TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

2.1 INTRODUCTION

The intent of this Chapter is to provide a broad review of studies which have been undertaken within the APSDA and the Port of Abbot Point (hereafter collectively referred to as 'Abbot Point') to document the existing environment and to identify potential impacts associated with Waratah Coal's construction and operations activities within the APSDA.

It is noted that the North Queensland Bulk Port (NQBP) have indicated that they will be responsible for environmental assessment for the Coal Terminal (T4-7) development within the APSDA. Waratah Coal has expressed interest in utilising one of the T4-7 tranches for coal stockpiling and transport for export.

The proposed Multi-user Infrastructure Corridor (MUC) and the Multi-cargo Facility (MCF) within the APSDA are also at an initial design phase. The MCF has been subject to an EIS however the MUC and the proposed T4-7 have not yet been subject to an Environmental Impact Assessment. Consequently this chapter can only give a broad assessment of the environment and potential impacts.

The approach used in this Chapter has been to review the existing environmental studies at two scales. First, where available, studies and environmental descriptions are derived for the area of the central portion of the APSDA, as this area covers the most likely location of T4-7. Where information covering this specific location is not available, studies which cover the broader APSDA have been reviewed.

2.2 DESCRIPTION OF EXISTING ENVIRONMENT

2.2.1 CLIMATE AND CLIMATE CHANGE

2.2.1.1 Climate

Existing Environment

Abbot Point has a tropical climate, with hot wet summers, and cool dry winters (BOM, 2010a). Summer conditions are monsoonal, influenced by tropical cyclones and lows, causing significant rainfall in the coastal areas. The low lying coastal floodplains of the APSDA are subject to flooding during high rainfall events. The Bureau of Meteorology (BOM) indicates that the most recent major flooding in the region was in February 2008 when a monsoonal low originating in the Gulf of Carpentaria caused significant rainfalls in the region of up to 300 mm in a 24 hour period.

This region also experiences dry periods, or drought. Large areas of the region surrounding Abbot Point have been drought declared for most of the last decade. The region surrounding the Abbot Point has not been drought declared since March 2008 (Department of Primary Industries and Fisheries, 2010); however, prior to that the region surrounding the coal terminal had been drought declared since January 2003.

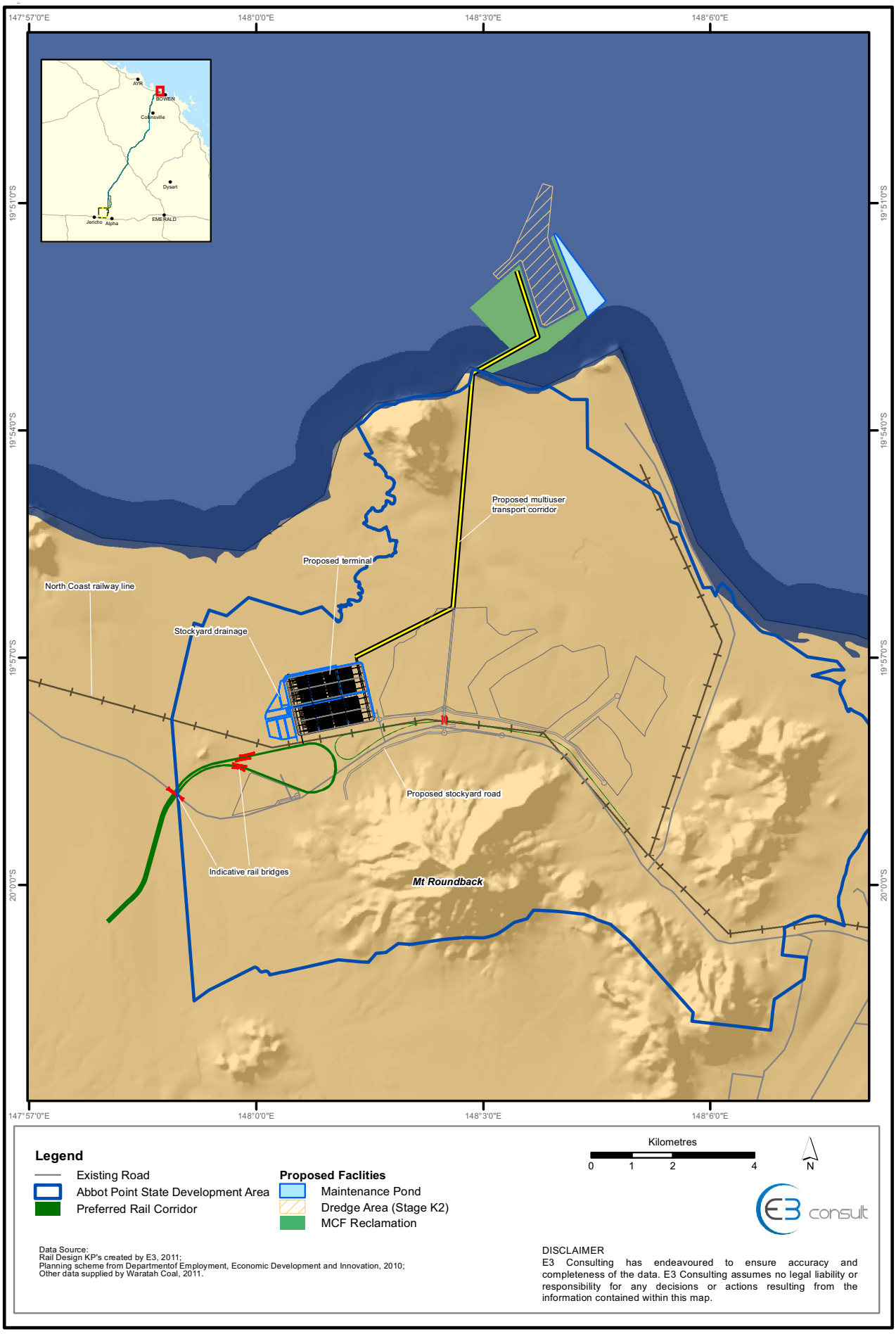
2.2.1.2 Climate Change

A assessment on Greenhouse Gas and Climate Change within the region (refer Volume 5, Appendix 19) indicates that climate change will lead to an increase in extreme weather, with more frequent storms and flooding, more severe droughts and heat waves; rising sea level; water shortages, the loss of coral reefs as oceans warm and tropical forests as fires become more frequent.

Potential impacts

The infrastructure and the materials used at the coal terminal will be designed to mitigate potential high or extreme impacts associated with storms and / or cyclones (including sea level increases, storm surge increases, and flooding). Modeling and further assessments as part of a subsequent Environmental Impact Assessment will need to be undertaken to understand the magnitude of potential impacts on the coal terminal and inform infrastructure design.

Figure 1. Central Portion of the APSDA



2.2.2 LAND

2.2.2.1 Topography and Geology

Existing Environment

The central region of the APSDA consists of coastal mud flats lying at elevations below 5 m AHD, Volume 5, Appendix 6.) Geological mapping of the region indicates that the surface geology is primarily Quaternary coastal dunes and sand plains derived from windblown sand and Cainozoic alluvial and deltaic deposits of silt, sand and clay.

