

## 4 ENVIRONMENTAL ASSESSMENT

An environmental risk review was completed by NCIG to identify any potential changes to otherwise approved impacts for further assessment in this EA.

### 4.1 ENVIRONMENTAL RISK REVIEW

As demonstrated in Table 1, there would be no change to the majority of the NCIG CET approved development components and consequently little to no change in potential impacts with the Rail Flyover Modification for several environmental aspects.

The results of the environmental risk review are provided in Table 2 with reference to where each environmental aspect is considered in this EA.

**Table 2  
Environmental Risk Review**

Environmental Aspect (From NCIG CET EA)	Potential Changes Associated with Rail Flyover Modification	Consideration and/or Further Assessment in this EA
Land Resources (including land use, soils and erosion potential and ASS)	Temporary minor disturbance of additional lands (less than 2.6 ha) resulting in potential erosion and sediment movement during construction works and excavation of Potential Acid Sulfate Soil [PASS] material.	Section 1.2.2 (land use) and Section 4.2 (soils [including PASS] and erosion potential)
Meteorology (including monitoring)	No change.	-
Noise	Minor realignments of Kooragang Island Main Line and additional elevation (approximately 1.9 m relative to existing NCIG rail spur embankment) of Northern Rail Spur may alter the approved intrusive noise levels at nearest receivers.	Section 4.3 and Appendix B
Air Quality	Temporary dust emissions during construction activities on additional lands resulting in contaminated particulates within the KIWEF becoming airborne.	Section 4.4
Visual Character (including night-lighting)	Minor realignments of Kooragang Island Main Line and additional elevation (approximately 1.9 m relative to existing NCIG rail spur embankment) of Northern Rail Spur and associated night-lighting may change the level of approved visual impact.	Section 4.5 and Appendix C
Surface Water (including surface water quality)	Temporary minor disturbance of additional lands during construction of rail embankments could potentially result in drainage of sediment laden runoff to downstream waterbodies. Management of additional stormwater runoff from the minor realignments of Kooragang Island Main Line.	Section 4.6
Land Contamination and Groundwater (including soil and water management during excavations, and pre-loading of rail infrastructure corridor)	Temporary minor disturbance of additional lands resulting in excavation of contaminated soils. Temporary consolidation of additional lands during construction of rail embankments leading to induced groundwater flows from clay aquitard to fill and estuarine aquifer. Capping of additional lands within KIWEF.	Section 4.7
Flora	Minor disturbance of additional lands (less than 2.6 ha) resulting in a potential effect on threatened species or endangered ecological communities (EECs).	Section 4.8 and Appendix D
Fauna	Minor disturbance of additional lands (less than 2.6 ha) (i.e. potential habitat) resulting in a potential effect on threatened or migratory fauna species. Minor realignments of Kooragang Island Main Line and additional elevation (approximately 1.9 m relative to existing NCIG rail spur embankment) of Northern Rail Spur resulting in minimal additional visibility of train headlights.	Section 4.9 and Appendix D
Heritage (Aboriginal and non-Aboriginal)	Minor disturbance of additional lands (less than 2.6 ha) resulting in identification/excavation of heritage items.	Section 4.10
Transport	Temporary additional traffic movements for import of fill for construction of rail embankments and rail ballast.	Section 4.11 and Appendix E

**Table 2 (Continued)  
Environmental Risk Review**

<b>Environmental Aspect (From NCIG CET EA)</b>	<b>Potential Changes Associated with Rail Flyover Modification</b>	<b>Consideration and/or Further Assessment in this EA</b>
The Regional Economy	No change.	-
Socio-Economic Considerations	No change.	-
Hazard and Risk	Minor disturbance of additional lands (less than 2.6 ha) resulting in an increased level of risk during construction and/or operational activities.	Section 4.12

**4.2 LAND RESOURCES**

Given the existing industrial land uses on Kooragang Island and associated with the Project site (i.e. approximately 180 ha), impacts on land use from the Rail Flyover Modification would be negligible. The total area of additional land required for the Rail Flyover Modification is less than 2.6 ha.

Modification to the existing topography would result from the construction of the grade separated inbound track for the NCIG Northern Rail Spur, and from the minor realignments of the inbound (western) track and outbound (eastern) track of the Kooragang Island Main Line, however it is considered that these works would be of a scale and nature consistent with the surrounding land use, topography and landscape features. A Visual Assessment Review for the Rail Flyover Modification is presented in Appendix C and Section 4.5.

The Rail Flyover Modification would have the potential to increase erosion and sediment movement due to temporary disturbance of soils. These potential impacts and mitigation measures are described in Section 4.5.

While no ASS were identified in material excavated during Stage 1 or Stage 2AA of the NCIG CET construction, excavations associated with the Rail Flyover Modification would have the potential to intercept ASS material, if present. The presence or otherwise of ASS material would be identified during the surface and sub-surface sampling (Section 4.7).

Given the limited amount of excavation works associated with the Rail Flyover Modification, and that no ASS material was identified during Stage 1 and Stage 2AA construction of the NCIG CET, the risk of intercepting ASS material is considered low. Notwithstanding, any ASS material encountered during construction works would be managed in accordance with the NCIG ASSMP.

**4.3 NOISE**

As part of the NCIG CET EA, a Noise Impact Assessment was undertaken by Heggies Australia (2006) including the development of an acoustic model. The Noise Impact Assessment considered operations up to the maximum capacity of 66 Mtpa and in all cases the predicted intrusive noise and amenity levels were below the relevant assessment criteria and any noise impacts were considered acceptable.

A Noise Assessment Review for the Rail Flyover Modification was undertaken by SLR (2012) and is presented in Appendix B.

The Noise Assessment Review presented the sound power levels associated with the CET plant and equipment as described in the NCIG CET EA, and compared these against the 'as-built' plant and equipment currently, and predicted, to be in use at the CET. The CET noise model was also updated to predict the CET contributed noise levels including the Rail Flyover Modification at the nearest receiver areas for comparison with the approved noise limits.

The review identified that the sound power level associated with the plant and equipment which will be in operation once the CET is operating at full capacity (of 66 Mtpa) is consistent with the predicted sound power level presented in the NCIG CET EA.

The review also assessed the potential noise impacts associated with the Rail Flyover Modification and concluded that although there are minor increases in the extent and elevation of the rail infrastructure associated with the Rail Flyover Modification, no additional operational plant or equipment would be introduced as a result of the Rail Flyover Modification and the on-site operating sound powers levels would remain unaltered. Therefore, any potential variation in the off-site intrusive noise level at the nearest receivers would be negligible as a result of the Rail Flyover Modification (Appendix B). These conclusions were confirmed by the prediction results from the updated CET noise model.

