Hunter Community Environment Centre
Submission to the Environmental Assessment
Port Waratah Coal Services Terminal 4, Project No. MP10_0215

Introduction

The Hunter Community Environment Centre (HCEC) objects to the proposed Port Waratah Coal Services (PWCS) Terminal 4 proposal for Newcastle (MP10_0215). The HCEC urges that this project not be approved due to the level of irreparable harm that will result for the environment and human health. This level of harm should be considered unacceptable.

As detailed below, it is evident that the Environmental Assessment (EA) for the PWCS Terminal 4 has failed to comply with a number of the Director General's requirements (DRGs) and Supplementary Director General's requirements (SDGRs). There are also substantive problems with key aspects of the proposal and its assessment. Our concerns about the EA and the proposal include that:

<u>Establishing need, project justification, project description and regulatory framework</u>

1) There is no established need for the project, given projected demand for and supply of Australian coal port capacity.
2) Justification for the project would require a consideration of alternative locations.
3) Justification for the project would require a consideration of alternative designs for the project at the proposed location. In particular designs that do not encroach into Office of Environment and Heritage (OEH) owned lands to the west and north of the existing main Kooragang rail line have not been considered.
4) The OEH owned lands (both those that have recently been excluded from the Hunter Wetlands National Park and those previously slated for inclusion within the national park) are substantively misrepresented in the EA.

<u>The assessment of environmental and health risks</u>

5) The EA documentation lacks a fulsome environmental risk assessment.
6) Heath risks to the community have not been analysed.

<u>Treatment of soil and groundwater contamination and surface water impacts:</u>

7) The base-case for modelling contamination impacts needs to be best practice contamination management without development.
8) The proposal does not prioritise remediation over containment.
9) The assessment of remediation options focuses on cost, time and ease of implementation rather than off-site migration risk and suitability for post-remediation development.
10) Further work is needed to understand the groundwater impacts.
11) Additional measures to minimise groundwater impacts should be included in the proposal.

12) The cumulative impacts of surface water discharges and groundwater contamination on the Kooragang wetlands and Hunter River need to be assessed.
13) Further surface water capture and treatment options are needed to account for wet years and expected climate change.
14) The EA does not include a plan to manage the waste dumps and site contamination if the development is substantially delayed or does not proceed as planned.

Treatment of ecological impacts

15) OEH owned lands that are currently managed for conservation must not be included within the proposed development.
16) The loss of Deep Pond, which is a critical freshwater drought refuge in the Lower Hunter Estuary system, cannot be compensated for.
17) The impact of the proposed development on habitat for migratory shore birds has not been adequately assessed.
18) The compensatory habitat strategy in the EA is inadequate and incomplete in relation to the impacts on threatened species and migratory shore birds.
19) There will be an unacceptable and unmitigated impact on the threatened Australasian Bittern.
20) The project needs to incorporate best practice habitat design in relation to compensatory habitat for the Green and Golden Bell Frog.
21) The loss of endangered endemic pondweed habitat will not be mitigated for.
22) The impacts of proposed dredging and bank realignment on ecological values, such as Ramsar wetlands and migratory shore birds, need to be included in the EA.

Treatment of air quality and greenhouse gas (GHG) impacts

23) Potentially significant air quality impacts on human health are ignored.
24) The EA misrepresents project related GHG emissions relative to total Australian GHG and global GHG emissions.

Treatment of cumulative impacts of increased coal mining, coal trains and coal ships

25) Impacts due to facilitating more coal mines in NSW are ignored in the EA.
26) The impacts of more trains in the Hunter and Newcastle are ignored in the EA.
27) The impacts of more coal shipping in the Port of Newcastle are ignored in the EA.
28) The cumulative increase in negative health impacts due to coal mining, coal transport and burning coal, both in the region and globally, are not accounted for in the EA.

The presentation of the economics of the proposal

29) That there is no direct operational employment is not acknowledged in the main EA document.
30) The economic assessment in the EA does not consider the implications for the project cost-benefit of possible delay or altered project staging due to a substantive change in the export coal market.

The HCEC submits that the issues raised in this submission render the EA for PWCS's Terminal 4 both inadequate in relation to DGRs and SDGRs and misleading in terms of the full implications of the project. Enough evidence is however presented to conclude that the proposal should not proceed. The Department must therefore either recommend that the project be denied approval or reject the current EA and ask the proponent to resubmit once substantive changes have been made.

The details of HCEC concern are given below.

Strategic need, project justification, project description and regulatory framework

Under 'Strategic need and project Justification' the key assessment requirements of the DGRs include:

"The EA must detail the stratergic need and justification for the project with speciifc refernece to the need, scale and location...alternatives considered..."

The SDGRs state that:

"- to the extent reasonably practicable any feasible alternative to the action including i) if relevant the alternatives to taking no actions ii) a comparative description of the impacts of each alternative in the matters protected by the controlling provisions of EPBC 2011/6029 for the action iii) sufficient detail to make clear why any alternative is preferred to another.

The EA has failed to address these requirements as described in the following two sections. A third section addresses concerns about the EA's representation of OEH lands.

1) Lack of need for the project

The EA does not attempt to establish the need for a fourth coal Terminal with a 120MT/yr capacity in the Port of Newcastle. In fact, the project is not necessary or justified once the current existing and approved coal export capacity in the Port of Newcastle, the existing and approved coal port capacity in Queensland and expected demand for Australian coal exports are considered.

The proponent for the terminal 4 project, PWCS, currently owns and operates the Carrington and Kooragang coal terminals which are both within the Port of Newcastle. The current combined capacity of these terminals is 113Mt/yr. Approved upgrade works at the Kooragang coal terminal will take PWCS total capacity to 145Mt/yr without T4. The Newcastle Coal Infrastructure Group's (NCIG) Terminal 3 is also currently being upgraded from 30MT/yr to 53Mt/yr with an approved capacity of 66 Mt/yr. This means that the built and approved coal export capacity in the Port of Newcastle is already 211 Mt/yr (145 Mt/yr for PWCS and 66 Mt/yr for NCIG).

The coal export capacity in Queensland coal ports was 205MT/yr in 2008 and current expansion will increase this to 341 MT/yr by 2014-15 (Qld Government 2008). Accounting for Newcastle, smaller ports such as Port Kembla and the Queensland's coal

ports, it is clear that by 2015 there will be well over 500 Mt/yr of coal port export capacity in Australia.

The EA states the reason for the project is that "*Additional capacity is required at the Port of Newcastle to accommodate contracted and projected future coal exports" and that "under the CFA [capacity framework agreements] PWCS has entered into long-term contracts with coal producers. The CFAs include contractual obligations that PWCS must ensure its terminal facilities have enough capacity to meet the contracted coal throughputs*" (section 1.1).

