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resourcing the future



Outer Harbour Development

Supplementary Report

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1 INTRODUCTION

BHP Billiton Iron Ore plans to develop the proposed Outer Harbour Development ('the Project') in Port Hedland, Western Australia. The development will be located adjacent to BHP Billiton Iron Ore's current operations at Port Hedland. The development will require dredging and spoil disposal to provide access for vessels to the new wharf facilities.

Dredging operations will create new berth pockets, turning basins, departure channel and tug access channel from the existing channel into the berth pockets. The proposed departure channel will be approximately 34 km in length and aligned approximately parallel to the existing Port Hedland shipping channel, deviating to the north-west from the existing channel at the outer end.

The total volume of material to be dredged is estimated to be approximately 50.4 Mm³ over a timeframe of approximately five years.

The proposal was subject to the requirements of the Environmental Protection Act 1986, and required a formal assessment and approval in accordance with Part IV of the Act (Environmental Impact Assessment). An Environmental Scoping Document (ESD) (BHP Billiton Iron Ore 2008a), describing the potential key environmental factors raised by the proposed Outer Harbour Development and the intended environmental studies to be completed as part of the assessment, was approved by the EPA on 4 November 2008. The Draft PER/EIS was submitted to the Environmental Protection Authority (EPA) on the 16 April 2011.

Numerous government agencies including various branches of the Department of Environment and Conservation (DEC) responded to the PER with a number of queries, issued on the 11 July 2011. All of these queries have now been addressed in a number of responses from the technical specialists. This Supplementary Report represents a compilation of those responses and supporting studies and survey information.

The scope of work of this report relates directly to a compilation of the questions raised by the various government agencies and the responses to those questions. As a result each question (grouped into sub-sections representing each government body) has been transcribed in full and is followed directly by its response.

BHP Billiton Iron Ore have also included revised management plans incorporating comments raised, and outcomes of additional surveys undertaken. The following management plans have been provided.

Management Plan 1	Noise Reduction Management Plan
Management Plan 2	Marine Fauna Management Plan
Management Plan 3	Significant Terrestrial Species Management Plan
Management Plan 4	Dredging and Spoil Disposal Management Plan
Management Plan 5	Mangrove Management Plan
Management Plan 6	Invasive Marine Species Management Plan
Management Plan 7	Acid Sulphate Soils Management Plan

When read in conjunction with the Draft PER/EIS, this Supplementary Report represents the Final Environmental Impact Statement for the Project.

2 RESPONSES

Respondent	No.	Comment	Response to Comment
Environmental Factor – Terrestrial Flora and Vegetation			
OEPA (Terrestrial Ecosystems Branch)	3.1	Two collections of an indeterminate <i>Liliaceous</i> species were made that are thought to be a potential range extension of a species from the Kimberley region. As the collection location of at least one these specimens will be impacted by the proposal, further work is required to resolve its taxonomic and conservation status and thus the significance of the locality.	Work required to resolve the taxonomic and conservation status of the <i>Liliaceous</i> sp., and significance of records within the development area, is underway and will be provided to the Department of Environment and Conservation. A revised regional Flora and Vegetation survey has been provided (Appendix 1)
OEPA(Terrestrial Ecosystems Branch)	3.2	The survey work resulted in numerous collection of priority flora and some significant range extensions (e.g. <i>Erichne sulcata</i>) which need to be lodged at the WA Herbarium if they have already done so.	All priority flora specimens collected have been lodged with the WA Herbarium.
OEPA (Terrestrial Ecosystems Branch)	3.3	The consultant for the proponent has not reported on those collections which were lodged at the WA Herbarium as required under EPA Guidance 51.	All priority flora specimens collected have been lodged with the WA Herbarium.
DEC	8.1	There are a number priority 1 and 2 flora species and samphire species in the Port Hedland area with uncertain taxonomy and/or regional conservation status. Quantitative information of the extent of local and regional impacts on these species is not presented in the PER. The proponent is therefore encouraged to consult with DEC in relation to these species and the extent of their local populations to confirm that the impact from development on their conservation status is low.	BHP Billiton is investigating the taxonomy and conservation status of these priority 1 and 2 flora and will consult with DEC in relation to the status of these species.
Environmental Factor – Terrestrial Fauna			
DEC (Terrestrial Ecosystems Branch)	3.4	Fauna surveys were stated as being undertaken in October 2007 and May 2008 during which locally significant geological features including billabongs (i.e. Cooliarin Pool), quartz outcrops, rockpiles and limestone hills were noted. OEPA responded to the draft PER that some of these areas represent specialised habitat and may contain species of conservation significance and in particular, the potential for the presence of the gecko <i>Gehyra nana</i> should be addressed. The revised PER needs to recognise that this gecko occurs in the region of the project area and should include information to state how impacts will be managed.	Targeted searches were conducted by ENV in July 2011 in rocky areas of the study area, in particular quartz and granite outcrops for the presence of the gecko <i>Gehyra nana</i> (ENV 2011). This gecko was recorded in the Boodarie survey (Mattiske 1994), and was specifically targeted as there is some taxonomic uncertainty with this species in the Pilbara. Two individuals were collected from separate locations and sent to the Western Australian Museum for identification. These were identified as <i>Gehyra punctata</i> , a common and morphologically similar species to <i>Gehyra nana</i> (ENV 2011). A revised regional Fauna survey report has been provided (Appendix 2)
DEC (Terrestrial Ecosystems Branch)	3.5	The revised PER needs to determine whether other specialist fauna species may occur in restricted habitats referred to above [billabongs, quartz outcrops, rock piles and limestone hills], and undertake targeted survey of these rare habitat types before the impacts of the proposal can be fully assessed.	ENV undertook additional vertebrate fauna surveys of the Port Hedland area in July 2011. This survey included habitat assessments and targeted searching within all habitats within the Outer Harbour Development Area and surrounds. The survey focused on restricted habitats within the region (quartz outcrops, Cooliarin Pool (billabong), and riparian vegetation. Additional fauna studies have also been undertaken in the region that included surveys of this restricted habitat (Biologic 2010). These habitats were found to support some species that are considered habitat specialists (e.g. <i>Varanus acanthurus</i> , <i>Gehyra punctata</i> , <i>Amphibolurus longirostris</i>), but all are considered to be widespread within the Pilbara and are not of conservation concern. These species were also recorded by Biologic (2011). Areas of rockpiles and quarries are known to support the Northern Quoll. The only area that is considered to support a significant population is Quarry 1 on BHPBIO's mainline rail. This quarry does not occur within the Outer Harbour Development proposed footprint. Quolls may use the riparian vegetation for dispersal. Low hills containing pebbles may support populations of the Priority 4 Western Pebble-mound Mouse.
Environmental Factor – Terrestrial Noise and Vibration			
DEC	8.16	That the proponent adheres to the recommendations of the PHAQNMP to monitor and manage noise using Noise Regulation 7 exemptions where appropriate. Including: - developing a cumulative noise model - defining noise sensitive zones	A noise modelling study for the proposed development is currently being undertaken to support the Works Approval application for construction and operation. The study includes cumulative noise for BHP Billiton operations, definition of noise sensitive zones and development of appropriate mitigation and monitoring measures in accordance with regulations. The study will cover both operational and construction noise. Specific noise mitigation measures will be incorporated into the Noise Reduction Management Plan (a draft of this plan which has been prepared to support the Works Approval application for RGP6, is provided in Management Plan 1) and implemented in

		- clarifying planning measures; and - clarifying building standards The proposal does mention the PHAQNMP and proposes the pursuit of Noise Regulation 17 approval for BHP Billiton Iron Ore's (BHPBIO) Port Hedland operations. However, DEC believes the management criteria above should be explicitly stated.	consultation with the regulator. A revised operational noise impact assessment and rail noise assessment have been provided, Appendix 3 and 4 respectively. This does not include the modelling for the proposed mitigation measures, this is currently underway. BHP Billiton Iron Ore will continue to engage with DEC as the specific engineering and mitigation controls and modelling progresses.
DEC	8.20	The proponent replace the 2009 SVT Engineering Consultants Port Hedland Outer Harbour Development Noise Assessment Report in Appendix B7 with the updated 2011 SVT Noise Assessment Report.	The revised noise impact assessment has been provided, Appendix 3 and 4.
DEC	8.21	The proponent relies heavily on their existing Environmental Noise Reduction Management Program in managing the noise impacts from their Port Hedland operations, including the proposed Outer Harbour Development. However this Program cannot be found the in PER package.	The current Noise Reduction Management Plan has been provided, Management Plan 1. The study includes cumulative noise for BHP Billiton operations, definition of noise sensitive zones and development of appropriate mitigation and monitoring measures in accordance with regulations.
DEC	8.22	The proponent should propose noise control measures that make the noise from the proposed Outer Harbour Development in isolation comply with the noise regulations and allow for the cumulative noise emission levels from BHP Billiton Iron Ore's Port Hedland operations to be gradually reduced.	As per the existing Noise Reduction Management Plan BHP Billiton's guiding principle is that, where possible, noise emissions for newly installed plant and infrastructure will comply with noise regulations in isolation and that cumulative emissions should not have an increased noise impact on the Port Hedland community. To gain required environmental approvals, BHP Billiton's proposed projects must comply with the noise requirements detailed in the Environmental Protection (Noise) Regulations 1997.
DEC	8.23	DEC accepts that the noise emissions from the existing port operation "cannot reasonably comply with" the noise regulations. However, for an expansion application like this in such a situation, the EPA guidance No. 8 requires that BHPIO demonstrate that the proposed new plant to be installed will, by itself, emit noise below the assigned levels. Therefore noise emissions from the proposed project in isolation should be expected to comply with the noise regulations.	BHP Billiton is currently undertaking detailed engineering studies to determine the most practicable and efficient emission reductions to minimise potential impacts from noise on public amenity.
Environmental Factor – Protected Marine Biota			
DEC	8.2	That the proponent considers positive conservation measures to offset the displacement of marine fauna, and particularly those species listed in the Wildlife Conservation (specially protected fauna) Notice 2010(2) and DEC's priority fauna list, due to noise and sedimentation from the proposed dredging and piling campaign, changes to bathymetry and loss of some habitats, increased light spill and through increased shipping and vessel movement.	BHP Billiton will be consulting with the OEPA in relation to offset measures as the OEPA's assessment of the proposal progresses.
DEC	8.3	That, in addition to existing commitments, the trained marine fauna observers (MFO) also record dolphins, identified to species level where possible.	BHP Billiton accepts this recommendation and will update the Marine Fauna Management Plan (Management Plan 2) accordingly.
DEC	8.4	The trained MFOs associated with the piling campaign look out for cetaceans (including dolphins) and dugongs within a two kilometre radius for 15 minutes prior to soft start-up procedure, and that soft start-up not begin until the cetaceans or dugongs leave the area of their own accord, or are not seen in this radius for more than 30 minutes.	BHP Billiton accepts this recommendation and will update the Marine Fauna Management Plan (Management Plan 2) accordingly.
DEC	8.5	Those significant disturbance incidents involving marine fauna are reported to DEC within 24 hours of their occurrence, and that the proponent consults with DEC in regard to an appropriate management response to avoid future disturbances.	BHP Billiton accepts this recommendation and will update the Marine Mammal Management Plan (now Marine Fauna Management Plan) accordingly (Management Plan 2).
DEC	8.6	That the proponent undertakes marine fauna surveys (primarily for species of conservation significance including turtles, cetaceans (including dolphins), dugongs, seabirds and shorebirds), designed in consultation with DEC prior to, during and after the construction phase to provide further information on the level of fauna displacement associated with the construction and operation of the proposed development.	BHP Billiton accepts this recommendation for turtles, and commits to undertaking marine mammal surveys prior to and following the completion of construction. BHP Billiton has undertaken a desktop study and field survey in April 2011, this is provided in Appendix 5. An additional avifauna survey will be undertaken during the next migration season (November 2011) prior to commencement of construction activities. The two relevant management plans, ie Marine Fauna Management Plan (Management Plan 2) and Significant Terrestrial Species Management Plan (Management Plan 3) will be updated accordingly.
DEC	8.8	That all vessel operators be made aware of the requirements of the Wildlife Conservation (closed season for marine mammals) Notice 1998 by the proponent.	The Wildlife Conservation (Closed Season for Marine Mammals) Notice 1998 sets guidelines to minimise the disturbance to marine mammals from interactions with humans, and also to protect people from inadvertent harm when interacting with marine mammals. Vessel operators will be made aware of the requirements of the Notice.
DEC	8.10	That creek causeway design allows for unimpeded movement of protected sawfish species as well as tidal movement.	BHP Billiton has committed to maintaining tidal flow through the creek causeway that will allow for unimpeded movement of protected sawfish species.