The underlying geology includes significantly eroded and remnant inselbergs of granitic rock representing the basement rocks that outcrop south of the site at Bald Hill and at Mt Luce (Mt Stuart). These are granitoids of Upper Carboniferous to late Permian age into which some dolerite dykes have subsequently intruded.

Potential Impacts

Given the relatively flat topography of the region any elevated topography is expected to have minor impacts on future coal terminal infrastructure. There is a likelihood of fossilised material being present due to the absence of sedimentary rocks from prolific fossiliferous periods. Further field assessments into the potential impacts of topography and geology will be undertaken as part of the subsequent NQBP EIS process for the T4-T7 and the multi-user corridor, connecting to the MCF.

2.2.2.2 Soils

Existing Environment

Assessment of the main soil types within and adjacent to the central portion of the APSDA (refer Volume 5, Appendix 6) indicates that the area is dominated by Sodosols – soils in which a clear B horizon where the upper 0.2 m or major part of the B horizon is sodic and not strongly subplastic. These soils are dominantly red, brown, yellow, grey or black in the B horizon and may have hardpans or calcrete. Sodosol soils will set hard when dry and are prone to dispersion and instability.

In addition, there are also areas of Tenosols (weakly developed soils) derived from the granitic intrusive and cracking clays present within the study area. Tenosols have a weak soil structure and are susceptible to erosion dispersion.

Potential Impacts

Accurate assessments of impacts to soils will not be conclusively known until NQBP have undertaken site specific assessments of the coal terminal (T4-7). Based on a broad assessment of the study area, potential impacts include:

- Where coal terminal infrastructure crosses black cracking clays with dispersive shrink / swell properties, the movement of these soils may result in damage to structures, foundations and buried services from differential ground movement. The degree of impact is dependent upon the soil profile thickness and the type of clays.
- Where Tenosols are encountered, these areas will potentially be susceptible to erosion. Where clays are encountered, there is potential that these will crust and set hard when dry. Both of these soil types have low potential for reuse as topsoils.
- Reactive clays, dispersive soils and soils with high ESP have potential to occur in the coal terminal (T4-7) footprint. These soils have greater potential for erosion with Tenosols having high erosion potential as they characteristically have thin soil profiles and little binding organic matter leading to increased potential for erosion. Construction of the coal terminal infrastructure could lead to loss of soil through increased erosion from exposed soils where the construction alignment intersects erosive or dispersive soils.
- Some soils at the coal terminal may have high salinity, due to the periodic inundation and saturated soils. This results in poor plant growth and greater potential for erosion. Salinity may further complicate design and construction criteria as high salinity soils can result in increased corrosion of metal and concrete structures.

2.2.2.3 Acid Sulfate Soils

Existing Environment

Review of the CSIRO's ASRIS broad scale soils mapping (1:2,000,000) indicates that areas of the central portion of the APSDA have a high probability of containing acid sulfate soils (ASS). The CSIRO mapping generally reflects the topography of Abbot Point with most areas under 5 m AHD considered to have a high probability of containing ASS, (refer Volume 5, Appendix 9). It is currently unknown if ASS are present at the proposed

coal terminal (T4-7), however further assessments will be undertaken by NQBP as part of the subsequent EIS process.

Potential Impacts

Based on a broad assessment environmental potential impacts that could arise if ASS are disturbed during the construction of the coal terminal include: lowering the pH of receiving waters, lowering the dissolved oxygen levels, metals contamination, discolouration of water and impacts on marine flora and fauna such as mass mortality and Red Spot disease. Mismanagement of ASS also has the potential to result in the corrosion of concrete footings / piles and steel structures weakening the coal conveyor support structures with the potential to cause catastrophic failure of the structure (worst case scenario) or increased maintenance and repair costs involved with dealing with the accelerated corrosion due to sulphuric acid attack on the coal conveyor structure. Further assessment of ASS will need to be undertaken by NQBP and successful proponents of coal terminal (T4-7) to document potential impact associated with construction and operation of the coal terminal.

2.2.2.4 Good Quality Agricultural Land (GQAL)

Existing Environment

The APSDA is not mapped as GQAL in the Whitsunday Regional Council (WRC) (refer Volume 5, Appendix 6). This corresponds with the soils mapping that indicates the land is likely to be dominated by Tenosols, Sodosols and saline mudflats. Therefore it is unlikely that the project will impact GQAL.

Potential Impacts

As the land within the central portion of the APSDA is generally unsuitable for agricultural uses with most of the area either not rated as GQAL or rated as Class D, (considered unsuitable for agricultural purposes) it is believed that potential impacts to GQAL would be minimal. However further assessments however will be undertaken as part of the subsequent EIS process.

2.2.2.5 Contaminated Land

Existing Environment

Assessments detailed in Volume 5, Appendix 7 established two areas of potential contamination within the central portion of the APSDA; both are listed as not of EMR status. One site is listed as a transport terminal and is considered to be potentially a high risk, the other site is a cattle dip which showed signs of contamination including grass suppression.

Potential Impacts

Potential impacts from contaminated land resulting from the construction and operation works associated with the new coal terminal infrastructure could include:

- disturbance of arsenic impacted soils where infrastructure intersects existing rail lines (i.e. the north coast rail line within the APSDA);
- spills and leakages during the construction and operation phases could impact sensitive receptors such as human health, on-site soil contamination and nearby local waterways; and
- PASS contamination resulting from disturbing soils during construction phase.

Further assessment into managing contamination within the central portion of the APSDA will need to be undertaken by NQBP as part of the subsequent EIS.