If PWCS has entered into long-term contracts for coal export that exceed its existing built and approved capacity of 145MT/yr then this evidence is not presented in the EA. Neither is any evidence offered for the timing of the development and the initial or final scale of the development. The EA includes an expected timetable for development that would see stage 1 (70 MT/yr) started in mid 2013, finalised in early 2017 with the first coal shipped by the end of 2015. Stage 2 (an additional 25MT/yr) is scheduled to be finalised in 2019 and Stage 3 (an further additional 25MT/yr) would be finished at the end of 2022 (see figure 3.6 in section 3). The EA should provide evidence of the need for 70 MT/yr additional coal export capacity in Newcastle by 2017. The EA should also provide the basis on which PWCS believe 331 MT/yr (211MT/yr built and approved and 120MT/yr from T4) of coal export capacity will be required in Newcastle by 2022.

The capacities, timing and economics of the T4 proposal as presented in the EA seem to be predicated on an assumption that there will be a continuing coal boom. The EA's economic assessment uses price of $100/T for steaming coal and $200/T for coking coal which are high historically. The demand for export coal in the EA is projected to continue to expand to 2020 and beyond. This assumption of a continuing boom in coal prices and demand looks less than certain with recent media indicating decreases in coal prices and companies such as Rio Tinto (a major shareholder in PWCS via Coal and allied Ltd) questioning coal investments in the Hunter and elsewhere (see for example 'Soaring costs trigger Rio coal retreat', FINANCIAL REVIEW, 03 MAY; 'Mount Pleasant open-cut coalmine under review' Newcastle Herald, 03 May, 'Asian Coal Slips to Lowest Since 2010 as China Imports Ease', Bloomburg May 2, 'Old king coal gets knocked off its throne, Sydney Morning Herald, April 28').

A more reasonable approach to assessing the need for additional coal export capacity at the Port of Newcastle is to look to the detailed energy modelling of the International Energy Association (IEA) presented in their World Energy Outlook (the most recent being 2011). The IEA modelled a number of world energy scenarios. Their median scenario 'new policies' includes some actions to mitigate climate change but follows a trajectory that is consistent with a long-term rise in average global temperature in excess of 3.5^{o}C by 2100 (World Energy Outlook 2011). This scenario therefore involves a high risk of dangerous climate change and would not meet the goals of global climate change agreements of which Australia is a signatory such as the Copenhagen and Cancun accords or the Durban platform.

Significantly, the EA references the World Energy Outlook 2011 and the IEA's 'new policies' scenario as part of the final project justification and conclusion in section 20.2 of the EA document. The EA however ignores the key aspects of the IEA's detailed energy projections in relation to Australian Coal exports.

Under the IEA 'new policies' scenario total coal exports (coking and steaming) from Australia will peak at 310MT/yr around 2020 and then decline to 300 MT/yr by 2035 (see p438 World Energy Outlook 2011 and figure 11.24 reproduced below). As discussed above, by 2015 there will already be over 500 Mt/yr of coal port export capacity in Australia. The Terminal 4 proposal is therefore not needed and even if stage 1 of T4 is built, the capacity levels for stages 2 and 3 would not be triggered under any energy supply-demand path remotely similar to the one modelled for the IEA 'new policies' scenario. In such a case stage 1 of T4, if built, will be a high risk of becoming a stranded asset.

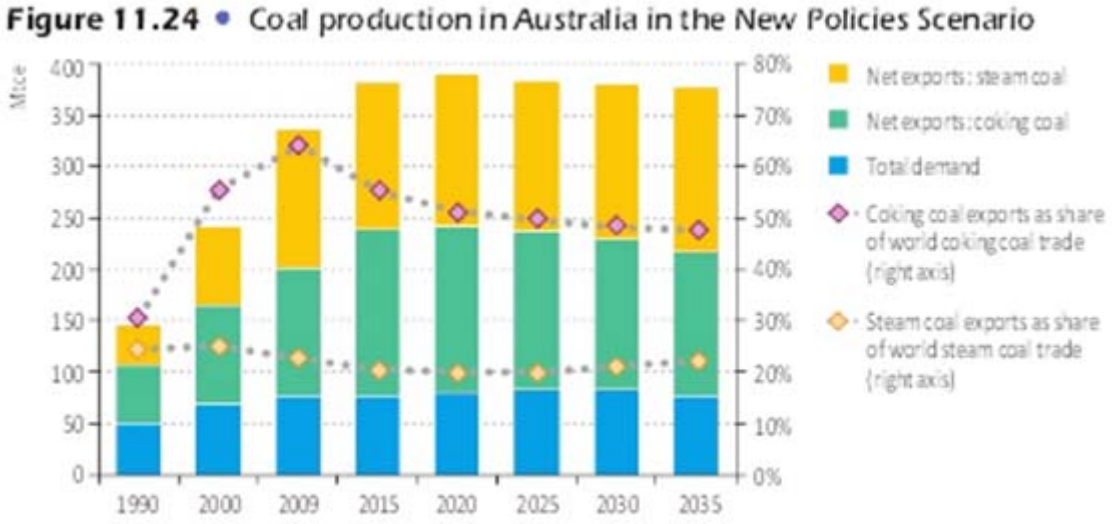


Figure 11.24 from IEA World Energy Outlook 2011

Critically the 'new policies' scenario is not a path that reduces CO_2 level sufficiently to avoid significant risks of dangerous climate change. Also in their World Energy Outlook 2011, the IEA modelled an energy scenario based on stabilising Greenhouse Gases at 450 parts per million by 2100. This '450 scenario' the IEA advises has a 50% chance of avoiding global warming of two degrees above pre-industrial temperatures. To meet this scenario the IEA states "*Global demand for both coal and oil [need to] peak before 2020, and then decline by 30% and 8% respectively by 2035, relative to their 2009 levels.*" (World Energy Outlook 2011).

If the world follows a similar path to the IEA 450 scenario (with actions based on the Durban platform) then it is likely that much of the existing coal port capacity in Australia will not be needed within a decade. New port capacity in the form of Terminal 4 would be unlikely to gain investment approval even if planning approval is granted. If T4 was built under this scenario it would quickly become a stranded asset.

2) Lack of consideration of alternative locations

The DGRs and SDGRs both indicate that alternatives to the project need to be consider and compared. A number of alternative locations are mentioned but none are developed to the point that they can be assessed and compared.

To be acceptable, the EA needs to meet the DGRs and SDGRs. Alternative locations need to be developed to the point that they can be assessed and compared and the comparisons included in the EA.

All feasible alternatives need to be included in the EA. This includes considering alternative means that PWCS has to meet its contractual obligations under the CFA (if these already exist). With the EA offering no justification for the 120MT/yr final capacity of T4, options that offer smaller increments in export capacity should be considered in the EA. As an example, two apparently feasible alternatives for PWCS to increase its coal export capacity in the Port of Newcastle that are not considered in the EA are:

- PWCS purchasing built or approved capacity from NCIG's Terminal 3.
- PWCS purchasing existing bulk handling shipping berths along Heron road towards Walsh point and expand its Kooragang coal terminal to service these berths.

