generated by growth around the Frenchs Forest area which is directly serviced by the Warringah Road corridor.[7]
7. Freight traffic is not a significant contributor to traffic volumes. Using Spit Bridge morning peak data for the most recent available years (2012, 2013, 2014), heavy vehicles comprised 8.80%, 8.86% and 9.26% of traffic volumes respectively.[8]

[4] EIS page 4-14
[5] Crows Nest Train Station | North Sydney Information | Sydney Metro; Sydney Metro Southwest Project Overview | Sydney Metro
[6] Residents journey to work | Northern Beaches Council area | profile.id (pp 3-4)
[7] NSW Transport for NSW Traffic Volume Viewer; Frenchs Forest Priority Growth Area - Summary
[8] Traffic Volume Viewer

Finally, it is noted that in the BLT EIS the proponent states the project will only provide meagre benefits for the Spit Road/Military Road corridor, in any event, with a 10% reduction in travel times by 2037. It is unstated in the EIS whether that 10% reduction is from current travel times or projected travel times taking into account predicted future traffic volumes. If the latter there may be no reduction from current traffic times at all.

Apart from absence of traffic increases on major corridors as shown by RMS traffic monitors,[9] the travel time savings suggested for trips such as North Sydney to Rozelle are only explicable by reference to projected future traffic volumes on relevant roads under a 'do-nothing' scenario.

The following figure is from the BLT EIS -

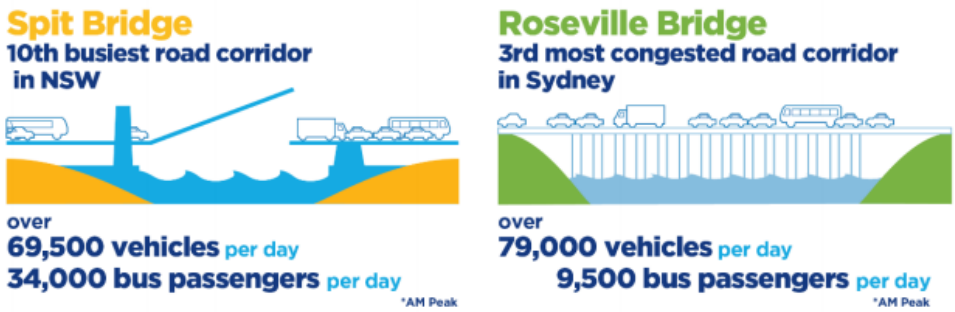


Figure E-2 Key metrics for the Eastern Harbour City's transport network

Figure 2 Diagram from Beaches Link Tunnel Environmental Impact Statement

It shows that the Warringah Road corridor is both busier and more congested than the Spit/Military Road corridor while being used less by public transport, reinforcing the need to consider public transport alternatives utilising this corridor.

Ted Nye, a civil engineer with extensive experience on major transport infrastructure development (see CV at Attachment B) has developed a feasible public transport alternative to the BLT as shown in the following graphic. This alternative would reduce traffic congestion, in particular along the Warringah Road corridor between Frenchs Forest and Chatswood, while also not having the undesirable environmental impacts identified elsewhere in this submission.

[9] NSW Transport for NSW Traffic Volume Viewer; Frenchs Forest Priority Growth Area - Summary

To demonstrate what a public transport Light Rail option that could have been included and assessed at part of the BLRT - EIS

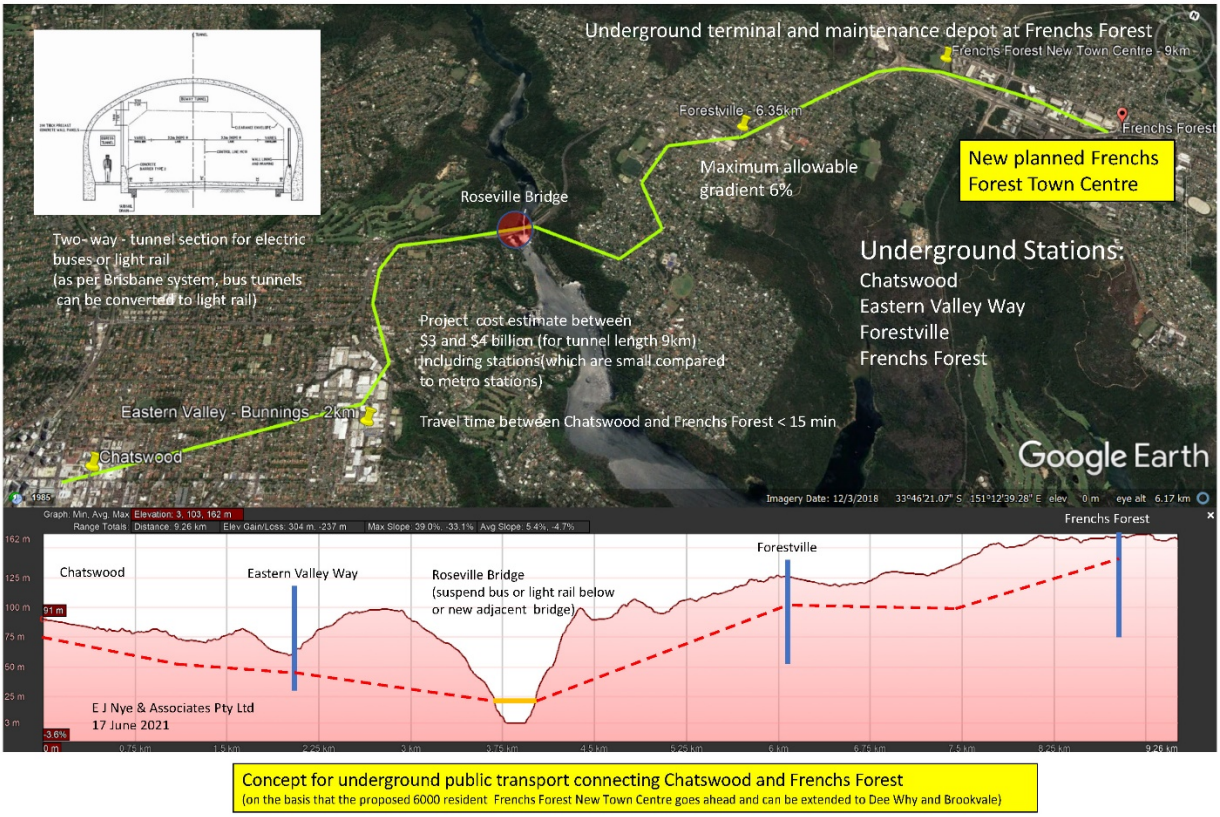


Figure 3 Possible public transport (electric bus or light rail) alternative to the BLT - Ted Nye

Recommendation 3

That the Inquiry recommend that the WHT and BHT EISs be revised to include the Benefit-Cost Ratio (BCR) of a frequent and fast public transport service from Dee Why to the metro at Chatswood compared to the BCR of the Beaches Link project, considered alone, setting out in detail how each has been calculated and including the business case for the Beaches Link.

Recommendation 4

That the Inquiry recommend that the WHT and BHT EISs be revised to include an independent review of the traffic flow forecasts for vehicles travelling to the city and beyond along the corridor roads to the Spit Bridge from 2021 – 2051. The forecast needs to take the following into account:

- the modest increase in new housing proposed in the Housing Strategy (currently on display) of the Northern Beaches Council;

- development of new housing in the Frenchs Forest Hospital Precinct at levels in keeping with surrounding districts, and in consultation with Northern Beaches Council;

- the impact of new bus routes and capacity connecting the northern beaches to the metro at Chatswood in conjunction with the public transport provided by the existing metro and the Metro City and South West to be opened in 2024;
- the adoption of Work from Home (WFH) by northern beaches residents and the establishment of WFH Hubs in the northern beaches; and
- unlike the single forecast for 2037 that TfNSW seems to have adopted, the independent forecast needs to be based on a risk-adjusted forecast range.

ToR (c) the cost of the project, including the reasons for overruns

The cost per kilometre of the BLT will be the most expensive of any road tunnel in NSW, due to the complex engineering and difficult sites involved. The type of engineering to be undertaken, and the factors still unknown (including contamination types and levels), suggest that there will be a great potential for contractors to overrun their budgets – at the expense of the NSW taxpayer.

ToR (d) the consideration of the governance and structure of the project including the use of a 'development partner' model

The BLT will be a 'tunnel to a peninsula' unlike other toll-financed roads and tunnels which move vehicles through and around parts of Sydney. The project is highly unlikely to generate enough traffic for the projects to be funded from tolls via the development partner model, and will need ongoing and high levels of subsidy from the NSW Government and taxpayers.

In relation to the BLT, the NSW Government might choose to either guarantee traffic volumes and/or indemnify a future private owner in relation to any departure from projected levels. This has happened in relation to previous projects.

Although the WestConnex Project Summary published February 2019, states that project risks relating to operational traffic are borne by the trustees rather than the RMS, this makes little difference where a government is intent on future privatisation as the value of the asset to a private buyer will be diminished if traffic volumes don't match desired toll revenues.

Either scenario is likely to result in the strangulation of potential public transport solutions and making users hostage to the tolled roadways.

WEPA is also concerned at the well documented governance failures that have plagued the WestConnex project and draw the inquiry's attention to the 2014 report by the Audit Office of NSW.[10]

A particularly concerning finding was the failure to comply with the Major Projects Assurance Framework and that the governance arrangements failed to clearly separate those responsible for delivery, commissioning and assurance. For instance, the report found:

> *Reliance was placed on steering committees and boards with responsibility for project delivery to also provide independent assurance to the Government. There is a fundamental conflict in such an arrangement. A steering committee or board with delivery responsibility cannot provide truly independent advice to government.*

ToR (e) the extent to which the project is meeting the original goals of the project

The stated project goals and objectives are not clearly delineated. They refer to reducing congestion and making faster journeys but do this without including measurable goals or outcomes. The data included in the BLT EIS suggests that a large percentage of journeys will have delays but not time savings elsewhere. The general objective of improving transport on the Northern Beaches will not be achieved through the BLT. Other methods, including more support for work from home, and more flexible, more frequent and faster public transport would be more effective and less damaging to the environment and communities.

ToR (f) the consultation methods and effectiveness, both with affected communities and stakeholders

Stakeholder Consultation

Both the WHT and BLT EISs were released during the Christmas period, when public focus is distracted, and were then open for comment across a month or more of school holiday breaks when schools were closed (and Parents & Citizens Association not convened) and parents across the area preoccupied with caring for children. The pupils, families and teachers of approximately 26 pre-school, primary and high schools are potentially impacted by the WHT and BLT.

[10] New South Wales Auditor-General's Report Performance Audit WestConnex: Assurance to the Government

The difficulty of this timing for the community was exacerbated by the restrictions imposed by the COVID-19 pandemic on meetings, community gatherings, libraries and access to computing equipment. These circumstances were highlighted in several letters from a wide range of organisations and schools asking for an extension to review the 12,000 pages of documents associated with the most recent EIS. The request for an extension was rejected.

The Transport information virtual sessions provided in this period were inadequate to the task of explaining aspects of the project as outlined in the EIS to the community. This was particularly the case due to the use of ZOOM meetings where questions could only be asked once, by typing in a 'chat' question, and answers given once, verbally, with little recourse for follow up questions if a satisfactory answer was not received or a follow-up question needed. Attempts to follow up on unsatisfactory answers through 'chat' were often characterised by the convenors as 'this has already been answered'. Participants were encouraged to send in other questions after the event but the whole point of group consultation is to allow the group to hear, query and judge the answers provided as a collective.

The EIS process has also been remiss in failing to identify and contact the plethora of community groups in these areas. Community consultation cannot be a 'one size fits all' process and attention should be given to identifying relevant key stakeholders and active groups in a community. Research should have been undertaken to identify the local Progress Associations, community, environmental, residents and sports groups likely to be interested in the proposed changes. The names of such groups are readily available by checking local council online registries. In addition, the NSW Government should not rely on people to necessarily pass along the information in their community – a more proactive approach in identifying stakeholders should be adopted at the outset. WEPA is aware that groups in and around the Clive Park site, in particular, only became aware of potential tunnel impacts in the last few weeks of the consultation period, which seriously impedes their ability to research and then raise the full range of questions and concerns they may hold about the project.

Misleading statements

The consultation documentation is full of misleading statements and opaque analysis. Misleading statements have been made in the EISs and prior information documents regarding expected travel time savings from the projects. It is never made clear that projected time savings are not based on **current travel times** but rather on predicted traffic volumes based on planned densification in areas such as Frenchs Forest.

Misleading statements have also been made in the EIS for the BLT[11] as to the impact of COVID-19 on future traffic volumes on relevant routes, by stating that traffic has returned to pre-COVID levels without considering the substantial but temporary decline in public transport patronage.

Artist impressions in consultation documents have been misleading by, amongst other things, understating the visual impact of ventilation stacks in the Balgowlah area, and understating the gradients along Flat Rock Drive which will have traffic lights installed near its lowest point to enable heavy vehicle access. Motorway facility sheds are shown in distant views and camouflaged green.

Historical analysis of previous land use has ignored potential sources of dangerous contaminants such as the Hallstrom refrigerator plant, despite it being mentioned in the historical study referred to in the BLT EIS.

Opaque Modelling

Table 8-15 of the BLT EIS attempts to analyse how intersection performance will be affected by construction generated traffic. It rates intersection performance on a scale of Level of Service (**LoS**) scale of A-F with F being the worst. It then goes on to identify where there will be deterioration based on the scale.

This is a totally inadequate way to approach the issue from the point of view of road users. What road users want to know is how much time construction traffic will add to their daily commute. Just because a LoS remains at F does not mean that you won't wait for longer at an intersection due to the construction traffic generated by the project. In fact, you would be waiting longer but it is impossible to know from the LoS rating, how much longer.

When it comes to spruiking the benefits of the program the proponent has come up with statements as to how many minutes will be saved on typical journeys but has not come up with similar measures when it comes to delays to typical journeys caused by construction traffic.

[11] BLT EIS, p.3.2

Recommendation 5
That the Inquiry recommend that the EIS be revised to include modelling of the impact of construction traffic generated by the project on typical journey times in terms of minutes of delay.

ToR (g) the extent to which changes in population growth, work and travel patterns due to the Covid-19 pandemic have impacted on the original cost benefit ratio

There has been no serious consideration given to the need for the project in light of changed work habits due to COVID-19 and the relative merits of public transport solutions in dealing with traffic congestion/transport issues on the North Shore and Northern Beaches.

The projects have proceeded on the basis that COVID-19 will have no impact on the traffic volumes on which the projects' benefits are predicated whereas evidence suggests that COVID-19 will lead to more permanent, lower traffic volumes than those predicted.

As opposed to the statement in the BLT EIS, the evidence suggests that COVID-19 is likely to result in lower traffic levels than predicted due to reduced population growth and a greater degree of working from home.

For instance, Infrastructure Australia's December 2020 report *Infrastructure beyond Covid-19* states:

> *A 2020 Gartner CFO survey reports that 74% (CFOs) expect a shift whereby some employees remote work permanently, indicating significant uncertainty for CBDs following COVID-19.*

In similar vein, *The Sydney Morning Herald*, 20 April 2021, quotes the NSW Chief Economist, Stephen Walters:

> *We are not coming in 100 per cent five days a week and so the reality is the demand for office space is not going to be what it used to be.*

As regards population growth, the Australian Government Centre for Population website states:

> *The impact of COVID-19 is expected to be long lasting. Australia's population is expected to be smaller and older than projected prior to the onset of the pandemic.*

Australia's population is estimated to be around 4 per cent smaller (1.1 million fewer people) by 30 June 2031 than it would have been in the absence of COVID-19. The population will also be older as a result of reduced net overseas migration and fewer births. Despite COVID-19, Australia's population is still growing and is expected to reach 28 million during 2028–29, three years later than estimated in the absence of COVID-19.

COVID-19 is projected to slow population growth across all geographic areas, with the duration and magnitude linked to the importance of net overseas migration to different parts of the country.

Capital cities are projected to bear the heaviest impacts, with total population across capital cities estimated to be around 5 per cent lower by 30 June 2031 than in the absence of COVID-19. By contrast, population outside the capital cities is estimated to be around 2 per cent smaller than it would otherwise have been.

Recommendation 6

That the Inquiry recommend the EISs be revised to deal with the need for the project in the light of likely COVID-19 impacts on relevant traffic volumes and population growth rates.

ToR (h) whether the NSW Government should publish the base-case financial model and benefit cost ratio for the for the project and its component parts

ToR (i) whether the project is subject to the appropriate levels of transparency and accountability that would be expected of a project delivered by a public sector body

The failure to publish the business case, and the failure of the EISs to include relevant matters means that the projects fail to meet the levels of transparency and accountability which taxpayers are entitled to expect.

The failure to consider and compare alternatives becomes of particular concern given the failure to release the business cases justifying the projects.

Recommendation 7

That the Inquiry recommend that all planning details, assumptions, business cases and cost benefit analyses must be released publicly to give the community confidence in the planning process.

ToR (j) the impact on the environment, including marine ecosystems

Wildlife and Habitat

The following comments focus on the impact of the BLT on the habitat for wildlife in the Willoughby LGA. We deal with other environmental impacts later in our response to this Term of Reference.

The proposed BLT tunnel works will result in the clearing of over 6 acres of bushland habitat at the top of a catchment with flow on effects to the rest of Flat Rock Gully, Tunks Park, Middle Harbour, the Sailors Bay foreshores, and local and regional north-south and east-west wildlife corridors. The futures of Flat Rock Gully and the currently pristine foreshores of Clive Park are unclear and there is a potential for this habitat and its wildlife to be lost to our area forever.

Biodiversity Assessment

The BLT EIS has assessed a number of threatened species listed under the *Environment Protection and Biodiversity Conservation Act* 1999 (Cwlth) (EPBCA) and concluded that they do not require referral to the Australian Government Minister for the Environment. WEPA believes that insufficient assessment and mitigation is provided to support this non-referral.

The BLT EIS also pays scant regard to the full biodiversity of the impacted sites. Biodiversity is commonly understood, and generally defined, in scientific terms to mean the variety of all life forms on earth - the different plants, animals and micro-organisms, their genes, and the terrestrial, marine and freshwater ecosystems of which they are a part. Critical to the preservation of biodiversity is the maintenance of viable habitat. While the Secretary's Environmental Assessment Requirements (SEARs) for the BLT EIS called for all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity[12] we do not believe that this requirement has been fully answered either in relation to the listed species or to the broader biodiversity at the sites proposed to be impacted by the project.

Flat Rock Gully Reserve

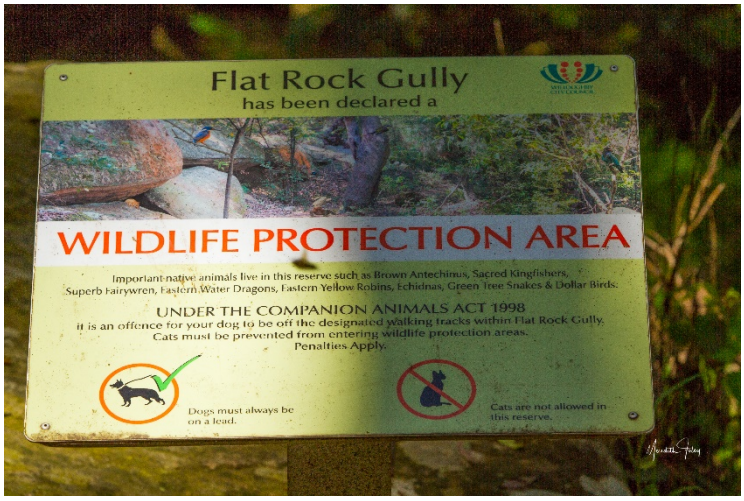
The proposed tunnel construction site on the eastern side of Flat Rock Drive will result in the clearance of a large area of much valued and biodiverse bushland and habitat which provides an important wildlife corridor; the regeneration of which has been a 25-year project for Willoughby City Council and the local community.