2.2.2.6 Land Use

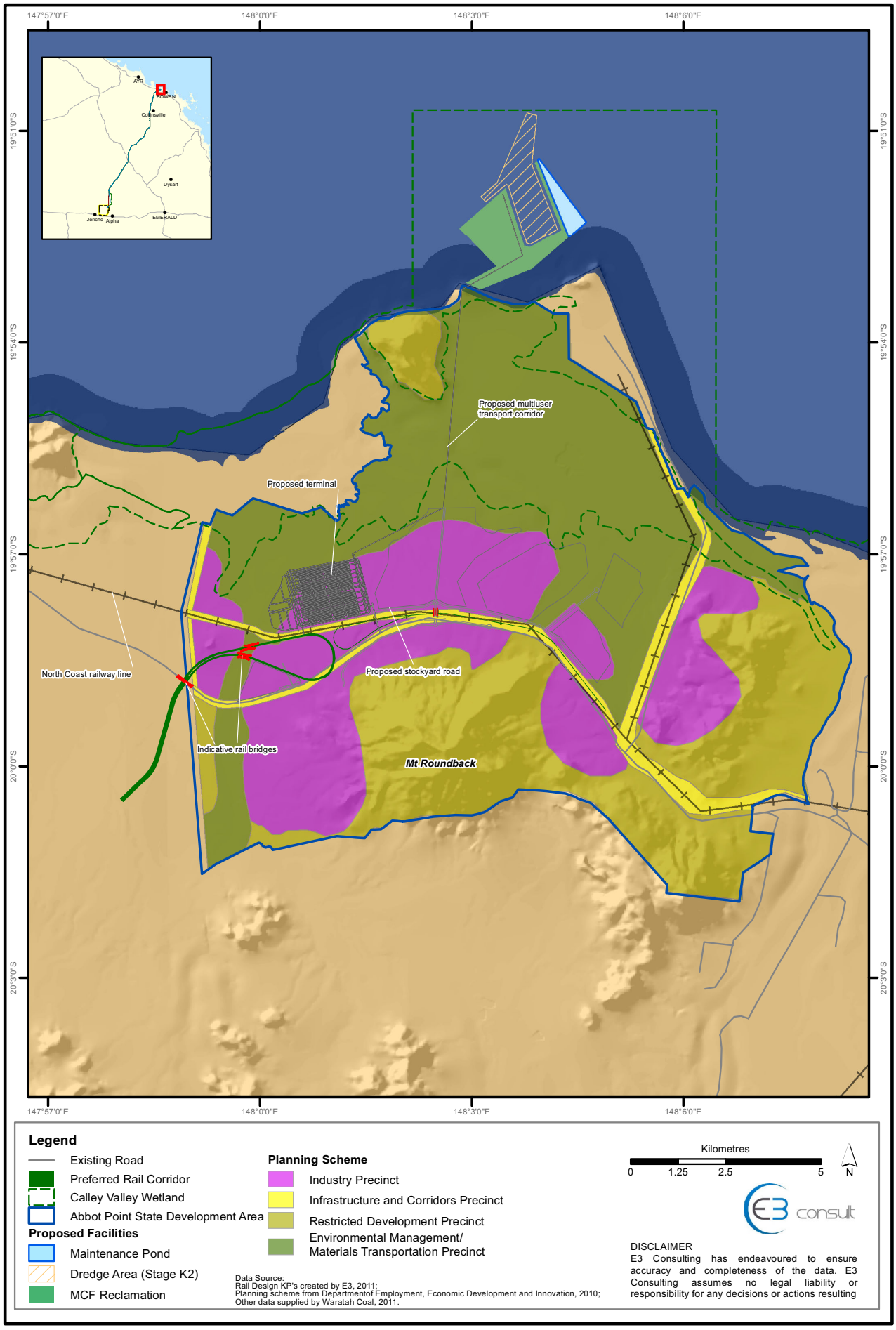
Existing Environment

The APSDA is divided into four precincts under the Development Scheme being:

- Industry Precinct;
- Infrastructure and Corridors Precinct;
- Restricted Development Precinct; and
- Environmental Management / Materials Transportation Precinct.

The proposed coal terminal (T4-7) is located partly within the Industry Precinct and the Environmental Management/Materials Transport Precinct (refer Figure 2). The proposed conveyers from the coal stockpiles and the multi-user infrastructure corridor are located within the Environmental Management/ Materials Transportation Precinct. The utilization of the proposed coal terminal (T4-T7) and multi-user infrastructure corridor by Waratah is consistent with the strategic direction of the ASPDA and the Development Scheme. Future industry to be developed with the central portion of the APSDA will be assessed by NQBP as part of an Environmental Impact Assessment and DEEDi in accordance with the Development Scheme.

Figure 2. APSDA Planning Scheme Information



Potential Impacts

The proposed location of the coal terminal (T4-7) is consistent with the intent of the APSDA Development Scheme therefore future impacts as a result of development of the coal terminal infrastructure are generally understood and expected.

2.2.3 TERRESTRIAL ECOLOGY

2.2.3.1 Floral Environment

The study area is located within the Brigalow Belt North bioregion. The principal land use within the bioregion is cattle production with approximately 90% of the bioregion under grazing (Bailey, 1984). Flora values within the central portion of the APSDA have largely been identified as 'low' due to the extent of clearing and past disturbance, with no threatened species of plant or priority taxa for this bioregion recorded within the study area (MCF EIS, 2010).

2.2.3.2 Nature and conservation reserves

The Abbot Bay Resources Reserve is located in the north western portion of the Caley Valley Wetlands and protects semi-evergreen vine thicket (SEVT) communities. This reserve is not within the central portion of the APSDA however it is recognised that it does connect to the Wetlands which traverses the north boundary of the study area. The Great Barrier Reef Marine Park (GBRMP) is located in the marine environments to the north and west of the study area however the GBRMP is not within the study area. No other nature conservation reserves occur within or adjoining the study area (DIP 2010).

2.2.3.3 Flora species

Field surveys reported in the Governments Land and Infrastructure Planning Study for the study area identified 184 species of plant of which 78% are native. Grasses (Poaceae) were observed as the most diverse family with 46 species recorded within the study area.

There is suitable habitat for two flora species of national and state significance (*Aristida granitica* and *Croton magneticus*) along Goodbye Creek and Breakfast Creek however field observations did not identify these species within the area and it was establish that they are unlikely to occur within the study area. No nature conservation reserves occur within the study area (DIP 2010).

A Desktop assessment of the coal terminal (T4-7) was undertaken by Waratah and determined the following:

- no Threatened Ecological Communities listed under the EPBC Act would occur in the proposed stockpile area.

Of the threatened flora species identified in this review only one has any potential to occur near to the proposed stockpile area, this being *Eucalyptus raveretiana* (black ironbox). The potential for this species to occur near to the proposed development was determined by the presence of suitable habitat along Splitters Creek. However, this species has not been recorded from the site with the closest known occurrence being along the Don River, 21 km south-east from the proposed stockpile area.

Two EPBC listed species (*Aristida granitica* and *Croton magneticus*) and one NCA list species (*Bonamia dietrichiana*) have been recorded from within the APSDA. However, the habitat requirements for these species are quite specific and suitable habitat within the proposed infrastructure area was not present.

Based on broad field and targeted desktop assessments, the location of the stockpile infrastructure is unlikely to impact significant flora communities or species.

2.2.3.4 Significant Weed Species

DPI field surveys identified four weeds of National Significance occurring within the study area including *Acacia nilotica* (prickly acacia), *Crytostegia grandiflora* (rubber vine), *Lantana camara* (common lantana) and *Parkinsonia aculeate* (Jerusalem thorn). A further six species of 'class 2 declared plants' under the *Land Protection (Pest and Stock Route Management) Act 2002* (LP regulation) were also recorded (Parsons Brinckerhoff, 2010).

Due to the extent of clearing and past disturbance for grazing and agriculture within the study area there are few risks or significant impacts associated with any future development. A weed management plan should be developed to reduce the spread of weeds.

2.2.3.5 Fauna habitat

Due to extensive clearing within the study area there has been a significant reduction in the available fauna habitat. As a result of cleaning potential roosting, nesting and foraging habitat associated with remnant and regrowth vegetation should be considered as having a medium to high ecological value (Parsons Brinckerhoff, 2010).

