WEPA Response to the Transport for NSW Beaches Link and Gore Hill Freeway Connection Environmental Impact Statement

28 February 2021

Clive Park, Northbridge Foreshore

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1 INTRODUCTION

The following submission is made on behalf of the members of the Willoughby Environmental Protection Association Inc. (WEPA) and outlines our **objections** to findings of the Transport for NSW Beaches Link and Gore Hill Freeway Connection Environmental Impact Statement (December 2020) (EIS). The submission is in two parts: Part 1 deals with Alternatives and Need, and the impacts of the proposed project on Biodiversity and Part 2 with Community impacts.

1.1 WEPA

WEPA was formed in 1981 and for close to forty years has been fighting to protect and regenerate Flat Rock Gully (FRG), 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 FRG bushland and creation of public walks on the eastern side of Flat Rock Gully and this has remained an important WEPA priority.

In keeping with our location and capacities as a local volunteer group, in response to the EIS we have focused on the biodiversity and environmental impacts on **Flat Rock Gully (FRG), 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 community in these areas will be submitting on these concerns. The submission which follows expands on our local focus and details our concerns in response to the breadth of the EIS, the mitigation strategies it includes and its overall conclusions.

2 EXECUTIVE SUMMARY

In line with our commitment to preserve Flat Rock Gully (FRG) and to oppose further environmental degradation in this area, WEPA **objects strongly** to the placement of the dive site for the proposed Beaches Link Tunnel at the top of FRG and the use of Clive Park and Middle Harbour as a construction site for an immersion tunnel. The tunnel works will result in the clearing of over 16 acres of bushland habitat at the top of the catchment with flow on effects to the rest of the gully, Tunks Park, Middle Harbour, the Sailors Bay foreshores, and local and regional north-south and east-west wildlife corridors. We are particularly concerned that the future of FRG is unclear and that part of this bushland habitat may be lost to our area forever.

The proposed works also raise serious health and safety risks for people using these areas, particularly the younger members of our community. We would like to see a moratorium on this project and a re-examination of 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. We have also requested greater transparency and additional research to be undertaken for the EIS and the development of more robust mitigation measures to ensure that it does not negatively impact the environment that our communities and local wildlife share.

In summary, our **major objections** are that:

- the Beaches Link construction sites will negatively disrupt significant wildlife corridors, including Flat Rock Gully, Clive Park and marine ecosystems at Middle Harbour;
- the biodiversity scoped in the Beaches Link EIS is, in line with existing legislation, deliberately narrowed. The bulk of the biodiversity assessment concentrates and comments on 23 threatened species only. It fails to assess impacts on the many hundreds of species which will lose their habitat, be driven away or bulldozed under by construction including a wide range of invertebrates, birds, frogs, reptiles, fish and mammals;
- the 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 construction risks contamination of local land, creeks and the harbour which threatens land and marine ecosystems and public health;
- the Preliminary Site Investigation in relation to FRG and its environs has been inadequate as there has not been a thorough investigation of past land use;
- the results of contamination testing relating to FRG have not been released;
- further mooted contamination testing in relation to FRG should be done now;
- many of the EIS mitigation measures proposed to protect biodiversity and public health are inadequate or require further evidence and details of proposed management methods;

- 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;
- there has been insufficient time for community members to inform themselves and comment on the EIS, in particular for P&Cs.

Recommendation 1
As the current EIS is inadequate in light of the matters raised in this submission, a revised EIS containing the additional information should be prepared and exhibited and a three-month period (not including the Christmas/ January period) allowed for public comment.

3 ALTERNATIVES AND NEED

These matters are required to be assessed as part of the Secretary's Environmental Assessment Requirements (SEARs).

Firstly, no **business case** has been released.

There has never been a full business case assessed by Infrastructure Australia or even a business case submitted to Infrastructure Australia for Beaches Link separately to the Western Harbour Tunnel. Therefore, Beaches Link (in conjunction with the Western Harbour Tunnel) is 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]

As far as WEPA can ascertain 'the appropriate time' has not yet arrived. There is certainly nothing in the EIS to suggest otherwise.

[1] Infrastructure Priority List, August 2020
[2] Infrastructure NSW, Final Business Case Summary Western Harbour Tunnel (FBCS)

Nevertheless, the FBCS states: '*Total economic benefits of the Program are estimated at $12,469 million in discounted terms.*[3] which is considerably less than the current estimated cost of the Program.

Even if this calculation is an incorrect way in which to calculate benefit compared to cost (**BCR**), the figure for the BCR for the Program – 1.2 to 1.3[4] – raises real questions as to whether the BCR for the Beaches Link considered alone would be over 1.0. This is because, as mentioned below, the project will not have any significant freight component compared to the Western Harbour Tunnel and is a road, in effect, to a peninsula as opposed to being part of any real network.

Secondly, no serious consideration has been given to the current need for the project in light of the impact of **COVID-19**, with any impact being dismissed with the following:

> *In Greater Sydney, traffic levels on most roads have returned to those experienced before NSW government restrictions were put in place. This indicates a relatively rapid response to the event by the city, and suggest that the movement of people, goods and services and demand for road capacity is returning to conditions similar to those prior to the COVID-19 pandemic.*

This is misleading as the proponent is well aware of the modal shift from public to private transport which has taken place due to COVID-19 and the fact that this shift is likely to be temporary. Comments such as those in Infrastructure Australia's December 2020 report "*Infrastructure beyond Covid-19*" are more relevant eg:

- *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*[5]

It should be a relatively simple matter for the proponent to adjust current traffic figures to allow for the temporary modal shift as it relates to traffic to and from the Northern Beaches Local Government Area (LGA) and assess the long-term impact of COVID-19 on relevant traffic volumes, as opposed to Greater Sydney traffic volumes.

