Agreed PTA will map the
Agreed PTA will map the
extent of Diuris purdiei habitat to determine if suitable habitat is likely to be impacted, and to inform any necessary application under Section 40 of the BC Act for the inadvertent take of potential stored seed and underground tubers.
ap 40 ina po

		under Section 40 of the BC Act for the inadvertent take for potential stored seed and underground tubers in topsoil to be stripped within the development envelope prior to the commencement of construction	proposed works appear to occur quite close to previously recorded plants (around 50m) so soil stored seed may also be present. It is noted that the CEMP will consider potential indirect impact to the Diuris purdiei populations and associated habitat.	
4	Johnsonii cygnorum subspecies pubescens (Priority 2) DBCA suggests that the known Perth Airport population of Johnsonii cygnorum subspecies pubescens is not considered in the calculations for the total known population of the species. Johnsonii cygnorum subspecies pubescens is known from 10 locations over a range of 70 km north-south by 20km east-west. The total number of plants for this species is unknown, as plant counts only exist for a few locations. Within the study area, a total of eight plants were located. The two nearest occurrences are approximately 5km and 7.5km to the south, with an unknown number of plants found at these occurrences. The BRE proposal will result in the taking of three plants and is likely to indirectly impact a further two plants. This is a 62% impact on known plants within the development envelope. DBCA notes in Appendix B that five of the locations within the development envelope are new records and additional populations have been	Population information on Johnsonia pubescens subsp. cygnorum was requested from DBCA in February 2021 in order to estimate potential regional impacts on the subspecies as a result of the proposal. A total population estimate of 2,201 was provided by DBCA to PTA in March 2021. It is understood that this total includes specimens that have been recorded in bushland at Perth Airport. In their submission, the DBCA states that the species is known to occur at ten locations in the region. However, according	The new records of Johnsonia pubescens subsp. Cygnorum, presented by the PTA from the TGSI Project shows that there are more populations than what was known when DBCA initially responded to the ERD. It appears that a significant number of the new plants are proposed to be taken by the TGSI project. The	PTA acknowledges DBCA's comments on population information supplied.

identified along Tonkin Highway. If very few plants persist in the region, the occurrence within the proposal area may be of regional significance. It is only when compared to the 2,201 plants in Perth Airport, where the taking of 5 plants could be considered as unlikely to be significant to the species. As the Perth Airport is Commonwealth land, DBCA considers it unlikely that the Perth Airport population, which is not listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), will be retained, given the future development proposed in the approved Perth Airport Master Plan

to GHD (2021) there are 18 records within the region where the species has been recorded representing 14 populations. Two of these populations occur on DBCA managed land (Woodman Environmental, 2021). A biological survey for the Tonkin Highway Grade Separated Interchanges (TGSI) Project (Woodman Environmental, 2021) recorded many occurrences of Johnsonia pubescens subsp. cygnorum. The species was recorded at 227 locations in the survey area (164 in the TGSI project development envelope and 63 outside of the development envelope). Woodman Environmental (2021) recorded 282 specimens in the survey area. An additional four individuals were recorded in the TGSI development envelope by GHD (2021). GHD (2021) recorded six locations (eight individuals) in the BRE survey area. Five of the locations (seven specimens) represent new records.

proposed development at Perth Airport and the TGSI, will result in the loss of the majority of the known plants on the basis that the Perth Airport Masterplan proposes additional development beyond the Perth Airport West and New Runway projects. The **Byford Rail impact** is minor compared to the developments listed above. The additional surveys provided create an improved understanding of the numbers of populations and plants that are to be lost through the proposals identified. Conversely, there is limited understanding of the size and health of any populations on secure

