



Our ref: DOC20/881350

Senders ref: SSI-10051

Mr Daniel Gorgioski
Planning and Assessment Group
Department of Planning, Industry and Environment
4 Parramatta Square, 12 Darcy Street
PARRAMATTA NSW 2150

Dear Mr Gorgioski

Subject: EES comments on Environmental Impact Statement for Sydney Metro - Western Sydney Airport Project – SSI-10051 – St Marys to Western Sydney Aerotropolis Core precinct

Thank you for your email of 20 October 2020 requesting advice on the Environmental Impact Statement (EIS) for this critical State significant infrastructure project.

The Environment, Energy and Science Group (EES) has reviewed the EIS and relevant documents and provides its recommendations and comments at Attachment A.

Please note that from 1 July 2020, Aboriginal cultural heritage (ACH) regulation, including advice on state significant infrastructure projects, is now managed by the Heritage NSW. The new contact for the ACH regulation team is heritagemailbox@environment.nsw.gov.au.

If you have any queries regarding this matter, please do not hesitate to contact Janne Grose, Senior Conservation Planning Officer on 02 8837 6017 or at janne.grose@environment.nsw.gov.au

Yours sincerely

A handwritten signature in black ink that reads 'S. Harrison'.

18/11/20

Susan Harrison

**Senior Team Leader Planning
Greater Sydney Branch
Environment, Energy and Science**

Subject: EES comments on Environmental Impact Statement for Sydney Metro - Western Sydney Airport Project – SSI-10051 – St Marys to Western Sydney Aerotropolis Core precinct

The Environment, Energy and Science Group (EES) has reviewed the following reports for this SSI:

- Environmental Impact Statement (EIS)
- Technical Paper 3 - Biodiversity Development Assessment Report (BDAR)
- Technical Paper 6 – Flooding, hydrology and water quality
- Appendix E – Design Guidelines

and provides the following comments.

Flooding

It is understood that the baseline model has been developed by considering the committed developments for the Western Sydney International Airport site, the M12 Motorway, the Northern Road, the St Marys Intermodal Facility and future development proposals. The baseline model has been updated by including the Sydney Metro Western Sydney Airport (WSA) infrastructure as the post-development model. The flooding impacts from the Sydney Metro WSA have been determined by comparing the modelling results of baseline and post-development models. The modelling results show that the flooding impacts from the Sydney Metro WSA along the waterway corridors would be small and /or insignificant. However, some minor increase of floodwater level would be expected upstream of the viaducts crossing the waterway corridors due to flow resistance at piers of these viaducts. It should be noted that the adopted hydraulic modelling tool may not be suitable for the assessment of scouring and sedimentation patterns and morphological changes at piers of these viaducts. Modelling at a finer resolution and alternative hydraulic approaches will need to be adopted for the assessment of long-term morphological changes at these locations to identify appropriate management measures. The supporting documents of the EIS have not included the assessment on morphological changes and the requirements for the management measures.

EES is aware that TfNSW has recently received data from INSW South Creek Sector Review related to the RAFTS hydrological model Base Case. TfNSW requested the data to adopt the latest hydrological modelling to inform the design of the project. EES highlights that TfNSW needs to validate their model against INSW Base Case.

In addition, the following factors will need to be elaborated and undertaken to normalise and validate the modelling outputs and generate representative flow characteristics for the Sydney Metro WSA Proposal.

- Calibration and validation are outlined at Appendix B without any plots by comparing the gauging data (and historical flood marks) and modelling results to demonstrate the temporal and magnitude bias of model performance.
- No consultation has been made by the proponent with EES to discuss the adopted modelling process and validation of models although it is a requirement of SEARs.
- Technical Report 6 has a heavy loading on modelling outputs based on adopted design parameters and assumptions and is very light on calibration and validation of models.

EES highlights that the proposed project should be designed to include any impacts due to climate change. The 0.5m freeboard must not be eroded to account for climate change impacts.

EES notes that the Local Flood Plans have been considered in the EIS. EES advises that in addition to Penrith and Liverpool Councils the NSW State Emergency Service (SES) Zone Commander is consulted on the preparation of a Flood Emergency Management Plan appropriate for the construction phase and post development. The Plan should consider the impacts on managing risk to life, emergency management arrangements, evacuation, access and contingency measures for the development considering the full range of flood risk.

While the proposed stations along the project alignment are located outside the probable maximum flood (PMF) flood extent, it is noted in the EIS that local overland flows have the potential to impact two of the proposed stations, namely St Marys and Aerotropolis Core. EES recommends that detailed overland flood modelling is undertaken, in consultation with councils, to determine the extent of the flood risk and recommend measures to mitigate the risk to life and property.

It would be desirable if the proponent/consultants upload the flood study report, models, GIS datasets and other relevant information into the NSW Flood Data Portal following completion of the study.

Biodiversity

Surveys

As discussed in Section 3.8 of the BDAR, surveys for the proposal were quite limited given landholder access restrictions, which has led to a significant proportion of the study area not being surveyed. Table 5.1 indicates that 59% of the area of PCTs to be impacted were not surveyed. Of note is that none of the intact patches of Shale-Gravel Transition Forest and River-flat Eucalypt Forest could be surveyed. The BDAR explains that where survey requirements could not be met, plot data from the Cumberland Plain Conservation Plan have been used, or vegetation attributes have been averaged, as set out in Table 3.5. Consequently, a conservation approach has been taken, in which species and communities have been assumed to be present where surveys were limited, which EES supports.

EES also notes that further surveys will be undertaken in spring 2020. It is assumed that if those further surveys indicate the presence of any large populations of threatened species, that all attempts will be made to avoid these populations, prior to the design and construction plans being finalised.