[3] FCBS, p.10
[4] FCBS, p.15
[5] Infrastructure beyond COVID-19, A national study on the impacts of the pandemic on Australia, 14 Dec 2020, p.49

Thirdly, the impact on congestion and journey times of the **current B-line service** has not been examined.

Fourthly, the impact on congestion and journey times of a **tilt lock system** to reduce the number of Spit Bridge openings has not been examined.[6]

Fifthly, while the EIS makes reference to the capacity of the planned rapid bus service from Dee Why to Chatswood in combination with the Metro from Chatswood to the Sydney CBD (due for completion in 2024) to **reduce relevant congestion**, there is no detailed analysis of the likely impact on traffic to and from the Northern Beaches LGA. Instead, there is reference to journey patterns in Greater Sydney:

> *While these projects would contribute to reducing congestion on the existing road network, 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 EIS states that the metro from Chatswood to the Sydney CBD will provide a capacity increase of 100,000 passengers an hour (page 4-14). 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.[7]
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

[6] https://www.yachtingmonthly.com/news/tilting-lock-submerges-yachts-under-low-bridges-31419

[7] Crows Nest Train Station | North Sydney Information | Sydney Metro; Sydney Metro Southwest Project Overview | Sydney Metro

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.[8]

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.[9]
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.[10]

Finally, it is noted that the proponent states the project will only provide meagre benefits for the Spit Road/Military Road corridor in any event with a 10% reduction from current travel volumes by 2037.

The following figure is from the EIS -

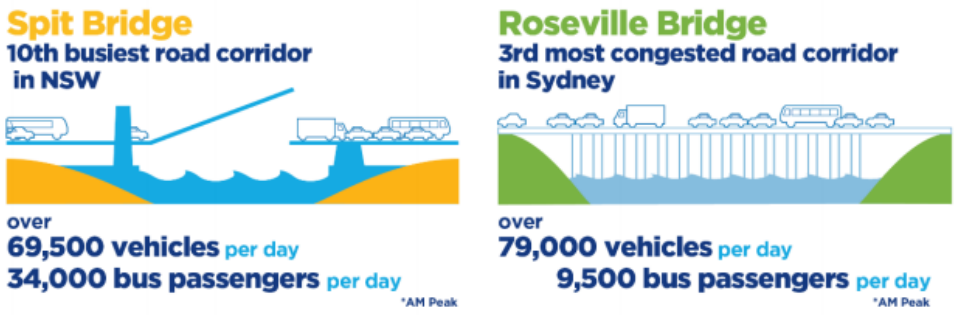

Figure E-2 Key metrics for the Eastern Harbour City's transport network

[8] Residents journey to work | Northern Beaches Council area | profile.id page 3-4)
[9] NSW Transport for NSW Traffic Volume Viewer; Frenchs Forest Priority Growth Area - Summary
[10] Traffic Volume Viewer

Recommendation 2

That the EIS 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; 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; and the BCR of a tilt lock under Spit Bridge setting out in detail how it has been calculated.

Recommendation 3

That a EIS 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;
- 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.

PART 1 BIODIVERSITY

4 BIODIVERSITY IMPACTS

4.1 SEARs, Legislative Framework and Biodiversity

Under the revised Secretary's Environmental Assessment Requirements (SEARs) for the Environmental Impact Statement (EIS) on the Beaches Link project, the EIS is,

> *to avoid, minimise or offset impacts so that the project, on balance, has the least adverse environmental, social and economic impact, including its cumulative impacts.*

The SEARs also requires that the,

> *project design considers all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity*[11].

These considerations seem to be in line with one of the key principles of Ecologically Sustainable Development in the *Protection of the Environment Administration Act 1991* (NSW) which declares that conservation of biological diversity and ecological integrity should be of fundamental consideration[12].

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.

There is a marked disjunction, however, between the holistic references above to the protection of biodiversity and its application in the form of the EIS. The SEARs goes on to indicate the need for biodiversity assessment to utilise the *Environment Protection and Biodiversity Conservation Act* 1999 (Cwlth) (EPBCA) and the NSW *Biodiversity Conservation Act 2016* (BCA). They are complemented by protection provided under Part 7 of the *Fisheries Management Act 1994*.

Despite the repeated use of the term biodiversity, what this legislation, and the associated Biodiversity Assessment Methodology (BAM), have in common is that they are limited in their focus to deal, not with the full gamut of biodiversity, but only with **threatened ecological communities** and certain **threatened species** which have been listed by the Federal and NSW acts. While this is an important measure for those threatened plants and wildlife and is to be commended if it assists in their conservation, it only provides protection for the rich native biodiversity and habitat found in the areas to be impacted by the proposed Beaches Link tunnel if those areas contain ecological communities and/or species listed in the two acts.

[11] SEARS 2020 6 Biodiversity
[12] PEAA Act Part 3(2)(c)

While the SEARs called for all feasible measures to avoid and minimise impacts on terrestrial and aquatic biodiversity[13] 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.

4.2 Saving Suburban Bushland

Urban bushland is fast disappearing under Sydney's bulldozers. WEPA believes that we can no longer afford to put construction sites, with all their impacts, in the remaining biodiversity rich areas.[14]

Research by Brendan Wintle, Professor, Conservation Ecology, University Melbourne, and others has found small urban bushland patches to be of far greater importance to continued biodiversity than hitherto thought:

> *The combined impact of the loss of many small patches is massive. It's a significant contributor to our current extinction crisis*.[15]

Dr Wintle's global study, which included Australian cities, found these small patches of habitat are critical to the long-term survival of many **common but declining** as well as rare and endangered species. Despite repeated Government commitments to enhance the vegetation cover of urban areas and halt species extinctions, the loss of vegetation in Australian cities continues.