[12] SEARS 2020 6 Biodiversity

The Flat Rock Gully Reserve is bounded by Flat Rock Drive to the west, falls away steeply into the gully and then extends under the Cammeray Bridge to the east, adjacent to Tunks Park.[13] The gully is deeply sided which naturally amplifies noise in its vicinity. It contains low open eucalypt woodland with a dense shrub layer typical in other Sydney sandstone woodlands. Several creeks, including Willoughby Creek and Flat Rock Gully Creek, and stormwater, flow into the gully providing water for plants and animals. In one section below the plateau, earthworks, which provide habitat for a wide range of lizards and other creatures, have been introduced to cap the former deep tip site. An ephemeral creek channel has been created in the upper section of Flat Rock Creek with three detention ponds which provide important habitat for frog and lizard populations and access to still, fresh water to a range of birds and other animals.

Reserve Designation

To preserve and protect our native wildlife, Council has designated selected bushland reserves in the Willoughby LGA as 'Wildlife Protection Areas' (WPAs) and has designated them as Zone E2 Environmental Conservation. The WPAs were selected because a Fauna Study undertaken by Council found that these areas provide essential habitat for many of the native animals found in Willoughby. Flat Rock Gully Reserve is one such area as it provides significant habitats that support a wide range of birds - particularly small birds – and mammals, reptiles and frogs that are disappearing from our urban areas.



WEPA is firmly of the belief that bushland, which the community has formally set aside for environmental protection, should not be destroyed or disturbed. To do so undermines the value of these designations of high biodiversity and leaves all protected areas open to destruction. In a situation where science and Government agencies have flagged a critical loss of biodiversity, it would seem important that we strive to protect the nature reserves already designated.

[13] Willoughby City Council, 'Flat Rock Gully Reserve Action Plan' (July 2018), p2

Recommendation 8

That the Inquiry recommend that the BLT EIS be revised to assess the impacts of destroying bushland which has been designated by the community and local government as a Wildlife Protection Area and set aside for Environmental Conservation.

Wildlife Corridors

Flat Rock Gully Reserve is also a key part of the network of wildlife corridors across Sydney required to maintain biodiversity. It is a major and central component of the east-west wildlife corridor between Middle Harbour and Lane Cove River Catchments. Bushland in Flat Rock Gully contributes to habitat linkages that include Tunks Park, Middle Harbour, Northbridge Park, Cliff Ave Reserve, Bicentennial Reserve and Artarmon Reserve. This wildlife corridor has been in place for many decades and is important to the wellbeing of wildlife across several catchments.

On a regional scale, Flat Rock Reserve is part of a significant east-west wildlife corridor which winds from the Berowra Valley National Park through to the shores of Middle Harbour, Northbridge as well as linking up to the north with Garigal and Ku-ring-gai National Parks and the Hawkesbury River[14]. This degree of habitat connectivity at a landscape scale, exerts substantial influence on the biodiversity of bird life and other fauna still present in the Willoughby Local Government Area (LGA).

In urban areas of Sydney, such as the Willoughby City Council LGA, where native vegetation has been intensively removed, wildlife corridors have become critical for the maintenance of the ecological processes underpinning natural biodiversity. These corridors provide shelter, food and protection from predators and allow the movement of birds, animals and insects and the continuation of viable wildlife populations. They support biodiversity by allowing wildlife to respond to environmental variables such as access to water, food abundance or scarcity, population changes and the access to breeding partners which maintains genetic diversity in a healthy, local population. Many threatened and endangered native species owe their survival to these wildlife corridors.

The importance of wildlife corridors was most recently emphasised in the draft Design Guidelines released by the NSW Architect in association with the Department of Planning. The Guidelines advocate for the incorporation of a goal to protect, conserve and connect

[14] See WCC Urban Bushland Management Plan; Vegetation Management Policy (2019); and WCC Reserve Action Plans.

urban wildlife habitat in all relevant NSW legislation, policies, strategies, plans, and programs.[15]

Recommendation 9

That the Inquiry recommend that the BLT EIS be revised to assess the impact the construction site will have on a significant local and regional wildlife corridor.

Figure 4 Birds photographed at Flat Rock Gully, Naremburn. From left to right: Superb Fairy-wren, Red-browed Finch, White-browed Scrubwren, Variegated Fairy-wren. Images: Meredith Foley

Regenerated Bushland

The proposal outlined in the BLT EIS is that all bushland and trees on the plateau above Flat Rock Gully, equal to around 6.77 ha (over 6 acres), be cleared. The EIS plays down the ecological importance of this area and attempts to justify the removal of the bush and trees on the basis that it is only 'regenerated bushland' having been introduced to cover a tip formerly on this site.[16]

The bush regeneration at this site is the result of the application of over 25 years of work and resources by Willoughby City Council (WCC) and the contributions of large numbers of bushcare volunteers. Most of the plantings were propagated from cuttings taken from local

[15] Government Architect NSW, Draft Greener Places Design Guide, Issue no.04 2020, pp.50ff
[16] EIS Chapt 19 Table 19-4

indigenous plants. No evidence is offered in the EIS that wildlife discriminates between regenerated and remnant indigenous trees and bushland and the wildlife lists for the area would seem to bear out its success as habitat for native wildlife (see Attachment C).

Recommendation 10
That the Inquiry recommend that the BLT EIS be revised to include a full study of the regenerated bushland marked for clearance at Flat Rock Gully to provide evidence of its value or otherwise as faunal habitat.

Tree removal

There continues to be a marked disjuncture between the State Government's policy on trees and its actions in the field. While the Secretaries of NSW Government agencies (including Transport) have signed a 'Secretaries' Pledge'[17] to 'contribute to the ongoing expansion of tree canopy and green cover in NSW', it would appear that the opposite continues to be the case. In this situation, when faced with the choice between using a sports field or clearing bushland, Transport has chosen the removal of bushland despite the environmental and social impacts.

Over 240 trees will be potentially or directly impacted (removed or roots built over) in the construction site at Flat Rock Gully.[18] Of this number, the EIS maintains that only two-thirds will be replaced. The WCC tree policy requires that 3 trees be replaced for each tree removed.[19] Local tree policies are urged by the NSW Government to reflect the needs of different areas for tree canopy, wildlife habitat and to combat the problems of rising urban heat. Particular care should be given to retaining trees and logs with hollows.

There is approximately 14 hectares (ha) of remnant bushland within the Flat Rock Creek Gully Reserve. It is bounded by Flat Rock Drive to the west and extends beyond the Cammeray Bridge to the east, adjacent to Tunks Park.[20] The EIS fails to confirm that this remnant bushland will be retained. It is unclear whether the large Sydney Red Gums at the bottom of the slopes on the north-eastern edge of the construction site are to be retained.
https://www.dpie.nsw.gov.au/__data/assets/pdf_file/0018/347040/Secretaries-Pledge-7.pdf

[17] Greening our Cities – Secretaries Pledge
[18] BLT EIS Annexure C in Appendix W Pt 1, p.32
[19] Willoughby City Council, Vegetation Management Strategy, 2020
[20] Willoughby City Council, 'Flat Rock Gully Reserve Action Plan' (July 2018), p2

Figure 5 Red Gums at Flat Rock Gully. Image: Meredith Foley

Recommendation 11

That the Inquiry recommend that, should the BLT be approved, it be a Condition of Approval (COA) that Willoughby City Council be allocated sufficient funds to ensure maintenance and management of replacement vegetation on land under their responsibility for a minimum of 10 years.

Assessments and Field Studies

The content of the EIS seems to indicate that only a limited assessment process was carried out in relation to Flat Rock Gully. A large part of the assessment appeared to be 'desktop' in nature, involving a search through databases to determine the species 'likely' to be present locally and to rate this likelihood. This was followed up it seems by approximately 5 visits to 'Willoughby' and 3 to Flat Rock Reserve over 4 years (May 2016 – April 2020). The length of the visit, its focus, the number of people involved, and their qualifications is difficult to determine from the BLT EIS chapters and appendices.[21]

What is clear is that a full assessment of wildlife actually on and near the construction site in Flat Rock Gully was not carried out. Council's well-kept register of wildlife sightings in and

[21] EIS Appendix S Table 2.2 Field Studies, pp19-20

around the Gully did not appear to have been utilised. The community living around and visiting the site were not asked about the wildlife they see daily in their visits.

Despite the importance to a wide range of native birds and animals of hollows in trees, the assessment of trees was carried out at ground level only.[22]

Recommendation 12
That the Inquiry recommend that the BLT EIS be revised to include a full study of biodiversity at Flat Rock Gully and other impacted sites and a full check of hollows in or around the construction site, given that a high proportion of native wildlife uses hollows, both small and large, to shelter and breed.

The inspections of waterways, including Willoughby Creek and Flat Rock Creek, also seem to have been limited to a desktop assessment of likely impacts. No assessment was done in this area for aquatic wildlife and microorganisms[23]. Despite human impacts, the creek system, particularly at the Flat Rock Gully site, still provides habitat for a number of aquatic species including a multitude of microorganisms as well as vertebrates such as mullet, common jolly tails, striped gudgeons, long-finned eels, long-necked turtles, frogs and water birds.

Recommendation 13
That the Inquiry recommend that the BLT EIS be revised to include a full assessment of fish and macroinvertebrate in creeks and waterways in the Flat Rock Gully area.

Native Flora
The EIS acknowledges that there are large tracts of native vegetation occurring at Flat Rock Gully Reserve, within and near the proposed construction site[24]. The native flora in the construction footprint, however, has been assessed for threatened plant species only. At Flat Rock Gully Reserve this is represented by a total of two plants of one species (EIS Table 10-5).

[22] BLT EIS Appendix W, p.v
[23] BLT Annexure D Freshwater ecology impact assessment in Appendix 6
[24] BLT EIS Chapt 19 Table 19.6

The rich biodiversity[25], with over 240 native plant species appearing on the Flat Rock Gully Native Plant Species List, demonstrated in the proposed construction footprint and adjacent areas does not appear to have received anything more than a passing acknowledgement.

Recommendation 14
That the Inquiry recommend the BLT EIS be revised to include a full assessment of native plant species and consideration of the impact of their removal on local fauna and the wildlife corridor.

Native Fauna
The flora noted above, coupled with the local geography, ensures that Flat Rock Gully Reserve has both natural and habitat significance. Flat Rock Gully is significant due to its diverse range of plant species and the fact that rock outcrops are home to locally rare fauna such as the Gully Shadeskink, Bibron's Toadlet, Short-beaked Echidna and Brown Antechinus.[26] Destruction of this habitat has the potential to cause local extinctions of these creatures.

The site has become a critical area for foraging and nesting for a suite of small birds; many now missing entirely from local suburbs.[27] It provides trees of different height and density, an intact shrub layer, a creek and other waterways, ponds, open grasslands and rock habitat.

Smith and Smith in their 2010 study for North Sydney Council[28], found that the lower end of the Flat Rock Gully catchment (around Tunks Park) in Cammeray was a biodiversity hotspot in terms of small birds and the **last refuge** for these birds in the North Sydney region. White-browed Scrub Wren, Eastern Spinebill, Superb Fairy-wren, Variegated Fairy-wren, Golden Whistler, Red-browed Finch, Eastern Yellow Robin, Grey Fantail and Silvereye are amongst the small, insectivorous birds regularly found in and around the proposed construction site at Flat Rock Gully but are absent from the surrounding suburbs.[29]

[25] WCC Urban Plan of Management Vol 2, Resource Inventory, Flat Rock Gully – Native Plant Species list, pp.157 - 164
[26] Willoughby City Council, 'Flat Rock Gully Reserve Action Plan' (July 2018), p2
[27] Insight Ecology, 'The Avifauna of the City of Willoughby Local Government Area: August 2016 survey report', 2017
[28] Peter Smith and Judy Smith, 'North Sydney Council Natural Area Survey Report', prepared for North Sydney Council, November 2010
[29] Tawar Razaghi, 'How our cities are killing our native bird species' homes' Domain, Nov 28 2019; https://www.environment.nsw.gov.au/get-involved/sydney-nature/wildlife/birds-in-sydney; Insight Ecology, 'The Avifauna of Willoughby LGA: August 2016 Survey Report', February 2017

The BLT EIS acknowledges at various points that native vegetation at Flat Rock Gully is providing fauna habitat resources for a range of mammals, birds, frogs, reptiles and bats but makes only passing mention of these other species. A full list of fauna in this Reserve – which could have been obtained from Willoughby City Council (see Attachment C) was not included in the EIS. The WCC list includes frogs (6 species), 1 turtle species, lizard (11 species), snakes (6 species), a total of at least 98 bird species and over 10 mammal species. Some species, such as Superb Lyrebird and Swamp Wallaby, have only returned to the Gully and neighbouring gardens in recent years after being locally extinct since the 1950s. In total more than 130 separate species of vertebrate wildlife are known to use the Flat Rock Gully area.

Recommendation 15

That the Inquiry recommend that the BLT EIS be revised to include an assessment of the full biodiversity of Flat Rock Gully. That such an assessment include species on the Willoughby City Council list, others identified in discussion with Council's bushland staff and Bushcare teams and ascertained further by community consultation.

The EIS argues that the removal at Flat Rock Gully of habitat,

> *would be negligible since the habitat to be removed does not comprise a significant proportion of habitat available to species in the surrounding terrestrial biodiversity locality or wider bioregion."*[30]

This statement seems to imply that, with little effort, the threatened species and other fauna will move away. This ignores the fact that Flat Rock Gully is bounded by suburbs, freeways and, at the eastern end of Tunks Park, by Middle Harbour. Terrestrial wildlife will have far fewer options to relocate if cut off from the rest of the Gully.

[30] BLT EIS Chapter 19, 19.5.2, pp.19-60

Figure 6: Swamp Wallaby photographed in Flat Rock Gully.

The EIS also states the intention that the site be visited 24 hours before construction commences to capture and relocate any fauna sighted. This approach ignores that:

- the habitat removal will have an impact on hundreds more species than those listed as threatened under the relevant Acts;
- this area provides water for local fauna;
- many species may not have the ability or instinct to move from the area;
- attempts at capture are likely to be futile and possibly injurious to the species involved;
- many are territorial and risk injury or death by being moved to other territories;
- this is just one in a number of removals of small patches of local bushland, on public and private land, which is gradually rendering many species locally extinct.

It is a peculiar and confounding circumstance that under the *Biodiversity Conservation Act* (NSW) 2016 it is an offence to harm a protected animal 2.1 (1) (c) (all NSW wildlife is protected with a few exceptions) but it is acceptable to destroy their habitat, injure them

through capture, disperse them to face injury or fatalities and in many cases to bury them under the advancing bulldozers. This situation would seem to be directly inimical to the need expressed to take all '*measures to avoid and minimise impacts on terrestrial and aquatic biodiversity'.*

The Willoughby City Council's list does not include the vast array of **invertebrates** which are present in these habitats and are an important part of the biodiversity network. Science is adamant that these organisms, many of which are the building blocks for life, are declining rapidly to the detriment of the entire environment.[31]

Recommendation 16
That the Inquiry recommend that the BLT EIS be revised to include the assessment of invertebrates in the areas impacted by the tunnel in recognition of their importance to the environment.

Figure 7 Lizards and amphibians in Flat Rock Gully, Naremburn. Image: Willoughby City Council

[31] University of Sydney, 'Insect population faces 'catastrophic' collapse: Sydney research', 12 February 2019

Clive Park and Sailors Bay Catchment

Another noticeable omission in the BLT EIS is the failure to provide any assessment of biodiversity impacts in Clive Park and in other bushland surrounding the Sailors Bay catchment. Clive Park is a 5.77ha Bushland Reserve, managed by Willoughby City Council, at the bottom of Sailors Bay Road, Northbridge. It is part of a group of four bushland reserves located in the north-east area of Northbridge. Clive Park is the largest of the four and is located at the junction of the Sailors Bay and Flat Rock Creek catchments. The bushland, according to Willoughby City Council, has high ecological integrity and has a small creek through the centre, which runs almost continually. The Sailors Bay catchment is marked by wooded bushland foreshores around the Middle Harbour area.

The construction related to the BLT tunnel crossing will be directly off Clive Park in Middle Harbour. Clive Park will be fully exposed to the noise of construction, including pile driving, several hours a day during coffer dam construction on its foreshores. The other foreshore areas will also be exposed to the noise, light, odour and movement associated with marine traffic and construction work.

Clive Park provides important habitat for some remnant populations of small-range species, such as Brown Antechinus, skink species as well as woodland birds. Its harbour foreshore also provides habitat for the threatened fishing bat species, the Southern Myotis, and its shallows are visited by the approximately 60 endangered Little Penguins from the Manly rookery, which is the last mainland NSW rookery for these birds.[32] Endangered, White-bellied Sea-Eagles fish in the area. Over 100 vertebrate species are included on the WCC Sailors Bay catchment list of native fauna. A full list of the vertebrate wildlife found in the bush around the foreshore can be seen in Attachment D [33].

The impact of light and noise (particularly pile-driving) on the wildlife in Clive Park could be even more significant than at Flat Rock Gully as they are not part of a larger contiguous area of bushland and are separated from similar habitat by dense housing, roads and the waters of Middle Harbour. Northbridge residences are predicted to experience noise levels that exceed noise management levels and could result in sleep disturbance.

[32] https://www.willoughby.nsw.gov.au/files/sharedassets/public/ecm/willoughby-council-website/publications-reports-master-plans-strategies-action-plans/publications-reports-master-plans-strategies-action-plans/1-clive_park_rap_2016_final.pdf. See also WCC Urban Bushland Plan of Management Part 2, p.108; Willoughby City Council, Native Fauna of Sailors Bay Catchment

[33] Willoughby City Council, Native Fauna of Sailors Bay Catchment

In order to protect local terrestrial and fauna from noise and associated harm, the EIS should first ascertain what wildlife is living locally.

Figure 8 Coastal sill off Clive Park, Northbridge, March 2021. Image: Meredith Foley

Recommendation 17

That the Inquiry recommend that the BLT EIS be revised to include a full biodiversity assessment of terrestrial fauna at Clive Park and in the bushland of the Sailors Bay catchment.

Middle Harbour and Foreshores

The environmental health of these areas has improved dramatically over the last few decades in terms of the clarity of the water, return of sea organisms and of marine fish and animals. The health of these waters, and the fact that they are part of a harbour which is one of the most biodiverse in the world, should be acknowledged meaningfully in the BLT EIS. Coastal and aquatic species have all returned to these waters with the closure of nearby industries and regulation of industrial and sewage inputs, the increased use of gross pollutant traps and

other water screening and protection regulations. [34] We have not forgotten the sight several years ago of a whale appearing at the exact site off Clive Park which is now proposed for dredging, silt disturbance and the placement of a coffer dam.[35] During the year a large seal was seen on a number of occasions swimming in and around piers in local waters.

The SEARs for the BLT EIS indicated concern over the impacts to aquatic habitats due to changes to tidal flushing across Middle Harbour and the disruption of existing (contaminated) sediment. The work to be undertaken will take up to four years as the coffer dams are set up, tunnelling undertaken, and the tubes set in place and then the site demobilised. The construction peak at this site will be when they are dredging and constructing the cofferdams and will be up to two and a half years in length.