Large Bent-wing Bat

Table 6.4 states that the Large Bent-wing Bat (*Miniopterus orianae oceanensis*) has been excluded from further consideration as its breeding habitat is not present within the study area. However, this species does occasionally use buildings and other human made structures as breeding habitat, as stated in Bionet. It is also noted that section 8.1.2 indicates that the proposal will lead to demolition of some structures. Therefore, the exclusion of this species has not been adequately justified

Marsdenia viridiflora ssp viridiflora

According to Table 6.2.3, *Marsdenia viridiflora ssp viridiflora* was not found during on-airport surveys. EES notes that there is a recent (2013) record of the species on Badgerys Creek Road, which is within about 5 metres of the 'DESN_SP_MetroAlignment_201004_MGA56' line. EES requests clarification that the on-airport surveys included the site of this record and the species was confirmed to no longer occur at this location

Dillwynia tenuifolia

Table 6.2.3 refers to the expert report for *Dillwynia tenuifolia*, undertaken as part of the Cumberland Plain Conservation Plan. Table 6.2.3 states that Figure 8 in the expert report does not show any areas of the species within the airport site. However, Figure 8 of the expert report for *D. tenuifolia* only shows areas of the species within the 'GPEC' and 'WSA' Growth Areas. Figure 8 does not include the on-airport area as part of the study.

Measures to avoid impacts

The discussion of measures to avoid impacts should also document the measures or options that were considered but not implemented as they were not feasible, such as a 'do nothing' option, as per section 1.2.3 of the Stage 2 BAM Operational Manual.

It is noted that the BDAR states that further surveys will be conducted in spring 2020, then the final offset obligation will be calculated.

It is also noted that the BDAR states that the final report on the offset liability will be delivered within 12 months of the final design and construction plan.

Avoid and minimise impacts on native vegetation

The EIS states “it has been assumed that all vegetation within the construction footprint would be removed but there may be opportunities to retain some vegetation within parts of the construction footprint and this would be confirmed by the construction contractor(s) when appointed” (Section 8.9.3, page 8.48). It indicates the project would impact approximately 60 hectares (ha) of native vegetation (27 ha on-airport and 33 ha of native vegetation off-airport) (page 8.48) which includes 33.32 ha of Cumberland Plain Woodland which is a critically endangered ecological community, 15.93 ha of River-flat Eucalypt Forest which is an endangered ecological community (EEC), 6.39 ha of Shale-gravel Transition Forest which is an EEC and 4.11 ha of Swamp oak floodplain forest which is an EEC (Table 24.5, page 24-19).

All attempts should be made for the project alignment and design to avoid/minimise impacts on native vegetation and where possible the project should be amended to avoid/minimise the clearing of native vegetation.

The EIS states that the project has been designed to avoid biodiversity impacts where possible, by providing bridges and viaducts over key riparian and vegetated areas and ensuring these structures are designed to maintain fauna connectivity. EES supports in principle the use of bridges and viaducts over key riparian and vegetated areas provided the structures are designed to maintain fauna connectivity and that rail corridor security fencing does not prevent fauna movement under these structures (section 11.1, page 11.1).

East-west regional corridor

The rail alignment crosses a regionally significant east -west corridor connection which runs between the Nepean River via Mulgoa Nature Reserve near Glenmore Park to Surveyors Creek riparian corridor to the Orchard Hills defence lands across to South Creek and further east to Ropes Creek at Eastern Creek.

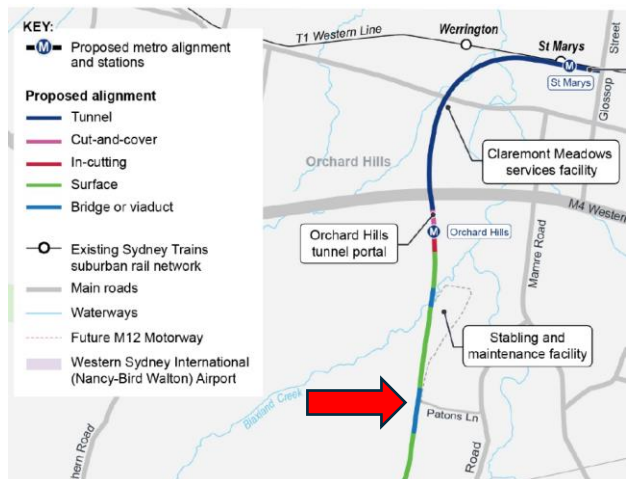
The rail alignment crosses the east-west corridor east of the Orchard Hills defence lands near Patons Lane and has the potential to sever the corridor linkage between the defence lands and South Creek if it is constructed at the surface and/or is not designed to maintain and improve connectivity (see extract below from Figure 3-1, page 3-2 in the EIS). The SSI should not sever the east-west corridor and should be designed to either incorporate an appropriate bridge or viaduct crossing or tunnel under the corridor.

Figure 3.1 in the EIS indicates the rail alignment is proposed to be constructed at the surface near Patons Lane while Figure 7-1 shows a bridge or viaduct is proposed to be constructed (page 7.3) and Table 7-2 indicates a viaduct is proposed to cross Patons Lane and the unnamed tributary of South Creek at this location. The RtS needs to confirm if the rail alignment at Patons Lane will be constructed at the surface, or if a bridge or viaduct is proposed. It is important the SSI protects and improves corridor connectivity at this location to enhance the regionally significant east -west corridor connection.

The EIS indicates the Defence Establishment Orchard Hills between Luddenham Road and Patons Lane within the off-airport land, has connectivity to a large bushland patch to the west (section 11.4.1, page 11.3) but it does not refer to the east-west regional corridor connection. It also notes the importance of the Orchard Hills Cumberland Plain Woodland and the regional corridors of South Creek and its tributaries and states “The project would be located to the east of the Orchard Hills Cumberland Plain Woodland, which is located to the east of the Northern Road, and would therefore not impact on this important Commonwealth heritage listed vegetation. South Creek and its tributaries are recognised as an important regional corridor for the proposed Western Parkland City under the Greater Sydney Region Plan and Western City District Plan and would be of regional landscape sensitivity (Table 20.1, page 20.5).”



