

# Appendix A Environmental Identification (ENVID) Summary

# A.1 INTRODUCTION

### A.1.1 Background

In March 2017, the Onslow Marine Support Base (OMSB) project team held an Environmental Issues Identification workshop (ENVID) to identify and then evaluate the potential environmental risks associated with construction (phase 2) and operation of the Onslow Marine Support Base.

An ENVID is an early and important step in any project, as it allows for identification of:

- Potential environmental fatal flaws (i.e. unacceptable environmental risks);
- Environmental risks that require further information to adequately assess impact; and/or
- Environmental risks that will require specific monitoring and management to ensure that the risks are effectively mitigated.

In addition to identification of environmental risks, the ENVID was used as an early evaluation and screening tool to determine the aspects or activities of the project (if any) which pose a significant risk of compromising the Environmental Objectives for each of the Environmental Protection Authority's (EPA) environmental factors.

### A.1.2 Purpose

This document provides a summary of the ENVID process that was undertaken to review and identify the proposal activities that pose a significant risk of compromising the Environmental Objectives for each of the EPA's environmental factors.

## A.2 ENVID PROCESS

### A.2.1 Overview

The ENVID was undertaken in two key stages:

- 1. Initial population of an environment risk assessment template based on desktop review of available information and preliminary survey findings;
- 2. An ENVID workshop to review and evaluate the risks of specific project activities impacting on the environment; and
- 3. A subsequent review of residual risks considering outcomes of further investigations.

The primary aims of the OMSB ENVID were to:

- a) To collectively review, evaluate and align on environmental risks;
- b) Rationalise reasonable monitoring and management proposed to be implemented; and
- c) Identify whether any gaps, further investigations and/or additional approvals are required.

### A.2.2 Participants

The organisations that were invited to participate in the ENVID, included key project team members, subject matter experts, construction contractors and key stakeholders. Participant organisation, roles and representatives are identified in **Table A-1**.



#### Table A-1ENVID Participants

| Organisation                   | Role   | Representatives              |
|--------------------------------|--|------------------------------|
| OMSB                           | Proponent                                    | Andrew Natta                 |
| Wallbridge Gilbert Aztec (WGA) | Engineering Design Consultants               | Luke Campbell<br>Will Bowyer |
| O2 Marine                      | Environmental Consultants                    | Travis Hurley<br>Chris Lane  |
| Hanley Consulting              | Subject Matter Expert – Dredging Impacts     | Russell Hanley               |
| Baird Australia                | Coastal Engineering Consultants              | Jim Churchill                |
| Maritime Constructions         | Dredging/Construction Contractor             | Imran Lambay                 |
| Department of Transport        | Stakeholder - Beadon Creek Maritime Facility | Lucya Roncevich              |

### A.2.3 Risk Assessment

The ENVID involved a risk assessment being undertaken for specific project activities (i.e. 'Stressors') in respect to the EPA's environmental factors. The risk assessment utilised the Risk Matrix<sup>1</sup> shown in **Figure A-1**. This matrix evaluates the risk rating as a combination of the consequence of an impact, and the likelihood of that consequence occurring. The risk evaluation includes identification and description of the project specific stressors, description of the environmental setting relevant to each stressor and identification of proposed management and mitigation.

During the ENVID, each of the pre-populated stressors was evaluated and any new stressors were also identified and evaluated. The evaluation enabled stressors to be categorised in terms of their relative importance or concern and subsequently determine which of those stressors warrant referral to the EPA. The evaluation also provides a basis for the identification of environmental priorities for monitoring, management and reporting.



|     |                                 |  |   | CONSEQUENCE   |  |   |
|-----|---------------------------------|--|---|---|--|---|
|     |                                 | Insignificant  | Minor   | Moderate  | Major  | Catastrophic  |
| E   | nvironmental Impacts            | Negligible impact to biota and<br>ecosystems (less than 1 year). Negligible<br>impact to cultural features | Minor impact (up to 1 year) to biota and<br>ecosystems. Minor / repairable impacts<br>to cultural features. Regulatory notice | Moderate impact (up to 2 years) to<br>biota & ecosystems.Moderate impact to<br>cultural features of low significance.<br>Regulatory notice and investigation. | Major impacts (up to 10 years) to biota,<br>ecosystems or environmental harm.<br>Extensive impacts to cultural features of<br>significance. Regulatory fine/prosecution<br>and/or warning. | Significant impacts to biota, ecosystems or<br>environmental harm - Impact Persistence >10<br>years. Impacts resulting in significant or total loss<br>of cultural features of high significance and/or<br>items of National Heritage Value. Loss of<br>licence/prosecution and/or fine |
|     | Almost Certain                  |  |   |   |  |   |
|     | Has occurred frequently at the  |  |   |   |  |   |
|     | location and in the Company.    | MOD  | HIGH  | HIGH  | EXT  | EXT   |
|     | Almost certain to occur during  |  |   |   |  |   |
|     | the next year                   |  |   |   |  |   |
|     | Has occurred frequently in the  |  |   |   |  |   |
|     | Company Likely to occur in the  | MOD  | MOD   | HIGH  | HIGH   | EXT   |
|     | next 2 years                    |  |   |   |  |   |
| 8   | Possible                        |  |   |   |  |   |
| 呈   | Has occurred once or twice in   | LOW  | MOD   | HIGH  | HIGH   | HIGH  |
| KEL | the Company. May occur          |  |   |   |  |   |
|     | within 5 years                  |  |   |   |  |   |
|     | Onlikely                        |  |   |   |  |   |
|     | Has occurred in Industry but    | LOW  | LOW   | MOD   | MOD  | HIGH  |
|     | not in the Company. May occur   |  |   |   |  |   |
|     | within the next 10 to 20 years. |  |   |   |  |   |
|     | Rare                            |  |   |   |  |   |
|     | Almost unheard of in the        | LOW  | LOW   | MOD   | MOD  | HIGH  |
|     | Industry. May occur within the  |  |   |   |  |   |
|     | next 20 to 50 years             |  |   |   |  |   |

Figure A-1 Risk matrix<sup>1</sup> used for a risk-based approach to identification and significance assessment of project stressors which have the potential to effect environmental factors.

<sup>1</sup> Risk Matrix was supplied by the Pilbara Ports Authority and adapted from the Port Hedland Marine Environmental Quality Management Plan (O2 Marine 2017).

# A.3 ENVID RISK ASSESSMENT

The completed ENVID risk assessment is presented in Table A-2.