Figure 9 Whale sighted off Clive Park, Middle Harbour

As for other areas, the assessments of wildlife in this area have focussed on threatened plant communities and vertebrate species only. It has been known for some time that more than 70 threatened species were at risk from the project including fragile seagrasses which support more than 20 species of endangered seahorses and sea dragons. Dolphins, turtles and whales are seen in the area. Rare fauna such as the endangered Black Rockcod, White's Seahorses, White-bellied Sea-eagle, Grey Nurse Shark (critically endangered) and Southern Myotis could also be affected. Middle Harbour is visited by Little Penguins travelling from their rookery at Manly. This population of Little Penguins is the last colony on the NSW coast. Threatened saltmarsh and seagrass (Posidonia australis) - two marine threatened ecological communities – also occur near the construction area. The shallower habitats closer to shore provide protection for juvenile fish of many local species.

Recommendation 18

That the Inquiry recommend that the BLT EIS be revised to include a full study of marine biodiversity, in addition to those designated as threatened, in the Middle Harbour area.

[34] Marine Estate Management Authority, Sydney Harbour Background Report (2014);

[35] Bryant Hevesi, Hundreds gather to see the amazing sight of whale frolicking in Middle Harbour, The Daily Telegraph, 27 July 2015

Other Impacts on Terrestrial Fauna

Apart from the removal of habitat, there will be a number of major impacts on all species, including threatened wildlife in Flat Rock Gully and Clive Park, over a period of five years or more including:

Noise

The proposed works on the Flat Rock Gully site and at the base of Clive Park would be expected to significantly impact wildlife and interfere with the existing wildlife corridors and ecological linkages across several local catchments. Apart from the obvious impacts arising from the destruction of trees and bushland, the around-the-clock nature of tunnelling and the passage of trucks and people to and from the site will undoubtedly introduce additional noise and night-time light pollution to the previously dark areas in and near these reserves. Exceedances, including night-time noise, are predicted during vegetation clearing, utility modification, access decline excavation and road modification works[36]

The EIS states that,

> *Construction activities would result in localised and temporary noise and vibration impacts; however, as most construction areas occur in highly urbanised areas that are subject to ambient noise, any increase in noise and vibration is not expected to have a significant impact on terrestrial fauna*.[37]

Research has shown that as noise levels increase in an area, abundance and species richness significantly decreases. This problem will be exacerbated at Flat Rock Gully because the natural amphitheatre created by the gully will cause sound to reverberate into and around the area and well beyond the construction footprint. The Australian Academy of Science has reviewed research about noise impacts on wildlife and concluded that anthropogenic noise pollution is affecting animals across multiple habitats, causing animals to alter their natural behaviours or relocate to avoid noisy areas.[38] The BLT EIS adds that "*For less mobile species or breeding individuals, the effects of the high noise levels may be more acute*".

Most animals have specially adapted to the natural noises in their environment —they are aware of them, understand them and know how to use and interpret them. When we start to add **artificial, unfamiliar noises** to soundscapes it can cause a range of problems. It can affect an animal's ability to hear or make it difficult for it to find food, locate mates and avoid predators. It can also impair its ability to navigate, communicate, reproduce and

[36] EIS Chapt 10.6.6

[37] EIS Chapter 19 EIS Table 19-6 p.19-25

[38] Australian Academy of Science, 'Noise pollution and the environment'

participate in normal behaviours. The noise to be added to Flat Rock Gully and Clive Park will be in addition to the usual noise of nearby traffic and from homes around the gully. Cumulative noise can often trigger a tipping point where species leave the area.

The population and diversity of certain bird populations has been shown to decline or change when exposed to continuous noise generated by urban environments, such as roads, cities and industrial sites. By discouraging species sensitive to loud sound, and replacing them with more tolerant ones, noise may also be reshaping ecosystems. This can potentially alter whole food webs and species combinations, resulting in groupings that may never have occurred naturally in the wild. Noise can change an animal's most basic stay-or-go assessments of habitat, and 'prompt more than the usual number of birds on thousand-mile marathons to skip a chance to rest and refuel'.

Bats

Numerous studies[39] have indicated that noise pollution decreases the foraging efficiency of bats, which are acoustic predators. Flat Rock Gully is known to be inhabited by Gould's Wattled Bat, the Grey-headed Flying Fox and the Lesser Long-eared Bat. Studies carried out during the EIS also found the Grey-Headed Flying Fox, the Large Bent-winged Bat, the Little Bent-winged Bat and the Large-eared Pied Bat – all of which are listed as Vulnerable – to be present in bushland near the proposed Flat Rock Gully construction site.[40] The Southern Myotis, which is also listed as Vulnerable, is believed to be present in the open water habitat within Middle Harbour.[41]

Recommendation 19

That the Inquiry recommend that the BLT EIS be revised to include a further expert study of the bats found in Flat Rock Gully – particularly those known to be Vulnerable - and their response to disruption caused by additional noise, light, odour and vibration.

Powerful Owl

Noise pollution could potentially interfere with other acoustic predators, such as owls, in a similar fashion. It is well known to the locals around Flat Rock Gully that a **Powerful Owl** pair roosts and hunts in Flat Rock Gully – the Powerful Owl is listed as Vulnerable and is the top predator in urban bushland, maintaining the balance of species. Their presence of was

[39] Haddock JK, Threlfall CG, Law B & Hochuli DF (2019) 'Light pollution at the urban forest edge negatively impacts insectivorous bats' *Biological Conservation*, pp 236, 17–28; Jones Dr Theresa, 'What happens to wildlife in a city that never sleeps', Pursuit, University of Melbourne;
[40] BLT EIS Chapt 19 pp.19-29
[41] BLT EIS Chapt 19 pp.19-26

confirmed by the EIS which reported that the Powerful Owl was recorded in bushland near the Flat Rock Gully construction site.

Figure 10 Powerful Owl chicks in Northbridge near Flat Rock Gully. Image: Ronwyn North

Guidance[42] provided by the Powerful Owl Coalition to managers of sites where these magnificent birds are located, emphasises the need to maintain suitable dense vegetation along drainage lines and gullies for roosting; protect canopy connectivity; provide natural buffers between development sites and local reserves; and, in particular, prevent proposals to remove more than 1 ha of foraging habitat within 2 km of a nest site. It is important that its core habitat areas are sufficiently away from noise and disturbance.

Recommendation 20

That the Inquiry recommend that the BLT EIS be revised to include a study, in association with BirdLife Australia's Powerful Owl Project experts[43], to determine where the Powerful Owl pair in Flat Rock Gully is roosting, hunting and breeding and the mitigation required to ensure they are not disturbed.

[42] STEP, 'Protecting Powerful Owls in Urban Areas' (2018) p.10
[43] https://birdlife.org.au/projects/urban-birds/powerful-owl-project-pow

Powerful Owls need large, deep hollows, which are increasingly difficult to find in suburban areas. It should be noted there have been few, if any, successes in encouraging Powerful Owls to adopt artificial nest boxes.

While the comments above deal with a handful of species, it is our contention that noise impacts should be known for **all fauna** before construction begins. We note the comment in the EIS that fauna is sensitive to elevated noise and may desert the area at start and that some species may return but "displacement from the immediate area could become permanent"[44]. In order to ensure that displacement of fauna does not become permanent we would suggest:

Recommendation 21

That the Inquiry recommend that the BLT EIS be revised to include a study, utilising peer-reviewed science, in relation to the impact of noise on the fauna of Flat Rock Gully and Clive Park.

Light

Research into light impacts[45] has increasingly noted the adverse impact of 'turning night into day' on indigenous fauna. The glare of artificial lights has a well-documented and drastic impact on native fauna interfering with reproduction and foraging patterns, revealing hiding places to predators, reducing dark cover for prey and blinding animals resulting in vehicle strike, all of which have serious implications for maintaining local biodiversity. There are measures which can be introduced to mitigate some of the damage caused by light spill:

Recommendation 22

That the Inquiry recommend that if the BLT is approved, it be a COA to include measures to prevent noise and light spill which impacts fauna in the bushland next to the construction sites. These can include:

- ensuring that lighting does not impact the full height of trees;

[44] EIS Chapter 19, p.19-64

[45] Jones Dr Theresa, 'What happens to wildlife in a city that never sleeps', Pursuit, University of Melbourne; Kusmanoff, Alex et al, Getting smarter about city lights is good for us and nature too, The Conversation, 16 Dec 2016; La Trobe University, 'How artificial light effects mammals', 30, 09/2015; Newport J et al, "The Effects of Light and Noise from Urban Development on Biodiversity: Implications for Protected Areas in Australia," Ecological Management & Restoration, vol. 15, no. 3, 2014. (see summary); Joanna K. Haddock, Caragh G. Threlfall, Bradley Law, Dieter F. Hochuli, Responses of insectivorous bats and nocturnal insects to local changes in street light technology. May 2019 (see summary); Andrew Taylor, Eastern suburbs council darkens the night sky to reduce light pollution, The Sydney Morning Herald, 28 Feb 2021

- that bright, artificial lighting is kept away from riparian areas, ponds and other core habitats and nesting sites; and
- that motion-activated lights are placed in parts of the site which do not require constant illumination.

Apart from the noise and light mitigation generally applied to development sites, there appear to be no measures developed specifically to protect fauna near construction sites. The EIS seems to take it as a given (but without evidence) that, as the construction areas are in highly, urbanised areas that are subject to ambient noise, any increase in noise and vibration are not expected to have a significant impact on terrestrial fauna[46] and that, if it does, those which are mobile will move away.

Collisions and Accidents

There are a large number of species in Flat Rock Gully which could be injured or killed by human and heavy vehicle traffic and machinery in or near the construction site.

Recommendation 23

That the Inquiry recommend that if the BLT is approved, there be a COA which prescribes the use of fauna exclusion fencing at Flat Rock Gully to keep terrestrial animals out of the construction site.

Contamination

WEPA is concerned that contaminated materials from the exposed tip site and/or accidental oil or chemical spills could be washed by stormwater or wastewater discharges into nearby waterways and onto soil with serious consequences to plant life, wildlife and the Long Bay catchment. We are also concerned as to the possible impacts of Respirable Crystalline Silica (see Attachment E, Diane Staat paper) and other potentially airborne contaminants on plants and animals.

(Refer also to recommendations relating to Contamination in response to (k) of the Terms of Reference.)

Recommendation 24

That the Inquiry recommend that, if the BLT is approved, it be a COA to include detailed plans to prevent contamination from the tip material or from accidental oil or chemical

[46] EIS, Chapt 19, p. 19-63

spills. The emergency remedial action to be taken if such contamination occurs should also be delineated.

Water Quality and Flows

WEPA has several concerns about the impact of changes to water quality and waterway flows on native fauna through diversions, wastewater release and flooding.

Recommendation 25

That the Inquiry recommend that the BLT EIS be revised to include the impacts on local wildlife of the diversion of Flat Rock Creek, which is currently above ground, of a culvert which will cover it.[47]

Wastewater

The BLT EIS notes that 711 Kl/d will be flushed down Flat Rock Creek each day during construction. More wastewater is likely to move into Flat Rock Gully during rain due to the impervious and/or compacted surfaces in the construction footprint.

Recommendation 26

That the Inquiry recommend that the BLT EIS be revised to explain the impacts of wastewater changes to Flat Rock and Quarry Creeks and thus the quality and flow rates of the water currently supporting bushland, trees and fauna in Flat Rock Gully.

Salinity and Sedimentation

There would also appear to be a potential for high levels of salinity and sedimentation to be introduced into the local waterways, due to the local geography, which would impact local aquatic and marine organisms.[48]

Recommendation 27

That the Inquiry recommend that, if the BLT is approved, it be a COA that consultants (independent of contractors) be engaged to measure water quality in the creek before, during and after construction to check for scouring, contamination from the site and elevated salinity and sediment levels. Make this information publicly available in a revised EIS.

[47] EIS p.19-65

[48] As confirmed in BLT EIS Appendix N Groundwater – Chapter 4.

Water Quality Improvements

Recommendation 28
That the Inquiry recommend that, if the BLT is approved, there be a COA that funds be set aside to install permanent water quality improvement devices that capture rubbish and improve water quality with sediment and nutrient management. The suitable infrastructure should be determined in consultation with Sydney Water and WCC as a form of offset.

Flooding

The BLT EIS is unclear as to how the tunnel builders will deal with the high level of flood water run-off into Flat Rock Creek and Flat Rock Gully.[49] There appears to be little assessment of the flooding impact on the Flat Rock Gully 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 Park. This information should inform the health risk and waterways assessment.

Recommendation 29
That the Inquiry recommend that the BLT EIS be revised to include an extended flood study covering the construction site at Flat Rock Gully and Flat Rock Creek as it continues into the gully and to Tunks Park.

Recommendation 30
That the Inquiry recommend that the BLT EIS be revised to include an explanation of the impacts on the creek and wildlife associated with these drainage works and to detail mitigation methods.

Recommendation 31
That the Inquiry recommend that the EIS be revised to clarify the method of wastewater treatment, where it will occur and the level to which the water will be treated.

Recommendation 32
That the Inquiry recommend that the EIS be revised to make provision for water monitoring stations around the Baseball Diamond in Bicentennial Reserve and in Long Bay to assess run off results. Run off modelling should be completed once an expanded flood study is done.

[49] Flat Rock Creek Flood Study 2018; ABC News Flood water spills over barriers in Naremburn, Sydney.

Flow Reductions

The EIS notes that there is a potential for a reduction in some flows during and after construction eg a 20% reduction at the end of construction into Flat Rock Creek and a 23% reduction in baseflow into Quarry Creek at the end of construction and continuing to decline[50] These reductions will surely have an impact on water flows and quality.

We were told at a Transport information session that Willoughby City Council also plans to draw water from Flat Rock Creek below the construction site to water their playing fields following construction and that this would be factored into the design.

Recommendation 33

That the Inquiry recommend that the BLT EIS be revised to include advice on the impacts of these longer-term reductions in flow in Flat Rock Creek on wildlife in Flat Rock Gully.

Groundwater drawdown

Tunnels create drawdown which can lead to instability, settlement and/or subsidence and changes to the existing water table. The drawdown is predicted to be significant for this project both during and after construction.

We are also concerned that groundwater drawdown (of up to four metres by 2028 and 11 metres by 2128)[51] caused by the construction, which is predicted to occur further downstream in Flat Rock Gully will, over time, and particularly in times of drought, lead to trees and bushland vegetation becoming highly stressed and/or dying and potential settlement and contamination issues to arise.[52]

The underground tunnel will impact groundwater levels and also has the potential to spread contamination around and downstream from the site. (BLT EIS Appendix N page 88 notes the potential for further contamination as works can create contaminated plumes). In addition, the flushing of large quantities of wastewater downstream potentially exposes Flat Rock Creek to a level of scouring and water quality which is not fully addressed in the EIS.

[50] EIS p.19-66. See also video of March 2021 flood water in Flat Rock Gully, Kristina Dodds: www.facebook.com/100008843199802/videos/pcb.1129502967496293/2514922662145816
[51] EIS p.19-67
[52] EIS p.19-49

Recommendation 34
That the Inquiry recommend that the BLT EIS be revised to map the potential areas impacted by drawdown and provide appropriate offsets including those based on a worst-case scenario as a precautionary principle in the COA. These should cover riparian areas and Threatened Ecological Communities.

Recommendation 35
That the Inquiry recommend that, if the BLT is approved, it be a COA to provide appropriate funds for Willoughby City Council to continue to monitor groundwater drawdown in the long term – for a minimum of 50 years. The COA should include a clear allocation of responsibilities.

Recommendation 36
Additional modelling based on the lining of the tunnel beneath Flat Rock Creek was mentioned in the BLT EIS.[53] That the Inquiry recommend that the BLT EIS be revised to confirm whether or not this lining will be implemented in order to prevent high levels of long-term groundwater drawdown.

Impacts on Marine Fauna
WEPA is concerned that the construction site planned for the end of Clive Park will have an unacceptable impact on marine fauna in this area through the destruction of foreshore areas, the dredging of the harbour floor, the potential for existing contamination to be redispersed, the storing of contaminated materials and the increase in marine traffic on Middle Harbour and across to Spit Point. There is also a potential for Clive Park to be contaminated and the foreshores permanently damaged and unable to sustain aquatic organisms.

Recommendation 37
That the Inquiry recommend that the BLT EIS be revised to consider alternatives to immersed tube tunnels involving less disturbance to sediment, such as a tunnel through bedrock or a submerged floating tunnel.

Habitat destruction
Clive Park's foreshore area is a relatively pristine part of Middle Harbour which has not been built on, in contrast to other foreshore areas in the vicinity. It is alarming to note that the

[53] refer to BLT EIS Chapter 16 (Geology, soils and groundwater) and Appendix N (Technical working paper: Groundwater)

EIS provides for a coffer dam close to the extended rock sill at the intertidal level off Clive Park.

Recommendation 38
That the Inquiry recommend that the BLT EIS be revised to provide detail of the process intended for protection and/or reinstatement of natural habitats like the sill at the edge of Clive Park provided at the level of detail needed to assess the potential for habitat recovery after the works.

The current construction methodologies (BLT EIS, chapters 13, 16, and 17) indicate that during and post construction, new potentially contaminated sedimentation will overlay the Clive Park Beach, foreshore and bay, and wider sea floor areas. The current EIS high level modelling indicates some 2-10mm of toxic sedimentation (containing re-animated toxins, heavy metals and odour release) will be deposited on areas used by wildlife, the public and in particular young children.

Contamination, turbidity and sedimentation
The project plans for Middle Harbour has the potential to dredge and remove tonnes of sediment contaminated by heavy metals, pesticides, potentially per- and polyfluoroalkyl substances' (PFAS) and tributyltin (used in shipworks), which has been banned world-wide since 2008 as it causes sex changes in marine organisms. These contaminants have been detected in Middle Harbour and found to be above 'safe levels'[54] However, only limited sampling seems to have been conducted at the Middle Harbour construction site.

Recommendation 39
That the Inquiry recommend that the BLT EIS be revised to include a detailed contamination analysis of the sea floor in the area of the proposed construction to provide a baseline for measuring contamination and to determine the full impacts on the sea floor, the foreshore, beaches and water quality during and after construction and at different times and flows.

Silt Curtains
The re-animation of toxic sediment has the potential to create toxic and turbid plumes of water that could impact aquatic life for several kilometres around the disturbed site.
This issue has been addressed in the BLT EIS by the proposed use of a series of silt curtains to alleviate the risk of contaminated material impacting surrounding waters. Questions have been raised previously about the ability of these silt curtains (which will not be fully

[54] BLT EIS Table 1, Annexure C, Appendix F

anchored) to operate effectively in such a deep area. For example, the US EPA has recommended that:

> *As a generalisation, silt curtains and screens are most effective in relatively shallow quiescent water. As the water depth increases and turbulence caused by currents and waves increase it becomes increasingly difficult to effectively isolate the dredge operation from the ambient water. The St. Lawrence Centre (1993) advises against the use of silt curtains in water deeper than 6.5m or in currents greater than 0.5m/s*. [55]

The BLT EIS states that the maximum depth in Middle Harbour where the immersed tubes are being laid is 34 metres, but the silt curtains will only have a draught of 12 metres. The Australian Marine Science Association[56] has noted previously that shallow silt curtains will not be effective at full containment of contaminated resuspended sediments. Full length silt curtains anchored to the sea floor are the only viable method of restricting the movement of fines. It should also be recognised that silt curtains cannot prevent the complete dispersal of toxic sediment created by dredging which will be compounded by wind, tide and vessel movements.