3) Lack of consideration of alternative designs

The DGR and SDGR both indicate that alternatives to the project need to be considered and compared. Despite this the EA includes no alternative designs for the terminal at the proposed location.

In particular HCEC is very concerned that an alternative design for the Terminal 4 project that does not encroach into OEH owned wetlands to the west and north of the existing main Kooragang rail line is not included in the EA. These areas include the Swan Pond, salt marsh and mangrove habitat. They are conservation lands and important habitat areas for migratory shore birds and threatened species.

All the lands to the west and north of the existing main Kooragang rail line are owned by OEH. Some of this area was included within the Hunter Wetlands National Park until mid 2011. Other parts have previously been slated for inclusion within the national park. The EA offers no justification for these publicly owned conservation lands being included within the development site.

It is imperative that a revised EA compare an alternative design for the project that limits development to the already existing industrial area that is to the east and south of the existing main Kooragang rail line.

4) Representation of OEH lands in project depictions and regulatory framework

The EA provides a misleading representation of the public lands within the project area to the west and north of the existing main Kooragang rail line. Two specific issues are:

i) In section 4 of the EA which describes the legislative and policy framework for the project, there is no mention the *National Parks and Wildlife Act*. This is despite lands within the project area being owned and managed by OEH under Part 11 of that Act. Critically this project is entirely inconsistent with the objectives and provisions of that Act. The EA therefore misleads by not acknowledging that part of the project site is currently owned and managed for conservation by National Parks.

ii) The project as currently designed involves building up to 8 rail lines into the OEH owned and managed water body known as the Swan pond. This fact is obscured in the EA. Swan Pond is considered the third most significant site for birds in the Hunter Estuary (Herbert, 2007). In recent trips to this wetland by HCEC members it has been possible to see thousands of water birds roosting and feeding around and on this shallow lake. The EA does not discuss the impact of constructing rail lines into the eastern side of Swan Pond. In fact it is only in the Appendix K (Part 1), that it is revealed that "*Approximately 2.3 hectares of Swan Pond,... occurs within the T4 project area*"

The EA needs to be altered to accurately reflect the status and significance of these publicly owned lands.

Environmental and human health risk assessments

Under the heading 'Environmental risk assessment' the DGRs state that *"the EA must include an environmental risk analysis to identify potential environmental impacts ....proposed mitigation measures and potentially significant residual environmental impacts after the application of proposed measures.."*

DGRs under Soils and Contamination Impacts include :

"the EA must include an invasive land and groundwater contamination investigation and assessment identifying the potential risk to human health and the environment from contamination that is likely to be disturbed, mobilised or imported onto the site"

The EA has failed to address the environmental risk assessment requirement and also does not analysis the potential risk to human health posed to the community.

5) Lack of a Environmental risk assessment

The EA does not include an environmental risk analysis despite the DGRs. What is described in the EA as a "*qualitative preliminary environmental risk assessment*" in section 6 is extremely limited. It presents a list of 32 issues with preliminary qualitative rankings. Of these 9 are considered to be of high risk and 15 rated as medium risk. This list cannot be described as an environmental risk analysis or environmental risk assessment and does not meet the DGRs.

Further, again despite the DGRs the EA contains no assessment of the residual environmental risk after the application of proposed mitigation measures. The EA contains not assessment of how many of the high risk and medium risk issues identified in section 6 will be mitigated by measures proposed. This deficiency is totally remiss.

What is presented in the EA does not come anywhere near meeting the requires of the relevant Standards "HB 203:2006 Environmental risk management - Principles and

Process" and AS/NZS ISO 310000:2009 "Risk Management - Principles and Guidelines" . This is a substantial shortcoming that requires remediation.

To meet the DGRs the proponent must conduct a robust environmental risk assessment based on the relevant standards. It needs to demonstrate sufficient rigour, adequate stakeholder input, and that all necessary data has been collated and considered. It needs to demonstrate how risks have been mitigated by the measures proposed. The environmental risk assessment also needs to be central to the EA.

Because the EA does not include an environmental risk analysis or environmental risk assessment the current EA should be withdrawn. A new EA should only be exhibited once a full environmental risk assessment is complete and the various assessments and analyses in the EA updated accordingly.

6) Health risk to surrounding community are not analysed

Human health risks of construction on a highly contaminated site were assessed via a qualitative health exposure assessment. This was prepared by Banksia EOHS and is found in Appendix F of Appendix C of the EA. The health exposure assessment however analysed health risk quantitatively only for workers and recommends mitigation measures for workers only. No health risk analysis was conducted for the surrounding community, consumers of seafood taken from the Hunter River and Fulerton Cove, or recreational users of the nearby National Park and Hunter River.

Given the presence of large volumes of highly toxic materials on the site including heavy metals (particularly manganese), hydrocarbons (including benzene, toluene, and xylenes) and pits containing lead dust with asbestos, the EA is remiss in not including a quantitative risk analysis of the potential risk to community members posed by construction activities and long term operations.

Further, to be adequate the human health risk assessment in the EA should include quantitative analyses of the risks posed by onsite accidents to both workers and community members.

Soil and groundwater contamination and surface water impacts

The T4 site is heavily contaminated with some areas that have been used as industrial waste dumps over many decades. In relation to what is being proposed to manage this waste and contamination legacy and how it has been assessed, HCEC has a series of concerns. Eight of these are detailed below. HCEC is continuing to seek experts to provide advice on best practice management of the industrial waste dumps and site contamination on the T4 site. If experts can be found who are willing to volunteer their time, HCEC will make a supplementary submission to the EA on this important issue.

7) Base-case for modelling needs to be best practice contamination management without development

In order to adequately assess the impact of the Terminal 4 proposal on soil and groundwater contamination and surface water quality, the EA must compare the

proposal to a base case of best practice contamination management for the site without development. The EA does not currently do this.

Without presenting groundwater, contaminant transport and surface water modelling results that provide a comparison to 'best practice without development' it is not possible to fully understand the expected impacts of the proposal. This comparison is needed before the EAs claims concerning the transport of toxic materials from the site can be assessed.

HCEC remains highly concerned about the potential for the T4 project as proposed to cause the mobilisation of the toxic materials currently on the project site into the groundwater, surface water and the air. As stated above, the HCEC is hoping to locate expert advice on this issue.

8) Proposal does not prioritise remediation over containment in remediation option selection

The proposal for managing site contamination does not prioritise remediation over containment. HCEC is of the opinion that the proponent needs to remediate the contamination on the site before it is developed. This is necessary in all instances where remediation is feasible and does not pose significant human health or environmental risk. Any containment strategies will pose some risk of failure and any failure of containment cannot be rectified once the T4 proposal has been built on top of the site.

A prioritisation of remediation options over containment where remediation is feasible would also appear to be in line with NSW guidelines, regulations and policies as outlined in section 9 of the Contamination Assessment Report (appendix C) to the EA.