#### Table A-2 ENVID RISK ASSESSMENT

|        | ENVIRONMENTAL<br>FACTOR               | EPA OBJECTIVE   | STRESSOR  | DESCRIPTION  | ENVIRONMENTAL SETTING  | IN                | ITIAL RISK RATIN | G              | PREVENTATIVE/MIT   | IGATIVE CONTROLS  | RESIDUAL<br>RISK RATING | SIGNIFICANCE   |
|--------|---------------------------------------|---|---|--|--|-------------------|------------------|----------------|--|---|-------------------------|--|
| ITEM   | EPA<br>Environmental<br>Factors       | EPA Environmental<br>Objectives   | Identify Project<br>stressors affecting<br>Environmental Factors                      | Description of<br>stressor   | Existing Environment Description   | Likelihood        | Consequence      | Risk<br>Rating | Management   | Monitoring  | Risk Rating             | Approvals  |
| THEME: | SEA                                   |   |   |  |  |                   |                  |                |  |   |                         |  |
| 1.1    | Benthic<br>Communities and<br>Habitat | To protect benthic<br>communities and<br>habitats so that<br>biological diversity<br>and ecological<br>integrity are<br>maintained. | Direct removal of<br>subtidal BPPH from<br>Channel Dredging (17<br>ha)                | Removal of BPPH<br>located in the<br>proposed channel<br>route   | Dive survey of Beadon Creek in 2003 determined<br>the creek and surroundings were entirely sand<br>habitat - no seagrass or macroalgae observed.<br>Intertidal reef<br>Offshore from Onslow the benthic habitat is<br>predominantly bare sand with sparse Halophila<br>spp. (<5%) or benthic primary producer habitat<br>(BPPH) (Chevron 2013)<br>Field Survey found low cover (1%) of mixed<br>communities of predominantly filter feeders (i.e.<br>sea pens, hydrozoans) with TA, MA, S, HC, SC and<br>other benthic invertebrates. There were patches<br>of limestone pavement where cover increased<br>although no significant reefs identified. | Almost<br>Certain | Insignificant    | Moderate       | BPPH Cumulative Loss<br>Assessment for EPA<br>approvals<br>Bund construction<br>engineered wall &<br>competent contractor                                    | Hydrographic surveys of<br>dredged areas to<br>ensure channel is<br>within proposed<br>boundaries<br>Real-time monitoring of<br>dredge position (lowers<br>risk)  | Moderate                | Meets EPA Objective<br>(with Management)   |
| 1.2    |                                       |   | Indirect impact on<br>subtidal BPPH from<br>turbidity and<br>sedimentation            | Turbidity and<br>sedimentation caused<br>from resuspension of<br>dredged material<br>during dredging and<br>loading can restrict<br>photosynthetic<br>activity and end in<br>mortality for BPPH                  | Survey indicated slightly higher patchy cover of<br>similar communities on limestone pavement<br>approximately 1-1.5km to the East of the channel<br>Mangrove/algal] habitat dewatering impacts  | Likely            | Insignificant    | Moderate       | Moderate size CSD<br>Dredge Management<br>Plan   | Plume sketches<br>Site photographs<br>Remote imagery<br>Aerial photography<br>Consider requirement<br>for telemetered water<br>quality monitoring<br>Comparison with CVX<br>dredge sizes/volumes<br>for benchmark | Moderate                | Meets EPA Objective<br>(with Management)   |
| 1.3    |                                       |   | Indirect impact on<br>intertidal BPPH from<br>dewatering                              | Changes to intertidal<br>habitats from<br>dewatering activities,<br>in particular the<br>salinity or smothering<br>during settlement<br>pond wall failure, may<br>cause indirect impacts<br>on benthic habitats. | The proposed disposal location drains into<br>supratidal samphire saltmarsh and upper<br>intertidal algal mat and mangrove habitat.  | Likely            | Insignificant    | Moderate       | Control discharge<br>Pipeline and positioning<br>of discharge areas<br>Dredge Management<br>Plan   | Monitor discharge<br>water quality<br>Environmental survey<br>for pipeline route to<br>discharge back into<br>Beadon Creek  | Moderate                | Meets EPA Objective<br>(with Management) -<br>Considered less<br>important as conditions<br>likely to recover to<br>normal following<br>activities                           |
| 1.4    |                                       |   | Changes to<br>hydrodynamics causes<br>indirect modification of<br>intertidal habitats | Intertidal habitats<br>modified due to<br>change in frequency<br>and duration of tidal<br>inundation, increased<br>hard surfaces, land<br>cover,<br>decreased/increased<br>water velocity                        | Depth of the channel will be modified,<br>particularly around the turning circle. Mangroves<br>predominantly occur in the upper creek.<br>Sediment sampling indicates the dredge material<br>provides a stable bank relatively resistant to<br>erosion. Intertidal reef system on the opposite<br>side of the bank adds stability.   | Unlikely          | Major            | Moderate       | Modelling changes to<br>the hydrodynamics in<br>Beadon Creek.<br>Beadon Creek berth-<br>pocket/turning circle<br>slope design provides<br>buffer for erosion | Aerial/site photography   | Moderate                | Meets EPA Objective<br>(with Management) -<br>Erosion of the Eastern<br>bank of Beadon Creek<br>raised as potential<br>concern by the EPA<br>during pre-referral<br>meeting. |