2.2.3.6 Fauna species

Fauna values within the central portion of the APSDA have been predominately identified as 'low' with the exception of major creek lines and the Calley Valley Wetlands, which have been identified as of 'high' fauna value. It is due to this close proximity to wetlands that a number of threatened species were recorded within the central portion of the APSDA. In total 17 fauna species of national significance were identified from desktop research occurring within this region, with 15 known to occur within the local area. Field surveys conducted within the central portion of the APSDA observed only one species of national significance, the squatter pigeon (refer Volume 5, Appendix 12). Another species of national significance, the black-throated finch (southern) (*Poephila cincta cincta)* has been recorded from the APSDA but has not been sighted in the central portion where infrastructure for this project will be located.

2.2.3.7 Threatened and Near Threatened Fauna Species

Database searches and / or fauna surveys identified 70 terrestrial fauna species listed either under the EPBC or VM Act as potentially occurring in the area. These include:

- 4 Endangered, 8 Vulnerable and 46 Migratory species under the EPBC Act; and
- 1 Potentially Extinct, 4 Endangered, 9 Vulnerable and 8 Near Threatened species under the NC Act.
- Field studies conducted by Waratah recorded two species listed as Near Threatened under the NC Act. These were the eastern curlew (*Numenius madagascariensis*) and the black-necked stork (*Ephippiorhynchus asiaticus*). Additional targeted field studies undertaken by Waratah to assess the suitability of habitat potentially impacted by project activities determined that habitat critical to two nationally significant species, black-throated finch and the water mouse (*Xeromys myoides*) is unlikely to be impacted by the development of the coal terminal (T4-7), rail alignment and multi user corridor (Volume 5, Appendix 12a).

The avifauna field survey also recorded eight Migratory Bird species listed under the EPBC Act, namely:

- eastern curlew (*Numenius madagascariensis*) – Migratory;
- sharp-tailed sandpiper (*Calidris acuminate*) – Migratory;
- red-necked stint (*Calidrus ruficollis*) – Migratory;
- latham's snipe (*Gallinago hardwickii*) – Migratory;
- white-bellied sea-eagle (*Haliaeetus leucogaster*) – Migratory;
- rainbow bee-eater (*Merops ornatus*) – Migratory;
- whimbrel (*Numenius phaeopus*) – Migratory; and
- marsh sandpiper (*Tringa stagnatilis*) – Migratory.

The complete results of the avifauna survey can be found in Volume 5, Appendix 12.

Previous fauna studies recorded three additional Threatened and Near Threatened bird species listed under the EPBC Act and / or the NC Act (MCF EIS, 2010; Stage 3 Expansion EIS, 2006), these include:

- Little Tern (Sterna albifrons) - Endangered under the NC Act (in estuarine habitats outside of the project footprint area);
- Squatter Pigeon (Geophaps scripta scripta) – Vulnerable under the EPBC Act (recorded near the coastal portion of the proposed multi-user transport corridor, the proposed coal stockyards and the proposed haul road locations); and
- Sooty Oystercatcher (Haematopus fuliginosus) – Near Threatened under the NC Act (in estuarine habitats outside of the project footprint area).

Fauna studies associated with the MCF EIS (2010) also made one potential recording of Coastal Sheathtail Bat (Taphozous australis), listed as Vulnerable under the NC Act, via an Anabat recorder. However, due to the similarity of this species call with the Common Sheathtail Bat (Taphozous georgianus) the MCF EIS (2010) was not able to confirm the presence of this species.

2.2.3.8 Introduced Fauna

Fauna studies associated with the MCF EIS (2010) identified five introduced fauna species occurring within this region. These include:

- cane toad (*Bufo marinus*);
- Asian house gecko (*Hemidactylus frenatus*);
- house mouse (*Mus musculus*);
- European rabbit (*Oryctolagus cuniculus*); and
- black rat (*Rattus rattus*).

Potential Impacts

The construction of the proposed development has the potential to have direct and indirect impacts on terrestrial ecology values of the area, these include:

- direct loss of vegetation and fauna habitat;
- mortality of fauna during construction;
- disruptions to wildlife behaviour as a result of increased noise, vibration and light levels;
- increased predation and competition by / with pest species;
- potential to alter the natural drainage pathways of watercourses (e.g. by directing surface water flow through man-made drainage structures such as culverts, changes to natural erosion processes);
- potential for pollution risk from sedimentation and contamination of surface water run-off resulting from flooding in surrounding areas including the coal stockyard by storm surge; and
- potential pollution contamination arising from spills, or inappropriate disposal or effluent wastewater.

The operation of the proposed development has the potential to have a number of direct and indirect impacts on the terrestrial ecology of the APSDA and the Port of Abbot Point. These impacts include:

- reduction in fauna habitat value due to increased noise, vibration and light levels;
- increased predation and competition by / with exotic species;
- fauna mortality due to road kill incidences; and
- potential for sedimentation and / or accidental release of pollutants into Caley Valley wetland.

Further assessment into potential impacts on terrestrial ecology will be undertaken by NQBP as part of the subsequent EIS.

2.2.4 AQUATIC ECOLOGY

Existing Environment

A number of aquatic flora and fauna habitats occur within and around the study area including Splitters Creek, Breakfast Creek, Goodbye Creek and the Caley Valley wetlands. Desktop investigations detailed in Volume 5, Appendix 13 suggests that a number of EPBC listed species occur within and surrounding the study area, including *Apus pacificus* (EPBC Act – Migratory and Marine), *Crocodylus porosus* (EPBC Act and NC Act – Vulnerable), *Ephippiorhynchus asiaticus* (NC Act – Near Threatened), *Eucalyptus raveretiana* (EPBC Act and NC Act Vulnerable), *Haliaeetus leucogaster* (EPBC Act – Migratory and Marine), *Hirundapus caudacutus* (EPBC Act – Migratory and Marine), *Nettapus coromandelianus* (NC Act – Near Threatened) and *Tadorna radja* ((NC Act – Near Threatened) occur within the Bowen catchment and Lower Catchments. Of these species, *Eucalyptus raveretiana* was observed at several of the sites. A total of 34 species of macro invertebrates, eight species of macro crustacea and 28 species of fish were observed across the project area. The fish observed during the study included three catadromous species, one facultative amphidromous fish species dependent on migratory linkages to the ocean and seven important fishery associated species. Species richness was highest within the Bowen River Catchment. A number of turtles and other aquatic related vertebrate species were also observed during field work.

Potential Impacts

The components of the coal terminal with the most potential to impact on aquatic ecosystems include construction of the coal stockyards and conveyor system and ongoing operation of the stockyards and conveyor. The activities with the most potential to impact streams include:

- piling works associated with the conveyor through the Caley Valley wetlands;
- clearing of vegetation, excavations and stockpiling of materials, including potential ASS, associated with construction of the coal stockyards;
- use of potentially contaminated / low quality water for dust suppression and other site activities; and
- storage of oil, fuel and chemicals on site.

2.2.5 GROUNDWATER RESOURCES

Existing Environment

The study area is located within the Bowen Groundwater Management Unit (GMU). Groundwater in the region has previously been used to supply water to the existing Port facility at Abbot Point. The source of the water was the Splitters Creek bore field which is located 14 km west of the Port. An annual volume of 250 L was licensed for the remaining bores within the area and this volume was not considered likely to increase (GHD, 2009).