The Sydney Metro - Chatswood to Sydenham EIS states that an immersed tube design was assessed and not selected due to the high contamination risks to Sydney Harbour. Given this was the case why is this EIS proposing an immersed tube for such a sensitive area of Middle Harbour where there are known contaminants?

There needs to be clear strategies to counteract the release of contaminants into Middle Harbour following storms and due to potential damage to the silt curtains during construction.

The BLT EIS also seems to be silent on the possible contamination of waters by oil leakages from equipment and barges. Contamination by oil spills can be fatal, for example, for Little Penguins if the oil adheres to their feathers as it interferes with their thermoregulation by allowing water and cold air to contact their skin. It is also toxic if ingested by the penguin. [57]

Recommendation 40

[55] U.S. Environmental Protection Agency, 1994 & DOER, 2005
[56] Australian Marine Science Association submission to the WHT EIS.
[57] Penguin Foundation, Penguin Jumpers, nd; NSW Department of Planning, Industry and Environment, 'Little Penguin', April 26 2019; NSW Environment, 'Environmental Impact Assessment Guidelines, 'Endangered Population of Little Penguins (Eudyptula minor) at Manly', Feb 2003

That the Inquiry recommend that the BLT EIS be revised to identify events which could cause damage to the silt curtains and, if the BLT is approved, it be a COA that:

1. the silt curtains extend to the sea floor
2. the silt curtains be regularly checked for effectiveness
3. that dredging work cease after an event which could cause damage to the silt curtains until such time as the curtain has been inspected and cleared
4. that a remediation plan or budget for compensating for spills or accidents be developed.

Recommendation 41

That the Inquiry recommend that the BLT EIS be revised to develop a detailed plan for dealing with contamination due to spills of oil and other contamination and make provision for compensation due to these event.

Waste

Much of the material to be dredged is expected to be classified as "controlled waste," which requires the NSW EPA to authorise any disposal plan. The potential of significant foreshore water pollution is also mentioned in the scoping documents. The BLT EIS notes that 10,000m^3 of contaminated sediment will be barged out of Middle Harbour past Clontarf and Balmoral Beaches to be dried out before being trucked to a licenced facility. Neither the drying point nor the disposal site have been revealed.

Recommendation 42

That the Inquiry recommend that the BLT EIS be revised to detail the drying point for the contaminated waste and the transport route for its disposal.

Altered hydrodynamics

The EIS states that a permanent alteration of hydrodynamics would occur due to the installation of the immersed tube tunnel [58] Chief among the impacts would be a reduction in the natural flushing of upstream environments which could lead to the death of marine life. Modelling of sea currents has been done on the assumption that the silt curtains have a draught of 12 metres. If the silt curtains go deeper this has implications for the sea current modelling as it applies during construction.

Recommendation 43

[58] BLT EIS pp.19-69 -70

That the Inquiry recommend that the BLT EIS be revised to include updated modelling on the impact on currents of full-length sea curtains to ascertain what impact this may have on marine life and whether any additional protective measures need to be implemented.

Underwater and terrestrial noise

The EIS acknowledges that underwater noise will have an impact on marine life. In most cases it believes that the noise will deter aquatic animals from approaching the site. This does not account for aquatic animals already close to the construction when the noise commences. The vulnerable **Little Penguin**, for example, is known to fish in the Middle Harbour waters. It can experience hearing loss or damage to auditory tissues due to an encounter with sudden or high levels of sound. The mitigation provided is to adopt '*an observer qualified to spot Little Penguins*' and call a stop to marine construction activities. [59] This would seem to be an almost impossible task given that Little Penguins are always difficult to see in the water, the water is likely to have chop and possibly be turbid.

Recommendation 44

That the Inquiry recommend that the BLT EIS be revised to include a proposal for barriers which will safely exclude marine animals from the Middle Harbour construction area in order to safeguard vulnerable species such as the Little Penguin.

Noise could also have negative impacts on the **Southern Myotis bat** which is recognised by the EIS as likely to be roosting near and fishing in these waters. The Southern Myotis, which is listed as Vulnerable under the Biodiversity Conservation Act, is easily displaced by human disturbance, particularly during the breeding season in November to December.[60]

Recommendation 45

That the Inquiry recommend that the BLT EIS be revised to include a field study to be undertaken in and near Clive Park to check for the roosts of Southern Myotis and the revised EIS should include any practices advised by experts which might limit their disturbance.

There is the potential for noise to be a major **threat** to the **White-bellied Sea-Eagles**[61] nesting in a nearby bay. This pair are regularly spotted flying over the Middle Harbour region. Disturbance of nesting pairs can cause them to abandon their nests, especially

[59] EIS Chapter 19, p.19-64
[60] NSW Office of Environment and Heritage, Southern Myotis – profile, 7 Aug 2020
[61] NSW Office of Environment and Heritage, White-bellied Sea-Eagle

during the early stages of the breeding season, and they may desert nests and young entirely if exposed to the noise and movement of construction and human activity.

Recommendation 46

That the Inquiry recommend that the BLT EIS be revised to include the location of the White-bellied Sea-Eagle nest, to be ascertained in consultation with the relevant Councils and that the revised EIS include plans to mitigate disturbances particularly during the breeding season.

Boat strike

Watercraft pose a unique threat to the Little Penguins because the birds sit low (within the top metre) of the water where they cannot easily be seen. They also blend in on the surface when the water is choppy. Research in Perth on **Little Penguins** found that over a quarter of recorded deaths was due to being hit by boats or propeller strikes.[62] Boats generally travel at speeds far faster than penguins that find it hard to get out of the way. So, "*if there are increasingly more boats in the same areas that are used by the penguins, then the likelihood of impacts will be higher*." As noted above, the presence of a Little Penguin spotter is unlikely to be effective and better outcomes may be achieved by instituting slower speeds for the barges and a form of exclusion fencing placed around the construction site and barge routes.

Recommendation 47

That the Inquiry recommend that the BLT EIS be revised to include expert advice on ways to further minimise boat strike in relation to Little Penguins and other marine animals with particular reference to the speed limits for the barges which will be plying across Middle Harbour to the Spit.

Wildlife Mitigations

The proposed mitigation measures contained in the BLT EIS to protect wildlife during construction are weak. Checking that no animals are in the way with a ground survey 24 hours before construction or having people 'spot' them from barges and remove them during construction seems doomed to failure as it will not be the main focus or within the expertise of most involved in the construction.

[62] Nicholas S. Phillips, Humans kill a quarter of Perth's Little Penguins Western Independent, September 20, 2016

Acting only on the assumption that the noise, lights, construction, contamination etc will merely drive wildlife on land and in the water away is, on any measure, basically a withdrawal of responsibility for mitigating impacts on biodiversity in this area. No evidence has been provided for the assertion that this will be temporary and at times the EIS admits that wildlife may be permanently driven away.

WEPA calls into questions the assessments made, and mitigations suggested, for threatened species and ecological communities listed under the EPBCA that are in the path of the project. The EIS maintains that the project does not require referral to the Australian Minister for the Environment. As noted above, some of these assessments appear to be incomplete and the mitigations prepared without expert advice. This would seem to undermine the assertion by the EIS that the project would not have a significant impact on these species and call for further work to be done in protecting these threatened species.

Recommendation 48
That the Inquiry recommend that the BLT EIS be revised to provide more detailed assessments, compiled with the aid of experts in each species, on the likely impacts of construction on threatened species and mitigations which might feasibly reduce this impact.

Biodiversity Offsetting

The only compensation offered for the potential impacts on threatened species likely or found to be in the areas (not the full biodiversity of fauna and plants destroyed or displaced) looked at in the EIS will be via the controversial system of biodiversity offsetting. Just over 440 biodiversity credits will need to be purchased for destroyed ecosystems and 1,099 credits for the potential impacts on threatened faunal species across the complete construction footprint for this project.[63]

The key principle of the Biodiversity Assessment Method (BAM) is 'no net loss', where impacts of development in one place are offset by improving the condition of vegetation or habitat at another Biodiversity Stewardship Site. Importantly, developments cannot proceed simply by securing the required offsets, they are required to firstly demonstrate avoidance, minimisation, and mitigation of impacts through reasonable measures prior to offsets being used. However, the BAM only considers **threatened** species, populations and communities listed under NSW legislation as well as Matters of National Environmental Significance (MNES) under the (EPBC Act).

[63] BLT EIS 19-81

The problems with its application have been fully discussed elsewhere.[64] Biodiversity credits are likely to be applied to areas far from the construction footprint. It has often been hard to find offsets which meet the criteria, or which are 'like for like' in urban environments and thus the offset guidelines have been amended to allow for monetary credit (for education and research) if on-the-ground offsets cannot be found.

It is important that action of this sort is fully informed. While our national parks and wilderness areas are essential to ensure the survival of our biodiversity, it has become apparent to researchers in recent years that urban areas are also significant if we are to stop further extinctions.[65] In fact, 25% of Australia's nationally listed threatened flora and 46% of threatened fauna is found in urban areas.[66] We cannot continue to sacrifice our 'biodiversity for bitumen'. To do so is a failure on the Government's part to meet the requirements of intergenerational equity.

This policy, which allows for the destruction of biodiversity in one area, as long as it is protected somewhere else in NSW, remains a recipe for local extinction.

Recommendation 49
That the Inquiry recommend that, if the BLT is approved, it be a COA that offsets can be applied to Flat Rock Gully and other local bushland. This additional work could include the provision of nest boxes and rock habitats for displaced wildlife and long-term bush regeneration in Flat Rock Gully Reserve, Tunks Park and Clive Park.

Other Impacts on the Environment

The projects will also have many other impacts on the environment, both during construction and operationally, which could be avoided were alternatives to be considered. This includes the loss of sailing courses in Middle Harbour due to construction of the

[64] Eg Rachel Walmsley, Endorsing extinction is not a 'minor' admin task, EDO, 14 Nov. 2019; STEP, 'Assessment of Biodiversity Offsetting – A Fail and Worse to Come, 15 June 2017; Philip Gibbons, 'A tree for a tree: can biodiversity offsets balance destruction and restoration? The Conversation, Oct 5 2011; Martine Maron and Ascelin Gordon, 'Biodiversity offsets could be locking in species decline', The Conversation, June 6 2013; Lisa Cox, 'Development should stop: serious flaws in offsets plan for new western Sydney airport, The Guardian, Feb 17 2021; Lisa Cox, 'It's an ecological wasteland': offsets for Sydney toll road were promised but never delivered' The Guardian, Feb 10 2021

[65] Brendan Wintle and Sarah Bekessy, 'The small patch of bush over your back fence might be key to a species' survival, The Conversation, Dec 13 2018

[66] Australian Conservation Foundation, 'New Report reveals extinction crisis in the suburbs', Aug 5 2020

immersed tube tunnels; the loss of visual and aural amenity due to construction of immersed tube tunnels; and traffic impacts including those outlined below.

Figure 11 Pre-schoolers on the Flat Rock Gully site to be cleared for the BLT tunnel.

Climate Change

It is indisputable that Australia and the rest of the world is in the midst of a climate emergency. There is a clear urgency for our nation to grapple with this future. Yet in the case of the BLT the Government has decided to construct a road tunnel which will continue, for decades, to encourage and promote people to take single occupant cars (which will, for the foreseeable future, be primarily combustion engines burning petroleum or LPG) for commuting and travelling. The project is not consistent with NSW greenhouse gas emissions reduction policy and Net Zero by 2050 goals to deal with climate change. The BLT will contribute significantly to greenhouse gas emissions both during construction and as a result of the escalating number of cars using it (even if this traffic includes electrical vehicles). The EIS states yearly operation emissions of 45.3 kt in 2027, which will then rise each year to 52.5kt by 2037, which equates to one single tunnel contributing 0.04% of the emissions of the entire state of NSW.

Transporting Spoil – Risk of Contamination and Traffic Accidents

The EIS covers the spoil from tunnel construction including contaminated spoil being dug up and trucked for disposal or dredged and barged out via our waterways. WEPA objects to the

following:

- that over 3 million tonnes of ground-based spoil, removed as part of the Beaches Link Project, will be trucked through local suburbs and dumped at an unknown location;
- that 153,000 cubic meters of sediment from Middle Harbour would be dumped at sea;
- that 10,000 cubic meters of contaminated sediment will be barged out under the Spit Bridge, past beaches and dried at an unknown location;
- that 900 additional vehicle movements per day will service the Flat Rock Drive site and there will be 590 vehicle movements per day at Cammeray with associated noise, contamination, vibration and safety risks; and
- that 500m^3 of spoil is permitted under the EIS to be stored outside of sheds at Flat Rock and 4500m^3 at Cammeray - this presents a significant dust risk to the area.

WEPA received an email from Transport for NSW in February this year[67] advising that trucks carrying spoil from the Flat Rock Drive site and returning to it will be travelling across the Sydney Harbour Bridge.

The email states that trucks crossing the bridge carrying spoil during the period of construction will be:

> ***Flat Rock Drive site***
> *900,000m3 (X 2.2 tonnes per m3) - roughly 2,000,000 tonnes of spoil*
> *Divide by 30T for each truck and dog*
> · *67,000 loads out*
> · *67,000 empty in*
> *Also materials for fit out.*
>
> ***The whole project generates***
> · *3,000,000m3*
> · *6,600,000T*
> · *220,000 full loads of spoil* .

In relation to the Balgowlah construction site, there also appears to be a strong possibility that spoil from that site will be crossing the Harbour Bridge with the same number of trucks

[67] Email from Shannon at TfNSW to John Moratelli, 19/2/21 at 16:35, form submission #24251

returning empty across the bridge. If one assumes that all spoil will be transported across the Harbour Bridge this equals 440,000 truck movements across the bridge during construction.
The email included a photo of the 'truck and dog' trucks it said would be used –

Figure 12 Truck and dog. Image: NSW Transport

No modelling of the risk of an accident involving one of the spoil trucks occurring on the Harbour Bridge has been done. This is despite that fact that the braking distance and momentum of these trucks is such that an accident is likely to be catastrophic should it occur. Such an accident would likely cause considerable delay for many, many thousands.

Recommendation 50
That the Inquiry recommend that the EIS be revised to model the risk of an accident involving a spoil truck travelling across the Harbour Bridge, and the consequences and costs of same, on the assumption that all trucks carrying spoil from both the Flat Rock Drive site and the Balgowlah site will be travelling across the Harbour Bridge and on the assumption that no contaminated spoil will be able to be encapsulated onsite.

Loss of Green Spaces
While 88% of Australians live in urbanised areas, Sydney is unique among Australian capital cities in having urban bushland so close to the city centre. This is an important feature in making the city and our suburbs liveable and in attracting tourism to our city. The loss of this bushland will have a devastating impact on the local community and the many people who use the gully for walking and passive recreation and find its upper reaches, proposed for the construction site, to be most accessible.

The importance of the tree canopy, of which urban bushland is a particularly important part,

is well recognized. Since the Premier's announcement in 2018 that the Government would commit to planting 5 million new trees in a bid to reduce the heat island effect growing across urban areas we have seen this intent raised by the Government on a multitude of occasions[68]. The hundreds of trees which will be lost from Flat Rock Gully (and the Seaforth, Wakehurst Parkway and Manly Dam sites) during construction will be mature, established native trees which are particularly important for:

- providing habitat for urban wildlife – the gully's mature trees provide hollows for birds and animals;
- connectivity for wildlife corridors;
- reduction of the 'urban heat island effect' and assisting climate change mitigation;
- improving air quality;
- providing contact with nature for people;
- providing opportunities for amenity and recreation;
- energy conservation;
- prevention of soil erosion (particularly important as the construction site is at the top of a steep creek which drains to Middle Harbour);
- improved water quality; and
- improved 'liveability', property values and other economic benefits.

Sydney's green urban canopy is a patchwork of remnant urban bushland, parks and reserves, backyards and street trees. It is constantly being eaten into by residential and industrial infrastructure development, the sale of crown lands, rezoning and the covering of vegetated ground with artificial turf and concrete. The removal of the trees and bushland at the Flat Rock Gully construction site will have an immediate impact not only on natural biodiversity but also on air quality, temperatures and liveability for users, many of whom come from all over Sydney, and local residents. There will also be a loss of greenspace at the Cammeray Golf Club to make way for permanent utility sheds for the Beaches Link Tunnel. The noise and construction at Clive Park will seriously limit its use as a site for recreation, passive enjoyment and sailing.

[68] Lisa Visentin, 'Sydney to be cooled by an extra five million trees by 2030', The Sydney Morning Herald, April 11 2018

The importance of these green spaces to communities under stress has been highlighted during the COVID-19 pandemic as numbers have threatened to overwhelm existing community parks, national parks and local bushwalking tracks. It will only increase as our need, under climate change, for a respite from heat grows.

TRAFFIC

During Construction

There will be additional congestion, noise, vibration, pollution, parking issues and pedestrian hazards inflicted on residents, school children and motorists in Northbridge, Willoughby, Artarmon, Crows Nest, Cammeray and Naremburn during the estimated 5 years of the construction of the Beaches Link.

There will also be the cumulative impact of the Western Harbour Tunnel, Warringah Freeway Upgrade, Beaches Link dive site and construction at the former Channel Nine site nearby in Artarmon.

> *The intersection of Ben Boyd Road and Military Road would operate with longer delays as a result of the project due to changes to access and travel patterns at the Ernest Street and Falcon Street interchanges.* [69]

Other roads impacted include Flat Rock Drive and Brook Street. This is a narrow local road which services the connection from Northbridge via Naremburn to the city. Dozens of schools on the Lower and Upper North Shore use this route as their school bus route. Brook St is also a significant active transport link from Willoughby to North Shore schools especially Cammeray due to zoning. Keeping children safe along this corridor will be a challenge for residents with the many dead-end streets along this corridor exiting onto Brook Street.

During Operation

The motorway developers appear to have calculated that extra volume on the motorway system justifies heavier traffic on our local streets and villages. The traffic report shows delays at intersections in the 2027 morning peak by comparing their performance without the tunnel and with the tunnel. The percentage below indicates the extra traffic delay that results from the tunnels:

INTERSECTION	EXTRA DELAY

[69] Western Harbour Tunnel and Warringah Freeway Upgrade Technical working paper: Traffic and transport, p. 236

Amherst Street/West Street	+80%
Amherst Street/Miller St	+81%
Miller Street/Ernest Street	+76%
Military Road/Ben Boyd Rd	+327%
Falcon Street/Merlin Street	+46%
Berry Street/Walker Street	+66%

Data source: WHT&WFU EIS p. 9-23 to 24

Extra delay in local streets means inconvenience for drivers and danger for people walking to school or the shops. Our community is already living with a major motorway cutting through it. This project will enlarge the motorway and concentrate traffic at restricted entry points, encouraging 'rat runs".

ToR (k) the adequacy of processes for accessing and responding to noise, vibration and other impacts on residents, during construction and operationally

The following comments relate to the adequacy of processes for accessing and responding to:

- contamination
- vibration
- air quality
- noise
- impacts on Aboriginal cultural heritage and
- marshalling.

The processes for responding to threats to residents from contamination in both the WHT and BLT EIS and in works undertaken to date have shown themselves to be inadequate. Processes for responding to threats to residents from noise and vibration have, from West Connex experience, also shown themselves to be inadequate. The lack of compliance with and enforcement to date of COAs applying to the WHT demonstrate that the processes aren't working.

CONTAMINATION

Failure to protect against risks from contamination from WHT

The WHT proceeded to approval with only a Phase 1 assessment of contamination being completed. The purpose of a Phase 1 assessment is to identify potential contamination, not to quantify it or suggest how it should be managed – this, later, detailed assessment is called a Phase 2 assessment. This is problematic as many aspects of the project such as waste removal and remediation cannot be planned for without a Phase 2 assessment. The

BLT EIS has also not included any Phase 2 assessment, but this is unfortunately does not seem to be a barrier to approval given the approval of the WHT without one.

