NEWCASTLE COAL INFRASTRUCTURE GROUP RAIL FLYOVER MODIFICATION ENVIRONMENTAL ASSESSMENT

DETAILED RESPONSES TO OEH SUBMISSION – PART B

No.	Subject	OEH Statement/Request	Response
B1	Fauna and Flora Surveys	*In general, the EA utilises a combination of desktop analyses of relevant databases (e.g. OEH 'Atlas of NSW Wildlife' database) and previous flora and fauna surveys not commissioned for the proposal to inform the likely or potential threatened species that will be impacted by the proposal. Although this approach has merit, the surveys used must have been conducted in accordance with the OEH's 'survey and assessment guidelines' (DEC 2004) and must not be greater than five years old.*	It is noted that the OEH acknowledge that the assessment approach has merit. The surveys are conducted in accordance with the NSW Department of Environment and Conservation (DEC) (2004) *Threatened Biodiversity Survey and Assessment Guidelines - Working Draft* and are less than five years old. Data sources less than five years old referenced in the Rail Flyover Modification Environmental Assessment (EA) include: • Umwelt (Australia) Pty Ltd (2012); • Biosphere Environmental Consultants Green and Golden Bell Frog Monitoring data (2006 – present); and • Hunter Bird Observers Club (HBOC) Bird Monitoring Records for Deep Pond (2008-2011). **Figure B-1** shows that the location of survey sites by Umwelt (Australia) Pty Ltd (2012). The survey work covered the proposed Rail Flyover Modification development area (i.e. the footprint of the proposed realignment of the Kooragang Island Main Line inbound track as part of the Rail Flyover Modification is located wholly within the T4 Project footprint). As stated in Section 3 of the Threatened Species Assessment (TSA), recent surveys (less than two years old) were undertaken by Umwelt (Australia) Pty Ltd (2012) in 2010, 2011 and 2012. In regard to flora, the OEH state in their submission: *OEH assessed this surveying as generally being in accordance with the 'Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft' (DEC 2004), and determined that the survey effort and methodologies utilised for this baseline flora survey appeared to be adequate and conducted in accordance with these guidelines.* It is noted that the OEH had an exception with Trailing Woodruff (*Asperula asthenes*) and Small Water-ribbons (*Maundia triglochinoides*), however, neither of these species are known to occur on Kooragang Island and appropriate surveys were undertaken for these species (refer to Sections 2 and 3 of the TSA).

No.	Subject	OEH Statement/Request	Response
B1 (Cont.)	Fauna and Flora Surveys		In regard to fauna, a reconciliation of the fauna surveys against the DEC (2004) *Threatened Biodiversity Survey and Assessment Guidelines - Working Draft* was provided by Umwelt (Australia) Pty Ltd (2012) and is included in **Attachment B-A** of this document. Umwelt (Australia) Pty Ltd (2012) concludes that the surveys are adequate (**Attachment B-A**). Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).
B2	Fauna and Flora Surveys	*OEH notes that surveys undertaken for the original NCIG Coal Export Terminal (CET) in 2006 are no longer current and are* [sic] *would have to be either supplemented with newer surveys or redone.*	As described in the Rail Flyover Modification EA, recent surveys have been conducted by Umwelt (Australia) Pty Ltd (2012) in accordance with DEC (2004) *Threatened Biodiversity Survey and Assessment Guidelines - Working Draft* (**Figure B-1**; **Attachment B-A**). Further, the numerous past reports that exist are also useful for confirming the results of the more recent surveys. The amount of data gathered in past years on the species present on Kooragang Island far exceeds the data which would be gained from a single survey in accordance with DEC (2004) *Threatened Biodiversity Survey and Assessment Guidelines - Working Draft*. Relevant data sources referenced in the Rail Flyover Modification EA include (in chronological order): • Umwelt (Australia) Pty Limited (2012); • Biosphere Environmental Consultants Green and Golden Bell Frog Monitoring data (2006 – present); • OEH Threatened Species - Atlas Database Records (2012); • Birds Australia Database Records (2012); • Australian Museum Database Records (2012); • HBOC Bird Monitoring Records for Deep Pond (2008-2011); • EcoBiological (2011); • McConville (2011); • FloraSearch (2011); • Herbert (2007) in Umwelt (Australia) Pty Limited (2012); • Connell Hatch (2006a); • Connell Hatch (2006b); • Australia Rail Track Corporation (2005); • NSW Department of Commerce (2005); • Premier's Department (2003); • Regional Land Management Corporation (2003);

No.	Subject	OEH Statement/Request	Response
B2 (Cont.)	Fauna and Flora Surveys		• Umwelt (Australia) Pty Limited (2003); • Hamer (2002); • Protech Steel (2001); • Straw (2000); • Straw (1999); • Winning (1998); • Hamer (1998); • Hamer (1997); and • Port Waratah Coal Services Limited (1996). Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).
B3	Fauna and Flora Surveys	*In particular, OEH must be satisfied that the following issues have been adequately addressed:* • *a suitable survey design was adopted* • *appropriate survey methodologies were utilised (as specified in the guidelines) and applied at a scale commensurate to detect the target species or guild* • *targeted surveys were adequate and the subject species chosen were appropriate* • *all surveys were conducted at the appropriate time with respect to seasonality and weather conditions (e.g. flower phenology)* • *all surveys/methodologies adequately cover the study area, including all vegetation/habitat types and indirect impact areas.*	**Figure B-1** shows the location of survey sites by Umwelt (Australia) Pty Ltd (2012). The survey design included multiple flora quadrats, meandering transects, targeted survey locations for the Green and Golden Bell Frog and targeted survey locations for the birds along the length of the Rail Flyover Modification area which is consistent with the DEC (2004) *Threatened Biodiversity Survey and Assessment Guidelines - Working Draft*. The scope of the survey in the Rail Flyover Modification area was appropriate to the scale of the disturbance and the consideration of other data sources from Kooragang Island provided for a conservative impact assessment where all potentially occurring threatened species have been considered (**Attachment B-B**). The timing of the surveys is provided in the Rail Flyover Modification. A reconciliation of the Umwelt (Australia) Pty Ltd (2012) fauna surveys against the DEC (2004) *Threatened Biodiversity Survey and Assessment Guidelines - Working Draft* is provided in **Attachment B-A**.
B4	Fauna and Flora Surveys	*In order for OEH to assess whether or not previous ecological studies/surveys are adequate with respect to guidelines, OEH will require copies of all the ecological reports used/ cited in the EA. Without such documents OEH is unable to determine whether or not the level of surveying is appropriate and that all likely/potential species and habitats/vegetation types have been adequately surveyed and/or considered.*	The ecology assessment by Umwelt (Australia) Pty Ltd (2012) is publicly available and the OEH reviewed it as part of the T4 Project (as noted in the OEH's submission). This report can be accessed on the NSW Department of Planning and Infrastructure (DP&I) website: http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=4399