Source: extract from Figure 3.1 of EIS shows surface alignment near Patons Lane (see red arrow) and the location of the east-west regional corridor linking across from the Orchard Hills defence land to South Creek



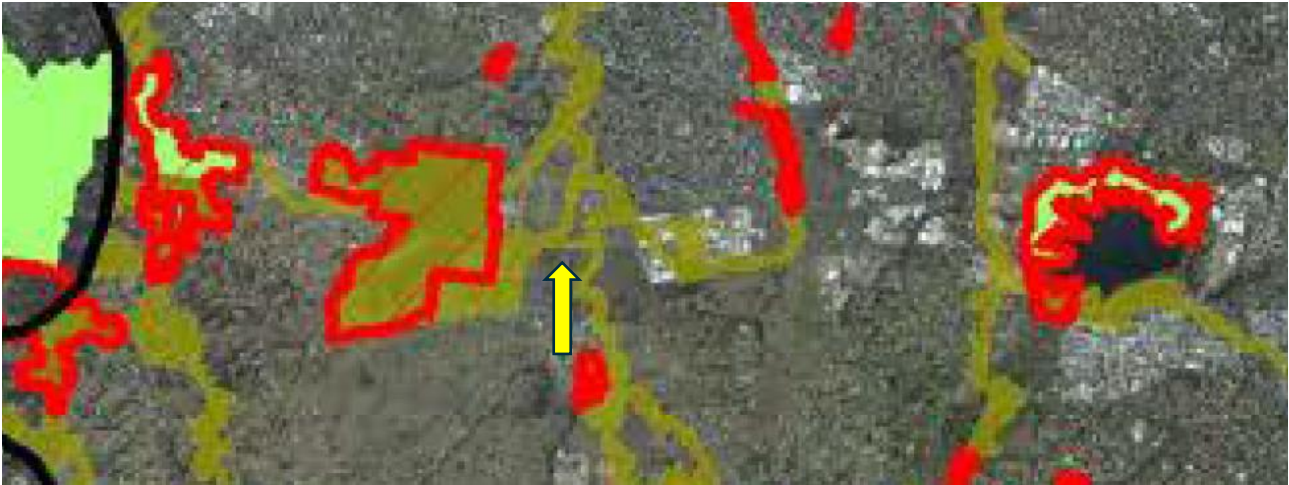
Source: extract from Figure 7.1 of EIS shows bridge or viaduct crossing near Patons Lane (see red arrow)

Planning Priority W14 Protecting and enhancing bushland and biodiversity, in the Western City District Plan includes the action, “Protect and enhance biodiversity by supporting landscape-scale biodiversity conservation and the restoration of bushland corridors”. Responsibility for implementation of this action extends to State agencies. The NSW Office of Environment and Heritage (2015) Biodiversity Investment Opportunities Map (BIO Map), referenced in W14, identifies this east-west corridor linkage as regional corridor 17 (see extract from Appendix 9 - draft Bio Map of the Cumberland Plain subregion below).

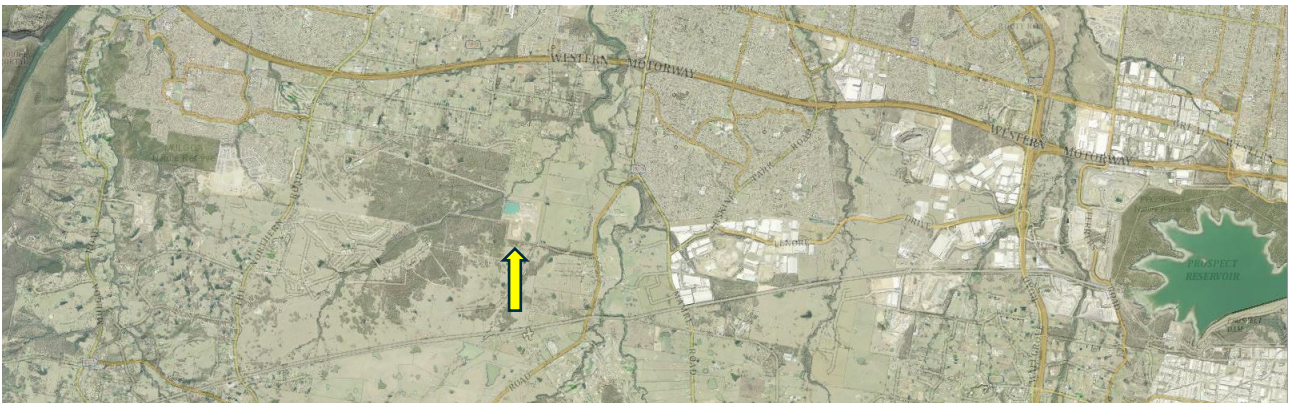
The EIS for the Northern Road Upgrade – Mersey Road - Bringelly to Glenmore Parkway, Glenmore Park (SSI-7127) refers to this regional corridor. The RtS for SSI-7127 confirms connectivity would be planned for in the future between the Mulgoa Nature Reserve and the Defence Establishment Orchard Hills via Regional Corridor 17 (Surveyors Creek corridor) with construction of a fauna crossing to allow for future connectivity (Appendix C, page 36).

The EIS for the Sydney Metro - Western Sydney Airport indicates that the Northern Road Upgrade is being delivered in six stages and that all stages are expected to be operational by 2021 except Stage 5: Littlefields Road, Luddenham to Glenmore Parkway, Glenmore Park, which is expected to be operational in 2022 (see Table 24.1, page 24.5). Figure 24.2 in the EIS shows the Stage 5 upgrade includes where The Northern Road crosses the east west corridor but Table 24.2 in the EIS which relates to potential cumulative impacts of the SSI combined with other projects does not list corridor connectivity/biodiversity as a key construction issue for the Northern Road upgrade.

As SSI-7127 plans to improve connectivity between the Mulgoa Nature Reserve and the Defence Establishment Orchard Hills, it is important that both the Stage 5 upgrade of the Northern Road and the Sydney Metro - Western Sydney Airport project protect and improve connectivity along this east-west regional corridor.



Extract from Office of Environment & Heritage (2015) Biodiversity Investment Opportunities Map (BIO Map) - Appendix 9 - draft Bio Map of the Cumberland Plain subregion - which shows the east-west biodiversity corridor of regional significance which connects from the Nepean River through to the Mulgoa Nature Reserve and the Orchard Hills defence lands to South Creek and across to Eastern Creek. The location of the corridor connection near Patons Lane is shown by a yellow arrow.