The following comments and recommendations in relation to the EIS deal not only with threatened species but with the **full biodiversity** of **Flat Rock Gully Reserve, Clive Park and Middle Harbour** and the significance of these small patches of bush in a highly urban area.

5 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

[13] SEARS 2020 6 Biodiversity

[14] Ives, Christopher D et al, Cities are Hotspots for Threatened Species, Global Ecology and Biogeography, 25 (1) Jan 2016

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

provides an important wildlife corridor, the regeneration of which has been a 25-year project for Willoughby City Council and the local community.

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.[16] 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 water to a range of birds and other animals.

5.1 Reserve Designation

To preserve and protect our native wildlife, Council has designated selected bushland reserves in the City 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 - 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.

Recommendation 4
That the 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.

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

Recommendation 5
That the EIS be revised to assess moving the Flat Rock Gully dive site to an area which will not involve the destruction of a Wildlife Protection Area or unacceptable contamination risks.

5.2 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[17]. 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

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

urban wildlife habitat in all relevant NSW legislation, policies, strategies, plans, and programs.[18]

Recommendation 6
That the EIS be revised to assess the impact the construction site will have on a significant local and regional wildlife corridor.

5.3 Regenerated Bushland

The proposal outlined in the EIS is that all bushland and trees on the plateau above FRG, equal to around 6.77 ha (over 16 acres), be cleared (EIS p.19.6). 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.[19]

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 bush care volunteers. Most of the plantings were propagated from cuttings taken from local 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 A).

Recommendation 7
That EIS be revised to include a full study of the regenerated bushland marked for clearance at FRG to provide evidence of its value or otherwise as faunal habitat.

5.4 Remnant Bushland

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.

[18] Government Architect NSW, Draft Greener Places Design Guide, Issue no.04 2020, p.50ff
[19] EIS Chapt 19 Table 19-4
[20] Willoughby City Council, 'Flat Rock Gully Reserve Action Plan' (July 2018), p2

Recommendation 8
That it be a condition of consent that construction works be sited so that they do not impinge on the remnant trees and bushland on the north-eastern edge or other boundaries of the site.

5.5 Tree removal

Over 240 trees will be potentially or directly impacted (removed or roots built over) in the construction site at FRG.[21] 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.[22] 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. Given the increasing need for trees for these purposes, local tree policies should not be overridden by the NSW State Government.

Recommendation 9
That it should be a condition of consent that there be full bush regeneration following any construction and provide three for one tree plantings as required by the local vegetation strategy.

Recommendation 10
That it be a condition of consent that all suitable felled trees with hollows, particularly those larger than 20cm, be relocated to nearby areas so they can continue to provide habitat for birds and arboreal mammals.

If that is not feasible, then funds should be set aside for new artificial hollows to be made in suitable dead trees nearby or habitat boxes installed. Provision should be made for long term maintenance of this infrastructure.

Recommendation 11
That it be a condition of consent 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.

[21] EIS Annexure C in Appendix W Pt 1, p.32
[22] Willoughby City Council, Vegetation Management Strategy, 2020

5.6 Assessments and Field Studies

The content of the EIS seems to indicate that only a limited assessment process was carried out in relation to FRG. 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 EIS chapters and appendices.[23]

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

Recommendation 12
That the EIS be revised to include a full study of biodiversity at FRG and other impacted sites.

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.[24]

Recommendation 13
That the EIS be revised to include 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 an assessment of likely impacts. No assessment was done in this area for aquatic wildlife and microorganisms[25]. Despite human impacts, the creek system, particularly at the FRG 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.

[23] EIS Appendix S Table 2.2 Field Studies, pp19-20
[24] EIS Appendix W, p.v
[25] Annexure D Freshwater ecology impact assessment in Appendix 6

Recommendation 14
That the EIS be revised to include a full assessment of fish and macroinvertebrate in creeks and waterways in the FRG area.

5.7 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[26]. 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).

The rich biodiversity[27], with over 240 native plant species appearing on the FRG 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 15
That the 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.

5.8 Native Fauna

The flora noted above, coupled with the local geography, ensures that Flat Rock Gully Reserve has both natural and habitat significance. FRG 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.[28] Destruction of this habitat has the potential to cause local extinctions of these creatures. The site has become a highly important area for foraging and nesting for a suite of small birds; many now missing entirely from local urban areas. It provides trees of different height and density, an intact shrub layer, a creek and other waterways, ponds, open grasslands and rock habitat.

[26] EIS Chapt 19 Table 19.6
[27] WCC Urban Plan of Management Vol 2, Resource Inventory, Flat Rock Gully – Native Plant Species list, pp.157 - 164
[28] Willoughby City Council, 'Flat Rock Gully Reserve Action Plan' (July 2018), p2

Smith and Smith in their 2010 study for North Sydney Council[29], 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 was 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 FRG.[30]

The EIS acknowledges at various points that native vegetation at FRG 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 A) 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 the Superb Lyrebird and the Swamp Wallabies, have only returned to FRG 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 FRG area.

Recommendation 16
That the EIS be revised to include an assessment of the full biodiversity of Flat Rock Gully. That such an assessment include species on the WCC 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 FRG 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."*[31]

[29] Peter Smith and Judy Smith, 'North Sydney Council Natural Area Survey Report', prepared for North Sydney Council, November 2010

[30] https://www.domain.com.au/news/australian-cities-urban-sprawl-is-killing-native-bird-species-homes-912289/; 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

[31] EIS Chapter 19, 19.5.2, p.19-60

This very broad statement implies that, with little effort, the threatened species and other fauna will move away. 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 moving 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 circumstance that under the BCA 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 during 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 WCC'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.[32]

Recommendation 17
That the EIS be revised to include the assessment of invertebrates in the areas impacted by the tunnel in recognition of their importance to the environment.