No.	Subject	OEH Statement/Request	Response
B4 (Cont.)	Fauna and Flora Surveys		Other reports are detailed in the approved Newcastle Coal Infrastructure Group (NCIG) Coal Export Terminal (CET) EA (NCIG, 2006a). This report can be accessed on the NCIG website: http://www.ncig.com.au/CommunityEnvironment/EnvironmentalDocumentation/tabid/93/Default.aspx Other specific documentation can be provided to the OEH upon request.
B5	Fauna and Flora Surveys	*To help speed up the assessment OEH suggest that the proponent summarise specific details of the relevant surveys to the NCIG site in tabular format, detailing the sampling methods and survey effort per stratification unit, including size of each unit, timing of surveys (not just the survey, but each specific component), prevailing climatic conditions at time of survey, and how they meet the minimum requirements in OEH survey guidelines (DEC 2004). This should be done for both the flora and fauna surveys component, including the threatened species-specific targeted searches.*	A summary of the Umwelt (Australia) Pty Ltd (2012) surveys is provided in **Attachment B-A**.
B6	Fauna and Flora Surveys	*OEH does not consider the brief reference of such surveys in the EA as an adequate indication that appropriate baseline surveying and targeted surveys have been adequately undertaken on the subject site. Furthermore clarification of how the stratification units were determined and how survey design was applied to these would help OEH determine the adequacy of these surveys. A map overlaying the survey details over the stratification units/vegetation types would also be helpful.*	The ecology assessment by Umwelt (Australia) Pty Ltd (2012) is publicly available and the OEH reviewed it as part of the T4 Project (as noted in the OEH's submission). The footprint of the proposed realignment of the Kooragang Island Main Line inbound track as part of the Rail Flyover Modification is located wholly within the T4 Project footprint. **Figure B-1** shows the location of survey sites by Umwelt (Australia) Pty Ltd (2012).
B7	Flora Surveys and Targeted Searches	*The EA indicates that flora surveys that were undertaken for the recent Port Waratah Coal T4 (as under taken by Umwelt (Australia) Pty Limited in 2010-12) proposal were used to inform the EA of the vegetation types present on site, and the likely or potential threatened flora species present (based on their targeted searches). OEH assessed this surveying as generally being in accordance with the 'Threatened Biodiversity Survey and Assessment: Guidelines for Development and Activities - Working Draft' (DEC 2004), and determined that the survey effort and methodologies utilised for this baseline flora survey appeared to be adequate and conducted in accordance with these guidelines.*	It is noted that the OEH determined that the flora survey effort and methodologies utilised for this baseline flora survey appeared to be adequate and conducted in accordance with the relevant guidelines.

No.	Subject	OEH Statement/Request	Response
B8	Flora Surveys and Targeted Searches	*However, OEH in their correspondence on the T4 EA requested further information regarding the flora survey details as outlined above. As such OEH recommends the proponent provide the above details to clarify their adequacy and indicate which surveys and sites were utilised in the EA.*	**Figure B-1** shows the location of survey sites by Umwelt (Australia) Pty Ltd (2012). The survey work covered the proposed Rail Flyover Modification development area (i.e. the footprint of the proposed realignment of the Kooragang Island Main Line inbound track as part of the Rail Flyover Modification is located wholly within the T4 Project footprint).
B9	Flora Surveys and Targeted Searches	*With respect to targeted flora searches, OEH was of the opinion that the majority of such surveys undertaken by Umwelt for the predicted threatened flora were adequate for the much larger and conspicuous taxa. However, some of the more cryptic potential threatened flora species that have broad habitat matches to the freshwater/estuarine wetland habitat were considered inadequate or some likely taxa not surveyed. As such, OEH is of the opinion the following taxa have potential to occur on the NCIG and the proponent should demonstrate that these species are not present on site by appropriate means, including if necessary, appropriately timed targeted surveys in accordance with OEH guidelines (DEC 2004):* • *Trailing Woodruff (Asperula asthenes)...* • *Small Water-ribbons (Maundia triglochinoides)...*	Neither the *Asperula asthenes* nor the *Maundia triglochinoides* are known to occur on Kooragang Island, based on the multiple sources used including databases such as the OEH (2012), and additional local survey data collected over the past nine years. The surveys conducted by Umwelt (Australia) Pty Ltd (2012) were adequate for these species. The *Asperula asthenes* can be found all year round according the OEH Threatened Species Database, and the *Maundia triglochinoides* can be found from November to March which is within the time that the Rail Flyover Modification area was surveyed by Umwelt (Australia) Pty Ltd (2012) (November).
B10	Fauna Surveys and Targeted Searches	*With respect to fauna baseline surveys and targeted searches, the EA implies (as per Section 3.3 of Appendix D) that the* [sic] *it has utilised surveys undertaken by Umwelt (Australia) Pty Limited on lands adjacent to the NCIG CET (including the proposed rail flyover area). As such it appears that no recent fauna surveys or targeted species-specific searches were undertaken on the development footprint for this EA.*	**Figure B-1** shows the location of survey sites by Umwelt (Australia) Pty Ltd (2012). The survey work covered the proposed Rail Flyover Modification development area (i.e. the footprint of the proposed realignment of the Kooragang Island Main Line inbound track as part of the Rail Flyover Modification is located wholly within the T4 Project footprint). As stated in Sections 2 and 3 of the TSA, recent surveys (less than two years old) were undertaken by Umwelt (Australia) Pty Ltd (2012) in 2010, 2011 and 2012. Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).
B11	Fauna Surveys and Targeted Searches	*OEH considers this a major failing of the EA and strongly recommends to Department of Planning and Infrastructure (DP&I) that the proponent conduct appropriate fauna surveys and targeted searches in accordance with OEH guidelines (DEC 2004). The lack of such surveys brings into question the validity and adequacy of the 'threatened species assessment' section, given that it is not based on any specific in situ data that would normally be utilised to inform and assess the proposal's impacts.*	Since appropriate fauna surveys and targeted searches were completed (refer to the response B10 above), the adequacy of the TSA is not questionable. In fact, a conservative assessment was provided in the Rail Flyover Modification EA assuming the presence of potentially occurring threatened species. As described in Sections 2 and 3 of the TSA, multiple sources have been used including databases such as the OEH (2012), Australian Museum (2012) and Birds Australia (2012), and additional local survey data collected over the past nine years.

No.	Subject	OEH Statement/Request	Response
B11 (Cont.)	Fauna Surveys and Targeted Searches		Further, the numerous past reports that exist are also useful for confirming the results of the more recent surveys. The amount of data gathered in past years on the species present on Kooragang Island far exceeds the data which would be gained from a single survey in accordance with DEC (2004) *Threatened Biodiversity Survey and Assessment Guidelines - Working Draft*. As described in Section 3.3.1 of the TSA, Biosphere Environmental Consultants Pty Ltd (Dr Arthur White) has undertaken monitoring for the Green and Golden Bell Frog on Kooragang Island since 2006. Dr Arthur White (a suitably qualified ecologist approved by the Director-General) has reviewed the TSA and considers the assessment adequate. Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).
B12	Fauna Surveys and Targeted Searches	*OEH considers this approach unsuitable and inconsistent with other recent development requirements in this locality, and is therefore not in a position to adequately assess the EA with respect to impacts on fauna until appropriate surveying is undertaken or adequate justification as to why this approach is acceptable and in accordance with OEH assessment procedures. If actual fauna surveys have been undertaken on the proposed development footprint, including previous studies, they need to be provided to OEH and summarised as outlined above. Details of any targeted threatened fauna surveys/ searches also need to be provided, including specific particulars of survey methodology, areas/habitats/vegetation types searched and timing.*	The TSA approach is consistent with other recent development requirements in this locality because some of the data was gathered for the T4 Project and other data was gathered for the NCIG CET EA (NCIG, 2006a). In addition, the following monitoring data is gathered in accordance with existing Project Approval conditions: • Biosphere Environmental Consultants Green and Golden Bell Frog Monitoring data (2006 – present); and • HBOC Bird Monitoring Records for Deep Pond (2008-2011). The ecology assessment by Umwelt (Australia) Pty Ltd (2012) is publicly available and the OEH reviewed it as part of the T4 Project (as noted in the OEH's submission). A summary of the Umwelt (Australia) Pty Ltd (2012) surveys is provided in **Attachment B-A**.
B13	Fauna Surveys and Targeted Searches	*Similarly, the above approach has been applied to the Green and Golden Bell Frog, a species potentially impacted by the development and predicted to occur on the subject site and known from the surrounds. Again, OEH would expect the EA to be informed by specific on-site targeted searches, with details of baseline population data provided (if applicable). Such details have not been provided in the results or threatened species section of the EA, and hence OEH recommends to DP&I that the proponent rectify this. OEH expects that such data exists, given the level of surveying/monitoring referenced in Table1 of Appendix D.*	The assumption that targeted surveys were not undertaken for the Green and Golden Bell Frog is not correct. **Figure B-1** shows the location of Green and Golden Bell Frog targeted survey sites by Umwelt (Australia) Pty Ltd (2012). As described in Section 3.3.1 of the TSA, Biosphere Environmental Consultants Pty Ltd (Dr Arthur White) has undertaken monitoring for the Green and Golden Bell Frog on Kooragang Island since 2006. Dr Arthur White (a suitably qualified ecologist approved by the Director-General) has reviewed the TSA and considers the assessment adequate.