|      | ENVIRONMENTAL<br>FACTOR            | EPA OBJECTIVE  | STRESSOR  | DESCRIPTION   | ENVIRONMENTAL SETTING  | IN                | ITIAL RISK RATIN | G              | PREVENTATIVE/MI  | FIGATIVE CONTROLS  | RESIDUAL<br>RISK RATING | SIGNIFICANCE  |
|------|------------------------------------|--|---|---|--|-------------------|------------------|----------------|--|--|-------------------------|---|
| ITEM | EPA<br>Environmental<br>Factors    | EPA Environmental<br>Objectives  | Identify Project<br>stressors affecting<br>Environmental Factors                              | Description of<br>stressor  | Existing Environment Description   | Likelihood        | Consequence      | Risk<br>Rating | Management   | Monitoring   | Risk Rating             | Approvals   |
| 2.1  | Coastal Processes                  | To maintain the<br>geophysical processes<br>that shape coastal<br>morphology so that<br>the environmental<br>values of the coast<br>are protected. | Changes to coastal and<br>creek bank morphology<br>as a result of deeper<br>channel proposed. | Change to coastal<br>processes, erosion of<br>the Eastern bank in<br>Beadon Creek   | Evidence of accretion on the Western side of the<br>training wall and existing coastal process studies<br>indicate coastal sediment transport generally to<br>east partly reversing in winter months (DoT<br>2016). Complex geomorphology at the channel<br>entrance which is in a 'quasi-equilibrium state'<br>whereby sediment can pass across the channel<br>entrance to the sandbar on the eastern side.<br>Modelling undertaken for Chevron MOF indicated<br>erosion of the beaches to the north of the MOF.  | Unlikely          | Moderate         | Moderate       | Modelling of<br>hydrodynamic and<br>morphological changes<br>around Beadon Creek<br>entrance resulting from<br>the deeper channel and<br>modifications to the<br>tidal prism upstream. | Hydrographic Survey<br>and Aerial Surveys<br>Vegetation surveys<br>from aerial photos  | Moderate                | Meets EPA Objective -<br>Raised as potential<br>concern by the EPA<br>during pre-referral<br>meeting.   |
| 2.2  |                                    |  | Sedimentation of the channel  | Investigate<br>maintenance dredging<br>and how this may be<br>handled under a<br>multi-user facility  | Survey and surface sediment data indicates (net)<br>sedimentation may occur at particular sections of<br>the existing channel.   | Almost<br>Certain | Insignificant    | Moderate       | Design (create<br>sediment basin)<br>OMSB to take<br>responsibility for<br>maintenance dredging<br>requirements  | Modelling<br>Hydrographic surveys  | Moderate                | Meets EPA Objective -<br>Raised as potential<br>concern by the EPA<br>during pre-referral<br>meeting.   |
| 3.1  | Marine<br>Environmental<br>Quality | To maintain the<br>quality of water,<br>sediment and biota so<br>that environmental<br>values are protected.                                       | Dredging and disposal<br>of contaminated<br>sediments   | Disturbance and<br>dewatering of<br>contaminated<br>sediments can release<br>toxins into the water<br>column.   | Dredged material is composed of clean sediments<br>and only a small amount of material at the<br>southern end of the berth pocket previously been<br>identified as 'potentially contaminated' with<br>elevated concentrations of tributyltin was<br>removed to assist DoT with remediation of this<br>site. Elevated Arsenic levels recorded in the outer<br>channel is consisted with elevated background<br>concentrations found in previous monitoring<br>programs. One elevation of Nickel above ISQG-<br>Low recorded in deeper sediments in turning<br>circle due to increased fine sediments, a<br>relationship previously identified in previous<br>studies. | Rare              | Major            | Moderate       | N/A  | Sediment sampling<br>program (completed)   | Moderate                | Meets EPA Objective<br>(with Management) –<br>Clean sediments to be<br>dredged so unlikely to<br>raise contamination<br>concerns                                      |
| 3.2  |                                    |  | Changes to the physico-<br>chemical properties of<br>the water column                         | Sediments<br>resuspended during<br>the dredging and<br>physico-chemical<br>parameters modified<br>after dewatering.<br>Physico-chemical<br>parameters in the<br>water column may be<br>outside the moderate<br>or high ecological<br>protection criteria. | Water quality monitoring undertaken during the<br>existing and previous dredging programs may be<br>used to derive suitable environmental quality<br>criteria for water quality parameters. Waters<br>within the creek and adjacent coastal area is<br>typically turbid, with strong current at the<br>entrance often resulting in clearer water than<br>surrounding coastal waters.   | Likely            | Minor            | Moderate       | Control discharge<br>Dredge Management<br>Plan   | DoT Maintenance<br>Dredge EQMF specifies:<br>plume sketches<br>site photographs<br>remote imagery<br>aerial photography<br>Consider additional<br>monitoring for BPPH<br>outer channel and<br>receiving water<br>monitoring site | Moderate                | Meets EPA Objective<br>(with Management) -<br>Clean sediments to be<br>dredged so unlikely to<br>raise contamination<br>concerns                                      |
| 3.3  |                                    |  | Changes to the physico-<br>chemical properties of<br>the intertidal zone                      | Intertidal sediment<br>properties altered<br>during dewatering  | Hypersaline areas occur in the upper-intertidal<br>supra-tidal areas. These saline habitats support<br>mangroves, algal mats and samphire<br>communities. Changes to the salinity of these<br>environments due to released water being less<br>saline than the receiving environment.  | Almost<br>Certain | Insignificant    | Moderate       | Control discharge<br>Dredge Management<br>Plan   | site photographs and<br>maps showing any<br>extent of change of<br>hypersaline habitats<br>and recovery after a<br>few years<br>Dewatering water<br>quality monitoring   | Moderate                | Meets EPA Objective<br>(with Management) –<br>Less important as<br>conditions likely to<br>return to hypersaline<br>conditions after<br>completion of the<br>project. |



|      | ENVIRONMENTAL<br>FACTOR         | EPA OBJECTIVE  | STRESSOR   | DESCRIPTION  | ENVIRONMENTAL SETTING   | IN         | ITIAL RISK RATIN | G              | PREVENTATIVE/MI   | TIGATIVE CONTROLS  | RESIDUAL<br>RISK RATING | SIGNIFICANCE   |
|------|---------------------------------|--|--|--|---|------------|------------------|----------------|---|--|-------------------------|--|
| ITEM | EPA<br>Environmental<br>Factors | EPA Environmental<br>Objectives  | Identify Project<br>stressors affecting<br>Environmental Factors | Description of<br>stressor   | Existing Environment Description  | Likelihood | Consequence      | Risk<br>Rating | Management  | Monitoring   | Risk Rating             | Approvals  |
| 3.4  |                                 |  | Acid sulfate soils   | ASS are naturally<br>occurring sediments<br>that contain iron<br>sulphide minerals<br>(commonly pyrite<br>FeS <sub>2</sub> ). The disturbance<br>of ASS during<br>dredging and its<br>oxygenation during<br>dewatering can lead<br>to sulphide oxidation<br>which releases acid<br>and metals and has<br>the potential to cause<br>significant<br>environmental and<br>economic impacts. | ASS are typically encountered in low-lying, water<br>logged, high organic areas which provide key<br>elements for the formation of sulfuric acid<br>(oxygen, bacteria).<br>Consistent with the results from previous testing<br>of ASS within Beadon Creek and at nearby coastal<br>locations for other dredging programs, field<br>testing indicate PASS occur within the dredge<br>footprint, indicating an ASS management plan is<br>required. However, testing indicates treatment of<br>PASS is not required as the acidity would be<br>effectively buffered by the natural alkaline<br>component of the sediment. | Unlikely   | Moderate         | Moderate       | ASS Management Plan   | pH monitoring of<br>disposal settlement<br>pond to monitor<br>requirement for<br>treatment<br>Testing of soils before<br>use.                  | Moderate                | Meets EPA Objective<br>(with Management)   |
| 3.5  |                                 |  | Hydrocarbon Spillage   | With the use of<br>various hydrocarbons<br>on site, including fuel,<br>oil and lubricants for<br>the dredge and<br>support vessel, there<br>will be a risk of<br>hydrocarbon spillage<br>to the marine<br>environment<br>Consider ongoing<br>management of<br>refuelling vessels and<br>whether this should<br>be included   | Testing of sediment samples did not detect any<br>hydrocarbons above the LoR.<br>In 2010/2011 MScience recorded some<br>background concentrations measured as Oil &<br>Grease sampled around the proposed outfall<br>location off the coast of Ashburton North.<br>However, it would be expected background<br>hydrocarbon concentrations are minimal in the<br>Project area.   | Unlikely   | Minor            | Low            | Vessel Management<br>Plan<br>Fuel Storage and<br>Handling Procedures<br>and Emergency Plan  | Reporting of<br>hydrocarbon spills   | Low                     | Meets EPA Objective<br>DoT may require Oil<br>Spill Contingency Plan   |
| 4.1  | Marine Fauna                    | To protect marine<br>fauna so that<br>biological diversity<br>and ecological<br>integrity are<br>maintained. | Entrainment of<br>protected fauna during<br>dredging             | Removal or loss of<br>individual organisms<br>of a specific<br>species (i.e. sawfish,<br>turtles), not a<br>population   | Turtle nesting of Flatback, Green and Hawksbill<br>turtles occurs on islands and at Ashburton Delta<br>beach. No known nesting occurs on beaches<br>either side of Beadon Creek although turtles may<br>be found foraging in the project area.<br>Sawfish occur in Beadon Creek. Low likelihood of<br>dredging sawfish inside the creek as historical<br>dredging has not recorded any issues. Potentially<br>avoid dredging during susceptible periods (i.e.<br>calving)   | Possible   | Minor            | Moderate       | Possible inclusions for<br>DMP:<br>Exclusions zones<br>Dredge move slowly<br>through area before<br>commencing for noise<br>and vibration hazing<br>when dredging new<br>areas<br>Overflow screens for<br>turtle assessment of<br>entrainment | MFO or MFO recording<br>Reporting of injured or<br>dead marine fauna<br>EPBC Matters Search<br>Contact DEC for listed<br>and threatened report | Moderate                | Meets EPA Objective<br>(with Management)<br>Minimising impacts on<br>conservation significant<br>marine fauna will avoid<br>referral of the project<br>to Commonwealth |
| 4.2  |                                 |  | Acoustic impacts from dredging activities                        | Disturbance and<br>general avoidance of<br>the dredge area.<br>Relevant to whales,<br>dolphins, dugongs,<br>marine turtles and<br>sawfish  | Baseline acoustic data recorded by Curtin<br>University at Ashburton North and offshore, also<br>piling noise recorded.   | Possible   | Insignificant    | Low            | Exclusions zones<br>(Wildlife Conservation<br>Notice 1998)<br>Vessel Maintenance  | MFO or MFO recording<br>Reporting of injured or<br>dead marine fauna<br>EPBC Matters Search<br>Contact DEC for listed<br>and threatened report | Low                     | Meets EPA Objective<br>(with Management)<br>Minimising impacts on<br>conservation significant<br>marine fauna will avoid<br>referral of the project<br>to Commonwealth |