A broad search of the DERM groundwater database indicated approximately 3,800 bores recorded in the Bowen GMU (refer Figure 3).

Potential Impacts

It is not currently known if the coal terminal will be located near any groundwater bores however, at a broad level it was determined through previous assessments detailed in Volume 5, Appendix 14 that potential impacts may include:

- impacts to groundwater from fuels and chemicals may occur from leaks and spills from fuel storage, refuelling activities and / or wastewater treatment and handling;
- potential for leaching of contaminants from coal stockpiles;
- sealing and settlement of areas due to the mass of infrastructure or coal stockpiles at the coal terminal may result in increased runoff and compaction of the shallow aquifer that may locally affect flow paths and groundwater levels around infrastructure;
- where saline or acid waters are present, there is potential for corrosive effects on infrastructure; and
- where groundwater levels are disturbed or large areas are sealed and either reduced rainfall infiltration and / or compaction of the underlying aquifer occurs there is potential for changes in shallow groundwater levels. In areas of acid sulphate soils this could result in exposure of ASS layers and generation of ASS Leachate.

2.2.6 SURFACE WATER RESOURCES

Existing Environment

An assessment of surface water resources detailed in Volume 5, Appendix 15 described the central portion of the APSDA area as low lying coastal floodplains and wetlands with some elevated areas including Mt Luce. Abbot Point falls within the Don River catchment; however, the dominant hydrological feature of the area is the Caley Valley Wetlands, which are situated to the south west of the existing coal terminal at Abbot Point. The wetland is currently bunded off from tidal exchange and is fed by a series of small creeks, including Armstrong and Sandy Creek. The total catchment draining into the wetland is approximately 400 km^2. The wetland retreats on a seasonal basis to a small lake (Lake Caley) and can become completely dry during drought; however when inundated, it can cover an area of 5,000 ha.

2.2.6.1 Aquifers

Searches of the DERM groundwater database indicate approximately 3,800 bores recorded in the Bowen GMU (refer Figure 3). These mainly comprise bores in alluvial unconfined aquifers with groundwater at 2 m to 20 m below ground level round the Don River (SKM, 2009). There are six bores within 5 km of the coal terminal. The data from these bores indicates a two aquifer system comprising a shallow alluvial aquifer system and the presence of a deeper saline granite aquifer.

The aquifers within the immediate vicinity of the coal terminal are comprised of Quaternary deposits and mud flats interspersed with alluvial deposits (SKM, 2009). Groundwater exists in a band of approximately 250 m width associated with the main dune ridge that intersects the site. A layer of silty sand at the base of the dunes is likely to form the primary water bearing strata within which the groundwater resources exist. This aquifer is likely to be bound above by sandy clay and below by saline clay sediments. It is also likely that within this aquifer system deeper saline groundwater exists below a lens of freshwater. The groundwater flow direction is likely to be both westerly and northerly from the granitoid intrusive and erosional outwash to the respective sinks of the Caley Valley Wetlands and Dingo Beach. Bores installed in the fractured granitic intrusive are interpreted as flowing into surrounding granitic outwash and coastal sediments.

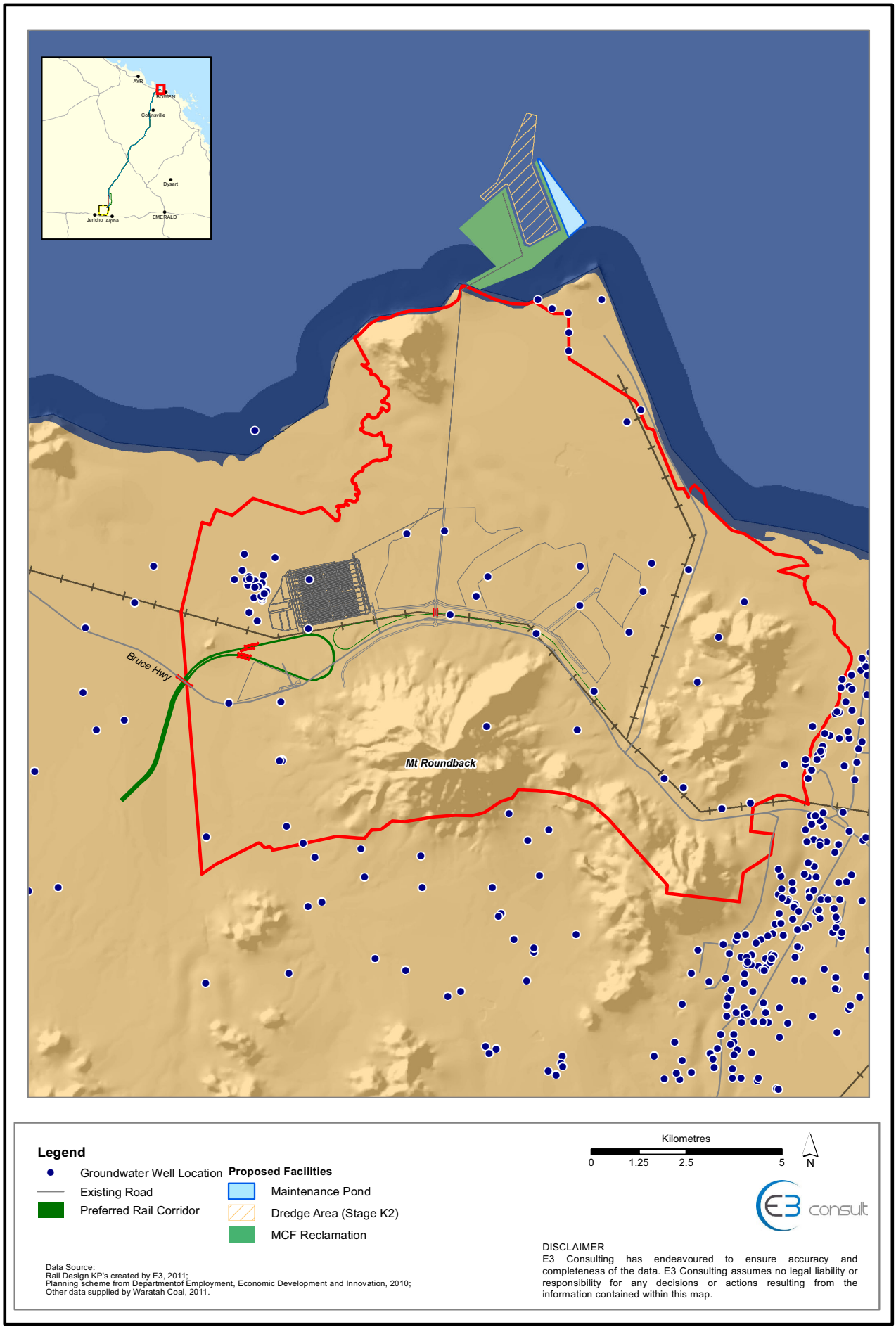
Water at the coal terminal is likely to be at a depth of <10 meters below ground level hosted in both the granite aquifer and shallow alluvial aquifers.