[32] https://www.sydney.edu.au/news-opinion/news/2019/02/12/insect-population-faces--catastrophic--collapse--sydney-research.html

6 CLIVE PARK AND SAILORS BAY CATCHMENT

Another noticeable omission in the 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 WCC, 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 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 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. 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 endangered Little Penguins from the Manly rookery, which is the last mainland NSW rookery for these birds.[33] 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 Appendix B[34].

The impact of light and noise (particularly pile-driving) on the wildlife in Clive Park could be even more significant than at FRG as they are not part of a larger contiguous area of

[33] 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

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-native_fauna_ofsailors_bay.pdf

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

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.

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

Recommendation 18
That the EIS be revised to include a full biodiversity assessment of terrestrial fauna at Clive Park and in the bushland of the Sailors Bay catchment.

7 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 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. [35] 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.[36] Several weeks ago a large seal was seen swimming in and around piers in local waters.

The SEARs for the EIS indicated concern over the impacts to aquatic habitats due to changes to tidal flushing across Middle Harbour and concerns about 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.

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

[35] Marine Estate Management Authority, Sydney Harbour Background Report (2014);
[36] https://www.dailytelegraph.com.au/newslocal/north-shore/hundreds-gather-to-see-the-amazing-sight-of-whale-frolicking-in-middle-harbour/news-story/4b09a6ce90638e928431b7aa0da09424

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 19
That the EIS be revised to include a full study of marine biodiversity, in addition to those designated as threatened, in the Middle Harbour area.

8 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 the areas, over a period of five years or more:

8.1 Noise

The proposed works on the FRG 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[37]

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*.[38]

[37] EIS Chapt 10.6.6
[38] EIS Chapter 19 EIS Table 19-6 p.19-25

Research has shown that as noise levels increase in an area, abundance and species richness significantly decreases. This problem will be exacerbated at FRG 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.[39] The 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 participate in normal behaviours. The noise to be added to FRG 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 site.

Bats

Numerous studies[40] have indicated that noise pollution decreases the foraging efficiency of bats, which are acoustic predators. FRG 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 FRG construction site.[41] The Southern Myotis, which is also listed as Vulnerable, is believed to be present in the open water habitat within Middle Harbour.[42]

[39] https://www.science.org.au/curious/earth-environment/noise-pollution-and-environment

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

[41] EIS Chapt 19 p.19-29

[42] EIS Chapt 19 p.19-26

Recommendation 20
That the EIS be revised to include a further expert study of the bats found in FRG – particularly those known to be Vulnerable - and their response to disruption caused by noise, light and vibration.

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 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'.

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 FRG that a **Powerful Owl** pair roosts and hunts in FRG – the Powerful Owl is listed as Vulnerable. This was confirmed by the EIS which reported that the Powerful Owl was recorded in bushland near the FRG construction site. Guidance[43] 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 21
That the EIS be revised to include a study, in association with BirdLife Australia's Powerful Owl Project[44], to determine where the Powerful Owl pair in FRG is roosting, hunting and breeding and the mitigation required to ensure they are not disturbed,

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.

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

While the comments above deal with a handful of species found in FRG 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"[45]. In order to ensure that displacement of fauna does not become permanent we would suggest:

Recommendation 22
That the EIS be revised to include a study, utilising peer-reviewed science, in relation to the impact of noise on the fauna of FRG and Clive Park.

8.2 Light

Research into light impacts[46] 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 23
That the EIS be revised 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;
- 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.

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

[46] 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; https://www.latrobe.edu.au/news/articles/2015/release/how-artificial-light-effects-mammals; 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 https://onlinelibrary.wiley.com/doi/abs/10.1111/emr.12120); 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 https://onlinelibrary.wiley.com/doi/abs/10.1111/aec.12772; Andrew Taylor, Eastern suburbs council darkens the night sky to reduce light pollution, SMH, 28 Feb 2021

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[47] and that, if it does, those which are mobile will move away.

8.3 Collisions and Accidents

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

Recommendation 24
That there be a condition of consent which prescribes the use of fauna exclusion fencing at FRG to keep terrestrial animals out of the construction site.

8.4 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 with serious consequences to plant life, wildlife and the Long Bay catchment. (Refer to recommendations in Part 2 Section 12 of this submission.)

Recommendation 25
That the EIS be revised to include detailed plans to prevent contamination from the tip material or from accidental oil or chemical spills. The emergency remedial action to be taken if such contamination occurs should also be delineated.

8.5 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.

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

Culvert

Recommendation 26
That the 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.[48]

Wastewater

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

Recommendation 27
That the EIS be expanded 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 (as confirmed in EIS Appendix N Groundwater – Chapter 4).

Recommendation 28
That it be a condition of consent 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.

Water Quality Improvements

Recommendation 29
That it be a condition of consent 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 EIS is unclear on how the tunnel builders will deal with the high level of flood water run-

[48] EIS p.19-65

off into Flat Rock Creek and FRG.[49] There appears to be little assessment of the flooding impact on the FRG 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 30
That the EIS be revised to include an extended flood study covering the construction site at FRG and Flat Rock Creek as it continues into the gully and to Tunks Park.

Recommendation 31
That the 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.

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 would 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 32
That the EIS be revised to include advice on the impacts of these longer-term reductions in flow in Flat Rock Creek on wildlife in FRG.

8.6 Groundwater drawdown

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

[49] Flat Rock Creek Flood Study 2018; ABC News Flood water spills over barriers in Naremburn, Sydney.
[50] EIS p.19-66.
[51] EIS p.19-67

downstream in FRG will, over time, and particularly in times of drought, lead to trees and bushland becoming highly stressed and/or dying.[52]

Recommendation 33
That the 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 conditions of consent. These should cover riparian areas and Threatened Ecological Communities.