|      | ENVIRONMENTAL<br>FACTOR         | EPA OBJECTIVE                   | STRESSOR   | DESCRIPTION  | ENVIRONMENTAL SETTING   | IN         | ITIAL RISK RATIN | G              | PREVENTATIVE/MI   | TIGATIVE CONTROLS  | RESIDUAL<br>RISK RATING | SIGNIFICANCE  |
|------|---------------------------------|---------------------------------|--|--|---|------------|------------------|----------------|---|--|-------------------------|---|
| ITEM | EPA<br>Environmental<br>Factors | EPA Environmental<br>Objectives | Identify Project<br>stressors affecting<br>Environmental Factors | Description of<br>stressor   | Existing Environment Description  | Likelihood | Consequence      | Risk<br>Rating | Management  | Monitoring   | Risk Rating             | Approvals   |
| 4.3  |                                 |                                 | Acoustic impacts from piling activities                          | Repetitive impulsive<br>nature of pile driving<br>can cause physical<br>damage to marine<br>fauna and some fish.<br>Relevant to whales,<br>dolphins, dugongs,<br>marine turtles and<br>sawfish         | Baseline acoustic data recorded by Curtin<br>University at Ashburton North and offshore, also<br>piling noise recorded.   | Rare       | Insignificant    | Low            | Observation zones and<br>Exclusions zones<br>Shutdown and restart<br>procedures<br>Vessel Maintenance<br>Anchored navigation<br>markers inside Beadon<br>Creek<br>Soft start procedures<br>No night operations<br>during low visual<br>visibility   | MFO or MFO recording<br>Reporting of injured or<br>dead marine fauna<br>Underwater noise<br>monitoring during piling<br>activities<br>EPBC Matters Search<br>Contact DEC for listed<br>and threatened report | Low                     | Meets EPA Objective<br>Minimising impacts on<br>conservation significant<br>marine fauna will avoid<br>referral of the project<br>to Commonwealth |
| 4.4  |                                 |                                 | Vessel strikes on<br>marine fauna                                | Vessel strikes can<br>result in fatality or<br>permanent injury.<br>Relevant to whales,<br>dolphins, dugongs and<br>marine turtles   | Wheatstone Project has been using speed limits<br>for the Project area except for crew transfer<br>vessels which were exempt from the speed limits.   | Unlikely   | Insignificant    | Low            | Speed limits for project<br>activities (unless<br>engaged in emergency<br>response)<br>Exclusion zones<br>Harbour user<br>agreement with DoT  | MFO or MFO recording<br>Reporting of injured or<br>dead marine fauna<br>EPBC Matters Search<br>Contact DEC for listed<br>and threatened report   | Low                     | Meets EPA Objective<br>Minimising impacts on<br>conservation significant<br>marine fauna will avoid<br>referral of the project<br>to Commonwealth |
| 4.5  |                                 |                                 | Habitat modification<br>from dredging activities                 | Changes in<br>bathymetry and<br>hydrodynamics of<br>Beadon Creek<br>relevant to sawfish.<br>Loss of seagrass<br>foraging habitat for<br>dugong   | Sawfish occur in Beadon Creek. Need to assess<br>with information from Dave Morgan<br>Seagrass foraging areas for dugongs to be<br>discussed with Wheatstone as to whether the<br>Project area represents important foraging<br>habitat                           | Unlikely   | Insignificant    | Low            | Dredge Management<br>Plan   | Modelling<br>EPBC Matters Search<br>Contact DEC for listed<br>and threatened report  | Low                     | Meets EPA Objective<br>Minimising impacts on<br>conservation significant<br>marine fauna will avoid<br>referral of the project<br>to Commonwealth |
| 4.6  |                                 |                                 | Entanglement or<br>ingestion of solid waste<br>(marine debris)   | Marine turtles are<br>susceptible to injury<br>or death from<br>entanglement or<br>ingestion of marine<br>debris   | Currently very low level of marine debris in remote coastal waters.   | Unlikely   | Minor            | Low            | Vessel waste<br>management plan<br>Dredge management<br>plan  | EPBC Matters Search<br>Contact DEC for listed<br>and threatened report   | Low                     | Meets EPA Objective<br>Minimising impacts on<br>conservation significant<br>marine fauna will avoid<br>referral of the project<br>to Commonwealth |
| 4.7  |                                 |                                 | Artificial Vessel Lighting                                       | Attraction of marine<br>turtle hatchlings,<br>Interference with<br>turtle nesting<br>behaviour and<br>attraction of seabirds<br>creating potential for<br>increased predation<br>of turtle hatchlings. | Turtles not known to nest on adjacent beaches<br>and nesting islands are located at a sufficient<br>distance from the Project site.<br>Not many artificial light sources with the<br>exception of Onslow town, ANSIA processing<br>plants and offshore platforms. | Unlikely   | Insignificant    | Low            | Visiting vessels will<br>follow international<br>lighting standards & will<br>be present only for the<br>duration of required<br>loading.<br>Project vessel light spill<br>will be reduced at night<br>where reasonably<br>practicable<br>Lights only used when<br>required<br>Project vessels not to<br>be moored within<br>1.5km of nesting beach<br>buffer zones<br>MARPOL agreement | EPBC Matters Search<br>Contact DEC for listed<br>and threatened report   | Low                     | Meets EPA Objective<br>Minimising impacts on<br>conservation significant<br>marine fauna will avoid<br>referral of the project<br>to Commonwealth |