The updated population estimate is 2,494 being comprised of the 2,201 individuals estimated by the DBCA, 286 specimens recorded in the TGSI survey area and the seven new records in the BRE survey area. With additional surveys further populations could be recorded in the Perth region (GHD,2021). The BRE proposal will directly impact three specimens and potentially indirectly impact two specimens representing 0.20% of the current estimated population. However, accurate population estimates are not available as counts for individual specimens have not been completed at all known populations. The potential cumulative impact to the species is estimated to be 1,123 specimens. This is comprised of impacts attributable to the following projects: Five specimens for the BRE proposal (three to be directly impacted and two specimens indirectly impacted), 119 specimens impacted by the TGSI project, and Up to 999 specimens impacted on

conservation estate. Further survey effort for this species within secure conservation areas may identify additional plants and populations, resulting in greater confidence that there are sufficient populations and plants in protected areas

Perth Airport land (429 for the Airport West Project and up to 570 individuals for the New Runway Project). This assumes complete loss of the species in these project areas. The impact attributable to the BRE project is insignificant in comparison to the scale of potential impacts attributed to the Perth Airport projects. The loss of the five specimens represents 0.44% of the predicted cumulative loss. PTA considers the impact of the Proposal on *J. pubescens* subsp. cygnorum is not significant as the predicted impacts represent a very small number of individual specimens. The specimens The updated population estimate is 2,494 being comprised of the 2,201 individuals estimated by the DBCA, 286 specimens recorded in the TGSI survey area and the seven new records in the BRE survey area. With additional surveys further populations could be recorded in the Perth region (GHD,2021). The BRE proposal will directly impact three specimens and potentially

indirectly impact two specimens representing 0.20% of the current estimated population. However, accurate population estimates are not available as counts for individual specimens have not been completed at all known populations. The potential cumulative impact to the species is estimated to be 1,123 specimens. This is comprised of impacts attributable to the following projects: Five specimens for the BRE proposal (three to be directly impacted and two specimens indirectly impacted), 119 specimens impacted by the TGSI project, and Up to 999 specimens impacted on Perth Airport land (429 for the Airport West Project and up to 570 individuals for the New Runway Project). This assumes complete loss of the species in these project areas. The impact attributable to the BRE project is insignificant in comparison to the scale of potential impacts attributed to the Perth Airport projects. The loss of the five specimens represents 0.44%

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		of the predicted cumulative		
		loss.		
		PTA considers the impact of		
		the Proposal on <i>J. pubescens</i>		
		subsp. <i>cygnorum</i> is not		
		significant as the predicted		
		impacts represent a very		
		small number of individual		
		specimens. The specimens		
		impacted are not considered		
		an outlier population or at the		
		edge of the species range.		
		The loss of this small number		
		of plants will not result in a		
		significant loss of genetic		
		material for the species.		
5	Threatened Ecological Communities	The PTA contends that the	The PTA response	Acknowledged. PTA has
	Refer to DBCA Byford Rail ERD Comments	FCT analysis conducted by	regarding FCTs	liaised with the DBCA
	DBCA has reviewed Appendix B Flora and Vegetation	GHD is correct.	present is not	including Val English from
	Assessment GHD March 2021(Appendix B), and Section	In response to the statement	supported by the	DBCA Species and
	6, Flora and Vegetation in the ERD and has identified	"The vegetation units as	available data.	Communities Branch.
	discrepancies in the data used to assign the floristic	described require re-	The establishment	PTA has conducted
	community type (FCT) for the quadrats shown in Table	evaluation, to provide a	of quadrats, and	further analysis as
	13 of Appendix B. This is likely caused by the accepted	vegetation map, inclusive of	the insertion of	requested by DBCA and
	methodology for determining FCT's be undertaken in	quadrat locations, that aligns	comprehensive	submitted a letter with
	reverse, as discussed below (refer to DBCA's full	with the FCTs, following the	quadrat data into	findings of this analysis to
	comments), which isn't in accordance with standard	recommended assignments	statistical analysis	DBCA. The findings
	practice.	of FCTs based on quadrat	against the Gibson	indicate an area of SCP3c
	practice.	-		within the indicative
		data and not on pre-	et al. (1994) and	
		determined vegetation units.", PTA does not believe the	Keighery <i>et al.</i>	project disturbance
			(2012) datasets is	footprint previously
		vegetation units need to be	the best method of	classified by PTA as
		re-evaluated. GHD undertook	evaluating the	SCP3a. PTA will revise its
		FCT analysis independently	FCTs present.	offset strategy to
		of the vegetation type	Unless there are	counterbalance the
		assessment. Field botanists	very good reasons	significant residual impact
		determined the vegetation	to question the	to this area of SCP3c.