No.	Subject	OEH Statement/Request	Response
B13 (Cont.)	Fauna Surveys and Targeted Searches		Relevantly, the TSA states: *The Freshwater Wetland that would be cleared* [0.13 ha] *appears to be suitable habitat but there are no Green and Golden Bell Frogs records from this location and no evidence that it has ever been used as a breeding site.*
B14	Fauna Surveys and Targeted Searches	*Correspondence provided to OEH from the Hunter Birds Observers Club (HBOC) indicates that the subject development footprint, in particular the eastern shorelines of the wetland known as 'Swan Pond' represents significant roosting, breeding and foraging habitat to a number of migratory waterbirds/shorebirds, including Curlew Sandpiper, Black-tailed Godwit and Broad-billed Sandpiper, which are listed under the NSW TSC Act. Additionally, the threatened Black-necked Stork, Australasian Bittern and White-fronted Chat which have all been recorded from the local surrounding environs, with the latter being represented by numerous records in the adjoining Saltmarsh habitat, its preferred habitat type.*	All of these species have been considered in the TSA. A specific assessment on Australasian Bitterns (*Botaurus poiciloptilus*) is provided in Table 8 (Section 5.8 of the TSA). The Black-necked Stork (*Ephippiorhynchus asiaticus*), Black-tailed Godwit (*Limosa limosa*), Curlew Sandpiper (*Calidris acuminata*), Broad-billed Sandpiper (*Limicola falcinellus*), and White-fronted Chat (*Epthianura albifrons*) are all considered in the assessment. They are listed in **Attachment B-B** and assessed in Section 5.8 of the TSA. All potentially occurring threatened species have been considered in the TSA. **Attachment B-B** provides a reconciliation of the threatened species considered in the assessment against the HBOC submission. In their submission on the Rail Flyover Modification, the HBOC refers to the threatened species occurring in Swan Pond, i.e. the Australasian Bittern, Black-necked Stork, Black-tailed Godwit, Curlew Sandpiper, Broad-billed Sandpiper and the White-fronted Chat. All of the species have been considered in the TSA. Herbert (2007) also provides a list of threatened species from Swan Pond and also notes that the Australasian Bittern and Black-necked Stork are rarely recorded in the locality of Swan Pond. Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).
B15	Fauna Surveys and Targeted Searches	*Although OEH acknowledges that the area to be impacted upon only represents a small area (2.6 ha) the EA fails to make reference to its specific importance to migratory and threatened waterbirds / shorebirds, in particular:* *(I) Swan Pond represents significant roosting/ foraging habitat to thousands of waterbirds, that are regularly seen on this water body,* *(ii) the surrounding Coastal Saltmarsh represents roosting habitat to a number of shorebird species and important foraging habitat to the White-fronted Chat (as stated above), and*	The area of saltmarsh to be impacted is half of what it stated by the OEH. As reported in Section 4.9 of the Rail Flyover Modification, the area of saltmarsh to be impacted is 1.32 ha not 2.6 ha. Section 4.9 (of the Rail Flyover Modification EA) describes how a linear strip of Saltmarsh (1.32 hectares [ha]) on the west of the existing rail embankment would be removed by the Project. All potentially occurring threatened species have been considered in the TSA. **Attachment B-B** provides a reconciliation of the threatened species considered in the assessment against the HBOC submission. In their submission on the Rail Flyover Modification, the HBOC refers to the threatened species occurring in Swan Pond, i.e. the Australasian Bittern, Black-necked Stork, Black-tailed Godwit, Curlew Sandpiper, Broad-billed Sandpiper and the White-fronted Chat.

No.	Subject	OEH Statement/Request	Response
B15 (Cont.)	Fauna Surveys and Targeted Searches	*(iii) exposed mudflats are important feeding habitat to a variety of migratory shorebirds and wetland birds. HBOC data indicates that 22 international migratory shorebirds have been recorded from Swan Pond and surrounds, three of those specifically listed under TSC Act.*	All of the species have been considered in the TSA. Herbert (2007) also provides a list of threatened species from Swan Pond and also notes that the Australasian Bittern and Black-necked Stork are rarely recorded in the locality of Swan Pond. Based on the small amount of habitat disturbance and the availability of proximal habitat external to the disturbance areas, it is considered that the NCIG CET including the Rail Flyover Modification would not have a significant impact on the available habitat for waterbirds. A majority of the surrounding Saltmarsh is already protected within the Hunter Wetlands National Park (**Figure B-1**). Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).
B16	Fauna Surveys and Targeted Searches	*Given the importance of the overall site and surrounds to migratory shorebirds OEH would expect the proposal would be deemed a 'controlled action' under the Australian Government Environment Protection and Biodiversity Conservation Act 1999 and referred to Department of Sustainability, Environment, Water, Population and Communities.*	The Rail Flyover Modification EA (Section 1.2.3) concludes that the Rail Flyover Modification would not have a significant impact on any threatened flora or fauna species or communities listed under the Schedules of the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act). The Rail Flyover Modification has therefore not been referred to the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities for consideration under the EPBC Act, as the 'Action' would continue to be conducted in a manner consistent with that described in the Terminal Referral (NCIG, 2006b) and in accordance with the conditions of EPBC Particular Manner Decision 2006/2987.
B17	Fauna Surveys and Targeted Searches	*The EA refers to various shorebird monitoring by HBOC and provides a list of bird species recorded and monitored at Deep Pond (an area not directly impacted by the modification), however, it fails to indicate that HBOC have carried out detailed monthly monitoring of Swan Pond, which is directly impacted upon, since 1999. OEH considers this a major omission given this is the main avian habitat that will be impacted by the proposal. As such OEH recommends to DP&I that the proponent provide details of this monitoring and assess impacts of the proposal on the basis of this data, specifically acknowledging the impacts on known threatened species, which to date have been poorly addressed.*	All potentially occurring threatened species have been considered in the TSA. **Attachment B-B** provides a reconciliation of the threatened species considered in the assessment against the HBOC submission. In their submission on the Rail Flyover Modification, the HBOC refers to the threatened species occurring in Swan Pond, i.e. the Australasian Bittern, Black-necked Stork, Black-tailed Godwit, Curlew Sandpiper, Broad-billed Sandpiper and the White-fronted Chat. All of the species have been considered in the TSA. Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).