#### 4.4 AIR QUALITY

As part of the NCIG CET EA, an Air Quality Impact Assessment (AQIA) was undertaken by Holmes Air Sciences (2006) for the construction and operation of the NCIG CET. The potential air quality impacts were modelled for both the Stage 1 (i.e. 30 Mtpa) and maximum 66 Mtpa capacity CET operations.

The AQIA considered that air quality impacts during construction (e.g. dust generated during earthworks undertaken in a progressive manner) would be less than that during Project operations, and combined with the sporadic nature of dust emissions from construction activities, modelling of a construction scenario was not required, and therefore is also not considered necessary for the Rail Flyover Modification.

Dust emissions during construction of the NCIG CET including the Rail Flyover Modification would continue to be controlled in accordance with the requirements of Project Approval (06\_0009) as follows:

- Conditions 2.2 and 2.4, Schedule 2: NCIG will design and construct the Project in a manner that minimises or prevents the emission of visible dust beyond the boundary of the site (including wind blown and traffic generated dust).
- Condition 2.5, Schedule 2: NCIG will control dust emissions on all internal roads, trafficable areas and manoeuvring areas to minimise the potential for dust generation by sealing, or otherwise treating surfaces in a manner acceptable to the Director-General.
- Condition 2.45, Schedule 2: All stockpiled construction materials will be managed to minimise erosion or dispersal (including wind-blown dust) of the materials.

Dust control measures to be implemented during construction of the NCIG CET including the Rail Flyover Modification would include the following:

- demarcation and minimisation of ground disturbance areas;
- watering of exposed ground disturbance areas and high traffic areas using water trucks (or similar) to minimise the generation of dust;
- confining vehicle movements to designated access routes;
- limiting the speed of vehicles on unpaved roads; and

- encapsulation of contaminated materials considered unsuitable for use as construction fill (Section 4.7).

Air quality monitoring (dust deposition) would continue to be undertaken in accordance with the existing environmental monitoring program for the NCIG CET, and consistent with the requirements of EPL 12693.

#### 4.5 VISUAL CHARACTER

As part of the NCIG CET EA, a Visual Impact Assessment was undertaken by EDAW Australia (2006).

For the purposes of this EA in support of the Rail Flyover Modification, Urbis was commissioned to conduct an assessment of the potential visual impacts associated with the Rail Flyover Modification and provides a comparison with the development for which approval was originally granted as described and assessed in the NCIG CET EA. The Visual Assessment Review for the Rail Flyover Modification is provided in Appendix C and the findings summarised below.

Within the regional setting, the Rail Flyover Modification is a minor component in the context of the already approved NCIG CET which includes large scale industrial elements including rail infrastructure, rail unloading facilities, conveyors, coal stockpiles, large stacker/reclaimers, wharf facilities and ship-loading facilities.

Within the local and sub-regional setting, the number of sensitive viewpoints and the scenic quality at those viewpoints has not substantially changed since the NCIG CET EA was prepared. To date, NCIG has not received any complaints regarding visual amenity, nor has NCIG been made aware of any complaints in regards to visual amenity of the NCIG CET.

Sensitive viewpoints that were assessed in the NCIG CET EA and have been re-assessed with the Rail Flyover Modification included (Figure 9):

- Mayfield (Viewpoint 1);
- Mayfield West (Viewpoint 2);
- Fern Bay - Nelson Bay Road (Viewpoint 3);
- Hunter Wetlands National Park (Kooragang Nature Reserve) (Viewpoint 4);
- Stockton Bridge (Viewpoint 5);
- Cormorant Road (Viewpoint 6); and
- Sandgate (Viewpoint 8).



Other areas (i.e. areas not assessed as sensitive areas) assessed to have the potential views of the Rail Flyover Modification included:

- The Hunter River (Viewpoint 7); and
- The Port related activities and industrial areas within the visual catchment.

The Visual Assessment Review (Appendix C) concluded that while the Rail Flyover Modification would result in a slight change of visibility of infrastructure elements at some viewpoints, the Rail Flyover Modification would not change the level of visual impact described in the NCIG CET EA for each of the above viewpoints. Further, the Rail Flyover Modification would not change the number of sensitive public viewpoints as assessed in the NCIG CET EA.

The mitigation measures and management measures for the maintenance of visual amenity at the NCIG CET outlined in the NCIG's approved CEMP and OEMP would continue to be implemented for the Rail Flyover Modification.

### **Night-lighting**

The Rail Flyover Modification would not include any additional night-lighting sources to those assessed in the NCIG CET EA.

The Visual Assessment Review (Appendix C) concluded that the nature of the night-lighting associated with trains would be of a similar intensity when compared to the existing night-lighting associated with rail operations on the Kooragang Island Main Line.

Notwithstanding, in accordance with Condition 7 of Particular Manner Decision (EPBC 2006/2987) (Attachment 3), NCIG would place screens, comprising timber paling fences or similar structures, at intervals along the rail infrastructure (including the Rail Flyover Modification) to minimise lighting impacts from trains and rail corridor lighting.

## **4.6 SURFACE WATER**

Surface water runoff from disturbance areas during the construction of the rail infrastructure could potentially contain sediments, soluble salts, heavy metals, organic contaminants, fuels, oils and grease. The surface water management layout for the NCIG CET including the Rail Flyover Modification is shown on Figure 8 and described in Section 3.5.

The Rail Flyover Modification would result in an increase in the Project disturbance area by less than 2.6 ha. Erosion and sediment control measures would be implemented for the Rail Flyover Modification consistent with the CSWMP and OEMP.

The following principles underpin the approach to erosion and sediment controls at the NCIG CET and for the Rail Flyover Modification to protect adjacent wetland areas, Deep Pond and the Hunter River:

- Minimising surface disturbance and restricting access to undisturbed areas.
- Separation of runoff from disturbed and undisturbed areas where practicable.
- Construction of surface drains to facilitate the efficient transport of surface runoff or utilisation of existing stormwater systems.
- Construction of the site drainage network including construction settling ponds, primary and secondary settling ponds and an overflow pond to contain runoff up to specified design criterion (Section 2.5.3).

The above principles take into account the general recommendations for site drainage works presented in *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom, 2004).

In addition to these principles, development activities would generally occur in the following order:

1. Construction of sediment fences (down slope of disturbance areas) where required.
2. General construction works will then take place once erosion and sediment control measures are in place.
3. Construction of drainage diversions (typically upslope of disturbance areas) – these will only be constructed where they will significantly reduce the runoff catchment of disturbance areas and will connect to the site drainage network where practicable.
4. Construction of collection drains (down slope of disturbance areas) where required to convey runoff to the site drainage network (including the construction settling ponds, primary and secondary settling ponds and the overflow pond).