types using a variety of methods: a combination of aerial photography, field data/observations and previous vegetation mapping). The report provides a summary of the vegetation types (Table 11, GHD 2021). Senior botanists undertook quadrat based FCT analysis in a separate process. The Senior botanist used collected quadrat data, then compared and analysed against two available datasets, the Gibson et al. (1994) dataset (referred to as the Gibson Dataset) and the Keighery et al. (2012) dataset (accessed through NatureMap (DBCA 2021), referred to as the Keighery Dataset) using appropriate statistical techniques and parameters (PATN). GHD then tabulated both quadrat (Table 13) and vegetation type (Table 12) to demonstrate where FCTs are present and where multiple FCTs are present within the one vegetation type. In this assessment, multiple FCTs were not deemed to occur within a single vegetation type.

logic of the assignment of FCTs that are based on statistical analyses and that are also consistent with habitat characteristics (e.g. Ridge Hill shelf -Forrestfield landform unit at Fletcher Park), the statistics are considered to provide the most reliable outcomes. Comparisons of FCTs present through on ground visual comparison of vegetation composition, aerial photos and similar broader comparisons are not considered as reliable as outcomes of the statistical analyses. The mapping of FCT 3a in DBCA's database for Fletcher Park is based on limited quadrats, which may not fully reflect the variability of this site. The FCTs

PTA acknowledges the FCT alignment presented by DBCA in Table 1 of their submission. However, the GHD FCT alignment is justified when a review of all results from the analysis (SSI and dendrograms) and collected field data is considered. As stated throughout the report, the analyses are based on the presence/absence of species only, and it is expected the analyses may be limited in differentiating between similar FCT types such as SCP 3a, 3b and 3c. In this assessment, due to the degraded nature of the vegetation, there were limited quadrats able to be sampled in Good or better condition. The results of the analysis reflect this, with a portion of the quadrats determined to be inconclusive. In light of these limitations and based on analysis results, as well as habitats, key species, existing DBCA database mapping and recovery plans, and previous studies (i.e. AECOM 2020) FCTs were assigned. GHD quadrats BRE01, BRE02, BRE05 are all

can sometimes be mapped at a finer scale by increasing the density of quadrats, Critical review of statistical analyses to determine the most logical FCTs will provide a better indication of the appropriate FCT for this area as detailed below in relation to the assigned FCT in Table 13 of the GHD report. Table 13 of the GHD report provides the similarity indices of Byford rail line quadrats when analysed against Gibson et al. (1994) and Keighery et al. (2012) data. For BRE01 the highest similarity is indicated to FCT3b for both datasets. The quadrat clusters with FCT3c, and with a larger clade of 3a, 3b. and 3c. The final determination

located in the eastern portion of Fletcher Park, with BRE07 located in the rail corridor. The DBCA TECPEC dataset indicates the vegetation is FCT 3a.