No.	Subject	OEH Statement/Request	Response
B18	Threatened Species Assessment	*OEH has not completed a detailed review of the threatened species assessment section of the EA, as some of the surveys may not have been undertaken, namely the fauna baseline and targeted searches.*	The appropriate fauna surveys and targeted searches are detailed in the TSA presented in the EA.
B19	Threatened Species Assessment	*Furthermore, OEH believes that the proposal has underestimated the impact on the wetland habitat of the site, given that OEH are of the opinion it represents important roosting, breeding and foraging habitat to a number of migratory waterbirds /shorebirds, including known listed threatened species under the TSC Act.*	The impact on the wetland habitat west of the existing Kooragang Island Main Line has not been underestimated. Section 4.9 (of the Rail Flyover Modification EA) describes how a linear strip of Saltmarsh (1.32 ha) on the west of the existing rail embankment would be removed.
B20	Threatened Species Assessment	*OEH does not concur with the EA evaluation of potential impacts on waterbirds (as outlined in Table 7 of the Appendix D), given the lack of on-site surveys to support these conclusion and absence of HBOC data which clearly indicates the importance of the affected Swan Pond and surrounds to locally occurring threatened and migratory shorebirds/waterbirds. Similarly, OEH believes the assessment on EEC communities (Tables 3 and 4 of Appendix D) fails to recognise their local value and importance to migratory and threatened species (as outlined above).*	As described in Section 3 of the TSA, on-site surveys were undertaken by Umwelt (Australia) Pty Ltd (2012). All potentially occurring threatened species have been considered in the TSA. **Attachment B-B** provides a reconciliation of the threatened species considered in the assessment against the HBOC submission. In their submission on the Rail Flyover Modification, the HBOC refers to the threatened species occurring in Swan Pond, i.e. the Australasian Bittern, Black-necked Stork, Black-tailed Godwit, Curlew Sandpiper, Broad-billed Sandpiper and the White-fronted Chat. All of the species have been considered in the TSA. Herbert (2007) also provides a list of threatened species from Swan Pond and also notes that the Australasian Bittern and Black-necked Stork are rarely recorded in the locality of Swan Pond.
B21	Threatened Species Assessment	*The EA's assessment of threatened species fails to specifically assess impacts on the following avian species, that are known to occur on or within the general local of the proposed modification (Note: OEH does not consider the grouping and assessing of species under the loose heading of 'waterbirds' is adequate):* • *Australasian Bittern,* • *Black-necked Stork,* • *Black-tailed Godwit* • *Broad-billed Sandpiper,* • *Curlew Sandpiper, and* • *White-fronted Chat.* *The above species need to be addressed singularly and adequately assessed before OEH can further review the EA.*	As stated in Section 1.2 of the TSA, the assessment was prepared in accordance with the *Draft Guidelines for Threatened Species Assessment* (DEC and NSW Department of Primary Industries, 2005). These guidelines do not require individual threatened species assessments and there are numerous examples of Projects approved under Part 3A of the NSW *Environmental Planning and Assessment Act, 1979* which have grouped assessments for threatened species. A specific assessment on Australasian Bitterns is provided in Table 8 (Section 5.8 of the TSA). The Black-necked Stork, Black-tailed Godwit, Curlew Sandpiper, Broad-billed Sandpiper and the White-fronted Chat are all considered in the assessment. They are listed in **Attachment B-B** and assessed in Section 5.8 of the TSA. Also refer to Part C (Additional Detail in Relation to Biodiversity Impacts).

No.	Subject	OEH Statement/Request	Response
B22	Provision of Offsets/ Compensatory Habitat	*OEH acknowledges that offsets/ compensatory habitat for the previous consent for the NCIG CET was addressed under the 'Compensatory Habitat Ecological Monitoring Program (CHEMP)', which only addresses impacts on the Green and Golden Bell Frog (GGBF). Under the CHEMP GGBF habitat is offset at a minimum ratio of 2:1, unless NCIG can provide pre-impact population data that suggests the area of land occupied by this population is less than the set ratio. To date, NCIG has not been able to determine the pre-impact population size and associated area occupied by the population at the existing CET. Accordingly, OEH has advised DP&I in recent correspondence (dated 30 July 2012) that a minimum 2:1 should be provided. However, this should be viewed in light of other projects on Kooragang Island that will have a greater offset requirement for similar impacts, due to them being assessed under OEH current offset policy for State Significant Developments (SSD; as outlined below).*	As described in the Rail Flyover Modification EA, NCIG has existing Project Approval conditions requiring the establishment of Green and Golden Bell Frog compensatory habitat in a location agreed by the Director-General, equivalent to or no less than twice the area of habitat to be removed. Green and Golden Bell Frog compensatory habitat would be established in accordance with the existing Project Approval (or as modified) conditions. Accordingly, the Green and Golden Bell Frog compensatory habitat would be described within a revised Compensatory Habitat Ecological Monitoring Program (CHEMP). An overview of NCIG's proposed compensatory habitat is provided in **Attachment B-C**.
B23	Provision of Offsets/ Compensatory Habitat	*OEH does not concur with the EA that migratory and threatened shorebird and waterbird habitat is not being impacted upon and would expect suitable offsets to be provided as compensatory measure. Such habitat was not subject to the original offset provisions of the CHEMP for the CET and hence the recommended fixed ratio for GGBF habitat does not apply. To determine the adequate biodiversity offset required to compensate the loss of threatened migratory shorebird/waterbird habitat (e.g. Freshwater Wetlands, Coastal Saltmarsh and tidal mudflats) either one of the following methodologies are to be used:* • *OEH 'offsetting principles', as outlined on the website: 'Principles for the use of biodiversity offsets in NSW' (OEH website 2011 -: Appendix 1) can be used as general guide for offsetting and compensatory habitat requirements (www.environment.nsw.gov.aulbiocertificationloffsets.htm)*	The assertion/claim that there is no shorebird compensatory habitat in the current Project Approval for the NCIG CET is incorrect. NCIG has existing Project Approval conditions requiring the establishment of compensatory shorebird habitat in a location agreed by the Director-General, equivalent to or no less than twice the area of habitat to be removed. Compensatory shorebird habitat would be established in accordance with the existing Project Approval (or as modified) conditions. Accordingly, the compensatory shorebird habitat would be described within a revised CHEMP. An overview of NCIG's proposed compensatory habitat is provided in **Attachment B-C**.

No.	Subject	OEH Statement/Request	Response
B23 (Cont.)	Provision of Offsets/ Compensatory Habitat	• *a biodiversity assessment using BioBanking Assessment Methodology (BBAM) under Biodiversity Banking and Offsets Scheme, as outlined in the 'BioBanking Assessment Methodology and Credit Calculator Operational Manual' (OEH 2011a). This would provide details of the required ecosystem and species (threatened) credits that need to be retired to offset the impacts of the development.*	
B24	Provision of Offsets/ Compensatory Habitat	*OEH acknowledges that BioBanking is a voluntary process and not a requirement under residual Part 3A and new SSD proposals, but believes it provides a valuable insight and quantitative appraisal into what would be an acceptable offset package to compensate the likely impacts of the modification. Similarly, OEH's 2011 'NSW OEH Interim policy on assessing and offsetting biodiversity impacts of Part 3A , State Significant Development (SSD) and State Significant Infrastructure (SSI) projects' (OEH 2011b; the 'policy') can apply. The policy allows for modification to the BBAM under limited circumstances.*	It is noted that BioBanking is a voluntary process and not a requirement under this modification approval process. NCIG have existing Project Approval conditions which prescribe the offsets required from impacts of the CET on the Green and Golden Bell Frog and shorebirds.
B25	Conservation in Perpetuity of Offset Lands	*Any offset proposed will need to be managed in perpetuity under an appropriate conservation mechanism, such as:* • *the establishment of biobanking sites with biobanking agreements under the Threatened Species Conservation Act 1995 (TSC Act)* • *the dedication of land under the National Parks and Wildlife Act 1974 (NPW Act)* • *a Conservation Agreement under the NPW Act* • *a Trust Agreement under the Nature Conservation Trust Act 2001* • *a Planning Agreement under s 93F of the Environmental Planning and Assessment Act 1979.* *The EA currently fails to indicate how offset/compensatory land will be managed and conserved in perpetuity.*	NCIG have consulted with the NSW Parks and Wildlife Service (NPWS) regarding the location for NCIG's compensatory habitat works since 2008 and the compensatory habitat would be located on Kooragang Island. Much of Kooragang Island is currently managed by the NPWS under an existing reserve (Hunter Wetland National Park) or crown land managed by NPWS. The proposed offsets would be enduring subject to the discretion of NPWS as the land owners.