|       | ENVIRONMENTAL<br>FACTOR         | EPA OBJECTIVE  | STRESSOR  | DESCRIPTION  | ENVIRONMENTAL SETTING  | IN                | IITIAL RISK RATIN | IG             | PREVENTATIVE/MI   | TIGATIVE CONTROLS  | RESIDUAL<br>RISK RATING | SIGNIFICANCE  |
|-------|---------------------------------|--|---|--|--|-------------------|-------------------|----------------|---|--|-------------------------|---|
| ITEM  | EPA<br>Environmental<br>Factors | EPA Environmental<br>Objectives  | Identify Project<br>stressors affecting<br>Environmental Factors  | Description of<br>stressor   | Existing Environment Description   | Likelihood        | Consequence       | Risk<br>Rating | Management  | Monitoring   | Risk Rating             | Approvals   |
| 4.8   |                                 |  | Introduced Marine<br>Pests  | Introduction of new<br>marine species to<br>Beadon Creek Boat<br>Harbour as biofouling<br>on the dredge or<br>visiting supply vessels<br>and/or within ballast<br>water, have the<br>potential to<br>significantly impact<br>marine industries and<br>the environment. | Australia has over 250 introduced marine species,<br>most remain relatively harmless but some have<br>become aggressive pests (Wells <i>et al.</i> 2009).<br>These species have had significant impacts on<br>marine ecosystems and marine industries.<br>Speak with Fred Wells regarding potential for<br>existing marine pests in Beadon Creek.  | Rare              | Major             | Moderate       | DoT IMP assessment<br>form<br>Ensure all vessels<br>classified as low risk<br>before entering port, or<br>undertake inspection if<br>not.<br>No international vessels<br>during construction.<br>Consult with DoF<br>regarding assessment<br>of IMP risks and<br>actions. | Undertake IMP risk<br>assessment on all<br>vessels coming to port  | Moderate                | Meets EPA Objective   |
| THEME | : LAND                          |  |   |  |  |                   |                   |                |   |  |                         |   |
| 5.1   | Flora and<br>Vegetation         | To protect flora and<br>vegetation so that<br>biological diversity<br>and ecological<br>integrity are<br>maintained. | Habitat removal or<br>disturbance from<br>clearing required for<br>the pipeline route or<br>disposal site | Removal, loss or<br>disturbance of large<br>areas of terrestrial<br>flora and vegetation<br>due to creation of the<br>pipeline route or<br>onshore disposal site   | Beadon CreekBeard Vegetation Association 676 which isdescribed as succulent steppe samphire Sheppardet al. 2001). Vegetation is described as degradedStructure severely disturbed, regeneration togood condition requires intensive management(Keighery 1994). Given the large proportion ofnative vegetation remaining in the local andregional context, the hectares under applicationhave not been considered to be a significantremnant.Disposal AreaThe site contains an area of unvegetatedintertidal mudflats bounded to the west by anundulating sandplain. The sandplain containsnarrow swales and sandy spurs vegetated withhummock and mixed grasslands of Soft Spinifex(Triodia pungens) and the invasive grass, BuffelGrass (Cenchrus cilaris), with Buffel Grassdominating in most parts with a sparse scatteringof shrubs such as Acacia bivenosa and Acaciatranslucens (ATA, 2000). A total of 67 taxa from47 genera and 21 families, were recorded fromthe study area.Average plant species richness was 36.2 taxa perquadrat ± 4.9 from a total of four sites. | Almost<br>Certain | Insignificant     | Moderate       | Minimal disturbance<br>outside narrow pipeline<br>route<br>Preference for disposal<br>site on degraded<br>mudflats.<br>Vegetation clearing<br>permit will likely be<br>required<br>Vegetation clearance<br>will only be required<br>within a permitted area               | Preliminary site<br>investigation and<br>literature review.<br>Consider rehabilitation<br>or recovery monitoring.<br>Site photographs.<br>Aerial imagery<br>assessment of the<br>condition of these<br>habitats<br>Contact DER for<br>threatened flora in the<br>area<br>EPBC Matters Report | Moderate                | Minimal disturbance<br>outside narrow pipeline<br>route<br>Preference for disposal<br>site on degraded<br>mudflats.<br>Vegetation clearing<br>permit will likely be<br>required<br>Vegetation clearance<br>will only be required<br>within a permitted area |