All stockpiled construction materials would be managed to minimise erosion or dispersal of the materials in accordance with Condition 2.45 of Project Approval (06\_0009).

All fill/preload material brought to the Project site would be managed in manner that minimises erosion and dispersal of those materials to the downstream waters (e.g. south arm of the Hunter River or adjacent wetland areas).

All erosion, sediment and pollution control infrastructure would be maintained on the Project site at or above design capacity for the duration of construction of the Project and until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment, in accordance with Condition 2.44, Schedule 2 of Project Approval (06\_0009).

In accordance with Condition 2.42 of the Project Approval, unless otherwise agreed by the Director-General, NCIG will design, construct, maintain and operate surface water and stormwater management infrastructure on the site to accommodate a 1 in 100 ARI rainfall event. In accordance with Condition 7.3 (b), Schedule 2, of the Project Approval (06\_0009), all elements of the site drainage network will include appropriately-sized stormwater controls, in accordance with *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom, 2004).

The general design criteria for sediment control structures are summarised in Table 3.

**Table 3  
Sediment Control Structures –  
General Capacity Requirements**

Sediment Control Structure	Function	Design Capacity
Upslope diversion drains	Reduce runoff from undisturbed areas onto disturbed areas.	Peak flow calculated for 1 in 100 year ARI rainfall event.
Downslope collection drains	Intercept and convey disturbed area runoff water to sediment ponds.	Peak flow calculated for 1 in 100 year ARI rainfall event.
Settling ponds	Containment of sediment-laden runoff.	Capacity to store the runoff produced from the 1 in 100 year ARI rainfall event and suitable sediment storage capacity in accordance with Landcom (2004).

Source: CSWMP (NCIG, 2010a)

Given the above measures, the proposed Rail Flyover Modification would have negligible additional impact on the surface water flows or quality to surrounds.

#### 4.7 LAND CONTAMINATION AND GROUNDWATER

A Land Contamination and Groundwater Assessment (RCA Australia, 2006) was conducted as part of the NCIG CET EA in accordance with *Managing Land Contamination – Planning Guidelines SEPP 55 – Remediation of Land*. The assessment identified a range of fill materials (including contaminated material) within the KIWEF:

- blast furnace slag;
- coal washery fine and coarse rejects;
- brecketts material and slag;
- refuse;
- BOS dust;
- dredge material;
- unknown fill status (water and marshes);
- miscellaneous fill (majority dredge material); and
- unknown fill.

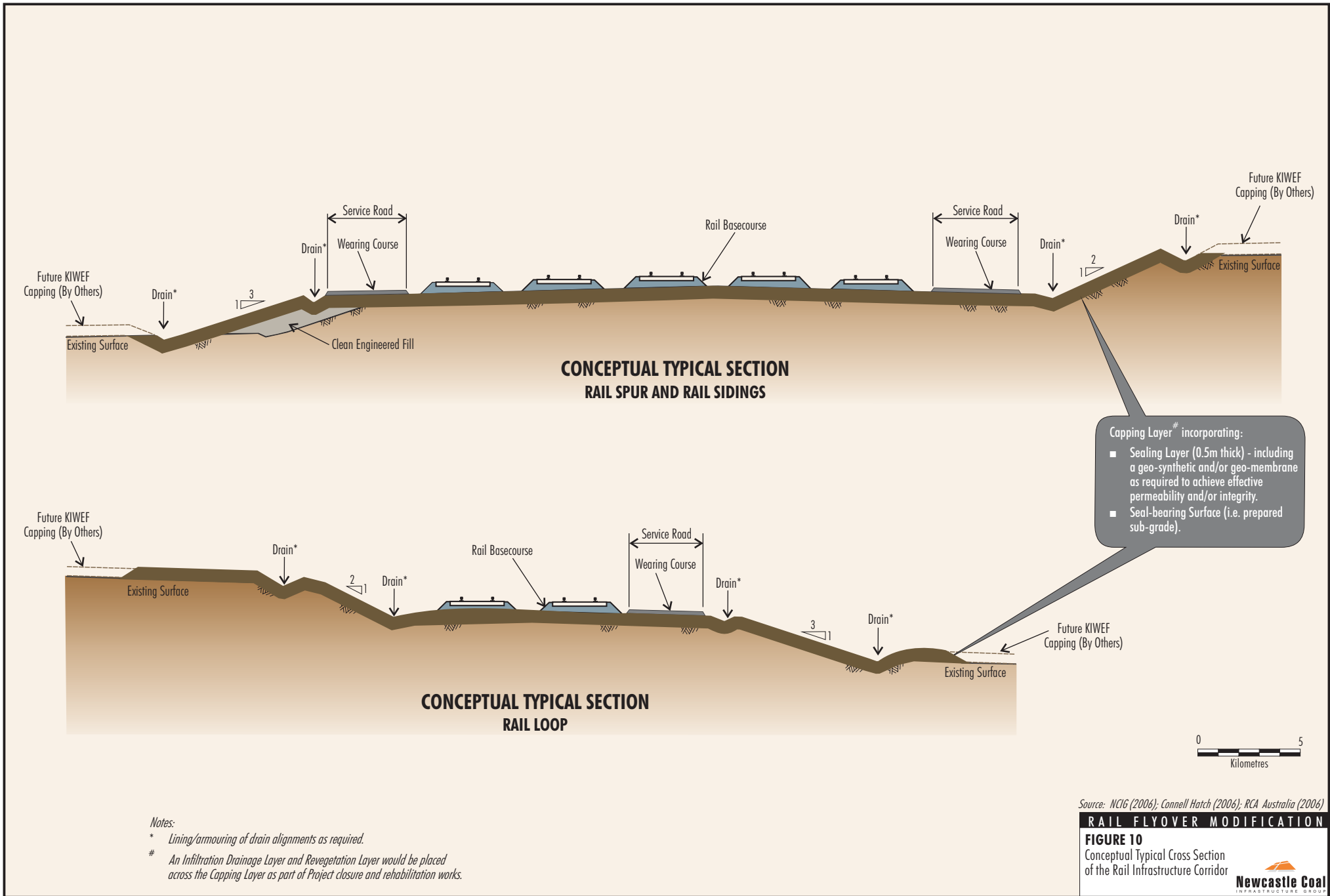
Limited excavations would be required during the construction of the Rail Flyover Modification components. As part of the CEMP required in accordance with Project Approval (06\_0009), procedures are included for the sampling and analysis of soil prior to any excavations and subsequent handling of contaminated materials, if identified.