No.	Subject	OEH Statement/Request	Response
B26	Management Plan	*Typically, OEH requires that an appropriate Management Plan (such as vegetation or habitat) be developed and implemented as a key amelioration measure, prior to any approvals. This will facilitate the assessment of the EA and whether or not it adequately addresses impacts on threatened species, their habitat and EEC. The EA does not indicate whether such a plan will be developed for the offsets, though OEH acknowledges that this may have been included under the original CET, and would except issues arising from this modification could be incorporated under appropriate plans from the original consent (if applicable).*	It is noted that the OEH accept that the Rail Flyover Modification could be incorporated under appropriate plans from the original Project Approval. The claim that the EA does not indicate whether such a plan will be developed for the offsets is not correct. As described in the Rail Flyover Modification EA, NCIG has existing Project Approval conditions requiring the establishment of compensatory habitat in accordance with the CHEMP.
B27	Management Plan	*Nevertheless, OEH would expect the management \ plan/ document would clearly outline how the offset/compensatory area, any retained vegetated areas or habitat features and proposed habitat management within the development footprint (e.g. buffer zones, habitat trees and nest boxes) will be managed and implemented with respect to long-term conservation and viability, including clear details on how they will be funded. The plan/document should cover, but not be limited to, the following issues (where applicable):*	This suggested requirement does not consider that the NCIG CET is already operational under a series of approved management plans and the additional requirements are general and not proportional to the proposed impacts from the Rail Flyover Modification.
		• *weed management (both control and suppression) and monitoring*	Noted.
		• *management of retained native vegetation and habitat (including buffer zones)*	This is not relevant as disturbance would be limited to the Rail Flyover Modification footprint. A description is provided in Section 2 of the Rail Flyover Modification EA.
		• *feral animal control*	Noted.
		• *fire management (including asset protection zones (APZs)*	NCIG has an existing fire management procedure.
		• *public access (including restriction of increased traffic and associated impacts, such as increased refuse and pets)*	Restricting public access (to reduce impacts on flora and fauna) is not relevant to the proposed Rail Flyover Modification. A description is provided in Section 2 of the Rail Flyover Modification EA.
		• *size and management of buffer zones*	Establishing a buffer zone is not relevant to the proposed Rail Flyover Modification. A description is provided in Section 2 of the Rail Flyover Modification EA.

No.	Subject	OEH Statement/Request	Response
B27 (Cont.)	Management Plan	• *minimisation of edge effects and fragmentation*	Some aspects of the rail design minimise impacts on threatened species, namely: • a considerable portion of the Rail Flyover Modification is located on previously disturbed land (42% already disturbed); • the Rail Flyover Modification is located adjacent to the existing Kooragang Island Main Line (thereby streamlining infrastructure); and • the Rail Flyover Modification has been specifically designed to avoid Deep Pond.
		• *stormwater control and changes to hydrology (including stormwater/runoff control and sediment/erosion control measures)*	Existing erosion and sediment control measures for the NCIG CET are documented in the Operation Water Management Plan.
		• *management of specific habitat enhancement measures (e.g. hollow/habitat trees, animal fencing to facilitate movement, artificial hollows and nest boxes etc.)*	None of the examples provided are relevant to the Rail Flyover Modification.
		• *fauna displacement and if appropriate translocation (including any licence requirements)*	Translocation is not relevant to the Rail Flyover Modification.
		• *proposed surveys, such as pre-extraction baseline, pre-clearance and rehabilitation surveys*	Pre-clearance survey requirements for the Green and Golden Bell Frog are documented in the approved Green and Golden Bell Frog Management Plan.
		• *details of long-term monitoring (including proposed timing)*	Monitoring is already described within the approved Green and Golden Bell Frog Management Plan and the CHEMP.
		• *details of any rehabilitation program, including details of timing (including proposed staging details), rehabilitation measures (including details of proposed revegetation and species mix), and post-rehabilitation monitoring*	Rehabilitation is not relevant to the Rail Flyover Modification. A description is provided in Section 2 of the Rail Flyover Modification EA.
		• *measures to ensure conservation in perpetuity (e.g. transfer to National Parks reserves, conservation agreements or covenants)*	This is not relevant. NCIG have consulted with the NPWS regarding the location for NCIG's compensatory habitat works since 2008 and the compensatory habitat would be located on Kooragang Island. Much of Kooragang Island is currently managed by the NPWS under an existing reserve (Hunter Wetland National Park) or crown land managed by the NPWS.
		• *funding details of long-term financial commitment to any proposed conservation measures, including any mechanisms to be implemented to achieve this.*	Noted. Commitment and mechanisms are documented in the CHEMP.

REFERENCES

Australian Museum (2012) *Database Records for the Search Area -32.9563, 151.6151; -32.7760, 151.6179; -32.7782, 151.8314; -32.9585, 151.8290*. Date Received: May 2012.

Australian Rail Track Corporation Ltd (2005) Sandgate Rail Grade Separation EIS. Report prepared by GHD.

Birds Australia (2012) *Database Records for the Search Area -31.9563, 151.6151; -32.7760, 151.6179; -32.7782, 151.8314; -32.9585, 151.8290*. Date Received: 24 May 2012.

Connell Hatch (2006a) *NCIG Kooragang Island Coal Export Terminal – Seasonal Ecological Investigations – Vegetation and Habitat Survey*. Revision 2.

Connell Hatch (2006b) *NCIG Kooragang Island Coal Export Terminal – Seasonal Ecological Investigations – Zannichellia palustris Targeted Surveys*. Revision 1

Department of Environment and Climate Change (2004) Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft.

Department of Environment and Conservation and Department of Primary Industries (2005) *Draft Guidelines for Threatened Species Assessment*.

EcoBiological (2011) *Baseline Fauna Study. Hunter Wetlands National Park, NSW*. EcoBiological Pty Ltd.

FloraSearch (2011) *NCIG CET Vegetation Mapping.*

Hamer, A. (1997) *The Distribution of Frog Fauna in the Kooragang Wetland Rehabilitation Project site, Ash Island, New South Wales.*

Hamer, A. (1998) *Aspects of the Ecology of the Green and Golden Bell Frog (Litoria aurea) on Kooragang Island, New South Wales, Australia.*

Hamer, A.J. (2002) *Ecology of the endangered green and golden bell frog Litoria aurea*: *roles of habitat determinants, spatial dynamics, population demography and threatening processes.* PhD thesis, The University of Newcastle.

Herbert (2007) Distribution, Abundance and Status of Birds in the Hunter Estuary, Hunter Bird Observers Club, Special Report No.4. Prepared for Newcastle City Council, September 2007.

McConville, A. (2011) *Bat Call Analysis Report. Hunter Estuary and Hexham Swamp National Park*. Prepared for OEH.

Newcastle Coal Infrastructure Group (2006a) Newcastle Coal Infrastructure Group Coal Export Terminal Environmental Assessment. July 2006.

Newcastle Coal Infrastructure Group (2006b) Newcastle Coal Infrastructure Group Kooragang Island Coal Export Terminal Referral. August 2006.

NSW Department of Commerce (2005) *Big Pond Habitat Offset Scheme Flora and Fauna Studies.* Prepared by GHD.

Office of Environment and Heritage (2012) *Atlas of NSW Wildlife Records for the Search Area -32.82, 151.78, -32.92, 151.68.* Date Received: 25 May 2012.

Port Waratah Coal Services Limited (PWCS) (1996) *Kooragang Coal Terminal Stage 3 Expansion EIS.*

Premier's Department (2003) *The Green and Golden Bell Frog on Kooragang Island Monitoring Study*. Report prepared by ERM.