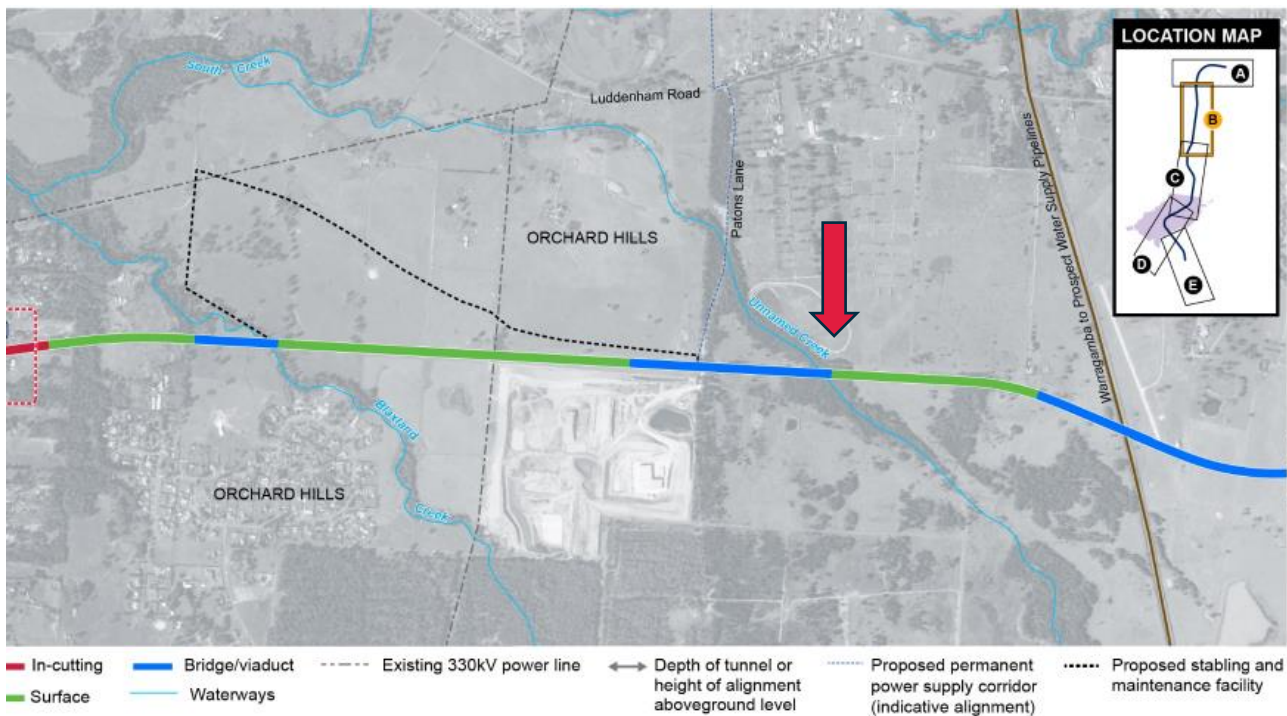
Extract from Sixviewer map – which shows the Nepean River on the far left of the air photo, the Mulgoa Nature Reserve, the Orchard Hills defence lands, South Creek and Eastern Creek which are intended to be linked by the east-west biodiversity corridor. The location of the corridor connection near Patons Lane is shown by a yellow arrow.

Corridor Width

The EIS indicates the viaduct to cross Patons Lane and an unnamed tributary of South Creek to the south of Patons Lane would consist of a series of spanning structures and would have an overall length of around 830 metres to clear all existing infrastructure, the potential flood zone and vegetation in this location (Table 7-2, section 7.2.4, page 7-19).

Figure 7.4b shows that part of the proposed bridge/viaduct near Patons Lane would be located over cleared land beside an existing quarry but the length of the bridge/viaduct does not extend to protect all of the existing remnant vegetation along the unnamed tributary of South Creek (see extract of figure below and red arrow).

The structure should preferably be longer in length and/or located to protect all the remnant vegetation. The bridge/viaduct structure should minimise the clearing/disturbance of existing native vegetation, maintain and/or improve connectivity under the structure to maximise the corridor function. It should be elevated and span the full width of the corridor and/or remnant native vegetation which-ever is the widest to avoid or reduce the need to clear and/or disturb remnant native vegetation. The RtS should provide further details on this.



Source: extract from Figure 7.4b of EIS

Stabling and Maintenance facility

Figure 7-39 shows a stabling and maintenance facility is proposed to be located near the east-west regional corridor and also close to the Blaxland Creek riparian corridor and that vehicular access to the facility and the proposed permanent power supply corridor is via Patons Lane where the east-west regional corridor is meant to be located to link the Orchard Hills defence lands to South Creek.

Section 7.5.4 indicates the power supply connection would include underground electrical cabling (page 7.64 and see Figure 7.42). The stabling and maintenance facility and access to the facility should not impact the regional east-west corridor connection.

Fauna Movement

The proposed viaduct/bridge structure at Patons Lane and the watercourse crossings should allow vegetation to grow under the structures to allow native fauna to move along the corridors beneath the structures.

Section 7.6.4 states the design of the project considers wildlife connectivity requirements where security fencing is not required, and this includes appropriate design of bridge and drainage structures to allow for fauna movement. Locations at which fauna connectivity has been considered and incorporated includes:

- the proposed bridge structures in the vicinity of Blaxland Creek and Cosgroves Creek
- the proposed viaduct structure crossing two existing vegetation corridors at Patons Lane and the unnamed watercourse to the south of Patons Lane
- a culvert (as part of a series of drainage culverts at this location) measuring around 1.5 metres in diameter providing connectivity for wildlife at an unnamed watercourse (tributary of Blaxland Creek) between Lansdowne Road and Blaxland Creek.