Where containment strategies are proposed, the EA should therefore support these recommendations with evidence that remediation is not technically feasible or would pose significant human health or environmental risks.

9) The assessment of remediation options focuses on cost, time and ease rather than off-site mitigation risk and post-remediation development

Remediation option selection in the EA is discussed in the remediation option report (Appendix F). That report scores possible options from 1 to 5 against 10 criteria (see Appendix B of Appendix F of the EA). These criteria are then weighted against each other. The criteria and weighting is shown in the table below.

The rationale and basis for criteria selection and weighting is not provided in the report or the main EA document. Significantly Cost, 'Sustainability' (or material and energy use which in this case is a proxy for cost), Ease of implementation, and Time to implement make up 50% of the assessment value. A key criterion in terms of the impact to adjacent wetlands and the Hunter River 'Off-site mitigation risk' is only weighted 10%. Criteria that would appear to be important in selecting options for this site, such as, 'Suitability for post-remediation development' are not included.

Criteria for assessment of remediation options	Weight
Technical effectiveness	20%
Track record in Australia	5%
Availability	5%
Ease of implementation	10%
Verification	5%
'Sustainability'	10%
Stakeholder acceptance	5%
Off-site mitigation risk	10%
Cost	20%
Time to implement	10%

Table Criteria for assessment of remediation options in EA

The EA should provide the rationale and basis for both criteria selection and weighting used in the remediation options assessment. The criteria should reflect the relevant NSW guidelines and account for the scale and type of development that is being proposed for the site.

10) Further work needed on the groundwater impacts

There are a number of areas were further work is needed on modelling groundwater impacts before conclusions can be drawn:

i) HCEC has obtained expert advice from Hydroecologist (see appendix A). Unfortunately due to professional concerns this expert wishes to remain anonymous. Please see Appendix A for technical details of areas where MODFLOW and ConSim modelling should be extended and/or improved so that Groundwater impacts and containment options can be fully assessed. The Expert also recommends additional Geotechnical modelling (HELP model is suggested) to assess the effectiveness of capping alternatives (if capping is used).

ii) HCEC has also obtained expert advice from ecotoxicologist of 20 years experience (see Appendix B). Unfortunately due to professional concerns he also wishes to remain anonymous, however HCEC endorses his comments including point 13 that:

"*The selected mitigation measures would appear to reduce or contain the horizontal flows or cap the contaminated groundwater and soils. The underlying principle of most of these techniques is the confining nature of the aquitard. The concerns are that the aquitard is of variable depth across the site and so there would be potential for escape of significant amounts of contaminants in areas where the aquitard is non-existent or shallow.* ***Aquitard depth needs to be more fully considered in this development***" [emphasis added].

iii) The dredging of 7,000,000m^3 of material from South Arm could be expected to have impacts on groundwater flows. The dredging of the river is currently not included in the EA but is integral to the T4 project. The combined impact of dredging the river and the onshore development (including emplacement of much of that dredged material) should to be modelled together and included in the EA.

11) Additional measures to minimise groundwater impact should be included in the proposal

Additional mitigation measures have been identified by a Hydroecology expert to minimise groundwater impacts (see appendix A). These measures were not considered in the EA but should be in any revision to the EA:

i. The establishment of vegetation around the site and particularly contaminated sites
ii. Removal of contaminated soil material prior and during construction
iii. If capping is used, modelling to assess the effectiveness of capping materials and designs
iv. If capping is used, drainage layers between caps and waste to divert water before it leaches through contaminated soils should be included.

12) Assessment of the cumulative impacts of surface water discharges and groundwater contamination

As stated above, HCEC has obtained expert advice from ecotoxicologist of 20 years experience and a number of his points relate to cumulative impacts (see Appendix B):

Point 8 "Surface waters commonly exceeded water quality guideline levels for existing ponds on the T4 site and for wetlands, ponds and the Hunter River offsite. This indicates that the Kooragang Island/Lower Hunter River area is heavily contaminated from decades of industrial use. The T4 site currently has a part in adding to this and future surface water runoff is acknowledged to have similar concentrations. ***The cumulative impacts of these discharges on the Kooragang wetlands and lower Hunter River system needs to be considered****."*

Point 15 "The long term site management plan and the groundwater and surface water monitoring plan are not currently available and so a true evaluation of these aspects cannot be determined."

Point 16 "Consideration of the cumulative impacts associated with offsite movement of contaminants needs to be assessed. ***The claim that the region is already contaminated does not justify the release of more contaminants into the system****"* [emphasis added]

HCEC endorses these concerns and believes that need to be addressed in the EA.

13) Further surface water capture and treatment options to account for wet years and expected climate change

As stated above HCEC has obtained expert advice from ecotoxicologist of 20 years experience (see Appendix B) and a number of his points relate to surface water discharges from the site:

Point 9 "During operations on average 24% of runoff waters will be released offsite once every 95 days. During wet years this frequency will potentially drop to once every 36 days with exceeds of 550ML/year. ***Further capture or treatment options need to be considered****."* [emphasis added]

Point 14 "The pond storage and surface water re-use measures are designed for average rainfall conditions. For above average rainfall conditions or under varied climate scenarios excess water will flow off the site carrying potential contaminants. The latter, at least, should be considered more intently."

Again HCEC endorses these concerns and believes that need to be addressed in the EA.

14) A plan for site management if the development is substantially delayed or does not proceed

The EA does not address the question of what will occur on the site if the development does not progress as scheduled to stage 2 and 3. Also the EA includes no plan for the management of contamination on the site if stage 1 works are significantly delayed by a changed economic environment for coal exports.

The EA includes a timetable for development that would see stage 1 started in mid 2013, finalised in early 2017 with the first coal shipped by the end of 2015 (see figure 3.6 in section 3). As discussed above under concern 1 (Lack of need for the project) it is uncertain that PWCS will need the additional export capacity at that time. The proponent PWCS's rationale for the project and the project timing is their prediction of a continuing increase in the demand for coal to 2017 and beyond. But they indicate the need for the project will only be triggered by increases in demand for coal exports above their exist capacity (which is 145MT/yr built and approved).

Given that uncertainties are already appearing around whether approved coal infrastructure development in NSW will in fact proceed (see the example of the Mt Pleasant mine in the newspaper articles previously referenced) it is important that the EA include a plan of management for the site and the contamination on the site that considers the implication of extended periods of delay. This means a plan for full contamination remediation that will occur even if stage 1 of T4 fails to get investment approval and accounts for the fact that demand for coal export capacity may never trigger the need for stages 2 or 3.

Ecological impacts

The Terminal 4 project, if built as proposed, will have profound negative impacts on the ecology of the Hunter Estuary system and species that rely on it. HCEC has wide ranging concerns in relation to these ecological impacts. Eight specific concerns about the project and the treatment of ecological impacts in the EA are detailed below.