Protech Steel (2001) *Protech Proposed Cold Mill Facility Kooragang Island EIS*.

Regional Land Management Corporation (2003) *Kooragang Port and Transport Corridor, Species Impact Statement.* Prepared by ERM.

Straw, P. (1999) *Hunter River Estuary Wader Habitat Investigation – Report to NSW National Parks and Wildlife Service.*

Straw, P. (2000) *Hunter Estuary Wader Habitat Investigation Stage 2 - Report to NSW National Parks and Wildlife Service.*

Umwelt (Australia) Pty Limited (2003) *Terrestrial Ecology Impact Assessment Report, Proposed Extension of Shipping Channels, Port of Newcastle*. Report prepared for New South Wales Waterways Authority.

Umwelt (Australia) Pty Limited (2012) Ecological Assessment for Port Waratah Coal Services (PWCS) Proposed Terminal 4 (T4) Project, Port of Newcastle NSW. Prepared on behalf of PWCS.

Winning, G. (1998) *Flora and Fauna Assessment for Proposed Rehabilitation of Estuarine Wetlands at Tomago, NSW*.

FIGURES

Legend

- T4 project area
- T4 project area beneath proposed NCIG rail flyover
- Hunter Wetlands National Park
- Flora Quadrat
- Flora Meandering Transect
- *Zannichellia palustris* Survey Area

Legend

- T4 project area
- T4 project area beneath proposed NCIG rail flyover
- Hunter Wetlands National Park

Fauna Survey Site:

- Hair funnel transect - Habitat assessment
- Bird survey
- Diurnal herpetological survey
- Spotlighting survey
- Natural call-playback survey
- Anabat survey

Targeted Threatened Fauna Survey Site:

- Green and Golden Bell Frog Survey
- Australasian Bittern Survey Site
- Eastern Grass Owl Survey Site
- Point Assessment Anabat Survey Site
- Bird Surveys in Important Bird Habitat
- Active Anabat Survey Site

0 400 800

Metres

Source: Umwelt (2012)

FIGURE B-1
Recent Surveys by Umwelt (2012)

Newcastle Coal
INFRASTRUCTURE GROUP

ATTACHMENT B-A

RECONCILIATION OF THE FAUNA SURVEYS AGAINST THE OEH'S *'SURVEY AND ASSESSMENT GUIDELINES'*

SOURCE: UMWELT (AUSTRALIA) PTY LTD (2012)

Table 3.12 – Adequacy of Terrestrial Fauna Survey Effort with Respect to OEH Guidelines

Survey Target	Survey Method	Survey Requirement (DEC 2004)	Survey Effort Employed for EA	Habitat Stratification Units Surveyed (number of sites)	Adequacy of survey effort with respect to OEH Guidelines
Amphibians (including green and golden bell frog (*Litoria aurea*))	Nocturnal Call playback	At least one playback on each of two separate nights	20 sessions of call playback were undertaken across 7 fauna survey sites over two seasons. In addition to this, at least two sessions were undertaken at the 24 targeted green and golden bell frog sites, over at least two seasons.	Freshwater Wetland (26) Saltmarsh (1) Mangrove Forest (2) Disturbed Land (2)	Adequate
	Night watercourse search	Two hours per 200 metres of water's edge	Two nocturnal watercourse surveys, each of one person-hour on two separate nights, were undertaken at the 7 fauna survey sites over two seasons. Between two and five nocturnal watercourse surveys were undertaken at the 24 targeted green and golden bell frog sites, over three seasons.	Freshwater Wetland (31)	Adequate
	Diurnal herpetological searches	One hour per stratification unit	Two diurnal herpetological surveys, each of one person-hour on two separate days, were undertaken at the 7 fauna survey sites, over two seasons.	Freshwater Wetland (1) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (2)	Adequate
	Opportunistic observations	-	Opportunistic observations were made throughout all surveys.	All	Adequate

Table 3.12 – Adequacy of Terrestrial Fauna Survey Effort with Respect to OEH Guidelines (cont)

Survey Target	Survey Method	Survey Requirement (DEC 2004)	Survey Effort Employed for EA	Habitat Stratification Units Surveyed (number of sites)	Adequacy of survey effort with respect to OEH Guidelines
Reptiles	Diurnal herpetological searches	30 minute search on two separate days targeting specific habitat	Two diurnal herpetological habitat searches, each of one person-hour on two separate days, were undertaken at the 7 fauna survey sites, over two seasons.	Freshwater Wetland (1) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (2)	Adequate
	Spotlighting surveys[2]	30 minute search on two separate nights targeting specific habitat	Two nocturnal spotlighting surveys, each of one person-hour on two separate nights, were undertaken at the 7 fauna survey sites, over two seasons.	Freshwater Wetland (1) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (2)	Adequate
	Opportunistic observations	-	Opportunistic observations were made throughout all surveys.	All	Adequate
Diurnal Birds (including threatened raptors, migratory shorebirds, threatened wetland-dependent birds and threatened woodland birds)	Area search	Per stratification unit	Two diurnal bird surveys, each of one person-hour, were undertaken at the 7 fauna survey sites, over two seasons. In addition to this, bird surveys were undertaken at two sites areas considered to be 'important bird habitat' by Lindsey (2008) and Herbert (2007). Two survey periods, each comprising one person-hour, were sampled at the two locations over one season. An additional site was surveyed in the proposed rail and utility corridor on one occasion.	Freshwater Wetland (3[1]) Mangrove Forest (2) Saltmarsh (3) Planting (1) Disturbed Land (2) Open Water (Deep Pond) (1[1])	Adequate
	Opportunistic observations	-	Opportunistic observations were made throughout all surveys.	All	Adequate

Table 3.12 – Adequacy of Terrestrial Fauna Survey Effort with Respect to OEH Guidelines (cont)

Survey Target	Survey Method	Survey Requirement (DEC 2004)	Survey Effort Employed for EA	Habitat Stratification Units Surveyed (number of sites)	Adequacy of survey effort with respect to OEH Guidelines
Nocturnal Birds[3] (including threatened owls, bitterns and bush-stone curlew (*Burhinus grallarius*))	Call playback surveys	Sites should be separated by 800 metres – 1km, and each site must have the playback session repeated as follows: - at least 5 visits per site, on different nights are required for the Powerful Owl, Barking Owl and the Grass Owl; - at least 6 visits per site for the Sooty Owl, and 8 visits per site for the Masked Owl are required. Sites for Bush Stone-curlew surveys should be 2-4 km apart and conducted during the breeding season.	20 sessions of call playback were undertaken across 7 fauna survey sites over two seasons. Two sessions of call playback were undertaken at the 6 targeted eastern grass owl sites, over three seasons. Two sessions of call playback were undertaken at the 13 targeted Australasian bittern sites, over four seasons.	Freshwater Wetland (14) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (6)	Adequate

Table 3.12 – Adequacy of Terrestrial Fauna Survey Effort with Respect to OEH Guidelines (cont)

Survey Target	Survey Method	Survey Requirement (DEC 2004)	Survey Effort Employed for EA	Habitat Stratification Units Surveyed (number of sites)	Adequacy of survey effort with respect to OEH Guidelines
Nocturnal Birds[3] (including threatened owls, bitterns and bush-stone curlew (*Burhinus grallarius*)) (cont)	Spotlighting surveys[2]	Spotlighting for plains wanderer and bush stone-curlew by foot or from a vehicle driven in first gear.	Two nocturnal spotlighting surveys, each of one person-hour on two separate nights, were undertaken at the 7 fauna survey sites, over two seasons. Spotlighting was undertaken in conjunction with call playback surveys at the 6 targeted eastern grass owl sites and 13 targeted Australasian bittern sites, over three and four seasons, respectively.	Freshwater Wetland (14) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (6)	Adequate
	Day habitat searches	Search habitat for pellets, and likely hollows. Flushing of bush stone-curlews by walking through potential habitat.	Two diurnal flushing surveys were undertaken at 3 targeted eastern grass owl sites in preferred habitat within the T4 project area, over two seasons. Two diurnal flushing surveys of potential diurnal roost habitat, such as tall emergent aquatic vegetation, was undertaken across the 13 targeted Australasian bittern sites within the T4 project area, over four seasons. One flushing survey was undertaken on one occasion within the proposed rail and utility corridor.	Freshwater Wetland (14) Disturbed Land (3)	Adequate
	Opportunistic observations	-	Opportunistic observations were made throughout all surveys.	All	Adequate