Section 7.6.5 of the EIS indicates all surface sections of the alignment would be bordered by security fencing to prevent public access to the rail corridor and preclude native fauna and livestock access and Table 11.13 notes the entire rail corridor will be fenced (excluding areas in tunnel or on viaduct). The RtS needs to clarify whether rail security fencing is proposed to be installed at the viaduct/bridge crossing for the east-west regional corridor and the crossings of watercourses/ riparian corridors as it would prevent native fauna movement along the corridors. If

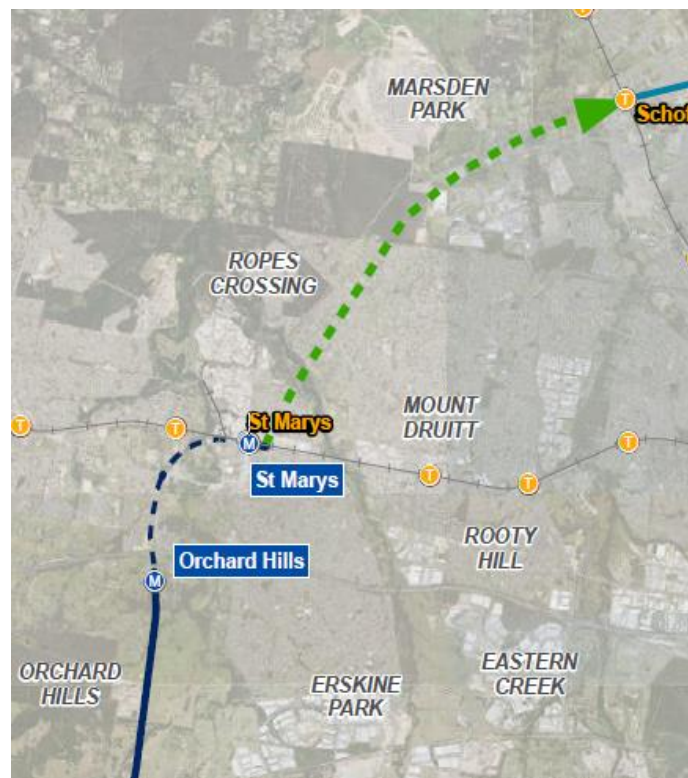
security fencing is required at these crossings that will prevent fauna movement it is recommended underground tunnelling is provided under the east-west regional corridor and the riparian corridors to mitigate impacts on fauna movement. A tunnel would also minimise noise and vibration and light impacts on fauna using the regional corridor during construction and operation, particularly as the EIS notes the Sydney Metro – Western Sydney Airport could operate as a 24-hour service (Section 7.7.2).

Potential north -south extension from St Marys to Schofields

Shanes Park

The EIS states the project includes the following safeguarding provisions “potential future extensions from St Marys heading north towards Schofields/Tallawong in Rouse Hill and from the Aerotropolis Core heading south towards Macarthur by providing underground tunnel stubs beyond the St Marys and Aerotropolis Core stations that would allow for minimal disruption of the operating line during construction of the extensions” (Section 7.1.4, page 7-9). This comment in the EIS indicates that any future extension north from St Marys will be by a tunnel rather than locate the rail alignment at the surface.

Figure 3.1 in the EIS shows the potential north-south extension from St Marys to Schofields (see green dashed line in the figure below). It appears the proposed tunnel could potentially pass beneath Shanes Park (Lot 1 DP447543).



Source: extract from Figure 3.1 of EIS – green dashed line shows the tunnel could potentially pass beneath Shanes Park

The proponent needs to clarify that the dashed green line shown in Figure 3.1 is a tunnel to ensure there is no surface infrastructure proposed to be in Shanes Park (such as surface rail alignment, vents, tunnel infrastructure etc).

Noting the rough estimation of the tunnel's location, EES' and NPWS' preference would be to see the tunnel not located beneath the park, and certainly no surface impacts. It would appear little deviation of the proposed route would be required to achieve this.

The transfer of the land (Shanes Park) to the NSW Government is scheduled to occur by the end of this year and most of it will subsequently be reserved under Part 4 of the *National Parks and Wildlife Act 1974*. Reservation is anticipated to occur early next year. A reserve category is yet to be determined but a stipulation of the transfer of the land from the Commonwealth is that it be managed equivalent to a national park, along with other commitments to the protection of the natural values of the land. There is a very small portion of the lot along the southern boundary that will be land held by the Minister and not reserved, to accommodate the existing pistol club and a potential freeway.

The park will effectively be reserved to the centre of the earth. So, if the proposed tunnel route is beneath the park, revocation of a part of the park will be required to accommodate it. This is something that the proponent needs to be aware of.

If surface impacts are proposed then this will have implications for the biodiversity certification of north west growth centres, along with implications for the commitments associated with the transfer of the land to protect its natural values. Conservation of the Shanes Park land represents the largest single contribution to the protection of 2,000 hectares of existing native vegetation required by the biodiversity certification and strategic approval of western Sydney growth centres. The reservation of Shanes Park is effectively a significant part-offset for the development of those growth centres.

Ropes Creek corridor

Figure 3.1 also shows the potential north-south extension from St Marys to Schofields tunnel could pass beneath the Ropes Creek corridor which links to the former ADI site. EES preference is for a tunnel at this location (rather than located at the surface). If the rail line were to cross the creek at the surface at this location EES recommends it is a bridge/viaduct crossing that spans the full width of the riparian corridor/remnant native vegetation.

Waterways and riparian corridors

Watercourse Crossings

The EIS indicates surface crossings of Blaxland Creek and Cosgroves Creek and other small waterways are required. Figure 7.1 shows a bridge/viaduct structure is proposed to cross Blaxland Creek, Cosgroves Creek and an unnamed tributary of South Creek and tunnels are proposed under Badgerys Creek and South Creek.

The EIS indicates fauna connectivity to existing waterways is currently limited but viaducts, bridges and culverts have been designed to promote fauna habitat connectivity (Table 11.13). It is important the project maintains and/or improves connectivity along the watercourses and riparian areas, particularly as:

- South Creek is identified in the Western City District Plan as one of the District's three major watercourses and the EIS states South Creek and its tributaries are recognised as an important regional corridor for the proposed Western Parkland City under the Greater Sydney Region Plan and Western City District Plan (Table 20.1, page 20.5). The proposed tunnelling under South Creek and Badgerys Creek avoids clearing riparian vegetation along these creeks and impacting the land zoned E2 Environmental Conservation along Badgerys Creek (table 11.10).
- Blaxland Creek is a tributary of South Creek and provides key fish habitat and it provides a link between the Orchard Hills defence lands and South Creek.
- Cosgroves Creek provides key fish habitat and flows into South Creek.