15) OEH lands must not be included within the proposed development

Part of the proposed terminal 4 site, to the west and north of the main Kooragang rail line, is currently owned by OEH. These OEH lands, including part of the Swan Pond, are currently managed for conservation under Part 11 of *National Parks and Wildlife Act*. They include critical habitat for migratory shore birds and threatened spices. They require continued protection.

It is totally unacceptable to HCEC and many people in the community that the

proponent, PWCS, has included public lands owned by OEH (and previously national park or slated national park) within the proposed development site. These lands should be removed for the proposal and retained by OEH.

16) The loss of Deep Pond

Deep Pond is a 23Ha fresh water body that takes up much of the north western corner of the T4 site inside the main Kooragang rail line. Four fifths of this substantial water body, the only major freshwater drought refuge in the Lower Hunter Estuary system, will be destroyed by the Terminal 4 proposal. As a critical freshwater drought refuge in the Lower Hunter Estuary, the loss of Deep pond cannot be compensated for by the proponent.

Deep Pond has been recorded to exceed the threshold of 0.1 per cent of the Australian flyway population for three migratory shorebird species - sharp-tailed sandpiper (Calidris acuminata), curlew sandpiper (Calidris ferruginea) and marsh sandpiper (Tringa stagnatilis) – as described by Herbert (2007). At least 15 species of waterfowl of which 3 are listed as threatened rely on the habitat of Deep Pond and its proximity to the Hunter Wetlands National Park and RAMSAR site. According to Herbert (2007), "*During the summer of 2005/2006, Deep Pond often had a greater diversity and abundance of bird species than the whole of Ash Island. Its importance, therefore, cannot be emphasised enough*."

Because of the valuable habitat that Deep Pond provides to threatened and protected species and its critical function to the nearby conservation areas and RAMSAR listed wetlands, Deep Pond should be protected and managed in coordination with existing conservation lands across the Hunter Estuary.

17) Potential impacts to migratory shorebird feeding areas in all OEH lands need to be fully assessed

HCEC has obtained comments on the ecological assessment in the T4 EA from Robert Clemens from the School of Biological Sciences at the University of Queensland. Robert has expertise in Australian shorebirds. His opinion was that *"this [the Hunter Wetlands] is the most important wetland estuary in the state [of NSW]".*
He stated that:

"*In the T4 reports I read, some conclusions appeared to be reached without any real evidence to support those conclusions. One example of concern to me was the conclusion that the project activities would not impact on the adjacent Ramsar wetland or national park. "*And that:

"*Generally I would agree that the potential impacts to migratory shorebird feeding areas adjacent to the proposed activities need to be better assessed, especially given my opinion that migratory shorebirds have been impacted more in the Hunter Estuary than in other areas in the country, and if true we don't know exactly why."*

Based on this advice HCEC contends that potential impacts on migratory shorebird feeding areas adjacent to the proposed activities need to be better assessed in the EA.

18) The compensatory habitat strategy is inadequate and incomplete

Contrary to the DGRs the Biodiversity Offset Strategy for the project is not finalised. The EA asserts that the proponent will offset the significant impacts of the project but these claims sound hollow when the locations of sites are not identified in the EA.

The impacts that the proponent would need to off-set include:

- Loss of 91ha of significant native vegetation and 24ha of open water habitat. The project site incorporates 18.8ha of saltmarsh (an endangered ecological community under the Threatened Species Conservation Act [TSC]), 28.9ha of mangrove and 27.3ha of freshwater wetland, 4ha of which are listed as an endangered community under the TSC Act.
- Loss of habitat for 23 threatened fauna species including the Australasian bittern (Botaurus poiciloptilus) (listed as endangered under the Environmental Protection and Biodiversity Conservation [EPBC] Act), and the Green and Golden Bell frog (also listed as vulnerable under the EPBC Act).
- Loss of habitat and disruption to an ecologically significant proportion of a population of four migratory shorebird species listed under international conservation conventions. At least 11 species of migratory birds recognised by international treaties rely on the habitat on the site and its proximity to the RAMSAR listed wetland.

The one identified offset site is located at Ellalong and is recognised in that region as critical for conservation in its own right. It however fails to compensate for the loss of habitat on the T4 site such as Deep Pond or the eastern end of Swan Pond because it is over 50km away from Kooragang Island and not habitat for migratory birds. These areas are of such significance because they provide key foraging and roosting habitat in close proximity to RAMSAR listed wetlands and other conservation lands within the Hunter estuary. As the EA acknowledges, "*Ellalong Lagoon is not known as a significant site for migratory shorebirds*". This acknowledgement does not however stop the EA from listing the 20ha of Freshwater wetland at Ellalong Lagoon in Table 7.7 as providing a habitat offset for these species.

The proponent seems to conclude that they cannot identify the offset sites necessary in the Hunter Estuary for key species in particular for the threatened Bittern (see concern 19 below) or the listed migratory shore birds. Such an approach should not be accepted, the off-set strategy needs to be significantly improved and finalised before any decisions about approval is made at a State or Commonwealth level.

Once there is a substantively improved and finalised off-set strategy, the community needs to be given the opportunity for a period of comment on that strategy.

19) An unacceptable and unmitigated impact to Australasian Bittern

Though 28ha of known habitat for the Australiasian Bittern will be lost to this project, the chief offset strategy proposed is to fund management of Australasian bittern habitat at the Hunter Wetland Centre Australia (HWCA). This is by providing an unspecified grant supplementing a Commonwealth Government grant HWCA has already received.

The Commonwealth grant is to modify 18ha of the HWCA site to make it more suitable for bitterns.

HCEC consider it highly inappropriate that PWCS is claiming a Commonwealth-funded threatened species recovery project as part of its offset strategy for T4. It is also promotes questions in terms of the expected impact on the Bittern:

- What is the marginal positive impact that can be realistically claimed for the Bittern from the additional funds ?
- How can any grant compensate for the loss of 28ha of known habitat when the HWCA project site is only 18ha in total?

The conclusion the EA makes that "*The Biodiversity Offset Strategy provides an adequate and appropriate means to counterbalance the residual significant impact of the T4 Project on the ecological values identified in Section 7.2.1*" is clearly not true in regard to the Australasian Bittern.

Basically for this nationally threatened species, no real mitigation of the impact of the project is proposed. HCEC urge the Commonwealth Government to declare that T4 will have an unacceptable impact on the Australasian Bittern and ask the proponent to redesign the project so that this impact does not occur.

20) Need to incorporate best practice design in relation to compensatory habitat for the Green and Golden Bell Frog

HCEC has obtained expert advice from ecologist with expertise on Green and Golden Bell Frogs (Litoria aurea). Unfortunately due to professional concerns this expert wishes to remain anonymous, however HCEC endorses his comments which are included in full below. HCEC notes in particular the need for the proposed development (if it occurs) to incorporate best practice habitat design in relation to compensatory habitat for the Green and Golden Bell Frogs. This means that habitat areas lost to development are compensated by a factor of at least 10. Our expert advice was that:

" There is a single population of the Green and Golden Bell Frog (GGBF) that inhabits the areas presently known as Kooragang Island (KI) and Ash Island (AI), which form part of what is now a single island within the Hunter River.