|      | ENVIRONMENTAL<br>FACTOR                 | EPA OBJECTIVE  | STRESSOR  | DESCRIPTION   | ENVIRONMENTAL SETTING   | IN         | IITIAL RISK RATIN | G              | PREVENTATIVE/MI           | TIGATIVE CONTROLS  | RESIDUAL<br>RISK RATING | SIGNIFICANCE  |
|------|---|--|---|---|---|------------|-------------------|----------------|---------------------------|--|-------------------------|---|
| ITEM | EPA<br>Environmental<br>Factors         | EPA Environmental<br>Objectives  | Identify Project<br>stressors affecting<br>Environmental Factors  | Description of<br>stressor  | Existing Environment Description  | Likelihood | Consequence       | Risk<br>Rating | Management                | Monitoring   | Risk Rating             | Approvals   |
| 5.2  |   |  | Disturbance of<br>conservation significant<br>terrestrial flora   | Flora and fauna are<br>protected formally<br>and informally by<br>various legislative and<br>non-legislative<br>measures, which are<br>as follows:<br>EPBC Act<br>WC Act<br>EP Act<br>DEC Priority lists for<br>flora, fauna and<br>vegetation;<br>DEC Recognition of<br>locally significant<br>populations | Airport Investigation<br>No species listed under the EPBC Act 1999 (Cth),<br>gazetted as Declared Rare Flora under the WC Act<br>1950 (WA), or listed as Priority Flora by the DEC,<br>were recorded in the study area. Six priority<br>species have been previously recorded within<br>40km area of the site therefore priority flora may<br>occur and one species Maireana lobiflora was<br>considered to be of local significance.<br>Three introduced species were recorded in the<br>study area. None of which are listed as<br>Declared Plants under the Agriculture and<br>Related Resources Protection Act 1976 (WA).<br>One vegetation association was mapped in the<br>study area. The vegetation association recorded<br>is not listed as a Threatened Ecological<br>Community under the EPBC Act 1999 (Cth), as an<br>Environmentally Sensitive Areas under the EP Act<br>1986 (WA), or as a Priority Ecological Community<br>by the DER. | Unlikely   | Minor             | Low            |                           | Literature review and<br>desktop investigation                 | Low                     | Meets EPA Objective<br>DER approval for<br>vegetation clearing<br>permit. |
| 6.1  | Landforms                               | To maintain the<br>variety and integrity<br>of distinctive physical<br>landforms so that<br>environmental values<br>are protected. | Pipeline route, disposal<br>site and plans for reuse<br>need to be evaluated to<br>determine potential<br>impacts on landforms. | Landforms of the<br>proposed disposal<br>area and proposed<br>industrial reuse areas<br>will inevitably change<br>the landform<br>characteristics.  | The Project is located within the Carnarvon Basin,<br>and the site is characterised by sediments of<br>Aeolian dominated coastal dunes and beach ridge<br>deposits, minor supratidal and coastal lake<br>deposits, mostly comprised of calcareous sand<br>and calcarenite. The geology of the area also<br>includes Tamala and Bossult Limestones and<br>Aeolian components of Bundera Calcarenite and<br>Exmouth Sandstone (Hooking <i>et al.</i> , 1987). Much<br>of the coastal area consists of low-lying salt flat<br>areas with minimal vegetation (ATA, 2000).<br>The vegetation association is predominantly<br>located on sand plains and dunes.<br>Landform and habitat association found<br>throughout the Pilbara   | Unlikely   | Minor             | Low            | N/A                       | N/A  | Low                     | Meets EPA Objective   |
| 7.1  | Subterranean<br>Fauna                   | To protect<br>subterranean fauna<br>so that biological<br>diversity and<br>ecological integrity<br>are maintained.                 | N/A for this project  |   |   |            |                   |                |                           |  |                         |   |
| 8.1  | Terrestrial<br>Environmental<br>Quality | To maintain the<br>quality of land and<br>soils so that<br>environmental values<br>are protected.                                  | Disposal of<br>contaminated<br>sediments  | Sediments see Section 3.4   | Seediments<br>See Section 3.4<br>Terrestrial<br>Red/brown loamy sand on dune systems.<br>Beach sand and spoil disposal area over the<br>beach sand on the coast.<br>Mudflats description  | Rare       | Minor             | Low            | Dredge Management<br>Plan | N/A  | Low                     | Meets EPA Objective   |
| 8.2  |   |  | Disposal of Acid<br>sulphate soils  | Sediments see section 3.4   | Sediments see section 3.4   | Unlikely   | Moderate          | Moderate       | ASS Management Plan       | TBA - As required in<br>accordance with ASS<br>Management plan | Low                     | Meets EPA Objective   |



|       | ENVIRONMENTAL<br>FACTOR         | EPA OBJECTIVE   | STRESSOR  | DESCRIPTION   | ENVIRONMENTAL SETTING   | IN         | ITIAL RISK RATIN | G              | PREVENTATIVE/MI  | FIGATIVE CONTROLS   | RESIDUAL<br>RISK RATING | SIGNIFICANCE  |
|-------|---------------------------------|---|---|---|---|------------|------------------|----------------|--|---|-------------------------|---|
| ITEM  | EPA<br>Environmental<br>Factors | EPA Environmental<br>Objectives   | Identify Project<br>stressors affecting<br>Environmental Factors                    | Description of<br>stressor  | Existing Environment Description  | Likelihood | Consequence      | Risk<br>Rating | Management   | Monitoring  | Risk Rating             | Approvals   |
| 8.3   |                                 |   | Disturbance of existing<br>Acid Sulfate Soils at the<br>proposed disposal<br>ground | The location of the<br>disposal site option 2<br>may contain ASS.<br>Disturbance of ASS<br>during earthworks can<br>lead to sulphide<br>oxidation which<br>releases acid and<br>metals and has the<br>potential to cause<br>significant<br>environmental and<br>economic impacts. | ASS risk mapping previously provided by the<br>WAPC now accessed via the Landgate SLIP<br>website indicates that the supra tidal saltmarsh<br>and intertidal mudflats are located in a 'high to<br>moderate' ASS risk area  | Unlikely   | Moderate         | Moderate       | If the risk of ASS is<br>present, the lower<br>intertidal area will<br>require stabilisation of<br>ASS using lime.   | TBA - As required in<br>accordance with ASS<br>Management plan  | Low                     | Meets EPA Objective   |
| 9.1   | Terrestrial Fauna               | To protect terrestrial<br>fauna so that<br>biological diversity<br>and ecological<br>integrity are<br>maintained. | Removal/smothering of<br>terrestrial vegetation<br>habitat                          | Removal of vegetation<br>for the pipeline route<br>and disposal site will<br>potentially impact<br>terrestrial fauna in the<br>Project area   | Simple habitat with little structure or variety.<br>Good quality habitat for reptiles but otherwise<br>relatively few fauna are able to utilise this<br>habitat.<br>Eight of the 13 conservation significant fauna<br>potentially occurring in the study area were<br>considered as 'Possible' inhabitants and two<br>species were considered as 'Likely'. Include<br>Spatial area description.<br>Previous records indicate:<br>5 amphibian species<br>72 reptiles<br>135 bird species (excluding marine & coastal<br>birds)<br>26 mammal species  | Possible   | Minor            | Moderate       | Pipeline and positioning<br>of discharge areas   | Environmental survey<br>for pipeline route to<br>discharge back into<br>Beadon Creek                                      | Low                     | Meets EPA Objective<br>DER approval for<br>vegetation clearing<br>permit. |
| 9.2   |                                 |   | Disturbance of<br>conservation significant<br>terrestrial fauna                     |   | 13 conservation significant species previously<br>recorded from within the study area:<br>Peregrine Falcon ( <i>Falco peregrinus</i> ), Western Star<br>Finch, nine migratory birds, the Long-tailed<br>Dunnart ( <i>Sminthopsis longicaudata</i> ) and Short-<br>tailed Mouse ( <i>Leggadina lakedownensis</i> ).<br>Eight of the 13 species are listed as 'Possible' to<br>occur within the study area. A further two species<br>were considered as 'Likely' to occur; one<br>migratory bird was noted as 'Present' (with<br>current project records), and two species<br>(Peregrine Falcon <i>Falco peregrinus</i> and Long-<br>tailed Dunnart <i>Sminthopsis longicaudata</i> ) were<br>considered as 'Unlikely' to occur within the study<br>area. Several of the 'Possible' birds are migrant<br>birds, and the only mammal 'likely' to occur is the<br>Short-tailed Mouse which has been recorded in<br>Onslow town. | Unlikely   | Major            | Moderate       | Seek advice how to<br>manage impacts on<br>conservation significant<br>fauna when<br>constructing a disposal<br>site | Desktop review<br>Contact DER for list of<br>threatened Fauna in the<br>area<br>EPBC Matters Report<br>Site investigation | Low                     | Meets EPA Objective<br>DER approval for<br>vegetation clearing<br>permit. |
| THEME | : WATER                         |   |   |   |   |            |                  |                |  |   |                         |   |