EES recommends scaled plans are provided which show:

- the location of the watercourses
- top of bank
- width of proposed riparian corridors
- existing remnant vegetation / EEC

- associated works including the footprint, length and location of the temporary and permanent watercourse crossings, the boundary of the stabling and maintenance facility which is proposed to be located to the south of Blaxland Creek etc.

Viaduct/bridge crossings

Table 14.4 in the EIS indicates the viaduct construction would involve the creation of temporary roads (including temporary creek crossings in some cases), hardstand areas, work set down areas and crane pads close to waterways. Further details are required on this and the potential impact on the watercourses and riparian vegetation.

Figures 7.4b and 7.4c show the proposed bridge/viaduct crossings of Cosgroves Creek and the unnamed tributary of South Creek do not completely span the remnant vegetation along the creeks. EES recommends the bridge/viaduct completely spans the full width of the riparian corridor/remnant native vegetation on both sides of these creeks.

EES recommends conditions of consent are included which incorporate the following:

- The viaducts/bridges are designed to minimise the clearing/disturbance of native vegetation and native riparian vegetation is protected.
- The viaduct/bridge crossings are designed to maintain and/or improve riparian/terrestrial connectivity under the structure to maximise the corridor function.
- The design should include:
 - a. an elevated structure to allow trees, shrubs and groundcover to grow under the structures
 - b. span the full width of the riparian corridor and/or remnant native vegetation which-ever is the widest on both sides of the waterway to avoid or reduce the need to clear and/or disturb remnant native vegetation
 - c. maximises light and moisture penetration under the structures to support native plant growth.

EES recommends the environmental management measure (EMM) FF8 is amended so that the design of the viaduct /bridge structure is elevated to allow for trees, shrubs and groundcover to grow under the structures. EMM FF8 should not only 'maintain wildlife connectivity' but improve connectivity to maximise the corridor function (page 11-34).

Culvert crossings

Table 11.13 refers to culvert crossings of waterways and water bodies and Section 7.6.4 of the EIS refers to a culvert (as part of a series of drainage culverts at this location) measuring around 1.5 metres in diameter providing connectivity for wildlife at an unnamed watercourse (tributary of Blaxland Creek) between Lansdowne Road and Blaxland Creek. It is unclear if any other waterways are proposed to have culvert crossings and where the culverts are proposed to be located. The RtS needs to provide details on this. Table 11.15 states culverts and bridges would be appropriately sized maintain fauna habitat connectivity.

Culvert crossings should be designed to maintain connectivity and provide fauna passage and the culverts should incorporate the following into the design:

- elevated "dry" cells to encourage terrestrial movement, and recessed "wet" cells to facilitate the movement of aquatic fauna
- maximises light penetration into the culvert using skylights or grates in the culvert structure.
- a naturalised base along the bed of the wet cells.
- 'fauna furniture' (such as rocks, logs, ropes and ledges) to facilitate fauna movement.

EES recommends an EMM and a condition of consent is included to this effect.

Replanting riparian vegetation

EMM LV7 refers to "restoring vegetation along the creeks" (page 20.37 of EIS). Riparian land and existing riparian vegetation removed or disturbed by the project should be rehabilitated with fully

structured local provenance native vegetation (trees, shrubs and groundcover species) from the relevant local native vegetation community or communities that occur along these creeks.

EES recommends a Vegetation Management Plan (VMP) is prepared by a suitably qualified bush regenerator for the protection and rehabilitation of riparian corridors and the following condition of consent is included:

A vegetation management plan shall be prepared and implemented by a suitably qualified bush regenerator to protect and restore the riparian corridors along the waterways which are to be crossed by the project. The plan should include:

- ***a scaled plan which locates the watercourses; top of highest bank; existing native vegetation along the creeks; the riparian corridor widths proposed along the creeks (measured from the top of the highest bank); the project boundary; the area of riparian land/riparian vegetation that will be temporarily disturbed or permanently removed by the project***
- ***details on the native vegetation communities and plant species that currently occur along the creeks***
- ***details on the local native provenance plant species (trees, shrubs and groundcovers) to be planted – a diversity of local native species should be used. The plan should demonstrate that the plant species consist of local native species***
- ***details on the location and number of trees and other plants that are proposed to be planted***
- ***specify that plants are to be propagated from locally sourced seeds to ensure genetic integrity. Seed should be collected from native trees and other native vegetation that is to be removed as part of the project and plants shall be propagated for use – the location of all seed sources should be identified in the VMP***
- ***any juvenile native plants to be removed by the project shall be replanted to locations where plants from these PCTs would naturally occur. The juvenile plants must be translocated prior to any earthworks and clearing of native vegetation commencing. The plants should be relocated when plant growth conditions are ideal to give the native plants the best possible opportunity to survive and should be maintained until established***
- ***details on topsoil removal and reuse. Topsoil from areas of native vegetation to be cleared will be collected for re-use, including within the rehabilitation of the riparian corridors***
- ***details on replacement tree hollows and/or nest boxes including their location, which must be provided prior to any loss of existing trees hollows***
- ***plant maintenance regime - riparian vegetation should be regularly maintained and watered for 12 months following planting. Should any plant loss occur during the maintenance period the plants should be replaced by the same plant species.***

Treated water discharge

Section 8.9.8 of the EIS states the excavation of the tunnels, stations and shafts is likely to intercept groundwater, resulting in the need to capture, treat, reuse or discharge water. It notes surplus treated water needs to be discharged from the sites and may be discharged to surrounding local watercourses including Badgerys Creek, Thompsons Creek, South Creek and an unnamed drainage line (see Table 8.8).

Section 14.5.1 of the EIS notes that treated groundwater discharge volumes have been estimated at between two and 10 litres per second (page 14.25). The discharge of 10 litres per second equates to 86400 litres per day. The RtS needs to identify if the water quality of the treated groundwater will be of similar quality to the receiving surface watercourses that it is being discharged to and whether it is likely to impact the downstream aquatic environment.

It is unclear if groundwater will need to continue to be discharged to the local watercourses during the operation of the project, and if so whether there could be any long-term impacts on the watercourses including modification to the flow regime and impacts on the downstream aquatic environment.

The location of the discharge points to the creeks for surface water and groundwater discharge should avoid the removal of existing riparian vegetation.