Table 3.12 – Adequacy of Terrestrial Fauna Survey Effort with Respect to OEH Guidelines (cont)

Survey Target	Survey Method	Survey Requirement (DEC 2004)	Survey Effort Employed for EA	Habitat Stratification Units Surveyed (number of sites)	Adequacy of survey effort with respect to OEH Guidelines
Mammals (excluding bats)	Hair tubes[4]	10 large and 10 small tubes in pairs for at least 4 days and 4 nights.	Hair funnel transects were placed along a 200 metre transect at the 7 fauna survey sites. Each transect comprised 20 terrestrial hair funnels. Hair funnels remained on-site for 14 days thereby resulting in 280 trap nights per fauna site.	Freshwater Wetland (1) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (2)	Adequate
	Spotlighting surveys[2]	2 x one hour and 1km up to 200 hectares of stratification unit, walking at approximately 1km per hour on 2 separate nights.	Two nocturnal spotlighting surveys, each of one person-hour on two separate nights, were undertaken at the 7 fauna survey sites, over two seasons.	Freshwater Wetland (1) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (2)	Adequate
	Search for scats and signs	30 minutes searching each relevant habitat, including trees for scratch marks	Two general habitat searches, each of one person-hour on two separate days, were undertaken at the 7 fauna survey sites, over two seasons.	Freshwater Wetland (1) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (2)	Adequate
	Opportunistic observations	-	Opportunistic observations were made throughout all surveys.	All	Adequate

Table 3.12 – Adequacy of Terrestrial Fauna Survey Effort with Respect to OEH Guidelines (cont)

Survey Target	Survey Method	Survey Requirement (DEC 2004)	Survey Effort Employed for EA	Habitat Stratification Units Surveyed (number of sites)	Adequacy of survey effort with respect to OEH Guidelines
Bats[5] (including threatened micro-bats and the grey-headed flying-fox (*Pteropus poliocephalus*))	Ultrasonic call recording (Anabat)	Two sound activated recording devices utilised for the entire night (a minimum of four hours), starting at dusk for two nights.	Anabat surveys, on two separate nights, were undertaken at the 7 fauna survey sites, over two seasons. In addition to this, Anabat surveys were conducted over two nights at nine targeted micro-bat habitat survey sites over three seasons. A targeted area search was also undertaken in mangrove habitat at two sites using a hand-held Anabat on one occasion.	Freshwater Wetland (5) Mangrove Forest (4) Saltmarsh (2) Planting (1) Disturbed Land (5) Open Water (Deep Pond) (1[1])	Adequate
	Spotlighting surveys[2]	2 x one hour spotlighting on two separate nights	Two nocturnal spotlighting surveys, each of one person-hour on two separate nights, were undertaken at the 7 fauna survey sites, over two seasons.	Freshwater Wetland (1) Mangrove Forest (2) Saltmarsh (1) Planting (1) Disturbed Land (2)	Adequate
	Stag watching	Observing potential roost hollows for 30 minutes prior to sunset and 60 minutes following sunset (recommended for gliders and possums)	Two stag watching surveys, each of one person-hour on one occasion, was undertaken at two potential mangrove micro-bat roost sites.	Mangrove Forest (2)	Adequate

Table 3.12 – Adequacy of Terrestrial Fauna Survey Effort with Respect to OEH Guidelines (cont)

Survey Target	Survey Method	Survey Requirement (DEC 2004)	Survey Effort Employed for EA	Habitat Stratification Units Surveyed (number of sites)	Adequacy of survey effort with respect to OEH Guidelines
Bats[5] (including threatened micro-bats and the grey-headed flying-fox (*Pteropus poliocephalus*)) (cont)	Day habitat searches	Searches for bat excreta at or near potential habitats.	One habitat assessment was undertaken on one occasion at four potential mangrove roost sites. Dominant species cover, ground cover, presence and quantity of perch sites, litter presence, number of stags, stumps and logs were recorded.	Mangrove Forest (4)	Adequate
	Opportunistic observations	-	Opportunistic observations were made throughout all surveys.	All	Adequate

Notes:

1. Habitat stratification units that were surveyed from adjacent disturbed land locations.
2. Spotlighting surveys for mammals, birds, amphibians and reptiles were all undertaken in conjunction due to the lack of treed habitats available.
3. No appropriate nocturnal bird habitat was available to conduct searches for pellets or suitable hollows for roosting and breeding.
4. Elliot and cage trapping were not undertaken due to the lack of habitat provided by the site for small and medium sized terrestrial and arboreal mammal species. Hair funnels were used to account for both large and small mammals being surveyed at the same time due to the depauperate mammal habitat identified in the T4 project area prior to surveys.
5. No pitfall trapping was undertaken during surveys in the T4 project area; this was partly due to potential health hazards present in a number of areas across the site (refer to **Section 1.3**), but also because it was highly unlikely that any threatened terrestrial mammals, reptiles or amphibians would be present that could not be targeted by other techniques (e.g. the green and golden bell frog).
6. Harp trapping for micro-bats was not undertaken as there was a lack of appropriate flyways present across the site at which harp trapping could be confidently undertaken. Additional Anabat surveys were undertaken to supplement the micro-bat survey results.

ATTACHMENT B-B

RECONCILIATION OF THE THREATENED SPECIES ASSESSED AGAINST THE THREATENED SPECIES LISTED IN THE HUNTER BIRD OBSERVERS CLUB SUBMISSION

Table BB-1
Reconciliation of the Threatened Species Assessed in the Rail Flyover Modification Threatened Species Assessment Against the Threatened Species listed in the Hunter Bird Observers Club Submission

Scientific Name	Common Name	Conservation Status[1]	Threatened Species Records from the Rail Flyover Modification Threatened Species Assessment				Hunter Bird Observers Club Submission	Was the Species Listed in the Hunter Bird Observers Club Submission Assessed?
			OEH BioNet/ Atlas of NSW Wildlife[2]	Australian Museum[3]	Birds Australia[4]	Ecological Assessment for PWCS T4 Project[5]		
Anseranas semipalmata	Magpie Goose	V	●	-	●	●	-	-
Stictonetta naevosa	Freckled Duck	V	●	-	●	●	-	-
Oxyura australis	Blue-billed Duck	V	-	-	●	●	-	-
Pterodroma solandri	Providence Petrel	V	-	-	-	●	-	-
Ephippiorhynchus asiaticus	Black-necked Stork	E	●	-	●	●	●	Yes
Botaurus poiciloptilus	Australasian Bittern	E	●	-	●	●	●	Yes
Ixobrychus flavicollis	Black Bittern	V	●	-	●	-	-	-
Pandion cristatus	Eastern Osprey	V	●	-	●	●	-	-
Lophoictinia isura	Square-tailed Kite	V	-	-	-	●	-	-
Circus assimilis	Spotted Harrier	V	●	-	●	●	-	-
Hieraaetus morphnoides	Little Eagle	V	●	-	●	●	-	-
Turnix maculosus	Red-backed Button-quail	V	-	-	-	●	-	-
Burhinus grallarius	Bush Stone-curlew	E	-	-	-	●	-	-
Haematopus longirostris	Pied Oystercatcher	E	-	-	●	-	-	-
Haematopus fuliginosus	Sooty Oystercatcher	V	-	-	●	●	-	-
Charadrius mongolus	Lesser Sand-plover	V	●	-	●	●	-	-
Charadrius leschenaultii	Greater Sand Plover	V	●	-	-	●	-	-
Irediparra gallinacea	Comb-crested Jacana	V	●	●	-	●	-	-
Rostratula australis	Australian Painted Snipe	E	●	-	●	-	-	-
Limosa limosa	Black-tailed Godwit	V	●	●	●	●	●	Yes
Xenus cinereus	Terek Sandpiper	V	●	●	●	●	-	-
Calidris tenuirostris	Great Knot	V	●	-	●	●	-	-