|       | ENVIRONMENTAL<br>FACTOR                   | EPA OBJECTIVE  | STRESSOR  | DESCRIPTION   | ENVIRONMENTAL SETTING  | IN         | IITIAL RISK RATIN | G              | PREVENTATIVE/MI   | TIGATIVE CONTROLS  | RESIDUAL<br>RISK RATING | SIGNIFICANCE   |
|-------|---|--|---|---|--|------------|-------------------|----------------|---|--|-------------------------|--|
| ITEM  | EPA<br>Environmental<br>Factors           | EPA Environmental<br>Objectives  | Identify Project<br>stressors affecting<br>Environmental Factors                              | Description of<br>stressor  | Existing Environment Description   | Likelihood | Consequence       | Risk<br>Rating | Management  | Monitoring   | Risk Rating             | Approvals  |
| 10.1  | Hydrological<br>Processes                 | To maintain the<br>hydrological regimes<br>of groundwater and<br>surface water so that<br>existing and potential<br>uses, including<br>ecosystem<br>maintenance, are<br>protected. | Altered surface water<br>runoff patterns  | Disposal site and<br>proposed reuse areas<br>may modify land<br>runoff into Beadon<br>Creek, threatening<br>identified upper and<br>supratidal ecosystems<br>(samphires, algal mat<br>and mangroves).             | Two disposal sites are proposed at the back of<br>the secondary dune systems which drain into a<br>southern tributary of Beadon Creek. The<br>catchment of Beadon Creek has already been<br>significantly modified by the Onslow Salt Ponds.<br>During times of heavy rains and large tidal cycles,<br>the tidal flats can be subjected to inundation. The<br>southern tributaries of Beadon Creek are the<br>outlets of tidal surges that frequently inundate<br>the intertidal flats (ATA, 2000).<br>Management of the water cycle may be very<br>complex involving a variety of factors that need<br>to be taken into consideration such as rainfall,<br>evapo-transpiration and overland and<br>groundwater flows. | Rare       | Minor             | Moderate       | Design of disposal<br>location will consider<br>dewatering flow back<br>into Beadon Creek and<br>overflow situations<br>under tropical cyclone<br>conditions. | Surface water<br>investigation from the<br>disposal site should be<br>undertaken<br>Aerial photography | Low                     | Meets EPA Objective<br>DoW approval for bed<br>and banks permit. |
| 11.1  | Inland Waters<br>Environmental<br>Quality | To maintain the<br>quality of<br>groundwater and<br>surface water,<br>sediment and biota so<br>that the<br>environmental values,<br>both ecological and<br>social, are protected.  | N/A for this project  |   |  |            |                   |                |   |  |                         |  |
| THEME | : AIR                                     |  |   |   |  |            |                   |                |   |  |                         |  |
| 12.1  | Air Quality                               | To maintain air<br>quality for the<br>protection of the<br>environment and<br>human health and<br>amenity.   | Dust generation from stockpiles   | Failure to implement<br>effective dust<br>suppression can result<br>in detrimental<br>environmental impact<br>and poor air quality  | Measures should be taken to ensure dust<br>emissions are as low as possible during the<br>dredging and disposal of sediment.   | Possible   | Minor             | Moderate       | Stockpiles will be<br>sprayed with a dust<br>suppressant if dust<br>emissions become<br>evident   | Visual daily monitoring<br>of dust from stockpiles   | Low                     | Meets EPA Objective  |
| THEME | : PEOPLE                                  | ·  |   | ,   |  | 1          | 1                 |                | •   |  |                         |  |
| 13.1  | Social<br>Surroundings                    | To protect social<br>surroundings from<br>significant harm.  | Pipeline route restricts<br>public access to beach,<br>roads and other<br>recreational areas. | The HDPE dredge<br>discharge pipe crosses<br>roads and areas<br>accessed by the<br>public. Unless pipe is<br>buried through all<br>access areas there is<br>potential to restrict<br>access with the<br>pipeline. | The pipe route will extend from the beach, along<br>the training wall access track, across Beadon<br>Creek Road and over the light industrial area<br>hardstand and over the back of the dune out to<br>the airport (depending on disposal option<br>selected).<br>Access restriction points occur on the beach,<br>across the training wall access road, across<br>Beadon Creek Rd, over the laydown yard and<br>across dirt access tracks over the back of the<br>dune.  | Unlikely   | Minor             | Low            | All public access areas<br>to be buried   | Public access areas to<br>be assessed  | Low                     | Meets EPA Objective  |
| 13.2  |   |  | Dredge plume turbidity<br>and sedimentation   | Negative public<br>perception of<br>dredging activity due<br>to turbidity plumes<br>generated   | Beadon Creek and the adjacent coastal waters<br>are naturally turbid due to strong tidal currents<br>within the creek and resuspension of fines from<br>minimal wave/wind action in coastal waters. This<br>can be particularly turbid following cyclonic or<br>tropical low storm events  | Unlikely   | Minor             | Low            | Signage<br>Public Notices and<br>updates<br>No concerns from<br>Phase 1<br>Working closely with<br>DoT/Shire  | Aesthetic water quality<br>monitoring (unlikely to<br>be required)                                     | Low                     | Meets EPA Objective  |