Potential Impacts

The activities with the most potential to impact streams include:

- piling works associated with the conveyor through the Caley Valley wetlands;
- clearing of vegetation, excavations and stockpiling of materials, including potential acid sulfate soils (ASS) associated with construction of the coal stockyards;
- disturbance and stockpiling of soils causing increased turbidity and / or suspended solids within the water column of streams / wetlands;
- the use of potentially contaminated / low quality water for dust suppression and other site activities; and
- the storage of chemicals on site (e.g. hydrocarbons, detergents, degreasers, etc) during construction and operations and the movement of these to streams / wetlands.

Figure 3. DERM Registered Groundwater Bores in the Vicinity of APSDA



2.2.7 AIR QUALITY

Existing Environment

The major existing dust emission source in the study area is the existing Abbot Point Coal Terminal (X50), currently with a coal handling capacity of 50 Mtpa. In addition, existing dust sources also include those typical for a rural area:

- the naturally blown dust from the landscape
- potential agricultural burning
- natural bush fires
- biogenic emissions
- sea water sprays for a coastal area

Assessments detailed in Volume 5 Appendix 18 identified that emissions will be released during both the construction phase and operation phase of the proposed coal terminal. During the construction phase of the coal terminal emissions will be primarily dust related, with some minor emissions of combustion pollutants such as nitrogen oxides and volatile organic compounds due to diesel and petrol vehicles and construction equipment. Activities that generate dust during the operational phase of the coal terminal include the transportation of coal around the coal terminal and coal stockpiling within the coal stockyards.

A number of sensitive receptors were identified within the central portion of the APSDA however it is not currently known how these receptors will be impacted.

Potential impacts

While the emission sources are currently known, the magnitude of emissions produced during both the construction and operation stage is not currently known. Further assessments of emissions and potential receptors will be undertaken as a part of the subsequent NQBP EIS process.

2.2.8 NOISE LEVELS

Existing Environment

Baseline ambient noise levels were sampled representing noise sensitive locations around the proposed coal terminal (refer Volume 5, Appendix 20). No baseline ground vibration assessment was undertaken, as there are no recognised sources of background vibration in the vicinity of the study area. A broad assessment established sensitive receptors or residences within the surrounding area (refer Figure 17, Volume 5, Appendix 20) that could potentially be impacted by the development of a coal terminal (T4-7).

Potential impacts

Noise will be generated from coal infrastructure including transfer towers, conveyors, motors, stacker reclaimers and surge bins. Previous assessments have further identified that conveyors are the most significant contribution to noise. The level of noise emissions produced by the coal infrastructure during both construction and operation is currently not known. Furthermore it is currently unknown what receptors will be impacted and the degree in which they will be impacted. Assessments will be undertaken to determine the potential impacts caused to surrounding receptors by NQBP as a part of their subsequent EIS process.

2.2.9 WASTE

Existing Environment

There are several waste management facilities in operation within the surrounding area seen in (refer Table 1).

The closest Landfill to the central portion of the APSDA is the Bowen Landfill, located on Collinsville Road approximately 16 km southwest of Bowen and approximately 17 km from the APSDA.

The Bowen Whitsunday Regional Waste Study (Maunsell AECOM, 2005) indicates that the Bowen Landfill operates under License No NR0175 relating to ERA 74 (e) – General Waste Disposal Facility, and ERA 76 – Regulated Waste Disposal. The report suggests that the current active cell at the landfill is unlined. Once full, three lined cells will be constructed with a combined lifespan of 15 years. Longer term, the site has the potential to be expanded to the south on council land.

Table 1. WRC Waste Management Facilities

FACILITY	LOCATION
Bowen Landfill	908 Collinsville Road, Bowen, QLD, 4804
Collinsvale Transfer Station	Scottville Road, Collinsville, QLD, 4805
Kelsey Creek Landfill	Kelsey Creek Road, Proserpine, QLD, 4008
Cannonvale Transfer Station	Carlo Drive, Cannonvale, QLD, 4802

Waste produced from both the operation and construction of the coal terminal will be required to be transported to one or more of the surrounding waste management facilities.

Potential impacts

Waste levels are predicted to increase during both the construction and operation phase of the coal terminal. Despite an expected overall increase in waste compared to baseline conditions, the cumulative impacts of the waste are expected to be minor due to the implementation of best practice protocols and a responsible waste management approach, ensuring the potential for harm to the environment and human health is minimised, and where possible, avoided completely. Assessment will be undertaken to evaluate potential waste impacts generated by the coal terminal as a part of the subsequent NQBP EIS process.

2.2.10 TRAFFIC AND TRANSPORT

Existing Environment

On a broad level the study area has well established transport facilities. There are a number of both private and public roads and the state controlled Bruce Highway within the immediate vicinity of the study area. The quality of the roads varies significantly from unsealed to sealed.

The North Coast Railway (narrow gauge, single track and electrified) with crossing loops is also situated within the study area. This railway is the principal general and containerised freight and passenger line within the Queensland Rail network.

Public transportation generally consisting of school buses is currently operating along the Bruce Highway and adjacent roads.

Potential impacts

An assessment conducted on the previous coal terminal location (refer Volume 5 Appendix 21) identified that the potential impacts associated with traffic and transport which will remain largely the same. These potential impacts are detailed below:

Generally, the coal terminal is identified as an appropriate use in the context of the region, with respect to traffic impact. The traffic impact of construction is expected to be more significant than operation; however, this will only occur over a short period. As such, detailed traffic impacts and assessments should be undertaken to identify temporary traffic impact mitigation. The proposed development of the coal terminal is expected to have a significant impact on the operation of the road network in the vicinity of the coal terminal.

The construction and operation of the coal terminal is not expected to compromise road capacity due to the existing low traffic volumes operating on local roads in the vicinity of the site. There is suitable spare capacity on the road network to accommodate higher traffic volumes and to provide access to the coal terminal, which is essentially an extension of the predominant land use in the immediate area. Further investigations will be undertaken by NQBP to assess the coal terminals impact on traffic and transportation as part of the subsequent EIS process.