Tunnelling under waterways

Section 14.5.1 of the EIS indicates construction of temporary and permanent power supply routes would require crossings of South Creek and Badgerys Creek and that it is proposed that horizontal directional drilling would be carried out to install the cables underground to avoid potential impacts to riparian vegetation, water quality and geomorphology (page 14.22). EES supports trenchless installation of the cables. It is recommended that the drilling be used to avoid impacts where:

- (i) there is permanent flow in the waterway or
- (ii) there is existing native riparian vegetation or
- (iii) the creek is in good natural condition or
- (iv) there is potential fish passage Class 1 or 2 or
- (v) the waterways are geomorphologically fragile or
- (vi) the bed of the watercourse has a mobile bed and not rock

The underground drilling should commence from the outer edge of the riparian corridor and it is bored for the full width of the watercourse and riparian corridor to avoid impacts on the waterway/aquatic environment and existing or rehabilitated native riparian vegetation.

Removal of Farm Dams

Table 11.13 states the project would require the removal and/or relocation of several farm dams (page 11-30). Details are required as to whether the existing dams provide potential habitat for native fauna including native aquatic fauna/foraging habitat for threatened fauna etc.

EES recommends a Dewatering Plan be prepared which includes a Fauna Relocation Plan to develop a strategy regarding the transfer of any native aquatic fauna and the acclimatisation of aquatic fauna to different water conditions prior to dewatering and removing the dams and this is included as a condition of consent :

- ***A dewatering plan will be developed by a suitably qualified and experienced ecologist prior to the dewatering of farm dams. The dewatering plan will include native aquatic fauna relocation requirements, and include details on:***
 - ***the native fauna species known to inhabit and/or use the dams which require transfer from the dams***
 - ***the methodology proposed to transfer the fauna***
 - ***the location and suitability of the proposed relocation sites***
 - ***any potential impacts of relocating the fauna to the relocation sites***
 - ***the need for a suitably qualified ecologist to be present during the dam dewatering.***

Pre- clearing of vegetation

Seed collection from native plants to be removed

The EIS states “Sydney Metro is also investigating the following opportunities to build upon the green infrastructure objectives” which includes “seed salvage of targeted local species for future use in landscaping for the project where possible” (page 20-32). Prior to the removal of any native vegetation, seed from the native plants (trees, shrubs and groundcover species) that is approved for removal should be collected and propagated and used in the project plantings including along the rail alignment, train stations, the rehabilitation of riparian corridors etc.

All plantings should be sourced from seed collected from native plants to be removed. The proponent should commence a seed collection programme as soon as possible so that local native provenance plant species are available to be planted, and the trees are advanced and established in size to improve the urban tree canopy and local biodiversity. EES recommends the following condition of consent is included for the project:

- ***The proponent must commence, as soon as possible, collecting seed from native plants to be removed and growing local provenance plants and/or sourcing local native provenance plant species, so that local provenance plants are available to be planted and the trees to be planted are advanced in size to improve the urban tree canopy and local biodiversity.***

Translocation of juvenile plants

Prior to any clearing of native vegetation, juvenile native vegetation, native seed and coarse woody debris on the ground that is to be cleared should be translocated and re-used at appropriate locations including along the riparian corridors and east-west regional corridor.

Any juvenile native plants that are to be removed should be transplanted within the riparian areas where plants from these plant community type (PCT) would naturally occur to conserve the local genetic diversity. The translocated plants should be maintained until established (i.e. weeding and watering).

Pre-clearance fauna surveys and Relocation of native fauna

EES recommends pre-clearance fauna surveys are undertaken by a qualified ecologist prior to any clearing of vegetation to determine the presence of resident native fauna using nests, dreys or hollows, logs etc. Any resident native fauna potentially impacted by the removal of vegetation should be relocated in a sensitive manner under the supervision of a qualified ecologist/licensed wildlife handler, including any fauna impacted by the removal of invasive trees.

The fauna inspection/relocation should apply to all “protected animals” under the *Biodiversity Conservation Act 2016* (BC Act) and not just threatened fauna. Protected animals are defined in Schedule 5 of the BC Act to include any of the following that are native to Australia or that periodically or occasionally migrate to Australia (including their eggs and young):

- amphibians - frogs or other members of the class amphibia
- birds - birds of any species
- mammals - mammals of any species (including aquatic or amphibious mammals but not including dingoes)
- reptiles - snakes, lizards, crocodiles, tortoises, turtles or other members of the class reptilia.

The BDAR states that a Flora and Fauna Management Plan (FFMP) is to be prepared. EES recommends an EMM and condition of consent is included to require that the FFMP includes pre-clearance fauna surveys and relocation of native fauna.

Replacement nest boxes

The EIS includes a mitigation measure that a Nest Box Strategy would be prepared to minimise habitat loss to hollow-dependent fauna and would include the following requirements:

- hollow-bearing trees would be marked/tagged and mapped prior to their removal. The size, type, number and location of nest boxes required would be based on the results of the pre-clearing survey
- about 70 per cent of nest boxes would be installed about one month prior to any vegetation removal to provide alternate habitat for hollow-dependent fauna displaced during clearing (page 11.33).

Details are required on the number of tree hollows to be removed and the number of replacement nest boxes to be installed, where the nest boxes are proposed to be installed and when the remaining 30% of nest boxes are to be installed. Compensatory tree hollows should be provided prior to removal of existing tree hollows and/or the release of any captured hollow dependent fauna.

EES recommends that the conditions of consent include that the FFMP is to include a Nest Box Strategy which is to be prepared by a suitably qualified ecologist.

Clearing of native vegetation

EES supports the inclusion of the EMM's LV1 and LV2 but recommends these measures are amended as follows so that they apply to the retention of remnant native vegetation and fauna habitat and not only to the retention of existing trees. EMM LV1 should also outline that any invasive trees or exotic species within the project footprint should be removed and replaced by local native provenance trees.

LV1 Opportunities for the retention and protection of existing **local native vegetation and fauna habitat including local native** street trees and trees within the construction sites. **Native vegetation to be retained** would be identified during detailed construction planning. **Any existing invasive or exotic trees within the project footprint must be removed and replaced by local native provenance trees.**

LV2 Existing **native vegetation including** trees to be retained would be protected prior to the commencement of construction in the vicinity of these **native vegetation** / trees in accordance with AS4970-2009 Protection of Trees on Development Sites.