DEC	8.11	It can be expected that marine fauna will be further displaced within and from the port area. This impact is unlikely to be fully mitigated and a high residual risk of marine fauna displacement can be expected to persist. On this basis, the proponent is encouraged to consider offsets that enhance the conservations of marine fauna, such as turtles, seabirds and shorebirds, cetaceans (including dolphins) and dugongs in Western Australia.	BHP Billiton will be consulting with the OEPA in relation to offset measures as the OEPA's assessment of the proposal progresses.
OEPA	11.11	<p>Indirect impacts to habitat, in particular, seagrass habitat that may be utilised by green sea turtles and dugong.</p> <p>The proponent should comment on the seasonal variance of both the seagrass distribution and movement of dugong and turtle and the potential ecological inter relationships and whether or not there are windows of environmental sensitivity in respect to seagrass and dugongs or turtles that should be taken into account in dredge management.</p>	<p>Refer to response 11.5 in regards to seasonal seagrass distribution.</p> <p>It is acknowledged that seagrass habitat may be spatially and temporally transient and that surveys provided a qualitative assessment of seagrass coverage at one point in time. To provide a quantitative assessment of seagrass coverage allowing for seasonal variation, BHP Billiton will follow the processes discussed in response to comment 11.5.</p> <p>There has only been one quantitative survey of dugong densities in the Port Hedland region, undertaken in 2000 (Prince <i>et al.</i> 2001). The aerial survey reported that the density of dugongs in the region was approximately 0.1 per km²; compared to 0.71 per km² in Shark Bay, as reported by Marsh <i>et al.</i> (1994). More recently, Pendoley Environmental conducted aerial surveys aimed at detecting marine turtles (2009), whilst also noting dugong presence. They reported six to eight dugongs near Little Turtle Island (approximately 45 km north-east of the project footprint) and confirmed that no feeding scars (tracks) were observed anywhere in, or adjacent to, the study area.</p> <p>During water quality investigations conducted in August 2008, a single dugong was spotted in the embayment between Weerde and Downes Island (Peter Morrison, SKM pers. comm.). Dugong feeding scars were not recorded in these seagrass beds during dives conducted in August 2009 (Kurt Wiegler, SKM pers. comm.).</p> <p>Given the paucity of seagrass habitat identified to date, and the presence of existing shipping activity, it is considered unlikely that dugongs maintain an extended presence in the study area (Holley, 2008). However, dugongs may move between preferred breeding and calving grounds to the north and south of Port Hedland. Concentrations of resident foraging turtles (primarily flatbacks) were generally located around offshore islands, including North and Little Turtle Islands, in creek mouths, over shallow intertidal platforms and out from the De Grey River mouth (Pendoley Environmental, 2009b).</p>
Environmental Factor – Air Quality - Dust			
Town of Port Hedland	1.4	The Town would appreciate further assurance that dust and noise from the development will not adversely impact upon Port and South Hedland. This relates not only to the jetty structure but also the stockpiles at the old HBI plant. We look forward to best practise being used in the management of noise and dust to reduce impacts during both construction and operation.	<p>To gain required environmental approvals, BHP Billiton's proposed projects must comply with dust limits set in Ministerial Statement 740 and the noise requirements detailed in the Environmental Protection (Noise) Regulations 1997.</p> <p>As outlined in the PER/Draft EIS, BHP Billiton is currently undertaking detailed engineering studies to determine the most practicable and efficient emission reductions to minimise potential impacts from dust and noise on public amenity.</p>
Port Hedland Port Authority	2.3	The proposal refers to a number of access roads and maintenance tracks, particularly associated with the services corridor from the stockpile area to the wharf. It is unclear whether these trafficable areas will be unsealed or sealed. The draft Port Hedland Best Practice Dust Management Guidelines currently being finalised with the PHPA in close consultation with the Port Hedland Dust Management Taskforce, identified the sealing major trafficable areas as best practice. PHPA would like to see a commitment from BHPBIO to ensure that all major trafficable areas are sealed.	<p>Where practicable major roads and access surfaces will be sealed, especially if the roads are part of the proposed permanent infrastructure to support operation of the Outer Harbour facilities. The Western Spur access track will be an unsealed road from Mooka through to Boodarie as per current Newman Mainline rail access tracks.</p> <p>Dust modelling and engineering optimisation is currently being undertaken which will further inform specific mitigation measures such as sealing of roads. This work considers the recommendations of the Dust Management Taskforce and Port Hedland Best Practice Dust Management Guidelines in development of mitigation measures.</p>
Robin Chapple MLC	7.3	Whilst dust has been addressed at some level, projected levels of fugitive cumulative dust from the identified BHPB expansion stockpile potential area, the proponent 2, 3 and 4 stockpile areas and the 3 potential stockyard expansion areas identified in the Port Hedland Port Authorities, Boodarie - Outer Harbour Stockyards and Industrial Area are not considered.	<p>To gain required environmental approvals, BHP Billiton's proposed projects must comply with dust limits set in Ministerial Statement 740 and the noise requirements detailed in the Environmental Protection (Noise) Regulations 1997.</p> <p>BHP Billiton is currently undertaking detailed engineering studies to determine the most practicable and efficient emission reductions to minimise potential impacts from dust on public amenity.</p> <p>Where applicable BHP Billiton has modelled for the potential cumulative impacts associated with dust, however this can only be undertaken for projects where there is available information. It is accepted by the Department of Environment and Conservation and the Office of the Environmental Protection Authority that the projects included in the cumulative modelling are approved projects only.</p>
Robin Chapple MLC	7.13	The majority of the dust that pervades the town of Port Hedland does not come from the larger stockpiles at the BHP Billiton Nelson Point site but comes from the smaller BHP Billiton Finucane Island stockpiles 1.5 kilometres to the N.W of the town of Port Hedland.	<p>The relative contribution of various sources of dust at Port Hedland varies depending on a number of factors including meteorological conditions and the location of receptors. This is demonstrated by BHP Billiton's dust monitoring at locations across Port Hedland.</p> <p>Where applicable BHP Billiton has modelled the potential cumulative impacts associated with dust at numerous receptors in the Port Hedland region, including South Hedland. BHP Billiton is currently undertaking detailed engineering studies to determine the most practicable and efficient emission reductions to minimise potential impacts from dust on public amenity.</p>
Robin Chapple MLC	7.14	That the proposed facilities on the BHP Billiton's Outer Harbour Development Project (the project) and Port Hedland Port Authority's Boodarie Outer Harbour Stockyards and Industrial Area be placed to the south of the current decommissioned BHP Billiton HBI plant, to ensure that those winds that are known to transmit fugitive dust pass to the South of South Hedland and Wedgefield.	<p>To gain required environmental approvals, BHP Billiton's proposed projects must comply with dust limits set in Ministerial Statement 740 and the noise requirements detailed in the Environmental Protection (Noise) Regulations 1997.</p>
DEC	8.12	The Government has approved the PHAQNMP (Port Hedland Air Quality	BHP Billiton supports the Taskforce's recommended approach to dust management for Port Hedland. However, until the PHAQNMP

		and Noise Management Plan) as the appropriate interim management measure for the protection of the population of Port Hedland. Proponents should acknowledge this and reflect is recommendations in their proposals in a manner that demonstrates that proposed management measures are appropriate to contribute to achieving the PHAQNMP's goals.	goals are given effect, BHP Billiton's proposed projects must comply with dust limits set in Ministerial Statement 740 and the noise requirements detailed in the Environmental Protection (Noise) Regulations 1997.
DEC	8.15	That the proponent adheres to the recommendations of the PHAQNMP for an interim guideline measure for air quality in Port Hedland for particles measured as PM10 based on the following criteria: - 70um/m3 (24 hr average) - 10 exceedances per calendar year; and - applies to residential areas east of Taplin Street. The proposal does make reference to the PHAQNMP, however, DEC believes the criteria above should be explicitly stated by the proponent.	The Port Hedland Air Quality and Noise Management Plan is discussed in Section 2.2 in the report titled 'Port Hedland Outer Harbour Development: Dust Modelling and Assessment'. This section also contains a discussion of the interim air quality guideline. In Section 2.3 of this report it is noted that the interim guideline (70ug/m3 at Taplin Street with less than 10 exceedences) will be used in this assessment. To gain required environmental approvals, BHP Billiton's proposed projects must currently comply with dust limits set in Ministerial Statement 740 and the noise requirements detailed in the Environmental Protection (Noise) Regulations 1997.
DEC	8.17	The proponent should amend the statement "Nuisance dust is a term generally used to describe dust which reduces environmental amenity without necessarily resulting in material environmental harm. Nuisance dust comprises particles with diameters nominally from about 1um up to 50um (1um = 1 millionth of a metre)" as the statement is misleading. This statement is incorrect since the stated size range includes PM10 and PM2 which have known health effects. The statement is contradicted in the following paragraph and should be reworded to provided clarity.	Noted. BHP Billiton will amend the statement as suggested.
DEC	8.18	The proponent needs to provide clarification on how the results in table 8-2 were obtained in relation to predicted maximum concentrations of PM10 at the hospital.	The results in Table 8-2 were obtained by implementation of the Environmental Protection Authority's AUSPLUME Gaussian computer dispersion model (Version 6.0) for the proposed development, along with site representative meteorological data for the year July 2004 to June 2005. Further details of the methodology are provided in section 6 of Appendix B28. A full explanation of the emission estimation, modelling and results are presented in the report titled 'Port Hedland Outer Harbour Development: Dust Modelling and Assessment', Appendix B29 of the PER/Draft EIS.
Environmental Factor – Marine Water and Sediment Quality			
Le Mer Pty Ltd	5.1	Pearl oysters are filter feeders and not motile animals which makes them susceptible to bio-accumulation from suspended sediments, or some degree of smothering from sediment fallout...we would ask that discussions between us and BHP Billiton continue as the project goes ahead, specifically as the EIS moves through its draft stage. We feel there is good potential to discuss the coordination of the data from the WIS monitoring site near the aquaculture licence area, and further management actions which may be integrated into the documentation for the project.	BHP Billiton will continue to engage with Le Mer Pty Ltd and their consultants on proposed marine monitoring and management requirements contained in the Dredge Spoil Disposal Management Plan. BHP Billiton has provided the relevant data for Weerde Island to Le Mer Pty Ltd.
Le Mer Pty Ltd	5.3	The BHP Billiton documentation notes the likelihood that some metals such as Mercury and Nickel are naturally occurring in the area. While the evidence seems to support his assertion, it must be noted that the act of dredging, especially with the explicit aim if breaking and cutting hard substrate to finer grades to allow for dredging, will exponentially increase the mechanical and chemical action between the substrate and the water, and therefore could potentially exponentially increase the bioavailability of the metals to organisms in the area. As was the case above, we would ask that discussion between us and BHP Billiton continue as the project goes ahead, specifically as the EIS moves through its draft stage.	The sediment sampling of the consolidated material from the geotechnical drilling programme that was undertaken to support the Sea Dumping Permit application did not detect elevated levels of mercury. Elevated levels of arsenic, chromium and nickel were detected in the some surficial unconsolidated material and consolidated deeper materials. Previous results of sediment quality investigations in surficial and consolidated sediment from the Port Hedland Inner Harbour found that while elevated concentrations of these metals were reported, the bioavailable fractions were below that of the relevant guidelines: <ul style="list-style-type: none"> • Concentrations of nickel, chromium and arsenic exceeded the NODGDM screening levels in the top 1 m of sediment but the bioavailability of these metals was acceptably low against ANZECC/ARMCANZ guideline levels (Oceanica 2005). • Concentrations of nickel were above the NAGD Screening level in the surficial sediments (i.e. to 1 m) in the Nelson Point area; however the bioavailable fraction was below the NAGD Screening level (BHPBIO 2009). • Elutriate analyses of metals in geotechnical sediment samples collected from Nelson Point indicated that concentrations of nickel (when accounting for dilution), chromium and arsenic met the ANZECC/ARMCANZ 99% species protection levels (BHPBIO 2009). BHP Billiton will continue to engage with Le Mer Pty Ltd and their consultants on proposed marine monitoring and management requirements contained in the Dredge Spoil Disposal Management Plan.
Le Mer Pty Ltd	5.4	We are concerned with the disposal of a significant volume of water from de-watering through Salmon Creek. We note the documentation speaks of rapid dilution of this water which therefore may mitigate against environmental effect. However, we also noted that the documentation also speaks of the strong diurnal tides in the area. Without further analysis, we are not convinced that the de-watering water will not affect the aquaculture	As described in the PER/Draft EIS, changes to water quality, including ambient salinity levels, associated with the discharge of dewatered groundwater into Salmon Creek will be restricted to the initial zone of mixing within the upper reaches of Salmon Creek. Concentrations of contaminants in receiving water will be rapidly diluted due to tidal flushing, thereby meeting the recommended 99% species protection limits for marine waters. Due to the strong tidal influence and associated flushing, bioavailable contaminants that may become associated with particulate material within the receiving environment are likely to be transported rapidly from the initial zone of mixing in the upper reaches of Salmon Creek, greatly reducing the likelihood of contaminant build up either in the water column or the