Recommendation 34
That the EIS be revised to include conditions of consent 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 conditions should include a clear allocation of responsibilities.

Recommendation 35
Additional modelling based on the lining of the tunnel beneath Flat Rock Creek was mentioned in the EIS.[53] That the EIS be revised to confirm whether or not this lining will be implemented in order to prevent high levels of long-term groundwater drawdown.

9 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. This would make a large portion of Middle Harbour waterways, including Northbridge Baths, unusable for the period of the project and, it is likely, for some time after. There is also a potential for Clive Park to be contaminated.

Recommendation 36
That the 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.

[52] EIS p.19-49
[53] refer to Chapter 16 (Geology, soils and groundwater) and Appendix N (Technical working paper: Groundwater))

9.1 Habitat destruction

This is a relatively pristine part of Middle Harbour and has not been built on in contrast to other foreshore areas in the vicinity. It is alarming to note that the EIS provides for the removal of the rock sill at the intertidal level off Clive Park.

Recommendation 37
That the EIS be revised to provide detail of the process intended for reinstatement of natural habitats like the rocky 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 (EIS, chapters 13, 16, and 17) indicate that during and post construction, that new potentially contaminated sedimentation will overlay the Clive Park Beach, foreshore and bay, 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.

9.2 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' (Table 1, Annexure C, Appendix F). However, only limited sampling seems to have been conducted at the Middle Harbour construction site.

Recommendation 38
That the 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 EIS by the proposed use of a series of silt curtains to alleviate the risk of contaminated material impacted surrounding waters. Questions have

been raised previously about the ability of these silt curtains (which will not be fully 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*. [54]

The 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 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 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 it 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. [55]

[54] U.S. Environmental Protection Agency, 1994 & DOER, 2005

[55] https://penguinfoundation.org.au/get-involved/penguin-jumpers; https://www.environment.nsw.gov.au/topics/animals-and-plants/native-animals/native-animal-facts/little-penguin; https://www.environment.nsw.gov.au/resources/nature/littlepenguineia0203.pdf

Recommendation 39

That the EIS be revised to identify events which could cause damage to the silt curtains and that the conditions of consent require:

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 40

That the 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 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. The drying point is not yet known or the disposal site.

Recommendation 41

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

9.3 Altered hydrodynamics

The EIS states that a permanent alteration of hydrodynamics would occur due to the installation of the immersed tube tunnel [56] Chief among the impacts would be a reduction in the natural flushing of upstream environments which could lead to the death of marine life.

[56] EIS p.19-69 -70

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 42
That the 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.

9.4 Underwater 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. [57] 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 43
That the 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 BCA, is easily displaced by human disturbance, particularly during the breeding season in November to December.[58]

Recommendation 44
That the 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.

[57] EIS Chapter 19, p.19-64
[58] https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10549

There is the potential for noise to be a major **threat** to the **White-bellied Sea-Eagles**[59] 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 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 45
That the 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.

9.5 Boat strike

Watercraft pose a unique threat to 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.[60] Boats generally travel at speeds far faster than penguins so they 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 46
That the 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.

9.6 Mitigations

The proposed mitigation measures contained in the 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

[59] https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=20322
[60] Nicholas S. Phillips, Humans kill a quarter of Perth's Little Penguins Western Independent September 20, 2016

seems doomed to failure as it will not be the main focus or within the expertise of most involved in the construction.

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 it may be permanent.

WEPA would call 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 Government 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 47
That the 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.

10 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.[61]

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

[61] EIS 19-81

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, 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).

The problems with its application have been fully discussed elsewhere.[62] 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.

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 48
That it be a condition of consent 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.

11 FUTURE OF FRG CONSTRUCTION SITE

The EIS remarks at several points that the future of the construction site at Flat Rock Gully is not confirmed. Transport officials at information sessions have suggested that some might like to see it utilized 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 FRG Reserve. The return of

[62] https://www.edo.org.au/publication/endorsing-extinction-is-not-a-minor-admin-task/; https://www.step.org.au/index.php/item/225-assessment-of-biodiversity-offsetting-a-fail-and-worse-to-come; https://theconversation.com/a-tree-for-a-tree-can-biodiversity-offsets-balance-destruction-and-restoration-3682; https://theconversation.com/a-tree-for-a-tree-can-biodiversity-offsets-balance-destruction-and-restoration-3682; https://theconversation.com/biodiversity-offsets-could-be-locking-in-species-decline-14177; https://www.theguardian.com/environment/2021/feb/17/development-should-stop-serious-flaws-in-offsets-plan-for-new-western-sydney-airport; https://www.theguardian.com/environment/2021/feb/10/its-an-ecological-wasteland-offsets-for-sydney-tollway-were-promised-but-never-delivered

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 49
Decision-making about the future of the Flat Rock Gully construction site should not be left to the end of the construction process. It should be a condition of consent 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 50
It should be a condition of consent 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.

Part 2 COMMUNITY IMPACTS

12 CONTAMINATION

12.1 Insufficient preliminary site investigation - Flat Rock Gully and environs

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 Preliminary Site Investigation, 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 EIS has done this inadequately.

The EIS 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.[63]

One of the sources used is a local history by Robert F Mc Killop *Managing our Waste* (2012). [64] There are also references to notifications under the Contaminated Land Management Act (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. This

[63] EIS Appendix M page 22
[64] Robert F.McKillop, Managing Our Waste (2012)

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, all the potential contaminants identified in McKillop are not properly reflected in Table 4-15: Potential contamination sources (anecdotal information).

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.