|      | ENVIRONMENTAL<br>FACTOR         | EPA OBJECTIVE                   | STRESSOR  | DESCRIPTION   | ENVIRONMENTAL SETTING   | IN         | IITIAL RISK RATIN | G              | PREVENTATIVE/MI   | FIGATIVE CONTROLS   | RESIDUAL<br>RISK RATING | SIGNIFICANCE   |
|------|---------------------------------|---------------------------------|---|---|---|------------|-------------------|----------------|---|---|-------------------------|--|
| ITEM | EPA<br>Environmental<br>Factors | EPA Environmental<br>Objectives | Identify Project<br>stressors affecting<br>Environmental Factors                | Description of<br>stressor  | Existing Environment Description  | Likelihood | Consequence       | Risk<br>Rating | Management  | Monitoring  | Risk Rating             | Approvals  |
| 13.3 |                                 |                                 | Disposal site<br>management   | Poor planning results<br>in pond wall failure,<br>overflow and or<br>insufficient<br>consultation to<br>interfere with<br>requirements of the<br>airport or light<br>industrial activities<br>(depending on<br>disposal area<br>selected) | Two disposal sites are proposed at the back of<br>the secondary dune system to extend the light<br>industrial area or out at the airport.<br>The airport is restricted by air-traffic international<br>guidelines which need to be understood and can<br>be busy during flight landing and departure times.<br>Some residents live in the light industrial zone at<br>their business.   | Unlikely   | Minor             | Low            | Stakeholder<br>consultation<br>Thorough engineering<br>planning and<br>assessment<br>Cyclone management<br>assessment   | Register of complaints<br>and resolutions   | Low                     | Meets EPA Objective  |
| 13.4 |                                 |                                 | Restrict public vessel<br>access and other<br>commercial use of<br>Beadon Creek | Large supply ships<br>interfere with public<br>and other commercial<br>access to Beadon<br>Creek and other<br>maritime facilities   | Numerous commercial wharves (TAMS,<br>Bhagwhan, Chevron) which are regularly utilised<br>and public access fuelling facility and boat ramp<br>used by locals and tourism  | Unlikely   | Minor             | Low            | Planning with DoT<br>Information handbook<br>Stakeholder<br>consultation<br>Redo signage<br>community education   | Vessel logs<br>Reporting to the Port of<br>Onslow Port Captain  | Low                     | Meets EPA Objective  |
| 13.5 |                                 |                                 | Noise from wharf<br>facility and vessels  | Vessel noise from<br>supply vessels<br>approaching and<br>departing the<br>maritime facility and<br>noise from wharf<br>activities may bother<br>local residents,<br>particularly during<br>night time                                    | Vessels entering and departing Beadon Creek<br>may occur over 24-hour period.<br>Wharf operations expected during daylight hours<br>only.   | Unlikely   | Minor             | Low            | Avoid night time<br>docking operations<br>Stakeholder<br>consultation with Shire<br>and community   | Vessel records  | Low                     | Meets EPA Objective  |
| 13.6 |                                 |                                 | Disturbance of a<br>significant aboriginal<br>heritage site                     | The pipeline route<br>and disposal site<br>occur on aboriginal<br>archaeological sites<br>resulting in<br>inadvertent impacts<br>without consultation<br>with the Buurabalayji<br>Thalandji Association<br>Inc.                           | Two ethnographic and archaeological surveys<br>have been undertaken:<br><u>Beadon Creek</u><br>No ethnographic or archaeological aboriginal<br>heritage sites or artefacts were reported in the<br>land portion of the Department of Transport's<br>project area. However, certain cultural protocols<br>are requested prior to dredging commencing in<br>order to ensure that proper respect is shown to<br>the <i>Warnamankura</i> (mythological water serpent).<br><u>Disposal Site</u><br>A search on the aboriginal sites register identified<br>two previously registered sites and an additional<br>site was identified during the survey in the<br>immediate vicinity of the Onslow airport. Site<br>6617 is outside the proposed project area,<br>although Archaeological Site Onslow Airport 01<br>and existing site DIA 6620 (Jinta 2) are<br>recommended to be avoided entirely during all<br>future works. Should the site be required to be<br>disturbed, Section 18 Application to the Minister<br>of Indigenous Affairs is recommended and no<br>new access tracks should be permitted. | Rare       | Major             | Moderate       | Stakeholder<br>consultation with the<br>Buurabalayji Thalandji<br>Association Inc.<br>Consultation with the<br>Shire of Ashburton to<br>determine<br>responsibilities under<br>intention to dispose<br>and develop airport<br>land. | Additional ethnographic<br>and archaeological<br>survey between airport<br>and light industrial<br>area/ disposal option 1<br>area required.<br>Salvage work upon an<br>aboriginal site<br>(including full recording<br>and artefact recovery)<br>may be required, in<br>consultation with the<br>Buurabalayji Thalandji<br>Association Inc, if<br>intended to develop<br>over the site | Low                     | Meets EPA Objective<br>Possible Section 18<br>Application to the<br>Minister of Indigenous<br>Affairs depending on<br>disposal option. |





# A.4 ENVID OUTCOMES

The ENVID identified a total of 38 project specific stressors which have the potential to compromise the EPA's objectives. Of these, 13 stressors were evaluated as posing a 'moderate' (or greater) risk (Table A-2), whilst the remaining 25 stressors were considered to pose a 'low' risk.

Stressors evaluated as posing 'low' risk, were not considered to warrant referral to the EPA, as the activities were unlikely to result in significant environmental impacts or effects. Typically, these 'low' risk stressors included those that did not require specific management, mitigation or monitoring, or can be effectively managed through typical best practice management (e.g. MARPOL Regulations for offshore waste disposal) of the proposed construction and operational activities.

Stressors evaluated as posing a 'moderate' (or greater) risk are identified in Table A-2. Identification of these stressors was used to identify those activities which were considered to warrant referral to the EPA as they have the potential to result in significant environmental impacts or effects. Typically, these stressors also included a requirement for further investigations, baseline assessment and/or specific management and monitoring actions to be applied during the project construction and/or operational phases.

| Table A-2          | Summary of project specific stressors evaluated as posing a residual 'moderate' risk on impacting on the EPA's |
|--------------------|--|
| environmental fact | tors   |

| Environmental Factor                   | Project Specific Stressors  | Risk     |
|--|---|----------|
| Benthic Communities<br>& Habitat (BCH) | Direct removal of subtidal BCH from Channel Dredging                          | Moderate |
|  | Indirect impact on subtidal BCH from turbidity and sedimentation              | Moderate |
|  | Indirect impact on intertidal BCH from dewatering                             | Moderate |
|  | Changes to hydrodynamics causes indirect modification of intertidal BCH       | Moderate |
| Coastal Processes                      | Changes to coastal and creek bank morphology as a result of deepening channel | Moderate |
|  | Sedimentation of the channel  | Moderate |
| Marine<br>Environmental<br>Quality     | Dredging and disposal of contaminated sediments                               | Moderate |
|  | Changes to the physico-chemical properties of the water column                | Moderate |
|  | Changes to the physico-chemical properties of the intertidal zone             | Moderate |
|  | Acid sulfate soils  | Moderate |
| Marine Fauna                           | Entrainment of protected fauna during dredging                                | Moderate |
|  | Introduced Marine Pests   | Moderate |
| Flora and Vegetation                   | Vegetation removal or disturbance for the pipeline route and/or disposal site | Moderate |

#### Disclaimer

The ENVID risk assessment outcomes do not necessarily represent the final list of project specific stressors, nor do they define the final proposed management and monitoring to be undertaken in order to manage potential environmental impacts. Rather the ENVID outcomes represents an early identification of the potential environmental risks and possible management and monitoring actions. This information was subsequently used to assist in the preparation of the environmental referral of the Proposal to the EPA.



# A.5 References

ATA Environmental (2000) Onslow Aerodrome Environmental Assessment and Management Plan, Perth, WA.

- Chevron (2013). Wheatstone Project State of the Marine Environment Surveys Baseline Report. WS0-0000-HES-RPT-CVX-000-00155-000
- DoT (2016) DoT (2016). "Onslow Beadon Creek Breakwater Literature and Data Review."
- Keighery, B.J. (1994) Bushland Plant Survey. A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc.), Western Australia.
- O2 Marine (2017) *Port Hedland Marine Environmental Quality Management Plan.* Report prepared for the Port Hedland Industries Council Marine Working Group. October 2016. pp121
- Sheppard, D.P., Beeston, G.R., and Hopkins, A.J.M (2001). *Native Vegetation in Western Australia*. Technical Report 249. Department of Agriculture Western Australia, South Perth
- Wells, F.E., McDonald, J.I., & Huisman, J.M. (2009). *Introduced Marine Species in Western Australia*. Western Australian Department of Fisheries, Occasional Publications 57:1-97