Other surveys have mapped FCT3a in the rail reserve in Lambert Lane Nature Reserve and Fletcher Park area (AECOM 2020). Field observations indicated the vegetation has similar characteristics to FCT 3a. The GHD FCT analysis results were variable and did not show a strong alignment any specific FCT. Therefore, GHD do not consider there is enough evidence to dispute the current assignment as FCT3a to the vegetation in Fletcher Park. GHD quadrat BRE07 is within

GHD quadrat BRE07 is within the area mapped as SCP 3a by the DBCA (Interim Recovery Plan/TECPEC dataset). The FCT analysis produced variable results and low similarities for this quadrat. Given the FCT results and existing information from DBCA, this quadrat was assigned to FCT 3a. Assigning this FCT3b would appear to be to be at variance with existing publicly

in the GHD report is that the quadrat aligns with FCT3a. FCT3b is a more logical conclusion for BRE01. The similarity indices with Gibson et al. (1994) and Keighery et al. (2012) data for BRE02 indicate closest alignment to FCT3b for both datasets. The quadrat clusters with FCT3b. The final determination in the GHD report is that the quadrat aligns with FCT3a. This conclusion is not consistent with the data, and FCT3b is a far more logical conclusion. The similarity indices with Gibson et al. (1994) and Keighery et al. (2012) data for BRE05 indicate

closest alignment

to FCT3b for both

datasets. The

quadrat clusters with 3b. The final

available data produced by DBCA. GHD BRE17 is located within the rail corridor, south of Thomas Road. This quadrat was rated Degraded in condition and the FCT results were variable with the similarities matrices and dendrograms producing different results. In this instance field observations were given a greater weighting than the analysis results (due to variability). While the similarity shows the greatest similarity to one quadrat of SCP3c, other results indicate different FCTs. Using other methods, such as reviewing species lists for this area indicates no clear FCT alignment. This quadrat is an example of limitations of statistical analyses, particularly when assessing degraded vegetation. In the Consultant's opinion this quadrat determination is inconclusive. BRE 19 is located within the rail corridor, south of Thomas Road. This quadrat was challenging to assign due to small size of intact vegetation present and ongoing maintenance activities

determination in the GHD report is that the quadrat aligns with FCT3a. This conclusion is not consistent with the data, and FCT3b is a more logical conclusion. The similarity indices with Gibson et al. (1994) and Keighery et al. (2012) data for BRE07 indicate greatest alignment to FCT3c for Gibson, and FCT25 (not logical in this habitat) and then FCT3c for Keighery. The quadrat clusters with 3c. The final determination in the GHD report is that the quadrat aligns with FCT3a. This conclusion is not consistent with the data, and FCT3c is a more logical conclusion. The similarity indices with Gibson et al. (1994) and Keighery et al. (2012) data for

(including managing overstorey vegetation). In this instance field observations had a greater weighting than the analysis results. The vegetation was similar in composition to BRE16 (on the western side of the railway) and had similar landform features and soils. It contained key indicator species for SCP3 communities (i.e. both SCP3a and 3c). Reviewing species lists for areas on both the western and eastern side of the railway showed no discernible difference. It is acknowledged, south of this area SCP3c is mapped on the eastern side of the railway and SCP3s is mapped on the western side of the railway. Based on the mixed, analysis results and in the absence further evidence at this location, it was the Consultant's opinion that the area represented SCP3a.

BRE17 indicate greatest alignment to FCT3c for Gibson, and with FCT3c for Keighery. The quadrat clusters with FCT3a, then 5. 6. Weed levels are likely to be influencing the cluster. The final determination in the GHD report is that the quadrat aligns with FCT3a. FCT3c/3a is considered to be a more logical conclusion. However, it is noted that BRE17 is in a degraded condition. DBCA does not consider floristic communities in less than good condition to be extant TEC's The similarity indices with Gibson et al. (1994) and Keighery et al. (2012) data for **BRE19** indicate greatest alignment to FCT3c for both

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	datasets. The	
	quadrat clusters	
	with FCT3c. The	
	final determination	
	in the GHD report	
	is that the quadrat	
	aligns with FCT3a.	
	This conclusion is	
	not consistent with	
	the data, and	
	FCT3c is a more	
	logical conclusion.	
	FCT boundaries	
	should be mapped	
	based on FCTs	
	that have been	
	assigned based on	
	results of statistical	
	analyses.	
	DBCA and PTA	
	have recently	
	discussed the	
	above advice.	
	PTA's consultants	
	will undertake	
	further	
	investigations to	
	refine the mapping	
	of the TEC floristic	
	occurrences and	
	will consult further	
	with DBCA.	
	For the purposes of	
	offsetting the	
	residual impact on	
	SCP FCT's 3a,3b	
	and 3c DBCA	
	considers that FCT	