Instead, the Department of Planning Industry and Environment (DPIE) imposed a COA on the WHT which required a Detailed Site Investigation (DSI) to be undertaken by a Contaminated Land Consultant, before construction starts, where a site has been identified in the EIS as being at moderate to high risk of being contaminated (COA E115). The DSI and the DSI report is the Phase 2 assessment.

COA E116 requires a DSI report to be provided to the Planning Secretary 'for information' and sets out certain requirements for the report.

The DSI report, should be placed on the Transport for NSW website, before construction starts (COA B15). There is no requirement that the DSI report remain on the website for a specified time before work commences to enable it to be considered by residents, other stakeholders or regulators such as the EPA, which is itself problematic.

Construction for the WHT began at the Ridge Street site, within St Leonard's Park, without the DSI report being finalised and without it being published on the Transport for NSW website. Standard contamination management measures required by the COA, such as dust screens and run-off controls also appear not to have been implemented prior to excavation commencing, despite the proximity of the site to a pre-school.

Of the three DSI reports prepared to date - Ridge Street, North Sydney; Rosalind Street, Cammeray; and Arthur Street, North Sydney – the first two involve a site carved out of a park and one in close proximity to a school, respectively. They do not adequately protect school children, and other sensitive users, as they:

- do not consider impacts, and transmission pathways, off-site as required by the COA.
- assess contaminants according to generic industrial/commercial health-based investigation levels rather than the more rigorous recreational/residential levels. There would be exceedances of benzo(a)pyrene at all sites and lead at Arthur Street if samples at the sites are assessed against recreational/residential levels.
- in Rosalind Street asbestos and polycyclic aromatic hydrocarbons reported in the WHT EIS have been ignored, on the basis that it couldn't be confirmed that the samples referred to in the EIS showing the presence of those contaminants were taken within the site.

The Ridge Street issues were reported to the DPIE, on 9 April, but no enforcement action has been taken. The recently published Rosalind St and Arthur St DSIs have also been reported to the DPIE for investigation.

These and other issues were raised with Transport for NSW at a meeting attended by WEPA on 15 June 2021. Minutes of the meeting haven't yet been prepared but our notes are that Transport for NSW does not acknowledge any breach of the COA in relation to Ridge Street and is of the view that it can commence work once contamination investigations reach a particular stage without the need to have finalised the DSI report, notified the Planning Secretary of the report, or published the report on its website. It believes this on the basis that it is only required to provide the DSI report to the Planning Secretary 'for information'. Given that there is no requirement for the report to remain on its website for a stipulated period, its argument has some substance.

Whichever way one views the situation it is unsatisfactory as the result is that there is no independent oversight of the adequacy of a Phase 2 assessment before construction which may cause contamination commences. A Contaminated Land Consultant does not provide this oversight and should be contrasted with a site auditor accredited under Part 4 of the *Contaminated Land Management Act 1979*.

The failure to effectively manage contamination risks directly impacts resident's access to recreation due to identified threats including to Bicentennial Park and Flat Rock Gully from disturbance of a former tip site; and to Middle Harbour (including the learn-to swim site at Clive Park) and Northbridge Baths from disturbance of contaminated sediment.

Insufficient Phase 1 assessment - Flat Rock Gully and environs

The main temporary dive site for the Beaches Link tunnel is proposed to be placed in the Flat Rock Gully Reserve at the top of the steep descent into Flat Rock Gully. This is an old land fill site with known contaminants which are still to be fully tested. It is also likely to be unstable due to the nature and depth of the fill and its uncontained nature at its edge. Flat Rock Gully is in a major catchment area and is subject to major flooding.

The process of contaminated site assessment should commence with a detailed assessment of sources of potential contamination from current or past activity – the best information can be found in the detailed records of those who used to operate facilities on a site, in particular through interviews with former employees. In addition to detailed records of the facilities, there are general pieces of publicly available information that should be reviewed

such as historical aerial photographs, council records, EPA notices, land titles, historic society information and libraries.

This Phase 1 assessment, which can include limited sampling where necessary, identifies what activities were carried out and where, so that a sampling analysis and quality plan can be developed to determine locations to sample and what to sample.

The BLT EIS has done this inadequately. It recognises that, from the 1940s, industrial and domestic waste was tipped and burnt in the area on both sides of Flat Rock Drive and into Flat Rock Reserve, ceasing in 1985, and that the landscaped area on the east side of Flat Rock Drive is situated on about 30 metres of landfilled waste material and soil fill. It also recognises that up to 40 metres of fill have been placed along Flat Rock Creek.[70] One of the sources used is a local history by Robert F McKillop *Managing our Waste* (2012). [71] There are also references to notifications under the *Contaminated Land Management Act 1979* (CLMA).

However, declaration 21033, made in April 2003 pursuant to the CLMA in relation to Tunks Park, which is downstream from the former landfill site, is not included in Table 4.4 in the EIS. This may be because it's not under current management under the CLMA but this makes it no less relevant to a proper preliminary site investigation, given that the contamination leading to the declaration likely emanated from the landfill site. In this respect investigations should be carried out as to what is known about the source, degree and type of contamination leading to the declaration. Also, based on anecdotal information, not all the potential contaminants identified in McKillop are properly reflected in *Table 4-15: Potential contamination sources*.

The table mentions three sites – Bicentennial Reserve, Willoughby Leisure Centre, and Flat Rock Reserve. It identifies potential contamination sources and potential contaminants but fails to identify the very large Hallstrom refrigerator plant and the potential contaminants from it, despite its close proximity and despite the area being used as a tip at the relevant time. It states that *'Prior to 1971, filling comprised putrescible materials'* despite this assertion being contrary to McKillop.

[70] BLT EIS Appendix M page 22
[71] Robert F.McKillop, Managing Our Waste (2012)

Hallstrom refrigerator factory

The Hallstrom refrigerator factory produced the 'Silent Night' fridge – in very large quantities after WWII – 1200 per week at its peak.[72] The Museum of Applied Arts and Sciences has an example in its collection. It describes it as follows:

> *This is an example of the famous Hallstrom 'Silent Knight' electric refrigerator made in the Sydney suburb of Willoughby in 1958 by Hallstroms's Pty Ltd. ……Cream painted sheet metal refrigerator cabinet with right hinged door, curved sides and a horizontal chromed steel handle. …. Inside the refrigerator are four chromed wire shelves with silver and white aluminium front finishing strips. …..By the mid-1940s Hallstroms Pty Ltd was turning out 1200 refrigerators per week and employed over seven hundred people,……*[73]

McKillop, states:

> *Dr David Pope served as the medical practitioner for the factory employees. Hallstrom personally told him that he had selected this site for the factory, because it was near the Flat Rock Creek, which made it convenient for him to discharge effluent and other rubbish into the creek.*[74]

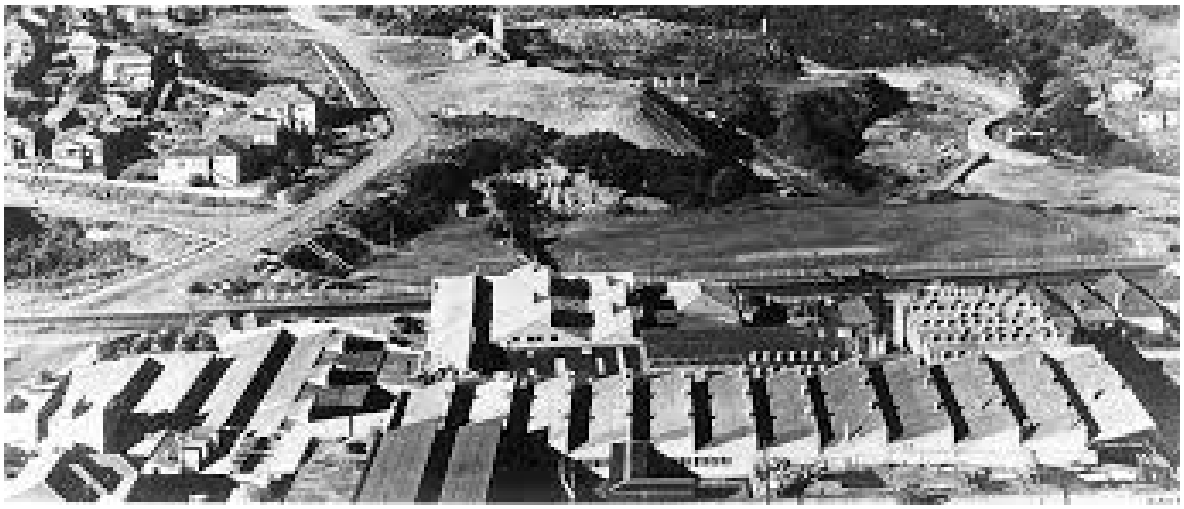


Figure 13 A view of the Hallstrom refrigerator factory in the foreground along Willoughby Road, Willoughby. Beyond the factory is the incinerator and the tip which extended to Flat Rock Gully. Image: Picture Australia

[72] McKillop p 41
[73] Hallstrom refrigerator - MAAS Collection
[74] McKillop, p.40

Given the above, effluent from the chrome plating process must be considered a potential contaminant. It is recognised that one of these contaminants is hexavalent chrome – a powerful carcinogen which featured in the movie *Erin Brokovich*.[75] Another is cyanide.[76]

Medical Waste

A number of members of the community have mentioned to the author of this submission that medical waste from Royal North Shore Hospital was also dumped at the landfill site. This is consistent with information in McKillop that the landfill site was used as the rubbish disposal site for North Sydney Council and would make sense given the close proximity of the hospital to the site. The proponent should undertake further investigation in this respect.

Recommendation 51

That the Inquiry recommend that the BLT EIS be revised to include a comprehensive and thorough review of all available historical data and current community knowledge to ascertain potential contaminants to inform testing.

Recognised potential contaminants but no Remediation Action Plan – Flat Rock Gully and environs

Despite the shortcomings in the preliminary site investigation the EIS makes it clear that there are considerable contamination risks associated with the proposed Flat Rock Drive construction support site in Flat Rock Reserve:

> *The historical landfill activities carried out within the areas surrounding the Willoughby Leisure Centre, Bicentennial Reserve and part of Flat Rock Reserve are likely to contain soil, groundwater and possible landfill gas contamination sources associated with the historical buried waste mass - Soils/wastes: The likely exposure of contamination (including asbestos) beneath the Flat Rock Drive construction support site (BL2) during construction of the access decline tunnel and associated works presents a moderate contamination risk - Landfill gas: It is possible that the waste mass beneath Flat Rock Drive construction support site (BL2) and the adjacent Willoughby Leisure Centre and Bicentennial Reserve may present a source of landfill gas, with the potential for it to migrate towards the proposed Flat Rock Drive construction support site (BL2) as a result of formation pressure due to ground disturbance from construction activities associated with the project. Targeted gas testing would be required as part of Stage 2.*

[75] Chrome Plating - an overview | ScienceDirect Topics
[76] controlling_risks_associated_with_electroplating.pdf (safeworkaustralia.gov.au)

contamination investigations - Groundwater contamination: The potential for interaction with contaminated groundwater beneath Flat Rock Drive construction support site (BL2) during construction of the access decline tunnel and associated works presents a moderate contamination risk. Also, known groundwater contamination in adjoining areas (Willoughby Leisure Centre and Bicentennial Reserve) could migrate towards to the main tunnel works which travel under Willoughby and Northbridge. [77]

There has only been limited testing done to date in relation to potential contaminants eg for groundwater.[78] The EIS has foreshadowed further testing eg in relation to groundwater and landfill gas[79]; and in relation to soil. [80]

Contamination investigation should be a staged approach:

- Preliminary Site Investigation (Phase 1) – establishing current and past history and perhaps some limited sampling
- Sampling analysis and quality plan (planning what you want to sample and where based on the site history)
- Detailed site investigation (Phase 2) – intrusive sampling (soil, groundwater, sediment, surface water, soil vapour, air etc)
- Remediation Action Plan – what are you going to do to clean up a site.

Once an adequate Preliminary Site Investigation has been completed, detailed site investigation should be carried out and a Remediation Action Plan developed. All this should be available for members of the community to consider as part of a revised EIS so that they can assess the adequacy of the investigations and any proposed management measures.

It is also a necessary pre-requisite to a proper costing of a project.

At the meeting with Transport for NSW on 15 June 2021, WEPA was advised that results of marine sediment testing could not be released until negotiations with the Commonwealth in relation to disposal of the sediment were complete. We fail to see why this should be the case.

[77] EIS, Appendix M, page v
[78] EIS, Appendix M page 98
[79] EIS, Appendix M page 98
[80] EIS, Table 9.1, Appendix M

Recommendation 52
That the Inquiry recommend that the BLT EIS be revised to include a Remediation Action Plan developed via the staged process described with all sampling results included.

SEARS not complied with – approval given anyway

The following, received from Transport for NSW on 26 February 2021, in response to an email in relation to the management of contaminated spoil, Illustrates the difficulty members of the community have in evaluating the appropriateness of contamination control measures where only a Phase 1 assessment has been completed as part of the EIS (The following has been edited for reasons of space and repetitiveness):

> ***1.Will all spoil containing contents of what used to be the tip at Flat Rock Gully be treated as contaminated?***
> *A Stage 1 contamination assessment has been carried out to determine the potential for encountering contaminated material during construction. The location of the proposed Flat Rock Drive construction support site (BL2) has the potential for contamination risks given the history of landfill activities in the area. Further investigations of this site including a Stage 2 contamination assessment is required to quantify the exposure…*
> *All identified contaminated materials would be managed during construction with the implementation of environmental management measures detailed Chapter 16 (Geology, soils and groundwater) of the EIS, and in accordance with the Guideline for the Management of Contamination (Roads and Maritime Services, 2013a).*
>
> ***2. If not, why not?***
> *As noted above, further investigations are required.*
>
> ***3. Will any other spoil from the Flat Rock site be treated as contaminated? If so, how will it be determined that it is contaminated?***
> *Please see response above.*
>
> ***4. In relation to the category of spoil at 1, what is the estimated quantity and how is this estimation reached****?*
> *As above, further investigations are required in order to determine quantities of material to be treated as contaminated material.*
> *The site will generate three sources of materials:*
>
> *a) Existing site materials which are to be moved around on site so as to form level pad areas for support site access roads, car parks and construction facilities such as an*

acoustic shed. Materials found to be contaminated would be treated accordingly and replaced with clean materials sourced off site. We propose to raise the site mostly to form the level pads so as to minimise disturbance of the existing materials as much as is possible.

b) Existing site materials required to be excavated to form the tunnel access decline or temporary access tunnel down into the main tunnel area. These materials will be from deeper down in the site and will likely be found to be contaminated to varying degrees and would be treated accordingly.

c) The vast bulk of the excavation materials will be clean VENM or virgin excavated natural materials (sandstone) which will be hauled away from site during normal construction hours.

The quantities for items a) and b) will be confirmed during the detail design phase. The percentage of contamination within these amounts will be determined during detailed site investigations prior to construction works commencing.

*5**. In relation to the category of spoil at 3, what is the estimated quantity and how is this estimation reached?***
Please see response above.

6. The EIS states that some contaminated spoil will be encapsulated and stored on site, while contaminated spoil not suitable for encapsulation will be taken off-site for disposal. Is this still the plan? What does encapsulation involve? What sort of contamination determines whether spoil is suitable for encapsulation or not? When will the encapsulation take place? What is the likely type of encapsulation that you will use?
Any contaminated material disturbed during construction would be separated from uncontaminated material on site to prevent cross contamination. Contaminated material would be encapsulated on site where possible, and in accordance with relevant regulatory requirements. Any material that is not suitable for encapsulation would be loaded into sealed and covered trucks for disposal at a suitably licensed facility. Further site investigations during the design development and construction planning phases would inform contamination management including determining where encapsulation is appropriate.

..Where contaminated soils and other materials are to be encapsulated onsite, encapsulation will be designed in accordance with the requirements detailed in the Guidelines for the Assessment of On-site Containment of Contaminated Soil

(ANZECC, 1999). This could include installing clay or geopolymer liners to prevent leaching of contaminants into non-contaminated soil and groundwater.

7. How much encapsulated spoil can be stored on site? Will this be stored inside or outside the acoustic shed? If outside, can you show on a map where? If inside, how much encapsulated soil can be stored in the acoustic shed?

Contaminated material would be encapsulated in accordance with relevant regulatory requirements. As noted above, further site investigations during the design development and construction planning phases would inform contamination management….

9. Will any contaminated spoil be stored on site before being encapsulated? If so, where?

Contaminated material would be encapsulated in accordance with relevant regulatory requirements. As noted above, further site investigations during the design development and construction planning phases would inform contamination management. Most of the works involving potential contaminated materials will occur whilst the site is being established. At that time, the acoustic shed will not have been fully constructed as it needs to be built on a level pad. It will be constructed after the site has been levelled as described above. We would hope to place materials directly into areas for encapsulation. Small amounts of contaminated materials may need to be stockpiled on site at times and will be done using accepted industry safe practices which involve fully covering the stockpiles.

10. Is there any excavated contaminated spoil you plan to store on site which is not to be encapsulated? If so, how will it be determined whether to encapsulate the spoil or not? Will any contaminated spoil, that is not to be encapsulated, be stored in the acoustic shed? Will any contaminated spoil, that is not to be encapsulated, be stored outside the acoustic shed?

As per above responses. Excavated contaminated soil may be temporarily stockpiled or stored onsite before being removed to a licenced disposal location or before being encapsulated onsite.

Further site investigations during design development and construction planning phases would inform the decision on whether to encapsulate the soil or not. These investigations will assist in confirming the extent of contamination, the contaminants present and their concentrations, and the spatial extent of the different contaminants.

This will be compared against regulatory requirements to assess the suitability of the material for encapsulation, based on the future land use of the site.

A detailed construction program will be determined by the Contractor, however it is likely that contaminated soil will be excavated prior to and during the construction of the acoustic shed, and therefore this material would not be managed within the acoustic shed. Rather the acoustic shed would be used to manage VENM sandstone material excavated from the tunnel, particularly where out of hours works are required...

12. For spoil that is on site but not encapsulated, what measures are being taken to ensure that any part of the spoil does not spread (eg by airborne particles, through truck movements, or by water eg because of rain or flooding)?
Wastes will be appropriately transported, stored and handled according to their waste classification and in a manner that prevents pollution of the surrounding environment. As noted above, contamination at this site will be further investigated and subject to the findings of these investigations, a Remediation Action Plan would be developed which will outline how the contaminated soil will be managed to prevent impacts to non-contaminated soil and watercourses and also to mitigate health impacts to the community and workforce. Depending on the contaminants found and their extent the Remediation Action Plan may include measures like:

- *Contaminated stockpiles are to be covered at all times*
- *Weather events will be tracked to ensure stockpiles can be covered in time prior to rain or high wind events to prevent erosion or wind-blown dust*
- *Contaminated stockpiles are to be bunded with clean soil to prevent runoff*
- *Placing compacted clean soil to stabilise the site.*

The project would also engage an independent, EPA accredited Site Auditor to oversee this process and the implementation of the control measures…

This response raises a number of concerns for members of the community. In summary, it is currently impossible to know:

- how much contaminated spoil there is
- how much of it will be encapsulated (buried) on site
- how much will be carried off-site
- the method of encapsulation, and the risks associated with different methods

- how seriously contaminated the waste in piles left outside will be, and what sort of health risks it will pose.