Scientific Name	Common Name	Conservation Status[1]	Threatened Species Records from the Rail Flyover Modification Threatened Species Assessment				Hunter Bird Observers Club Submission	Was the Species Listed in the Hunter Bird Observers Club Submission Assessed?
			OEH BioNet/ Atlas of NSW Wildlife[2]	Australian Museum[3]	Birds Australia[4]	Ecological Assessment for PWCS T4 Project[5]		
Calidris ferruginea	Curlew Sandpiper	E	●	●	●	●	●	Yes
Limicola falcinellus	Broad-billed Sandpiper	V	●	-	●	●	●	Yes
Sternula albifrons	Little Tern	E	●	-	●	●	-	-
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	-	-	●	-	-
Ninox strenua	Powerful Owl	V	●	-	-	●	-	-
Tyto novaehollandiae	Masked Owl	V	-	-	●	-	-	-
Tyto longimembris	Eastern Grass Owl	V	-	-	●	-	-	-
Epthianura albifrons	White-fronted Chat	V	●	●	●	●	●	Yes
Stagonopleura guttata	Diamond Firetail	V	●	-	-	●	-	-

1 Conservation status under NSW *Threatened Species Conservation Act, 1995* and Commonwealth *Environment Protection an Biodiversity Conservation Act, 1999* (current as at 25 May 2012).
V – Vulnerable; E – Endangered, CE – Critically Endangered.

2 Office of Environment and Heritage (2012) *BioNet/Atlas of NSW Wildlife Records for the Search Area: N: -32.82, S: -32.92, W: 151.68, E: 151.78.* Date Received: 25 May 2012.

3 Australian Museum (2012) *Database Records for the Search Area: -32.9563, 151.6151; -32.7760, 151.6179; -32.7782, 151.8314; -32.9585, 151.8290.* Date Received: 30 May 2012.

4 Birds Australia (2012) *Database Records for the Search Area: -32.9563, 151.6151; -32.7760, 151.6179; -32.7782, 151.8314; -32.9585, 151.8290. Date Received: 24 May 2012*.

5 Umwelt (Australia) Pty Ltd (2012) *Ecological Assessment for Port Waratah Coal Services (PWCS) Proposed Terminal 4 (T4) Project, Port of Newcastle NSW*.

ATTACHMENT B-C

OVERVIEW OF NCIG'S PROPOSED COMPENSATORY HABITAT

Shorebird Compensatory Habitat

NCIG has existing Project Approval conditions requiring the establishment of shorebird compensatory habitat. Condition 2.20 (b) (ii) Schedule 2 of the Project Approval (06_0009) states:

> *The Proponent shall develop and submit for the approval of the Director-General, a Compensatory Habitat and Ecological Monitoring Program to detail how habitat and ecological values lost as a result of the project will be off-set, and how ecological monitoring will be undertaken to inform on-going ecological management. The Program shall be developed in consultation with the DECC, and shall include, but not necessarily be limited to:*
>
> *a) ecological surveys, following detailed design of the project, to identify and quantify the extent and types of habitat that would be lost or degraded as a result of the project;*
>
> *b) provision for establishment of compensatory habitat for each relevant component of the project as follows, unless otherwise agreed by the Director-General:*
>
> *…*
>
> *ii) for migratory shore bird habitat lost as a result of the filling in of parts of Deep Pond and the construction of the optional rail spur, establishment of compensatory habitat in a location agreed by the Director-General, in consultation with the DECC, equivalent to no less than twice the area of habitat identified under a), with commencement of compensatory habitat works prior to the commencement of construction of the optional rail spur.*

The Rail Flyover Modification would result in the removal of 1.32 ha of saltmarsh habitat and 0.13 ha of freshwater wetland.

The shorebird compensatory habitat would be described within a revised CHEMP. The shorebird compensatory habitat is expected to:

- be in a location agreed by the Director-General and is expected to be located on Kooragang Island given the past consultation with NPWS;
- be an incremental increase in the shorebird compensatory habitat which will be established to satisfy Condition 2.20 (b) (ii);
- be equivalent to no less than twice the area of habitat removed (1.45 ha x 2) would be created (i.e. 2.9 ha of shorebird habitat);
- adjacent to a larger area of existing shorebird habitat to expand the area available to shorebirds;
- targeted towards an area that is known to have previously been habitat for shorebirds on Kooragang Island;
- include managing existing threats (such as mangrove encroachment) to provide shorebird habitat;
- be designed to provide enduring habitat for shorebirds;
- be managed to preserve it as shorebird habitat for the life of the NCIG CET; and
- be beyond existing requirements and not already funded under another scheme.

In 2009, NCIG commenced compensatory habitat works on Kooragang Island with the installation of a hydraulic control structure (culvert) on Creek 5 to commence "*reversal of the trend of mangrove encroachment into Ash Island Area E*" consistent with the DECC *Kooragang Island: Threatened Species Offsets Framework*.

Green and Golden Bell Frog Compensatory Habitat

NCIG has existing Project Approval conditions requiring the establishment of Green and Golden Bell Frog compensatory habitat. Condition 2.20 (b) (ii) Schedule 2 of the Project Approval (06_0009) states:

> *The Proponent shall develop and submit for the approval of the Director-General, a Compensatory Habitat and Ecological Monitoring Program to detail how habitat and ecological values lost as a result of the project will be off-set, and how ecological monitoring will be undertaken to inform on-going ecological management. The Program shall be developed in consultation with the DECC, and shall include, but not necessarily be limited to:*
>
> *a) ecological surveys, following detailed design of the project, to identify and quantify the extent and types of habitat that would be lost or degraded as a result of the project;*
>
> *b) provision for establishment of compensatory habitat for each relevant component of the project as follows, unless otherwise agreed by the Director-General:*
>
> *…*
>
> *i) for Litoria aurea habitat lost as a result of the project, establishment of compensatory habitat in a location agreed by the Director-General, in consultation with DECC, to no less than twice the area of habitat identified under a), with commencement of compensatory habitat works within six months of the commencement of construction;*

To compensate for the additional clearance of approximately 1.45 ha of potential habitat for the Green and Golden Bell Frog, NCIG would establish additional compensatory habitat in a location agreed by the Director-General, equivalent to or no less than twice the area of habitat to be removed (i.e. 2.9 ha).

The Green and Golden Bell Frog compensatory habitat would be described within a revised CHEMP. The compensatory habitat is expected to:

- be in a location agreed by the Director-General and is expected to be located on Kooragang Island given the past consultation with NPWS;
- be an incremental increase in the Green and Golden Bell Frog compensatory habitat which will be established to satisfy Condition 2.20 (b) (ii);
- be equivalent to no less than twice the area of habitat removed (1.45 ha x 2) would be created (i.e. 2.9 ha of Green and Golden Bell Frog habitat);
- include creation of artificial frog ponds;
- be designed provide enduring habitat for the Green and Golden Bell Frog;
- be managed to preserve it as Green and Golden Bell Frog habitat for the life of the NCIG CET; and
- be beyond existing requirements and not already funded under another scheme.