			3a or FCT3c can be interchangeable, whereas FCT 3b is different.	
11	Stream Environment and Water undertook a Byford Rail Extension: Wetland Assessment (January 2021) (Appendix J) to inform and support environmental assessments for the project. The ERD describes that the development footprint overlaps seven wetlands included in the Geomorphic Wetlands of the Swan Coastal Plain dataset (GWSP) and will directly impact approximately 55.5 ha of wetlands of which3.5 hectares is Conservation Category wetland (CCW) and 51.9 ha is Multiple Use wetland (MUW) category (page 262 and 269). The ERD notes (page 278) that Stream 2021a (Appendix J) recommends that 0.9ha of CCW should be changed to MUW, and as result a total of 2.6ha of CCW would be impacted." This calculation is dependent on the reclassification of portions of wetlands and needs clarifying, as a reclassification process for this has not yet been undertaken.	PTA acknowledge that the calculations included in the ERD are based on recommended changes to the Geomorphic wetland mapping that are yet to be verified by DBCA. The Wetland Assessment completed by Stream (2021a) followed the evaluation procedures detailed in A methodology for the evaluation of wetlands on the Swan Coastal Plain, Western Australia (DBCA 2017a). Where changes were recommended to management categories of wetlands (or sections of wetlands) they were based on the outcomes of the desktop and field assessment following the assessment methodology detailed in DBCA (2017a). Details of the assessment results including field data sheets for assessment sites and site photographs are provided in Stream (2021a).	Noted A proposal to modify the Geormorphic wetland (Swan Coastal Plain) mapping dataset will need to be submitted to DBCA's Wetlands Conservation Section. The PTA should contact DBCA's Wetland Conservation section to facilitate the modification process.	Acknowledged. PTA will liaise with the DBCA Wetlands Conservation Section and submit a proposal to modify the Geormorphic wetland (Swan Coastal Plain) mapping dataset.

		The three wetlands referred to in the ERD on page 278 as recommended to be changed from Conservation to Multiple Use management category were assessed as retaining limited wetland values. Details of the assessment for each wetland, including their evaluation based on desktop and field assessment results are provided in the Stream (2021a) report.		
		Even though the degraded 0.9 ha portion of the CCW wetland has not been reclassified to MUW PTA contends impacts to this 0.9 ha portion should not be considered a significant residual impact.		
13	Wungong Brook is within the catchment area of the Swan Canning River system as defined in the Swan and Canning Rivers Management Act 2006 (SCRM Act). The objectives of SCRM Act include the management of activities that affect the ecological and community benefits and amenity of the Swan and Canning rivers. The Wungong Brook is part of the Southern River Catchment which flows into the Canning River. Activities within the catchment have the potential to impact on the river system. It is noted that an overarching CEMP will be developed and implemented to address the management of key environmental factors. DBCA considers that the preparation of	PTA will be required to prepare a Development Approval application for works that impact the SCRM Development Control Area. The Development Approval application will be submitted to DBCA for review and comment. DBCA's conditions will become binding on the Project. The PTA will prepare a Construction EMP prior to commencement of	It is understood that a development application would be lodged with the WAPC, which may be referred to DBCA under Clause 30A(2)(b)(ii) of the MRS if the application is likely to affect waters in the DCA. It should be noted that any	Noted
	specific management plans, including a management plan regarding impacts on Wungong Brook and associated	construction. The CEMP will address all significant	conditions recommended under	