This has implications for the number of truck movements, the risk of spillages of contaminated spoil, the amount of movement of contaminated spoil, the risk of dispersal of contaminated spoil, and all the associated risks to the health and wellbeing of members of the community and the natural environment.

Members of the community also have no way of knowing how thorough the assessment which will determine the Remediation Action Plan will be, in identifying the type, amounts, concentrations and locations of contaminants. We do know that if the assessment is not done properly there will be piles of contaminated spoil outdoors subject to dispersal by the vagaries of the weather.

We do not know whether the potentially dangerous spoil will be dispersed by being moved from where it has been excavated to where it is piled. We do not know exactly where the paths which currently traverse the site, and which are heavily used by pedestrians and cyclists and will be relocated, will be in relation to the proposed piles of contaminated spoil or heavy machinery carrying same uncovered.

In summation we do not believe that the SEARs which requires:

> *Where contaminated spoil and/or sediments are to be handled, the Proponent must provide details of contamination characteristics and measures to manage this spoil to avoid adverse impacts to land and water quality.*

is satisfied when only a Phase 1 assessment has been done, but this doesn't seem to have been a barrier to approval of the WHT EIS.

The dose makes the poison is an adage intended to indicate a basic principle of toxicology. Here we not only don't have the dose but don't have some of the substances we need to check for the dose.

For these reasons, we support Recommendations 51 and 52 made earlier in this section.

Management of spoil

It would be inappropriate for any monitoring of dust etc from the spoil piles to be solely based on monitors set up to measure dust concentrations. Given that the piles and machinery moving the spoil will be outside, in close proximity to pedestrians and cyclists, this would very much be - *Shutting the gate after the horse has bolted.* Winds can blow up very quickly and covers can take time to attach. A precautionary approach needs to be taken so work is shut down when there is any risk of dispersion based on local weather forecasts and alarms should go off so that residents can see that appropriate measures are being taken.

Recommendation 53

That the Inquiry recommend that, should the BLT be approved, it be a COA that a precautionary approach be adopted to ensure that work stops, not only when a weather event which could cause dangerous dispersal occurs, but when it is likely to occur; and that an alert system be established to enable local residents to monitor compliance.

There is a lack of detail in the BLT EIS as to how material is to be assessed in relation to such issues as whether it is suitable for encapsulation or needs to be taken offsite. It would be appropriate to require that material to be moved around should be tested prior to movement at an appropriate density for chemicals of potential concern to ensure dust and release of potential contaminants does not occur.

Recommendation 54

That the Inquiry recommend that, should the BLT be approved, it be a COA that material to be moved around should be tested prior to movement at an appropriate density for chemicals of potential concern to ensure dust and release of potential contaminants does not occur.

Although the Transport for NSW response mentions an EPA accredited site auditor, it is noted that the site auditor approves appropriateness of plans in accordance with guidance and good practise. This does not cover the day-to-day compliance with the plans as information is provided to the auditor usually at the end of the process.

Recommendation 55

That the Inquiry recommend that should the BLT be approved, it be a COA that there be an on-site independent auditor or weekly unannounced visits by an independent auditor to ensure compliance with plans.

Sub-contractors often will not know what is required for separating contaminated and non-contaminated material on site. To prevent cross-contamination, detailed procedures need to be articulated and all relevant persons trained in them.

Recommendation 56
That the Inquiry recommend that should the BLT be approved, it be a COA that the procedure for separating contaminated and non-contaminated material on site to prevent cross contamination, be articulated in detail and all relevant persons trained in the procedure.

Contaminated spoil that cannot be encapsulated will presumably be quite highly contaminated. It will also need to be transported long distances along busy roads, some of which will be in tunnels. Although the EIS provides for trucks carrying the spoil to be properly covered, there needs to be a rigorous system to ensure this occurs.

Recommendation 57
That the Inquiry recommend that, should the BLT be approved, it be a COA that every load required to be covered be inspected by a supervisor to ensure every load is fully contained and there be a clear audit trail to identify the person who carried out each inspection.

The *Protection of the Environment Operations Act 1997* (POEO Act) defines virgin excavated natural material (VENM) as natural material (such as clay, gravel, sand, soil or rock fines):

> *(a) that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities and*
>
> *(b) that does not contain any sulfidic ores or soils or any other waste and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.' - Virgin excavated natural material (nsw.gov.au)*

Until comprehensive testing has been done, it is by no means clear that the statement that: *The vast bulk of the excavation materials will be clean VENM or virgin excavated natural materials (sandstone),* is correct, given the definition referred to above. This would appear to be so for a number of reasons not only including existing contamination but also contamination that could occur during the construction process through the migration of contaminants into the areas being tunnelled.

Recommendation 58
That the Inquiry recommend that, should the BLT be approved, it be a COA to assess the amount of VENM consistent with the above definition, and consistently with the other recommendations made in this section.

Respirable Crystalline Silica (RCS)
RCS is a recognised danger to human health. Attachment E to this submission – a paper prepared by Diane Staats and reviewed by Ian Bridge – environmental scientist, university lecturer and expert on non-occupational exposure to RCS – sets out mitigation measures required to keep children safe given the proximity of construction sites to schools, parks and reserves. The paper was provided to Transport for NSW which was put on notice before the meeting on 15 June 2021 that we wanted to know whether they would adopt the mitigation measures contained in the paper and specify in tender documents that such measures needed to be implemented.

The answer from Transport for NSW at the meeting was no. The reason given was that this would make Transport for NSW responsible for WHS rather than the contractor. WEPA finds this explanation unconvincing as it is inconsistent with the *Work Health and Safety Act 2011* (WHS Act).

It also needs to be noted that the protections afforded under the WHS Act are afforded to "workers" and children in close proximity to worksites would not appear to fall within the definition of worker. As such the only way in which children would be protected would be if Transport for NSW required its contractors and sub-contractors as part of their contracts to implement the required mitigation measures and enforced compliance.

Recommendation 59:
That the Inquiry recommend that, should the BLT be approved, it be a COA that Transport for NSW require, as part of their contracts, relevant contractors and sub-contractors to comply with the mitigation measures, set out in Attachment E, to protect children from RCS exposure, and enforce such requirements.

OTHER

Groundwater Drawdown
Discussion of groundwater issues has already been covered in the section on Groundwater under Terms of Reference (j). The following recommendations relate to the potential impact of drawdown on housing in the area.

Recommendation 60

In order to improve the level of drawdown it is suggested that the Inquiry recommend that, if the BLT is approved, it be a COA to provide for the tunnel lining discussed in BLT EIS Chapter 16 to 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.

Recommendation 61

That the Inquiry recommend that If the BLT is approved, it be a COA to provide for a Community Consultation Forum with key stakeholders to discuss the results of monitoring and mitigation and for the information presented there to be available online.

Vibration

Tunnelling for the project will be underway near sandstone outcrops and foreshore environments which are likely to be sensitive to ground disturbance. This includes the Henry Lawson Cave at Bicentennial Reserve and has the potential to pose risks to Aboriginal sites in Clive Park and Flat Rock Gully.

WEPA is aware that real-time constant vibration monitoring is often required for residential developments where vibration due to excavation could affect rock overhangs. However, It is unclear whether such requirements have been imposed pursuant to the WHT COA.

Recommendation 62

That the Inquiry recommend that, should the BLT be approved, it be a COA that there be constant real-time vibration monitoring to ensure the safety of the large cave/midden and rock overhang in Clive Park (45-6-0654) and in relation to other overhangs in Bicentennial Reserve and Flat Rock Gully. If there is sign of instability people should be restricted from entering the area.

Recommendation 63

That the Inquiry recommend that should the BLT be approved, there be a COA for funds to be set aside for maintenance and repair for any damage caused by the development. Responsibility for implementation should also be agreed. This should be determined in consultation with relevant stakeholders eg Aboriginal Heritage Office, NSW Government authorities, local government and most importantly Aboriginal custodians.

Air Quality, Pollution and Stacks

Almost daily we are seeing the results of international studies of air pollution which demonstrate how comprehensively air pollution is damaging our bodies and minds. WEPA shares the concern of the many local school communities and parents that the ventilation stacks along the proposed route will not be filtered and will be located close to a number of schools, including Anzac Primary and Cammeray Public, and childcare centres. Our community will not only face the risk of encountering fine dust particles in the area around the construction sites for this project but will be facing the road pollution discharge from unfiltered stacks from tunnels far exceeding the length of the existing tunnels whose data has been used to model emissions.

Our major concerns are as follows:

- Particulate Matter (PM) readings are already higher in Sydney than the recommended "safe" readings. PM2.5 and PM10 levels are already above the guidelines for both the 24-hour average and the annual average;
- base-line monitoring of air quality for the streets and suburbs around Flat Rock Gully has not been made available in the EIS;
- the tunnel proponents have emphasised the views of the Chief Health Officer on the contribution of the unfiltered stacks but he has not commented on the overall impact the project is likely to have on local air quality;
- Transport for NSW's conclusion in the BLT EIS, that the air quality across the area on average will not be substantially worse, is predicated on the assertion that surface level traffic will reduce. This assertion is contradicted many times in the EIS via data which demonstrates increased intersection delays; the potential of additional toll avoidance; slower bus times; intersection failures; the admission that 'rat-running' will be required to access changed access arrangements to the freeway and an increased proportion of trucks through the area and several other factors;
- the Western Harbour and Beaches Link program of works cuts through the largest school corridor in Sydney with 500-1000 pupils at approx. 26 schools. The precautionary principle must be applied to ensure the health of children across the project footprint.

WEPA would make the following suggestions:

Recommendation 64

That the Inquiry recommend that the EIS be revised to include full modelling of each possible pollutant from the stacks. This analysis should cover dispersal at various heights and distances from the stacks and a cost/ benefit analysis completed for inclusion in the revised EIS. This should not be limited to a 300m circumference given that the Chief

Scientists states that ground level pollution can be at its highest 1km+ from the stacks.

Recommendation 65
That the Inquiry recommend that the EIS be revised to gather and make publicly available background data about current Particulate Matter levels in order to inform long-term monitoring.

Recommendation 66
That the Inquiry recommend that the EIS be revised to include a COA to allow for an alert style monitor to be placed near children's playing fields, to which sporting groups and parents can subscribe, to determine if playing sport is a safe option given the potential for contaminated dust and heavy vehicle emissions to be at elevated levels around Artarmon Park, Bicentennial Reserve and Cammeray Oval.

Recommendation 67
That the Inquiry recommend that the EIS be revised to provide modelling of levels of particulate matter/other air pollutants in the environment if the stacks were filtered.

Trucks accelerating up a steep hill from zero are likely to create a substantial amount of diesel pollution - the health impacts of this have not been fully assessed.

Noise
There is great concern within the local community about the impact of tunnelling and construction noise associated with the project.

Finding 14 of the 2018 Parliamentary Inquiry into the WestConnex Project was,

> *That the various noise mitigation measures offered by Roads and Maritime Services are wholly inadequate to substantially reduce heavy construction noise.*

No evidence has been found that improvements have been made to these processes. The onus for dealing with noise difficulties during construction will fall on the residents impacted.

As has been noted earlier, the proposed Flat Rock Gully dive site is in a natural amphitheatre which will cause noise to reverberate some distance from construction. The following recommendations are made to alleviate some anticipated noise problems:

Recommendation 68

That the Inquiry recommend that the EIS be revised to consider the potential for temporary acoustic walls along Flat Rock Drive and near Anzac Park and Cammeray Oval to alleviate noise impacts during construction. In addition, a fully independent advocate or arbitrator should be appointed to work on behalf of residents and the community to negotiate with contractors.

The noise assessment in the BLT EIS states that the trucks on Flat Rock Drive would not create more noise however the assessment does not appear to account for braking on a very steep hill - the noise assessment should be redone.

Recommendation 69

That the Inquiry recommend that the EIS be revised to include an updated noise assessment which takes into account the impact of braking.

Aboriginal Heritage

There is evidence of Aboriginal occupation throughout the construction areas for the Beaches Link Tunnel; some of which dates back at least 5,800 years.[81] In the Warringah, Willoughby, Lane Cove and North Sydney Council areas alone there are approximately 1,000 Aboriginal sites including middens, rock engravings, axe grinding grooves, carved trees and stone arrangements. David Watts, Aboriginal Heritage Manager for these Councils, maintains that these are 'still in reasonable condition' and hold 'key secrets to our country's history'.[82] Aboriginal people have a rich cultural heritage, both tangible and intangible, which needs to be preserved.

The EIS identifies a number of Aboriginal sites within 50 metres of the project as well as highlighting the likelihood that undiscovered sites may exist in Cammeray Golf Course, Artarmon Park and Artarmon Reserve, as well as the Flat Rock Reserve and the surrounding alluvial terraces and exposed sandstone outcrops. There are also potential submerged sites (inundated rock shelters) in the area between Northbridge and Seaforth, Pearl Bay (west of Spit West Reserve) and between Clive Park and Beauty Point). Despite the potential cultural richness of these sites and their existence close to construction and often within sandstone levels, the EIS suggests that damage to these sites will be negligible.

WEPA has already made recommendation 63 above and would also like to make the

[81] Ian Hoskins, Aboriginal North Sydney, North Sydney Council 2019
[82] Hoskins 2019, p.6

following recommendations:

Recommendation 70
That the Inquiry recommend that the mitigation measures included in the BLT EIS, Appendix L, Section 9, become a COA in a revised EIS.

We note that it is intended to provide cultural and historic heritage awareness training to personnel engaged in work that may impact heritage items before commencing works for the project but would argue that this would be insufficient to detect and mitigate impact to heritage sites, particularly those as yet undiscovered.

Recommendation 71
That the Inquiry recommend that the EIS be revised to include a COA with provision for a qualified archaeologist specialising in Aboriginal cultural heritage to be present at all times at all constructions sites whilst work is in progress.

Recommendation 72
That the Inquiry recommend that the EIS be revised to include a COA that any variation to the EIS sought by the construction company once the EIS has been approved should not be granted until the risk to known and potential Aboriginal heritage has been reassessed by engineers and archaeologists.

Marshalling
Marshalling areas will be needed for trucks across all sites but particularly at the Flat Rock Gully site.

The only COA imposed in relation to marshalling for the WHT is:

> *E139 Vehicles (including light and heavy vehicles) associated with the CSSI must be managed to: (a) minimise parking on public roads; (b) minimise idling and queueing on state and regional roads; (c) not carry out marshalling of construction vehicles near sensitive land user(s)*

This is so vague as to be unenforceable and is inadequate in any event.

Recommendation 73
That the Inquiry recommend that, should the BLT be approved, it be a COA that marshalling should not be permitted on local streets and particularly not in the Naremburn Conservation

Area due to the increased vibration risk, and that trucks should not be allowed to idle while marshalling.

ToR (l) the impact of the project on nearby public sites, including Yurulbin Point and Dawn Fraser Baths

The impact of the projects on nearby public sites includes the permanent loss of 2.8 hectares of community green space, equivalent to four soccer fields, in Cammeray Park; and the impact on areas such as Bicentennial Reserve, Flat Rock Gully, Northbridge Baths and Clive Park mentioned above.

The BLT also poses contamination risks to Tunks Park, Northbridge which is at risk from contamination emanating from the old tip site in Flat Rock Gully, as notified to the EPA by Willoughby Council in February 2021 pursuant to section 60 of the Contaminated Land Management Act, 1979.

Flat Rock Gully

The EIS remarks at several points that the future of the site at Flat Rock Gully, post-construction, is not confirmed. Transport officials at information sessions have suggested that some might like to see it utilised for competitive sports fields.

The Flat Rock Gully Reserve was set aside for environmental protection and it is clear that since it was declared, the need for this type of reserve and its importance in relation to biodiversity extinctions, has become even more critical to the community. The construction site to be excised from the Reserve represents over 10% of the Flat Rock Gully Reserve. The return of this land to bushland will both buffer the existing Reserve from traffic and nearby carparks and sports fields and provide a large enough habitat for a healthy biodiversity to regenerate over time.

While there is constant pressure on local sporting bodies to find available land for their sports, it should also be noted that there is an even larger community of people who want access to a beautiful area of bushland where they can enjoy nature in a range of quiet ways and also participate in non-competitive activities such as strolling or bush walking, pushing prams, picnicking, nature observation, resting, playing with children, jogging, bird watching and cycling amongst a range of other activities. Some people will not even visit these areas but will draw comfort from their existence for wildlife and the continuation of natural areas in suburban Sydney.

Recommendation 74

That the Inquiry recommends that decision-making about the future of the Flat Rock Gully construction site should not be left to the end of the construction process. If the BLT is approved, it should be a COA that it be restored to bushland consistent with the Environmental Conservation zoning of the site and in accordance with the local *Urban Bushland Plan of Management* and the *Flat Rock Gully Reserve Action Plan.*

It should also be noted that WCC has spent over $1m on earthworks and other infrastructure works and a further $1.5m on administering this bush reserve since site restoration was completed 20 years ago.

We note that, in relation to the Western Harbour Tunnel a short-list of preferred private partners has been recently released. The relevant press release states that the chosen partner will be responsible for 'procurement and delivery'. There is always a danger that a private entity will become insolvent which is why it is commonplace in the mining industry to require rehabilitation bonds. We believe the same principle should apply here.

Recommendation 75

That the Inquiry recommends that it should be a COA that the site is required to be rehabilitated to its original condition with the entity responsible for the work specified. Should the responsible entity be a private entity rather than the NSW government, the private entity should be required to deposit a bond sufficient to cover Willoughby City Council's estimate of the cost to adequately restore the site by matching the original level of investment and regenerating the site and its infrastructure, all adjusted for inflation.

ToR (m) any other related matter.

Speakers from WEPA are available to address the inquiry on aspects of this submission if required.

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www.wepa.org.au

ATTACHMENT A - Response to GIPA request made by WEPA 31 January 2020

NSW GOVERNMENT | Transport for NSW

31 January 2020

Our ref: 20T-0140

Ms [redacted]

By email: [redacted]

Dear [redacted]

Notice of decision on your access application under the *Government Information (Public Access) Act 2009* (GIPA Act)

Applicant:	[redacted]
File reference:	20T-0140
Decision maker:	
Received date:	6 December 2018
Due date:	17 January 2020
Extended due date	3 February 2020
Date of decision:	31 January 2020

1 Your access application

1.1 On 6 December 2018 Transport for NSW (TfNSW) received your access application under the GIPA Act for the following information:

'1. Information regarding the impact the B-line bus service has had on congestion along its route over the past 24 months.

2. Information regarding journey times from Brookvale to Sydney CBD using the B-line over the past 24 months.

3. Information regarding changes in numbers of passengers carried during the morning and afternoon peaks to and from Sydney CBD using the B-line over the past 24 months.

4. Information regarding the type, volume, origin, destination, and time of freight traffic entering and leaving the Northern Beaches LGA over the past 24 months.'

Transport for NSW
18 Lee Street, Chippendale NSW 2008 | PO Box K659, Haymarket NSW 1240
T 02 8202 2200 | F 02 8202 2494 | W transport.nsw.gov.au | ABN 18 804 239 602

1.2 On 16 January 2020, we informed you that we were required to consult third parties in relation to your application. In accordance with section 57(2) of the GIPA Act, the timeframe for deciding your application was extended to 3 February 2020.

1.3 In your access application you indicated a preference for receiving correspondence by email at suzie@rockbath.com

2 Searches for information

2.1 Under the GIPA Act, we must conduct reasonable searches to locate the government information for which you have applied.