		area. Of particular interest to us is the otherwise benign effect of reducing ambient salinity in the area in periods when it would otherwise be stable (dry season).	seabed. Appropriate disposal and/or reuse options for this water will be developed and implemented depending on the quality and volume of water removed. If the quality of the water is appropriate, it will be used for dust suppression and other construction activities. Where the water quality or volume does not allow for onsite use it will be discharged in accordance with regulatory requirements at Salmon Creek to the north of the Boodarie stockyards, approximately 500 m downstream of the existing approved discharge location for BHP Billiton's Rapid Grown Project 5 Dredge Material Management Area A. BHP Billiton Iron Ore has undertaken modelling and an impact assessment of the "worst case" scenario, that is, all dewatering discharge is pumped to Salmon Creek. This impact assessment and modelling is provided in Appendix 6.
DEC	8.13	It is understood that dewatering of up to 8 megalitres per day will be required for a period of 9-12 months for construction activities associated with the proposed development. It is recommended that the proponents develop a management plan for construction dewatering that indicates how water quality of the pumped effluent will be monitored and outlines contingency measure for water treatment in the event that the effluent contains concentrations of metals and metalloids at levels that may cause harm to receiving aquatic ecosystems.	BHP Billiton is currently undertaking detailed hydrogeological investigations as part of geotechnical investigations to determine the volumes of dewatering and likely water quality. Appropriate disposal and/or reuse options for this water will be developed and implemented depending on the quality and volume of water removed. If the quality of the water is appropriate, it will be used for dust suppression and other construction activities. Where the water quality or volume does not allow for onsite use it will be discharged in accordance with regulatory requirements at Salmon Creek to the north of the Boodarie stockyards, approximately 500 m downstream of the existing approved discharge location for BHP Billiton's Rapid Grown Project 5 Dredge Material Management Area A. BHP Billiton Iron Ore has undertaken modelling and an impact assessment of the "worst case" scenario, that is, all dewatering discharge is pumped to Salmon Creek. This impact assessment and modelling is provided in Appendix 6. Groundwater monitoring will be undertaken during construction activities according to regulatory requirements.
DEC	8.14	That elutriate testing is undertaken on any dredge spoil materials that are discharged to onshore containment areas.	Investigations into the onshore disposal of dredged material have demonstrated that this is not a viable option due to a range of factors including: potential increased impacts on water quality and turbidity; logistical, economic and environmental challenges; and the limited portion of material that could be suitable for use as fill. This sampling was summarised in the SAP Implementation Report which is Appendix B6 of the Draft PER/EIS.
WA FIC	9.4	A high level of water quality is a critical factor for commercial fishing operations. Dredging and the disposal of dredge spoil will result in increased suspended sediment within the area subject to marine construction activities and possibly beyond.	As detailed within the PER/Draft EIS, the operation areas for the four commercial fisheries are located considerable distances from the proposed Outer Harbour Development and these areas are not expected to be significantly impacted. Increased suspended sediment levels will occur during the dredging and spoil disposal operations. It is not expected that ongoing increased levels of suspended sediments will occur once dredging and spoil disposal activities are completed. Section 11.9 of the PER/Draft EIS details expected impacts on commercial fisheries. Section 10.1 and 10.3 of the PER/Draft EIS details the predicted levels of suspended sediments during the dredging and spoil disposal operations.
OEPA	11.13	The Pilbara Coastal Water Quality Consultation Outcomes—Environmental Values and Environmental Quality Objectives, (DoE Marine Series Report No.1, 2006) outlines principles for assigning Moderate Ecological Protection Areas (MEPAs) to inner port areas. It is recommended that the area proposed as a MEPA in figure 10.1 be re-drawn consistent with the principles in the DoE document above. This requires deletion of proposed MEPA areas adjacent to shipping channels and the jetty (reverting to High Ecological Protection Areas as current shown in the DoE report).	Figure 10.1 has been amended to include the areas adjacent to shipping channels and the jetty as High Ecological Protection Areas consistent with the DoE Marine Series Report No. 1 (2006). This is included as Appendix 7.
OEPA	11.14	It is noted that there is limited baseline data (Appendix B19 "baseline water quality monitoring program" (SKM 2009f)), especially in relation to seasonal variation in water quality parameters in the area proposed for the turning basin and wharf. Baseline data will be required in order to monitor conformance with the levels of ecological protection set through the EIA process, if an approval is granted. It is recommended that the proponent assess the need to add to the baseline with additional water quality monitoring.	Baseline water quality data has been collected offshore of Port Hedland and within the Port Hedland harbour since 2008. A revised baseline water quality and coral health report has been provided, Appendix 8 and 9 respectively. A number of additional water quality monitoring sites are in the process of being established for the ongoing monitoring program, including the establishment of a monitoring site in the vicinity of the area proposed for the turning basin and wharf. Water quality data is currently being collected at a number of sites within the project area by the Port Hedland Port Authority for the current South West Creek dredging project. The large quantity of water quality data collected is considered sufficient to be able to monitor conformance with levels of ecological protection.
OEPA	11.18	Dredging and Dredge Spoil Management There is a strong preference that the Dredge and Dredge Spoil Management Plan is completed so as to allow it to be considered as a part of the EPA's assessment.	The Dredging and Spoil Disposal Management Plan (DSDMP) has been provided, Management Plan 4.
Environmental Factor – Marine Noise, Blasting and Vibration			
DEC	8.7	That the proponent facilitates further study of the propagation of noise associated with pile driving, dredging and vessel movement during the construction phase to verify if suggested management actions (exclusion zones and soft start-up procedures) are appropriate for the Port Hedland	Underwater noise monitoring to establish ambient conditions has commenced at two locations within the proposed development footprint. Underwater noise monitoring will continue during the construction phase of the project. The results of this monitoring will be regularly reviewed to verify the appropriateness of the proposed management actions. The results of the first round of monitoring have been included in Appendix 15.

		offshore environment.	
DEC	8.9	That no blasting occurs without an appropriate level of consideration of potential impacts to significant marine fauna being undertaken by DEC.	Detailed site investigation data (geotechnical coring) demonstrated that there is no rock material within the proposed dredging area that will require blasting (i.e. soft enough for ripping and use of a cutter suction dredge). Should drilling and blasting be required, a drilling and blasting management plan would be developed in consultation with DEC.
Environmental Factor - Light			
Environmental Factor – Aboriginal Heritage			
Robin Chapple MLC	7.5	The projection of known cultural material in the region in respect of the cumulative land impacts of all known and future dated developments on the Boodarie Industrial Estate.	BHP Billiton has conducted numerous archaeological and ethnographic surveys over the proposed development area and the surrounding Port Hedland region. BHP Billiton is currently working with both the Australian National University and the University of Queensland to ensure that archaeological or ethnographic sites are located and appropriately managed within the proposed development area. The Company is conscious of the fact that there is a significant complex of archaeological sites situated to the north of the Boodarie industrial estate beyond the proposed development footprint (South West Creek engraving complex). The proposed Outer Harbour Development has been specifically designed to avoid this area completely and BHP Billiton is currently in discussion with the Kariyarra people as to how this place should best be managed in the future. To assist these discussions, BHP Billiton, in conjunction with the Kariyarra, commissioned a draft Management Plan for the Boodarie area. Public access to the engraving sites was identified as the greatest risk to the heritage values of the area and the Boodarie Management Plan outlined a range of strategies to minimise these impacts. BHP Billiton is currently developing a Cultural Heritage Management Plan (CHMP) in consultation with the Kariyarra that will outline a range of protocols and procedures for ensuring significant heritage places are adequately protected. BHP Billiton is confident that the proposed Outer Harbour Development will not have a major impact on the heritage landscape.
Environmental Factor – Social Impacts			
Town of Port Hedland	1.1	The Town is committed to ensure that as part of their expansion BHPB has a strong focus upon residential based workforce rather than FIFO. We accept that some level of FIFO is required, however every effort should be made to accommodate as many workers based permanently in Port Hedland as possible.	BHP Billiton has a significant residential workforce at present and remains committed to maintaining a strong residential presence in Port Hedland. The Company has made significant investment in accommodation in the Pilbara including dwellings for singles, couples and families. More than \$340 million was invested in the first two phases of the Hedland and Newman accommodation projects and a third phase of accommodation development is currently underway. It is anticipated that both residential and FIFO workforces will need to increase to implement the proposed Outer Harbour Development and additional accommodation will be required to house construction and operational workforces. BHP Billiton is currently studying a number of accommodation options for the first stages of the proposed development to ensure the most suitable accommodation models are chosen. We will continue to engage and work collaboratively with the Town of Port Hedland on these issues.
Town of Port Hedland	1.2	Access to Finucane Island boat ramp needs to be maintained during the construction and operation phases. BHPB has indicated this is their intention; however, we would like further assurance and detail on how this will be achieved. In addition to this we would like to see further detail on how access by public boats will be provided under and around the jetty structure.	Public access to Finucane Island boat ramp will be maintained during the construction and operation phases of the proposed development. Minor temporary changes, such as establishment of alternative access routes to the beach and boat ramp areas, may be required from time-to-time but overall access will continue. BHP Billiton will engage with the Town of Port Hedland and Department of Main Roads to develop traffic management procedures prior to commencement of construction to ensure public access to Finucane Island is maintained and properly managed. During marine construction of the proposed development, restricted areas for vessels will be established to ensure public safety. Security patrols will regularly monitor the restricted areas for the safety of all marine vessels and anglers. If it is necessary for vessels to enter or cross a restricted area, they are to navigate with extreme caution and maintain a minimal distance of 100 metres from any construction works, unless accessing controlled locations under the jetty. BHP Billiton will engage with the Port Hedland Port Authority and other relevant stakeholders to develop a marine traffic procedure prior to the commencement of construction. Once constructed the proposed Outer Harbour wharf and jetty will extend approximately 6 km north of Finucane Island. BHP Billiton is currently investigating the feasibility of providing passage for recreational vessels under the jetty at specified locations in order to reduce the distance these vessels would otherwise have to travel to access fishing areas to the west of the proposed Outer Harbour Development. The final decision on whether these cross-over points will be established is dependent on safety and operational considerations and would be subject to relevant government approvals.
Town of Port Hedland	1.6	Industrial tourism is rapidly growing in significance in Port Hedland and it would be ideal if as part of this development elements could be incorporated into the project to capitalize on this opportunity.	Last financial year BHP Billiton invested over \$50million into the communities in which it operates including significant investments into key community facilities, programming and amenity which has served to increase attractiveness of Port Hedland to visitors. Some specific examples that support tourism are the Red Bank Bridge tourist stop, the town entry statement on the Great Northern Highway, information bay upgrades at entrances to Port Hedland and providing access for the Port Hedland Visitor Centre to conduct industrial tourism tours of BHP Billiton's Nelson Point operations. BHP Billiton will continue to work with the Town of Port Hedland and other stakeholders to identify other opportunities for industrial tourism through its community development program and partnerships; however, we consider the Outer Harbour Development proposal is not the appropriate vehicle for addressing industrial tourism proposals.
Town of Port	1.7	The number of construction FIFO workers will significantly increase the	Airport passenger numbers are predicted to increase as a result of the increased workforce for BHP Billiton and all of the other industry