As described in Section 2.1.1, the rail infrastructure corridor would continue to be designed and constructed such that it meets the goals of benchmark techniques 28 and 29 in *Environmental Guidelines: Solid Waste Landfills* (EPA, 1996) where it traverses the KIWEF, and would include capping and drainage works (Figure 10).

With continued implementation of the management measures for the NCIG CET site for the additional lands associated with the Rail Flyover Modification in accordance with SEPP 55, the development site would be suitable.

#### Groundwater

As described in the NCIG CET EA, the fill aquifer that the rail infrastructure corridor traverses comprises various waste materials. The permeability of the waste materials varies from low to moderate and groundwater flow is generally dominated by areas of recharge across the site, as evidenced by groundwater mounding. The groundwater flow from these mounds is radial to the surrounding surface water ponds and is expected to be downward to the underlying estuarine aquifer (RCA Australia, 2006).



*Notes:*

\* Lining/armouring of drain alignments as required.

# An Infiltration Drainage Layer and Revegetation Layer would be placed across the Capping Layer as part of Project closure and rehabilitation works.

The groundwater flow regime in the estuarine aquifer comprises a low hydraulic gradient, with flow ultimately discharging to the adjacent wetlands and south arm of the Hunter River.

The placement of embankment material for the Rail Flyover Modification components may cause some consolidation of the underlying soils. The consolidation could lead to a minor increase in pore pressure, which would induce flows from the clay aquitard into the fill and estuarine aquifers. This increase in flow would be expected to be short-term and localised similar to those predicted and experienced during the construction of the existing NCIG CET rail spur. The presence of fill materials would assist in dissipating the groundwater pressure from the placement of fill for the rail embankment and therefore any increases in flow rate is expected to be only minor.

Consistent with the conclusions in the NCIG CET EA, it is expected that some short-term localised and minor increases in the groundwater table would occur in areas of consolidation within the KIWEF, but such increases are expected to have negligible impact on surrounding groundwater systems due to the elevated water table present in the area.

Ground improvement techniques would continue to be used to accelerate consolidation in the clay aquitard in areas of significant fill. Potential impacts associated with the use of wick drains (i.e. increased groundwater flows) would be localised, of generally short duration, and would eventually collapse or block with sediment resulting in a reduction in flow.

Notwithstanding the above, monitoring and contingency measures developed for the NCIG CET would continue to be implemented including:

- installation of bores along the perimeter of the rail infrastructure corridors (including the Rail Flyover Modification components); and
- monitoring of any groundwater changes/effects and, if significant, undertake an investigation and consider contingencies (i.e. pumping of bores or installation of localised subsurface low permeability barriers).

#### 4.8 FLORA

A Threatened Species Assessment for the Rail Flyover Modification is presented in Appendix D. A summary of the findings is provided below.

A Flora Assessment was undertaken by NCIG (2006c) as part of the NCIG CET EA in association with (i.e. co-authored by) Professor David Goldney.

The potential impacts on flora from the CET (relevant to the rail infrastructure) were identified as clearing of native vegetation, alteration of surface water flow to wetland flora and incursion of weeds.

The CET is a semi-natural to highly disturbed industrial site, although the Flora Assessment (NCIG, 2006c) for the CET recognised that it also provided habitat for some threatened flora species and communities listed under the NSW *Threatened Species Conservation Act, 1995* (TSC Act). The CET is approved to disturb some potential habitat for *Zannichellia palustris*, an aquatic plant listed as endangered under the TSC Act. It is also approved to remove:

- approximately 50 ha of *Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions Endangered Ecological Community* (Freshwater Wetlands on Coastal Floodplains EEC); and
- approximately 3 ha of *Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions Endangered Ecological Community* (Coastal Saltmarsh EEC).

A number of flora surveys have been conducted in the general area of the NCIG CET (Protech Steel, 2001; Umwelt [Australia] Pty Limited, 2003; Department of Commerce, 2005; Connell-Hatch, 2006a, 2006b). The most recent surveys have been undertaken by Umwelt (Australia) Pty Limited (2012). Their flora surveys involved a detailed review of relevant literature, reports and vegetation mapping as well as database searches. Flora and vegetation surveys were undertaken in November and December 2010, May and November 2011 and January 2012 and comprised field surveys and vegetation mapping. Field surveys included quadrat vegetation sampling, sampling along meandering transects and field reconnaissance to identify the spatial arrangement of vegetation across the study area which included the proposed Rail Flyover Modification area. Searches of threatened flora species listed under the TSC Act and EPBC Act were undertaken. Additional surveys for the *Zannichellia palustris* were undertaken in December 2010, December 2011 and January 2012.

The proposed Rail Flyover Modification would involve similar potential impacts on flora as those identified for the CET (clearing of native vegetation and potential for incursion of weeds). The proposed Rail Flyover Modification would have negligible additional impact on the surface water flows or quality (Section 4.6) as to affect surrounding wetland areas.

No threatened flora species listed under the TSC Act or EPBC Act have been recorded within the additional lands associated with the Rail Flyover Modification.

Native vegetation communities recorded within the Rail Flyover Modification area are listed in Table 4 and shown on Figure 11.

The additional lands associated with the Rail Flyover Modification cover less than 2.6 ha, comprising approximately 1.5 ha of native vegetation and approximately 1.1 ha of disturbed land. The additional native vegetation proposed to be cleared for the Rail Flyover Modification, comprises of approximately 0.13 ha of Freshwater Wetlands on Coastal Floodplains EEC and approximately 1.3 ha of Coastal Saltmarsh EEC (Table 4).

**Table 4  
Vegetation Communities**

Vegetation Communities <sup>1</sup>	Description <sup>1</sup>	Area (ha)
Freshwater Wetland*	The lack of tidal flow and inundation by freshwater from rainfall has resulted in the colonisation of freshwater wetland species.	0.02
Freshwater Wetland Variant – Occurring in Fill*	Filled/reclaimed land that collects rainwater and forms artificial freshwater wetlands that have been colonised by a collection of aquatic flora species that are typical of disturbed wetlands.	0.11
Mangrove Forest	Forest of grey mangrove ( <i>Avicennia marina</i> subsp. <i>australasica</i> )	0.05
Saltmarsh**	Saltmarsh vegetation	0.88
Saltmarsh Variant: with Freshwater Influence**	Saltmarsh vegetation with some invasion of fresh/brackish plant species.	0.44
Disturbed Land		1.1
	Total	2.6

<sup>1</sup> Umwelt (Australia) Pty Limited (2012)

\* Freshwater Wetlands on Coastal Floodplains EEC.

\*\* Coastal Saltmarsh EEC.

These EECs occur more extensively across Kooragang Island in semi-natural to highly disturbed wetland areas, and larger areas of these two EECs surrounding the site would remain (as identified as part of the Flora Assessment for the NCIG CET [NCIG, 2006c]).