2.2.11 INDIGENOUS CULTURAL HERITAGE

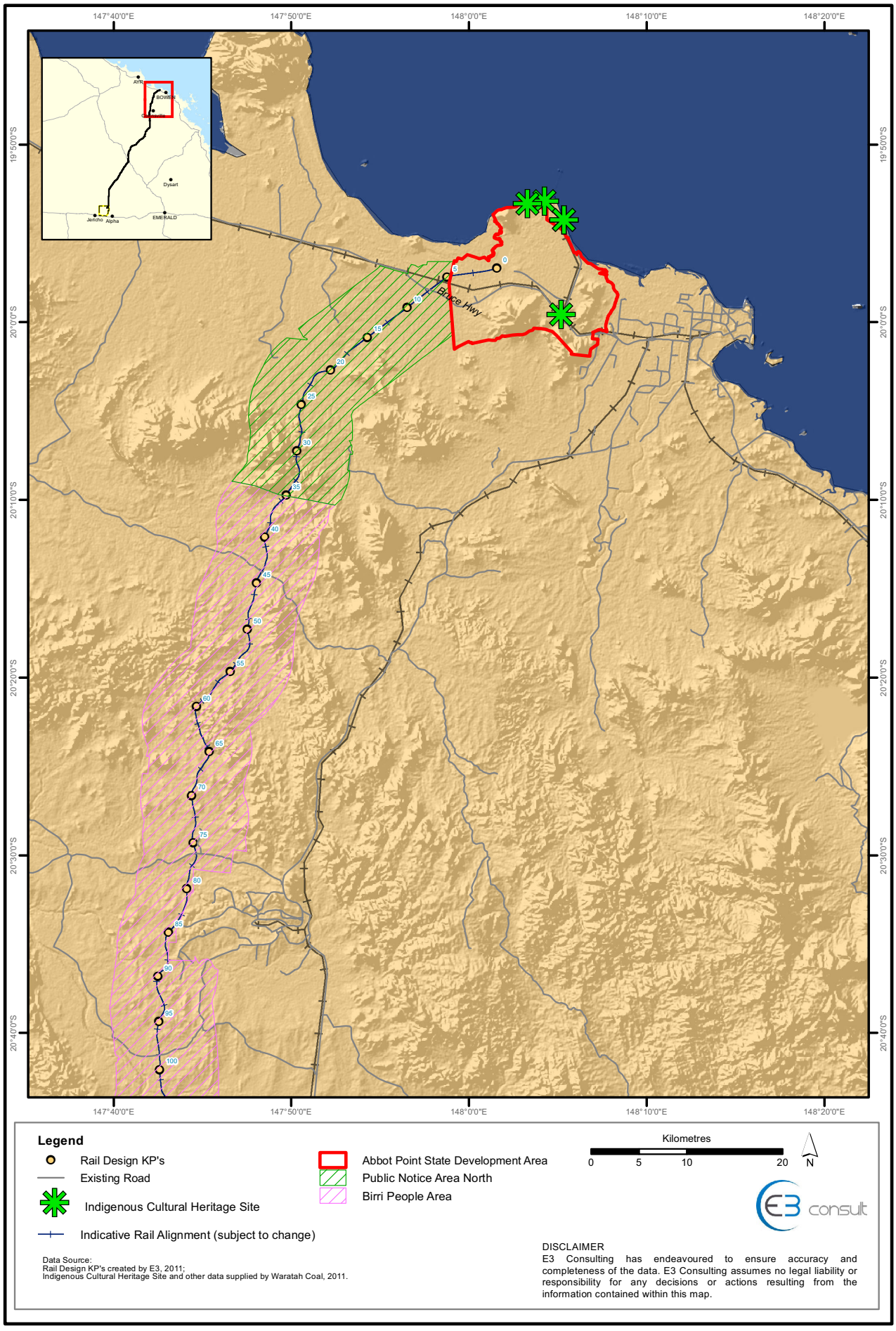
Existing Environment

A desktop review was conducted on indigenous cultural heritage sites within the central portion of the APSDA. This review established that archaeological surveys were undertaken by Northern Archaeological Consultancies (NAC) and Traditional Owner representatives for the X50 expansion of the Port and identified five cultural sites occurring around this region (refer Figure 4). These sites included a shell midden and artefact scatter, a stone-wall tidal fish trap and potential fish trap, a habitat tree, a historical survey mark and native woodland vegetation. None of these indigenous cultural heritage sites were found to be located within the study area.

Potential impacts

A desktop review of the NAC study has established that none of these listed Indigenous cultural heritage sites are located within the central portion of the APSDA and therefore will not be impacted by the development of a coal terminal within this area. Items of unrecorded Indigenous cultural heritage may occur within of near the proposed coal terminal infrastructure development process and without appropriate site management initiatives, may be threatened by construction impacts. NQBP will undertake further field assessments to locate any indigenous cultural heritage sites within the proposed coal terminal site as a part of their subsequent EIS process.

Figure 4. Coal Terminal Study Area and Registered Indigenous Cultural Heritage Sites



2.2.12 NON INDIGENOUS CULTURAL HERITAGE

Existing Environment

An assessment of non-indigenous cultural heritage sites (refer Volume 5 Appendix 22) established that six cultural features or sites that occur outside of the central portion of the APSDA. Five of the sites were found to be associated with two cattle properties, two sites are homesteads and three are dams. All of these sites were confirmed as not significant however one area of local significance is a mid-19th century beach house.

Potential impacts

As no non indigenous cultural heritage sites occur within the study are it is unlikely that the coal terminal development will have any impact on these features. NQBP will undertake further assessments on non-indigenous cultural heritage sites, through an EIS process.

2.2.13 SOCIAL VALUES

Existing Environment

The proposed coal terminal is located approximately 25 km north-west of Bowen. Referred to as the Bowen area in the EIS, it occupies 21,177 km^2 and contains a permanent residential population of around 13,000. The main towns are Bowen (population 10,000) and Collinsville (population 2,000) (refer Volume 5 Appendix 23).

Although the SIA focuses on the areas in which the mine, railway and coal terminal are located, impacts are also considered for Mackay and Rockhampton and at the regional and state level. For the purpose of the SIA, the region is defined as the Whitsunday Regional Council (WRC), Barcaldine Regional Council (BRC), Isaac Regional Council (IRC) and the Central Highlands Regional Council (CHRC).

Several Indigenous groups have traditional links to areas that contain project facilities, including the Juru People along the coast. Information is presented for Indigenous people and impacts specified separately as and when appropriate.

Potential impacts

The development of coal terminal is expected on a broad level to have the following impacts;

- an increase of up to 460 people, or a 5% increase in Bowen's current population;
- an increase in employment;
- demographic change due to workforce shortages, (foreign workers will either be granted temporary work visas or will migrate to Queensland);
- increased demand on social and welfare services;
- an increase in the number of children attending schools in Bowen;
- an increase in the demand for health care, and in particular, aged care facilities and services;
- an increase in the demand for child care services;
- an increase in the demand for a wide range of welfare services (including, for example, accommodation support, victims of domestic violence, victims of child abuse, mental health support, etc);
- an increase in demand on the rural fire brigade;
- an increase in demand on emergency services (resulting from increased population and increased traffic);
- higher housing prices (and higher rental costs) in the Bowen area;
- negative impact on the availability of tradesmen such as builders, plumbers, electricians and painters.
- increase in demand for temporary accommodation (hotels, motels and cabins, caravans and powered sites in caravan parks);
- increased 'sense of community' and improved community values with mining companies often provide funding for local infrastructure or community activities;
- increased housing prices and rental costs, and a possible increase in drug and alcohol abuse, and subsequent may increase in crime, in the larger centres. These adverse impacts should not be tied specifically to the development of resource projects, but to population growth and social change.; and
- minimal direct impact on disadvantaged groups, with the exception of rising housing prices in Bowen. The increase in the cost of living may disadvantage low income earners, in particular single parents and aged pensioners

2.2.14 ECONOMICS

Existing Environment

Whitsunday LGA was the second fastest growing LGA within the Study Area between 2004 and 2009, recording population growth of 2.8% per annum on average to 34,195 residents in 2009. Whitsunday LGA's population is projected to grow at a rate of 1.6% per annum on average through to 2031, to 48,041 residents (refer Volume 5, Appendix 24).