12.2 Hallstrom refrigerator factory

The Hallstrom refrigerator factory produced the 'Silent Night' fridge – in very large quantities after WWII – 1200 per week at its peak.[65]

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,……*[66]

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*

[65] McKillop p 41

[66] Hallstrom refrigerator - MAAS Collection

the Flat Rock Creek, which made it convenient for him to discharge effluent and other rubbish into the creek.[67]

Given the above, contaminants 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 featured in the movie *Erin Brokovich*.[68] Another is cyanide.[69]

12.3 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 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.

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

Despite the shortcomings in the prelimary 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

[67] McKillop, p.40
[68] Chrome Plating - an overview | ScienceDirect Topics
[69] controlling_risks_associated_with_electroplating.pdf (safeworkaustralia.gov.au)

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. 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. [70]

There has only been limited testing done to date in relation to potential contaminants eg for groundwater.[71] The results of that testing have not been included in the EIS. The EIS has foreshadowed further testing eg in relation to groundwater and landfill gas[72]; and in relation to soil. [73]

It is not appropriate that the results of testing to date have not been released to enable members of the community to assess the adequacy of any proposed management measures. Nor is it appropriate that the results of a detailed site investigation and the proposed remediation action plan are unavailable.

Contamination investigation should be a staged approach:

- Preliminary Site Investigation – 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 – 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.

[70] EIS, Appendix M, page v
[71] EIS, Appendix M page 98
[72] EIS, Appendix M page 98
[73] EIS, Table 9.1, Appendix M

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.

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

12.4 Proposed management of contaminated spoil

The following, received from the proponent on 26 February, in response to an email in relation to the management of contaminated spoil, Illustrates the difficulty members of the community have in responding to the EIS (It 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.

We 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*

has been satisfied.

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 repeat the two recommendations already made in this chapter:

> *Recommendation 51*
>
> *That the 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.*
>
> *Recommendation 52*
> *That the EIS be revised to include a Remediation Action Plan developed via the staged process described with all sampling results included.*

As the proponent has stated at public information sessions that it is not known what the site will be used for after construction is complete, as this will be determined in conjunction with relevant stakeholders, but this may affect the Remediation Action Plan, it's conceivable the site could be used for some activity involving young children.

Recommendation 53
The Remediation Action Plan to be included in the revised EIS should assume future use by very young children.

Although this will be covered in the Remediation Action Plan 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 54
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 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. Although the Remediation Action Plan should deal with this 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 55
That it be a condition of consent that the Remediation Action Plan should 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.

Although the TfNSW 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 of the plans as information is provided to the auditor usually at the end of the process.

Recommendation 56
That it be a condition of consent that there be an on-site independent auditor or weekly unannounced visits by an independent auditor to ensure compliance with plans.

Sub-contractors often won't 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 57
That it be a condition of consent 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 58
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.

12.5 Classification of spoil as virgin excavated natural materials

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 59
That the EIS be revised to assess the amount of VENM consistent with the above definition, and consistently with the other recommendations made in this chapter.

13 LAND IMPACTS

13.1 Flat Rock Gully

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. As noted above this is an old land fill site with known contaminants which are still to be fully tested. It is also likely to be highly unstable as it is at the edge of the Gully, capped with and is composed of deep layers of tip fill capped with sandstone. FRG is in a major catchment area and is subject to major flooding. Flat Rock Gully is also unsuitable as a construction site due

to the groundwater levels and water quality issues exposed by the EIS in the short and long term.

Recommendation 60
That the EIS be revised to reconsider the use of Flat Rock Gully Reserve as the dive site for the Beaches Link tunnel due to its instability and water issues.

13.2 Spoil

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.

See **section 12 Contamination** for recommendations for dealing with this spoil.

13.3 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.

WEPA is concerned with the EIS estimates that the drawdown in Northbridge as a result of the project will be 28m, in Flat Rock reserve 21m and at Willoughby Leisure Centre 22m, resulting in water stress/death for native plants and trees and potential settlement and contamination issues. The underground tunnel will impact groundwater levels and also has

the potential to spread contamination around and downstream from the site. (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.

The following Recommendations were made in Part 1 of this response to address some of these problems:

Recommendation 27
That the EIS be expanded 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.

Recommendation 28
That it be a condition of consent 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.

Recommendation 29
That it be a condition of consent 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.

Recommendation 30
That the EIS be revised to include an extended flood study covering the construction site at FRG and Flat Rock Creek as it continues into the gully and to Tunks Park.

Recommendation 31
That the 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 32
That the EIS be revised to include advice on the impacts of these longer-term reductions in flow in Flat Rock Creek on wildlife in FRG.

Recommendation 33
That the 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 conditions of consent. These should cover riparian areas and Threatened Ecological Communities.

Recommendation 34
That the EIS be revised to include conditions of consent 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 conditions should include a clear allocation of responsibilities.

Recommendation 35
Additional modelling based on the lining of the tunnel beneath Flat Rock Creek was mentioned in the EIS.[74] That the EIS be revised to confirm whether or not this lining will be implemented in order to prevent high levels of long-term groundwater drawdown.

In addition to the above, we would also like to suggest:

Recommendation 61
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 62
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.

Recommendation 63
In order to improve the level of drawdown it is suggested that the EIS be revised to provide for the tunnel lining discussed in 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.

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

Recommendation 64
That the EIS be revised 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.

13.4 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 risks to Aboriginal sites in Clive Park and Flat Rock Gully.

Recommendation 65
That the EIS be revised to provide for constant monitoring via engineering audits 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 66
That the conditions of consent include, as a precautionary measure, a provision 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.

14 HEALTH AND WELLBEING

14.1 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 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[75]. 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 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 for recreation.

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. The need for this green, open space is well-established and our *recommendations nos.1, 2,6, and 8* in Part 1 of the WEPA response argue for the importance of the retention of Flat Rock Gully and other similar sites as green space with an established urban tree canopy.