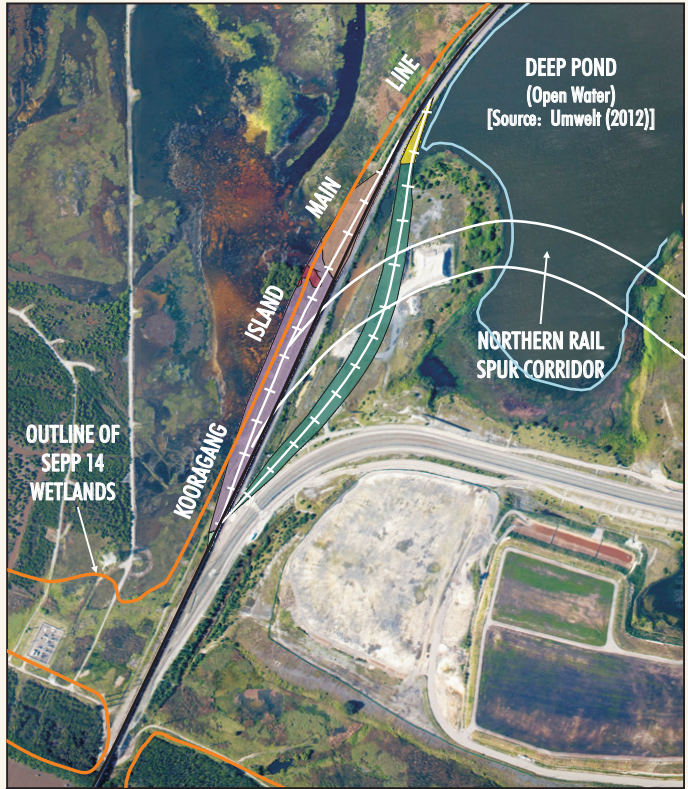
The additional EECs proposed to be removed for the Rail Flyover Modification is only a small incremental disturbance (<3 percent [%]) additional to the area of EECs already approved for clearance. The EECs proposed to be removed is also located adjacent to the existing rail infrastructure.

Construction of the Rail Flyover Modification has the potential to facilitate the incursion and spread of environmental weeds and weeds listed as noxious under the NSW *Noxious Weeds Act, 1993* (e.g. Crofton Weed [*Ageratina adenophora*], Bitou Bush [*Chrysanthemoides monilifera* ssp. *rotunda*], Boneseed [*Chrysanthemoides monilifera* ssp. *monilifera*] and Pampas Grass [*Cortaderia selloana*]). The weed management program would continue to be implemented to limit the spread and colonisation of weeds in the Project site (including the Rail Flyover Modification) during construction and operations.

NCIG would continue to implement the CHEMP. This would include continuation of the vegetation clearance protocol to delineate disturbance areas to approved Project boundaries.

Dr Arthur White (a suitably qualified ecologist approved by the Director-General) has reviewed the threatened species assessment (Appendix D) and considers it adequate. The biodiversity values in the region are likely to be maintained considering:

- the small scale of land disturbance required the Rail Flyover Modification (2.6 ha);
- the proportion of proposed land disturbance which is already disturbed (42% or 1.1 ha);
- the additional EECs proposed to be removed for the Rail Flyover Modification are only small incremental disturbances (<3%) additional to the area of EECs already approved for clearance;
- the Rail Flyover Modification area is a linear disturbance located adjacent to the existing rail (infrastructure would therefore be streamlined);
- the works would not significantly impact any threatened species, populations, or ecological communities, or their habitats, listed under the TSC Act;
- the works would be undertaken in accordance with a number of approved environmental management plans, including controls for weeds, animal pests, lighting, etc.



- LEGEND**
- Rail Flyover Modification
- Vegetation Communities**
- Disturbed Land (wasteland, roads, exotic grasslands etc)
  - Freshwater Wetland
  - Freshwater Wetland Variant - Occurring in Fill
  - Mangrove Forest
  - Saltmarsh
  - Saltmarsh Variant: with Freshwater Influence



Source: Aerial Photo NCIG (February 2012) (Not Orthorectored) and Umwelt (2012)

**RAIL FLYOVER MODIFICATION**

**FIGURE 11**

Vegetation Mapping



- NCIG would establish additional compensatory habitat for the Green and Golden Bell Frog in accordance with the existing NCIG *Compensatory Habitat and Ecological Monitoring Program*; and
- NCIG would undertake the works in accordance with the modified conditions of approval.

Dr Arthur White's peer-review letter is provided in Appendix D.

#### 4.9 FAUNA

A Threatened Species Assessment for the Rail Flyover Modification is presented in Appendix D. A summary of the findings is provided below.

A Fauna Assessment was undertaken by NCIG (2006d) as part of the NCIG CET EA. The potential impacts on fauna from the CET (relevant to the rail infrastructure) were identified as clearing of native vegetation, alteration of surface water flow to wetland habitat, potential for attracting introduced fauna, fauna mortality due to traffic movements, disruption of fauna routine activities due to noise emissions and fauna movement due to fencing.

A number of fauna surveys have been conducted in the general area of the NCIG CET (NSW Department of Commerce, 2005; Protech Steel, 2001; Umwelt, 2003; Regional Land Management Corporation, 2003; Hamer, 1997, 1998, 2002; Premier's Department, 2003; Winning, 1998; PWCS, 1996; ARTC, 2005; Straw, 1999, 2000).

The most recent surveys of the lands adjacent to the NCIG CET (including the Rail Flyover Modification area) have been undertaken by Umwelt (Australia) Pty Limited (2012). Their fauna surveys involved a detailed review of relevant literature, reports and vegetation mapping as well as database searches. Fauna surveys were undertaken in February, March, August, November and December 2010; January, February and March 2011; and January 2012.

Surveys comprised hair funnel sampling, bird surveys, diurnal herpetological surveys, spotlighting surveys, nocturnal call-playback, micro-bat echolocation recording surveys and habitat assessments.

Searches of threatened fauna species listed under the TSC Act and EPBC Act were undertaken. Additional targeted surveys for the Green and Golden Bell Frog (*Litoria aurea*), Australasian Bittern (*Botaurus poiciloptilus*), Eastern Grass Owl (*Tyto longimembris*) and threatened micro-bats were also undertaken. In addition, sites located outside of the survey area were also surveyed for the Green and Golden Bell Frog.

The broad fauna habitat types associated with the Rail Flyover Modification are listed in Table 5, based on the vegetation communities listed in Table 4.

**Table 5  
Broad Fauna Habitat Types**

Vegetation Communities	Area (ha)
Freshwater Wetland*	0.13
Mangrove Forest	0.05
Saltmarsh**	1.32
Disturbed Land	1.1
Total	2.6

\* Freshwater Wetlands on Coastal Floodplains EEC.