2.2 The following areas of TfNSW have conducted searches:

- Customer Strategy and Technology (CST)
  - Public Affairs and Engagement
  - Transport Performance and Analytics
- Greater Sydney (GS)
  - Services
  - North West Precinct
  - Easing Sydney's Congestion Program Office
- Infrastructure and Place (IP)
  - Precincts & Infrastructure

2.3 CST, GS and IP were requested to conduct searches as they were identified as areas of TfNSW which would likely hold the information relevant to your application.

2.4 Information has been identified by CST and GS as falling within the scope of your application.

3 Decision

3.1 I am authorised by the Principal Officer, for the purposes of section 9(3) of the GIPA Act, to decide your access application.

3.2 I have decided:

- to provide access to the information under section 58(1)(a);
- that the information is not held under section 58(1)(b).

3.3 Please see below a summary of my decision:

Page Ref.	Information	Act Ref.	Access
1-2	**Item 2:** 19 months of average actual journey times ***New record of information created under section 75 of the GIPA Act.***	s58(1)(a) s75	Full
3	**Item 3:** Changes in numbers of passengers carried during morning and afternoon peak times to/from Sydney CBD using the B-Line over the past 24 months. ***New record of information created under section 75 of the GIPA Act.***	s58(1)(a) s75	Full
4	**Item 4:** Austroads Vehicle Classification	s58(1)(a)	Full

5–156	**Item 4:** Classified Vehicle Counts (Volumes) for various sites located within Northern Beaches LGA: • RNP54-A01 Auto Class Report • RNP54-A02 Auto Class Report • RNP54-A03 Auto Class Report • RNP54-A04 Auto Class Report • RNP54-A05 Auto Class Report • RNP54-A06 Auto Class Report • RNP54-A07 Auto Class Report • RNP54-A08 Auto Class Report	s58(1)(a)	Full
157-270	**Item 4:** Classified Vehicle Counts (Volumes) for various sites located within Northern Beaches LGA: • RNP59-A01 Auto Class Report • RNP59-A02 Auto Class Report • RNP59-A03 Auto Class Report • RNP59-A04 Auto Class Report • RNP59-A05 Auto Class Report • RNP59-A06 Auto Class Report	s58(1)(a)	Full
N/A	**Item 4**: Road Network Plan Reports • N4218 RNP 21 Studies ATC Report - Updated Version • N4218 RNP 40 Studies ATC Report - Updated Version 270818	s58(1)(a)	Full

3.4 The B-Line is part of a tailored transport solution making it simpler and more reliable to travel around the Northern Beaches and Lower North Shore, as well as to-and-from the Sydney CBD. To help traffic flow more easily and make bus services more reliable, work is being carried out to ease congestion on roads along the B-Line route such as creating new bus bays to help keep buses and traffic moving, tidal flow systems and extended turning lanes to maximise traffic flow in the peak direction.

3.5 This work is due for completion early 2020 when all of the parts of the B-Line come together. Reliability and time saving benefits, which will be progressively monitored and quantified, will be realised for the Northern Beaches and Lower North Shore once the full program of work has been completed.

3.6 In respect of **item 1** of your application, I have been informed by the Greater Sydney (GS) division that travel time data has been collected for all vehicles using the B-Line corridor, however analysis of the raw data has not yet been completed, and therefore, no comparison of journey times or data to link congestion with the operation of the B-line bus services has been undertaken to date. Based on this information and the searches that have been conducted in TfNSW, I have decided that this information is not held by TfNSW.

3.7 In response to **items 2** and **3** of your application, new records of information under section 75 of the GIPA Act have been created. I have decided to release this information to you in full.

3.8 In response to **item 4** of your application, information was provided by the GS division. The information provided concerns the type, volume, and time of freight traffic entering and leaving the Northern Beaches local government area (LGA). As there is no current method of analysis that allows TfNSW to determine the 'origin' and 'destination' of such vehicles, I have decided that no information is held by TfNSW responding to that particular aspect of item 4 of your request.

ATTACHMENT B – Ted Nye CV

Edward (Ted) J Nye

Nationality	Australian
Year of Birth	1952
Profession	Chartered Engineer
Specialisation	Underground Engineering – Transport
Position	Director, E J Nye & Associates Pty Ltd
Key Qualifications	Dip. Eng(Civil), B. Eng(Civil), NER, FIEAust

KEY EXPERTISE

Over 40 years investigative, design and construction experience over a wide range of major transport and related projects (across Australia and in the UK, China, Hong Kong, Singapore, Chile, and the Pacific Islands). Delivery manager, design management, design team leader, tunnel design engineer and associated construction methodologies development. Project concept development for road and rail. Specialist expertise in assessing the interaction between underground and surface structures. Led multi-teams including civil, structural, geotechnical and E & M, including tunnel ventilation and fire safety. Provide leadership and innovative solutions across disciplines. Client side, D & C and Alliance contract experience.

EDUCATION AND PROFESSIONAL STATUS

Verified Certificates - Python for Data Science – UC-San Diego & MIT– Dec 19, Mar 20.
Verified Certificates in C programming - Dartmouth_IMTx - 2020
Bachelor of Engineering (Civil), Swinburne College of Technology, 1977
Diploma of Engineering (Civil), Caulfield Institute of Technology, 1974
Member of the Australian Tunnelling Society (ATS)
Member of the Australasian Geomechanics Society (AGS)
Fellow of the Institution of Engineers, Australia
Chairman of the 15th Australasian Tunnelling Conference, September 2014.
ATS Committee member and past Chairman, 1995 – 2015
Warren Centre – Underground Space Study 1996 – Steering Committee Member, Working Group Chair
Austroads Tunnelling Committee, advisor, 2008 to 2013.
During 2015 was a presenter at four overseas conferences (Singapore* – annual guest lecture, Tunnelling Society of Singapore, Shanghai*, New Orleans, Switzerland*), Shanghai* 2016 and Wuhan 2017. (Invited speaker *). Other overseas visits to TBM factories, Herrenknecht, Germany and CREG, Zhengzhou, China (most recent in 2015, but also 1996 and 2005 to Germany).

EXPERIENCE RECORD SUMMARY

Dec 2016 – present E J Nye & Associates Pty Ltd, Tunnel Specialist

Green Square Station – (new study) potential 16-storey building over the south platform tunnel. Peer review role for the design and approval process with Sydney trains. Previous experience with this development opportunity since 2004 with the same client. Client: Toga

Sydney Airport- Domestic Terminal Station – advisor to SACL and their consultants for the replacement of existing car parks between Terminal 2 and 3, over and adjacent to the underground station and railway tunnels. Works resulting from the commencement of the Gateway Project which will be completed in 2024. Client: SACL.

Derailment Risk Assessment – risk assessment for potential derailment of train and then impact into a new building development in Ashfield adjacent to the rail corridor. Client: Buildview/EIAustralia

Waterloo Road Development – Approval application report including finite element analysis to assess potential impact from a building basement excavation on a Sydney Metro cross-over tunnel just west of Macquarie Park Station. Clients: John Holland/Meinhardt.

Westconnex – Rozelle Interchange – Peer reviewer for design, construction, geotechnical, settlement, noise and vibration, monitoring etc. Client: RMS/TSA.

Developments Adjacent to Rail Tunnels – Technical advisor on more than 8 significant projects (Sydney Metro/Airport Line/City Circle), bus transport interchange and car park, MLC Centre, Holiday

Edward (Ted) J Nye

Inn Hotel - Mascot, Green Square Station (building above and just north of the station). Clients: including SACL, Savills, GPT, Roberts Pizzarotti, Toga.
Burrawang to Avon Dam Water Supply Tunnel with potential HEPS - Technical advisor for this potential 20km tunnel, 200m drop shaft and underground hydro-electric power station (240MW), plus connecting 9km long spur pipeline. Client: WaterNSW.
Forrestfield Airport Link – Perth – technical advisor to a contractor on this project. Ground treatment (jet grouting, post construction, jet grouting. 7m diameter twin tunnels. Construction methods and end clients design reviewed. Client: Trevi Aust. Pty Ltd.
Wynyard Place Project - dilapidation surveys related to works adjacent to Wynyard Station. Station column removal/pavement/existing buildings/light rail in George Street, Client: Multiplex.
Access Improvement Study– Concept development of 12km long combined diesel freight and electric passenger train tunnel with a significant river crossing (bored and immersed tube). Client: TfNSW/Kinhill
Faster Rail Project – PM for strategy report to improve existing main line rail access to allow further land development. Client: Walker Corporation.
Northconnex Road Tunnel – Technical reviews on this 10km long road tunnel. Shotcrete and waterproofing issues, specifications, and contractor's submissions. Client: Transurban.
Connector Motorway, Melbourne – Technical assessment and report to resolve a dispute between the operator/owner and the contractors. Joint Clients, Connector Motorway, John Holland and CPB Contractors.
Northshore Transport Options – Development and promotion of a rail tunnel under Sydney Heads and later an alternative to the Western Harbour Crossing and Beaches Link tunnel alignments focusing on Chatswood. Client: none
Mott MacDonald in 2016/17 - Continued involvement on the Norwest Rail Link Project, Project 2C at Sydney Airport and the Sydney Harbour Bridge Toll Plaza removal project.

2011 – 2016 Mott MacDonald Australia Pty Ltd, Tunnel Practice Leader
Led a group of geotechnical, tunnel, ventilation and as required structural engineers.
St James Station - inspection and assessment of disused platforms and tunnels. Client: confidential
Wynyard Place Project – Led a five-person team, dilapidation survey of rail and disused trams tunnels, Wynyard Station, high rise buildings, gardens, and road pavements. Client: Multiplex.
Toll Plaza Removal, Sydney Harbour Bridge – temporary crane load checking and dilapidation survey of the rail and disused trams tunnels approaches on the south end of the bridge. Client: RMS.
Barangaroo Central - advising developers bid team on the interface issues between the development and the proposed Barangaroo Station in Hickson Road. Client: Lend Lease.
Barangaroo South - developed the criteria to design the building foundations to preserve the Sydney Metro rail corridor down to Darling Harbour. Risk assessment for tunnelling. Client: Lend Lease.
Sydney Metro Stage 1 (OTS contract)- team lead, shafts (provided fully tanked solution with tension piles), shallow cover pedestrian tunnels connecting to stations, y-junction interface connection with the ECRL. Inspections of ERCL tunnels associated with upgrades for the driverless trains.
Airport Rail Link – assessment of in-situ concrete lining including testing and strain gauge monitoring. Engaged materials and survey monitoring specialist. Hard rock section. Client: Broadspectrum
Project 2C - Sydney Airport – approvals from Sydney Trains for deep piling, design and construction reviews retaining walls, ground treatment, waterproofing, soft ground design reviews. Client: Contractor
Westminster Road Widening - Developing the concept and supervision of detailed design of a traffic impact barrier along the top of a railway embankment, the barrier is restrained laterally by a row of deep bored piles and a capping beam. Client: RMS.
Westconnex – Initially with contractors tender then contributed to advisory report the authority.
North Strathfield Rail Underpass – Design lead for a very shallow cover tunnel under live railway tracks. Construction supervision. First use of shotcrete only lining and spray-on membrane in in Australia. Shaved three years off construction program with driven tunnel solution. Construction supervision through the site PTT process. Client: SKM/PB JV.
Melbourne Metro – client side - verification tunnels and review of station cavern reference designs. Review of alignments, inspection of SI core, review of standard to be used. Client: Vic. Dep. Transport.

Edward (Ted) J Nye

Sydney Opera House VAPS Project - Technical advisor for initial design and designer selection. The project requires bulk excavation under the monumental stairs and tunnelling under the opera house or access to modified or new lift shafts. Client: Sydney Opera House Trust
M2 Tunnel Widening, Sydney – Design verification for widening by 3.6m of a twin bored hard rock tunnels under high operating road traffic conditions in metropolitan Sydney. Site inspections. Developed the original widening concept for Transurban when at SKM. Client: SKM.

2002 – 2010 Sinclair Knight Merz, Tunnel Engineering Manager
Northern Link, Brisbane – Technical assessment of the EOI for this 4km long road tunnel.
Boggo Road Busway Tunnel, Brisbane – Led the driven tunnel design team. Detailed design of a 15m wide by 430m long busway tunnel with very shallow ground cover. Construction supervision. Client: Alliance - Thiess Contractors, Main Roads and SKM.
Epping Chatswood Rail Link – Project Manager for Railcorp asset assessment report prior to their acceptance of the asset transfer from and delivered by another government department.
Eastlink Freeway Project, Melbourne – Design and site visit construction reviews of the 1.5km long twin three lane road tunnel. Client: South East Integrated Transport Authority.
North South Bypass and TransApex Road Tunnels, Brisbane – Review of construction methods and design, co-ordination, and review of tunnel. Client: Brisbane City Council and State Government.
M2 – F3 Connection (now Northconnex). Design planning, supervision of tunnel ventilation, geotechnical engineering, cost estimator for up to 10km of tunnel. Client: Federal Dep. Transport
Lane Cove Road Tunnel – High level advice to the Lane Cove Tunnel Company throughout project.
Expert Witness - 1 - Claim processed through arbitration following a fatal rock roof fall on the Cross City Tunnel. Specialist advice given on the construction methodology adopted by the contractor.
Expert Witness – 2 – Supreme Court of NSW. Assessed the potential impact of new building development on an existing 1970s cut and cover twin track rail tunnel.
Endeavour Drift Project – Project manager and designer. Concept design for coal surge bins at 500m depth, review of material handling issues related to bin geometry, construction methodologies and analysis of rock with high in-situ stresses and complex geometry. Client: BHP Billiton.
Overseas Assignments. Led team of specialist, geotechnical, cost estimator, construction and TBM. Feasibility of twin 10m diameter tunnels for mine access in the Andes, Chile. Client: Codelco

1989 – 2001 E J Nye and Associates Pty Ltd, Director (Self Employed)
M5 Motorway Road Tunnel – Consultant at tender, design and construction phases. Client: RTA.
Airport Rail Link (Sydney) – EIS construction methodology, interfacing with the FAC, project management, technical reviews, site inspections including deep diaphragm walls. Soft ground tunnel by 11m diameter slurry TBM (6km in length) and the Cooks River Crossing (using circular coffer dams). Client: Rail Access Corporation/Kinhill.
Tunnel Protection. Developed guidelines then reviewed numerous developments along the 11km length of the Airport Rail Link, either for developers, Railcorp or Sydney Airport. Client: RAC
Epping Chatswood/Parramatta Rail Link – EIS construction methodology, client for tender issued design of the station caverns. Tunnelling methods leading into Parramatta. Client: DoT and PRL.
North West Rail Link - Initial planning for the alignment and station locations. Client: Arups
Techbase Software: Marketing and developing applications for this relational database with a 3D graphical interface. Liaison support firms in the US, NZ and Australia. Licenced to major mining companies.
High Speed Train Study. Tunnel technical adviser for a potential HST north of Sydney to Gosford. Long tunnels (> 10km) to be used for both passenger and freight trains. Following an extensive literature search, provided a strategic report on rolling stock, tunnel and tunnel portal design to mitigate transient air pressure impacts. Client: Arup.
Overseas Assignments: Hong Kong, verification, Tai Lam Road Tunnel. Feasibility study, 150km freeway, China (with 54 tunnels and 120 bridges) for the Asian Development Bank including 2 months in China, Three Gorges Dam ship lock site visit, advise the YRRI and cross-country study tour in Europe for the ARL project.

Edward (Ted) J Nye

1974 – 1989 John Connell, Mott, Hay and Anderson - Senior Tunnel Engineer
Shangri la Hotel (ANA Hotel), Sydney. Design team leader all site civil works including over the railway tunnel. Client: CRI
Sydney Harbour Tunnel. Design team leader for the land tunnels. Project design engineer for the feasibility study including the south immersed tube connection. Concept design under the Opera House Forecourt. Client: Transfield/Kumagai.
Melbourne Underground Rail Loop (MURL). Geotechnical monitoring tunnels and all stations then structural design of station booking halls and pedestrian tunnels. Assembly of large diameter plate bearing testing equipment and assessing results. Installation of a very wide range of monitoring sensors including strain gauges, loads cells and extensometers. Ground vibration and noise monitoring due to blasting. Finite Element analyses to compare filed data with FE analysis. Viaduct repairs, bonding various materials (including rubber to aluminium and concrete), specifications, and testing. Client: MURLA
Buildings adjacent to Tunnels. Detailed FE analysis to assess potential impacts of three new major buildings, including their basement excavations on the new MURLA tunnels.
Foundation design. Numerous projects including bored piers to rock to liquefaction potential of saturated sand under large structures.
Overseas Assignments. Hong Kong (12 months) slope, retaining wall and tunnel stability and later (4 months) feasibility study for a 5km long road tunnel. London, major bridge and building foundations, study for immersed tube crossing of the English Channel. Large hydro tunnels in Malaysia, contractors claim, rock bursts. Three aid assignments in the Pacific, all site investigations over water with barges, Kiribati (2 no.) and Tonga (3 months each, 3km long causeway, a fishery jetty and a container wharf).

Publications - over 30 published papers - selection only here/ & 1 YouTube video.

"Excavations Adjacent to Tunnels in Rock". A. J. Bennett and E. J. Nye. Conference on Finite Element Methods in Engineering, Melbourne, August 1987.

"Data Collection and Management in Underground Engineering", E. J. Nye. 8th Australian Tunnelling Conference, Sydney, August 1993.

"The Soft Ground Bored Tunnel Under Sydney Airport". Nye, EJ. 10th Australian Tunnelling Conference, Melbourne, March 1999.

"South Coast Electrification Project – Enlargement of the Croom and Bombo Tunnels". E. Nye and S. Sutherland. ITA Conference, Sydney, 2002.

"Buildings Around Tunnels – Case Histories", Nye, EJ. Published at the AGS AUCTA Mini-Symposium: Geotechnical Aspects of Tunnelling for Infrastructure Projects, October 2005.

"North Strathfield Rail Underpass Shallow Cover Driven Tunnel", Ted Nye, RETC Washington DC, June 2013.

"Construction above, adjacent to and under future and existing rail infrastructure". Ted Nye. Core2016 conference, Melbourne, May 2016.

"Sydney Metro Northwest – Design and Construction of the services Facility Shafts", E. Nye et al. 16th Australasian Tunnelling Conference, October 2017.

"Sydney Heads Rail Tunnel – a Treasure Trove of Planning Opportunities". E. Nye, P. Prince and Dr S. Lackey. ITA-AITES World Tunnel Congress, WTC2020, Malaysia, September 2020.

Link to YouTube video – Sydney Heads Rail Tunnel, March 2019. Joint meeting AGS/ATS
https://www.youtube.com/watch?v=t70kd6eUMfI

The final project for the edX data science courses from UC-San Diego was titled "Australian Fatal Road Accidents (1989 to 2019)".