Hedland		passenger numbers at the airport. BHPB have offered to provide support to working with them and the State to achieve this outcome.	expansion occurring in Port Hedland. BHP Billiton has supported the Town of Port Hedland to plan for this growth through the funding of an Airport Masterplan. BHP Billiton has also offered to further assist the Town of Port Hedland with planning for its airport terminal expansion and facility upgrades; however the Company believes that the expansion should be funded through a passenger based user-pays model which BHP Billiton would support.
Town of Port Hedland	1.8	Overall the Town of Port Hedland is eager to investigate how we maximise the long-term legacy outcomes associated with this proposed expansion project the Town and the community. The Council with the support of Pilbara Cities and Department of Planning is spending \$1.5 million to develop a City Growth Plan. This plan will create a vision for the City of Port Hedland and also have an implementation plan of achieving this vision. We will need to ensure that any mitigation issues arising from this project are in alignment with the City Growth Plan.	BHP Billiton remains committed to working in partnership with the Town of Port Hedland to realise their vision. This includes actively working with them to improve both the physical amenities of the area and expand community infrastructure to support a growing population. In 2008, the Town of Port Hedland developed a 2020 vision for the town that took into account the potential future projected growth of the community and the infrastructure and social needs of the community. This exercise was entitled the <i>Hedland Future Blueprint</i> . Some examples of the success of this model include the new multipurpose recreation centre, the new youth centre, the South Hedland CBD upgrade, new water-based recreation park, South Hedland Aquatic Centre upgrade and new clubrooms and function centre at Colin Mathieson Reserve, the Port Hedland Yacht Club, a network of CCTV cameras throughout the community, various recreation upgrades including cycle paths, and support facilities, lighting upgrades, new skate parks and new childcare centre. More recently, BHP Billiton has been an active participant in the development of the Port City Growth Plan. On completion of the Plan, joint priority setting between the Town of Port Hedland and BHP Billiton can occur.
Le Mer Pty Ltd	5.9	Section 11 of the document discusses the impact of the project on small vessel movements although largely in the context of recreation anglers. It notes that there may be restrictions on the use of boat launching facilities on Finucane Island as well as restrictions on vessels transiting the area through various construction phases. We understand BHP Billiton's need for safety on and around their infrastructure. We would ask that BHP Billiton appreciate the need for us to have relatively unfettered small vessel access to our site. On a similar issue, we would ask that small vessels working on the project be made aware of our site, and that there be come mutually agreed protocol restricting unnecessary small vessel movements in and around the licence area.	Public access to Finucane Island boat ramp will be maintained during the construction and operation phases of the proposed development. Minor temporary changes, such as establishment of alternative access routes to the beach and boat ramp areas, may be required from time-to-time but overall access will continue. Fishing and boating will still be permitted during the construction, however, exclusion zones will apply to development areas and these will be regularly monitored by security patrols. If it is necessary for vessels to enter or cross a restricted area, they are to navigate with extreme caution and maintain a minimal distance of 100 metres from any construction works, unless accessing controlled locations under the jetty. Prior to construction, BHP Billiton will engage with PHPA and key stakeholders (including Le Mer Pty Ltd) on development of a marine traffic management procedure. An area designated for small craft crossing of the construction areas will be included in this plan. BHP Billiton is open to discuss Le Mer's specific requirements for inclusion in this plan, in addition to implementation of exclusion zones to minimise impact on Le Mer's operations.
Port Hedland Community Progress Association Inc	6.1	The PHCPA Inc is concerned that mining has a plan for 40-50 years and our towns operate on short term 5-10 year plans with Government Funding from election to election. The PHCPA Inc has proven that a 50-100 year plan is the way other long term sustainable cities develop and believe the same long term planning is necessary for Port Hedland and the whole of Australia's North. Suggestion: A 50 year plan with Government and Industry will result in private investment.	BHP Billiton is participating in a number of initiatives including the State Government led Pilbara Planning and Infrastructure Framework; the State Port Authorities review, the specific Port Hedland Port Authority Review and the Town of Port Hedland sponsored Port Hedland City Growth Plan. The Company believes that any long term planning requires a clearly articulated strategic direction and implementation plan to ensure fully coordinated development, particularly in the Pilbara. BHP Billiton supports long term planning; however, we consider that the Outer Harbour Development proposal is not the appropriate vehicle for addressing long term planning issues.
Port Hedland Community Progress Association Inc	6.2	The PHCPA is generally satisfied with the way BHPB have been operating over the last 4 years in Port Hedland through their partnerships with community, Government and other industries through the creation of the Pilbara Industry Council. We wish to see these types of partnerships continue and expand to ensure all stakeholders are continuously informed and work together to create a vibrant city in the North to support continued industrial growth. Suggestion: Continued partnerships until the towns are self supporting.	BHP Billiton is committed to facilitating vibrant, resilient and self-sustaining townships in the Pilbara through a range of community partnerships and advocacy. BHP Billiton's Community Development Program focus areas are health, education, townships, environment and Indigenous wellbeing. Through the Community Development Infrastructure Budget, BHP Billiton is currently working with local government, State government departments and agencies and non-government organisations on a range of future community partnerships in Perth, Port Hedland and Newman in excess of \$50 million. Current and future partnership projects include funding new housing to encourage GPs to Port Hedland, a Multipurpose Recreation Centre, South Hedland Aquatic Centre, YMCA childcare facilities, Newman Town Centre, Port Hedland training centre, Jigalong Workshop and community/youth centre.
Port Hedland Community Progress Association Inc	6.3	Section 11 has only identified possible effects on community and infrastructure in isolation with the construction of the "Outer Harbour" not as a cumulative effect with other industry expansion that will be taking place. We cannot see a section where the effects have been identified in conjunction concurrently by professional demographers. Suggestion: Calculate cumulative effect of FIFO workforce.	BHP Billiton has undertaken a range of studies to understand the cumulative impacts of its combined growth activities including the proposed Outer Harbour Development. This includes social impact assessment, annual community surveys, workforce surveys and a comprehensive program of ongoing stakeholder community engagement including demographic projections through the Pilbara Industry's Community Council. Further consultation and research will occur as the project progresses.
Port Hedland Community Progress Association Inc	6.6	The West End is the original area of the town site of Port Hedland and abuts the harbour and the port. BHPB have been instrumental in working with the Government to address dust issues and preservation of the historical townsite; however our history and building are endangered from age, neglect and lack of maintenance. We wish to see a preservation plan that protects our old buildings in the West End. The first State primary school building in McKay Street Port Hedland must be preserved for	BHP Billiton is committed to contributing to the improvement of the Port Hedland community. In relation to the West End of Port Hedland the Company values the cultural and historical significance of the area and has invested more than \$8 million over four years to enhance these elements. Moving forward the Company's commitment to the West End will be guided by the identification of agreed Town of Port Hedland priorities in order to continue to enhance the cultural and historical significance of this area.

		'community use' as a legacy for our youth through protecting our heritage and promotion of the arts, including music and dance. Suggest: Save our Old School	
Port Hedland Community Progress Association Inc	6.7	BHPB have built a 1200 person accommodation know as "Port Haven" that operates on a 10 year lease over part of the Council Land at the Airport and expires 11/3 2019. The community supported the construction of the accommodation village on the condition that it contributed substantial community benefit. The main benefit was for the income from the lease of the site to be used as capital for the construction of a multipurpose recreation centre and the village to revert to council ownership at the end of the 10 year lease for use as "university campus accommodation". BHPB now plan to expand for another 1200 people, so this doubles the university accommodation which is wonderful. We request this requirement include the additional rooms and facilities so the university accommodation campus expands to 2400 people. Suggest: 2400 Rooms and Port haven Village to Council for University Accommodation 11/03/2019	BHP Billiton is considering a range of accommodation growth options to meet business needs. Should a formal proposal be developed regarding further development at Port Haven, it will be negotiated cognisant of the existing commercial framework between the Town of Port Hedland, Compass Group and BHP Billiton Iron Ore.
Port Hedland Community Progress Association Inc	6.8	Traffic - Whilst there is an Avoidance/Mitigation/Management plan for road traffic, air traffic remains a problem that will only worsen as the FIFO population increases. The recent increases in volume of flights can only be a good thing for creating a vibrant city with easy access; however the availability of those flights to the public due to the amount of FIFO taking up the seats is limited. With planned expansion of the airport, (hopefully an increase in flight options) now would be an excellent time to look at the possibility of moving the airport and releasing the land for development. Suggestion: Increase flights to all.	The Town of Port Hedland are the owners and operators of the airport and as such any decision to move or expand the airport would be theirs to make. BHP Billiton has supported the Town of Port Hedland's plans for growth through the funding of an Airport Masterplan. BHP Billiton is also having ongoing dialogue with the Town of Port Hedland and with flight providers regarding estimated passenger numbers to ensure adequate flights to meet industry and community needs are planned for.
Port Hedland Community Progress Association Inc	6.9	Monorail Link around town - Monorail link to Port Hedland, South Hedland and the airport and eventually to Wedgefield to allow people access to their places of employment without using vehicles and contributing to the huge load of traffic and carbon dioxide emissions affecting the environment. Suggestion: BHP Billiton contributes the steel and TOPH build it.	BHP Billiton has made significant investments into the community in line with priorities identified by the Town of Port Hedland and those captured with the Hedlands' Future Today (Blueprint) document. The mono rail project has not been prioritised by the Town of Port Hedland and therefore has not been considered for investment by BHP Billiton. During the past two years, BHP Billiton has invested more than \$42.8 million in South Hedland in various town projects and infrastructure in response to community consultation and discussion. BHP Billiton's future priorities for community investment will be guided by the Town of Port Hedland's priorities.
Port Hedland Community Progress Association Inc	6.12	From 1989 to 2006 there was a Music Department at TAFE with a Musical director partially funded by BHP. His name is Jango Chapkana while he was here, he gave piano recitals on Sunday evenings at the Civic Centre, composed music for special events, directed the Port Hedland Choral Society who performed at all public functions, organised concerts and taught piano. (When the Port Hedland TAFE was amalgamated with Karratha and the admin moved down there, the building was been neglected, interest in classes, language and culture stopped) Suggestion: support the arts to ensure we have a balanced society.	BHP Billiton has an ongoing commitment to working with local communities and all levels of government to provide students in the Pilbara with a world-class education. We have partnered with the Department of Education and Training to deliver the Pilbara Education Partnership which has resulted in improved secondary school retention rates for Indigenous and non-Indigenous students, maximised student outcomes across a range of learning areas and additional tertiary education and training opportunities. During the past two years BHP Billiton has provided approximately \$18 million to regional education, arts and culture programs to offer young people a diverse range of training and career opportunities to help build brighter and healthier communities. This includes a suite of education and training initiatives ranging from sophisticated electronic delivery of upper school subjects to Hedland and Newman Senior High Schools through to the upgrade of a training facility to TAFE lecturing standards.

Environmental Factor – Geology, Soils and Landforms

Environmental Factor – Subterranean Fauna

Environmental Factor – Surface Water Flows

Robin Chapple MLC	7.1	Cyclones, tidal surges and their potential to affect proposed industrial development in the Port Hedland Outer harbour area, as well as considerations of rainfall and hydrology associated with South Creek-West Creek flood regimes and the cumulative impact of the BHP Billiton's Outer Harbour Development Project (the project) and the Port Hedland Port Authority's, Boodarie - Outer Harbour Stockyards and Industrial Area proposal are not apparent.	A combined storm and flood study is currently being undertaken for the proposed development area. The study will take into account all known infrastructure that is to be built in the area, including that of other proponents. Allowances for sea level rise are also being considered as part of this study.
Environmental Factor – Intertidal and Subtidal Benthic Primary Producer Habitat			
Port Hedland Community Progress Association Inc	6.5	Spoilbank protection: This is a sand bank area of several kilometres length that was created perpendicular to the beach near the centre of town in the 1960s. The sand is moving towards the beach and is covering the reef. These needs to be reversed urgently [and] one way to do that would be to re-open the channel between the spoil bank and the shore to allow for natural flow of water to carry the silt through to a natural conclusion. A bridge could be put in place to allow access and reduce the amount of silt clogging the reef.	BHP Billiton has made significant investments into the community in line with priorities identified by the Town of Port Hedland and those captured within the Hedlands' Future Today (Blueprint) document. The spoil bank has not been prioritised by the Town of Port Hedland and therefore has not been considered for investment by BHP Billiton. BHP Billiton does not consider the Outer Harbour Development proposal to be the appropriate vehicle for addressing this issue.
OEPA	11.1	A section explaining the threshold values in the draft Dredging and Spoil Disposal Management and Monitoring Plan, (on page 58) is contradicted by the definition in Table 5.6 on page 59. Could the proponent confirm that Table 5.6 is correct and that thresholds are as defined in that table.	Section 5.3 of the Dredging and Spoil Disposal Management and Monitoring Plan (Management Plan 4) has been reconciled so that the content of the text and tables provide consistent information.
OEPA	11.2	Predicted loss in the context of the assigned Local Assessment Unit (LAU). Further consultation is required with the OEPA to ensure that the LAU (Section 10 PER) used by the proponent is consistent with the proposed Inner Harbour LAU developed by the OEPA. It is not expected that any change to the LAU will materially affect the extent of predicted irreversible losses of BPPH in Port Hedland Harbour.	Noted. The Port Hedland Industrial Local Assessment Unit has been used throughout the most recent (2011) intertidal and subtidal impact assessment processes.
OEPA	11.3	Habitat maps and maps showing LAUs and Impact Zones (Section 10 PER). The OEPA requires spatial data describing the extent and distribution of mapped benthic habitat, LAUs and impact zone boundaries.	Requested spatial data has been provided to the OEPA. Figure 10.1 (Appendix 7) has been amended to include the areas adjacent to shipping channels and the jetty as High Ecological Protection Areas consistent with the Department of Environment Marine Series Report No. 1 (2006).
OEPA	11.4	Appendix A3 (Dredge and Dredge Spoil Disposal Management Plan, Section 7.1.5.4, page 69. And page 66, Table 7.4) defines the Zone of Moderate Impact (ZoMI) as "up to 50% averaged net community cover change". The PER describes the ZoMI in terms similar to those used in EPA's Environmental Assessment Guideline No.7, Marine Dredging Proposals (EAG No 7)(page 10-43). The proponent is requested to reconcile this discrepancy within the PER document to ensure that a consistent approach is adopted.	The wording and descriptions of the zones of impact and influence have been made consistent within the Dredge and Dredge Spoil Disposal Management Plan (Management Plan 4).
OEPA	11.5	The PER provides limited information on seasonal variation in seagrass and macro algae distribution within State waters potentially impacted by the proposed development. Further, the adequacy of BPPH mapping of ephemeral BPPH, seagrass and macroalgae and the level of confidence in the estimates of seagrass and macroalgal community extent and distribution in the study area needs to be addressed further. The SKM "Attachment 3" notes that seagrass is ephemeral and "survival is linked closely to light availability". Based on current knowledge about subtidal seagrasses in WAs tropics, it is likely that above ground biomass of ephemeral seagrass (eg. from the Genus Halophila) will peak towards the end of the dry season (eg. in November/ December), prior to wet season tropical lows and cyclones. However, in State waters there have only been 3 towed video transects within LAU 8 and this was done during winter (July 2007), off shore from Finucane Island. These transects were carried out in	The habitat map is effectively a probability map based on a combination of substrate type and biota distribution. As detailed in the Marine Benthic Habitat Survey Report, the distribution of BPPH, BPP and non-BPP were predicted with a high level of accuracy, ranging from 82% (invertebrates) to 97% (hard substrate) for the different habitat and biota classes. BHP Billiton considers that this is the most sophisticated and detailed habitat mapping exercise undertaken along the Pilbara coast to date. With respect to seagrass, the attached technical note summarises the surveys that have been undertaken including locations and seasonal timing. The benthic habitat at over 700 locations on variable substrates spread throughout the study area has been surveyed using a variety of techniques. Seagrass has only been detected in protected embayments and on the margin of islands, specifically: <ul style="list-style-type: none"> • 85 ha of <i>H. ovalis</i> at low (5 – 25% cover) to medium (25 – 50% cover) densities in the embayment between Weerde and Downes Island • approximately 0.0025 ha of low density <i>H. decipiens</i> offshore of Weerde Island • approximately 0.0025 ha of low density <i>H. ovalis</i> offshore of North Turtle Island • small (≤ 0.0005 ha), low density stands of <i>T. hemprichii</i> and <i>H. uninervis</i> at Hunt Point.