\*\* Coastal Saltmarsh EEC.

The additional lands associated with the Rail Flyover Modification area cover less than 2.6 ha, comprising approximately 1.5 ha of native vegetation and approximately 1.1 ha of disturbed land. The majority of habitat in the Rail Flyover Modification area occurs on the western side of the existing rail embankment. These habitats extend further to the Hunter Wetlands National Park and occur more extensively across Kooragang Island (Figure 11). As described in Section 3.3, the realignment of the outbound track has been specifically designed to avoid Deep Pond beyond that for the approved NCIG CET.

A component of the Freshwater Wetland broad habitat type, the *Freshwater Wetland Variant – Occurring in Fill*, occurs on the eastern side of the existing rail embankment as a result of filled/reclaimed land (Figure 11). This habitat is likely to be opportunistically used by fauna with general habitat requirements.

Only one threatened fauna species has the potential to be directly impacted by the Rail Flyover Modification. The Green and Golden Bell Frog (*Litoria aurea*) is listed as endangered under the TSC Act and vulnerable under the EPBC Act. It is known to occupy Kooragang Island environs.

The Rail Flyover Modification would involve the removal of approximately 1.45 ha of potential habitat for the Green and Golden Bell Frog, comprising Freshwater Wetland habitat and Saltmarsh habitat. It is noted that the Green and Golden Bell Frog are known to use disturbed areas for movement between breeding habitats. However in this case, the majority of the disturbed land (Figure 11) would not be used by this frog as it is largely associated with the existing rail infrastructure and is not located between known habitat areas. NCIG would continue to implement the GGBFMP, including measures such as pre-clearance surveys for the frog.

Mitigation measures proposed for the Rail Flyover Modification to mitigate potential impacts on fauna species are listed below:

- Feral animal and noxious weed control would be achieved by mandating a clean, rubbish-free environment to discourage scavenging and reduce the potential for further colonisation by non-endemic fauna (e.g. introduced rodents and foxes).
- Amphibian chytrid fungus management measures (as described in the GGBFMP) would be implemented to minimise the further spread of amphibian chytrid fungus, including potentially new strains of the fungus into the rail flyover construction area. Project personnel would be trained in site hygiene management in accordance with the *Hygiene Protocol for the Control of Disease in Frogs* (NSW National Parks and Wildlife Service, 2001), tyres and wheels of vehicles brought into the rail flyover construction areas that have been exposed to mud and are to be used in areas in close proximity to potential frog habitat would be disinfected. Mobile plant would be inspected prior to entering the site and would not be permitted to enter the site if it is not adequately clean (i.e. free of soil and/or organic matter).
- Lighting management in accordance with the requirements of EPBC Act Particular Manner Decision 2006/2987 (Attachment 3).
- Noise management measures, including the implementation of noise and vibration controls in accordance with NCIG's CNMP and ONMP (NCIG, 2010a, 2010b).
- Groundwater management to prevent off-site impacts to ensure that proximate vegetation communities and aquatic systems are not adversely impacted in accordance with the CSWMP and OWMP (NCIG, 2010a, 2010b).
- Surface water management to prevent off-site impacts and manage potential erosion and sedimentation issues to ensure that proximate vegetation communities and aquatic systems are not adversely impacted in accordance with the CSWMP and OWMP (NCIG, 2010a, 2010b)
- Dust management to control the potential impacts on air quality in accordance with NCIG's ODMP (NCIG, 2010b).

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) in accordance with the CHEMP.

Dr Arthur White (a suitably qualified ecologist approved by the Director-General) has reviewed the threatened species assessment (Appendix D) and considers it adequate for the reasons described in Section 4.8 and Appendix D. Dr Arthur White's peer-review letter is provided in Appendix D.

#### 4.10 HERITAGE

As part of the NCIG CET EA, a Preliminary Aboriginal Heritage Assessment (PAHA) and desktop non-Aboriginal heritage assessment were undertaken for the Project site and surrounds.

##### **Aboriginal Heritage**

The PAHA identified two Aboriginal sites (shell middens) on Kooragang Island as being registered on the Aboriginal Heritage Information Management System (AHIMS) database. Neither of these registered sites is located within the NCIG CET site including the Rail Flyover Modification.

Of relevance, the PAHA also concluded:

- The area has been subject to agricultural development since European settlement, and over a period of more than 50 years, dredge spoil, land reclamation and waste disposal activities.
- Previous surveys have not identified any remaining archaeological evidence of Aboriginal occupation.
- Consultation with the Aboriginal community had not identified any significant cultural heritage values in the Kooragang Port and Industrial Area including the NCIG CET site.

Notwithstanding the fact that no Aboriginal sites have been identified within the NCIG CET site including the Rail Flyover Modification, NCIG would continue to implement the management measures described in the CEMP, as follows:

- During induction training, NCIG personnel would be advised of their responsibility to advise management if they uncover any item that could be of Aboriginal heritage significance.
- If potential archaeological material is identified, construction activities proximal to the potential archaeological material would cease and the OEH's, North East Branch - Environment Protection and Regulation Group, Regional Archaeologist would be contacted to determine appropriate management requirements.
- If items of Aboriginal cultural heritage significance are salvaged on-site, they would be stored in a keeping place on-site for the duration of the Project.
- At the cessation of the Project, if any salvaged Aboriginal objects are stored on-site their ongoing management will be determined in consultation with the Aboriginal community and the OEH.

#### ***Non-Aboriginal Heritage***

No known non-Aboriginal heritage items of significance have been identified within the NCIG CET site including the Rail Flyover Modification.

Notwithstanding the fact that no non-Aboriginal heritage items of significance have been identified, NCIG would continue to implement the management measures described in the NCIG CET EA, as follows:

- During induction training, NCIG personnel would be advised of their responsibility to advise management if they uncover any item that could be of non-Aboriginal heritage significance.
- If an item of possible heritage significance is identified on-site during excavation or construction activities, analysis would be undertaken by a suitably qualified heritage consultant to determine the significance of the identified objects.
- If the item is of a local or higher significance, subsequent consultation would be undertaken with the NSW Heritage Office in regard to the fate of the item.

## **4.11 TRANSPORT**

### ***Construction (Fill) Transport***

During construction of Stage 2AA of the NCIG CET, NCIG sought and obtained the agreement of the Director-General of the DP&I (in accordance with Condition 2.47 of Project Approval [06\_0009]) to import construction fill at the NCIG CET site from local quarries with heavy vehicle movements of up to 120 truck deliveries per day over a 10 month period between 7:00 am to 6:00 pm, six days per week (Monday to Saturday).