Mining is a key contributor to the local economy, with the northern tip of the Bowen Basin situated in the western parts of Whitsunday LGA, providing 22.3% of Gross Regional Product GRP. Transport, postal and warehousing is the second largest contributor to GRP (11.4%), driven by a combination of coal exports from the Abbot Point Coal Terminal and a sizable tourism industry centred on the internationally recognised Whitsunday Islands catered to by a charter boat fleet and the Hamilton and Proserpine airports. In line with its standing as a major tourism destination, accommodation and food services and retail trade are key employers in the Whitsunday LGA.

Key values of the economic environment of the Abbot Point Catchment include:

- high reliance on the mining sector: The Abbot Point Catchment incorporates the northern tip of the Bowen Basin, and the mining industry generated approximately 22.3% of GRP in the Abbot Point Catchment in 2008 / 09;
- considerable coal exports: The Abbot Point Coal Terminal, which is located within the APSDA and has undergone numerous upgrades in recent years to expand capacity to 50 Mtpa, is one of the key coal export terminals in the Mackay-Whitsunday region, along with Dalrymple Bay and Hay Point. Additional export capacity to 80 Mtpa and 110 Mtpa is currently being investigated for the Port of Abbot Point;
- the current expression of interest for the coal terminal (T4-7) will increase the capacity of the Port by an additional 120mtpa
- trade exposure: Because of the reliance on coal mining and coal exports in the region, fluctuations in global resource markets can potentially have considerable adverse impacts on the region. It is not known how global or national climate change policies will affect trade exposure;
- internationally recognised tourism product: The Whitsundays are an internationally recognised tourism destination, attracting over 200,000 international visitors per year and approximately 400,000 to 500,000 domestic visitors (Tourism Queensland, 2010). The juxtaposition of tourism in the internationally recognised Whitsundays and industrial exports from Bowen will require careful management, as both these have distinct needs and requirements. Satisfying the desires of both interests requires the careful management of the region's natural and human resources; and
- competition for labour: Recent activity throughout the Central Queensland region highlights that demand for mining commodities and higher wages paid by the mining sector has drawn labour from other sectors in the region.

Potential impacts

Key impacts of the Project in the Abbot Point Catchment and Queensland include:

- an increase in export revenues of $4.6 billion per annum through the export of 40 Mtpa of high quality thermal coal, representing an increase in Australian thermal coal export revenues of approximately 25.7% and an increase in total Australian exports of 2.0% from 2008 / 09 levels. The increase in export revenues may provide support for the strength of the Australian dollar;
- an increase in industry output in Queensland of $231.9 million per annum on average during the three year construction period, including an increase in output of $235.4 million per annum on average in the Abbot Point Catchment;
- a $5.2 billion per annum on average boost to industry output in the Queensland economy over the first five years of operation, increasing to an average of $5.7 billion per annum on average thereafter to 2036 / 37. The Abbot Point Catchment is estimated to record an annual increase in industry output above what would be achieved without the project of approximately $279.6 million during the first five years of operation, and $274.5 million per annum thereafter;
- support and development for local business and industry, through securing local contracts for the supply of goods and services for the project where possible and through other flow-on activities and increased household consumption. Key industries supported by the project in the Abbot Point Catchment

include transport and storage, construction and property and business services. A large proportion of goods and services are also anticipated to be sourced from elsewhere in the State, in particular from Mackay and southeast Queensland;

- increased competition for inputs such as land, labour and capital will result in resources moving to regions and industries that generate the greatest returns. As a result, output from Queensland's manufacturing and agricultural industries is estimated to decrease, largely due to increased competition for skilled labour. Agriculture in the Abbot Point Catchment will also be adversely impacted by disruption of property management practices for those properties intersected by the rail corridor, including potential impacts on land accessibility for land holders and livestock with restricted crossing between land parcels, additional costs for mustering, weed control and general property management (e.g., additional fuel usage, fencing, etc.), and the potential for 'land locking' of some land parcels (i.e., isolating or stranding some areas of land and thereby decreasing their commercial attractiveness and utilisation);
- an increase in employment in Queensland of 2,975 FTE employees per annum on average during the three year construction period, including 1,260 FTE employees in the Abbot Point Catchment. During the first five years of operation (2013 / 14 to 2017 / 18) the project is estimated to support an additional 4,464 FTE employment positions per annum on average in Queensland, and approximately 3,954 FTE employment positions per annum on average thereafter. In the Abbot Point Catchment the Project is estimated to support an additional 224 employment positions per annum on average during the first five years of operation, and approximately 124 FTE employment positions per annum on average thereafter;
- capacity building and skills development in the local labour force through apprenticeships, traineeships and skills training, as well as ongoing skills transfer between imported and local labour and the permanent migration of some skilled labour;
- a decrease in unemployment and the unemployment rate as a result of jobs created by the project throughout the project's study area, including the Abbot Point Catchment;
- an increase in household incomes of:
  - approximately $41.8 million per annum on average in the Abbot Point Catchment between 2010 / 11 and 2012 / 13, and approximately $17.1 million per annum on average between 2013 / 14 and 2036 / 37; and
  - approximately $452.7 million per annum on average between 2010 / 11 in Queensland and 2012 / 13 and $776.1 million per annum on average between 2013 / 14 and 2036 / 37;
- upward pressure on labour prices due to the increase in demand for skilled labour, particularly in industries experiencing skills shortages, further increasing household incomes. This increase is expected to be over and above any increases in the cost of living, representing an increase in real wages;
- a minor increase in residential property demand in the Abbot Point Catchment during construction and operation, although this is unlikely to have any significant implications on property prices;
- an increase in:
  - Queensland Government revenues of approximately $364.9 million, primarily in the form of approximately $343 million per annum in royalty payments; and
  - Australian Government revenues of approximately $709.8 million, primarily through avenues such as company tax (approximately $302.9 million), personal income tax (approximately $237.8 million) and goods and services tax (approximately $158.3 million).

These increased government revenues will provide opportunities for government to fund additional infrastructure and enhanced service provision at a range of levels; and

- development of rail and port infrastructure, as well as local road infrastructure, an airstrip and utilities infrastructure to support the project (e.g., power, water and telecommunications). This will provide benefits to the entire project study area by providing a link between the abundant resources in the Galilee Basin and export infrastructure, assisting in commercialising these resources. This infrastructure will also improve regional business capacity and competitiveness, and will provide positive legacy benefits for the region.

2.3 CONCLUSION

While it is acknowledged that the coal terminal will have an impact on the existing environment, the EIS to be undertaken by NQBP for the MCF, coal terminal (T4-7) and multi user corridor will identify specific impacts, enabling Waratah to design appropriate mitigation measures and develop management plans. Similarly the design will include options to mitigate the impact of weather events on infrastructure and operations.

2.4 COMMITMENTS

Waratah coal is committed to the following actions:

- Undertaking all coal terminal works in accordance with contractual agreements made with NQBP;
- Complying with all necessary approvals and legislation issued by local, State and Federal Government;
- Undertaking further assessments where necessary to determine potential impacts of all activity undertaken at Waratah Coals future coal terminal.