ATTACHMENT C – Native Fauna of Long Bay Catchment

NATIVE FAUNA OF LONG BAY CATCHMENT

WILLOUGHBY CITY COUNCIL
City of Diversity

INCLUDES LOWER FLAT ROCK CREEK, FLAT ROCK GULLY RESERVE, TUNKS PARK, NORTHBRIDGE GOLD COURSE, WRECK BAY AND NEIGHBOURHOOD

FROGS

Common Eastern Froglet
Brown-striped Frog
Bibron's Toadlet
Eastern Dwarf Tree Frog
Peron's Tree Frog
Leaf-green Tree Frog

REPTILES

Turtles

Long-Necked Turtle

Lizards

Broad-tailed Gecko
Burton's Snake-lizard
Cream-striped Shinning-skink
Eastern Water-skink
Dark-flecked Garden Sunskink
Pale-flecked Garden Sunskink
Weasel Skink
Gully Shadeskink
Eastern Blue-tongue
Eastern Water Dragon
Lace Monitor

Snakes

Diamond Python
Common Tree Snake
Golden-crowned Snake
Eastern Small-eyed Snake
Yellow-faced Whip Snake
Red-bellied Black Snake

BIRDS

Non-passerine

Australian Brush-turkey
Brown Quail
Chestnut Teal
Pacific Black Duck
Australian Wood Duck
White-headed Pigeon
Crested Pigeon
Tawny Frogmouth
Australian Swiftlet
Uniform Swiftlet
White-throated Needletail
Little Penguin
Little Pied Cormorant
Great Cormorant
Little Black Cormorant
Pied Cormorant
Australian Pelican
White-necked Heron
Striated Heron
White-faced Heron
Nankeen Night Heron
Spoonbill sp
Australian White Ibis
Straw-necked Ibis
Collared Sparrowhawk
Brown Goshawk
Grey Goshawk
Pacific Baza
Black-shouldered Kite
White-bellied Sea-Eagle
Nankeen Kestrel
Peregrine Falcon
Dusky Moorhen
Buff-banded Rail
Masked Lapwing
Silver Gull
Sulphur-crested Cockatoo
Little Corella
Yellow-tailed Black-Cockatoo
Galah
Australian King-Parrot
Musk Lorikeet
Scaly-breasted Lorikeet
Rainbow Lorikeet
Crimson Rosella
Eastern Rosella
Pheasant Coucal
Fan-tailed Cuckoo
Eastern Koel
Channel-billed Cuckoo
Powerful Owl
Southern Boobook
Laughing Kookaburra
Sacred Kingfisher
Dollarbird
Superb Lyrebird

Passerine

Superb Fairy-wren
Variegated Fairy-wren
Brown Thornbill
Grey Gerygone
Brown Gerygone
White-throated Gerygone
White-browed Scrubwren
Spotted Pardalote
Eastern Spinebill
Red Wattlebird
Little Wattlebird
Noisy Miner
Noisy Friarbird
New Holland Honeyeater
Yellow-faced Honeyeater
Eastern Whipbird
Black-faced Cuckoo-shrike
Grey Shrike-thrush
Golden Whistler
Rufous Whistler
Olive-backed Oriole
Australasian Figbird
Australian Magpie
Grey Butcherbird
Pied Currawong
Grey Fantail
Willie Wagtail
Australian Raven
Magpie-lark
Black-faced Monarch
Leaden Flycatcher
Eastern Yellow Robin
Jacky Winter
Rose Robin
Golden-headed Cisticola
Silvereye
Welcome Swallow
Tree Martin
Mistletoebird
Red-browed Finch
Double-barred Finch
House Sparrow

MAMMALS

Short-beaked Echidna
Brown Antechinus
Long-nosed Bandicoot
Sugar Glider
Common Ringtail Possum
Common Brushtail Possum
Grey-headed Flying-fox
Gould's Wattled Bat
Lesser Long-eared Bat

These records are from Willoughby City Councils' Wildlife Register. To contribute sightings to the wildlife register email wildlifewatch@willoughby.nsw.gov.au. All sightings are also recorded in BioNet and Atlas of Living Australia.

ATTACHMENT D – Native Fauna of Sailors Bay Catchment

NATIVE FAUNA OF SAILORS BAY CATCHMENT

WILLOUGHBY CITY COUNCIL
City of Diversity

INCLUDES UPPER SAILORS BAY CREEK, INCLUDING BUTTRESS, CASEMENT, CASTLEHAVEN, CORTILE, EMBRASURE, HAVEN AMPHITHEATRE, KEEP, LOOKOUT, MERLON, ORIEL, RETREAT, SAILORS BAY PARK, THE BAILEY, TOWER, TURRET, WARNERS PARK, WATERGATE, CLIVE PARK AND NEIGHBOURHOOD

FROGS

Common Eastern Froglet
Brown-striped Frog
Red-crowned Toadlet
Leaf-green Tree Frog
Peron's Tree Frog

REPTILES

Turtles

Long-Necked Turtle

Lizards

Broad-tailed Gecko
Cream-striped Shinning-skink
Eastern Water-skink
Dark-flecked Garden Sunskink
Pale-flecked Garden Sunskink
Gully Shadeskink
Eastern Blue-tongue
Eastern Water Dragon
Lace Monitor

Snakes

Common Tree Snake
Golden-crowned Snake
Eastern Small-eyed Snake
Red-bellied Black Snake

BIRDS

Non-passerine

Australian Brush-turkey
Pacific Black Duck
White-headed Pigeon
Brown Cuckoo-Dove
Crested Pigeon
Tawny Frogmouth
Australian Owlet-nightjar
Little Penguin
Little Pied Cormorant
Little Black Cormorant
Pied Cormorant
Striated Heron
White-faced Heron
Australian White Ibis
Brown Goshawk
Pacific Baza
Black-shouldered Kite
Peregrine Falcon
Black Falcon
Buff-banded Rail
Masked Lapwing
Common Sandpiper
Painted Button-quail
Silver Gull
Sulphur-crested Cockatoo
Yellow-tailed Black-Cockatoo
Galah
Australian King-Parrot
Crimson Rosella
Eastern Rosella
Rainbow Lorikeet
Pheasant Coucal
Shining Bronze-Cuckoo
Eastern Koel
Channel-billed Cuckoo
Barking Owl
Southern Boobook
Powerful Owl
Azure Kingfisher
Laughing Kookaburra
Sacred Kingfisher
Dollarbird
Superb Lyrebird
Superb Fairy-wren

Passerine

Variegated Fairy-wren
Brown Thornbill
White-browed Scrubwren
Spotted Pardalote
Eastern Spinebill
Red Wattlebird
Little Wattlebird
Noisy Miner
New Holland Honeyeater
Eastern Whipbird
Black-faced Cuckoo-shrike
Golden Whistler
Olive-backed Oriole
Australasian Figbird
Australian Magpie
Grey Butcherbird
Pied Currawong
Grey Fantail
Willie Wagtail
Rufous Fantail
Australian Raven
Magpie-lark
Black-faced Monarch
White-winged Chough
Eastern Yellow Robin
Jacky Winter
Rose Robin
Silvereye
Welcome Swallow
Red-browed Finch
House Sparrow

MAMMALS

Short-beaked Echidna
Brown Antechinus
Long-nosed Bandicoot
Sugar Glider
Common Ringtail Possum
Common Brushtail Possum
Swamp Wallaby
Grey-headed Flying-fox
Gould's Wattled Bat
Southern Myotis

These records are from Willoughby City Councils' Wildlife Register. To contribute sightings to the wildlife register email wildlifewatch@willoughby.nsw.gov.au. All sightings are also recorded in BioNet and Atlas of Living Australia.

ATTACHMENT E – Diane Staats, 'Respirable Crystalline Silica Dust in tunnelling spoil - Risks of harm to children living, playing sports and going to school near the construction site at Cammeray'. See separate attachment lodged with submission.

Respirable Crystalline Silica Dust in tunnelling spoil - Risks of harm to children living, playing sports and going to school near the construction site at Cammeray

1. Overview

School children living, going to school and playing in sports fields/parks, near the construction site at Cammeray Golf Course will be exposed to **respirable crystalline silica dust** (**RCS**) over **7- 8 years** (during the back to back Western Harbour Tunnel (**WHT**) and Beaches Link (**BL**) projects) unless there are appropriate mitigation measures.

Children at Anzac Park Public School, Cammeray Public School, KU Cammeray Preschool, Cammeraygal High School (Senior Campus) and Neutral Bay Public School, and children exercising at Green Park and Cammeray Oval and Tennis Courts, are potentially affected because of their proximity to the Cammeray site: see attached Map 1.

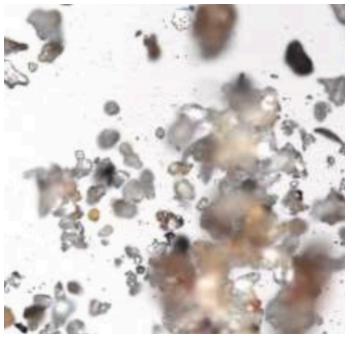
Ian Bridge, an environmental scientist and expert on non-occupational exposure to RCS dust, recommends the application of additional mitigation measures in order to keep children safe:

- a negative pressure acoustic shed
- tunnelling spoil be loaded into trucks using a method to prevent the emission of particulates during loading operations
- ambient RCS levels are limited to 3ug/m^3 with stop work requirements when exceeded
- monitoring of particulates in areas where children may be exposed
- stockpiles from surface works should be contained in a second shed; if temporary stockpiling is required, it should covered at all times
- monitoring, including cameras, with real time data feed, be installed and with results accessible by the Community.

2. Detailed Analysis

2.1 **Respirable crystalline silica** is:

- made of **crushed quartz** from sandstone
- can be breathed deep into the alveolar region of the lungs where it causes damage
- invisible (being less than 4 microns in size)
- can remain in the environment for days.



Magnified view of RCS

2.2 **Exposure to amounts of RCS above the 3 microgram annual average can be harmful:**

- RCS is a Class 1 carcinogen
- There is a causal link between RCS and **lung disease (including silicosis)**

- Beyond a critical level of exposure to silica, the body can no longer clear the silica and it produces an inflammatory response and irreversible damage to the lung occurs
- The dust next to the 5 cent coin is the daily exposure limit for a worker in a tunnel.

The NSW Government has a campaign to minimise exposure to RCS, following the alarming rise of silicosis in stonemasons dealing with engineered stone and coal miners.

2.3 **Tunnelling spoil with RCS dust at Cammeray site**

The WHT and BL will generate over 5 millions tonnes of spoil (630,000 tonnes at Cammeray), primarily from tunnelling over 7- 8 years. The tunnelling projects are similar to an extractive mine. Huge mounds of tunnelling spoil containing RCS will be stockpiled at the Cammeray site in acoustic sheds. The acoustic shed can store one days' tunnelling spoil.

Acoustic shed at WestConnex

Spoil (including crushed rock containing silica) can be stockpiled outside (up to 4,500 cubic metres at Cammeray) for each of WHT and BL projects.

2.4 **Risk of harmful exposure**

There is a risk of harm from **non-occupational** exposure to RCS dust, blown or otherwise dispersed from the stockpiles of ***freshly*** crushed sandstone spoil inside and outside the acoustic shed at the Cammeray site as:

- tunnelling spoil from Sydney's Hawkesbury sandstone contains very high levels of RCS (up to **95%** quartz)
- freshly fractured silica particles (less than 6 hours old) are particularly harmful
- trucks will enter the acoustic sheds every few minutes and be filled with trench spoil, re-dispersing, and making airborne, the harmful RCS contained within the crushed rock. Doors of the acoustic shed are unlikely to be kept closed during the day because of the number of heavy truck movements at Cammeray (485 daily)
- the BL EIS acknowledges that mitigation measures for suppressing dust may be ineffective, particularly on hot windy days, "where the wind is blowing towards a receiver".

During the WestConnex Project, recommended air quality targets were exceeded regularly from dust blowing from construction sites, including outside stockpiles. A dust storm from construction sites was even recorded: https://www.wendybacon.com/2018/haberfield-dust-storm-not-just-a-regional-event

2.5 **There is no 500 metre buffer zone between the site and schools needed to keep children safe -** as recommended by Victoria's EPA and required by NSW Councils for sites involving the crushing and stockpiling of RCS. Anzac Public, Cammeray Public, and KU Cammeray are less than 500 metres from the construction site.

Studies show that silica dust levels remain high 750 metres downwind from sites that may release silica particles - and so Cammeraygal High School and Neutral Bay Public School could also be impacted.

A sandmine at Somersby Fields was refused by the DPIE because of its impact on a primary school which was less than 200 metres from the site (the key issue was exposure to RCS with 95% quartz levels): https://www.smh.com.au/environment/scorn-at-sandmine-rejection-20090810-efmt.html

2.6 **It can be anticipated that children living, going to school and exercising within 500 metres of construction sites will suffer from more severe respiratory illnesses**.

Residents living next to the WestConnex Project experienced: first-time diagnoses of asthma among children, worsening asthma or other respiratory symptoms, conjunctivitis and skin irritations, as well as dust allergies. A study also showed similar symptoms were significantly greater for those living within 500m of a sand quarry as compared to those living farther away.

2.7 **Immediate mitigation measures needed to protect children**

The risks of non-occupational exposure to RCS has been considered by environmental scientist and expert, Ian Bridge, in his peer reviewed paper:

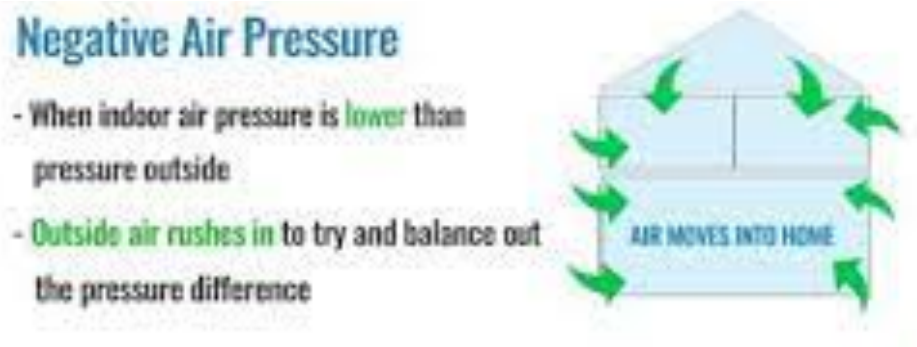
http://www.superquarry.org.au/wp-content/uploads/2011/02/Bridge-2009-environmental-silicosis-risk045.pdf

Mr Bridge recommends the following mitigation measures to help keep children safe:

(a) The acoustic shed needs to be modified to a **negative pressure** shed

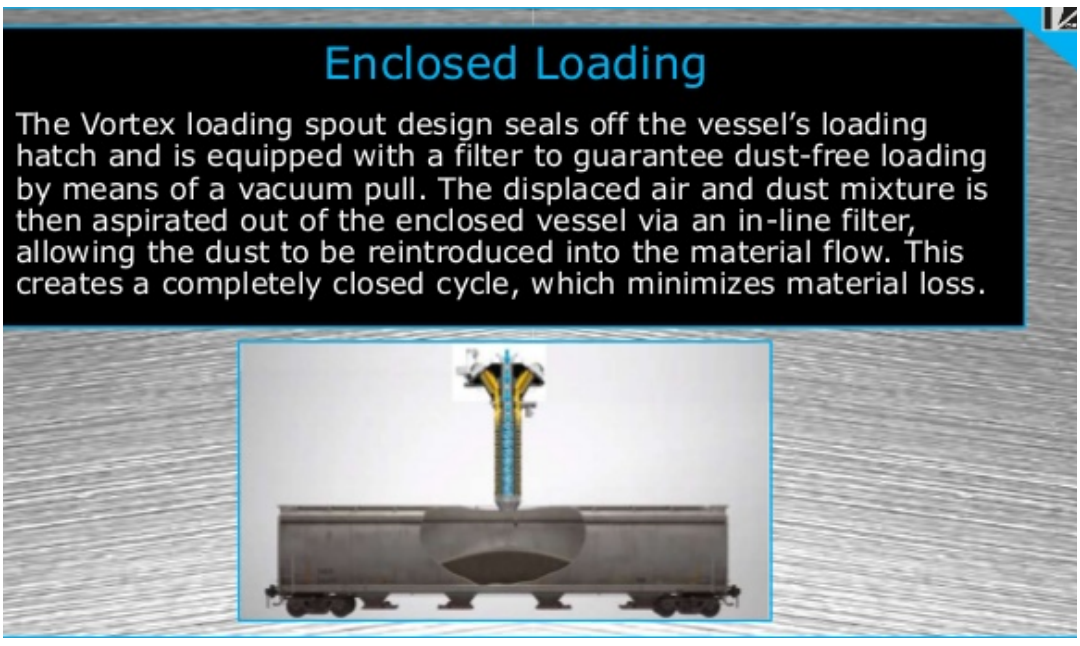
The pressure inside of the shed will be less than outside - with the result that air from outside will flow Into the shed but air from inside the shed will not flow out. The air in the acoustic shed would be exhausted outside though filters which will reduce emissions of particulates.

Dust filter unit



(b) Tunnelling spoil should be loaded into trucks using a method to prevent the emission of particulates during loading operations

The loading spout, in the example below, would be an appropriate technology.



Water misting/sprays would not be effective at controlling ultra fine particles.

(c) Ambient RCS levels should be 3ug/m^3 or less

The DPIE (under the Air Quality Management Plan), or the EPA (under a Environment Protection Licence), should implement Victoria's EPA recommendation for a total exposure limit of 3ug/m3 for ambient RCS to protect communities who are potentially exposed in the vicinity of peak sources.

(d)) High quality PM 2.5 and PM 10 monitors should provide real data to the Community and alert them if there is an exceedance of air quality standards

The monitors should be installed in playing fields adjacent to the construction sites and in all schools located within 750 metres from the construction site. Baseline data should be collected before the commencement of construction activities so that there are effective enforcement rights for breach of air quality standards.

This feed should be recorded and stored as a permanent public record as the health impacts of exposure to RCS dust and other particulates may become apparent much later if clusters of cancer or respirable diseases emerge.

(e) There should be stop work requirements when air quality standards are exceeded

The Air Quality Management Plan for the WHT, and the Conditions of Approval for the Beaches Link, should require a cessation of work at the construction site if, and for as long as, ambient RCS dust levels and other ambient air quality standards are exceeded. Stop work should still occur even if the exceedences are not caused by the tunnelling construction works eg by bushfires, and should only resume when air quality is within acceptable limits. This is because <u>total</u> exposure to ambient air quality particulates is the health risk concern.

(d) No stockpiles outside sheds and spoil from adjoining surface works must be tested

There should be a prohibition on:

- leaving uncovered stockpiles outside - stockpiles of surface works should be stored in a separate shed (without increasing the footprint of the construction site); if temporary stockpiles are required before the constructions of sheds, they should be covered at all times
- any silica dust in stockpiles
- stockpiling spoil from surface works in other areas because of contamination concerns (unless the spoil is re - tested after excavation to confirm no contamination).

(e) Installation of cameras and monitors with real time data accessible by the Community

Cameras with real time data feed on the website should be placed in the Cammeray construction site (both within and outside the acoustic shed). This is to ensure that there is compliance with Conditions of Approval.

2.8 Possible future mitigation measures (RCS monitors)

As soon as real time RCS monitors are commercially available, such monitors should be added as additional mitigation measures and installed:
- at the construction site (in and outside the acoustic sheds)
- in playing fields adjacent to the construction site
- In schools located within 750 metres from the construction site.

The monitors should provide real time data to the Community and alert them if there is an exceedance of the RCS levels. This feed should be recorded and stored as a permanent public record as the health impacts of exposure to RCS dust may become apparent much later if clusters of cancer or respirable diseases emerge.

Work at the construction site should cease if, and for as long as, ambient RCS dust levels are exceeded.

3 **Other comments**

3.1 **Additional mitigation measures**

Additional measures may be necessary to deal with particulates arising from construction activities or from the operation of the tunnel.

3.2 **Beaches Link - other affected areas**

The concerns about children's exposure to RCS also affects children using playing fields at Flat Rock Baseball Diamond, Bicentennial Netball Courts and Ovals and Shore Oval (their proximity to the Flat Rock Reserve site is shown in Map 2) and children going to school at Balgowlah Boys High School, St Cecilia's and Seaforth Public School.

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Paper reviewed by Ian Bridge - environmental scientist, university lecturer and and expert on non-occupational exposure to RCS dust: https://www.linkedin.com/in/ian-bridge-5639908/