As described in Section 3.4, the road transport impacts associated with the Rail Flyover Modification are related to the transport of construction fill material to the CET.

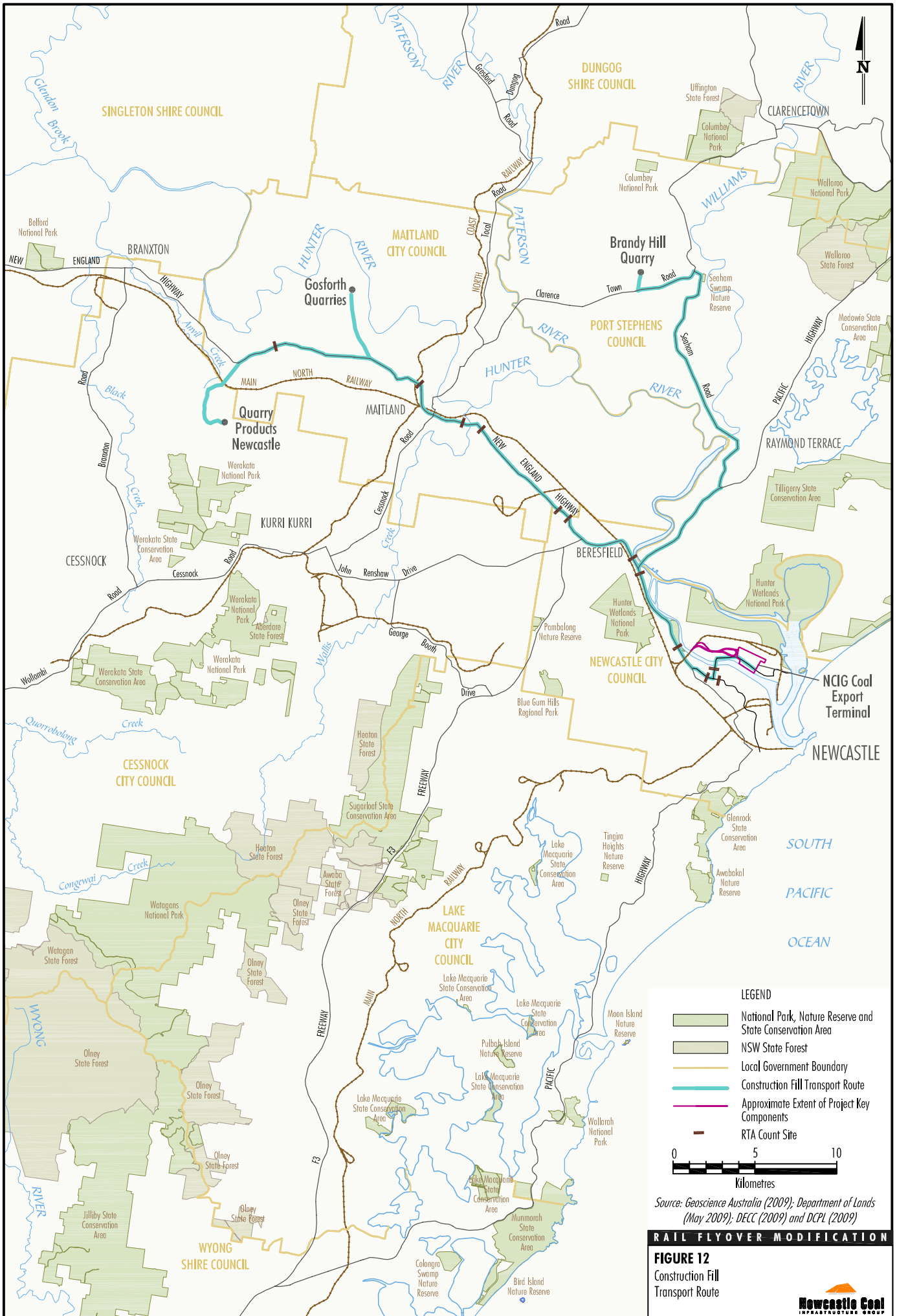
Consistent with the approach undertaken for Stage 2AA construction, NCIG commissioned GTA Consultants to conduct an assessment of the potential impacts associated with the transport of construction fill material for the Rail Flyover Modification (Appendix E).

It is anticipated that up to 48 deliveries per day would be required to transport the required amount of material for a period of approximately 18 months. The material would be sourced from three quarries located within the Lochinvar Area (Figure 12).

Consistent with the existing management of fill transport to the CET, fill would be transported between 7.00 am and 6.00 pm Monday to Friday, and between 7.00 am and 1.00 pm on Saturdays. The proposed transport route for fill would be via the same routes for Stage 2AA (i.e. New England Highway, Pacific Highway, Industrial Drive, Tourle Street Bridge and Cormorant Road ) (Figure 12).

Access to the CET site would continue to be via the prescribed access points as presented in Road Transport Assessment report of the EA (Masson Wilson Twiney, 2006).

Consistent with the approved access routes, vehicles would access the rail flyover construction site using the existing access point immediately to the north of the Tourle Street bridge (Delta Access Road). This would be via left turn northbound movements only. Trucks would leave the CET site by left turn onto Cormorant Road from Delta Access Road and performing a U-turn at the roundabout to return to the New England Highway.



The primary entry to the rail flyover construction site would be via Delta Access Road, however during exceptional circumstances, when access via Delta Access Road is restricted, trucks may enter and leave the site (left turn in, left turn out) via Pacific National Road. This potential route would be expected to only carry a small percentage of the overall traffic volume for the Rail Flyover Modification.

A cumulative assessment of potential traffic impacts concluded that the road transport implications of the flyover construction works will be limited to the local access arrangements on Kooragang Island (Appendix E).

It is considered that the traffic movements associated with the construction of the Rail Flyover Modification can be adequately and appropriately mitigated and managed in accordance with the CTMP (Appendix E).

### ***Rail Transport***

As described in Section 1.1.1, the Kooragang Island Main Line (Figure 3) services the Kooragang Coal Terminal and a number of other industrial facilities' on Kooragang Island, including Boral Cement and facilities on Walsh Point.

Construction of the rail flyover would be undertaken in a manner to avoid where possible or otherwise minimise interruptions to services on Kooragang Island in consultation with the ARTC.

Once complete, the rail flyover would be beneficial to rail transport services on Kooragang Island, reducing potential future scheduling issues for train movements.

## **4.12 HAZARD AND RISK**

As part of the NCIG CET EA, a PHA was conducted in accordance with SEPP 33 (Section 1.2.2).

The NCIG CET operates in accordance with the environmental management plans and management procedures required by the existing Project Approval (06\_0009) (Section 2.7). These plans and procedures have been developed to minimise the environmental risks associated with construction and operation of the CET.