- *This population is presently subjected to a considerable level of current and/or proposed development across areas owned and/ or managed by a number of different companies and agencies. Much of this development is occurring or proposed in the context of increased export of coal.*
- *The surveys that have been carried out re the GGBF on KI/ AI seem to me to be adequate in terms of detecting the species and assessing areas of habitat that are likely to be important. The most recent surveys by PWCS are, on their own, inadequate for this purpose. However, there have been many other similar surveys and, when the results of all the surveys are combined, areas of GGBF habitat can be reasonably well assessed.*
- *The estimated area of about 5 ha of GGBF breeding habitat that would be lost through the proposed development is, in my view, likely to be an underestimate. It is based*

only on areas where observations have been made of tadpoles and/ or metamorphs (i.e., animals that have both arms and legs, and hence have commenced metamorphosis into frogs, but still have a tail; when the tail has been completely resorbed, such animals are considered immature frogs). However, there are almost certainly additional areas that are similar or otherwise appear to be suitable breeding habitat, but where such evidence of breeding has not yet been recorded. Methodology exists to enable assessment of such additional areas of GGBF breeding habitat.

- *The documentation proposes the establishment of offset GGBF habitat to compensate for any such habitat that is lost to the proposed development, but it does not adequately address this issue. Relevant a priori issues are the location of such offset habitat, its extent, and its design features. A posteriori issues are the extent to which the GGBF is able to colonise and maintain long-term self-sustaining populations in such offset habitat. Discussion of these issues is vague or non-existent.*
- *There are two fundamental aspects of GGBF biology that must be kept in mind when assessing such proposals as the present one. The first is that there are some sites, where the GGBF occurs, that are to a large degree human-created. This indicates that we should be able to create or enhance areas of habitat that are suitable for this species, IF ONLY we can get the recipe right. It is incorrect to think that this is going to be simple or easy. The second is that most attempts to create/ enhance habitat for the GGBF have so far been either completely unsuccessful or have had very limited success. On this basis,* ***it would be reasonable to argue that any area of offset habitat should, assuming that best practice habitat design features are adopted, exceed the area lost to development by a factor of at least 10****." [emphasis added]*

21) No actual mitigation proposed for the loss of endangered endemic pondweed habitat

The pondweed (*Zannichellia palustris*) is an endangered submerged aquatic plant and was recorded at eight ponds within the project area during the EA process. It was listed in 1998. The Final Determination of the Scientific Committee in listing the plant noted that "*All the known sites are in areas where considerable changes have, and are continuing, to take place in their catchments. These changes in catchment land use may result in changes in hydrological conditions and water quality, which may affect the ability of the species to persist in areas where it is known to occur*."

Despite the fact that the plant is only known to exist at Hexham and on Kooragang and Ash Islands and that 7ha of its core habitat and 30ha of potential habitat are being removed, the EA concludes that the project "may" have a significant impact on this species (section 10 p192). There is no estimate of what proportion this loss represents of the entire suitable and core habitat available for this species. Given that *Zannichellia palustris* is highly restricted in its distribution the proportion could be significant.

The EA fails to identify an offset site for this species and this should be address. The EA does reveal that pondweed was not found in surveys on the current offset sites. "No threatened plant species were recorded in the Hunter Estuary Wetlands Offset site."

And then "It is possible, but unlikely, that offsetting for *Zannichellia palustris* would be achievable at this site" (7.4.1.4) Similarly, at Ellalong Lagoon, "No threatened plant species were recorded by Umwelt in the Ellalong Lagoon Offset site." (section 7.4.2.2).

22) Dredging and bank realignment need to be included in a full understanding of the impacts on ecological values

The PWCS 4th terminal proposal cannot proceed without either:

i) a significant realignment of the banks of the South Arm of the Hunter River and the construction of a 'turning circle' or 'swing basin' to accommodate Cape Class ships; or

ii) the dredging of over 7,000,000m^3 of material from the South Arm of the river. This will take the river from its natural depth of 2-4m down to 16.2m, with 17.8m deep shipping berths along each bank.

Both the dredging and alteration of the river banks will have significant ecological impacts that extend throughout the estuary. These include the removal of aquatic habitats and impacts on estuarine habitats via changes to tidal hydrodynamics and salinity. Also, it has the potential of creating stagnant deep holes, altering currents, causing riverbed erosion and releasing pollutants that are currently trapped within the bottom sediments.

These ecological impacts need to be considered alongside the ecological impacts that are included in the EA so the impacts can be seen in total. By isolating parts of the project into separate assessments the full implications of the proposal on ecological values are not ever assessed.

Further for the dredging, PWCS is relying on alterations to environmental approval for South Arm dredging originally given in 2003 and which have been extended and modified 8 times. The massive extent of the current Terminal 4 proposal and dredging required was not envisaged in the 2003 approval and this also points to the need for the dredging to be part of the current EA.

For a Commonwealth perspective, this is a serious flaw. By excluding both the dredging and the bank realignment the EA does not contain the evidence required to reach a conclusion that the project activities would not significantly impact key ecological values. These include the adjacent RAMSAR wetlands, threatened species and on listed shorebirds. The Commonwealth should require the proponent rectify this concern before any decision under the EPBC Act is made.

The importance of including the dredging and the bank realignment in the EA is highlighted in advice received by HCEC on the EA from Robert Clemens from the School of Biological Sciences at the University of Queensland. He stated:

"Some shorebirds use foraging habitat that is relatively irreplaceable. I've never seen an example of shorebird foraging habitat being created for species like Great Knot, Red Knot, Eastern Curlew, or Bar-tailed Godwit. Therefore, the impacts to these species is potentially

much more severe, and is why greater certainty regarding the potential impacts of dredging are important.

I did not find the assessment of fauna impacts in the dredging document very compelling**. I assume more work will be done, or has been done. That document had no detail in which to assess their conclusions.* ***In my view the dredging assessment was incomplete and not at all adequate.

Foraging habitat is dynamic, but responds to changes in flow, sediment, and water quality. The potential for this dredging to impact those features is not well understood, and certainly was not addressed in the document I saw. Other dredging projects have been conducted near shorebird habitat and in estuaries, so there is potential to identify potential problems or highlight the lack of previous problems." [emphasis added]

Air quality and greenhouse gas impacts

HCEC has significant concerns about the proposals impacts on air quality and GHG emissions as well as how there have been assessed or presented in the EA.