		<p>the dry season following a wet season in which 3 cyclones passed close to Port Hedland). Also, while a large number of spot dives were carried out in LAU 8 in the area to be dredged, none were conducted in areas that are predicted to be impacted by sedimentation. These limitations in benthic surveys expose uncertainty in terms of the extent and distribution of benthic habitat types, (seagrass and macro algae) which in turn raises issues regarding the level of confidence that can be placed in predictions of impact to these habitats and key biota which are liked ecologically to these (e.g. dugong and turtles).</p> <p>Can the proponent comment on the level of confidence that can reasonably be assigned to the habitat mapping within state waters and in particular for LAU 8?</p>	<p>To further investigate the seasonal aspects of seagrass within the study area, BHP Billiton will:</p> <ul style="list-style-type: none"> Establish a seagrass monitoring site near Werdee Island as part of the ongoing sub-tidal habitats monitoring program, this is timed to ensure surveys occur across all seasons. This site will be monitored on a monthly basis via towed video. Conduct further opportunistic surveys for areas that may contain seagrass around Little Turtle and/or North Turtle Islands. These surveys will be undertaken during the ongoing sub-tidal habitats monitoring program and will commence in September 2011. Depending on the findings of these surveys, an additional seagrass monitoring site may be established in this area. <p>BHP Billiton is confident the habitat mapping inside LAU 8 undertaken to date is an accurate reflection of the areas of habitat and associated biological communities that were present inside LAU 8 at the time of the mapping exercise. The ongoing monthly subtidal habitat surveys will provide an assessment of the likely variability in habitat areas and associated communities through space and time. Towed video data will be collected during upcoming surveys associated with the ongoing sub-tidal monitoring program which is informing the design of the sub-tidal monitoring program, and post impact surveys, in conjunction with the dredge plume modelling. Video transects will focus on the limestone ridges that are predicted within the habitat modelling to potentially contain benthos. This data will be used to further ground-truth the habitat modelling as appropriate.</p>																						
OEPA	11.6	<p>Loss of BPPH in the ZoMI and alignment with EPA guidance principles. The fundamental principle that should be applied where assigning impacts to the ZoMI is that the impacts are reversible (i.e. recovery predicted with 5 years). The proponent is asked to confirm that this principle has been applied and provide a technical rational supporting its prediction.</p>	<p>The principle of recovery within five years has been applied. The assessment that impacts will be reversible is based upon the following observations made by Sinclair Knight Merz during baseline habitat surveys in 2009:</p> <p>Physical characteristics:</p> <ul style="list-style-type: none"> Sites where impacts have been predicted are shallow waters, exposed coastline, high tidal range suggesting high wave energy environment at least seasonally. This is borne out by presence of coarse mobile sands. Evidence that large areas of hard substrate are buried and exposed on cyclical basis, likely also to be scoured by mobile sands during cyclones. <p>Biological communities:</p> <ul style="list-style-type: none"> Coverage of habitat by benthic community is sparse, and highly variable through space and time (see physical characteristics for explanation). Species of corals are fast growing, and size/growth estimates show most are <5 years old. Components of benthos such as sponges and soft corals may be slower growing but are more resilient to sediment/ Total Suspended Solids (TSS) pressures. Macroalgae, turf algae are seasonally abundant and highly variable interannually. <p>Evidence of high turnover rates and fast growth of corals coupled with low abundance and cover strongly indicates recovery to existing levels of cover will be fast, inside five years (Appendix 10). Evidence of mobility of sands and coarse nature of sands suggests that any fines depositing at these sites will be remobilised into the water column swiftly; the grades of material that could be capable of smothering these sites for a protracted period of time will fall out of suspension far closer to the dredge.</p>																						
OEPA	11.7	<p>The quote from the PER: “the Zone of High Impact (ZoHI) is predicted to experience 100% coral loss if at any stage during the dredging program there is one period of four consecutive “no light” fortnights; and The ZoMI is predicted to experience 0% coral loss if at any stage during the dredging program there is one period of four consecutive “low light” fortnights. It is not clear how cumulative light reduction has been dealt with. For example if an area is subject to alternative periods of 2 fortnights of “low light” followed by 2 consecutive fortnights of “no light”, it is unclear what zone would those communities be assigned to.</p> <p>The proponent is requested to provide more clear explanation of the application of these thresholds and also discuss how cumulative light stress has been addressed.</p>	<p>The revised Water Quality Thresholds report has been provided in Appendix 11. The thresholds approach has been modified to allow for the cumulative effect of light reduction on BPP as follows:</p> <table border="1"> <thead> <tr> <th>Effect</th> <th>Zone</th> <th>Intensity</th> <th>Duration*</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Lethal</td> <td>Inshore and LTI</td> <td rowspan="2">1% Surface Irradiance (SI) at benthos</td> <td rowspan="6">All daylight</td> <td>>40 days in a 60 day period</td> </tr> <tr> <td>Offshore</td> <td>>7 days in a 20 day period</td> </tr> <tr> <td rowspan="2">Sub-lethal</td> <td>Inshore and LTI</td> <td rowspan="2">Less than 15% SI at benthos</td> <td>>40 days in a 60 day period</td> </tr> <tr> <td>Offshore</td> <td>>7 days in a 20 day period</td> </tr> <tr> <td>No measurable change</td> <td>All zones</td> <td>Not more than 5 mg/L above background</td> <td>>8 consecutive days</td> </tr> </tbody> </table> <p>*Refers to 10 daylight hours (0800 – 1800) LTI = Little Turtle Island State waters = Inshore and LTI</p> <p>The intensity-duration-frequency thresholds are evaluated against the dredge plume modelling outputs to identify areas that experience lethal, sub-lethal and no measurable effects and are used to define the Zones of High Impact, Moderate Impact and Influence. The approach of using ‘x days in a y day period’ moves away from the ‘number of consecutive fortnights’ duration and frequency and also standardises the duration (i.e. all daylight) across all zones.</p> <p>The Zone of High Impact will include both those areas of direct removal or destruction of BPPH from the dredging and construction footprint (considered to be irreversible) and indirect losses of BPP from the lethal effect of reduced light defined using the thresholds. No losses are predicted to occur in the Zone of Moderate Impact.</p> <p>The cumulative threshold approach is conservative. The literature has indicated that cumulative and complete fortnights (3 consecutive) are considered necessary to produce an impact on coral mortality. The ‘40 days in a 60 day period’ frequency applied to the Inshore and LTI zones is considered to be conservative, as it has entailed reducing the total number of days of stress (resulting from low light conditions) from 42 (i.e. 3 x 14 days) to 40 and extended the total number of days over which cumulative stress would be calculated to 60</p>	Effect	Zone	Intensity	Duration*	Frequency	Lethal	Inshore and LTI	1% Surface Irradiance (SI) at benthos	All daylight	>40 days in a 60 day period	Offshore	>7 days in a 20 day period	Sub-lethal	Inshore and LTI	Less than 15% SI at benthos	>40 days in a 60 day period	Offshore	>7 days in a 20 day period	No measurable change	All zones	Not more than 5 mg/L above background	>8 consecutive days
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No measurable change	All zones	Not more than 5 mg/L above background		>8 consecutive days																					

			(from 42). As there is some <i>Acropora</i> sp. in the Offshore zone (Commonwealth waters), the literature on its tolerances has been used to derive an estimate for this zone. The setting of 7 days in a 20 day period also reflects some evidence from a current dredging program which has recorded mortality in sensitive corals at this frequency. The thresholds no longer attempt to define a percent of predicted mortality. Recent evidence from current dredge monitoring programs is demonstrating very clearly this is not possible with any degree of certainty and therefore should be avoided.
OEPA	11.8	The predicted loss of BPPH in LAU8 due to the proposal has been calculated >40% and the cumulative loss of BPPH in the same LAU is estimated to be in excess of 50%. The proponent should clarify whether these loss estimates are based on BPPH loss only or include losses of both BPPH as well as non-BPPH types and Clarification of BPPH loss in LAU 8 is required. Further, BPPH and non-BPPH should not be combined. The proponent should also provide an analysis to the OEPA, based on the benthic habitat data it has acquired to calculate the cumulative loss of each of the different BPPH types that have been mapped in the LAU.	BHP Billiton understands BPPH to be benthic primary producer habitat as defined in EAG No.3 (EPA 2009, 3): ' <i>Benthic primary producer habitats are functional ecological communities that inhabit the seabed within which algae..., seagrass, mangroves, corals or mixtures of these groups are prominent components. Benthic primary producer habitats also include areas of seabed that can support these communities.</i> ' Cumulative losses for LAU8 have been calculated as per EAG No.3 to include historical, direct and indirect losses. BPPH in the proposed Outer Harbour Development area has been defined as hard substrate areas supporting benthic biota in alignment with the section cited, and is very distinctive in the benthic habitat map as this BPPH is associated with limestone ridgelines that are clearly discernible. The high percentages are a function of the loss calculation approach in that the total BPPH is calculated for the LAU and the proposed plus historical losses are divided by the total. Because the total BPPH areas are small to start with, the proposed losses are seemingly high. The losses are included in the Subtidal BPPH Impact Assessment (Appendix 12)
OEPA	11.9	Potential ecological consequences of BPPH loss in LAU 8. For any estimate of cumulative loss of BPPH that significantly exceeds the relevant cumulative loss guideline, the proponent is expected to provide a technically robust case regarding the potential consequences of that loss for ecological integrity of the LAU. This information is required in order for the EPA to make a judgment about the environmental acceptability of the loss.	LiDAR mapping offshore from Port Hedland indicates low relief ridgelines extending along the entire extent of the coastline from North Turtle Island in the north-east to beyond Cape Thouin in the south-west (SKM 2009). The ridgelines extend well beyond the extent of the mapping, which implies a uniform ecosystem composed of parallel ridge lines extending for hundreds of kilometres. The ecological significance of estimated hard coral losses is minimal, based on the observations that: <ul style="list-style-type: none"> the direct losses of BPPH associated with the marine infrastructure represent a very small fraction of the total BPPH of this type in the Port Hedland region; any areas in which indirect losses occur are expected to be rapidly recolonised because the supply of coral recruits through the extensive representation of this benthic community and habitat will be available; from a regional perspective, the species richness of coral taxa in the area affected is very low in comparison to elsewhere in the Pilbara region. In addition, these coral communities do not appear to contain endemic species and are not considered to be regionally significant coral communities with high preservation values; and there is little evidence of carbonate accretion onto the tops of the limestone ridges on which the coral communities are found, suggesting that the extreme metocean conditions the coral communities experience during the seasonal storms and frequent cyclones that occur in this area are likely responsible for the observed low diversity, relatively small colonies and low percent cover of coral.
OEPA	11.10	With regard to the loss of BPPH in LAU 8, of particular note is the band of habitat (marked on figure 10.28) that traverse LAU 8 from west to east in a ridge where the bathymetry dips from very shallow water inshore to water of 3 to 5 m depth. The habitat includes hard and soft coral, macro invertebrates, macro algae and sponge habitat. Figure 10.28 shows the ZoHI running adjacent to the ridge and at a location near the shipping channel across the ridge of habitat, however most of the ridge is predicted to be un-impacted by the development, lying in the zone of influence (figure 10.25). Figure 10.25, read with Figure 10.28, indicates that the portion of the inshore ridge that is within the ZoHI lies directly adjacent to areas that are shown to be in the zone of influence (wet season extent). Is it correct that there is no zone of moderate impact predicted for an area between the ZoHI and the Zol for the habitat ridge in 3 to 5 m on Figure 10.28. If so, explain in clear terms how this prediction was generated. What are the monitoring and management actions that the proponent intends to take to avoid impact to the habitat outside of the ZoHI along this inshore ridge of habitat.	The dredge plume modelling output will be interrogated with a set of revised thresholds (see response to 11.7), which are in Appendix 11, based on consultation with the OEPA. Revised zones of impact will be generated in accordance with EAG No. 7. The proposed monitoring and management actions to avoid impact to the habitats in the Zone of Influence will be detailed in the revised DSDMP (Management Plan 4).
OEPA	11.15	Application of impact avoidance and minimisation and best practice. In accordance with in EPA's Environmental Assessment Guideline No.3, Protection of Benthic Primary Producer Habitat in Western Australia's Marine Environment (EAG No.3) the proponent should discuss the application of impact avoidance and minimisation, and best practice principles in the context of its proposal. In particular, alternative designs for the proposed causeway across West Creek should be discussed.	BHP Billiton's reference case for the West creek crossing is the construction of a causeway. The causeway footprint and potential impact to mangroves has been minimised by: <ul style="list-style-type: none"> - reducing the proposed infrastructure corridor from 150 m to 80 m width, and - planning construction of the corridor from end-to-end, thereby reducing the footprint to only the embankments and the conveyor/road corridor. West Creek is already a disturbed environment. The building of the original causeway to Finucane Island created a barrier to the tidal flows that kept West Creek channel open. Since the construction of the current causeway the area alongside (on both sides) is silting up and is now full of very fine material that ordinarily would have been flushed away by the normal tidal flows in this large channel. The area of siltation is slowly extending