The Rail Flyover Modification would not introduce any new hazardous materials to the NCIG CET during construction, nor would it increase the risks beyond those already ranked and assessed in the PHA to:

- the off-site environment;
- members of the public; and
- private property.

Therefore, the Rail Flyover Modification would not significantly alter the consequences or likelihood of a hazardous event occurring at the NCIG CET, as the construction and operational activities on-site would be generally unchanged.

Notwithstanding, environmental management plans and procedures would be updated to include the Rail Flyover Modification, where relevant (Section 5.2).

## **5 ENVIRONMENTAL MONITORING AND MANAGEMENT**

### **5.1 ENVIRONMENTAL MONITORING**

The existing environmental monitoring network for the NCIG CET includes monitoring sites and monitoring frequencies for a range of environmental parameters (Section 2.7). The Rail Flyover Modification is located within and adjacent to existing/approved construction and operational areas and therefore the existing NCIG CET environmental monitoring network already covers the majority of issues or requirements relevant to the Rail Flyover Modification. Additional surface water monitoring sites would however be established to the west of the Kooragang Island Main Line embankment.

### **5.2 ENVIRONMENTAL MANAGEMENT**

Existing environmental management plans (Section 2.7) that would be updated to reflect the Rail Flyover Modification would include:

- the CEMP and, if required, relevant components (e.g. ASSMP, CSWMP, CNMP and CTMP);
- the OEMP and, if required, relevant components (e.g. ONMP and OWMP); and
- CHEMP.

Compliance with the requirements of the Project Approval (06\_0009), including compliance status reviews and independent environmental audits, would continue to be reported to the Director-General of the DP&I. An AEMR would continue to be prepared and distributed to government agencies, stakeholders and interested parties, to review NCIG's performance against the requirements of the environmental management plans, protocols and programs.

If required, any variations to existing EPL 12693 for the Rail Flyover Modification would be undertaken in consultation with the OEH.

NCIG's Community Support Program (Section 1.3.1) would continue to be implemented to provide community groups/organisations within the Newcastle area with sponsorship support to help meet their objectives.

## 6 REFERENCES

- Aurecon Hatch (2011) *Newcastle Coal Infrastructure Group Coal Export Kooragang Island Stage 2F Feasibility Study: Annexure 5J Rail Flyover Design Criteria and Description*. February 2011.
- Australian Rail Track Corporation Ltd (2005) *Sandgate Rail Grade Separation EIS*. Report prepared by GHD.
- 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.
- EDAW (2006) *Newcastle Coal Infrastructure Group Coal Export Terminal Visual Assessment*. Appendix H of the Newcastle Coal Infrastructure Group (2006) *Newcastle Coal Infrastructure Group Coal Export Terminal Environmental Assessment*.
- Environment Protection Authority (EPA) (1996) *Environmental Guidelines: Solid Waste Landfills*.
- 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.
- Heggies Australia (2006) *Newcastle Coal Infrastructure Group Coal Export Terminal Construction, Operation and Road Transport Noise Impact Assessment*. Appendix A of the Newcastle Coal Infrastructure Group (2006a) *Newcastle Coal Infrastructure Group Coal Export Terminal Environmental Assessment*.
- Holmes Air Sciences (2006) *Newcastle Coal Export Terminal Air Quality Impact Assessment*. Appendix B of the Newcastle Coal Infrastructure Group (2006a) *Newcastle Coal Infrastructure Group Coal Export Terminal Environmental Assessment*.
- Landcom (2004) *Managing Urban Stormwater: Soils and Construction - Volume 1*.
- Masson Wilson Twiney (2006) *Newcastle Coal Export Terminal Road Transport Assessment*. May 2006.
- Newcastle Coal Infrastructure Group (NCIG) (2006a) *Newcastle Coal Infrastructure Group Coal Export Terminal Environmental Assessment*. July 2006.
- Newcastle Coal Infrastructure Group (NCIG) (2006b) *Newcastle Coal Infrastructure Group Kooragang Island Coal Export Terminal Referral*. August 2006.
- Newcastle Coal Infrastructure Group (NCIG) (2006c) *Newcastle Coal Infrastructure Group Coal Export Terminal Appendix E Flora Assessment*. Appendix E of the Newcastle Coal Infrastructure Group (2006a) *Newcastle Coal Infrastructure Group Coal Export Terminal Environmental Assessment*.
- Newcastle Coal Infrastructure Group (NCIG) (2006d) *Newcastle Coal Infrastructure Group Coal Export Terminal Appendix F Fauna Assessment*. Appendix F of the Newcastle Coal Infrastructure Group (2006a) *Newcastle Coal Infrastructure Group Coal Export Terminal Environmental Assessment*.
- Newcastle Coal Infrastructure Group (NCIG) (2007a) *Green and Golden Bell Frog Management Plan*. October 2007.
- Newcastle Coal Infrastructure Group (NCIG) (2007b) *Coordinated Works Program*. August 2007.
- Newcastle Coal Infrastructure Group (NCIG) (2010a) *Construction Environmental Management Plan*. September 2010.
- Newcastle Coal Infrastructure Group (NCIG) (2010b) *Operation Environmental Management Plan*. May 2010.

- Newcastle Coal Infrastructure Group (NCIG) (2010c) *Compensatory Habitat and Ecological Monitoring Program*. November 2010.
- Newcastle Coal Infrastructure Group (NCIG) (2011) *Compliance Tracking Program*. April 2011.
- NSW Department of Commerce (2005) *Big Pond Habitat Offset Scheme Flora and Fauna Studies*. Prepared by GHD.
- NSW Department of Urban Affairs and Planning (DUAP) and Environment Protection Authority (EPA) (1998) *Managing Land Contamination Planning Guidelines SEPP 55 – Remediation of Land*.
- NSW National Parks and Wildlife Service (2001) *Hygiene Protocol for the Control of Disease in Frogs*.
- Port Waratah Coal Services Limited (PWCS) (1996) *Kooragang Coal Terminal Stage 3 Expansion EIS*.
- Port Waratah Coal Services Limited (PWCS) (2011) *Environmental Assessment Kooragang Coal Terminal Proposed Fourth Rail Loop Realignment*. Prepared by Umwelt (Australia) Pty Limited. June 2011.
- Port Waratah Coal Services Limited (PWCS) (2012) *T4 Project Environmental Assessment*. Prepared by EMGA Mitchell McLennan Pty Limited. February 2012.
- 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*.
- RCA Australia (2006) *Land Contamination and Groundwater Assessment, Newcastle Coal Infrastructure Group Coal Export Terminal, Kooragang Island*. June 2006.
- 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*.