23) Potentially significant air quality impacts on human health are ignored

The EA downplays impacts on air quality implications by stating: "*The T4 project is not expected to result in any criterion exceedences on any additional days of the year*" It does not seem credible that the number of additional uncovered coal stockpiles, coal trains and coal ships will not significantly increase the amount of coal dust and residuals from diesel combustion effecting Newcastle suburbs and communities along the coal rail corridors.

Further the EA does not adequacy incorporate recent health studies which demonstrate the danger of ultra fine particles (Higginbotham et al 2012). Such particles can come from coal dust and from diesel combustion by coal trains, coal ships and on site. Ultra fine particles are considered a significant risk to human health because they are inhaled deep into the lungs. They can cause serious health effects and there is not a know threshold below which they don't have adverse health impacts.

To be credible the EA must assess the serious air quality implications of the increases in ultra fine particles that can be expected from coal dust and diesel combustion at the site along rail lines, and from shipping.

Without adequate assessment of these air quality impacts, potential mitigation measures such as enclosing coal wagons and containing coal stockpiles have also been ignored in the EA. This also should be redressed.

24) Misrepresentation of Scope 3 Greenhouse Gas emissions relative total Australian and global GHG emissions

The Terminal 4 proposal, if built as proposed, will facilitate a globally significant increase in GHG emissions. At maximum capacity the EA estimates this at 299 $MTCO_2$-

e/yr. This is equivalent to 55% of Australia's 2011 emissions or nearly 3 times Australia's legislated 2050 emissions target.

The EA misrepresents the significance of the GHG emissions stating that "*298.6MTCO$_2$-e/yr, (which) represents 0.42% of the 2030 estimated global CO$_2$-e Emissions*" (section 13.2).

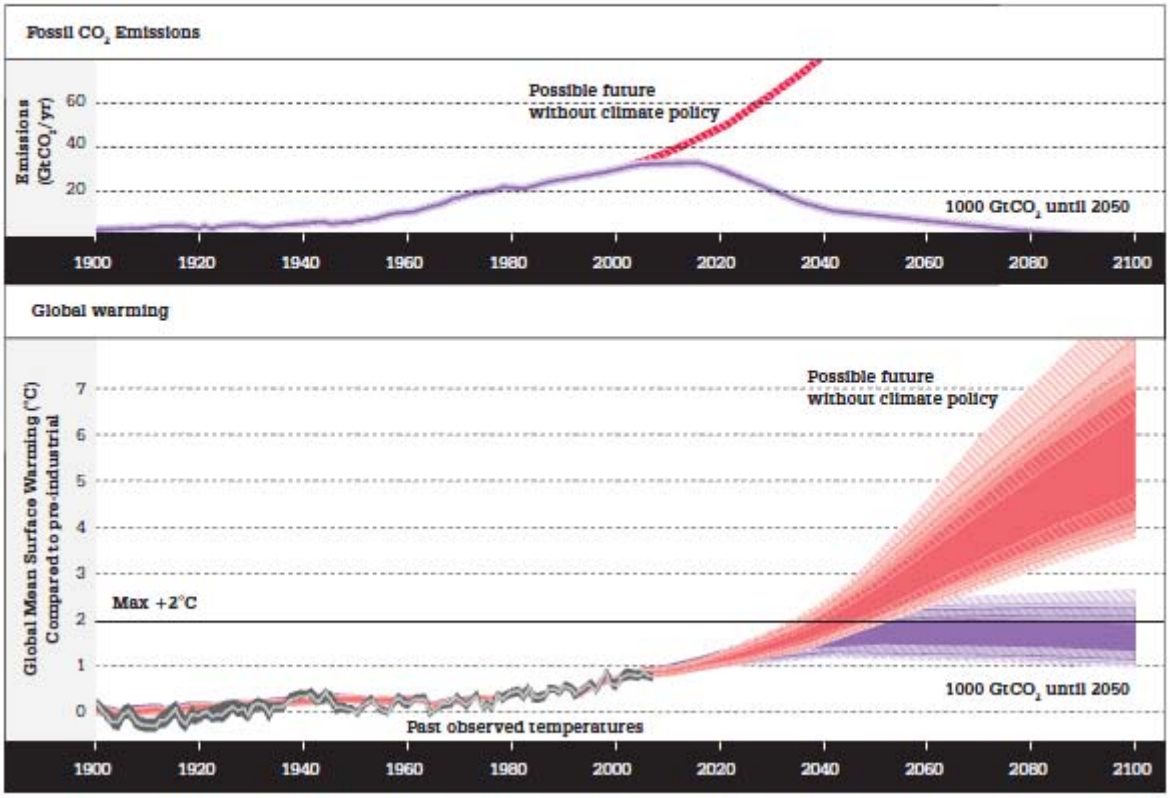
This proportion can be traced back to the Greenhouse Gas Assessment report (appendix N) were GHG emission related to the project are compared to both Australian and Global projected emissions. The figures used in the GHG report for comparisons are 2030 projections of 803 MTCO$_2$-e/yr for Australia and 70.4 GTCO$_2$-e/yr globally. These 2030 projection are high range and extreme. They are projects consistent with there being no action on climate change and increases in the concentrations of GHG in the atmosphere to over 1000ppm by 2050. Such an outcome is expected to lead to global warming in a range between 4 and 6 degree above pre-industrial temperatures and potentially higher by 2100 (Meinshausen et al 2009). Such temperate increases would have a significant risk of triggering runaway climate change.

The 803 MTCO$_2$-e/yr for Australia in 2030 used in the EA is a 'without action' scenario used by the Department of Climate Change (DCCEE, 2010) to contrast the impact of action that is occurring to meet the bipartisan 5% GHG reduction target from 2000 levels by 2020. This -5% target for Australia in 2020 is 530 MTCO$_2$-e/yr (DCCEE, 2010). Using high range projection for comparisons is misleading and the benchmarks for Australian emission used in the EA should be either current levels or legislated targets. Australia's 2011 total emissions were estimated at 547 MTCO$_2$-e/yr (DCCEE, 2012). Australia's only legislated by emissions target is for an 80% reduction by 2050 from 2000 levels or 110 MTCO$_2$-e/yr.

Globally a 70 GTCO$_2$-e/yr per year projection in 2030 is also a high end projection that is consistent with no global action on climate change. Using this as a benchmark for the projects scope 3 emission gives a misleading picture of the T4 projects global significance. The IEA estimate of global GHG emissions in 2010 of 30.6 GT CO$_2$-e (IEA, 2011) would provide a more balanced benchmark.

If the EA does seek to include comparisons to projected 2030 emission then these should be consistent with global action on climate change that is in line with Australian Government policy and global agreements. One projection that could be utilised in the EA is from the Australian Government's Climate Commission. In it's "The Critical Decade" report (2011) the Climate Commission has global emissions reducing to about 20 GTCO$_2$-e/yr per year based on what is needed to meet a goal of keeping average temperature increases below 2.0°C (see figure 36 from that report reproduced below). The 299MT CO$_2$-e/yr per year attributed to T4 in the EA would be 1.5% of this 20 GTCO$_2$-e/yr global emission figure.