[75] http://www.smh.com.au/nsw/sydney-to-be-cooled-by-an-extra-five-million-trees-by-2030-20180411-p4z8x7.html?btis

14.2 Pollution Air Quality 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 FRG 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 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.

In addition, WEPA would make the following suggestions:

Recommendation 67
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 300mtr circumference given that the Chief Scientists states that ground level pollution can be at its highest 1km+ from the stacks.

Recommendation 68
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 69
That the conditions of consent in the revised EIS 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 70
That the revised EIS provide modelling of levels of particulate matter/other air pollutants in the environment if the stacks were filtered.

14.3 Noise

There is great concern within the local community about the impact of tunnelling and construction noise associated with the project. The following recommendations are made to alleviate some anticipated noise problems:

Recommendation 71
That the EIS be revised to consider the potential for acoustic walls along Flat Rock Drive and near Anzac Park and Cammeray Oval to alleviate noise impacts.

15 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.[76] 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'.[77] Aboriginal people have left us with 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 the following further recommendation:

> *Recommendation 65*
> *That the revised EIS provide for constant monitoring via engineering audits 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.*

We would also like to make the following recommendations:

Recommendation 72
That the mitigation measures included in Appendix L, Section 9, become conditions of consent in a revised EIS.

We note that it is intended to provide cultural and historic heritage awareness training to

[76] Ian Hoskins, Aboriginal North Sydney, North Sydney Council 2019
[77] Hoskins 2019, p.6

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 73
That the conditions of consent include 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 74
It should be a condition of consent 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.

16 TRAFFIC

16.1 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 and Warringah Freeway Upgrade and construction at the former Channel Nine site in Artarmon.

16.2 Opaque Modelling

Table 8-15 of the 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.

Recommendation 75
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.

16.3 Number of trucks not quantified due to incomplete testing of contaminants

We repeat the matters raised in Chapter 12 Contamination and the recommendations therein. Because of these matters it is impossible to know how much of the spoil will be able to be safely encapsulated and how much will need to be trucked offsite

16.4 Likely impact of routing across Harbour Bridge not quantified

The author received an email from TfNSW in February this year[78] 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 .*

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

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

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 76
The EIS should be revised to model the risk of an accident involving a spoil truck travelling across the Harbour Bridge, and the consequences 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.

16.5 Flat Rock Drive/Brook Street is crossed by many children and others

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.

16.6 Marshalling

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

Recommendation 77
It should be a condition of consent that marshalling should not be permitted on local streets and particularly not in the Naremburn Conservation Area due to the increased vibration risk. Trucks should not be allowed to idle while marshalling.

16.7 Pollutants

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.

The following recommendation, made previously, covers this issue:

> *Recommendation 69*
> *That the conditions of consent in the revised EIS 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.*

16.8 Noise

The noise assessment in the 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 78
The EIS should be revised to include an updated noise assessment which takes into account the impact of braking.

17 CONSULTATION AND COMMUNICATION

WEPA strongly objects to the timing of release of both the Western Harbour Tunnel EIS and the Beaches Link Tunnel; both were released at Christmas, 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 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 – subsequently unsuccessful – for an extension to review the 12,000 pages of documents associated with the most recent EIS.

The Transport information 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 and answers given once with no recourse for follow up questions if a satisfactory answer was not received. Attempts to follow up on unsatisfactory answers were usually characterised by the convenors as 'this has already been answered'.

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. In addition, the NSW Government should not rely on people to 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, have only been alerted to the impacts of construction in the last few weeks which seriously impedes their ability to raise the full range of questions and concerns they may hold about the project.

WEPA LIST OF RECOMMENDATIONS

Recommendation 1

As the current EIS is inadequate in light of the matters raised in this submission, a revised EIS containing the additional information should be prepared and exhibited and a three-month period (not including the Christmas/ January period) allowed for public comment.

Recommendation 2

That the EIS be revised to include: the need for the project in the light of likely COVID-19 impacts on relevant traffic volumes and population growth rates; 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; and the BCR of a tilt lock under Spit Bridge setting out in detail how it has been calculated.

Recommendation 3

That the EIS 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;
- 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.

Recommendation 4
That the 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.

Recommendation 5
That the EIS be revised to assess moving the Flat Rock Gully dive site to an area which will not involve the destruction of a Wildlife Protection Area or unacceptable contamination risks.

Recommendation 6
That the EIS be revised to assess to take into consideration the impact the construction site will have on a significant local and regional wildlife corridor.

Recommendation 7
That EIS be revised to include a full study of the regenerated bushland marked for clearance at FRG to provide evidence of its value or otherwise as faunal habitat.

Recommendation 8
That it be a condition of consent that construction works be sited so that they do not impinge on the remnant trees and bushland on the north-eastern edge or other boundaries of the site.

Recommendation 9
That it should be a condition of consent that there be full bush regeneration following any construction and provide three for one tree plantings as required by the local vegetation strategy.

Recommendation 10
That it be a condition of consent that all suitable felled trees with hollows, particularly those larger than 20cm, be relocated to nearby areas so they can continue to provide habitat for birds and arboreal mammals.

If that is not feasible, then funds should be set aside for new artificial hollows to be made in suitable dead trees nearby or habitat boxes installed. Provision should be made for long term maintenance of this infrastructure.

Recommendation 11
That it be a condition of consent 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.

Recommendation 12
That the EIS be revised to include a full study of biodiversity at FRG and other impacted sites.

Recommendation 13
That the EIS be revised to include 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.

Recommendation 14
That the EIS be revised to include a full assessment of fish and macroinvertebrate in creeks and waterways in the FRG area.

Recommendation 15
That the 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.

Recommendation 16
That the EIS be revised to include an assessment of the full biodiversity of Flat Rock Gully. That such an assessment include species on the WCC list, others identified in discussion with Council's bushland staff and Bushcare teams and ascertained further by community consultation.