Reuse and removed trees and hollows

EES recommends the SSI reuses native trees that are removed including hollows and tree trunks (greater than approximately 25-30cm in diameter and 3m in length) and root balls and these are used by the project in the rehabilitation of riparian corridors, the east west regional corridor, etc to enhance habitat.

Each hollow-bearing tree approved for removal should be salvaged and re-located to appropriate locations (including the riparian corridors, the east west regional corridor etc on the same day the tree hollows are removed and prior to the release of any native fauna found using the tree hollows.

As the project may not be able to reuse all removed native trees, EES recommends a condition of consent is included that the proponent consults with the local community restoration/rehabilitation groups, Landcare groups and councils prior to any clearing commencing to determine if the removed trees can be re-used by others in habitat enhancement and rehabilitation work. This detail including consultation with the community groups and their responses should be documented in the CEMP/FFMP.

EES recommends the project includes the following condition, that the FFMP requires that:

- ***The Proponent must where it is practicable reuse any of the native trees that are to be removed as part of this project, including tree hollows, tree trunks (greater than 25-30 centimetres in diameter and three metres in length), and root balls to enhance habitat:***
 - ***Any hollow sections of wood removed should be salvaged and re-located to appropriate locations including the riparian corridors or the east west regional corridor to provide natural nest boxes prior to the release of any native fauna found using the tree hollows.***
 - ***If removed native trees are not able to be entirely re-used by the project, the proponent should consult with local community restoration/rehabilitation groups, Landcare groups, Councils and relevant public authorities prior to removing any native trees to determine if the removed trees can be reused in habitat enhancement and rehabilitation work. This detail including consultation with the community groups and their responses must be documented in the CEMP/FFMP.***

Revegetation and Landscaping

The EIS states “the project performance outcomes and mitigation measures support the green infrastructure objectives including ensuring a net increase in the number of trees within the project area and using a range of local species to enhance canopy coverage, subject to the constraints on tree planting associated with safe airport operations” (page 20-32).

EES recommends the SSI replaces any trees removed by this project at a ratio greater than 1:1 for trees that are not covered by a biodiversity offset strategy. EES has provided similar advice for other infrastructure projects, including the Botany Rail Duplication project (SSI-9714) and the Sydney Gateway project (SSI-9737). Condition E6 of the consent for SSI-9714 (dated 28 July 2020) and condition E82 of the consent for SSI-9737 (dated 27 August 2020) require these projects to deliver a net increase in trees.

The RtS should provide details on:

- the total number of trees to be removed by the project, the tree species, and whether the trees to be removed are exotic, invasive, non-local natives or local native species
- the number of replacement trees, the replacement planting locations and the replacement plant species.

The Design Guidelines states “Landscape design in surface sections of the alignment will be based upon the appropriate Cumberland Plain Woodland vegetation communities. Riparian zones traversed by the alignment will be revegetated using endemic species from the appropriate vegetation community” and “Planting in viaduct sections of the alignment should mimic relatively open woodland to allow for recreational areas and activities to be included in the design” (page 78). It notes woodland style plantings are proposed where space and function permits on areas of surface corridor and areas beneath, or adjacent to, viaducts and that species selection will largely be made from a palette drawn from local ecological communities, along with consideration of species suitability for local environmental/climatic conditions (page 25). It also notes street tree plantings will primarily draw on a Cumberland Plains palette while planting choices for station plazas will largely be driven by ornamental and amenity considerations (page 25).

EES recommends a suitably qualified bush regenerator is engaged to provide advice on the collection of local native seed, the use of local native provenance species and to prepare a landscape plan for the project.

As noted above, EES recommends all landscaping/planting along the rail alignment, train stations, street planting and the rehabilitation of riparian corridors use a diversity of local provenance native species from the relevant native vegetation community (or communities) that occurs, or once occurred along the rail alignment rather than use exotic species or non-local native species.

The local native provenance tree species to be planted should be advanced in size to assist improve the urban tree canopy and local biodiversity.

Weed management and maintenance should be undertaken in areas disturbed by the project both during and following construction until the areas disturbed by the project are stabilised, including areas downslope of, and/or adjoining the disturbed areas. An EMM needs to be provided to address ongoing weed management and maintenance until the areas disturbed by the project are stabilised.

It is recommended the following conditions of consent are included:

- ***Any planting/ landscaping, rehabilitation associated with the project shall use a diversity of local provenance native trees, shrubs and groundcover species (rather than exotic species or non-local native species) from the relevant native vegetation community (or communities) that occur or once occurred along the rail alignment / local area***
- ***Trees removed by the project must be replaced at a ratio greater than 1:1 for trees that are not covered by a biodiversity offset strategy to mitigate the local urban heat island effect and improve local biodiversity over time***
- ***Tree planting shall use advanced and established local native trees with a minimum plant container pot size of 100 litres, or greater for local native tree species which are commercially available. Other local native tree species which are not commercially available may be sourced as juvenile sized trees or pre-grown from provenance seed.***

- ***Enough area/space is provided to allow the trees to grow to maturity.***
- ***A Landscape Plan is to be prepared and implemented by an appropriately qualified bush regenerator and include details on:***
 - a. seed collection – the location of all native seed sources should be identified***
 - b. the type, species, size, quantity and location of replacement trees***
 - c. the species, quantity and location of shrubs and groundcover plantings***
 - d. the plan demonstrates replacement trees plantings will deliver a net increase in trees for trees that are not covered by a biodiversity offset strategy***
 - e. the native vegetation community (or communities) that once occurred in the areas to be planted and the plan demonstrates that the plant species consist of local provenance***
 - f. a list of local provenance species to be used***
 - g. the quantity and location of plantings***
 - h. the pot size of the trees to be planted***
 - i. the area/space required to allow the planted trees to grow to maturity***
 - j. plant maintenance regime. The planted vegetation must be regularly maintained and watered for 12 months following planting. Should any plant loss occur during the maintenance period the plants should be replaced by the same plant species.***

End of Submission