			<p>westward away from the causeway and down the channel. Eventually the elevation of the substrate near the causeway is likely to reach a point where it can be colonised by mangroves and it will then be encroached upon by mangroves. It is anticipated that the proposed causeway with culverts will accelerate sedimentation and colonisation by mangroves.</p> <p>The likely outcome then, as long as sufficient ebb and flow of tide is permitted through culvert design and position will be to increase the area of mangrove within the area between the existing and proposed causeways. The ebb tide flow of water is the key driver as it needs to be strong enough to maintain all channels across the tidal flats, and that is why we have identified the need for smaller culverts up on the tidal flats where some channels are cut by the proposed causeway.</p> <p>BHP Billiton has undertaken a tidal flushing study, and commits to maintaining the tidal flows upstream of the proposed corridor.</p> <p>BHP Billiton Iron Ore have prepared a summary of best practicable approach to dredging that has been adopted during the engineering and design of this project – Appendix 14.</p> <p>A summary of key on-site mitigation measures (Avoid, Minimise, Rectify and Reduce) and the residual impact is included in Appendix 16.</p>
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OEPA	11.16	<p>Regarding the estimated irreversible loss of mangroves, the worst case scenario for the Port Hedland Outer Harbour project is predicted to cause the loss of 27 ha of mangroves. The PER calculates historical loss of mangrove on the basis of an analysis of mangrove distribution in 1963 compared with 2008. This approach gives a cumulative loss assessment of 5.7%.</p> <p>The proponent should also produce an estimate, based on the most contemporary relevant data, of the irreversible losses of mangrove BPPHs that have occurred in the Port Hedland LAU in accordance with EAG No.3.</p>	<p>Estimates based on Guidance Statement 1, using the 1963 estimate is shown in table below.</p> <p>Cumulative Loss of Mangrove BPPH in Port Hedland Industrial Area Management Unit assuming no recruitment since 1963</p> <table border="1" data-bbox="1270 346 2392 1045"> <thead> <tr> <th>Management Unit</th> <th>1963 mangrove extent⁽¹⁾</th> <th>2008 mangrove extent⁽⁶⁾</th> <th>Historical losses assuming no recruitment</th> <th>Cumulative losses (%)</th> </tr> </thead> <tbody> <tr> <td>Port Hedland Industrial Area (154.3 km²)</td> <td>2699 ha</td> <td>2640 ha</td> <td>Area of 385.95 ha <i>lost</i> due to existing and approved developments: BHP East Creek – 155.7 ha⁽¹⁾ Cargill Salt facility – 146.3 ha⁽¹⁾ FMG Stage A – 14.8 ha⁽²⁾ FMG 3rd Berth – 0.05 ha⁽³⁾ PHPA Utah Point – 18.6 ha⁽⁴⁾ BHPBIO RGP 5 – 6.5 ha⁽⁵⁾ BHPBIO RGP 6 – 4.0 ha⁽⁶⁾ PHPA South West Creek - 40.0 ha⁽⁷⁾</td> <td>14.2</td> </tr> <tr> <td>Port Hedland Industrial Area (154.3 km²)</td> <td>2699 ha</td> <td></td> <td><i>Assuming no gains since 1963</i> <i>Worst-case loss scenario:</i> Port Hedland Outer Harbour Development net loss of 385.95 + 29.5 ha = 415.45 ha</td> <td>15.4</td> </tr> </tbody> </table>	Management Unit	1963 mangrove extent ⁽¹⁾	2008 mangrove extent ⁽⁶⁾	Historical losses assuming no recruitment	Cumulative losses (%)	Port Hedland Industrial Area (154.3 km ²)	2699 ha	2640 ha	Area of 385.95 ha <i>lost</i> due to existing and approved developments: BHP East Creek – 155.7 ha ⁽¹⁾ Cargill Salt facility – 146.3 ha ⁽¹⁾ FMG Stage A – 14.8 ha ⁽²⁾ FMG 3rd Berth – 0.05 ha ⁽³⁾ PHPA Utah Point – 18.6 ha ⁽⁴⁾ BHPBIO RGP 5 – 6.5 ha ⁽⁵⁾ BHPBIO RGP 6 – 4.0 ha ⁽⁶⁾ PHPA South West Creek - 40.0 ha ⁽⁷⁾	14.2	Port Hedland Industrial Area (154.3 km ²)	2699 ha		<i>Assuming no gains since 1963</i> <i>Worst-case loss scenario:</i> Port Hedland Outer Harbour Development net loss of 385.95 + 29.5 ha = 415.45 ha	15.4
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OEPA	11.17	<p>Potential impact to mangrove areas subject to EPA's Guidance Statement No. 1, Guidance Statement for Protection of Tropical Arid Zone, Mangroves Along the Pilbara Coastline (EPA Guidance Statement No.1). The PER is unclear whether impacts to mangroves are predicted in Guideline 1 areas identified in EPA Guidance Statement No.1. Noting the EPA's objective for these important areas, the proponent should clarify whether potential impacts to mangroves are predicted in EPA Guidance Statement No.1 areas.</p>	<p>The closest regionally significant area of mangroves identified under Guidance Statement No.1 is the Oyster Passage Barrier area (reference number 21). This area will not be impacted by the proposed development.</p> <p>Dredge plume modelling shows that there is no sedimentation within the Oyster Passage Barrier area. The total volume of material likely to be deposited along the coastline is small relative to the total volume of material that is likely to be mobilised by natural physical processes along the coast. The distance from the site of dredge operations means the particles reaching these areas are small, and therefore are unlikely to settle, or in the event of settling, remain in the area. In the event there is some sedimentation in the Oyster Passage Barrier area then it is not predicted to be of a volume that would pose a risk to mangroves. Sedimentation events need to be of magnitudes of tens of centimetres in depth and acute in order to cause sufficient burial of pneumatophores and cause stress and/or death. The Intertidal BPPH Impact Assessment and Mangrove Management Plan are in Appendix 13, and Management Plan 5 respectively.</p>															
Environmental Factor – Hydrodynamics and Coastal Processes																		
Robin Chapple MLC	7.4	Impacts of potential sea rise associated with climate change seem to be underestimated given current CSIRO projections.	A combined storm and flood study is currently being undertaken for the proposed development area. The study will take into account all known infrastructure that is to be built in the area, including that of other proponents. Allowances for sea level rise are also being considered as part of this study.															
Robin Chapple MLC	7.7	It should be noted that whilst there are projections for storm surge and a one in one hundred year flood event, no modelling has married the combined and possible impact of the two occurring at the same time (Bureau of Meteorology 1995).	A combined storm and flood study is currently being undertaken for the proposed development area. The study will take into account sea level and all known existing and proposed infrastructure, including that of other proponents. The risk to proposed Outer Harbour Development infrastructure will be assessed as part of this study.															
Robin Chapple MLC	7.8	Because of the low lying area of all the proposed industry within the land vested in the Port Hedland Port Authority's Boodarie Industrial Estate and the requirements of significant fill and armouring associated with such development to deal with current and projected storm surge events, that no further development of land for industry plant be allowed within the boundaries of the Boodarie Industrial Estate that are below the current 10 AHD, and all such developments be placed on land that has a topographic base of at least 10 meters AHD.																
Robin Chapple MLC	7.9	Whilst an effort to provide site specific security via diversions, no consideration is given to the potential diverted cumulative flood impacts on the Wedgefield light Industrial Area, South Hedland or even the current or	BHP Billiton's proposed Outer Harbour Development has been planned and designed, having regard for the Ultimate Development Plan developed with the Port Hedland Port Authority and Town of Port Hedland, and in full contemplation of other proposed developments in the area, including the Port Hedland Port Authority's Boodarie - Outer Harbour Stockyards project and Roy Hill Iron Ore's project. During															

		proposed Finucane road or rail reserves. Again these issues of the cumulative effect of all the barrier impacts of rail on infrastructure of both the BHP Billiton's Outer Harbour Development Project (the project) and the Port Hedland Port Authority's, Boodarie - Outer Harbour Stockyards and Industrial Area proposal seem not have been considered.	2010, the Department of Transport led a multi-agency process to ensure effective integration of projects in the Port Hedland area. A combined storm and flood study is currently being undertaken for the proposed development area. The study will take into account all known infrastructure that is to be built in the area, including that of other proponents. Allowances for sea level rise are also being considered as part of this study.
Robin Chapple MLC	7.10	There has been no analysis of the combined [flooding] effects of the BHP Billiton's Outer Harbour Development Project (the project) and the Port Hedland Port Authority's, Boodarie-Outer Harbour Stockyards and Industrial Area proposal or its roads, rail transport corridors, the current power plant and other developments in the harbour or proposed for the Boodarie Heavy Industrial Site.	A combined storm and flood study is currently being undertaken for the proposed development area. The study will take into account all known infrastructure that is to be built in the area, including that of other proponents. Allowances for sea level rise are also being considered as part of this study.
Robin Chapple MLC	7.11	Because of the low lying area of all the proposed industry within the land vested in the Port Hedland Port Authority's Boodarie Industrial Estate and the requirements of significant fill associated with such a development, that the impediments to the flood out regime associated with South and South West Creeks are so great as to place the residents of South Hedland at unacceptable risk, that no further development of the land for industry plant be allowed within the boundaries of the Port Hedland Port Authority's Boodarie Industrial Estate and all such developments be placed on land that has a topographic base of at least 10 meters AHD.	
Robin Chapple MLC	7.12	Because the impacts of climate change would place this area under extreme risk from sea level rise in the low lying area of all proposed industry within the land vested in the Port Hedland Port Authority, including both the BHP Billiton's Outer Harbour Development Project (the project) and the Port Hedland Port Authority's Boodarie - Outer harbour Stockyards and Industrial Area proposal, that no further development of land for industrial plant be allowed within the boundaries of the Port Hedland Port Authority's Boodarie Industrial Estate, until such time as these impacts have been addressed and quantified by CSIRO.	
Environmental Factor – Non-endemic Marine Species			
Le Mer Pty Ltd	5.6	We feel that having a significant increase in the ballast water discharged in the outer harbour will increase the risk of pest organisms and/or pathogens affecting the lease. This is especially the case given the strong tidal movements in the area. We request clarity on the level of monitoring for pest organisms and/or pathogens which BHP Billiton will carry out, how these will be conveyed to stakeholders such as ourselves, and what if any management actions can be taken if there is any detection.	The management of the risk associated with invasive marine species will be managed via the Invasive Marine Species Management Plan (IMSMP). This plan details the management measures that will be applied to prevent introduction of invasive species including ballast water management, and has been included as Management Plan 6. All construction and operational vessels that have travelled internationally will be required to adhere to the Australian Quarantine and Inspection Service Mandatory Ballast Water Requirements. This means that all vessels with high risk ballast water (including all vessels from international waters) will be prohibited from discharging ballast water within 12 nautical miles of Australian waters. It should also be noted that starting in 2009, new ships are required to have on-board ballast water treatment systems in place. Between 2009 and 2016, existing ships will progressively (based on ballast water capacity) be required to have on-board ballast water treatment systems in place. From 2016, all ships will be required to have on-board treatment facilities.
WA FIC	9.3	WAFIC is also concerned that there will be an increase of marine vessel traffic in the region as a result of the proposal. This requires careful management to ensure that maritime safety standards are upheld and marine pest invasions are avoided.	The management of the risk associated with invasive marine species will be managed via the Invasive Marine Species Management Plan (IMSMP). This plan details the management measures that will be applied to prevent introduction of invasive species including ballast water management, and has been included as Management Plan 6. All construction and operational vessels that have travelled internationally will be required to adhere to the Australian Quarantine and Inspection Service Mandatory Ballast Water Requirements. This means that all vessels with high risk ballast water (including all vessels from international waters) will be prohibited from discharging ballast water within 12 nautical miles of Australian waters. It should also be noted that starting in 2009, new ships are required to have on-board ballast water treatment systems in place. Between 2009 and 2016, existing ships will progressively (based on ballast water capacity) be required to have on-board ballast water treatment systems in place. From 2016, all ships will be required to have on-board treatment facilities. In the event that known or suspected invasive marine species are identified on construction vessels (as detailed in the IMSMP), BHP Billiton will immediately report this to the relevant regulatory agencies and cooperate with that agency to determine appropriate response measures. Stakeholders will be kept informed of the results of invasive marine species monitoring and management. All construction and operational vessel movements will be coordinated through the Port Hedland Port Authority in accordance with relevant maritime safety standards.
Department	10.3	As noted within the document the Introduced Marine Species Management	This is correct. The ongoing management and mitigation of the risk of introduced marine pests will be in accordance with State and