6 I	regetation would mitigate the impacts to the relevant environmental factors. (refer to additional in the Environmental Management Plans Section detail below). A Water Quality Improvement Plan has been prepared for the Southern River Catchment which aims to draw together activities that contribute to improved water quality outcomes, including developing projects based on partnerships with local government, community and shared stakeholders. The Armadale Gosnells Landcare Group (AGLG) is very active in this area and should be consulted in regard to impacts and appropriate rehabilitation.	construction related risks, including those related to the proposed activities at Wungong Brook.	this clause will only need to be given due regards by the WAPC, though it is likely they would apply them in this case.	
	disturbed within the brook, bank protection and erosion control measures; Proposed water quality monitoring; Clearing of riparian vegetation; Proposed revegetation and weed control; Management of stormwater and floodwaters; Fill requirements; Impacts from noise and vibration; Impacts from water abstraction and dewatering; Visual impact;	The PTA's contractor will prepare a Construction EMP to outline how environmental impacts will be managed during the construction phase of the project. Specific environmental issues such as construction in areas containing TECs, wetlands, Wungong Brook and other drainage lines, Lambert Lane/Fletcher Park, Carter's Freshwater Mussel, etc. will be addressed in more detail within environmental management sub-plans or via the incorporation of procedures. The Construction EMP, or excerpts from the document can be provided to DBCA for review. As the project will be situated within an existing operating rail reserve the PTA does not consider any additional impacts	The comments that the level of impact does not require a wetland management plan (on the basis that wetland management issues will be addressed within Environmental Management subplans of the CEMP) are noted and accepted. It is noted that specific issues such as managing impacts on Lambert Lane/Fletcher Park will be addressed in more detail within Environmental Management sub	Measures to mitigate environmental impacts to Lambert lane/Fletcher Park will be addressed in the CEMP. PTA will establish an indirect impact monitoring zone within 50m of direct impacts to the TEC. Areas of Lambert Lane Nature Reserve that occur in close proximity to the development envelope will also be included in the indirect impact zone. Prior to construction, a baseline vegetation condition survey will be conducted within the indirect impact monitoring zone by experienced botanists. Permanently marked transects will be set

- should be in accordance with relevant guidelines and best management practices in consultation with DBCA.
- Consideration of requirements for fish survey in the area potentially impacted by the proposed works.

Wetlands – to ensure that impacts to high value wetlands are identified and mitigated during both the construction and operation of the rail line, a wetland management plan should be prepared, which would include the wetland vegetation on Lambert Lane Nature Reserve. Detailed measures to mitigate hydrological impacts, protect and maintain riparian and wetland dependant vegetation and monitor changes to flora, fauna and hydrology during and post- construction should be included in the plan.

Identification and management of any changes to the hydrology of wetlands as a result of the construction of additional hardstand areas, disruption to natural flows and hydrological catchments as a result of the project, which are not currently addressed in the CEMP, could be included in this plan."

on wetlands resulting from the project significant enough to warrant a stand-alone Wetlands Management Plan. The PTA will consult with DBCA during the development of the CEMP on measures to protect high value wetlands.

PTA acknowledges that a
Development Approval for
works that impact the SCRM
Development Control Area at
Wungong Brook will be
required. The Development
Approval application will be
submitted to DBCA for review
and approval. This will include
environmental management
measures to address these
DBCA comments for Wungong
Brook. DBCA's approval
conditions will become binding
on the Project.

plans, and that a TEC SCP 3a condition monitoring program will be implemented to avoid impacts on terrestrial groundwater dependent ecosystems. Spatially and temporally linked monitoring of significant vegetation (including the TEC vegetation on Lambert Lane Nature Reserve), and groundwater levels is required to demonstrate that the construction, dewatering and localised groundwater drawdown do not cause significant or long term impacts to the native vegetation.

up to monitor the condition of the flora and vegetation. Subsequent vegetation condition monitoring will be undertaken along these transects and will enable early detection of any inadvertent impacts to the TEC.

In addition, groundwater monitoring will also be conducted in accordance with DWER guidelines during and after the completion of dewatering activities to assess the impacts of dewatering on groundwater.