Recommendation 17
That the EIS be revised to include the assessment of invertebrates in the areas impacted by the tunnel in recognition of their importance to the environment.

Recommendation 18
That the EIS be revised to include a full biodiversity assessment of terrestrial fauna at Clive Park and in the bushland of the Sailors Bay catchment.

Recommendation 19
That the EIS be revised to include a full study of marine biodiversity, in addition to those designated as threatened, in the Middle Harbour area.

Recommendation 20
That the EIS be revised to include a further expert study of the bats found in FRG – particularly those known to be Vulnerable - and their response to disruption caused by noise, light and vibration.

Recommendation 21
That the EIS be revised to include a study, in association with BirdLife Australia's Powerful Owl Project[79], to determine where the Powerful Owl pair in FRG is roosting, hunting and breeding and the mitigation required to ensure they are not disturbed,

Recommendation 22
That the EIS be revised to include a study, utilising peer-reviewed science, in relation to the impact of noise on the fauna of FRG and Clive Park.

Recommendation 23
That the EIS be revised 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;
- 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.

Recommendation 24
That there be a condition of consent which prescribes the use of fauna exclusion fencing at FRG to keep terrestrial animals out of the construction site.

[79] https://birdlife.org.au/projects/urban-birds/powerful-owl-project-pow

Recommendation 25
That the EIS be revised to include detailed plans to prevent contamination from the tip material or from accidental oil or chemical spills. The emergency remedial action to be taken if such contamination occurs should also be delineated.

Recommendation 26
That the 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.[80]

Recommendation 27
That the EIS be expanded 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.

Recommendation 28
That it be a condition of consent 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.

Recommendation 29
That it be a condition of consent 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.

Recommendation 30
That the EIS be revised to include an extended flood study covering the construction site at FRG and Flat Rock Creek as it continues into the gully and to Tunks Park.

Recommendation 31
That the 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 32

[80] EIS p.19-65

That the EIS be revised to include advice on the impacts of these longer-term reductions in flow in Flat Rock Creek on wildlife in FRG.

Recommendation 33
That the 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 conditions of consent. These should cover riparian areas and Threatened Ecological Communities.

Recommendation 34
That the EIS be revised to include conditions of consent 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 conditions should include a clear allocation of responsibilities.

Recommendation 35
Additional modelling based on the lining of the tunnel beneath Flat Rock Creek was mentioned in the EIS.[81] That the EIS be revised to confirm whether or not this lining will be implemented in order to prevent high levels of long-term groundwater drawdown.

Recommendation 36
That the 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.

Recommendation 37
That the EIS be revised to provide detail of the process intended for reinstatement of natural habitats like the rocky sill at the edge of Clive Park provided at the level of detail needed to assess the potential for habitat recovery after the works.

Recommendation 38
That the 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.

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

Recommendation 39

That the EIS be revised to identify events which could cause damage to the silt curtains and that the conditions of consent require:

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 40

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

Recommendation 41

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

Recommendation 42

That the 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.

Recommendation 43

That the 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.

Recommendation 44

That the 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.

Recommendation 45
That the 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.

Recommendation 46
That the 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.

Recommendation 47
That the 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.

Recommendation 48
That it be a condition of consent 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.

Recommendation 49
Decision-making about the future of the Flat Rock Gully construction site should not be left to the end of the construction process. It should be a condition of consent 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*.

Recommendation 50
It should be a condition of consent 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.

Recommendation 51
That the 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.

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

Recommendation 53
The Remediation Action Plan to be included in the revised EIS should assume future use by very young children.

Recommendation 54
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.

Recommendation 55
That it be a condition of consent that the Remediation Action Plan should 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 56
That it be a condition of consent that there be an on-site independent auditor or weekly unannounced visits by an independent auditor to ensure compliance with plans.

Recommendation 57
That it be a condition of consent 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.

Recommendation 58
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.

Recommendation 59
That the EIS be revised to assess the amount of VENM consistent with the above definition, and consistently with the other recommendations made in this chapter.

Recommendation 60
That the EIS be revised to reconsider the use of Flat Rock Gully Reserve as the dive site for the Beaches Link tunnel due to its instability and water issues.

Recommendation 61
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 62
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.

Recommendation 63
In order to improve the level of drawdown it is suggested that the EIS be revised to provide for the tunnel lining discussed in 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 64
That the EIS be revised 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.

Recommendation 65
That the EIS be revised to provide for constant monitoring via engineering audits 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 66
That the conditions of consent include, as a precautionary measure, a provision 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.

Recommendation 67
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 300mtr circumference given that the Chief Scientists states that ground level pollution can be at its highest 1km+ from the stacks.

Recommendation 68
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.

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Recommendation 70
That the revised EIS provide modelling of levels of particulate matter/other air pollutants in the environment if the stacks were filtered.

Recommendation 71
That the EIS be revised to consider the potential for acoustic walls along Flat Rock Drive and near Anzac Park and Cammeray Oval to alleviate noise impacts.

Recommendation 72
That the mitigation measures included in Appendix L, Section 9, become conditions of consent in a revised EIS.

Recommendation 73
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It should be a condition of consent 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.

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It should be a condition of consent that marshalling should not be permitted on local streets and particularly not in the Naremburn Conservation Area due to the increased vibration risk. Trucks should not be allowed to idle while marshalling.

Recommendation 78
The EIS should be revised to include an updated noise assessment which takes into account the impact of braking.

ATTACHMENT A

Willoughby City Council, 'Native Fauna of Long Bay Catchment'

NATIVE FAUNA OF LONG BAY CATCHMENT

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 B

Willoughby City Council, 'Native Fauna of Sailors Bay Catchment'

NATIVE FAUNA OF SAILORS BAY CATCHMENT

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.

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