of Fisheries		Plan (IMSMP) is only concerned with the development phase of this project and not with on-going management and mitigation of the risk of introduced marine pests.	Commonwealth legislation and guidelines.
Department of Fisheries	10.4	Appendix 5 2.6 p8 NIMPCG don't exist anymore; now it's the Marine Pest Sectoral Committee.	The Invasive Marine Species Management Plan (Management Plan 6) has been updated to reflect this change.
Department of Fisheries	10.5	Appendix 5 3.1 p9 First sentence - this is incorrect. The sentence describes introduced species - invasive species not only survive in a new environment, but also negatively impact that environment or other species.	The Invasive Marine Species Management Plan (Management Plan 6) has been updated to correct this statement.
Department of Fisheries	10.6	Appendix 5 7.1 p25 IMS inspections: With regards to all vessel/immersion equipment inspections, reports should be provided to DoF. They state the inspection shall be undertaken within 7 days of the final vessel departure for the IMSMA. DoF considers that inspection should be undertaken within 72 hrs of final vessel departure for the IMSMA. Similarly, the duration at any one supply port visited en route to the IMSMA should not exceed 72 hrs (this is stipulated as 7 days in the document).	BHP Billiton accepts this recommendation and have updated the Invasive Marine Species Management Plan (Management Plan 6) accordingly.
Department of Fisheries	10.7	Appendix 5 Figures 6.1, 6.2 and 6.3 pp19 - 21 The intent of these figures still suggests that the risk assessment and management plan are most likely to be applied to dredges and associated vessels/equipment. This contradicts the Scope (Section 1.5), which states that it will be applied to all construction vessels associated with the development. DoF considers that the above should be applied to all vessels mobilising to the project, not just dredging and dredging support vessels.	The intent is to apply the risk assessment and management plan to all vessels mobilising during the construction phase. The Invasive Marine Species Management Plan (Management Plan 6) will be updated accordingly.
Environmental Factor – Air Quality – Greenhouse Gas			
Port Hedland Port Authority	2.4	Section 8.2 addresses estimates of greenhouse gas emissions from the proposal however it is unclear whether these estimates include emissions from increased ship, tug and small vessel movements associated with the operation of the facility.	Estimates provided in the PER/Draft EIS do not include emissions from ship, tug and small vessel movements associated with the operation of the facility.
Environmental Factor – Groundwater and Surface Water Quality			
DEC	8.19	The proponent should consider implementing a groundwater monitoring program for the detection of negative impacts to groundwater as a result of contamination from hydrocarbons in the project area.	BHP Billiton already undertakes groundwater monitoring at the Boodarie site as part of the existing HBI facilities. BHP Billiton will implement a groundwater monitoring programme in accordance with Department of Water licensing to support the dewatering of the car dumpers.
Environmental Factor – Solid and Liquid Waste Disposal			
Town of Port Hedland	1.3	The dumping of dredged spoil is an issue we would like to see revised. Port Hedland, as part of its growth, needs a significant amount of fill to create residential land. We appreciate some of the dredged spoil is not suitable for fill given acid sulphate soils and this is much cheaper to dispose of the spoil at sea, however, it may be worth further exploring the opportunity to use some of this spoil as fill for residential development.	Investigations into the onshore disposal of dredged material have demonstrated that this is not a viable option due to a range of factors including: potential increased impacts on water quality and turbidity; logistical, economic and environmental challenges; and the limited portion of material that would be suitable for use as fill.
Port Hedland Port Authority	2.5	Sections 8.3 Marine Discharges and Section 8.4 General Waste deal with discharges and waste from the operation of the facility. It is unclear whether BHPBIO has considered ships waste in the proposal and how these wastes will be managed. Sewage is identified however other wastes such as quarantine wastes are not (Table 8.9 does not list quarantine wastes as a waste category)	Solid and liquid wastes, including quarantine wastes, from all vessels will be discharged ashore for disposal by registered waste disposal contractor(s) in accordance with relevant regulatory requirements.
Le Mer Pty Ltd	5.7	We note that BHP Billiton has plans in place for the safe removal of solid and liquid waste from the structures. We note that this issue is of significant concern to us, especially the safe removal of sewage. We would request that we be kept informed of any significant changes to the existing proposals.	Noted. BHP Billiton will continue to engage with Le Mer Pty Ltd and their consultants.

Le Mer Pty Ltd	5.8	We note that the documentation (perhaps inadvertently) notes the potential for the discharge of sewage from vessels in waters outside 12 nautical miles as per MARPOL regulations. While we acknowledge that this is legal, we would request that BHP rule out this an option. The documentation notes that the tidal influence in the area can result in a dispersal range of approximately 10 nautical miles. We also note that the continental shelf in the area is significantly more than 12 nautical miles off shore. As such waters at or near 12 nautical miles in the area under consideration are more akin to being "local" rather than being "off shore".	Section 8.5.3 of the PER/Draft EIS states, "Sewage from dredging or support vessels will be either discharged outside of Western Australia Coastal Waters (>12 nautical miles) in accordance with MARPOL Convention 1973/1978 and the Protection of the Sea (Prevention of Pollution from Ships) Act 1983, or will be contained and taken onshore for treatment by the onsite facilities or a licensed contractor." BHP Billiton confirms that the dredging and support vessels will not dispose of any sewage which is not treated. Sewage will be treated with an International Maritime Organisation compliant sewage treatment system prior to any discharge.
OEPA	11.12	No waste discharges to sea are proposed. As no waste discharges are proposed none would be approved under this assessment process. Any future release to the marine environment would require separate assessment.	Dewatering is likely to be required during excavation and construction activities associated with car dumpers. Reuse options for this water will be evaluated, however if disposal of part or all the water is required, water will be discharged in accordance with guidelines into Salmon Creek. The impact assessment and associated modelling reports are included in Appendix 6.
Environmental Factor - Fisheries			
Western Australian Fishing Industry Council	9.1	WAFIC has concerns about the Proposal's impacts to intersecting fisheries commercial fishing operations as well as subsequent cumulative impacts on the marine environment arising from an array of developments in the Pilbara region. Intersecting commercial fisheries which may be affected include: - pearling and aquaculture operations; - marine aquarium; - specimen shell; - Pilbara Developmental Crab - Pilbara Wetline, Trap, and Trawl; and - Mackerel	As noted in Section 11.9.4 of the PER/Draft EIS, the operational areas of the commercial fisheries are located considerable distances from the activities associated with the proposed Outer Harbour Development: <ul style="list-style-type: none">- The Pilbara Demersal Finfish Fisheries are located offshore beyond the 30 m depth contour (50 m for the Trawl Fishery), and are approximately 16 km from the activities associated with the proposed Outer Harbour Development (Department of Fisheries (DoF) 2008).- Mackerel in the Port Hedland area are commercially targeted 75 to 100 km offshore, primarily over shoal/reef areas in depths of 50 to 60 m of water (DoF 2008). There is one pearl oyster aquaculture lease close to the proposed Outer Harbour Development located between Weerde and Downes Islands. This lease could be affected by increased levels of suspended sediments. BHP Billiton is continuing to engage with the owners of this lease, with respect to potential impacts, monitoring and management.
Western Australian Fishing Industry Council	9.2	The proposal will preclude access to fishing areas and will have, at best, temporary impacts on fish habitats and fish stocks. Together, these factors may threaten the viability of some commercial fishing operations.	As noted in Section 11.9.4 of the PER/Draft EIS, the operational areas of the commercial fisheries are located considerable distances from the activities associated with the proposed Outer Harbour Development. The proposed Outer Harbour facilities and new navigation channel will be located within Port Hedland Port Authority (PHPA) port limits. Vessel operators including commercial fishing vessels will be required to comply with statutory legislation with respect to operating ports, as well as PHPA requirements. This is not expected to significantly impact on access of commercial fishers to previously accessible fishing areas as the proposed Outer Harbour facilities will be located in State waters, close to shore and in an area that is currently shallow water. The new navigational channel has been aligned so that it mirrors the existing shipping channel, and as such should not significantly affect accessibility to commercial fisheries. Increased suspended sediment levels will occur during the dredging and spoil disposal operations. It is not expected that ongoing increased levels of suspended sediments will occur once dredging and spoil disposal activities are completed. Section 11.9 of the PER/Draft EIS details expected impacts on commercial fisheries. Section 10.1 and 10.3 of the PER/Draft EIS details the predicted levels of suspended sediments during the dredging and spoil disposal operations. As detailed within the PER/Draft EIS, the operation areas for the four commercial fisheries are located considerable distances from the proposed Outer Harbour Development. Significant increases in the suspended sediments are not expected to frequently extend into the operation areas of these fisheries and as such they are not expected to be significantly impacted.
Western Australian Fishing Industry Council	9.5	It is difficult to estimate to what extent intersecting and adjacent commercial fishing operations will be affected by the proposal. The proponent should work closely with the relevant commercial fishing, pearling and aquaculture interest holders with view to undertaking a rigorous assessment of any potential impacts. The Proponent should also accept responsibility for compensating any adversely affected fishing and related businesses.	As noted in Section 11.9.4 of the PER/Draft EIS, the operational areas of the commercial fisheries are located considerable distances from the activities associated with the proposed Outer Harbour Development: <ul style="list-style-type: none">- The Pilbara Demersal Finfish Fisheries are located offshore beyond the 30 m depth contour (50 m for the Trawl Fishery), and are approximately 16 km from the activities associated with the proposed Outer Harbour Development (Department of Fisheries (DoF) 2008).- Mackerel in the Port Hedland area are commercially targeted 75 to 100 km offshore, primarily over shoal/reef areas in depths of 50 to 60 m of water (DoF 2008). There is one pearl oyster aquaculture lease close to the proposed Outer Harbour Development located between Weerde and Downes Islands. This lease could be affected by increased levels of suspended sediments. BHP Billiton is continuing to engage with the owners of this lease, with respect to potential impacts, monitoring and management.
Department of Fisheries	10.1	It is understood that implementation of the proposal will result in the direct loss of approximately 64 hectares of benthic fish habitat. It is understood that proposed exclusion zones around the port and pipeline alignments will also restrict the access of commercial fishers to previously accessible	Section 10 of the PER/Draft EIS presents the direct loss of benthic primary producer habitat that will occur as a result of dredging. This direct loss includes 64.2 ha within Commonwealth waters and 7.6 ha within State waters. These losses are not expected to result in impacts at ecosystem level. Exclusion zones around the proposed Outer Harbour Development have not been proposed by BHP Billiton. The Outer Harbour facilities