Figure 36. Top: Fossil fuel CO_2 emissions for two scenarios: one "business as usual" (red) and the other with net emissions peaking before 2020 and then reducing sharply to near zero emissions by 2100, with the cumulative emission between 2000 and 2050 capped at 1 trillion tonnes of CO_2 (purple). Bottom: Median projections and uncertainties of global-mean surface air temperature based on these two emissions scenarios out to 2100. The darkest shaded range for each scenario indicates the most likely temperature rise (50% of simulations fall within this range).



Source: Australian Academy of Science (2010), adapted from Meinshausen et al. (2009).

Figure 36 from "The Critical Decade" by the Climate Commission

In its "The Critical Decade" report the Climate Commission has taken a carbon budget approach to understanding emission targets. Such an approach is more useful because instead of focusing on the yearly emission projections the focus is the total emission budget from the period 2000 to 2050. Based on the work of Meinshausen et al 2009 there is a budget of 1 trillion tons of CO_2-e if the goal of avoiding more that 2.0°C rise has a 75% chance of being meet. The Climate Commission estimated that 30% of the emission budget had been used to 2010. This left 700 GT CO_2-e for the period 2010-2050 (Climate Commission, 2011).

HCEC has calculated that if T4 is built as planned it would facilitate GHG emission that account for 1.4% of the worlds 700 GT budget and that PWCS's combined Newcastle operations (T4, Kooragang and Carrington) would account for 23.5 GT CO_2-e or 3.4% of the worlds 2010-2050 carbon budget. These are not insignificant proportion of the world's emissions under the budget necessary to meet agreed temperature targets.

The cumulative impacts of more coal mining, coal trains and coal ships have been ignored

DGRs General Requirements include:

"3 an assessment of the key issues .... direct indirect and cumulative impacts must be considered...."

DGRs key assessment requirements under Noise and vibration impacts also include :

" EA must include ..impacts of the project in isolation and in a cumulative context...

"impact from all activities and sources on and off site, with particular focus on the operation of coal trains, coal stockyards/reclaimer equipment and ship loading..."

These significant indirect, cumulative impacts are not addressed.

25) Significant impacts due to facilitating more coal mines in NSW are ignored

The Fourth Coal Terminal would facilitate more and larger coal mines in the Hunter Valley, Liverpool Plains, Gunnedah basin and Mudgee regions. The expansion of mining will impact negatively on food and water security by destroying prime agricultural land, irreversibly damaging ground water systems and polluting waterways.

As the economic assessment attached to the EA identifies the costs of more mining to the State of NSW as being: greenhouse gas generation at mines, loss of agricultural lands, blasting, noise, poor air quality, loss of aboriginal and non-aboriginal heritage, visual impacts, loss and pollution of surface water and groundwater, damage to aquatic ecology, flora and fauna loss. These costs are not estimated in the EA in relation to the T4 project.

26) Significant impacts resulting from more trains in the Hunter Valley and Newcastle are ignored

The impact of trains taking coal to the fourth coal terminal will be in addition to the expansions already approved for the PWCS Kooragang terminal and NCIG terminal 3. Together this will see the number of coal trains through Maitland and into Newcastle nearly triple every day from 2011 level.

Coal train movements associated with the Port of Newcastle have been estimated to rise to 108,000 train pass-bys per year, or one every 4.9 minutes, in some affected communities(Higginbotham et al 2012). The T4 project would contribute 39,344 of these annual train pass-bys .

Increasing coal train numbers in this manner will dramatically increase the dust, diesel residual and the noise impacts for communities already badly affected by the coal trains in Maitland, Newcastle and up the Hunter Valley. These major impacts are not assessed or included in the EA.

27) Impacts of more coal ships in the port of Newcastle are ignored

An increase in shipping will negatively impact on Newcastle harbour water quality with sediment disturbance (some of which is contaminated), release of bilge water, more antifouling agents, chemicals and oil spills, as well as increased dumping of debris. It will also reduce access for other harbour users and increase the risk of introduced species. Again these impacts are not assessed or included in the EA.

28) Cumulative health impacts of the project

The cumulative health impacts associated with the T4 project include those from the increase in mining that is facilitative, the air quality and noise impacts associated with coal trains, the direct health risks at the site and the impacts of burning the coal in other countries.

In the Hunter Valley the increase in dust due to coal mining has been related to health problems such as asthma and other respiratory ailments. Noise and air quality from coal trains has an adverse affect human. The health impact from the site will include both air quality impacts of increased dust and potentially impacts is toxic material are mobilised and find their way to human receptors.

Once the coal is exported health impacts can be expected to continue. The Australian Academy of Technological Sciences and Engineering estimates that the monetary costs of damages to health due to the pollution from coal-fired power stations in Australia is $2.6 billion per annum (ATSE, 2009). Based on this figure Higginbotham et al (2012) estimated the value of negative health impact of burning coal transported through T4 was 11.7 billion.

The cumulative cost of this series of health impacts is not estimated in the EA in relation to the T4 project

The presentation of the economics of the proposal

HCEC has some concerns how the economics of the T4 project are presented in the EA.

29) No direct operational employment in Newcastle but proposal may impact other sources of employment

From the economic assessment report by Gillespie Economics it is clear that after construction the proposed fourth coal terminal will provide no additional direct employment.

Rather the coal terminal is likely to result in the loss of other economic activities in the Port of Newcastle. This will be from the impacts of increased coal shipping on the potential for tourism and for non-coal shipping. The proposal is also expected to have direct impacts on commercial fishing due to the loss of habitat in the South Arm caused by the dredging and the increased water contamination from dredging and from the proposal site.

The economic assessment report states "*There is no additional operational employment associated with the T4 Project*" (p41 Economic assessment report). Given the potential impact on other employment in the Newcastle area this is an important piece of information and it needs to be included in the body of the EA report.

30) The economic assessment does not consider the implications altered timeline for project staging

The economic assessment for the EA does not consider the implications of delays in the timeline for project staging or the implications if coal export demand never reaches stage 2 and 3 trigger levels.

As discussed above under concern 1 (Lack of need for the project) it is far from clear that PWCS will need the additional export capacity from stage 1 of the T4 project let alone stages 2 and 3. As demonstrated, the supply of Australian coal export capacity can be expected to exceed the demand for Australian coal export capacity by at least 200MT/yr by 2015. This is if IEA 'new policies scenario' projections of world energy supply and demand are accurate.

A sensitivity analysis presented in the economic assessment for the EA does consider a 20% reduction in the price of coal (based on $100/T for steaming coal and $200/T for coking coal). It does not however consider the implications of such as drop in coal price in terms of subsequent delays to project staging.

The economic assessment should analyses the cost benefit implications of delays in staging as well as the potential that demand for export capacity may never reach stage 2 and 3 trigger levels.

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