		fishing areas.	and new navigation channel will be located within Port Hedland Port Authority (PHPA) port limits. Vessel operators including commercial fishing vessels will be required to comply with statutory legislation with respect to operating ports, as well as PHPA requirements. This is not expected to significantly impact on access of commercial fishers to previously accessible fishing areas as the Outer Harbour facilities will be located in State waters, close to shore and in an area that is currently shallow water. The new navigational channel has been aligned so that it mirrors the existing channel, and as such should not significantly effect accessibility to commercial fisheries. There is no pipeline proposed for the proposed Outer Harbour Development.
Department of Fisheries	10.2	It is understood that there is a long term plan to establish a population centre of up to 40,000 people on the hinterland adjacent to the Port. While the Department appreciates that the proponent has made a commitment to manage recreational fishing effort during the construction phase of the project, the details of this approach remain unclear.	Local angling and boating groups have been consulted as part of the environmental impact assessment process. Impacts on recreational fisheries will be localised and limited to the construction phase of the proposed development. Access to recreational areas accessed via both land and sea will be largely maintained during construction. Notwithstanding the area occupied by the proposed jetty and wharf, access to marine and shoreline recreational area will be maintained post construction. BHP Billiton will continue to work with the community as part of the ongoing consultation process to further understand the impacts the proposed Outer Harbour Development may have on recreational fishing and boating in the Hedland region and to consider options that will minimise the impacts of the proposed development on recreational marine activities.
Department of Fisheries	10.8	General comments Increased recreational fishing pressure. The potential increase in recreational fishing pressure as a result of additional workforce associated with this project should be included in the risk assessment. BHP Billiton should ensure that all staff and sub contractors are aware of DoF fishing regulations.	Local angling and boating groups have been consulted as part of the environmental impact assessment process. Impacts on recreational fisheries will be localised and limited to the construction phase of the proposed development. Access to recreational areas accessed via both land and sea will be largely maintained during construction. Notwithstanding the area occupied by the proposed jetty and wharf, access to marine and shoreline recreational area will be maintained post construction. BHP Billiton will continue to work with the community as part of the ongoing consultation process to further understand the impacts the proposed Outer Harbour Development may have on recreational fishing and boating in the Hedland region and to consider options that will minimise the impacts of the proposed development on recreational marine activities. BHP Billiton will provide information on responsible recreational fishing practices to its workforce.
Environmental Factor – Visual Amenity			
Environmental Factor – European Heritage			
Environmental Factor - Recreation			
Port Hedland Community Progress Association Inc	6.10	Port Hedland boasts the highest recreation boat ownership in Australia. Recreation and fishing sea vessels currently use the boat ramp close the harbour to access the sea. It is near the channel that is used for major sea liners. This is unsafe and requires a safe boat harbour to separate small recreation vessels from large ocean liners. Suggestion: Build a designated safe boat harbour for recreation and fishing industry 7.	This is a strategic matter for the State Government, Port Hedland Port Authority and the Town of Port Hedland. Separation of recreational and smaller commercial boats from industry-related shipping activity in both the harbour and the shipping channel is supported by BHP Billiton. BHP Billiton as one of many port users would be willing to participate in further discussions and initiatives that seek to achieve this aim in a considered manner.
Port Hedland Community Progress Association Inc	6.11	BHPB, lets build an industrial theme park with old mining equipment. It would encourage young people to stay in town and work in the mining industry and help locals and tourist understand the benefits and excitement of the mining industry. It would be down the spoilbank. Suggestion: Build and industrial theme park	BHP Billiton has made a range of investments in line with the Town of Port Hedland’s “Hedlands Future Today” (Blueprint) document. Likewise, BHP Billiton’s future priorities for community investment will be guided by the Town of Port Hedland’s priorities.
Environmental Factor - Decommissioning			
Department of Mines and Petroleum	4.2	The proposal does not detail how the proposed infrastructure would be decommissioned or whether the assets will be transferred to the State or another party should the infrastructure not be required in the future.	The wharf (or installations in the harbour), railway, housing at the port and things other than plant or removable buildings shall be kept in good operating condition and will become the property of the State in accordance with provisions of the Iron Ore (Mount Goldsworthy) Agreement Act 1964. Should BHP Billiton wish to remove the rolling stock, plant, equipment or buildings, the State must be notified in writing and given the option to purchase subject to valuation.
Environmental Factor - Hydrocarbons and Hazardous Materials			
Le Mer Pty Ltd	5.10	BHP Billiton’s documentation raises the prospect of uncontrolled spills of toxic material such as hydrocarbons, paint, anti-fouling agents and the like. This issue, especially the prospect of anti-fouling agents, is of particular concern to us which are very toxic to bi-valves. We would like to remain	BHP Billiton and relevant contractors will develop a spill prevention and response plan that will apply to all marine activities associated with the Outer Harbour Development. BHP Billiton will continue to engage with Le Mer Pty Ltd on the development of this plan.

		engaged with BHP Billiton to ensure that we are kept fully informed of the types of contingency plans which BHP may have in place.	
Other Issues Raised – Water Supply			
Town of Port Hedland	1.5	Water Corporation and the Department of Water balance the use of water by both industry and residential uses. The scale of this development might allow for more innovative solutions to be developed using non-potable water to irrigate stockpiles to reduce the usage of potable water for this use.	BHP Billiton is currently exploring options for additional potable and non-potable water supply in conjunction with Water Corporation and the Department of Water to meet future industrial and residential requirements for water at Port Hedland. A non-potable water source for stockpile irrigation and construction water supply is supported by BHP Billiton. BHP Billiton continues to work with Iron Ore customers to understand their requirements and the relevant processing tolerances of using a non-potable water source for dust suppression. Similarly, BHP Billiton is working with its contractors to utilise non-potable water in construction activities where practicable.
Le Mer Pty Ltd	5.5	From an overall perspective, we would also encourage BHP Billiton to make every attempt to find a constructive use for as much of the water as possible. We note that some of it is super saline and not suitable for some uses, but also note that there are significant amounts of potable water used in the infrastructure corridor by Fortescue Metals Group, and the Port Hedland Port Authority for low level uses such as dust suppression. BHP Billiton's own construction and operation along the corridor will also use significant amount of potable water for this purpose.	Appropriate disposal and/or reuse options for this water will be developed and implemented depending on the quality and volume of water removed. If the quality of the water is appropriate, it will be used for dust suppression and other construction activities. Where the water quality or volume does not allow for onsite use it will be discharged in accordance with regulatory requirements at Salmon Creek to the north of the Boodarie stockyards, approximately 500 m downstream of the existing approved discharge location for BHP Billiton's Rapid Grown Project 5 Dredge Material Management Area A. Groundwater monitoring will be undertaken during construction activities according to regulatory requirements.
Port Hedland Community Progress Association Inc	6.4	Potable water is still being used as the main source of dust suppression in town centres. This causes concern in the community as the Water Corporation is currently educating people in water wise methodology whilst potable water is poured onto stock piles. Suggestion: Engage in environmentally sound dust suppression.	BHP Billiton is currently exploring options for additional potable and non-potable water supply in conjunction with Water Corporation and the Department of Water to meet future industrial and residential requirements for water in Port Hedland. A non-potable water source for stockpile irrigation and construction water supply is supported by BHP Billiton. BHP Billiton continues to work with Iron Ore customers to understand their requirements and the relevant processing tolerances of using a non-potable water source for dust suppression. Similarly, BHP Billiton is working with its contractors to utilise non-potable water in construction activities where practicable.
Robin Chapple MLC	7.6	Region Water supply associated with the project and other proposed developments must be considered.	Water Corporation is working with BHP Billiton and other industry partners to deliver a sustainable water supply for residential, community and industrial uses in the Port Hedland region.
Robin Chapple MLC	7.15	That the proposed BHP Billiton Outer Harbour Development Project (the project) and the Port Hedland Port Authority's, Boodarie - Outer Harbour Stockyards and Industrial Area identify, procure and finance all their own water requirements for water.	Water Corporation is working with BHP Billiton and other industry partners to deliver a sustainable and fit-for-purpose water supply, and commercial arrangements are being considered as part of this process.
Other Issues Raised - Development Scope			
Port Hedland Port Authority	2.1	The alternative proposal shown as the Goldsworthy rail loops in BHPBIO's figure ES.1 and Figure 2.1 was not considered as part of the Outer Harbour Study Report. These figures illustrate that BHPBIO is potentially considering an alternative rail alignment option to accommodate its Outer Harbour throughput. However there is insufficient detail contained in their PER/Draft EIS to describe this part of the project.	Iron ore will be transported to Boodarie along the Western Spur. The loop and connection to the Goldsworthy rail line has been incorporated into the Outer Harbour Development proposal to facilitate an alternative movement of locomotives and ore cars to the Boodarie Depot located on the Goldsworthy mainline for trip servicing, minor maintenance and minor repair.
Port Hedland Port Authority	2.2	BHPBIO has referred to the proposal as 240 Mtpa throughput facility. To date, planning and studies have considered a nominal 400 Mtpa iron ore export capacity at the Port Hedland Outer Harbour, with long term sustainable capacity of 200 Mtpa for the initial proponent (BHPBIO) and 200 Mtpa for other exporters. The Outer Harbour concept provides for a multi-user port facility to the west of BHPBIO's proposed Outer Harbour facility, and PHPA wishes to ensure that the development of the multi-user port facility to a nominal 200Mtpa is not compromised.	The PER/Draft EIS is intended to reflect the maximum impact envelope for the proposed Outer Harbour Development. The development includes 8 cape size berths, which at existing usage and tonnage allocations represent a potential capacity of up to 240 Mtpa, comprising up to 60 Mtpa of estimated capacity per shiploader. This is consistent with existing usage and capacity allocations in Port Hedland Inner Harbour. The environmental assessment is unrelated to commercial processes involving BHP Billiton and the Port Hedland Port Authority. BHP Billiton intends to fully utilise infrastructure that it funds and develops while also recognising the potential for additional capacity in the channel and turning circles to be utilised by other iron ore miners should they wish to fund and develop associated out-load capacity.
Le Mer Pty Ltd	5.2	Our concerns with sediment are primarily associated with dredging in general and Spoil Ground 7 in particular. We would like, at this early stage of project development, to flag the possibility of the location of Spoil Ground 7 being re-visited, or the possibility that it become the contingency ground rather than Spoil Ground 2 (Section 10, p.16).	BHP Billiton is working closely with Port Hedland Port Authority to determine the location of the spoil grounds and marine infrastructure. Spoil Ground 7 is located in an area that offers the least environmental impact due to sedimentation of benthic primary producers. Spoil Ground 2 and 9 do not have sufficient capacity to hold the total proposed volume of material to be dredged for the proposed development.
Robin Chapple	7.2	Integrated planning of onshore activities between BHP Billiton's Outer Harbour Development Project (the project) and the Port Hedland Port	BHP Billiton's proposed Outer Harbour Development has been planned and designed in full contemplation of other proposed developments in the area, including the Port Hedland Port Authority's Boodarie - Outer Harbour Stockyards project and Roy Hill Iron Ore's

MLC		Authority's, Boodarie - Outer Harbour Stockyards and Industrial Area Proposal are not apparent.	project. During 2010, the Department of Transport led a multi-agency process to ensure effective integration of projects in the Port Hedland area. Dust modelling undertaken for the PER/Draft EIS considers the cumulative impacts associated with the known proposed developments in Port Hedland.
Other Issues Raised - Tenure			
Department of Mines and Petroleum	4.1	Please note that the depth restriction of 15 metres applies to the General Purpose Leases listed in the table 2.2 (GPL 45/62 to 211, 22-224, 235-256). If the proposed excavations/geotechnical drilling, piling working required for the construction of car dumpers/bore/monitoring wells are deeper than this 15m depth the proposed work would have to be amended or different/additional tenure applied for.	BHP Billiton will secure additional tenure to address the depth restriction which applies to the General Purpose Leases.

3 APPENDICES

Management Plan 1	Noise Reduction Management Plan
Management Plan 2	Marine Fauna Management Plan
Management Plan 3	Significant Terrestrial Species Management Plan
Management Plan 4	Dredging and Spoil Disposal Management Plan
Management Plan 5	Mangrove Management Plan
Management Plan 6	Invasive Marine Species Management Plan
Management Plan 7	Acid Sulphate Soils Management Plan
Appendix 1	Port Hedland Regional Flora and Vegetation Assessment
Appendix 2	Port Hedland Regional Fauna Assessment
Appendix 3	Outer Harbour Development Operational Noise Assessment
Appendix 4	Outer Harbour Development Rail Noise Assessment
Appendix 5	Port Hedland Migratory Shorebird Survey Report and Impact Assessment
Appendix 6	Outer Harbour Development Salmon Creek Discharge Report
Appendix 7	Figure 10.1
Appendix 8	Outer Harbour Development Baseline Water Quality Report
Appendix 9	Outer Harbour Development Baseline Coral Health Report
Appendix 10	Hard Coral Cover and Size - Frequency Distribution
Appendix 11	Outer Harbour Development Water Quality Thresholds
Appendix 12	Subtidal BPPH Impact Assessment
Appendix 13	Intertidal BPPH Impact Assessment
Appendix 14	Implementation of Best Practicable Approach to Dredging
Appendix 15	Sea Noise Logger Program, Field Report March – July 2011
Appendix 16	Outer Harbour Environmental Management – Hierarchy Controls